STATE OF DELAWARE
DEPARTMENT OF OMB / DIVISION OF
FACILITIES MANAGEMENT
CONTRACT # MC1002000445

SPECIFICATIONS
FOR

CAFETERIA RENOVATIONS

AT

CARVEL STATE OFFICE BUILDING
820 N FRENCH STREET
WILMINGTON, DE  19801

PREPARED
BY

STUDIO JAED ARCHITECTS & ENGINEERS
2500 WRANGLE HILL ROAD
BEAR, DE  19701
STUDIO JAED PROJECT # 19034

ISSUED FOR
BIDDING
SEPTEMBER 22, 2020
STATE OF DELAWARE
DEPARTMENT OF OMB / DIVISION OF
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SEALS PAGE

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RESPONSIBLE FOR DIV. 26 AND DIV. 28.

END OF SECTION
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 CONTRACTING REQUIREMENTS

INTRODUCTORY INFORMATION

00 01 01 – PROJECT TITLE 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 DOCUMENT AIA A101-2017

00 54 13 – SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR

00 54 14 – SUPPLEMENT TO A101-2017 – EXHIBIT A – INSURANCE & BONDS

SAMPLE DOCUMENT AIA A101-2017 – EXHIBIT A – INSURANCE & BONDS

00 61 13.13 – PERFORMANCE BOND
00 61 13.16 – PAYMENT BOND

00 62 76 – APPLICATION AND CERTIFICATE FOR PAYMENT FORMS

SAMPLE DOCUMENTS AIA G702-1992 & G703-1992

00 63 73 – ALLOWANCE AUTHORIZATION FORM

00 65 01 – CLOSEOUT DOCUMENTS CHECKLIST

00 72 13 – GENERAL CONDITIONS TO THE CONTRACT

SAMPLE DOCUMENT AIA A201-2017
00 73 13 – SUPPLEMENTARY GENERAL CONDITIONS TO THE CONTRACT

00 73 46 – WAGE RATE DETERMINATION SCHEDULE

00 81 13 – GENERAL REQUIREMENTS

00 81 14 – DRUG TESTING FORMS

DIVISION 01 – GENERAL REQUIREMENTS

01 10 00 – SUMMARY

01 20 00 – PRICE AND PAYMENT PROCEDURES

01 21 00 – ALLOWANCES

01 23 00 – ALTERNATES

01 30 00 – ADMINISTRATIVE REQUIREMENTS

01 40 00 – QUALITY REQUIREMENTS

01 42 16 – DEFINITIONS

01 50 00 – TEMPORARY FACILITIES AND CONTROLS

01 60 00 – PRODUCT REQUIREMENTS

01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS

01 73 29 – CUTTING AND PATCHING

01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

01 76 10 – TEMPORARY PROTECTIVE COVERINGS

01 78 00 – CLOSEOUT SUBMITTALS

01 79 00 – DEMONSTRATION AND TRAINING

DIVISION 02 – EXISTING CONDITIONS

02 41 00 – DEMOLITION

DIVISION 05 – METALS

05 40 00 – COLD-FORMED METAL FRAMING

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

06 10 00 – ROUGH CARPENTRY

06 20 00 – FINISH CARPENTRY
06 65 10 – SOLID SURFACE FABRICATIONS

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 84 00 – FIRESTOPPING
07 90 05 – JOINT SEALERS

DIVISION 08 – OPENINGS

08 11 13 – HOLLOW METAL DOORS AND FRAMES
08 14 16 – FLUSH WOOD DOORS
08 31 00 – ACCESS DOORS AND PANELS
08 71 00 – DOOR HARDWARE
08 80 00 – GLAZING
08 87 13 – SUN CONTROL WINDOW FILM

DIVISION 09 – FINISHES

09 21 16 – GYPSUM BOARD ASSEMBLIES
09 51 00 – ACOUSTICAL CEILINGS
09 65 00 – RESILIENT FLOORING
09 90 00 – PAINTING AND COATING

DIVISION 10 – SPECIALTIES

10 14 00 – SIGNAGE
10 26 00 – WALL AND DOOR PROTECTION
10 44 00 – FIRE PROTECTION SPECIALTIES

DIVISION 12 - FURNISHINGS

12 24 13 – ROLLER SHADES
12 30 40 – LAMINATE CLAD CASEWORK

DIVISION 21 – FIRE SUPPRESSION

21 05 00 – COMMON WORK RESULTS FOR FIRE SUPPRESSION
21 05 48 – VIBRATION AND SEISMIC CONTROLS FOR EQUIPMENT
21 05 53 – IDENTIFICATION FOR FIRE SUPP. PIPING AND EQUIPMENT
21 13 00 – FIRE SUPPRESSION SPRINKLERS

DIVISION 22 – PLUMBING

22 10 05 – PLUMBING PIPING
22 40 00 – PLUMBING FIXTURES

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 05 53 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 05 93 – TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 07 13 – DUCT INSULATION
23 31 00 – HVAC DUCTS AND CASINGS
23 33 00 – AIR DUCT ACCESSORIES
23 34 23 – HVAC POWER VENTILATORS
23 37 00 – AIR OUTLETS AND INLETS

DIVISION 26 – ELECTRICAL

26 05 01 – MINOR ELECTRICAL DEMOLITION
26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 34 – CONDUIT
26 05 37 – BOXES
26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 23 – LIGHTING CONTROL DEVICES
26 24 16 – PANELBOARDS
26 27 17 – EQUIPMENT WIRING
26 27 26 – WIRING DEVICES
26 28 13 – FUSES
26 28 16.13 – ENCLOSED CIRCUIT BREAKERS

26 28 16.16 – ENCLOSED SWITCHES

26 29 13 – ENCLOSED CONTROLLERS

26 51 00 – INTERIOR LIGHTING

DIVISION 27 – COMMUNICATIONS

27 10 05 – STRUCTURED CABLING FOR VOICE AND DATA-INSIDE-PLANT

END OF SECTION
## LIST OF DRAWING SHEETS

### GENERAL INFORMATION
- **G-000** COVER SHEET
- **GC000** CODE COMPLIANCE, ABBREVIATIONS, AND SYMBOLS

### ARCHITECTURAL
- **A-001** OVERALL MEZZANINE FLOOR PLAN
- **AD101** DEMOLITION FLOOR PLANS
- **A-101** NEW CONSTRUCTION FLOOR PLANS AND DOOR SCHEDULE
- **A-102** EQUIPMENT AND FURNITURE PLANS
- **A-103** INTERIOR ELEVATIONS AND CASEWORK SECTIONS

### MECHANICAL
- **M-000** MECHANICAL SYMBOLS, ABBREVIATIONS, AND NOTES
- **M-100** MECHANICAL PLANS

### ELECTRICAL
- **E-000** ELECTRICAL SYMBOLS, ABBREVIATIONS, AND NOTES
- **E-102** ELECTRICAL 2ND FLOOR PLANS
- **E-102A** ELECTRICAL 2.5 FLOOR PLANS
- **E-111** ELECTRICAL 11.5 FLOOR PLAN
- **E-500** ELECTRICAL DETAILS

### PLUMBING
- **P-000** PLUMBING SYMBOLS, ABBREVIATIONS, AND NOTES
- **P-102** PLUMBING 2ND FLOOR PLANS

### FIRE PROTECTION
- **F-000** FIRE PROTECTION SYMBOLS, ABBREVIATIONS, AND NOTES
- **F-102** FIRE PROTECTION 2ND FLOOR PLANS

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END OF SECTION
ADVERTISEMENT FOR BIDS

Sealed bids for OMB/DFM Contract No. MC1002000445 – State of Delaware – Carvel State Office Building – Cafeteria Renovations will be received by the State of Delaware, Office of Management and Budget, Division of Facilities Management, by either electronic mail or by mail as follows. Bid submissions submitted by electronic mail must be sent to DFM-BID@delaware.gov and a hard copy of the entire submission shall be sent by mail within five (5) business days of the bid submission deadline.

Sealed bids shall be mailed and addressed to the Division of Facilities Management, Thomas Collins Building, 540 S. DuPont Highway, Suite 1 (Third Floor), Dover, DE 19901. The outer envelope should clearly indicate: “OMB/DFM CONTRACT NO. MC1002000445 – STATE OF DELAWARE – CARVEL STATE OFFICE BUILDING – CAFETERIA RENOVATIONS - SEALED BID - DO NOT OPEN.”

Bids will be accepted until 9:30 AM on Monday, November 23, 2020. Bids will be opened and read aloud at 10:15 AM on Monday, November 23, 2020. Bidder bears the risk of late delivery. Any bids received after the stated time whether by mail or electronic mail will be rejected and the mailed bids will be returned unopened. The bid opening will be held through electronic means to comply with the Governor’s State of Emergency. To attend the bid opening, the public may participate by joining the meeting at Webex.com, meeting number 173 726 7555 and password 4DkPH23pUpF. There will be no in-person meeting.

The project involves the following at the Carvel State Office Building in Wilmington, DE: renovation of the existing cafeteria. There will be demolition of select walls, flooring, ceiling, and finishes in the space, and construction of new walls and finishes per the new layout. There is associated mechanical, electrical, plumbing, sprinkler, and fire alarm scope to support the new layout.

A MANDATORY Pre-Bid Meeting will be held on 9:30 AM on Tuesday, November 3, 2020. In compliance with the Governor’s State of Emergency, the pre-bid meeting will be held by electronics means. There will be no in-person meeting. The public may join the pre-bid meeting at Webex.com, meeting number 173 655 1787 and password pE43xpEP4hj for the purpose of establishing the list of subcontractors and to answer questions. Representatives of each party to any Joint Venture must attend this meeting. ATTENDANCE OF THIS MEETING IS A PREREQUISITE FOR BIDDING ON THIS CONTRACT.

Contract documents may be obtained at Reprographics Center, Inc., 298 Churchmans Road, New Castle, DE 19720, phone (302) 328-5019, upon receipt of $100.00 per physical set or $75.00 per electronic set, non-refundable. Checks are to be made payable to “StudioJAED”.

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.

END OF SECTION
Effective Date: March 30, 2020

To the Business Partners/Vendors of the State of Delaware:

The U.S. and Countries around the world are experiencing an unprecedented risk of exposure to CoViD19 (Corona Virus Disease). In order to ensure the highest level of safety to its business partners, the State of Delaware is implementing a virtual procurement process, replacing all of its “in person” encounters with “virtual experiences”. We are here to keep your team connected on any internet-enabled device, maintaining the highest level of process integrity while mitigating your risk of exposure.

Effective today, the Team of the Office of Management and Budget (OMB), Government Support Services (GSS) and the Division of Facilities Management (DFM) will begin this new virtual procurement process on Monday, March 30, 2020. The following processes will be done by electronic means in lieu of in-person gatherings:

1. Pre-Bid meetings
2. Bid submissions
3. Bid Openings

**Pre-Bid meetings**

Participation in pre-bid meetings will continue to be mandatory. Participants must download the WebEx application (this is free, can be downloaded to your phone or computer devices, and can be found at [https://www.webex.com/](https://www.webex.com/)).

The bid advertisement posted at bids.delaware.gov will identify the date and time for the pre-bid. Participants will be provided a meeting number to access the meeting at Webex.com. Both video & voice features will be available. “In-person” pre-bid attendance will not be available.

When the virtual meeting begins, participants will be required to state their name, title and company name at the beginning of the meeting and again at the end of the meeting.

Participants must remain for the duration of the entire meeting. If a participant becomes disconnected from WebEx, the participant will need to call back immediately and announce that they’ve returned to the meeting.

Prior to speaking to make observations or ask questions, the participant must identify themselves and their company name.

If a “walk through” is conducted, it will be scheduled by the Project Manager (PM) in groups of ten (10) or less participants and be strictly conducted under the Host Agency’s (HA) visitation procedures. Participants will be informed of those procedures prior to the scheduled “walk through”.

**Bid submissions**

“In-person” bid/proposal submissions will no longer be accepted.
Bids must be sent by email to DFM-BID@delaware.gov, and one (1) full hard copy by mail. The hard copy does not need to be received by the bid submission deadline, but the email bid submission must be received timely or the bid will be rejected.

Bid advertisements at bids.delaware.gov will indicate a bid submission due date and time as well as a bid opening date and time. These bid opening dates/ and times must be met in order for the submission to be considered responsive.

**Bid openings**

Interested parties can log to listen/watch by utilizing Webex.com and the meeting number associated. Guests **will not be admitted into a facility** for a bid opening. Bid openings will be recorded and posted to bids.delaware.gov as an addendum. A link and password will be provided at the bottom of the bid tabulation sheet.

**Final Word**

Thank you for bearing with us during this change. As we move forward in this evolving environment, each of us will have to do our part to mitigate that transmission of COVID-19. Please remember to:

- Follow Governor Carney’s orders ([https://governor.delaware.gov/health-soe/](https://governor.delaware.gov/health-soe/))
- Wash your hands frequently
- Cover your cough with a tissue or inside of your elbow
- Disinfect surfaces frequently
- Stay home if you are sick
- Get your flu shot, if you haven’t already.

If you have any questions concerning this change in process, please contact the Project Manager listed as the contact on the bids.delaware.gov website.

Best Regards,

OMB/DFM
TABLE OF ARTICLES

1. DEFINITIONS
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.

ARTICLE 2: BIDDER'S REPRESENTATIONS

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 his 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 and shall submit a copy of a valid Delaware Business License with their Bid.

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.

4.1.12 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
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).

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.

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.

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.

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.

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(d)(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(d)(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, 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 The scale of the wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work.

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.”

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 one year after the date of substantial completion.

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 a copy of its Delaware business license,
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 BUSINESS DESIGNATION FORM

6.2.1 Successful bidder shall be required to accurately complete an Office of Management and Budget Business Designation Form for Subcontractors.

6.3 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 AGENCY 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
BID FORM

For Bids Due: ___________________________ To: OMB/ Division of Facilities Management

540 South DuPont Highway, Suite 1
Dover, DE 19901

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: Remove existing interior storefront system, including transom and door D233-1. Furnish and install new 90 minute fire rated interior storefront system.

Add/Deduct: ___________________________

($ ___________________________ )

UNIT PRICES

There are no unit prices.

ALLOWANCES

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

ALLOWANCE No. 1: For general contingencies and repairs, the remaining balance of which is to be returned to owner by credit change order at project conclusion ($10,000).
Cafeteria Renovations
Carvel State Office Building; 820 N French Street; Wilmington, DE 19801
Contract No. MC1002000445

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 within _______ calendar days of the Notice to Proceed.

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: ___________________________
(SEAL) (Authorized Signature)

(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)
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, note 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.

<table>
<thead>
<tr>
<th>Subcontractor Category</th>
<th>Subcontractor</th>
<th>Address (City &amp; State)</th>
<th>Subcontractors tax-payer ID # or Delaware Business license #</th>
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</table>
Cafeteria Renovations
Carvel State Office Building; 820 N French Street; Wilmington, DE 19801
Contract No. MC1002000445

**BID FORM**

3.  
   - A.  
   - B.  
   - C.  

4.  
   - A.  
   - B.  
   - C.  

5.  
   - A.  
   - B.  
   - C.  

BID FORM
00 41 13 - 4

NOT FOR BIDDING
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 (Project or Contract Number) 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.
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 ________________________________.
Cafeteria Renovations
Carvel State Office Building; 820 N French Street; Wilmington, DE 19801
Contract No. MC1002000445

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.
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. OMB MC1002000445, to be paid to the State for the use and benefit of OMB / Division of Facilities Management 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 OMB / Division of Facilities Management 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 OMB / Division of Facilities Management 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__) day.

SEALED, AND DELIVERED IN THE
Presence of

________________________________________
Name of Bidder (Organization)

________________________________________
Authorized Signature

Title

________________________________________
Name of Surety

Title

________________________________________
Witness: ____________________________

________________________________________
Title
STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR A101-2017

The contract to be utilized on this project shall be the “Standard Form of Agreement Between Owner and Contractor” AIA Document A101-2017, including AIA Document A101 – 2017 Exhibit A, as well as Supplements to A101-2017 and Exhibit A and the State of Delaware’s General Requirements.
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)

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

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

Sample Project

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

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. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

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

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

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS
The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT
The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Choose 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

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

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

<table>
<thead>
<tr>
<th>Portion of Work</th>
<th>Substantial Completion Date</th>
</tr>
</thead>
</table>

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

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor’s performance of the Contract. The Contract Sum shall be Zero Dollars and Zero Cents ($ 0.00), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
<th>Conditions for Acceptance</th>
</tr>
</thead>
</table>

§ 4.3 Allowances, if any, included in the Contract Sum:

(Identify each allowance.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
</table>

§ 4.4 Unit prices, if any:

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

<table>
<thead>
<tr>
<th>Item</th>
<th>Units and Limitations</th>
<th>Price per Unit ($0.00)</th>
</tr>
</thead>
</table>

§ 4.5 Liquidated damages, if any:

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

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)
ARTICLE 5 PAYMENTS
§ 5.1 Progress Payments
§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

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

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

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

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

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

§ 5.1.6.1 The amount of each progress payment shall first include:
  .1 That portion of the Contract Sum properly allocable to completed Work;
  .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
  .3 That portion of Construction Change Directives that the Architect determines, in the Architect’s professional judgment, to be reasonably justified.

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

§ 5.1.7 Retainage
§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)
§ 5.1.7.1 The following items are not subject to retaiine:
(Insert any items not subject to the withholding of retaiine, such as general conditions, insurance, etc.)

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

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

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

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

§ 5.2 Final Payment
§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when
.1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
.2 a final Certificate for Payment has been issued by the Architect.

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

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

%  

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 Initial Decision Maker
The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)
§ 6.2 Binding Dispute Resolution
For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[ ] Litigation in a court of competent jurisdiction

[ ] Other (Specify)

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

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

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

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

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

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)
§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

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

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

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, 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 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS
§ 9.1 This Agreement is comprised of the following documents:

1. AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
3. AIA Document A201™–2017, General Conditions of the Contract for Construction
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

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Date</th>
</tr>
</thead>
</table>

.6 Specifications

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Date</th>
<th>Pages</th>
</tr>
</thead>
</table>

.7 Addenda, if any:

<table>
<thead>
<tr>
<th>Number</th>
<th>Date</th>
<th>Pages</th>
</tr>
</thead>
</table>

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

.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)
AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:

(Insert the date of the E204-2017 incorporated into this Agreement.)

The Sustainability Plan:

Title  Date  Pages

Supplementary and other Conditions of the Contract:

Document  Title  Date  Pages

.9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

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

OWNER (Signature)  CONTRACTOR (Signature)

(Printed name and title)  (Printed name and title)
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)

THE OWNER:
(Name, legal status and address)

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 A201™–2017, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER’S INSURANCE
§ A.2.1 General
Prior to commencement of the Work, the Owner shall secure the insurance, 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 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.

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

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

This document is intended to be used in conjunction with AIA Document A201™–2017, General Conditions of the Contract for Construction. Article 11 of A201™–2017 contains additional insurance provisions.
§ 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 insured. 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.)

<table>
<thead>
<tr>
<th>Causes of Loss</th>
<th>Sub-Limit</th>
</tr>
</thead>
</table>

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

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Sub-Limit</th>
</tr>
</thead>
</table>

§ 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 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.

§ 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.)

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Limits</th>
</tr>
</thead>
</table>

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

§ A.3.2 Contractor's Required Insurance Coverage

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

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

§ 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

.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.

Init.

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User Notes:

(1298886473)
§ 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, 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.

§ 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.)

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<tr>
<th></th>
<th>§ A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall 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.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>§ 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.</td>
</tr>
<tr>
<td></td>
<td>§ 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.</td>
</tr>
<tr>
<td></td>
<td>§ 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 &quot;all-risks&quot; completed value form.</td>
</tr>
<tr>
<td></td>
<td>§ A.3.3.2.5 Property insurance on an &quot;all-risks&quot; completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.</td>
</tr>
<tr>
<td></td>
<td>§ A.3.3.2.6 Other Insurance (List below any other insurance coverage to be provided by the Contractor and any applicable limits.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Limits</th>
</tr>
</thead>
</table>

Init. / 

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§ 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.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Penal Sum ($0.00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment Bond</td>
<td></td>
</tr>
<tr>
<td>Performance Bond</td>
<td></td>
</tr>
</tbody>
</table>

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:
SUPPLEMENT TO AGREEMENT BETWEEN OWNER AND CONTRACTOR A101-2017

The following supplements modify the “Standard Form of Agreement Between Owner and Constructor,” AIA Document A101-2017. 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 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.”

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.”

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

ARTICLE 6: DISPUTE RESOLUTION

6.2 BINDING DISPUTE RESOLUTION

Check Other – and add the following sentence:

"Any remedies available in law or in equity.”

ARTICLE 7: TERMINATION or SUSPENSION

7.1.1 Delete paragraph 7.1.1 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.”

END OF SECTION
The following supplements modify the “Standard Form of Agreement Between Owner and Contractor,” AIA Document A101-2017 Exhibit A Insurance and Bonds. 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 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.3.1.3 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.3.3.2.1 Delete paragraph 3.3.2.1 in its entirety and replace with the following:
Property Insurance of the same type and scope satisfying the requirements identified in Section A.2.3, The Contractor shall comply with all obligations of the Owner under A.2.3 except to the extent provided below. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required.

END OF SECTION
PERFORMANCE BOND

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

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 State of Delaware Office of Management & Budget ("Owner"), 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. OMB MC1002000445 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: ____________________________
Title: ____________________________

(Surety)

SURETY

Name: ____________________________
Witness or Attest: Address: ____________________________

By: ____________________________ (SEAL)
Name: ____________________________
Title: ____________________________

(Surety)
PAYMENT BOND

STATE OF DELAWARE
OFFICE OF MANAGEMENT AND BUDGET

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 State of Delaware Office of Management & Budget ("Owner"), 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. OMB MC1002000445 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 moneys 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: __________________________

Title: __________________________

(Corporate Seal)

SURETY

Name: ________________________________

Witness or Attest: Address: ________________________________

________________________________________

By: ____________________________ (SEAL)

Name: __________________________

Title: __________________________

(Corporate Seal)
APPLICATION AND CERTIFICATE FOR PAYMENT FORMS

The Application and Certificate for Payment are as stated in the American Institute of Architects Document AIA G702 & AIA G703 (1992 version) entitled Application and Certificate for Payment and is part of this project manual as if herein written in full. A draft sample has been included for reference.
AIA Document G702™ – 1992

Application and Certificate for Payment

TO OWNER: sample
FROM CONTRACTOR: VIA ARCHITECT:

CONTRACTOR’S APPLICATION FOR PAYMENT

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

1. ORIGINAL CONTRACT SUM ............................................. $ 0.00
2. Net change by Change Orders .............................................. $ 0.00
3. CONTRACT SUM TO DATE (Line 1 + 2) ................................. $ 0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) ... $ 0.00
5. RETAINAGE:
   a. 0% of Completed Work: (Column D + E on G703) .................. $ 0.00
      b. 0% of Stored Material: (Column F on G703) ....................... $ 0.00
   Total Retainage (Lines 5a + 5b or Total in Column I of G703) .... $ 0.00
6. TOTAL EARNED LESS RETAINAGE ................................. $ 0.00
   (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ...................... $ 0.00
   (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE ............................................... $ 0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE 
   (Line 3 less Line 6) ................................................... $ 0.00

CHANGE ORDER SUMMARY

<table>
<thead>
<tr>
<th>ADDITIONS</th>
<th>DEDUCTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
</tbody>
</table>

TOTAL $ 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:

ARCHITECT’S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect’s 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 certified.)

ARCHITECT:
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 rights of the Owner or Contractor under this Contract.

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User Notes: (2049092763)
AIA Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached. In tabulations below, amounts are stated to the nearest dollar. Use Column I on Contracts where variable retention for line items may apply.

<table>
<thead>
<tr>
<th>A ITEM NO.</th>
<th>B DESCRIPTION OF WORK</th>
<th>C SCHEDULED VALUE</th>
<th>D WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)</th>
<th>E THIS PERIOD</th>
<th>F MATERIALS PRESENTLY STORED (NOT IN D OR E)</th>
<th>G TOTAL COMPLETED AND STORED TO DATE (D+E+F)</th>
<th>H % (G / C)</th>
<th>I BALANCE TO FINISH (C - G)</th>
<th>J RETAINAGE (IF VARIABLE RATE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAND TOTAL</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
<td>0.00 %</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
<td>$ 0.00</td>
</tr>
</tbody>
</table>

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User Notes: (875520561)
ALLOWANCE AUTHORIZATION FORM

Project: Cafeteria Renovations at Carvel State Office Building

Architect: StudioJAED Architects & Engineers

Contractor:

AAA No.: Initiation Date:

The Allowance is allocated as follows:

Allowance No. 1: $10,000 for General Contingencies and Repairs.

Total original Contract Allowance was: $10,000.00
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: Approved by:
Contractor Owner

By (Signature): _________________________ By (Signature): _________________________
Date: __________________________ Date: __________________________

END OF SECTION
Closeout Document Checklist

Project: 

Date: 

1. 2 original Form G704 Substantial Completion
2. 2 original Form G706 Affidavit of Payment of Debts and Claims
3. 2 original Form 706A Release of Liens Contractor / Subcontractor
4. 2 original Form 707 Consent of Surety Company
5. 3 original Final Payment App 
6. Meeting Minutes
7. General Correspondence
8. Certificate of Occupancy
9. Environmental Certificates
10. 2 original of Warranties (Letter of Guarantee and Warranty Info)
11. 2 O&M Manuals
12. 2 Hard Copy of As-Built Drawings
13. 2 sets of drawing discs. Updated CAD files
14. Occupancy Permits
15. Test & Balancing Reports
16. Field Reports/Inspection Reports
17. Pest Control Final Inspection Report & Warranty (Slabs over 400SF)
18. 2 original Substantial Completion Form
19. 2 sets of Record Shop Drawings and submittals
20. Affidavit of Discharge of State Tax Liability
21. Copy of completed final punch list signed off on by Owner’s Rep
22. Punch list Closeout Letter.
GENERAL CONDITIONS TO THE CONTRACT FOR CONSTRUCTION A201-2017

The General Conditions of this Contract are as stated in the American Institute of Architects Document AIA A201 (2017 Edition) entitled General Conditions of the Contract for Construction as revised by the Supplementary General Conditions and is part of this project manual as if herein written in full.
AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

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

Sample

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

TABLE OF ARTICLES
1 GENERAL PROVISIONS
2 OWNER
3 CONTRACTOR
4 ARCHITECT
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

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

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.
INDEX
(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work
9.6.6, 9.9.3, 12.3
Acceptance of Work
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3
Access to Work
3.16, 6.2.1, 12.1
Accident Prevention
10
Acts and Omissions
3.2, 3.3.2, 3.12.8, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2
Addenda
1.1.1
Additional Costs, Claims for
3.7.4, 3.7.5, 10.3.2, 15.1.5
Additional Inspections and Testing
9.4.2, 9.8.3, 12.2.1, 13.4
Additional Time, Claims for
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, 15.1.6
Administration of the Contract
3.1.3, 4.2, 9.4, 9.5
Approval
2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1
Arbitration
8.3.1, 15.3.2, 15.4
ARCHITECT
4
Architect, Definition of
4.1.1
Architect, Extent of Authority
2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1
Architect, Limitations of Authority and Responsibility
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2
Architect’s Additional Services and Expenses
2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4
Architect’s Administration of the Contract
3.1.3, 3.7.4, 15.2, 9.4.1, 9.5
Architect’s Approvals
2.5, 3.1.3, 3.5, 3.10.2, 4.2.7
Architect’s Authority to Reject Work
3.5, 4.2.6, 12.1.2, 12.2.1
Architect’s Copyright
1.1.7, 1.5
Architect’s Decisions
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2
Architect’s Inspections
3.7.4, 4.2.2, 4.2.9, 4.9.2, 9.8.3, 9.9.2, 9.10.1, 13.4
Architect’s Instructions
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2
Architect’s Interpretations
4.2.11, 4.2.12
Architect’s Project Representative
4.2.10
Architect’s Relationship with Contractor
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7.8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2
Architect’s Relationship with Subcontractors
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3
Architect’s Representations
9.4.2, 9.5.1, 9.10.1
Architect’s Site Visits
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Asbestos
10.3.1
Attorneys’ Fees
3.18.1, 9.6.8, 9.10.2, 10.3.3
Award of Separate Contracts
6.1.1, 6.1.2
Award of Subcontracts and Other Contracts for Portions of the Work
5.2
Basic Definitions
1.1
Bidding Requirements
1.1.1
Binding Dispute Resolution
8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1
Bonds, Lien
7.3.4.4, 9.6.8, 9.10.2, 9.10.3
Bonds, Performance, and Payment
7.3.4.4, 9.6.7, 9.10.3, 11.1.2, 11.1.3, 11.5
Building Information Models Use and Reliance
1.8
Building Permit
3.7.1
Capitalization
1.3
Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5
Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4
Certificates of Inspection, Testing or Approval
13.4.4
Certificates of Insurance
9.10.2

Change Orders
1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2

Change Orders, Definition of
7.2.1

CHANGES IN THE WORK
2.2.2, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5

Claims, Definition of
15.1.1
Claims, Notice of
1.6.2, 15.1.3

CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4
Claims and Timely Assertion of Claims
15.4.1

Claims for Additional Cost
3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, 15.1.5

Claims for Additional Time
3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, 15.1.6

Concealed or Unknown Conditions, Claims for
3.7.4

Claims for Damages
3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7

Claims Subject to Arbitration
15.4.1

Cleaning Up
3.15, 6.3

Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, 15.1.5

Commencement of the Work, Definition of
8.1.2

Communications
3.9.1, 4.2.4

Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2

COMPLETION, PAYMENTS AND
9

Completion, Substantial
3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2

Compliance with Laws
2.3.2, 2.3.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3

Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3

Conditions of the Contract
1.1.1, 6.1.1, 6.1.4

Consent, Written
3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2

Consolidation or Joinder
15.4.4

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
1.1.4, 6

Construction Change Directive, Definition of
7.3.1

Construction Change Directives
1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, 7.3, 9.3.1.1

Construction Schedules, Contractor’s
3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2

Contingent Assignment of Subcontracts
5.4, 14.2.2.2

Continuing Contract Performance
15.1.4

Contract, Definition of
1.1.2

CONTRACT, TERMINATION OR SUSPENSION OF THE
5.4.1.1, 5.4.2, 11.5, 14

Contract Administration
3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1

Contract Documents, Copies Furnished and Use of
1.5.2, 2.3.6, 5.3

Contract Documents, Definition of
1.1.1

Contract Sum
2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, 9.1, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, 15.1.5, 15.2.5

Contract Sum, Definition of
9.1

Contract Time
1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7.7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5

Contract Time, Definition of
8.1.1

CONTRACTOR
3

Contractor, Definition of
3.1, 6.1.2

Contractor’s Construction and Submittal
Schedules
3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2

User Notes:
Contractor’s Employees
2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.3, 14.1, 14.2.1.1

**Contractor’s Liability Insurance**

11.1
Contractor’s Relationship with Separate Contractors and Owner’s Forces
3.12.5, 3.14.2, 4.2.4, 6.11, 13.12, 24.2
Contractor’s Relationship with Subcontractors
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2, 9.6.7, 9.10.2, 11.2, 11.3, 11.4
Contractor’s Relationship with the Architect
1.1.2, 1.5, 2.3.3, 3.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.51, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4.5, 9.7, 9.8, 9.9, 10.2, 10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1
Contractor’s Representatives
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor’s Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor’s Review of Contract Documents
3.2
Contractor’s Right to Stop the Work
2.2.2, 9.7
Contractor’s Right to Terminate the Contract
14.1
Contractor’s Submittals
Contractor’s Superintendent
3.9, 10.2.6
Contractor’s Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.10, 6.2.10, 6.2.2, 6.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 7.3.6, 8.2, 9.3, 10.2, 12, 14, 15.1.4
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.16, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 23.6, 3.11
Copyrights
1.5, 3.17
Correction of Work
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2.2, 12.3, 15.1.3.1, 15.1.3.2, 15.2.1
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.4
Costs
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2, 11.3, 14.2.4, 15.1.7
Damages for Delay
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.6, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2, 14.2.2, 14.2.4, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, 9.5, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance, Rejection and Correction of
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1
Delays and Extensions of Time
3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
Digital Data Use and Transmission
1.7
Disputes
6.3, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2
Emergencies
10.4, 14.1.1.2, 15.1.5
Employees, Contractor’s
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.3, 14.1, 14.2.1.1
Equipment, Labor, or Materials
1.1.3, 1.1.6, 3.4.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1, 3.10.1, 3.12.1, 3.14.4, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2, 10.4, 14.3, 15.1.6, 15.2.5
Failure of Payment
9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
Faulty Work
(See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.9, 9.8.2, 9.10, 12.3, 14.2.4, 14.4.3
Financial Arrangements, Owner’s
2.2.1, 13.2.2, 14.1.1.4
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty)
Hazardous Materials and Substances
10.2.4, 10.3
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.17, 3.18, 9.6.8, 9.10.2, 10.2.4, 10.3.3, 11.3
Information and Services Required of the Owner
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5, 9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Decisions
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Initial Decision Maker, Extent of Authority
14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4
Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 12.2.1, 13.4
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4
Instruments of Service, Definition of
1.1.7
Insurance
6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5, 11
Insurance, Notice of Cancellation or Expiration
11.1.4, 11.2.3
Insurance, Contractor’s Liability
11.1
Insurance, Effective Date of
8.2.2, 14.2.2
Insurance, Owner’s Liability
11.2
Insurance, Property
10.2.5, 11.2, 11.4, 11.5
Insurance, Stored Materials
9.3.2
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1
Insured loss, Adjustment and Settlement of
11.5
Intent of the Contract Documents
1.2.1, 4.2.7, 4.2.12, 4.2.13
Interest
13.5
Interpretation
1.1.8, 1.2.3, 1.4, 4.1.1, 5.1, 6.1.2, 15.1.1
Interpretations, Written
4.2.11, 4.2.12
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Labor Disputes
8.3.1
Laws and Regulations
1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Liens
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Limitations, Statutes of
12.2.5, 15.1.2, 15.4.1.1
Limitations of Liability
3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6, 4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3, 11.3, 12.2.5, 13.3.1
Limitations of Time
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15, 15.1.2, 15.1.3, 15.1.5
Materials, Hazardous
10.2.4, 10.3
Materials, Labor, Equipment and
1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2
Means, Methods, Techniques, Sequences and Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
Mechanic’s Lien
2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
Minor Changes in the Work
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, 7.4
MISCELLANEOUS PROVISIONS
13

Modifications, Definition of
1.1.1
Modifications to the Contract
1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2

Mutual Responsibility
6.2

Nonconforming Work, Acceptance of
9.6.6, 9.9.3, 12.3
Nonconforming Work, Rejection and Correction of
2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2

Notice
1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2, 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2, 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1
Notice of Cancellation or Expiration of Insurance
11.1.4, 11.2.3

Notice of Claims
1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, 15.1.3, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1
Notice of Testing and Inspections
13.4.1, 13.4.2
Observations, Contractor’s
3.2, 3.7.4
Occupancy
2.3.1, 9.6.6, 9.8
Orders, Written
1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1

OWNER
2

Owner, Definition of
2.1.1

Owner, Evidence of Financial Arrangements
2.2, 13.2.2, 14.1.1.4

Owner, Information and Services Required of the
2.1.2, 2.2, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4

Owner’s Authority
1.5, 2.1.1, 2.3.3.2.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7

Owner’s Insurance
11.2

Owner’s Relationship with Subcontractors
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2

Owner’s Right to Carry Out the Work
2.5, 14.2.2

Owner’s Right to Clean Up
6.3

Owner’s Right to Perform Construction and to Award Separate Contracts
6.1

Owner’s Right to Stop the Work
2.4

Owner’s Right to Suspend the Work
14.3

Owner’s Right to Terminate the Contract
14.2, 14.4

Ownership and Use of Drawings, Specifications and Other Instruments of Service
1.1.1, 1.1.6, 1.1.7, 1.5, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3

Partial Occupancy or Use
9.6.6, 9.9

Patching, Cutting and
3.14, 6.2.5

Patents
3.17

Payment, Applications for
4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3

Payment, Certificates for
4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4

Payment, Failure of
9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2

Payment, Final
4.2.1, 4.2.9, 9.10, 12.3, 14.2.4, 14.4.3

Payment Bond, Performance Bond and
7.3.4.4, 9.6.7, 9.10.3, 11.1.2

Payments, Progress
9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4

PAYMENTS AND COMPLETION
9

Payments to Subcontractors
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2

PCB
10.3.1

Performance Bond and Payment Bond
7.3.4.4, 9.6.7, 9.10.3, 11.1.2

Permits, Fees, Notices and Compliance with Laws
2.3.1, 3.7, 3.13, 7.3.4.4, 10.2.2

PERSONS AND PROPERTY, PROTECTION OF
10

Polychlorinated Biphenyl
10.3.1

Product Data, Definition of
3.12.2

Product Data and Samples, Shop Drawings
3.11, 3.12, 4.2.7

Progress and Completion
4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.4

Progress Payments
9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4
1.1.4 Project, Definition of
1.1.5 Project Representatives
4.2.10 Property Insurance
10.2.5, 11.2 Proposal Requirements
1.1.1 PROTECTION OF PERSONS AND PROPERTY
10 Regulations and Laws
1.5, 2.3.2, 2.3.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8, 15.4
Rejection of Work
4.2.6, 12.2.1
Releases and Waivers of Liens
9.3.1, 9.10.2
Representations
3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1
Responsibility for Those Performing the Work
3.3.2, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
3.2, 3.12.7, 6.1.3
Review of Contractor’s Submittals by Owner and Architect
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12
Rights and Remedies
1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2, 12.2.4, 13.3, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.3.1, 4.2.2, 4.2.7, 5.3, 10.1, 10.2, 10.4
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, 3.12, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Separate Contractors, Definition of
6.1.1
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, 3.12, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4
Site Visits, Architect’s
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
Special Inspections and Testing
4.2.6, 12.2.1, 13.4
Specifications, Definition of
1.1.6
Specifications
1.1.1, 1.1.6, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14
Statute of Limitations
15.1.2, 15.4.1.1
Stopping the Work
2.2.2, 2.4, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1, 12.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
Submittals
3.10.1, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, 11.3
Substances, Hazardous
10.3
Substantial Completion
4.2.9, 8.1.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
2.3.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
5.1.2

NOT FOR BIDDING

NOT FOR BIDDING

NOT FOR BIDDING

NOT FOR BIDDING
Subsurface Conditions
3.7.4

Successors and Assigns
13.2

Superintendent
3.9, 10.2.6

Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4

Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6, 9.10.5, 14.2.1

Surety
5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2, 15.2.7

Surety, Consent of
9.8.5, 9.10.2, 9.10.3

Surveys
1.1.7, 2.3.4

Suspension by the Owner for Convenience
14.3

Suspension of the Work
3.7.5, 5.4.2, 14.3

Suspension or Termination of the Contract
5.4.1.1, 14

Taxes
3.6, 3.8.2.1, 7.3.4.4

Termination by the Contractor
14.1, 15.1.7

Termination by the Owner for Cause
5.4.1.1, 14.2, 15.1.7

Termination by the Owner for Convenience
14.4

Termination of the Architect
2.3.3

Termination of the Contractor Employment
14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT
14

Tests and Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 12.2.1, 13.4

TIME
8

Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5

Time Limits
2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15.1.2, 15.1.3, 15.4

Time Limits on Claims
3.7.4, 10.2.8, 15.1.2, 15.1.3

Title to Work
9.3.2, 9.3.3

UNCOVERING AND CORRECTION OF WORK
12

Uncovering of Work
12.1

Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3

Unit Prices
7.3.3.2, 9.1.2

Use of Documents
1.1.1, 1.5, 2.3.6, 3.12.6, 5.3

Use of Site
3.13, 6.1.1, 6.2.1

Values, Schedule of
9.2, 9.3.1

Waiver of Claims by the Architect
13.3.2

Waiver of Claims by the Contractor
9.10.5, 13.3.2, 15.1.7

Waiver of Claims by the Owner
9.9.3, 9.10.5, 10.4, 12.2.2.1, 13.3.2, 14.2.4, 15.1.7

Waiver of Consequential Damages
14.2.4, 15.1.7

Waiver of Liens
9.3, 9.10.2, 9.10.4

Waivers of Subrogation
6.1.1, 11.3

Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2, 15.1.2

Weather Delays
8.3, 15.1.6.2

Work, Definition of
1.1.3

Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3, 13.2, 13.3.2, 15.4.4.2

Written Interpreations
4.2.11, 4.2.12

Written Orders
1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1
ARTICLE 1   GENERAL PROVISIONS

§ 1.1 Basic Definitions

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

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

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

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

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

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

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

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

§ 1.2 Correlation and Intent of the Contract Documents
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties’ intentions and purposes in executing the Contract.

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

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

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

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

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

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

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

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

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

§ 1.8 Building Information Models Use and Reliance
Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document
ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner’s Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.
§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

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

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

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

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

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

ARTICLE 3 CONTRACTOR
§ 3.1 General
§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor
§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.
§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.4 Labor and Materials

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

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.
§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 3.11 Documents and Samples at the Site
The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and
§ 3.12 Shop Drawings, Product Data and Samples
§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

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

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

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

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect’s services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect’s consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.
§ 4.2.5 Based on the Architect’s evaluations of the Contractor’s Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

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

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

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

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

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

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

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

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

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.
ARTICLE 5  SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.
When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

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

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

ARTICLE 6   CONSTRUCTION BY OWNER OR BY SEparate CONTRACTORS

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

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

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

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

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

§ 6.2 Mutual Responsibility

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

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

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

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.
§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

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

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

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

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

§ 7.2 Change Orders
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:
   .1 The change in the Work;
   .2 The amount of the adjustment, if any, in the Contract Sum; and
   .3 The extent of the adjustment, if any, in the Contract Time.

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

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

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
   .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
   .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
   .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
   .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:
.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers’ compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

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

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

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

ARTICLE 8 TIME
§ 8.1 Definitions
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

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

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.
§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

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

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

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

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION
§ 9.1 Contract Sum
§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

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

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

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

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.
§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney’s fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.
§ 9.7 Failure of Payment
If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days’ notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

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

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

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

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

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

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

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.
§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

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

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

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

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled; .2 failure of the Work to comply with the requirements of the Contract Documents; .3 terms of special warranties required by the Contract Documents; or .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY
§ 10.1 Safety Precautions and Programs
The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property
§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to
employees on the Work and other persons who may be affected thereby;
the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

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

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

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

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

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

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

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

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

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

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

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor’s Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor’s Insurance and Bonds

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

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

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

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

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

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

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

§ 11.3 Waivers of Subrogation
§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect’s consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect’s consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.
§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance
The Owner, at the Owner’s option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner’s property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner’s property, due to fire or other hazards however caused.

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

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK
§ 12.1 Uncovering of Work
§ 12.1.1 If a portion of the Work is covered contrary to the Architect’s request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect’s examination and be replaced at the Contractor’s expense without change in the Contract Time.

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

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

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

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

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

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

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

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

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

ARTICLE 13 MISCELLANEOUS PROVISIONS
§ 13.1 Governing Law
The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction’s choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

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

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.
§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

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

§ 14.2 Termination by the Owner for Cause
§ 14.2.1 The Owner may terminate the Contract if the Contractor
.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
.2 Accept assignment of subcontracts pursuant to Section 5.4; and
.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

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

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent
.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience
§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner’s convenience, the Contractor shall cease operations as directed by the Owner in the notice;
.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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

ARTICLE 15   CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

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

§ 15.1.4 Continuing Contract Performance

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

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

§ 15.1.5 Claims for Additional Cost

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

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.
§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

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

1. damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

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

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

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

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

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

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

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

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

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

§ 15.3 Mediation

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

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

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

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

§ 15.4 Arbitration

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

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

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.
§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

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

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

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.
SUPPLEMENTARY GENERAL CONDITIONS A201-2017

The following supplements modify the “General Conditions of the Contract for Construction,” AIA Document A201-2017. 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. ADMINISTRATION OF THE CONTRACT
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
ARTICLE 1: GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

Strike the last sentence of Section 1.1.1 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."

Add the following Section:

"1.1.1.1 In the event of conflict or discrepancies among the Contract Documents, the Documents prepared by the State of Delaware, Division of Facilities Management shall take precedence over all other documents."

1.1.8 INITIAL DECISION MAKER

Strike the last sentence of Section 1.1.8 in its entirety and add the following to the end of the remaining sentence:

"and certify termination of the Agreement under Section 14.2.2."

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1.1 Insert “if possible” at the end of the second sentence.

Add the following Sections:

"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

Strike Section 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. 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. Prior to re-use of construction documents for a Project in which the Architect is not also involved, the Owner will remove from such documents all identification of the original Architect, including name, address and professional seal or stamp.”

Strike Section 1.5.2 in its entirety.

1.7 DIGITAL DATA USE AND TRANSMISSION

Strike Section 1.7 in its entirety and replace with the following:

“The parties shall agree upon protocols governing transmission and use of Instruments of Service or any other information or documentation in digital form.”

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Strike Section 1.8 in its entirety.

ARTICLE 2: OWNER

2.2 EVIDENCE OF THE OWNERS FINANCIAL ARRANGEMENTS

Strike Section 2.2 in its entirety.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.3 Strike 2.3.3 in its entirety.

2.3.4 Add the following sentence at the end of the paragraph:

“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.”

Strike Section 2.3.6 in its entirety and replace with the following:

“2.3.6 The Contractor shall be furnished free of charge (1) electronic set of the Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage and handling.”

2.5 OWNER’S RIGHT TO CARRY OUT THE WORK

Add “, except as outlined in Section 3.15” after the reference to “Article 15” at the end of the last sentence of the Section.
ARTICLE 3: CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.2 Add "and Owner" after "report to the Architect" in the second sentence.

3.2.4 Strike "subject to Section 15.1.7" in the second sentence.

3.2.4 Strike the third sentence.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Sections:

"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 so 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 for the proper protection and safe storage of their materials, or as otherwise identified by the specifications. 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

Add the Following Sections:

"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 Architect & Owner 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 Sections:

"3.5.3 The Contractor will guarantee all materials and workmanship against original defects, except injury from proper and usual wear when used for the purpose intended, for two years after Acceptance by the Owner, and will maintain all items in perfect condition during the period of warranty."
“3.5.4 Defects appearing during the period of warranty will be made good by the Contractor at his expense upon demand of the Owner, it being required that all work will be in perfect condition when the period of warranty will have elapsed.”

“3.5.5 Upon notification by the Owner of a defect covered by the Contractor’s warranty, the Contractor shall respond within 4 hours of the notification.”

“3.5.6 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.”

“3.5.7 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.”

3.8 ALLOWANCES

Add the following Section:

“3.8.1.1 For costs to be covered under a project allowance, (included in the schedule of values) the Contractor shall submit a summary of those costs anticipated and an Allowance Access Authorization Form to the Architect and Owner, reflecting the projected costs. The Allowance Access Authorization Form must be signed by the Owner prior to initiating any work associated with the allowance.”

3.10 CONTRACTOR’S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add “estimated” after “and the” and before “date of” in the second sentence.

3.10.2 Strike “and thereafter as necessary to maintain a current submittal schedule” in the first sentence.

Add the following section:

“3.10.4 The Contractor’s Construction and Submittal Schedules shall be in accordance with the DFM - Supplemental Project Scheduling Guidelines.”

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following Sections:

“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 the conformed contract 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 Upon completion of the work noted in 3.11.2 the contractor shall schedule a meeting with the Architect/Engineer and Owner to review the final record drawings and closeout documents prior to submission. After this meeting the Contractor shall make adjustments per the review, and submit one (1) original markup and (2) copies of the red...
Supplementary General Conditions

Line drawings (as-built conditions, to the Owner and one (1) print to the Architect. In addition, attach one complete set of the as-built documents to each of the Operating and Maintenance Instructions/Manuals. The Contractor will include (2) USB drives, each containing all "red line drawings (as-built) and Closeout Documents properly tabbed in accordance with closeout requirements as defined elsewhere in the contract documents."

3.12 Shop Drawings, Product Data and Samples

3.12.10.2 Strike "If the Contract Documents require" from the beginning of the sentence.

3.12.10.2 Strike "to" between “professional” and certify” and replace with “shall”.

3.17 Insert "indemnify and" between “shall” and "hold" in the second sentence.

Article 4: Administration of the Contract

4.2 Administration of the Contract

4.2.7 Strike the first sentence 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.”

4.2.7 Strike the second sentence 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 Section:

“4.2.10.1 There will be no full-time Project Representative provided by the Owner or Architect on this project.”

“4.2.13 Add “and in compliance with all local requirements.” to the end of the sentence.”

Article 5: Subcontractors

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

5.2.3 Strike Section 5.2.3 in its entirety and replace with the following:

“If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection, subject to the statutory requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4.”

5.2.4 Strike Section 5.2.4 in its entirety and replace with the following:

"The Contractor may not substitute any Subcontractor listed in its Bid unless the Contractor complies with the requirements of 29 Delaware Code § 6962(d)(10)b.3 and 4."
Failure to comply with this requirement shall subject the Contractor to a penalty as outlined in Section 5.2 of the Owner's General Requirements.

Add the following Section:

“5.2.5 The Contractor shall comply and shall ensure all Subcontractors comply with all requirements for drug testing as set forth in TITLE 19 LABOR DELAWARE ADMINISTRATIVE CODE 4000 Office of Management and Budget 4100 Division of Facilities Management 4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects.”

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 Strike “and waiver of subrogation” from the end of the second sentence.

6.1.4 Strike Section 6.1.4 in its entirety.

6.2 MUTUAL RESPONSIBILITY

6.2.3 Strike “shall” and replace with “may” in the second sentence.

ARTICLE 7: CHANGES IN THE WORK

7.3.4.1 Strike “and other employee costs approved by the Architect” after “worker’s compensation insurance.”

7.3.4.4 Add “work attributable to the” before “change” at the end of the sentence.

7.4 MINOR CHANGES IN WORK

Add “unless such changes are approved” at the end of the third sentence.

ARTICLE 8: TIME

8.2 PROGRESS AND COMPLETION

8.2.1 Add the following Section:

“8.2.1.1 Refer to Project Specifications Section SUMMARY OF WORK for Contract time requirements.”

8.2.2 After “by the Contractor” strike “and” and insert “to”.

8.2.4 Add the following Section:
“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 “any and all remedies at law or in equity”.

Add the following Section:

“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.”

Strike Section 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 Section 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 Section:

“8.3.4 By permitting the Contractor to work after the expired time for completion of the project, the Owner does not waive their rights under the Contract.”

ARTICLE 9: PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES

Add the following Sections:

“9.2.1 The Schedule of Values shall be submitted using AIA Document G703, Continuation Sheet to G702.”

“9.2.2 The Schedule of Values is to include a line item for Project Closeout Document Submittal. The value of this item is to be no less than 1.5% of the initial contract amount.”

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Strike Section 9.3.1 in its entirety and replace with the following:

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

Add the following Sections:
"9.3.1.3 Application for Payment shall be submitted on AIA Document G702 "Application and Certificate for Payment", supported by AIA Document G703 "Continuation Sheet". Said Applications shall be fully executed and notarized."

"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 Subsections 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

9.6.1 Strike Section 9.6.1 in its entirety and replace with the following:

"9.6.1 After the Architect has 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," in the first sentence.

9.7 FAILURE OF PAYMENT

Strike Section 9.7 in its entirety and replace with the following:

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

9.8 SUBSTANTIAL COMPLETION

9.8.3 At the end of Section 9.8.3, add the following sentence:

"If the Architect is required to make more than 2 inspections of the same portion of work, the Contractor shall be responsible for all costs associated with subsequent inspections including but not limited to any Architect's fees."

9.8.5 Strike "shall" and insert "may" in the second sentence.
9.8.5 Insert “1/2 of the” after “make payment of” in the second sentence.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 Strike the first sentence and replace with the following (the remainder of the Section remains as written):
“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 authorized by public authorities having jurisdiction over the Project.”

9.10.2 Strike “to remain in force after final payment is currently in effect” after “required by the Contract Documents” and replace with “shall remain in force until final payment is completed” in the first sentence.

9.10.4.4 Strike “if permitted by the Contract Documents,”

ARTICLE 10: PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following Sections:

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 Section:

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 work place, 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, along with the shipping slips that include those products.

10.2.5 Strike the second sentence in its entirety.

10.3 HAZARDOUS MATERIALS AND SUBSTANCES

10.3.3 Strike Section 10.3.3 in its entirety.

10.3.4 Insert “hazardous” in the last sentence after “handling of such”.

10.3.6 Strike Section 10.3.6 in its entirety.
ARTICLE 11: INSURANCE AND BONDS

11.1 CONTRACTOR’S INSURANCE AND BONDS

11.1.1 Strike “Owner” from the third sentence.

11.2 OWNER’S LIABILITY INSURANCE

Strike 11.2 in its entirety, except that in the case of school projects in which case Section 11.2 shall remain.

11.3 WAIVERS OF SUBROGATION

Delete Section 11.3 in its entirety

11.4 LOSS OF USE, BUSINESS INTERRUPTION, AND DELAY IN COMPLETION INSURANCE

Delete Section 11.4 in its entirety

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

Add the following Section:

“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 non-conforming work and that required under contract including any damage to the structure.”

12.2.2.1 Strike all references to “one year” or “one-year” and replace with “two years”.

12.2.2.2 Strike “one-year” and replace with “two years”.

12.2.2.3 Strike “one-year” and replace with “two years”.

12.2.5 Strike “one-year” and replace with “two years”.

ARTICLE 13: MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Strike the last sentence.

13.4 TESTS AND INSPECTIONS

13.4.1 Strike the last sentence and replace with the following:

“The Owner shall pay for tests, inspections, or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.”
13.5 **INTEREST**

Strike "the date payment is due at such rate as the parties may 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" and replace with "30 days of presentment of the authorized Certificate of Payment at the annual rate of 12% or 1% per month."

Insert the following Section:

"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**

14.1 **TERMINATION BY THE CONTRACTOR**

14.1.1.4 Insert ", upon the Contractors' request," after "furnish to the Contractor".

14.1.3 Strike "and profit on Work not executed, and" after "as well as reasonable overhead" and replace with ", profit, and reasonable"

14.3 **SUSPENSION BY OWNER FOR CONVENIENCE**

14.3.2 Strike "Adjustment of the Contract Sum shall include profit".

14.4 **TERMINATION BY THE OWNER FOR CONVENIENCE**

14.4.3 Strike Section 14.4.3 in its entirety and replace with the following:

"In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and reasonable costs incurred by reason of such termination along with reasonable overhead."

**ARTICLE 15: CLAIMS AND DISPUTES**

15.1 **CLAIMS**

15.1.2 **TIME LIMITS ON CLAIMS**

Strike the last sentence.

15.1.3 **NOTICE OF CLAIM**

Strike all references to "21" and replace with "45".

15.1.5 **CLAIMS FOR ADDITIONAL COSTS**

Strike the first sentence and replace with the following:
“Contractor shall not proceed to execute any portion of the Work that is subject to the Claim without prior approval of the costs or method of payment for the costs associated with the Claim as determined by the Architect and approved by the Owner.”

15.1.7 WAIVER OF CLAIMS FOR CONSEQUENTIAL DAMAGES

Strike Section 15.1.7 in its entirety.

15.2 INITIAL DECISION

15.2.1 Strike “and binding dispute resolution” in the fourth sentence and replace with “or any and all remedies at law or in equity”.

15.2.5 Strike Section 15.2.5 in its entirety and replace with the following:

“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 any or all remedies at law or in equity.”

15.2.6 Strike Section 15.2.6 and its subSections in their entirety.

15.3 MEDIATION

15.3.1 Strike “binding dispute resolution” and replace with “any or all remedies at law or in equity”.

15.3.2 Strike “, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedure in effect on the date of the Agreement,” in the first sentence.

15.3.2 Strike all references to “binding dispute resolution” and replace with “any or all remedies at law and in equity”.

15.3.3 Strike Section 15.3.3 in its entirety.

15.4 ARBITRATION

Strike Section 15.4 and its Subsections in their entirety.

END OF SECTION
SUPPLEMENT –
DFM - PROJECT SCHEDULING GUIDELINES

The following provides supplemental direction on the establishment and maintenance of the Contractors construction and submittal schedules.

Preliminary Schedule:
Initial Schedule.

Within 10 Days of the date of Award, the contractor shall submit a preliminary schedule.

The owner will use the initial schedule to monitor progress until the baseline schedule is accepted. Prepare and submit a schedule for the first 60 calendar days of work in accordance with subsections 3.1 and 3.2, plus a summary bar chart schedule for the balance of the project. Activity durations on the summary chart may not exceed 15 working days.

Submit the following items:
3.1.1 A transmittal letter to the owner identifying which schedule in the database is being submitted for review.
3.1.2 A narrative report

3.2 Preparing Schedule on Separate Database. If the schedule is prepared using Primavera Version 6.0, Primavera for Contractors, or some other software compatible with Primavera Version 6.0, then, for each schedule submission, submit the following items:
3.2.1 A transmittal letter
3.2.2 A narrative report
3.2.3 A Primavera Version 6.0 compatible electronic file of the schedule on a computer disc (CD)
3.2.4 The critical path in bar chart format (Longest Path sort)
3.2.5 Work paths with total float values within 20 workdays of the critical path’s total float value in bar chart format. For example, if the critical path has a total float value of zero, then show all of the work paths with total float values of 20 or less.
3.2.6 An activity network diagram plotted in color, on E-size paper, with each sheet of the plot including a title, match data for diagram correlation, a page number, and a legend. The activity network diagram should only be submitted with schedules with revised relationships or activity durations.
3.2.7 A Predecessor/Successor report with the following items for each activity:
3.2.7.1 Activity ID and description
3.2.7.2 Original duration
3.2.7.3 Remaining duration
3.2.7.4 Calendar ID
3.2.7.5 Predecessors and Successors
3.2.7.6 Early start date
3.2.7.7 Early finish date
3.2.7.8 Late start date
3.2.7.9 Late finish date
3.2.7.10 Total float
3.2.7.11 Relationship type
3.2.7.12 Lags
3.2.7.13 Constraints

Baseline Schedule

The contractor shall submit a Baseline (Initial) CPM (Critical Path Method) Schedule for use in coordinating and monitoring the Work specified in the Contract documents.

The schedule will include activities for long lead and other major submittal/procurement/delivery items as well as activities for installing and constructing the specified Work. It will indicate the starting and finishing dates of all activities. The baseline schedule shall have 0 progress. The Data Date will be the date of the project’s ‘Commencement.’ Once accepted, the Contractor shall adhere to the schedule with adjustments accepted in subsequent progress schedules. Updated (Progress) Schedules shall be submitted as directed by the Owner.

Purpose of Project Schedules

The Project Schedules shall be used for evaluating all issues related to time for this Contract. The Project Schedules shall be used by the Owner and Contractor for the following purposes as well as any other purpose where the issue of time is relevant:

- To communicate to the Owner the Contractor’s current plan for carrying out the Work;
- To identify work paths that are critical to the timely completion of the Work,
- To identify upcoming activities on the critical path(s);
- To evaluate the best course of action for mitigating the impact of unforeseen events;
- As the basis for analyzing the time impact of changes in the Work,
- As a reference in determining the cost associated with increases or decreases in the Work;
- To identify and prioritize activities, for which the Owner is responsible;
- To document the actual progress of the Work;
- To integrate the Work with the operational requirements of the Owner’s facilities;
- To schedule and coordinate interfaces with adjacent contracts;
- As a basis for determining valid acceleration plans; and
- To facilitate efforts to complete the Work in a timely manner.
- To validate contract requirements for the commissioning process have been incorporated by the contractor into the schedule

The Project Schedules provide a basis for Owner decisions that may impact the Work under this Contract. The Contractor shall submit schedule submittals in a timely manner. The Project Schedules shall at all times accurately reflect the Contractor’s current plan for the Work and shall be updated as described in this specification and elsewhere in the project documents.
Baseline and Progress Schedule Submittals - All Progress Schedules shall be submitted as a complete package, including all supporting narrative, and reports as required. Incomplete packages will be considered not submitted.

PROJECT SCHEDULING SOFTWARE

The Project Schedule shall employ the Critical Path Method (CPM) using retained logic for the planning, scheduling and reporting of the work to be performed under the Contract. The schedule will be produced utilizing any version of Oracle’s Primavera Project Planning Software or any other software system fully transferable to any Oracle Primavera project planning and scheduling software system. The scheduling software used by the Contractor shall be fully capable of importing/exporting data to/from Oracle Primavera software. The proposed software shall be capable of transferring the information without degradation in the data, including, but not limited to, scheduling logic and sequencing, activities, durations, cost loading, calendars, etc. The type of schedule shall be PDM (Precedence Diagramming Method).

Along with a legible PDF rendition of the project’s network, all schedules shall be submitted in CPM format (xer in Oracle’s P6 Software) fully compatible with Oracle’s P6 Software via email or flash drive as a single compressed database. If electronic submission is used, it is the Contractor’s responsibility to verify that the documents submitted are in a format compatible with the Owner’s and Architect’s and that the submission has been received by the Owner and Architect.

SCHEDULING DEFINITIONS AND REQUIREMENTS

Activity Constraints - Activity Constraints can only be used if specified by the Contract or agreed to by the Owner. For example, if a Phase of the project must be completed by a specific date, that activity for completion of the Phase shall be “Constrained” to that date specified. The use of negative lags or the use of any other float suppression techniques is also prohibited from use in project schedules.

Activity Dates - Early and Late start and Finish dates of activities shall be calculated for each activity based upon the schedule data date, actual dates, % completes, schedule logic, schedule constraints, calendars, and original duration or remaining duration, in accordance with the scheduling parameters defined in this specification.

Activity Description - The activity description shall identify the unique scope of the activity. There shall not be any two activities with the same activity description. It shall not be necessary to investigate activity code assignments or logic relationships to identify the scope of an activity. For example, the description “POUR FOOTING” will not be acceptable; the description “POUR FOOTING RAMP RT-Sta. 42+00-42+50” will be acceptable. At the same time the Activity Description shall be concise enough so as to not require excessive column width in the Oracle Primavera P6 layout. The terms “Miscellaneous”, or other vague adjectives shall not be used in an activity description. All activity descriptions shall include a verb. Activity descriptions shall not be modified, except at the direction or with the consent of the Owner.

Activity Duration – All activity durations shall be reflected in Calendar Days. Unless otherwise specified or approved, all construction activities shall have durations not exceeding 14 calendar days. The Contractor shall substantiate the need for specific activities having longer durations than stated herein. Once accepted, Original Durations of activities shall not be modified without explicit approval by the Owner.

Activity Identification - Each activity in the Project Schedules shall have an activity identifier (Activity ID). The Contractor shall utilize an Activity ID that is simple and allows space between existing activities for the future addition of activities for continuing sort and display capability. The Activity ID of an
existing activity shall not be modified or assigned to another activity. The scope of work for an
activity shall not be substantially changed once the Baseline Schedule is accepted.

Activity Predecessors and Successors - Every activity shall have logically assigned predecessors and
successors. The logical predecessors for each activity will be limited to those activities whose
scope of work necessarily must be completed or, in some instances, started, in order to perform
the current activity. Unless otherwise specified, Commencement/Notice To Proceed shall be the
only activity in the Project Schedule without a predecessor. Unless otherwise specified, Contractual
substantial completion shall be the only activity in the Project Schedule without a successor.

Activity Percent Complete - Activity percent complete shall be entered in the Project Schedule by the
Contractor as appropriate to indicate activity progress and status as of the current Data Date
for the update.

Activity Relationships - The schedule CPM logic for each activity shall be constructed in conformance
with the following requirements:
- Determine predecessors - Activities that must be completed before the activity can start.
- Determine parallel activities - Activities that can occur concurrently with the activity.
- Determine successors - Activities that cannot start until the activity is complete.

Baseline Schedule - The Baseline Schedule comprises the plan and schedule that the Contractor intends
to use to perform and complete the Work. Upon acceptance by the Owner, the Baseline Schedule
shall be the schedule of record for the project until subsequent updated (progress) schedules are
accepted by the Owner.

Calendars - Calendars shall be developed and assigned to each activity. All durations should be reflected
in calendar days. A calendar that incorporates unanticipated adverse weather (see Weather) shall
be assigned to activities that may be affected by adverse weather conditions. A calendar that
incorporates a 7-day workweek shall be developed and assigned to appropriate activities (concrete
cure, contractual substantial completion milestone, etc. Other calendars (including incorporation of
Federal and State observed holidays) appropriate for the scoped contract work shall be developed
and assigned to appropriate activities.

Critical Path - The Critical Path is defined as the longest continuous series of activities through the network
to the Substantial Completion Deadline.

Critical Path Method (CPM) – The Critical Path Method (CPM) is a scheduling technique that utilizes
activity durations and network logic to calculate the schedule for an entire project. A CPM schedule
is a network-based schedule that graphically depicts the timing of activities, interrelationships
between the activities, and the project critical path. Every project, regardless of size or complexity,
has a critical path; however, only a critical path schedule identifies the critical path.

Written Narrative - A Narrative is a written document which provides an outline of the plan on which the
schedule is based. This document is submitted along with any project Schedule and is used to
communicate problems encountered throughout the progress period along with the overall plan to
complete the remaining Work.
Data Date – The day after the date through which a schedule is current. Everything occurring earlier than the Data Date is “as-built” and everything on or after the Data Date is “planned”.

Milestone Activities - An activity with zero duration that typically represents a significant event, such as the beginning and end of a project, milestones set forth in the Contract, construction stages, a major work package, Substantial Completion Date and Final Completion Date.

Recovery Schedule – If at any point during the course of the project the Architect, Owner, or the Owner’s scheduling consultant determines that there is slippage in the Project finish forecast, Scope Addition, or Omission or a change in the Construction Methodology or Constructability method, the contractor may be required to produce a Recovery Schedule that reflects an adjustment in project durations, resources, or other methodology to show completion of the project within the required duration or completion date established. The Recovery Schedule shall have the same requirements for submission as that of the baseline schedule.

Schedule Progress Updates - Schedule Progress Updates are submitted monthly (or as directed by the Owner) by the Contractor to update the Current Baseline Schedule with status during the period of the update and to reflect the Contractor’s current plan for performing the remaining Work. Each Contractor’s Application for Payment must be accompanied by an approved Construction Schedule Update as precedent for payment.

1. Submission of any Schedule Updates must include all required documents. No partial schedule submissions will be acknowledged. The Date of the submittal and the start of the review will commence only after a complete submission is made to the Architect and copied to the Owner and the Owner’s Scheduling Consultant where applicable.

2. No new activity shall be added, nor shall any existing activity be modified in any schedule update to imply specific responsibility of delays or extensions to the associated duration of any tasks that have not been approved and documented in the form of an official Change Order to the contract.

Submittal and Procurement Activities – Activities detailing materiel submittals to include manufacturers product data, shop drawings, samples, etc. Provide a duration of at least 21 calendar days for activities required for review and approval of working drawings and materials by the Owner.

The Contractor shall include separate activities for each required submittal item in coordination with the Submittal Schedule. Activities shall be added for each to reflect:

1. Contractor Submittal - Early and late finish dates shall reflect the dates upon which the contractor must submit a complete submittal package to the Architect to avoid delay to successive activities.

2. Architect Review and Approval – This reflects the appropriate time frame for the review and approval of the submittal package. Duration as noted above should be no less than 21 calendar days.

3. Order Materials/Equipment – Reflects the dates that materials must be ordered to avoid delay to the project. Duration should reflect the appropriate lead time required as verified by the material and equipment suppliers.

4. Material/Equipment Delivered. Reflects the dates required in order that the material is delivered to the site without delaying associated installation activities.
The Contractor’s response to any Rejected Submittal requiring revision and resubmission is due within 3 days of the receipt of requirement for resubmission.

**Total Float** - Total Float (TF) for an activity shall be defined as the number of days from the Early Finish date (EF) to the Late Finish date (LF) of the activity. Total Float shall be calculated relative to the Contractual Substantial Completion Deadline. Total Float is the difference between the schedule’s finish date and the contract completion date. Float is not for the exclusive use or benefit of either the Owner or the Contractor, but is an expiring resource available to all parties, acting in good faith, as needed to meet the Substantial Completion Deadline.

**WBS – Work Breakdown Structure** – is defined as “a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables.”

**Weather** – Depending on the type of work, some projects (or several activities in most projects) will be more apt to be affected by adverse weather conditions than others. The contractor shall prepare and submit a calendar that reflects the (5) year average of weather delays for each month based on NOAA (National Oceanic and Atmospheric Administration) or similar data acceptable to the Owner. After review of the historical data, and once the Owner and the Contractor agree on the (5) year average for each month, this calendar will act as the reference toward determining adverse weather delays to the project.

In the event the weather experienced at the project site during a particular month, surpasses the reflected (5) year historical average agreed upon for the similar month, the Contractor shall submit a time impact analysis reflecting the delays caused to critical path activities. If the weather delays reported by the contractor for the period exceed the average for the similar month as indicated in historical data, the Contractor may be granted a non-compensable time extension to account for those days impacted by the unusually severe weather. No time extensions will be granted for delays affecting activities not on the critical path.

**WRITTEN NARRATIVES**

**Baseline Schedule Narrative**

The Baseline Schedule narrative shall demonstrate a feasible approach to achieving the work as planned in the accompanying schedule. It should provide the following information:

1. Identification of the Data Date and schedule file name.
2. A description of the planned flow of work, identifying all key or driving resources.
3. A summary of planned labor utilization for the Contract.
4. A summary of planned equipment utilization for the Contract.
5. An explanation of how adverse weather conditions have been addressed in the Baseline Schedule.
6. The narrative shall address the Contractor’s material procurement plan and identify the strategy for any long lead item(s).
7. The narrative shall indicate the sequence of contract required commissioning activities

**Schedule Progress Update Narrative**

Update submittal packages shall include a narrative containing the following information:

1. Identification of the update period, the Data Date, and the schedule file name.
2. Identification of activities with critical float that were planned to occur during the update period, of which did not occur or occurred later than the scheduled Late Start or Late Finish date, and
an explanation of these delays.

3. Identification of delays occurring to activities taking place off the Project site, e.g., submittal preparation, fabrication, and delivery activities.

4. A summary of planned labor utilization for the Contract.

5. Revisions to logic or duration(s) by the Contractor: These revisions shall contain the following information:
   a. Identification of the activities changed.
   b. Description of the scope of the logic change and identification of the advantages and disadvantages of implementing the change.
   c. Identification of all driving resources, if any.
   d. Identification of key constraints influencing the Contractor's approach to the Work.

Changes and Time Impact Analysis

The Contractor shall develop and submit a time impact analysis and a Proposed Schedule Update when one or more of the following conditions occur:

a. The Contractor's plan for the Work as reflected in the Current Baseline Schedule is materially changed;

b. The Owner has approved a Change Order that affects the Critical Path of the Work necessitating an adjustment in a Completion Deadline;

c. The Contractor's progress on the Work is behind the Substantial Completion date by thirty (30) Days or more;

d. In the Owner's opinion, the Current Baseline Schedule no longer accurately reflects the Contractor's plan for performing the Work;

e. The Contractor is required by the Contract or chooses to submit a time impact analysis demonstrating entitlement to an adjustment to a Completion Deadline or to submit a plan demonstrating how the Contractor intends to recover delay; or

f. Any allowable change has occurred according to the Contract.

g. Unless otherwise agreed to by the Owner, Contractor's requests for additional cost and/or time associated with any change to the scope of work shall be submitted to the Owner within 7 days of the associated direction from the Owner or Architect. In accordance with State law, no work can proceed on any changed scope that would constitute an increase in cost or time prior to written approval by the owner including the associated increase to the contractors purchase order where additional cost is merited.

h. With the exception of providing Actual Completion dates for activities, in any Schedule update or Time Impact Analysis, no new activities should be added, and no existing activities should be changed without prior submission, to and approval of the owner.

i. Activities associated with time delays - All changes to activities in any schedule update or Time Impact Analysis shall be detailed, providing the activity number, name, and reference to the approval of the change or addition of the activity by the Owner in the narrative accompanying that schedule submission.

j. No new activity shall be added, nor shall any existing activity be modified to imply specific responsibility of delays or extensions to the associated duration of any tasks that have not been approved and documented in the form of an official Change Order to the contract.

Contractor's Responsibility

It is the Contractor's responsibility to ensure that all Project Schedule documents comply with the requirements of the Contract. Errors in any Project Schedule document accepted by the
Owner, including but not limited to activity durations, relationships between activities, resource allocation or other float suppression techniques that do not accurately reflect the Work, may be identified at any time and once identified, shall be corrected by the Contractor. The Owner is not responsible for any erroneous assumptions or information in any Project Schedule document, regardless of origin.

Project Milestones - Unless specific milestones for this project are otherwise identified in the project documents, the Contractor shall prepare and submit for review and approval by the Owner/Architect, individual milestones appropriate to identify key areas of the work.

The Owner and/or Architect may request additional milestones and/or activities be added in order to allow for efficient tracking of the work of the project.

1. Notice to Proceed.
2. Pre-construction meeting.
4. Set up temporary partitions, barriers, and signage for construction.
5. Schedule shutdown for MEP and sprinkler for demolition.
6. Demolition.
7. Meeting to review existing conditions on site.
8. New construction.
9. Perform shutdown to tie into existing MEP and sprinkler.
10. Schedule fire marshal and building inspection.
11. Punch List – Walkthrough
12. Final cleaning – Punch List Complete
WAGE RATE DETERMINATION SCHEDULE

The Delaware Department of Labor Division of Industrial Affairs has established the category and associated prevailing wage rate for this project. The project approved prevailing wage rate determination schedule follows.
PREVAILING WAGES FOR **BUILDING CONSTRUCTION** EFFECTIVE MARCH 13, 2020

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CERTIFIED: 08/14/2020  BY:  [Signature]
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) 761-8200.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: MC1002000445 Carvel State Office Building - Cafeteria Renovations, New Castle County
GENERAL REQUIREMENTS

TABLE OF ARTICLES

1. GENERAL PROVISIONS
2. OWNER
3. CONTRACTOR
4. ADMINISTRATION OF THE CONTRACT
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
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 pursuing 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.
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.

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.

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.

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.

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.

The Contractor shall, at their own expense, (in addition to the above) carry the following forms of insurance:

**Contractor's Contractual Liability Insurance**

Minimum coverage to be:

<table>
<thead>
<tr>
<th>Type of Liability</th>
<th>Minimum Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily Injury</td>
<td>$500,000 for each person, $1,000,000 for each occurrence, $1,000,000 aggregate</td>
</tr>
<tr>
<td>Property Damage</td>
<td>$500,000 for each occurrence, $1,000,000 aggregate</td>
</tr>
</tbody>
</table>

**Contractor's Protective Liability Insurance**

Minimum coverage to be:

<table>
<thead>
<tr>
<th>Type of Liability</th>
<th>Minimum Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily Injury</td>
<td>$500,000 for each person, $1,000,000 for each occurrence, $1,000,000 aggregate</td>
</tr>
<tr>
<td>Property Damage</td>
<td>$500,000 for each occurrence, $500,000 aggregate</td>
</tr>
</tbody>
</table>
11.7.3 **Automobile Liability Insurance**

Minimum coverage to be:

<table>
<thead>
<tr>
<th>Coverage</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily Injury</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Property Damage</td>
<td>$500,000</td>
</tr>
<tr>
<td>Property Damage</td>
<td>$1,000,000</td>
</tr>
</tbody>
</table>

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 OF 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
DRUG TESTING FORMS

The Office of Management and Budget (OMB) has developed the 4014 regulations as part of the Delaware Code that requires Contractors and Subcontractors to implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part without public funds pursuant to 29 Del.C. §6908(a)(6). The regulations establish the mechanism, standards and requirements of a Mandatory Drug Testing Program that will be incorporated for reference into the Contract awarded pursuant to 29 Del.C. §6962. Sample copies of Testing Report Forms maintained and/or submitted pursuant to the requirements of 4104 regulations for this Project are included herewith.
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.
AFFIDAVIT OF CRAFT TRAINING COMPLIANCE

The Affidavit of Craft Training Compliance is included on the following page.

END OF SECTION
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. 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://det.delawareworks.com/apprenticeship/documents/Apprenticeship Occupation List for 29Del6962 Compliance.pdf](https://det.delawareworks.com/apprenticeship/documents/Apprenticeship Occupation List for 29Del6962 Compliance.pdf). If you have questions regarding craft training programs, please submit them in writing to the Delaware Department of Labor at: [apprenticeship@delaware.gov](mailto:apprenticeship@delaware.gov). The Craft Training Compliance Affidavit must be submitted prior to contract execution. In addition to this Affidavit, all information pertaining to craft training for subcontractors must also be submitted prior to contract execution. Information to be provided is the craft, company name, registration number (indicate DE, US DOL or identify other state) or that craft training requirements do not apply and the reason.

In accordance with Title 29, Chapter 69, Section 6962(d)(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(d)(13) of the Delaware Code.

Craft(s): ____________________________

Contractor Name: ____________________________

Contractor Address: ____________________________

Contractor Program Registration Number __________________________________________________

On this line also indicate whether DE, Other State (identify) or US Registration Number

Or

Craft Training requirements are not applicable because: ____________________________

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 TO BE CONSIDERED.
PART 1 GENERAL
1.01 PROJECT
A. Project Name: Carvel State Office Building Cafeteria Renovations.
B. Owner's Name: Department of Facilities Management, Office of Management and Budget.
C. Architect / Engineer's Name: StudioJAED
D. The Project consists of the renovation of the Cafeteria at the Carvel State Office Building

1.02 CONTRACT DESCRIPTION
A. Contract Type: A single prime contract based on a Stipulated Price as described in Division 00.

1.03 GENERAL SCOPE OF WORK DESCRIPTION

1.04 DESCRIPTION OF ALTERATIONS WORK
A. Scope of demolition and removal work is generally shown on drawings and specified in Section 02 41 00 - Demolition.
B. The project shall be as indicated in the drawings and specs and includes, but is not limited to the following:
   1. Demolition of serving line in its entirety, including casework, countertop and equipment.
   2. Demolition of kitchen equipment and stainless steel tables, counters and shelving.
   3. Demolish partitions as indicated.
   4. Demolish wall finish and gypsum wall board as indicated.
   5. Demolish doors, frames and storefront systems as indicated.
   6. Demolish flooring.
   7. Demolish suspended ceiling and spline ceiling.
   8. Demolish grilles, registers, diffusers and associated ductwork as indicated.
   10. Demolish plumbing fixtures and associated piping as indicated.
   11. Demolish light fixtures and associated power distribution as indicated.
   12. Construct new Kitchenette and self service Grab-n-Go food service line.
   13. Construct new partitions as indicated.
   14. Construct new doors, frames and storefront systems.
   15. Construct new floor finishes, wall finishes, and ceiling systems.
   17. Construct new HVAC distribution system.
   18. Construct new plumbing systems.
   19. Modify, extend, adapt sprinkler system.
   20. Construct new power and lighting system.
   21. Modify, extend, adapt fire alarm and detection system.
C. Plumbing: Alter existing system and add new construction, keeping existing in operation.
D. HVAC: Alter existing system and add new construction, keeping existing in operation.
E. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
F. Fire Suppression Sprinklers: Alter existing system and add new construction, keeping existing in operation.
G. Fire Alarm: Alter existing system and add new construction, keeping existing in operation.
H. Telephone: Alter existing system and add new construction, keeping existing in operation.
I. Security System: Alter existing system and add new construction, keeping existing in operation.

1.05 WORK BY OWNER
A. Certain equipment will be furnished by the Owner for installation by the contractor. See drawings for additional information.

1.06 OWNER OCCUPANCY
A. Owner intends to continue to occupy portions of the existing building during the entire construction period.
B. Cooperate with Owner and DFM to minimize conflict and to facilitate Owner's operations.
C. Schedule the Work to accommodate Owner's occupancy.

1.07 CONTRACTOR USE OF SITE AND PREMISES
A. Construction Operations: Limited to the building premises.
   1. Construction Hours shall be 8:00 AM – 4:30 PM, Monday through Friday. Alternative hours will only be considered on a special-need basis.
   2. Construction will be phased to allow one (1) main entrance to be open at all times with an auxiliary emergency exit in place at all times.
B. This project will require electrical shutdowns, domestic water shutdowns, and natural gas shutdowns to facilitate the installation of the new equipment. The work must be coordinated with the Owner's schedule and other work at the site, which may include work during off-hours.
C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.
   3. Adhere to DFM's guidelines regarding entrance and egress to the site as identified during the pre-bid meeting.
D. Utility Outages and Shutdown:
   1. Coordinate any interruption and/or shutdown of utilities with DFM and the State of Delaware at least 7 days in advance of the anticipated interruption and/or shutdown. Limit any interruptions/shutdowns to the absolute minimum amount of time.
   2. DFM reserves the right to reschedule construction shutdowns with minimal warning to the contractor as required to respond to emergencies.

1.08 GENERAL STANDARDS
A. Mechanical Systems
   1. The return airflows indicated on the plans correspond to the occupied mode with minimum outside air being supplied. The balance report is to indicate these airflows in this mode of operation.
   2. Notify the owner in the event any existing hazardous materials, such as asbestos, PCB's, lead, etc., are 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 regulations, laws and ordinances.
   3. Prior to submitting bid, the contractor shall visit the site and be thoroughly familiar with the existing conditions and proposed construction. Contractor shall include in their bid all materials, labor and all incidentals for a complete installation whether specifically indicated or not. All errors, discrepancies and missed items shall be brought to the attention of the engineer during the bidding process by the contractor. These items shall be included in the bid price. No extra cost will be allowed for any discrepancy which could have been noticed at the site by the contractor.
4. The contractor shall be responsible for all additional costs incurred as a result of substitutions or deviations from the basis of design shown on these drawings.
5. All gas piping is to be installed per NFPA 54, and all local and national codes.
6. Before any system of gas piping is finally put in service, it shall be tested to ensure that it is gas tight. To test for tightness, the piping shall be filled with air or an inert gas, but not with any other gas or liquid. Testing, inspection and purging of gas piping systems shall comply with NFPA 54.

B. Electrical Systems
1. Material and equipment shall be UL, NEMA, ANSI, IEEE, ADA & CMB approved for intended purpose. Material and installation shall meet requirements of national and local electrical code.
2. Provide all labor, materials, tools, equipment, coordination, additional design and all incidentals necessary to provide a complete and operable system as detailed on plans to the satisfaction of the engineer and the owner. Coordinate all work with the engineer before the start of work.
3. Prior to submitting bid, the contractor shall visit the site and be thoroughly familiar with the existing conditions and proposed construction. Contractor shall include in their bid all material, labor, and all incidentals for a complete installation whether specifically indicated or not. All errors, discrepancies and missed items shall be brought to the attention of the engineer during the bidding process by the contractor. These items shall be included in the bid price. No extra cost will be allowed for any discrepancy which could have been noticed at the site visit by the contractor.
4. Perform work as required by applicable codes, regulations, and laws of local, state, and federal governments and other authorities with lawful jurisdiction. All work shall be in accordance with the latest edition of the national electric code.
5. Material and equipment shall be ul, nema, ansi, iee, ada & cmb approved for intended purpose. Material and installation shall meet requirements of national and local electrical code.
6. Give notices, file plans, obtain permits, and licenses, pay fees and back charges, and obtain necessary approvals from authorities that have jurisdiction.
7. Maintain record drawings on site. Record set must be complete and current and available for inspection when requisitions for payment are submitted.
8. Guarantee work in writing per specifications, repair or replace defective materials or installation at no cost to owner during the guarantee period. Correct damage caused in making necessary repairs and replacements under guarantee at no cost to owner. Submit guarantee to owner before final payment.
9. Coordinate all electrical items with existing field conditions. Locations shown are approximate and may require minor adjustment in the field to satisfy the design intent.
10. Damage to existing facilities and equipment shall be repaired or replaced immediately by the contractor at no additional expense to the owner.
11. The locations on these plans are approximate and require coordination with all other trades and verification of existing conditions. Routing of conduit is diagrammatic in nature and not intended to show all required offsets and details. The contractor is responsible for field verification of all existing associated equipment and conditions. Coordinate the location of all equipment with the engineer and the owner. Contractor is responsible for obtaining all other trade’s drawings and specifications and coordinating with all other trades during bidding and construction.
12. Contractor shall be responsible for maintaining continuity of all power, control, fire alarm, security systems, and communications functions to all areas affected by demolition and/or new construction.
13. Repair and patch any disturbed areas to match adjacent construction.
14. Disconnect and make safe any equipment to be removed by others. Coordinate removal of equipment with other trades prior to demolition.
15. In any area requiring the performance of any trade’s work, this contractor shall carefully remove and store any or all electrical items in path of work, reinstalling, and reconnecting same as required, in accordance with the plans and/or as directed after completion of other trade’s work in that area.
16. Prior to the start of demolition, contractor shall field verify all branch circuits and maintain those circuits that extend outside the scope of work.
17. After renovating existing electrical work, the contractor shall ensure that all remaining and new equipment will operate properly, including but not limited to backfeeding of existing power and lighting circuits. Refer to single line diagram.
18. All electrical work indicated to remain shall be suitably protected to prevent any damage.
19. Where electrical systems pass through renovated areas to serve other portions of the premises, systems shall be suitably protected to prevent damage or relocated and the systems restored to normal operation. Any outages in systems shall be coordinated with owner. Restore power to existing to remain equipment if interrupted by demolished circuits in the area.
20. Contractor shall submit for review, shop drawings for all equipment and materials used on the project. Submittals shall be reviewed by the engineer before purchase of materials.
21. All wiring shall be copper, 600v, 75°/90° rated, flame-retardant, heat and moisture resistant.
22. Permanently label all new electrical equipment, including but not limited to, device designation and supply circuit designation. Update or replace panel directories to include new circuit information resulting from this project.
23. Provide temporary power and lighting for all trades as required to complete the project. All temporary and interim equipment shall be installed in accordance with all applicable codes and standards including, but not limited to NFPA 110 and NFPA 70.
24. Refer to specifications for additional information that is not shown on the drawings.
25. Openings in existing concrete walls and floors required for conduit installation shall be core drilled. Maximum core drill size shall be 5” in diameter. Core drill locations shall be spaced a minimum of 6” from each other measured from the outside edge of the core drill. All core drill openings shall be properly sealed according to their location and application.
26. All wiring devices located in the basement are to be surface mounted with circuit wiring in rigid conduit. Use of mc cable is limited to branch circuit wiring above recessed ceiling or concealed in wall. Wiring to outlets on table shall be provide in either EMT conduit or flexible metal conduit.
27. Provide identification labels for all branch circuits and feeders circuits at junction boxes, panelboards, troughs, and splice boxes.
28. Provide identification labels for all branch circuits and feeders circuits at junction boxes, panelboards, troughs, and splice boxes.
29. Provide unspliced feeders from panelboard or switchboard to all equipment. Splicing is permitted for single phase circuits for lighting and outlets only.
30. All wiring devices located in the basement are to be surface mounted with circuit wiring routed in surface mounted conduit per specifications. All other wiring devices shall be recessed unless noted otherwise.
31. Electrical contractor shall provide and install (2) #14-3/4” from each vendor supplied duct smoke detector to FACP. Installation of detector by mechanical contractor. Electrical
contractor shall provide all necessary electrical terminations. Each unit over 2000 CFM shall have one (1) smoke detector. In a multi-story building, each riser over 15,000 CFM shall include one smoke detector per floor in the riser.

32. All exposed wiring and cabling to be routed on existing walls or exterior walls shall be installed in surface mounted raceway, series 2400, manufactured by wiremold/legrand with dual channel configuration where necessary to facilitate installation of standard voltage and low voltage wiring and cabling.

C. Plumbing Systems
1. See the architectural drawings for information on the scope of construction.
2. Collect fixture vents in vent header above ceiling and connect to closest existing VTR or branch vent (of the same or larger size).
3. For all equipment requirements, refer to specifications, plumbing schedule or drawings. Contractor shall not install equipment/materials until same is approved.
4. Install water hammer arrestors in domestic water piping as required per PDI WH-201 standards for water hammer arrestors.
5. Provide traps for all plumbing equipment connections and/or in any sanitary piping as required by the application.
6. Prior to submitting bid, the contractor shall visit the site and be thoroughly familiar with the existing conditions and proposed construction. Contractor shall include in their bid all materials, labor and all incidentals for a complete installation whether specifically indicated or not. All errors, discrepancies and missed items shall be brought to the attention of the engineer during the bidding process by the contractor. These items shall be included in the bid price. No extra cost will be allowed for any discrepancy which could have been noticed at the site by the contractor.
7. All installations shall comply with all codes or regulations, local, state, or national having jurisdiction over the project.
8. All fixtures and piping installations shall be properly braced, rigidly supported, and installed with adequate vibration isolation and insulation.
9. Provide all labor, materials, and installation apparatus to insure a complete operating system implied by drawing content and as specified.
10. Thoroughly coordinate all plumbing installations with work of other construction disciplines.
11. Seal all respective wall, floor, and ceiling/roof penetrations as appropriate to maintain a weather tight enclosure, fire barrier, smoke barrier, etc. As applicable. Refer to architecture plans for smoke and fire barriers/partitions.
12. Contractor to pay for all fees and permits associated with plumbing work indicated as necessary to secure a complete and operational system on schedule and in a timely manner.
13. Connect HW, CW, vent, and soil & waste lines to fixtures in accordance with sizes indicated on fixture schedule.
14. Run 2" minimum sizes soil & waste piping below ground inside building regardless of size on fixture connection schedule.
15. All dimensions and pipe sizes are in inches, unless noted otherwise.
16. Furnish and install access panels where required for access to all concealed valves, traps, or other equipment furnished under this contract where no other means is available.
17. Install all shut-off and isolation valves (with access panels if necessary) in a location which is accessible from the main floor.
18. Contractor to provide shut-off valves at all devices.
19. Keep all openings in pipes or fittings plugged or capped until connected.
20. Slope all DWV lines 1/8" per foot (3" and above), 1/4" per foot (2 1/2" and below).
21. Install all fixtures, as specified, with supply stops.
22. Install waste and supply guards under all lavs - see fixture schedule.
23. Maintain record drawings on site. Record set must be complete, current and available for inspection when requisitions for payment are submitted.

1.09 WORK SEQUENCE

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Procedures for preparation and submittal of applications for progress payments.
B. Change procedures.

1.02 SCHEDULE OF VALUES
A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
B. Forms filled out by hand will not be accepted.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS
A. Payment Period: Submit at intervals stipulated in the Agreement.
B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
C. Forms filled out by hand will not be accepted.
D. Execute certification by signature of authorized officer.
E. Submit three copies of each Application for Payment.

1.04 MODIFICATION PROCEDURES
A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.
B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Price or Contract Time.
   2. Promptly execute the change.
C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 5 days.
D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
E. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
SECTION 01 21 00
ALLOWANCES

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Contingency allowance.

1.02 RELATED REQUIREMENTS
   A. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CONTINGENCY ALLOWANCE
   A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
   B. Funds will be drawn from the Contingency Allowance only by Change Order.
   C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 ALLOWANCES SCHEDULE
   A. Allowance #1 is set aside for unpredicted scope on the project, to be verified and billed as the project conditions dictate: Sum of $10,000 thirty thousand dollars.
   B. If any part of these Allowances are used, the "Allowance Authorization" form must be authorized.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 23 00
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Description of Alternates.

1.02 RELATED REQUIREMENTS
A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for Alternates.

1.03 ACCEPTANCE OF ALTERNATES
A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner’s option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.04 SCHEDULE OF ALTERNATES
A. None.

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. Preconstruction meeting.
   B. Site mobilization meeting.
   C. Progress meetings.
   D. Submittals for review, information, and project closeout.
   E. Number of copies of submittals.
   F. Submittal procedures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING
   A. Owner will schedule a meeting after Notice of Award.
   B. Attendance Required:
      1. Owner.
      3. Contractor.
   C. Agenda:
      1. Execution of Owner-Contractor Agreement.
      2. Submission of executed bonds and insurance certificates.
      4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
      5. Designation of personnel representing the parties to Contract, OMB and Architect.
      6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
      7. Scheduling.
   D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING
   A. Owner will schedule a meeting at the Project site prior to Contractor occupancy.
   B. Attendance Required:
      1. Contractor.
      2. Owner.
      3. Architect.
      4. Contractor's Superintendent.
      5. Contractor's Project Manager.
   C. Agenda:
      1. Use of premises by Owner and Contractor.
      2. Owner's requirements and occupancy prior to completion.
      3. Construction facilities and controls provided by Contractor and Owner.
      5. Schedules.
6. Application for payment procedures.
7. Procedures for maintaining record documents.
8. Requirements for start-up of equipment.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, and Architect, as appropriate to agenda topics for each meeting.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to Work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### 3.04 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

### 3.05 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 conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only 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.

### 3.06 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. No action will be taken.

3.07 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   5. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.08 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit the number of copies that Contractor requires, plus two copies that will be retained by Architect.

B. Documents for Information: Submit two copies.

C. 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.

3.09 SUBMITTAL PROCEDURES

A. Transmit each submittal with approved form.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. 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.

E. Schedule submittals to expedite the Project, and coordinate submission of related items.

F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

H. Provide space for Contractor and Architect review stamps.

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

END OF SECTION
SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Control of installation.
B. Tolerances.
C. Testing and inspection services.
D. Mock-ups.
E. Manufacturers’ field services.

PART 3 EXECUTION
2.01 CONTROL OF INSTALLATION
A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
B. Comply with manufacturers’ instructions, including each step in sequence.
C. Should manufacturers’ instructions conflict with Contract Documents, request clarification from Architect before proceeding.
D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have Work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2.02 MOCK-UPS
A. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
C. Accepted mock-ups shall be a comparison standard for the remaining Work.
D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

2.03 TOLERANCES
A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
B. Comply with manufacturers’ tolerances. Should manufacturers’ tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
C. Adjust products to appropriate dimensions; position before securing products in place.

2.04 TESTING AND INSPECTION
A. See individual specification sections for testing required.
B. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
C. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

2.05 MANUFACTURERS’ FIELD SERVICES
A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment and operation as applicable, and to initiate instructions when necessary.
B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers’ written instructions.

2.06 DEFECT ASSESSMENT
A. Replace Work or portions of the Work not conforming to specified requirements.
B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION
SECTION 01 42 16
DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY
A. Other definitions are included in individual specification sections.

1.02 DEFINITIONS
A. Furnish: To supply, deliver, unload, and inspect for damage.
B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
E. Provide: To furnish and install.
F. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1  GENERAL

1.01  SECTION INCLUDES
A.  Temporary sanitary facilities.
B.  Security requirements.
C.  Vehicular access and parking.
D.  Waste removal facilities and services.

1.02  TEMPORARY SANITARY FACILITIES
A.  Provide and maintain required facilities and enclosures.  Provide at time of project mobilization.
B.  Maintain daily in clean and sanitary condition.

1.03  BARRIERS
A.  Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner’s use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B.  Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C.  Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
D.  Traffic Controls: Coordinate with the Owner and the City of Wilmington.

1.04  FENCING
A.  Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.05  INTERIOR ENCLOSURES
A.  Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
B.  Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1.06  SECURITY
A.  Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
B.  Coordinate with Owner's security program.

1.07  VEHICULAR ACCESS AND PARKING
A.  Coordinate access and haul routes with governing authorities and Owner.
B.  Provide and maintain access to fire hydrants, free of obstructions.
C.  Parking is limited in this area. Parking will be coordinated by the contractor and will be off-site.

1.08  WASTE REMOVAL
A.  Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
B.  Provide containers with lids. Remove trash from site daily.
C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.09 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Transportation, handing, storage and protection.
B. Product option requirements.
C. Substitution limitations and procedures.
D. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 SUBMITTALS
A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 NEW PRODUCTS
A. Provide new products unless specifically required or permitted by the Contract Documents.
B. Where all other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
   2. If wet-applied, have lower VOC content, as defined in Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
   3. Have a published GreenScreen Chemical Hazard Analysis.

2.02 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.03 MAINTENANCE MATERIALS
A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES
A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

C. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

D. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING
   A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
   B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
   C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
   D. Transport and handle products in accordance with manufacturer's instructions.
   E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
   F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
   G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
   H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION
   A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
   B. Store and protect products in accordance with manufacturers' instructions.
   C. Store with seals and labels intact and legible.
   D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
   E. For exterior storage of fabricated products, place on sloped supports above ground.
   F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
   G. Comply with manufacturer's warranty conditions, if any.
H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
I. Prevent contact with material that may cause corrosion, discoloration, or staining.
J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION
SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
C. Cutting and patching.
D. Surveying for laying out the work.
E. Cleaning and protection.
F. Starting of systems and equipment.
G. Demonstration and instruction of Owner personnel.
H. Closeout procedures, except payment procedures.
I. General requirements for maintenance service.

1.02  RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
B. Section 01 30 00 - Administrative Requirements: Submittals procedures.
C. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
D. Section 07 84 00 - Firestopping.

1.03  SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   5. Work of Owner or separate Contractor.

1.04  QUALIFICATIONS

A. For survey work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

1.05  PROJECT CONDITIONS

A. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
D. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
E. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.06 COORDINATION
A. See Section 01 10 00 - Summary, for occupancy-related requirements.
B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
C. Notify affected utility companies and comply with their requirements.
D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
G. Coordinate completion and clean-up of work of separate sections.

PART 2 PRODUCTS
2.01 PATCHING MATERIALS
A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.
3.02 LAYING OUT THE WORK
A. Verify locations of survey control points prior to starting work.
B. Promptly notify Architect of any discrepancies discovered.
C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
F. Utilize recognized engineering survey practices.
G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading; fill and topsoil placement; utility locations, slopes, and invert elevations; and ________.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations, and ________.
H. Periodically verify layouts by same means.
I. Maintain a complete and accurate log of control and survey work as it progresses.

3.03 GENERAL INSTALLATION REQUIREMENTS
A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.04 ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.
B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and ________): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.

3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
   b. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.

5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
G. Restore work with new products in accordance with requirements of Contract Documents.
H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.08 SYSTEM STARTUP
A. Coordinate schedule for start-up of various equipment and systems.
B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
D. Verify that wiring and support components for equipment are complete and tested.
E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
F. Submit a written report that equipment or system has been properly installed and is functioning correctly.
3.09 DEMONSTRATION AND INSTRUCTION
   A. See Section 01 79 00 - Demonstration and Training.
   B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner personnel in detail to explain all aspects of operation and maintenance.
   C. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.10 ADJUSTING
   A. Adjust operating products and equipment to ensure smooth and unhindered operation.
   B. Testing, adjusting, and balancing HVAC systems: See Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.

3.11 FINAL CLEANING
   A. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
   B. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
   C. Clean debris from roofs, gutters, downspouts, and drainage systems.
   D. Clean site; sweep paved areas, rake clean landscaped surfaces.
   E. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES
   A. Make submittals that are required by governing or other authorities.
   B. Notify Architect when work is considered ready for Substantial Completion.
   C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
   D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
   E. Notify Architect when work is considered finally complete.
   F. Complete items of work determined by Architect's final inspection.
   G. Provided completed documentation as follows:
      1. Consent to Surety of Final Payment
      2. Certificate of Substantial Completion
      3. Contractor Satisfaction of Debt and Claims
      4. Release of Liens for the Contractor, his Subcontractors, and his Suppliers

3.13 MAINTENANCE
   A. Provide service and maintenance of components indicated in specification sections.
   B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
   C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
   D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION
PART 1 GENERAL

1.01 RELATED DOCUMENTS
   A. The Contract Documents, including but not limited to, the Drawings and Individual Specification Sections, apply to this Section.

1.02 SUMMARY
   A. This Section includes procedural requirements for cutting and patching.
   B. Responsibility: Each Contractor is responsible for the cutting and patching to permit installation or performance of Work of their contract.
   C. Related Sections include the following:
      1. Individual Specification Sections.

1.03 DEFINITIONS
   A. Cutting: Removal of in-place construction necessary to permit installation or performance of Work of the contract.
   B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of Work of the contract.

1.04 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: At each occurrence, 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. Design Professional’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.

1.05 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 result in increased maintenance or decreased operational life or safety.
   C. Fire Rated Elements: Do not cut and patch fire rated elements (i.e. floors, walls, roofs, shafts, etc.) in a manner that results in reducing their capacity to perform as intended or that results in decreased fire rating.
D. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, which results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.

E. 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 Design Professional’s opinion, reduce the building’s aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

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

1.06 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
2.01 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, unless specified otherwise in other Sections.
C. Fire Rated Elements: Provide firestopping products/systems specified in system design listings by approved testing agencies that conform to the construction type, penetrating item, annular space requirements and fire rating involved in each separate assembly. Refer to applicable Individual Specification Sections.

PART 3 EXECUTION
3.01 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.

3.02 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.
D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting or patching to minimize interruption to occupied areas.
3.03 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.
   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 or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   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.
   3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
   5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
   6. Fire Rated Elements: Install firestopping systems to comply with applicable Individual Specification Sections and firestopping manufacturer’s written installation instructions and published drawings for products and applications.
D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION
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.

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.

1.4 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.

1.5 WASTE MANAGEMENT PLAN – Contractor 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 a landfill. The plan should include 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.
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.

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.

END OF SECTION
<table>
<thead>
<tr>
<th>MATERIAL CATEGORY</th>
<th>DISPOSED IN MUNICIPAL SOLID WASTE LANDFILL</th>
<th>DIVERTED FROM LANDFILL BY RECYCLING, SALVAGE OR REUSE</th>
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<tbody>
<tr>
<td></td>
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<td>Recycled</td>
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<tr>
<td>1. Acoustical Ceiling Tiles</td>
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<td>2. Asphalt</td>
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<td>3. Asphalt Shingles</td>
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<td>4. Cardboard Packaging</td>
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<td>5. Carpet and Carpet Pad</td>
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<td>6. Concrete</td>
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<td>7. Drywall</td>
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<td>8. Fluorescent Lights and Ballasts</td>
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<td>9. Land Clearing Debris</td>
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<td>10. Metals</td>
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<td>11. Paint (through hazardous waste outlets)</td>
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<td>12. Wood</td>
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<td>13. Plastic Film (sheeting, shrink wrap, packaging)</td>
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<td>14. Window Glass</td>
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<td>15. Field Office Waste (office paper, aluminum cans, glass, plastic, and coffee cardboard)</td>
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<td>16. Other (insert description)</td>
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<td>17. Other (insert description)</td>
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<tr>
<td>Total (In Weight)</td>
<td>(TOTAL OF ALL ABOVE VALUES – IN WEIGHT)</td>
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<tr>
<td>Percentage of Waste Diverted</td>
<td>(TOTAL WASTE DIVIDED BY TOTAL DIVERTED)</td>
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SECTION 01 76 10
TEMPORARY PROTECTIVE COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Temporary protective coverings for installed floors, walls, and other surfaces.

1.02 RELATED REQUIREMENTS
A. Section 01 70 00 - Execution and Closeout Requirements: Coordination of requirements for materials specified in this section.

1.03 REFERENCE STANDARDS
A. ANSI A135.4 - American National Standard for Basic Hardboard.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes available; and installation instructions.
C. Shop Drawings: Indicate existing finished surfaces to be protected.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Temporary Protective Coverings:
B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GENERAL
A. Provide materials that are easily removed without damage to the surfaces covered and with the following characteristics:
   1. Water resistant.
   2. Vapor permeable.
   3. Impact resistant.
   4. Slip resistant.
   5. Flame retardant.

2.03 MATERIALS
A. Sheet Materials:
   2. Recycled paperboard/plastic composite sheet.
   3. Recycled paperboard sheet.
   5. Plywood, 1/2 inch thick nominal.
   6. Fiberboard: ASTM C208, 1/2 inch thick nominal.
   7. Flame Retardance: Meet requirements of NFPA 701.
8. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.

B. Rolled Materials:
2. Recycled cellulose fiberboard paper.
3. Laminated glass fiber reinforced kraft paper.
4. Rosin coated paper.
5. Flame Retardance: Meet requirements of NFPA 701.
6. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.

C. Corner and Door Jamb Protection Materials:
1. Cardboard, shaped specifically for application.
2. PVC plastic.

D. Tape: Type recommended by protective covering material manufacturer.

PART 3 EXECUTION

3.01 PREPARATION
A. Remove dirt and debris from surfaces to be protected.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Trim or overlap sheet materials to fit area to be covered.
C. Roll out and cut rolled materials to fit area to be covered.
D. Tape seams. Avoid taping directly to finished surfaces.
E. Stretch self-adhering film materials to completely cover surface.
F. Install door jamb protection to full height of opening.

3.03 REMOVAL
A. Remove protective coverings prior to Date of Substantial Completion. Reuse or recycle materials if possible.

END OF SECTION
SECTION 01 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Project Record Documents.
   B. Operation and Maintenance Data.
   C. Warranties and bonds.

1.02 RELATED REQUIREMENTS
   A. Section 00 72 00 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
   B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
   C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
   D. Individual Product Sections: Specific requirements for operation and maintenance data.
   E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS
   A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
   B. Operation and Maintenance Data:
      1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
      2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
      3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
      4. Submit two sets of revised final documents in final form within 10 days after final inspection.
   C. Warranties and Bonds:
      1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
      2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
      3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS
   A. Maintain on site one set of the following record documents; record actual revisions to the Work:
      1. Drawings.
      2. Addenda.
      3. Change Orders and other modifications to the Contract.
   B. Ensure entries are complete and accurate, enabling future reference by Owner.
   C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.

E. Record Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.05 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

END OF SECTION
SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY
A. Demonstration of products and systems where indicated in specific specification sections.
B. Training of Owner personnel in operation and maintenance is required for:
   1. Electrical systems and equipment.

1.02 RELATED REQUIREMENTS
A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.
B. Section 01 91 13 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.
C. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Architect for transmittal to Owner.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such as slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
   1. Identification of each training session, date, time, and duration.
   2. Sign-in sheet showing names and job titles of attendees.
   3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

1.04 QUALITY ASSURANCE
A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL
A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
B. Demonstration may be combined with Owner personnel training if applicable.
C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventative maintenance.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.
   2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
D. Non-Operating Products: Demonstrate cleaning, scheduled and preventative maintenance, and repair procedures.
   1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL
A. Conduct training on-site unless otherwise indicated.
B. Owner will provide classroom and seating at no cost to Contractor.
C. Provide training in minimum two hour segments.
D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.
F. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4. Provide hands-on training on all operational modes possible and preventive maintenance.
   5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6. Discuss common troubleshooting problems and solutions.
   7. Discuss any peculiarities of equipment installation or operation.
   8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION
SECTION 02 41 00
DEMOLITION

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Selective demolition of building elements for alteration purposes.
B. Legal disposal of demolished items.

1.02 RELATED REQUIREMENTS
A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
B. Section 01 10 00 - Summary: Sequencing and staging requirements.
C. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
D. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
E. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS
A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 PROJECT CONDITIONS
A. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

PART 3 EXECUTION
2.01 SCOPE
A. As indicated on Drawings and herein specified.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS
A. Comply with other requirements specified in Section 01 70 00 Execution and Closeout Requirements.
B. Comply with applicable codes and regulations for demolition operations and safety of the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary dust proof partitions/wall assembly barriers and security devices.
   4. Use adequate physical barriers and wall assemblies to prevent access to areas that could be hazardous to workers or the public.
   5. Conduct operations to minimize effects on and interference with adjacent construction and occupants.
   6. Do not close or obstruct means of egress corridors, roadways or sidewalks without permit.
7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Comply with requirements of Section 01 74 19 - Waste Management.
   2. Dismantle existing construction and separate materials.
   3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

2.03 EXISTING UTILITIES
A. Protect existing utilities to remain from damage.
B. Do not close, shut off, or disrupt existing life safety systems that are in use without permission from the Owner.
C. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without permission from the Owner.
D. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions and wall assemblies during demolition and construction.
C. Remove existing work as indicated and as required to accomplish new work.
   1. At areas of demolition and transition, remove materials and finishes including, but not limited to, rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings and notes.
D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removal neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.
   5. Patch to match existing at areas of transition and demolition unless noted and/or scheduled otherwise.

2.05 REMOVE DEBRIS, AND TRASH FROM SITE.

A. Remove from site all materials not to be reused on site.

B. Leave site in clean condition, ready for subsequent work.

C. See Section 01 74 19 Construction Waste Management and Disposal.

END OF SECTION
SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Communications and electrical room mounting boards to be fire and preservative treated.
B. Concealed wood blocking, nailers, and supports to be fire and preservative treated.
C. Miscellaneous wood nailers, furring, and grounds to be fire and preservative treated.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
G. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood Protection Association.
H. AWPA C9 - Plywood -- Preservative Treatment by Pressure Processes; American Wood Protection Association.
I. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Protection Association.
J. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Protection Association.
M. PS 1 - Structural Plywood.
O. SPIB (GR) - Grading Rules.
P. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17.
Q. WWPA G-5 - Western Lumber Grading Rules.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 QUALITY ASSURANCE
A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
1. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

C. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

C. Provide sustainably harvested wood.

D. Provide wood harvested within a 500 mile radius of the project site; see Section 01 60 00 for requirements for locally-sourced products.

E. Dimensional lumber to be fire and preservative treated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

E. Miscellaneous Blocking, Furring, Nailers, and Curbs:
   1. Lumber: S4S, No. 1 or Construction Grade.

F. Dimensional lumber to be fire and preservative treated.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84. Communications and Electrical Room mounting Boards to be fire treated.
B. Other Applications to be fire and preservative treated.
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.
   4. Electrical Component Mounting: APA rated plywood B-C sheathing, fire retardant treated.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M; or Stainless Steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Manufacturers:
      d. Substitutions: Not permitted.
   2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Treat rough carpentry items as scheduled; or as indicated.
      c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
   1. Manufacturers:
      d. Substitutions: Not permitted.

D. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
   1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   2. Treat lumber in contact with roofing, flashing, or waterproofing.
   3. Treat lumber in contact with masonry or concrete.
4. Treat lumber less than 18 inches above grade.
   a. Treat lumber in other locations as indicated.
5. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
   a. Kiln dry plywood after treatment to maximum moisture content of 15 percent.
   b. Treat plywood in contact with masonry or concrete.
   c. Treat plywood in other locations as indicated.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL
   A. Select material sizes to minimize waste.
   B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
   C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.02 FRAMING INSTALLATION
   A. Select material sizes to minimize waste.
   B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
   C. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
   D. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
   E. Install structural members full length without splices unless otherwise specifically detailed.
   F. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.

3.03 BLOCKING, NAILERS, AND SUPPORTS
   A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
   B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
   C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
   D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
   E. Specifically, provide the following non-structural framing and blocking:
      1. Cabinets and shelf supports.
      2. Wall brackets.
      3. Handrails.
      4. Grab bars.
      5. Bath accessories.
      6. Wall-mounted door stops.
      7. Visual display and marker boards.
3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

3.05 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.
B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.06 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 78 39.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION
SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Wood casings and moldings.

1.02 REFERENCE STANDARDS
   B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards.

1.03 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate the work with installation of associated and adjacent components.
   B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS
   A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Premium Grade.
   B. Interior Woodwork Items:
      1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2.02 WOOD-BASED COMPONENTS
   A. Wood fabricated from old growth timber is not permitted.
   B. Provide sustainably harvested wood, certified or labeled as specified in Section 01 60 00.
   C. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless otherwise noted, provided it is clean and free of contamination; identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.

2.03 LUMBER MATERIALS
   A. Hardwood Lumber: hard maple species, plain sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.04 ACCESSORIES
   A. Lumber for Shimming
   B. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 FABRICATION
   A. Shop assemble work for delivery to site, permitting passage through building openings.
   B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
2.06 SHOP FINISHING
   A. Apply wood filler in exposed nail and screw indentations.
   B. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
   C. Prime paint surfaces in contact with cementitious materials.
   D. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify adequacy of backing and support framing.

3.02 INSTALLATION
   A. Install work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.
   B. Set and secure materials and components in place, plumb and level.
   C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 TOLERANCES
   A. Maximum Variation from True Position: 1/16 inch.
   B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION
SECTION 06 65 10
SOLID SURFACE FABRICATIONS

PART 1 GENERAL
1.01 RELATED DOCUMENTS
A. Drawings and general provisions of the contract, including general and supplementary conditions and Division 1 Specification Sections, apply to this Section.

1.02 1.2 SUMMARY
A. This Section includes the following horizontal and trim solid surface product types:
   1. Reception areas
B. Related Sections include the following:
   1. Division 5 Section 05 50 00 “Metal Fabrications” for Blocking.
   2. Division 6 Section 06 10 00 “Rough Carpentry” for Blocking.

1.03 DEFINITION
A. Solid surface is defined as nonporous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.04 1.4 SUBMITTALS
A. Shop drawings:
   1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
      a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
      b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
      c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.
B. Samples:
   1. For each type of product indicated.
      a. Submit minimum 6-inch by 6-inch sample in specified gloss.
      b. Cut sample and seam together for representation of inconspicuous seam.
      c. Indicate full range of color and pattern variation.
   2. Approved samples will be retained as a standard for work.
C. Product data:
   1. Indicate product description, fabrication information and compliance with specified performance requirements.
D. Product certificates:
   1. For each type of product, signed by product manufacturer.
E. Manufacturer certificates:
   1. Signed by manufacturers certifying that they comply with requirements.
F. Maintenance data:
   1. Submit manufacturer’s care and maintenance data, including repair and cleaning instructions.
      a. Maintenance kit for finishes shall be submitted.
   2. Include in project closeout documents.

1.05 QUALITY ASSURANCE
A. Qualifications:
1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:
   1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

C. Applicable standards:
   1. Standards of the following, as referenced herein:
      a. American National Standards Institute (ANSI)
      b. American Society for Testing and Materials (ASTM)
      c. National Electrical Manufacturers Association (NEMA)
      d. NSF International
   2. Fire test response characteristics:
      a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
         1) Flame Spread Index: 25 or less.
         2) Smoke Developed Index: 450 or less.

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.

E. Drawings shall:
   1. Be produced in 1/2-inch scale for all fabricated items.

F. Drawings must be complete and submitted to the architect within 60 days after award of contract for record only.
   1. No review or approval will be forthcoming.
   2. Coordination drawings are required for the benefit of contractor’s fabricators/installers as an aid to coordination of their work so as to eliminate or reduce conflicts that may arise during the installation of their work.

G. Job mock-up:
   1. Prior to fabrication of architectural millwork, erect sample unit to further verify selections made under sample submittals and to demonstrate the quality of materials and execution.
   2. Build the mock-up to comply with the contract documents and install in a location as directed by the architect.
   3. Notify the architect two weeks in advance of the date of when the mock-up will be delivered.
   4. Should mock-up not be approved, re-fabricate and reinstall until approval is secured.
a. Remove rejected units from project site.
5. After approval, the mock-up may become a part of the project.
6. This mock-up, once approved, shall serve as a standard for judging quality of all completed units of work.

H. Pre-installation conference:
  1. Conduct conference at project site to comply with requirements in Division 1.

1.06 DELIVERY, STORAGE AND HANDLING
A. Deliver no components to project site until areas are ready for installation.
B. Store components indoors prior to installation.
C. Handle materials to prevent damage to finished surfaces.
   1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.07 WARRANTY
A. Provide manufacturer’s warranty against defects in materials.
   1. Warranty shall provide material and labor to repair or replace defective materials.
   2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.
B. Manufacturer’s warranty period:
   1. Ten years from date of substantial completion.

1.08 MAINTENANCE
A. Provide maintenance requirements as specified by the manufacturer.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Manufacturers:
   1. Subject to compliance with requirements, provide products by one of the following:
      a. Corian® surfaces from the DuPont company (basis of design).
      b. Approved equal.

2.02 MATERIALS
A. Solid polymer components
   1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
   2. Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.
B. Thickness:
   1. 1/2 inch
C. Edge treatment:
   1. See drawings

2.03 ACCESSORIES
A. Joint adhesive:
   1. Manufacturer’s standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
B. Sealant:
   1. Manufacturer’s standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.
2.04 FACTORY FABRICATION

A. Shop assembly
   1. 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.
   2. Form joints between components using manufacturer’s standard joint adhesive without conspicuous joints.
      a. Reinforce with strip of solid polymer material, 2” wide.
   3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
   4. Rout and finish component edges with clean, sharp returns.
      a. Rout cutouts, radii and contours to template.
      b. Smooth edges.
      c. Repair or reject defective and inaccurate work.

2.05 FINISHES

A. Color Price Group A & B

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
   1. Provide product in the largest pieces available.
   2. Form field joints using manufacturer’s recommended adhesive, with joints inconspicuous in finished work.
   3. Exposed joints/seams shall not be allowed.
   4. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
   5. Cut and finish component edges with clean, sharp returns.
   6. Rout radii and contours to template.
   7. Anchor securely to base cabinets or other supports.
   8. Align adjacent countertops and form seams to comply with manufacturer’s written recommendations using adhesive in color to match countertop.
   9. Carefully dress joints smooth, remove surface scratches and clean entire surface.
   10. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.

B. Coved backsplashes and applied sidesplashes:
   1. Install applied sidesplashes using manufacturer’s standard color-matched silicone sealant.
   2. Adhere applied sidesplashes to countertops using manufacturer’s standard color-matched silicone sealant.

3.03 REPAIR

A. Repair or replace damaged work which cannot be repaired to architect’s satisfaction.

3.04 CLEANING AND PROTECTION

A. Keep components clean during installation.
B. Remove adhesives, sealants and other stains.

END OF SECTION
SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Firestopping systems.
   B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS
   A. Section 01 70 00 - Execution and Closeout Requirements: Cutting and patching.
   B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS
   E. ITS (DIR) - Directory of Listed Products.
   F. FM 4991 - Approval Standard for Firestop Contractors.
   G. FM P7825 - Approval Guide; Factory Mutual Research Corporation.
   H. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168.
   J. UL (FRD) - Fire Resistance Directory.

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
   C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
   D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
   E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   F. Certificate from authority having jurisdiction indicating approval of materials used.
   G. Qualification statements for installing mechanics.

1.05 QUALITY ASSURANCE
   A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
      1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
      2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
      3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
B. Installing Mechanic's Qualifications: Trained by firestopping manufacturer and able to provide evidence thereof.

1.06 MOCK-UP
A. Install one firestopping assembly representative of each fire rating design required on project.
   1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
   2. Where firestopping is intended to fill a linear opening, install minimum of 2 linear ft.
B. Obtain approval of authority having jurisdiction before proceeding.
C. If accepted, mock-up will represent minimum standard for the Work.
D. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

1.07 FIELD CONDITIONS
A. Comply with firestopping manufacturer’s recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING - GENERAL REQUIREMENTS
A. Manufacturers:
   2. 3M Fire Protection Products: www.3m.com/firestop.
B. Firestopping Materials with Volatile Content: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS
A. Head-of-Wall Firestopping at Joints Between Non-Rated Floor and Fire-Rated Wall: Use any system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
   1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
B. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use any system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
   1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
   2. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: In addition, provide systems that have been tested to show W Rating as indicated.
   4. Listing by UL, FM, or Intertek in their certification directory will be considered evidence of successful testing.
C. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Temperature Rise: In addition, provide systems that have been tested to show T Rating as indicated.
   2. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.
   3. Listing by UL, FM, or Intertek in their certification directory will be considered evidence of successful testing.

2.03 FIRESTOPPING FOR FLOOR-TO-FLOOR, WALL-TO-FLOOR, AND WALL-TO-WALL JOINTS

A. Concrete and Concrete Masonry Walls and Floors:
   1. Top of Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
      a. 2 Hour Construction: UL System HW-D-0181; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      b. 2 Hour Construction: UL System HW-D-1037; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   2. Concrete/Concrete Masonry Wall to Wall Joints:
      a. 2 Hour Construction: UL System WW-D-0017; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      b. 2 Hour Construction: UL System WW-D-0032; Hilti CP 606 Flexible Firestop Sealant.

B. Gypsum Board Walls:
   1. Wall to Wall Joints:
      a. 2 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
      b. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.

2.04 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

A. Blank Openings:
   1. In Walls:
      a. 2 Hour Construction: UL System C-AJ-0090; Hilti FS-ONE Intumescent Firestop Sealant.

B. Penetrations Through Walls By:
   1. Multiple Penetrations in Large Openings:
      a. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE Intumescent Firestop Sealant.
   2. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 2 Hour Construction: UL System C-AJ-1421; Hilti FS-ONE Intumescent Firestop Sealant or CP 604 Self-Leveling Firestop Sealant.
      b. 2 Hour Construction: UL System C-AJ-1498; Hilti CP 680-P/M Cast-In Device.
   3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
      a. 2 Hour Construction: UL System C-AJ-2109; Hilti CP 643N/644 Firestop Collar.
      b. 2 Hour Construction: UL System C-BJ-2021; Hilti CP 643N Firestop Collar.
   4. Electrical Cables Not In Conduit:
      a. 2 Hour Construction: UL System C-AJ-3216; Hilti CP 658 Firestop Plug.
      b. 2 Hour Construction: UL System W-J-3198; Hilti CFS-SL RK Retrofit Sleeve Kit for existing cables.
      c. 2 Hour Construction: UL System W-J-3199; Hilti CFS-SL SK Firestop Sleeve Kit.
   5. Cable Trays with Electrical Cables:
      a. 3 Hour Construction: UL System C-AJ-4035; Hilti FS-ONE Intumescent Firestop Sealant.
6. Insulated Pipes:
   a. 2 Hour Construction: UL System C-AJ-5048; Hilti FS-ONE Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CP 601S Elastomeric Firestop Sealant, or CP 604 Self-Leveling Firestop Sealant.

7. HVAC Ducts, Uninsulated:
   a. 2 Hour Construction: UL System C-AJ-7111; Hilti FS-ONE Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-7084; Hilti FS-ONE Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CP 601S Elastomeric Firestop Sealant, or CP 604 Self-Leveling Firestop Sealant.

C. Penetrations Through Walls By:
   1. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 2 Hour Construction: UL System W-J-1067; Hilti FS-ONE Intumescent Firestop Sealant.
   2. Electrical Cables Not In Conduit:
      a. 2 Hour Construction: UL System W-J-3060; Hilti FS-ONE Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
      b. 2 Hour Construction: UL System W-J-3143; Hilti CP 658T Firestop Plug.
   3. Insulated Pipes:
      a. 2 Hour Construction: UL System W-J-5041; Hilti FS-ONE Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System W-J-5042; Hilti FS-ONE Intumescent Firestop Sealant.
      c. 2 Hour Construction: UL System W-J-5028; Hilti FS-ONE Intumescent Firestop Sealant.
   4. HVAC Ducts, Uninsulated:
      a. 2 Hour Construction: UL System W-J-7109; Hilti FS-ONE Intumescent Firestop Sealant or CP 606 Flexible Firestop Sealant.
   5. HVAC Ducts, Insulated:
      a. 2 Hour Construction: UL System W-J-7112; Hilti FS-ONE Intumescent Firestop Sealant.

2.05 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

A. Blank Openings:
   1. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.

B. Penetrations By:
   1. Multiple Penetrations in Large Openings:
      a. 2 Hour Construction: UL System W-L-1389; Hilti FS-ONE Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System W-L-1408; Hilti FS-ONE Intumescent Firestop Sealant.
      c. 2 Hour Construction: UL System W-L-8071; Hilti FS-ONE Intumescent Firestop Sealant.
      d. 2 Hour Construction: UL System W-L-8079; Hilti FS-ONE Intumescent Firestop Sealant.
      e. 2 Hour Construction: UL System W-L-8087; Hilti FS 657 Fire Block.
   2. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 2 Hour Construction: UL System W-L-1054; Hilti FS-ONE Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System W-L-1164; Hilti FS-ONE Intumescent Firestop Sealant.
c. 2 Hour Construction: UL System W-L-1206; Hilti FS-ONE Intumescent Firestop Sealant.

3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
   b. 2 Hour Construction: UL System W-L-2411; Hilti CP 648-E Firestop Wrap Strip.
   c. 2 Hour Construction: UL System W-L-2128; Hilti FS-ONE Intumescent Firestop Sealant.

4. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System W-L-3065; Hilti FS-ONE Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
   b. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
   c. 2 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for existing cables.
   d. 2 Hour Construction: UL System W-L-3394; Hilti CFS-SL SK Firestop Sleeve Kit.
   e. 2 Hour Construction: UL System W-L-3395; Hilti CP653 Speed Sleeve.

5. Cable Trays with Electrical Cables:
   a. 2 Hour Construction: UL System W-L-4011; Hilti FS 657 Fire Block.
   b. 2 Hour Construction: UL System W-L-4060; Hilti FS-ONE Intumescent Firestop Sealant.

6. Insulated Pipes:
   a. 2 Hour Construction: UL System W-L-5028; Hilti FS-ONE Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System W-L-5096; Hilti FS-ONE Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System W-L-5257; Hilti FS-ONE Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, or CP 601S Elastomeric Firestop Sealant.
   e. 2 Hour Construction: UL System W-L-5244; Hilti CP 648-E Firestop Wrap Strip.

7. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-L-7156; Hilti FS-ONE Intumescent Firestop Sealant.

2.06 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements. Foam, caulk, putty or manufactured device.
   1. Fire Ratings: Use any system listed by UL, FM, or ITS (Warnock Hersey) or that has F Rating equal to fire rating of penetrated assembly and minimum T Rating of 0 and that meets all other specified requirements.
   2. Fire Ratings: See Drawings for required systems and ratings.

B. Firestopping at Uninsulated Metallic Pipe and Conduit Penetrations, of diameter 4 inches or less: Any material meeting requirements. Foam, caulk, putty or manufactured device.

C. Firestopping at Cable Tray Penetrations: Any material meeting requirements. Foam, caulk, putty or manufactured device.

D. Firestopping at Cable Penetrations, not in Conduit or Cable Tray: Any material meeting requirements. Foam, caulk, putty or manufactured device.

E. Firestopping at Control and Expansion Joints (without Penetrations): Any material meeting requirements and caulk.
2.07 MATERIALS
   A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
   B. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
   C. Foam Firestopping: Single component silicone foam compound.
   D. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers.
   E. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening.
   F. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION
   A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
   B. Remove incompatible materials that could adversely affect bond.
   C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION
   A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
   B. Do not cover installed firestopping until inspected by authority having jurisdiction.
   C. Install labeling required by code.

CLEANING
4.01 CLEAN ADJACENT SURFACES OF FIRESTOPPING MATERIALS.
4.02 PROTECTION
   A. Clean adjacent surfaces of firestopping materials.
   B. Protect adjacent surfaces from damage by material installation.

END OF SECTION
SECTION 07 90 05
JOINT SEALERS

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Sealants and joint backer rods.
B. Precompressed foam sealers.

1.02  RELATED REQUIREMENTS
A. Section 07 62 00: Sealants required in conjunction with flashing.

1.03  REFERENCE STANDARDS

1.04  ADMINISTRATIVE REQUIREMENTS
A. Coordinate the work with other sections referencing this section.

1.05  SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
C. Samples: Submit two samples, 2 x 1/2 in size illustrating sealant colors for selection.
D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

1.06  FIELD CONDITIONS
A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07  COORDINATION
A. Coordinate the work with all sections referencing this section.

1.08  WARRANTY
A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
B. Correct defective work within a five year period after Date of Substantial Completion.
C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2  PRODUCTS

2.01  MANUFACTURERS
A. Polyurethane Sealants:
   2. Bostik, Inc www.bostik-us.com
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Acrylic Sealants (ASTM C920):
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Preformed Compressible Foam Sealers and backer rods:
   2. Emseal Joint Systems, Ltd.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SEALANTS

A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

B. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component.
   2. Product: Pecora 890 manufactured by Pecora.
   3. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
      b. Joints between concrete and other materials.
      c. Joints between metal frames and other materials.
      d. Other exterior joints for which no other sealant is indicated.

C. Type 2 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
   3. Applications: Use for:
      a. Interior wall and ceiling control joints.
      b. Joints between door and window frames and wall surfaces.
      c. Other interior joints for which no other type of sealant is indicated.

D. Type 3 - Exterior Expansion Joint Sealer: ASTM D 2628, hollow neoprene (polychloroprene) compression gasket.
   2. Size and Shape: As indicated by drawings.
   4. Applications: Use for:
      a. Exterior wall expansion joints.

2.03 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.
PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that substrate surfaces and joint openings are ready to receive work.
B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION
A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean and prime joints in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION
A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Perform installation in accordance with ASTM C1193.
C. Perform acoustical sealant application work in accordance with ASTM C919.
D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
E. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
   2. Neck dimension no greater than 1/3 of the joint width.
   3. Surface bond area on each side not less than 75 percent of joint width.
F. Install bond breaker where joint backing is not used.
G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
I. Tool joints concave.
J. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

3.04 CLEANING
A. Clean adjacent soiled surfaces.

3.05 PROTECTION
A. Protect sealants until cured.

END OF SECTION
SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Non-fire-rated steel door frames.
B. Fire-rated steel doors and frames.

1.02 RELATED REQUIREMENTS
A. Section 08 71 00 - Door Hardware.
B. Section 09 90 00 - Paints and Coatings: Field painting.

1.03 REFERENCE STANDARDS
B. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100).
C. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
E. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames.
F. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute (ANSI/DHI A115 Series).
G. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage andfastening methods, and finishes; and one copy of referenced grade standard.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
D. Samples: Submit two samples of metal, 2 x 2 inches in size showing factory finishes, colors, and surface texture.
E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE
A. Maintain at the project site a copy of all reference standards dealing with installation.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Store in accordance with NAAMM HMMA 840.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.
PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Steel Door Frames:
   4. Phillip Manufacturing Company
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS AND FRAMES
A. Requirements for All Door Frames:
   2. Finish: Factory primed, for field finishing.

2.03 STEEL DOORS
A. Interior Doors, Non-Fire-Rated:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 1, full flush.
   2. Core: Polystyrene foam.
   5. Finish: Factory primed, for field finishing.
B. Interior Doors, Fire-Rated:
   1. Fire Rating: As indicated on Door and Frame Schedule, As indicated on drawings, 1-1/2 hours tested in accordance with UL 10C ("positive pressure"), UL 10B or NFPA 252 ("neutral pressure").
      a. Provide units listed and labeled by UL or WH.
      b. Attach fire rating label to each fire rated unit.
   2. Core: Mineral fiberboard.
   3. Texture: Smooth faces.
   4. Finish: Factory primed, for field finishing.

2.04 STEEL FRAMES
A. General:
   1. Comply with the requirements of grade specified for corresponding door.
      a. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 2
   2. Finish: Factory primed, for field finishing.
   3. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
B. Interior Door Frames, Non-Fire-Rated: Fully welded type.
   1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
   2. Finish: Factory primed, for field finishing.
C. Door Frames, Fire-Rated: Knock-down type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
   3. Finish: Factory primed, for field finishing.

2.05 FINISHES
A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
2.06 ACCESSORY MATERIALS
   A. Glazing: As specified in Section 08 80 00, factory installed.
   B. Silencers: Resilient rubber or vinyl, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
   C. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.07 FINISH MATERIALS
   A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer’s standard, baked on.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that opening sizes and tolerances are acceptable.
   C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION
   A. Install doors and frames in accordance with manufacturer’s instructions and related requirements of specified door and frame standards or custom guidelines indicated.
   B. Install fire rated units in accordance with NFPA 80.
   C. Coordinate frame anchor placement with wall construction.
   D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
   E. Coordinate installation of hardware.
   F. Touch up damaged factory finishes.

3.03 TOLERANCES
   A. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.04 ADJUSTING
   A. Adjust for smooth and balanced door movement.

END OF SECTION
SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Wall access door and frame units.
B. Ceiling access door and frame units.

1.02 RELATED REQUIREMENTS
A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 78 39 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
C. Section 09 90 00 - Paints and Coatings: Field paint finish.

1.03 REFERENCE STANDARDS
A. ITS (DIR) - Directory of Listed Products.
B. UL (FRD) - Fire Resistance Directory.

1.04 SUBMITTALS
A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 ACCESS DOOR AND PANEL APPLICATIONS
A. Walls, Unless Otherwise Indicated:
   1. Material: Steel.
   2. Size: 18 x 18 inches, unless otherwise indicated.
   4. Tool-operated spring or cam lock; no handle.
   5. In All Wall Types: Surface mounted face frame and door surface flush with frame surface.
   6. In Gypsum Board: Drywall bead frame with door surface flush with wall surface.
   8. In Masonry: Surface mounted frame with door surface flush with frame surface.

B. Walls in Wet Areas:
   1. Material: Steel, hot-dipped galvanized.
   2. Size: 18 x 18 inches, unless otherwise indicated.
   4. Tool-operated spring or cam lock; no handle.
   5. In All Wall Types: Surface mounted face frame and door surface flush with frame surface.
   6. In Gypsum Board: Drywall bead frame with door surface flush with wall surface.
   8. In Masonry: Surface mounted frame with door surface flush with frame surface.

C. Fire Rated Walls: See drawings for wall fire ratings.
   1. Material: Steel.
   2. Size: 18 x 18 inches, unless otherwise indicated.
   3. Insulated, double skin door panel.
   4. Tool-operated spring or cam lock; no handle.

D. Ceilings, Unless Otherwise Indicated: Same type as for walls.
   1. Material: Steel.
   2. Size in Lay-in Grid Ceilings: To match grid module.
3. Size in Other Ceilings: 18 x18 inches, unless otherwise indicated.
4. Standard duty, hinged door.
5. Tool-operated spring or cam lock; no handle.

E. Fire Rated Ceilings: See drawings for ceiling fire ratings.
1. Material: Steel.
2. Size: 18 x 18 inches, unless otherwise indicated.
4. Tool-operated spring or cam lock; no handle.

2.02 WALL AND CEILING UNITS

A. Manufacturers:

B. Access Doors: Factory fabricated door and frame units, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
1. Door Style: Single thickness with rolled or turned in edges.
2. Double-Skinned Hollow Steel Door Panels: 16 gage, 0.059 inch, minimum, on both sides and all edges.
3. Units in Fire Rated Assemblies: Fire rating as required by applicable code for the fire rated assembly in which they are to be installed.
5. Primed Finish: Polyester powder coat; manufacturer's standard color.
6. Hardware:
   a. Hardware for Fire Rated Units: As required for listing.
   b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
   c. Handle: Fixed.
   d. Latch/Lock: Tamperproof tool-operated cam latch.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION
A. Install units in accordance with manufacturer's instructions.
B. Install frames plumb and level in openings. Secure rigidly in place.
C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION
SECTION 08 41 23
FIRE RATED GLASS AND FRAMING SYSTEMS

PART 1  GENERAL
1.01  SUMMARY

A.  Section Includes:
1.  Fire rated door and framing systems.
2.  Related Sections:
   a.  Section 07 84 00 “Firestopping:” Firestops between work of this section and other fire resistive assemblies.

B.  REFERENCES
1.  American Architectural Manufacturers Association (AAMA)
   b.  AAMA 501.2-2003: Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems
   c.  AAMA 501.5-2005: Test Method for Thermal Cycling of Exterior Walls
   a.  Material related
      2)  ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2006b.
   b.  Exterior related
      1)  ASTM E 283-04: Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen
      2)  ASTM E 330-02: Test Method for Structural Performance of Exterior Windows, Skylights and Curtain Walls by Uniform Static Air Pressure Difference Procedure A
      3)  ASTM E 331-04: Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
      4)  ASTM E 783-02: Test Method for Field Measurement of Air Leakage through Installed Exterior Windows and Doors
      5)  ASTM E 1105-00: Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference
   c.  Sound related:
1) ASTM E 90-04: Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
2) ASTM E 413-04: Standard Classification for Rating Sound Insulation
3. American Welding Society (AWS)
   a. AWS D1.3 - Structural Welding Code - Sheet Steel; 2007
4. Builders Hardware Manufacturers Association, Inc.
5. Canadian Standards
   a. CAN-S101 Fire Endurance Tests of Building Construction and Materials
   b. CAN4-S104 Fire Tests of Door Assemblies
   c. CAN4-S106 Standard Method for Fire Tests of Window and Glass Block Assemblies
   d. NFPA 257: Standard on Fire Test for Window and Glass Block Assemblies.
7. Underwriters Laboratories, Inc. (UL):
   b. UL 10B: Fire Tests of Door Assemblies.
   c. UL 10C: Positive Pressure Fire Tests of Door Assemblies.
10. American Society of Civil Engineers (ASCE)
    a. ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2005
11. New York City approval
    a. MEA# 242-00-M
C. SUBMITTALS
1. Submit in accordance with Section 01 30 00.
2. Product Data:
3. Shop Drawings:
   a. Include plans, elevations and details of product showing component dimensions; framed opening requirements, dimensions, tolerances, and attachment to structure
D. Hardware schedule: list of manufacture supplied hardware and verification of cylinder size complying with Section 08 71 00
E. Glazing Schedule: Use same designations indicated on drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
F. Warranties: Submit manufacturer’s warranty.
G. Certificates of compliance from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements.
   1. Separate certification will not be required for glazing materials bearing manufacturer’s permanent label designating type and thickness of glass, provided labels represent a
quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

H. QUALITY ASSURANCE

1. Testing Agency Qualifications: Qualified according to
   a. International Accreditation Service for a Type A Third-Party Inspection Body (Field Services ICC-ES Third-Party Inspections Standard Operating Procedures, 00-BL-S0400 and S0401)
   b. International Accreditation Service for Testing Body-Building Materials and Systems
      1) Fire Testing
         (a) ASTM Standards E 119
         (b) CPSC Standards 16 CFR 1201
         (c) NFPA Standards 251, 252, 257
         (d) UL Standards 9, 10B, 10C, 1784, UL Subject 63
         (e) BS 476; Part 22: 1987
         (f) EN 1634-1
         (g) CAN Standards S 101, S 104, S 106
   2. Source Limitations for Glazing Accessories: Obtain framing system, glazing and glazing accessories from one source for each product and installation method indicated.
   3. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are classified and labeled by UL, for fire ratings indicated, based on testing according to NFPA 252. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.
   4. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are classified and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.
   5. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by Underwriters Laboratories® maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer’s listing.
   6. Regulatory Requirements: Comply with provisions of the following:
         1) Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
         2) Door Closers: Comply with the following maximum opening-force requirements indicated:
            (a) Accessible doors no more than 5 lbf (22.2 N) push or pull force
            (b) Fire Doors: Minimum opening force allowable by authorities having jurisdiction
      b. Compliance with this standard requires auto openers to be added to the opening due to the weight of the doors. Coordinate the addition of auto-openers with the Division 8 section “Door Hardware” or other section containing these devices. Verify that the Authority Having Jurisdiction is using NFPA 101 and/or IBC and which edition dates of both as a requirement for the facility. NFPA 101: Comply with the following for means of egress doors:
         1) Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
2) Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

c. IBC 2018 Chapter 10 Means of Egress: Comply with the following for means of egress doors:

1) Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.

2) Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

I. DELIVERY, STORAGE AND HANDLING
1. Deliver, store and handle under provisions specified by manufacturer.

J. PROJECT CONDITIONS
1. Obtain field measurements prior to fabrication of frame units. If field measurements will not be available in a timely manner coordinate planned measurements with the work of other sections.

   a. Note whether field or planned dimensions were used in the creation of the shop drawings.

2. Coordinate the work of this section with others effected including but not limited to: other interior and/or exterior envelope components and door hardware beyond that provided by this section.

K. WARRANTY
1. Provide the Manufacturer's standard five-year manufacturer warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS - FIRE RATED DOOR AND WINDOW ASSEMBLY

A. Fire-Resistance-Rated Glass: Subject to compliance with the specifications, products may be provided by the following manufacturers:

1. SAFTIFIRST, a division of O'Keeffe's Inc: www.safti.com/


4. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Basis-Of-Design Product:


2. Frame System: “Heat Barrier Series by TGP” fire-rated steel frame system as manufactured and supplied by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 phone (800.426.0279) fax (425.396.8300) e-mail sales@fireglass.com web site http://www.fireglass.com.

C. PERFORMANCE REQUIREMENTS

1. Fire Rating Requirements
a. Duration -- Doors: Capable of providing a fire rating for 90 minutes.

b. Duration-- Window Assembly: Capable of providing a fire rating for 120 minutes.

D. MATERIALS - GLASS


2. Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacturer, testing laboratory (UL® only), fire rating period, safety glazing standards, and date of manufacture.
3. Performance: Glass must be rated to stop fire from either direction and must meet all testing requirements including the required hose-stream test (where fire-rating exceeds 20 minutes).

E. MATERIALS – STEEL FRAMES AND DOORS
1. Steel Framing System including 90-minute rated doors, 120-minute rated windows.
   a. Frame: Steel profiled formed tubing.
   b. Fasteners: As recommended by manufacturer
   c. Glazing Accessories: calcium silicate setting blocks.
   d. Glazing Compounds:
      1) FireLite®, FireLite Plus®, FireLite® NT, FireLite® IGU, Fireglass®20, or Pilkington Pyrostop®: Approved closed cell PVC tape, Fibrefra, or pure silicone sealant. Glaze FireLite® panels that exceed 1,393 sq. inches for 90-minute ratings with “Kerafix 2000” glazing tape supplied by manufacturer.
         (a) When glazed with Pilkington Pyrostop (60-90 minutes) glazing products, doors meet the maximum transmitted temperature rise of not more than 450 degrees Fahrenheit (250 degrees Celsius) at the end of 30 minutes of the standard fire test exposure.

F. FABRICATION
1. Furnish frame assemblies pre-welded.
   a. When necessary, splice frames too large for shop fabrication or shipping or to fit in available building openings.
   b. Fit with suitable fasteners.
   c. Knock-down frames are not permitted
2. Furnish interior frame assemblies “K-D” (or welded upon request).
   a. When necessary, splice frames too large for shop fabrication or shipping or to fit in available building openings.
   b. Fit with suitable fasteners.
   c. Knock-down door perimeter frames are not permitted
3. Field glaze door and frame assemblies.
4. Factory prepare steel door assemblies and install all hardware.
5. Fabrication Dimensions: Fabricate to fire-rated field dimensions.
6. Obtain approved shop drawings prior to fabrication.

G. FINISHES, GENERAL
1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
2. Finish frames after assembly.
3. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

H. POWDERCOAT FINISHES
1. Finish after fabrication.
2. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.
3. Interior and Exterior Steel Finishes (Note: this finish is suitable for exterior exposed portions of the wall systems, including extruded aluminum covers).
   a. Powder-Coat Finish: Polyester Super Durable powder coating which meets AAMA 2604 for chalking and fading. Apply manufacturer's standard powder coating finish system applied to factory-assembled frames before shipping, complying with manufacturer's recommended instructions for surface preparation including pretreatment, application, and minimum dry film thickness.
   b. Color and Gloss: Dark Bronze to match existing storefront systems.
I. DOOR HARDWARE
1. Furnish hardware with 90 minute fire door by the manufacturer.
2. Select hardware from door manufacturer's standard recommended and approved hardware groups as specified in Division 8 Section – Door Hardware.
3. Provide power assisted hardware for use at any door that cannot meet the opening force(s) required by code noted in Part I above.
   a. High energy, power-operated doors must meet the requirements of ANSI/BHMA A156.10 and power-assisted low energy doors must comply with ANSI/BHMA 156.19
4. Operating hardware for Fireframes® Designer Series Active-Active Pair of Doors Outswing with Exit Device. Each pair to have the following.

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Finish*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cylinder</td>
<td>Technical Glass Products</td>
<td>626</td>
</tr>
<tr>
<td>2.</td>
<td>Closers</td>
<td>LCN</td>
<td>689</td>
</tr>
<tr>
<td>3.</td>
<td>Lever Trim</td>
<td>Von Duprin</td>
<td>626</td>
</tr>
<tr>
<td>4.</td>
<td>Exit Device</td>
<td>3547A-F Concealed</td>
<td>Von Duprin</td>
</tr>
<tr>
<td>5.</td>
<td>Auxiliary Fire Latch</td>
<td>Used with exit device with no bottom rod</td>
<td>Technical Glass Products</td>
</tr>
<tr>
<td>6.</td>
<td>Hanging Devices</td>
<td>Weld on Pivots</td>
<td>Technical Glass Products</td>
</tr>
<tr>
<td>7.</td>
<td>Auto door Bottoms</td>
<td>420APKL Smoke Seal</td>
<td>Pemko</td>
</tr>
</tbody>
</table>

Balance of hardware by others

5. * FINISH LEGEND:
   a. Painted to match frame
   b. Mill Finish Aluminum
   c. Aluminum Paint
   d. Satin Stainless Steel
   e. Satin Chrome Plated

J. ACCESSORY MATERIALS
1. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for [30-mil] [0.762-mm] thickness per coat.

PART 3 EXECUTION

3.01 EXAMINATION
A. Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation.
B. Provide openings plumb, square and within allowable tolerances.
   1. Provide 3/8 inch shim space at all walls
   2. Notify Architect of any conditions which jeopardize the integrity of the proposed fire wall / door system.
   3. Do not proceed until such conditions are corrected.
C. INSTALLATION
   1. Install per manufacturer's instructions.
D. REPAIR AND TOUCH UP
1. Limited to minor repair of small scratches. Use only manufacturer’s recommended products.
   a. Such repairs shall match original finish for quality or material and view.
2. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

E. ADJUSTING
1. Adjust door function and hardware for smooth operation. Coordinate with other hardware suppliers for function and use of any other attached hardware.

F. PROTECTION AND CLEANING
1. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
   a. Do not clean with astringent cleaners. Use a clean “grit free” cloth and a small amount of mild soap and water or mild detergent.
   b. Do not use any of the following:
      1) Steam jets
      2) Abrasives
      3) Strong acidic or alkaline detergents, or surface-reactive agents
      4) Detergents not recommended in writing by the manufacturer
      5) Do not use any detergent above 77 degrees F
      6) Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
      7) Metal or hard parts of cleaning equipment must not touch the glass surface
2. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
3. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION
SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum doors.

1.02 RELATED REQUIREMENTS
A. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.
B. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.
C. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS
A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site.
B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate with installation of other components that comprise the exterior enclosure.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Qualifications: Submit manufacturer's qualifications.
C. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.
D. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Handle products of this section in accordance with AAMA CW-10.
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS
A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.
1.08 WARRANTY
   A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS
2.01 BASIS OF DESIGN -- SWINGING DOORS
   A. Medium Stile, Insulating Glazing, Thermally-Broken with 10 inch bottom rail:
      1. Basis of Design: Kawneer; AA 425 Thermal Entrance

2.02 COMPONENTS
   A. Glazing: As specified in Section 08 80 00.
   B. Swing Doors: Glazed aluminum.
      1. Thickness: 2 1/4 inches, thermally broken.
      2. Top Rail: 4 1/4 inches wide.
      5. Glazing Type: Insulated.
      7. Finish: Same as storefront.

2.03 MATERIALS

2.04 FINISHES
   A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

2.05 HARDWARE
   A. Specified in Section 08 71 00.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify dimensions, tolerances, and method of attachment with other work.
   B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION
   A. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
   B. Install hardware using templates provided.
   C. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 FIELD QUALITY CONTROL
   A. See Section 01 40 00 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

3.04 ADJUSTING
   A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING
   A. Remove protective material from pre-finished aluminum surfaces.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

END OF SECTION
SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Hardware for hollow steel doors.
   B. Hardware for fire-rated doors.

1.02 RELATED REQUIREMENTS
   A. Section 08 11 13 - Hollow Metal Doors and Frames.
   B. Section 08 14 16 - Flush Wood Doors.
   C. Section 08 41 23 - Fire Rated Glass and Framing Systems

1.03 REFERENCE STANDARDS
   B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
   D. BHMA A156.1 - American National Standard for Butts and Hinges.
   E. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches.
   F. BHMA A156.3 - American National Standard for Exit Devices.
   G. BHMA A156.4 - American National Standard for Door Controls - Closers.
   H. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks.
   I. BHMA A156.6 - American National Standard for Architectural Door Trim.
   J. BHMA A156.7 - American National Standard for Template Hinge Dimensions.
   K. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders.
   L. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association (ANSI/BHMA A156.9).
   O. BHMA A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators.
   Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
   S. UL (DIR) - Online Certifications Directory.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.
   B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
   C. Convey Owner's keying requirements to manufacturers.
D. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.
C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
D. Keying Schedule: Submit for approval of Owner.
E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
F. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
G. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.
H. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

1.06 QUALITY ASSURANCE
A. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.08 WARRANTY
A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS
2.01 DOOR HARDWARE - GENERAL
A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
B. Provide all items of a single type of the same model by the same manufacturer.
C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   5. Hardware on Fire-Rated Doors, Except Hinges: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
   6. Hardware for Smoke and Draft Control Doors: Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
   7. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
D. Function: Lock and latch function numbers and descriptions of manufactures series as listed in hardware schedule.

E. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.

F. Finishes: Identified in schedule.

2.02 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. If no hardware set is indicated for a swinging door provide an office lockset.
   2. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   3. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer's standard tumbler type, six-pin standard core.
   1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.03 HINGES

A. Hinges: Provide hinges on every swinging door.
   1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2. Provide ball-bearing hinges at all doors having closers.
   3. Provide hinges in the quantities indicated.
   4. Provide non-removable pins on exterior outswinging doors.
   5. Where electrified hardware is mounted in door leaf, provide power transfer hinges.

B. Quantity of Hinges Per Door:
   1. Doors up to 60 inches High: Two hinges.
   2. Doors From 60 inches High up to 90 inches High: Three hinges.

C. Manufacturers - Hinges:

2.04 PIVOTS

A. Pivots: Comply with BHMA A156.17.

B. Manufacturers - Pivots:

2.05 PUSH/PULLS

A. Push/Pulls: Comply with BHMA A156.6.
   1. Provide push and pull on doors not specified to have lockset, latchset, exit device, or auxiliary lock.
   2. On solid doors, provide matching push plate and pull plate on opposite faces.

B. Manufacturers - Push/Pulls:

2.06 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
1. Hardware Sets indicate locking functions required for each door.
2. If no hardware set is indicated for a swinging door provide an office lockset.
3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Lock Cylinders: Manufacturer's standard tumbler type, six-pin standard core.
1. Provide cams and/or tailpieces as required for locking devices required.

C. Keying: Grand master keyed.

D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.07 CYLINDRICAL LOCKSETS

A. Locking Functions: As defined in BHMA A156.2, and as follows:
1. Office: F81, key not required to lock, remains locked upon exit.

B. Manufacturers - Cylindrical Locksets:
1. Assa Abloy Corbin Russwin, Sargent, or Yale: www.assaabloydss.com/#sle.

2.08 ELECTRIC STRIKES

A. Electric Strikes: Complying with BHMA A156.31 and UL listed as a Burglary-Resistant Electric Door Strike; style to suit locks.

B. Manufacturers:

2.09 CLOSERS

A. Closers: Complying with BHMA A156.4.
1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
2. Provide a door closer on every exterior door.
3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
5. At outswinging exterior doors, mount closer in inside of door.

B. Manufacturers - Closers:

2.10 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

2.11 GASKETING AND THRESHOLDS

A. Gaskets: Complying with BHMA A156.22.
   1. On doors indicated as "sound-rated", "acoustical", or with an STC rating, provide sound-rated gaskets and automatic door bottom; make gaskets completely continuous, do not cut or notch gaskets for installation.

2.12 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates:
   1. Kickplate: Provide on push side of every door with closer, except storefront and all-glass doors.
   2. Mop Plates:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.
B. Use templates provided by hardware item manufacturer.
C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
D. Mounting heights for hardware from finished floor to center line of hardware item:

3.03 ADJUSTING

A. Adjust work under provisions of Section 01 70 00.
B. Adjust hardware for smooth operation.

3.04 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

A. Protect finished Work under provisions of Section 01 70 00.
B. Do not permit adjacent work to damage hardware or finish.

HARDWARE SETS

CARVEL STATE OFFICE BUILDING - CAFETERIA

HARDWARE SET #: 1A - PRS DRS
D233-1, BASE BID

A. Existing door, frame and hardware to remain. Service and adjust hardware to provide smooth, fully functioning operation. Replace gaskets/silencers.
HARDWARE SET #: 1B - PRS DRS
D233-1, ALTERNATE 1

A. Door hardware specified in Section 08 41 23 - Fire Rated Glass and Framing Systems.

HARDWARE SET #: 2 - SGL DRS
D233-1, ALTERNATE 1

OPENING TO HAVE:

<table>
<thead>
<tr>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>FINISH</th>
<th>MFG</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>1 CONTINUOUS HINGE A500 x FULL HEIGHT</td>
<td>630</td>
<td>ABH</td>
</tr>
<tr>
<td>B.</td>
<td>1 COMMUNICATING LOCKSET 93K7-W-14C-S3</td>
<td>626</td>
<td>BEST</td>
</tr>
<tr>
<td>C.</td>
<td>1 DOOR CLOSER D-4550</td>
<td>689</td>
<td>STANLEY</td>
</tr>
<tr>
<td>D.</td>
<td>1 TEAR DROP SEAL 797B x HEAD &amp; JAMBS</td>
<td>BLK</td>
<td>REESE</td>
</tr>
<tr>
<td>E.</td>
<td>1 THRESHOLD S483APR x SRS x FHS x FULL WIDTH</td>
<td>628</td>
<td>REESE</td>
</tr>
<tr>
<td>F.</td>
<td>1 DOOR SWEEP 772A x FULL WIDTH</td>
<td>628</td>
<td>REESE</td>
</tr>
</tbody>
</table>

HARDWARE SET #: 3 - PRS DRS
D234

OPENING TO HAVE:

<table>
<thead>
<tr>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>FINISH</th>
<th>MFG</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>6 HINGE CB168 4.5 x 4.5 x NRP</td>
<td>652</td>
<td>STANLEY</td>
</tr>
<tr>
<td>B.</td>
<td>1 STOREROOM LOCKSET 93K7-AB-14C-S3</td>
<td>626</td>
<td>BEST</td>
</tr>
<tr>
<td>C.</td>
<td>1 TOP &amp; BOTTOM SURFACE BOLTS</td>
<td>626</td>
<td>TRIMCO</td>
</tr>
<tr>
<td>D.</td>
<td>2 OVERHEAD STOP</td>
<td>630</td>
<td>ROCKWOOD</td>
</tr>
<tr>
<td>E.</td>
<td>2 KICK PLATE 10&quot; x 2&quot; LDW .050 x B4E x CTSK</td>
<td>630</td>
<td>TRIMCO</td>
</tr>
<tr>
<td>F.</td>
<td>2 MOP PLATE 6&quot; x 1&quot; LDW .050 x B4E x CTSK</td>
<td>630</td>
<td>TRIMCO</td>
</tr>
<tr>
<td>G.</td>
<td>3 SILENCERS 1229A</td>
<td></td>
<td>GRAY TRIMCO</td>
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</tbody>
</table>

HARDWARE SET #: 4 - PRS DRS
D234-A

OPENING TO HAVE:

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<thead>
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<th>QTY</th>
<th>DESCRIPTION</th>
<th>FINISH</th>
<th>MFG</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>6 HINGE CB168 4.5 x 4.5 x NRP</td>
<td>652</td>
<td>STANLEY</td>
</tr>
<tr>
<td>B.</td>
<td>1 KEYED REMOVABLE MULLION 1340KR-8 x L</td>
<td>600</td>
<td>DORMA KABA</td>
</tr>
<tr>
<td>C.</td>
<td>1 RIM EXIT DEVICE 9300CD x YR08C x L x KEY DOGGING</td>
<td>630</td>
<td>DORMA KABA</td>
</tr>
<tr>
<td>D.</td>
<td>1 DEAD BOLT, KEY BOTH SIDES</td>
<td>626</td>
<td>BEST</td>
</tr>
<tr>
<td>E.</td>
<td>1 DOOR CLOSER D-4550</td>
<td>689</td>
<td>STANLEY</td>
</tr>
<tr>
<td>F.</td>
<td>2 KICK PLATE 10&quot; x 2&quot; LDW .050 x B4E x CTSK</td>
<td>630</td>
<td>TRIMCO</td>
</tr>
</tbody>
</table>
G. 2 MOP PLATE 6" x 1" LDW .050 x B4E x CTSK
H. 6 SILENCERS 1229A

END OF SECTION

NOT FOR BIDDING

END OF SECTION
SECTION 08 80 00
GLAZING

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Glazing units.
B. Plastic films.
C. Glass for doors and storefronts

1.02  RELATED REQUIREMENTS
A. Section 07 90 05 - Joint Sealants: Sealants for other than glazing purposes.
B. Section 08 41 23 - Fire Rated Glass and Framing Systems - For glazing in fire rated framing systems.

1.03  REFERENCE STANDARDS
E. GANA (SM) - GANA Sealant Manual.

1.04  SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
C. Certificate: Certify that products of this section meet or exceed specified requirements.
D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner’s name and registered with manufacturer.

1.05  MOCK-UPS
A. See Section 01 40 00 - Quality Requirements, for additional mock-up requirements.
B. Provide on-site mock-up of plastic film(s). Install at full surface of one glass panel for each type of film.
C. Locate where directed.
D. Mock-ups may remain as part of the Work.

1.06  FIELD CONDITIONS
A. Do not install glazing when ambient temperature is less than 40 degrees F.
B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07  WARRANTY
A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2  PRODUCTS

2.01  MANUFACTURERS
A. Glass Fabricators:
   1. GGI - General Glass International: www.generalglass.com/#sle.
5. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Float Glass Manufacturers:
5. Substitutions: Refer to Section 01 60 00 - Product Requirements.

C. Wired Glass Manufacturers:
1. GGI - General Glass International; Wire Glass: www.generalglass.com/#sle.
2. Substitutions: Refer to Section 01 60 00 - Product Requirements.

D. Plastic Films Manufacturers:
1. 3M Window Film: solutions.3m.com/wps/portal/3M/en_US/Window_Film/Solutions/#sle.
2. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.02 GLASS MATERIALS
A. Float Glass: Provide float glass based glazing unless noted otherwise.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and FT.

2.03 INSULATING GLASS UNITS
A. Manufacturers:
1. Any of the manufacturers specified for float glass.
6. Substitutions: Refer to Section 01 60 00 - Product Requirements.
B. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Spacer Color: Black.
C. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with argon.
3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Match Existing.
   b. Coating: Low-E (passive type), on #2 surface.
4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Match Existing.
5. Total Thickness: 1 inch.

2.04 GLAZING UNITS
A. Type G-1 - Monolithic Interior Vision Glazing.
1. Applications: Interior glazing unless otherwise indicated.
2. Glass Type: Fully tempered float glass.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.
2.05 PLASTIC FILMS
   A. Type F-1 - Solar Control Plastic Film: Mylar type.
      1. Application: Locations as indicated on drawings.
      2. Color: Bronze.
      3. Thickness Without Liner: 0.00236 inch.

PART 3 EXECUTION
3.01 VERIFICATION OF CONDITIONS
   A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
   B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION
   A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
   B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
   C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL
   A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
   B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer’s instructions.
   C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
   D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
   E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
   F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)
   A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
   B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
   C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
   D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - PLASTIC FILM
   A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
   B. Place without air bubbles, creases or visible distortion.
   C. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required. Do not score the glass.
3.06 FIELD QUALITY CONTROL
   A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
   B. Monitor and report installation procedures and unacceptable conditions.

3.07 CLEANING
   A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
   B. Remove non-permanent labels immediately after glazing installation is complete.
   C. Clean glass and adjacent surfaces after sealants are fully cured.
   D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer’s written recommendations.

3.08 PROTECTION
   A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
   B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION
SECTION 08 87 13
SUN CONTROL WINDOW FILM

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Sun control window films of the following types:
   1. Prestige sun control film.

1.02 REFERENCES
A. ASHRAE - American Society for Heating, Refrigeration, and Air Conditioning Engineers; Handbook of Fundamentals.
B. ASTM International (ASTM):
   3. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
   4. ASTM D 1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
   5. ASTM D 1044 - Standard Method of Test for Resistance of Transparent Plastics to Surface Abrasion (Taber Abrader Test).
   11. ASTM E 308 - Standard Recommended Practice for Spectrophotometry and Description of Color in CIE 1931 System.
   15. ASTM F1642 - Standard Method of Test for Glazing and Glazing Systems Subject to Airblast Loadings.
   17. NFRC 100/200 (Formerly ASTM E903) - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.

1.03 DEFINITIONS
A. Light to Solar Gain Ratio: The ratio of visible light transmission to Solar Heat Gain Coefficient.
1.04 SUBMITTALS
   A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
   B. Product Data: Manufacturer's data sheets on each product to be used, including:
      1. Preparation instructions and recommendations.
      2. Storage and handling requirements and recommendations.
      3. Installation methods.
   C. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years experience.
   B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
   C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
      1. Finish areas designated by Architect.
      2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
      3. Refinish mock-up area as required to produce acceptable work.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Follow manufacturer's instructions for storing and handling.
   B. Store products in manufacturer's unopened packaging until ready for installation.

1.07 PROJECT CONDITIONS
   A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.08 WARRANTY
   A. At project closeout, provide to Owner or Owners Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
   B. In order to validate warranty, installation must be performed by an Authorized 3M dealer and according to Manufacturer's installation instructions. Verification of Authorized 3M dealer can be confirmed by submission of active 3M dealer code number.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Acceptable Manufacturer: 3M Commercial Solutions, which is located at: 3M Center Bldg. 220-12-E-04; St. Paul, MN 55144-1000; Toll Free Tel: 888-650-3497; Tel: 651-737-1081; Fax: 651 737 8241; Email: request info (3mredinsidesales@mmm.com); Web: http://www.3m.com/3M/en_US/architectural-design-us/?utm_medium=redirect&utm_source=vanity-url&utm_campaign=www.3M.com/AMD|http://www.3m.com/3M/en_US/building-window-solutions-us
   B. Substitutions: Refer to Section 01 60 00 - Product Requirements.

2.02 3M PRESTIGE SUN CONTROL FILM
   A. Physical Properties:
1. Composition: Optically clear polyester film containing at least 220 layers and incorporating pressure sensitive adhesive on one side and an acrylic abrasion resistant coating on the other. Nanotechnology represents a breakthrough in technology due to the enhanced heat, UV and IR rejection, without the presence of any metals. The film does not contain dyes.

2. Uniformity: No noticeable pin holes, streaks, thin spots, scratches, banding or other optical defects.

3. Variation in Total Transmission across the Width: Less than 2 percent over the average at any portion along the length.

4. Thickness: Nominal 2.0 mils (0.1mm) with no evidence of coating voids.

5. Identification: Labeled as to Manufacturer as listed in this Section.

B. Performance, Prestige 70 - Clear Film, nanotechnology, no metal and at least 220 plus layers applied to 1/4 Inch (6.4 mm) Thick Clear Glass:
   1. Visible Light Transmission (NFRC 100/200, ASTM E 308): 69 percent
   4. Ultraviolet Rejected (NFRC 100/200): 99.9 percent.
   5. Infrared Energy Rejected (NFRC 100/200): Up to 97 percent, as measured between 900-1000 nm.
   7. Solar Heat Gain Coefficient (Normal Incidence) (NFRC 100/200): 0.50.
   8. Total Solar Energy Rejected (TSER) at 90 Degrees (Normal Incidence) (NFRC 100/200): 50 percent.
   9. Total Solar Energy Rejected (TSER) at 60 Degrees (NFRC 100/200): 59 percent.

C. Performance, Prestige 50 - Lightly Tinted Film, nanotechnology, no metal and at least 220 plus layers applied to 1/4 Inch (6.4 mm) Thick Clear Glass:
   4. Ultraviolet Rejected (NFRC 100/200): 99.9 percent.
   5. Infrared Energy Rejected (NFRC 100/200): 97 percent; as measured between 900-1000 nm.
   7. Solar Heat Gain Coefficient at 90 Degrees (Normal Incidence) (NFRC 100/200): 0.44.
   8. Total Solar Energy Rejected (TSER) at 90 Degrees (Normal Incidence) (NFRC 100/200): 56 percent.
   9. Total Solar Energy Rejected (TSER) at 60 Degrees (NFRC 100/200): 63 percent.

PART 3 EXECUTION

3.01 EXAMINATION

A. Film Examination:
   1. If preparation of glass surfaces is the responsibility of another installer, notify Architect in writing of deviations from manufacturer’s recommended installation tolerances and conditions.
     a. Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance.
   2. Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer’s recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
   3. Commencement of installation constitutes acceptance of conditions.
3.02 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.

3.03 INSTALLATION, GENERAL
   A. General: Install in accordance with manufacturer’s instructions and the following.
      1. Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant.
      2. Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to facilitate proper positioning of film.
      3. Apply film to glass and lightly spray film with slip solution.
      4. Squeegee from top to bottom of window.
      5. Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
      6. Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

3.04 CLEANING AND PROTECTION
   A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
   B. Touch-up, repair or replace damaged products before Substantial Completion.
   C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

END OF SECTION
SECTION 09 21 16  
GYPSUM BOARD ASSEMBLIES  

PART 1 GENERAL  

1.01 SECTION INCLUDES  
A. Metal stud wall, ceiling and soffit framing.  
B. Metal framing for top of wall bracing and ceiling framing.  
C. Gypsum sheathing.  
D. Moisture resistant gypsum wallboard.  
E. Joint treatment and accessories.  

1.02 RELATED REQUIREMENTS  
A. Section 06 10 00 - Rough Carpentry: Building Framing and Wood blocking.  
B. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.  

1.03 REFERENCE STANDARDS  
A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute. (replaced SG-971)  
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.  
G. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.  
H. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.  
M. GA-214 - Recommended Levels of Gypsum Board Finish; Gypsum Association.  
N. GA-216 - Application and Finishing of Gypsum Board.  

1.04 SUBMITTALS  
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.  
B. Shop Drawings: Indicate special details associated with vertical deflection joints and acoustic seals. Provide special details for suspended ceilings. Indicate layout, anchorage to structure, type and location of fasteners, framed openings, accessories, and items of related work.
C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE
A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES
A. Provide completed assemblies per drawings.

2.02 METAL FRAMING MATERIALS
A. Manufacturers - Metal Framing, Connectors, and Accessories:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/360 at 5 psf.
   1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
      a. Acceptable Products:
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C shaped.
C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
   3. Provide kickers / framing for top of wall and soffits as necessary.

2.03 BOARD MATERIALS
A. Manufacturers - Gypsum-Based Board:
   5. Substitutions: See Section 01 60 00 - Product Requirements.
B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Thickness:

C. Impact-Rated Wallboard: Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C1629.
   1. Application: Walls.
   2. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
   3. Type: Fire resistance rated Type X, UL or WH listed.
   5. Edges: Tapered.
   6. Products:
      b. USG Corporation; Fiberock Brand Panels--VHI Abuse-Resistant.

D. Water-Resistant Gypsum Board: ASTM C 1396/C 1396M; ends square cut.
   1. Core Type: Type X.
   2. Thickness: 5/8 inch.

2.04 ACCESSORIES
A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 inch.
B. Finishing Accessories: ASTM C1047, rigid plastic, unless otherwise indicated.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.
C. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
   5. Chemical hardening type compound.
D. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
E. Screws for Attachment to Steel Members From 0.033 to 0.112 Inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
F. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
G. Anchorage to Substrate: Tie wire, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION
A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/600.
   2. Laterally brace entire suspension system, to structure above.
   3. Install bracing as required at exterior locations to resist wind uplift.

C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

D. Connections: Minimum (4) #12 screws per connection of cold formed metal framing members.

E. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

F. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall mounted cabinets.

G. Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame openings, toilet accessories, and hardware. Comply with Section 06 10 00 for wood blocking.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install as follows:
   1. Place two beads continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes; and other penetrations.

3.04 BOARD INSTALLATION

A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as directed.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.06 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use fiberglass joint tape, bedded with ready-mixed vinyl-based; or powder-type vinyl-based; or chemical hardening type joint compound and finished with ready-mixed vinyl-based; or powder-type vinyl-based; or chemical hardening type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

C. Finish gypsum board in scheduled areas in accordance with levels defined in GA-214; or ASTM C 840 and as scheduled below.
   1. Above Finished Ceilings Concealed From View: Level 1.
   2. Utility Areas and Areas Behind Cabinetry: Level 2.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.

3.07 TOLERANCES
   A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION
SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Tile for wall applications.
   B. Cementitious backer board as tile substrate.
   C. Ceramic trim.

1.02 RELATED REQUIREMENTS
   A. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
   B. Section 09 21 16 - Gypsum Board Assemblies: Tile backer board.

1.03 REFERENCE STANDARDS
   B. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar.

1.04 SUBmittALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
   C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
   D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.
   E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
   G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
      1. See Section 01 60 00 - Product Requirements, for additional provisions.
      2. Extra Tile: 5 percent of each size, color, and surface finish combination.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 FIELD CONDITIONS
   A. Do not install solvent-based products in an unventilated environment.
B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

A. Glazed Wall Tile, Type CT-01: ANSI A137.1, standard grade.
   1. Moisture Absorption: 7.0 to 20.0 percent as tested in accordance with ASTM C373.
   2. Size: 3 by 6 inch, nominal.
   3. Edges: Cushioned.
   5. Color(s): As indicated on drawings.
   7. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

2.02 SETTING MATERIALS

A. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

   1. Products:
      b. Substitutions: See Section 01 60 00 - Product Requirements.


2.03 GROUTS

A. Manufacturers:
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
   1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
   2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
   3. Color(s): As selected by Architect from manufacturer's full line.
   4. Products:
      b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

B. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.
B. Vacuum clean surfaces and damp clean.
C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer’s instructions.

3.03 INSTALLATION - GENERAL
A. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
C. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
D. Form internal angles square and external angles bullnosed.
E. Sound tile after setting. Replace hollow sounding units.
F. Keep control and expansion joints free of mortar, grout, and adhesive.
G. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
H. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
I. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - WALL TILE
A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.
B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.
C. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.05 CLEANING
A. Clean tile and grout surfaces.

3.06 PROTECTION
A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION
SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Suspended metal grid ceiling system.
   B. Acoustical units.
   C. Support hangers, channels, and wires.

1.02 RELATED REQUIREMENTS
   A. Section 21 13 00 - Fire Suppression Sprinklers: Sprinkler heads in ceiling system.
   B. Section 23 37 00 - Air Outlets and Inlets: Air diffusion devices in ceiling.
   C. Section 26 51 00 - Interior Lighting: Light fixtures in ceiling system.

1.03 REFERENCE STANDARDS
   C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

1.04 SUBMITTALS
   A. See Section 01 30 00 - General Conditions, for submittal procedures.
   B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
   C. Product Data: Provide data on suspension system components and acoustical units.
   D. Samples: Submit two samples 4x4 inch in size illustrating material and finish of acoustical units.
   E. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner, and perimeter molding.
   F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 FIELD CONDITIONS
   A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.06 PROJECT CONDITIONS
   A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
   B. Install acoustical units after interior wet work is dry.

1.07 EXTRA MATERIALS
   A. See Section 01 60 00 - Product Requirements, for additional provisions.
   B. Provide (1) carton of extrat ceiling tiles of each type used for Owner's use in maintenance of project.
PART 2 PRODUCTS

2.01 ACoustical UNITS
A. Manufacturers:
   2. Substitutions: See Section 01 60 00 - Product Requirements.
B. Acoustical Units - General: ASTM E1264, Class A.
C. Acoustical Tile Type ACT 1: Painted mineral fiber, ASTM E 1264 Type III, with to the following characteristics:
   1. Size: 24 x 24 inches.
   2. Thickness: 3/4 inches.
   3. Edge: Tegular
   5. Surface Pattern: Ultima Tegular.

2.02 SUSPENSION SYSTEM(S) UNLESS NOTED OTHERWISE ABOVE.
A. Manufacturers:
   1. Same as for acoustical units.
   3. Substitutions: See Section 01 60 00 - Product Requirements.
B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
C. Exposed Tee Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; heavy-duty.
   1. Profile: Tee; for square edge panels 15/16 inch wide face.
   2. Construction: Double web.
   4. Product: Prelude XL, 15/16" by Armstrong.

2.03 ACCESSORIES
A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
B. Perimeter Moldings: Same material and finish as grid.
C. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.
D. Gasket For Perimeter Moldings: Closed cell rubber sponge tape.
E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM
A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions and as supplemented in this section.
B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:240.
C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Locate system on room axis according to reflected plan.

E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

J. Do not eccentrically load system or induce rotation of runners.

K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Install in bed of acoustical sealant or with continuous gasket.
   2. Use longest practical lengths.
   3. Miter or overlap and rivet corners.

L. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

G. Where round obstructions and bullnose corners occur, provide preformed closures to match perimeter molding.

H. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.

I. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION
SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Resilient tile flooring with (1) field and (2) accent colors.
B. Resilient base and pre-molded internal / external corners.
C. Installation accessories.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS
B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
G. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov.
I. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute.
J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; www.aqmd.gov.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Shop Drawings: Indicate seaming plan.
D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
E. Verification Samples: Submit two samples, 12x12 inch in size illustrating color and pattern for each resilient flooring product specified.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Protect roll materials from damage by storing on end.

1.06 FIELD CONDITIONS
A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.07 EXTRA MATERIALS
A. See Section 01 6000 - Product Requirements, for additional provisions.
B. Provide 50 sq ft of flooring, 20 lineal feet of base, of each type and color specified.
PART 2  PRODUCTS

2.01  TILE FLOORING
A. Vinyl Composition Tile: Homogeneous, with uniform color extending throughout thickness
   1. Minimum Requirements: Comply with ASTM F 1066, of Class corresponding to type
      specified. Composition 1, class 2.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in
      accordance with ASTM E 648.
   3. Size: 12 x 12 inch.
   4. Thickness: 0.125 inch.
   5. Pattern: Marbleized.
   6. Manufacture:
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.02  RESILIENT BASE
A. Resilient Base: ASTM F 1861, Type TP, rubber, thermoplastic; Style A, Straight; and Style B, Cove, and as follows:
   1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in
      accordance with ASTM E 648 or NFPA 253.
   2. Height: 4 inch.
   3. Thickness: 0.125 inch thick.
   5. Length: Roll.
   6. Color: Color as selected from manufacturer’s standards.
   7. Accessories: Premolded external corners and end stops.
   8. Manufacture:
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03  ACCESSORIES
A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring
   manufacturer.
   1. Provide only products having lower volatile organic compound (VOC) content than required
      by the more stringent of the South Coast Air Quality Management District Rule No.1168
      and the Bay Area Air Quality Management District Regulation 8, Rule 51.
C. Moldings and Edge Strips: Metal or metal.
D. Filler for Coved Base: Plastic or as recommended by manufacturer.
E. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3  EXECUTION

3.01  EXAMINATION
A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of
   work and are ready to receive resilient flooring.
B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work,
   are dust-free, and are ready to receive resilient base.
C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of
   adhesive materials to sub-floor surfaces.
D. Verify that concrete sub-floor surfaces are ready for resilient flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
   1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.

3.02 PREPARATION
A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.
B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
C. Prohibit traffic until filler is cured.
D. Clean substrate.
E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION
A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install in accordance with manufacturer's instructions.
C. Spread only enough adhesive to permit installation of materials before initial set.
D. Fit joints tightly.
E. Set flooring in place, press with heavy roller to attain full adhesion.
F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 TILE FLOORING
A. Install in accordance with manufacturer's instructions.
B. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.
C. Spread only enough adhesive to permit installation of materials before initial set.
D. Set flooring in place, press with heavy roller to attain full adhesion.
E. Lay flooring with joints and seams parallel or as shown on plans to building lines to produce symmetrical tile pattern.
F. Install tile to basket weave pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
G. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
H. Install edge and termination strips at unprotected or exposed edges, where flooring terminates, and where indicated. Before installation of flooring, secure metal strips with stainless steel screws.
I. Scribe flooring to walls, columns, cabinets, and other appurtenances to produce tight joints.
J. Install feature strips and floor markings where indicated. Fit joints tightly.
3.05 RESILIENT BASE
   A. Fit joints tightly and make vertical. Maintain minimum dimension of 48 inches between joints.
   B. At external and internal corners, use premolded units. At exposed ends, use premolded units.
   C. Install base on solid backing. Bond tightly to wall and floor surfaces.
   D. Scribe and fit to door frames and other interruptions.

3.06 CLEANING
   A. Remove excess adhesive from floor, base, and wall surfaces without damage.
   B. Clean, seal, and wax resilient flooring products in accordance with manufacturer’s instructions.

3.07 PROTECTION
   A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION
SECTION 09 90 00
PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints and other coatings.
C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Elevator pit ladders.
   3. Exposed surfaces of steel lintels and ledge angles.
   4. Surfaces inside cabinets.
   5. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.
D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Floors, unless specifically so indicated.
   7. Glass.
   8. Acoustical materials, unless specifically so indicated.
   9. Concealed pipes, ducts, and conduits.
E. Painting materials and methods for conduit identification specified in Section 26 05 53.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 78 39 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS

C. NACE (IMP) - Industrial Maintenance Painting; NACE International; Edition date unknown.
D. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings.

1.04 DEFINITIONS

A. Conform to ASTM D 16 for interpretation of terms used in this section.
1.05 SUBMITTALS
   A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on all finishing products and special coatings, including VOC content.
   C. Samples: Submit two paper chip samples, 1 X 1 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
   D. Samples: Submit two painted samples, illustrating selected colors and textures for each color and system selected with specified coats cascaded. Submit on aluminum sheet, 6 x 6 inch in size.
   E. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
   F. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
   G. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.
   H. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.06 REGULATORY REQUIREMENTS
   A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
   B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
   C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS
   A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
   B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
   C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
   D. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
   E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.09 EXTRA MATERIALS
   A. See Section 01 60 00 - Product Requirements, for additional provisions.
   B. Supply 1 gallon of each color; store where directed.
   C. Label each container with color, type, texture, and room locations in addition to the manufacturer's label.
PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
B. Paints:
   1. ICI Paints North America: www.icipaints.com
C. Field-Catalyzed Coatings:
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL
A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   3. Supply each coating material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
C. Volatile Organic Compound (VOC) Content: Comply with Section 01 61 16.
D. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.
E. Colors: To be selected from manufacturer's full range of available colors.
   1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.

2.03 PAINT SYSTEMS - EXTERIOR
A. Paint CE-OP-3L - Masonry/Concrete, Opaque, Latex, 3 Coat:
   1. One coat of block filler.
   2. Satin: Two coats of latex enamel.
B. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
   1. One coat of alkyd primer.

2.04 PAINT SYSTEMS - INTERIOR
A. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
   1. One coat of latex primer sealer.
2. Semi-gloss: Two coats of latex enamel

B. Paint WI-TR-V - Wood, Transparent, Varnish, No Stain:
   1. One coat sealer.
   2. Satin: One coat of varnish.

C. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:
   1. One coat of block filler.
   2. Egg Shell: Two coats of latex enamel.

D. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
   1. Touch-up with latex primer or manufacturer recommended.
   2. Flat: Two coats of latex enamel.

E. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
   1. One coat of alkyd or latex primer sealer.
   2. Eggshell: Two coats of latex enamel.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Plaster and Stucco: 12 percent.
   3. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

E. Marks: Seal with shellac or stain blocker those which may bleed through surface finishes.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate.
phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

I. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.

J. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

K. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

L. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

M. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

N. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

O. Interior Wood Surfaces to be Painted: Prime metal door top and bottom edge surfaces. Re-prime entire shop-primed item.

P. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

Q. Exterior and Interior Wood to Receive Opaque Latex Stain Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after initial coat has been applied. Back stain concealed surfaces before installation.

R. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's instructions.

D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Apply each coat to uniform appearance.

G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

H. Sand wood and metal surfaces lightly between coats to achieve required finish.
I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

J. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT
A. Refer to Section 22 05 53, Section 23 05 53 and Section 26 05 53 for schedule of color coding of equipment, duct work, piping, and conduit.

B. Paint shop-primed equipment, where indicated.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Finish equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.

E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

3.06 CLEANING
A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 PROTECTION
A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

3.08 SCHEDULE - SURFACES TO BE FINISHED
A. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically noted.
   2. Fire rating labels, equipment serial number and capacity labels.
   3. Stainless steel items.

B. Paint the surfaces described below under Schedule - Paint Systems.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
   1. Where indicated as exposed, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment occurring in finished areas to match background surfaces.
   2. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
   3. Paint shop-primed items occurring in finished areas.
   4. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
   5. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

D. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

END OF SECTION
SECTION 10 14 00  
SIGNAGE

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Room and door signs.
   B. Building signs on wall.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
   C. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

1.04 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Package signs as required to prevent damage before installation.
   B. Package room and door signs in sequential order of installation, labeled by floor or building.
   C. Store tape adhesive at normal room temperature.

1.06 FIELD CONDITIONS
   A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
   B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Flat Signs:
      5. Bayuk Graphic Systems, Inc.
      6. Substitutions: See Section 01 60 00 - Product Requirements.

   B. Dimensional Letter Signs on Wall:
      2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SIGNAGE APPLICATIONS
   A. Accessibility Compliance: All signs are required to comply with ADA Standards for Accessible Design and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements. Provide at each stair landing, each elevator landing, each restroom door.
B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.

C. Building Identification Signs on Walls:
   1. Use individual fabricated metal letters.

2.03 ROOM AND DOOR SIGN TYPES
A. Sign Types as shown on drawings. The following applies to all sign types:
   1. Process: Graphic Blast raised 1/32"
   2. Material: .125" MP Plastic
   3. Material Finish: Matte
   4. Edge Treatment: Standard Bevel
   5. Corner Treatment: .5" Radius
   6. Border: N/A
   7. Copy Size: As shown on drawings
   8. Typestyle: Helvetica Bold Condensed
   9. Braille: Grade II
   10. Attachment: Silicone Adhesive & VFT
   11. Letter Color: Standard Range
   12. Background Color: Standard Range

2.04 DIMENSIONAL LETTERS FOR WALLS
A. Fabricated Aluminum Letters
   1. Material: Aluminum
   2. Finish: Powder coat
   3. Font: Perpetua Bold
   4. Mounting: Fabricated stainless steel backer with studs and spacers
   5. Height: 12"
   6. Thickness: 1"

2.05 ACCESSORIES
A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Install neatly, with horizontal edges level.
C. Locate signs where indicated and in accordance with ADA Standards and ICC A117.1:
   1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
   2. If no location is indicated obtain Owner's instructions.
D. Protect from damage until Substantial Completion; repair or replace damage items.
E. When flat sign must be glass mounted, provide blank sign for other side of glass to cover tape adhesive.

END OF SECTION
SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Corner guards.

1.02 RELATED REQUIREMENTS
A. Section 05 50 00 - Metal Fabrications: Corner guards fabricated from rolled metal sections or bent plate.
B. Section 05 50 00 - Metal Fabrications: Anchors for attachment of work of this section, concealed in wall.
C. Section 06 10 00 - Rough Carpentry: Blocking for wall and corner guard anchors.
D. Section 09 21 16 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS
A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
C. Shop Drawings: Include plans, elevation, sections, and attachment details.
D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
   1. Submit two sections of corner guards, 24 inches long.
E. Manufacturer’s Instructions: Indicate special procedures, perimeter conditions requiring special attention.
F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
G. Maintenance Materials: Furnish the following for Owner’s use in maintenance of project:
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Stock Materials: One package(s) of minimum 96 inches long unit of each kind of covers for corner guards.
H. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.
1.05 DELIVERY, STORAGE, AND HANDLING
   A. Deliver wall and door protection items in original, undamaged protective packaging. Label items
to designate installation locations.
   B. Protect work from moisture damage.
   C. Protect work from UV light damage.
   D. Do not deliver products to project site until areas for storage and installation are fully enclosed,
and interior temperature and humidity are in compliance with manufacturer's recommendations
for each type of item.
   E. Store products in either horizontal or vertical position, in compliance with manufacturer's
instructions.

1.06 WARRANTY
   A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective Work within a one year period after Date of Substantial Completion.
   C. Provide five year manufacturer and installer warranty for metal crash rails.
      1. Failures include, but are not limited to, the following:
         a. Structural failures, internal connection failures, and/or detachment of rail system from
substrates.
         b. Deterioration of materials beyond that expected of normal use, as intended by
manufacturer.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Corner Guards:
      2. Inpro; _____:  www.inprocorp.com/#sle.
      3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE CRITERIA
   A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that
have been successfully tested for compliance with applicable provisions of ASTM D256 and/or
ASTM F476.
   B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and
assemblies with chemical and stain resistance complying with applicable provisions of ASTM
D543.

2.03 PRODUCT TYPES
   A. Corner Guards - Surface Mounted:
      1. Corner guards fabricated from rolled section or bent plate are specified in Section 05 50
00.
      2. Material: Type 304 stainless steel, No. 4 finish, 16 gage, 1/16” inch thick.
      3. Width of Wings: 2 inches.
      5. Color: As selected from manufacturer's standard colors.

2.04 FABRICATION
   A. Fabricate components with tight joints, corners and seams.
PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
B. Verify that field measurements are as instructed by the manufacturer.
C. Verify that substrate surfaces for adhered items are clean and smooth.
   1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer’s recommendations for remedial measures at locations and/or application conditions where adhesion test’s results are unsatisfactory.
D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION
A. Install components in accordance with manufacturer’s instructions, level and plumb, secured rigidly in position to supporting construction.
B. Position corner guard 4 inches above finished floor to 52 inches high.

3.03 TOLERANCES
A. Maximum Variation From Required Height: 1/4 inch.
B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

3.04 CLEANING
A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
B. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION
SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Fire extinguishers.
   B. Fire extinguisher cabinets.

1.02 REFERENCE STANDARDS
   A. NFPA 10 - Standard for Portable Fire Extinguishers.
   B. UL (DIR) - Online Certifications Directory.

1.03 PERFORMANCE REQUIREMENTS
   A. Conform to NFPA 10 and applicable code.
   B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc., or testing firm acceptable to the authority having jurisdiction, for the purpose specified and indicated.

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate cabinet physical dimensions and location.
   C. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.
   D. Manufacturer’s Installation Instructions: Indicate special criteria and wall opening coordination requirements.
   E. Manufacturer’s Certificate: Certify that products meet or exceed specified requirements.
   F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS
   A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Fire Extinguishers:
      4. Substitutions: See Section 01 60 00 - Product Requirements.
   B. Fire Extinguisher Cabinets and Accessories:
      4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE EXTINGUISHERS
   A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   B. Dry Chemical Type Fire Extinguishers: Cast steel tank, with pressure gage.
      1. Class 2A - 10B:C.
      2. Size 5 lb.
3. Finish: Baked enamel, red color.
4. Design Basis = Larsen’s manufacturing MP-5.

2.03 FIRE EXTINGUISHER CABINETS
A. Metal: Formed primed steel sheet; 0.036 inch thick base metal.
B. Cabinet Configuration: Semi-recessed type.
   1. Sized to accommodate accessories.
      a. One size for fire extinguisher only. One size for fire extinguisher and fire blanket.
C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with continuous piano hinge. Provide nylon or roller type catch.
E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
F. Weld, fill, and grind components smooth.
G. Finish of Cabinet Exterior Trim and Door: Stainless steel No. 4.
H. Finish of Cabinet Interior: White enamel

2.04 ACCESSORIES
A. Extinguisher Brackets: Formed steel, chrome-plated.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.

3.02 INSTALLATION
A. Install in accordance with manufacturer’s instructions.
B. Install cabinets plumb and level in wall openings, 27 inches from finished floor to inside bottom of cabinet.
C. Secure rigidly in place.
D. Place extinguishers in cabinets.

END OF SECTION
SECTION 12 24 13
ROLLER SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Sunscreen roller shades.

1.02 REFERENCE STANDARDS
B. NFPA 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.03 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
   3. Storage and handling requirements and recommendations.
   4. Mounting details and installation methods.
C. Shop Drawings: Indicate Plans, elevations, sections, product details, installation details, operational clearances, and relationship to adjacent work.
D. Selection Samples: For each finished product specified, one set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
E. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, and instructions for operating hardware.

1.04 QUALITY ASSURANCE
A. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
B. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC 9645.

1.05 MOCK-UP
A. Provide one mock-up, approximately 10 feet long by approximately 5 feet wide, illustrating method of installation, color, fabric and operation.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver shades to project site in factory-labeled packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations as on Drawings.

1.07 FIELD CONDITIONS
A. Environmental Limitations: Install roller shades after finish work including painting is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating twenty-five year limited warranty.
PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with the specifications, products from the following manufacturers may be provided:
   1. MechoShade Systems, Inc., 42-03 35th Street, Long Island, NY 11101; Tel: 718-729-2020; Email: angela.gratereaux@mechoshade.com; Web: www.mechoshade.com.
   2. Legrand Solarfective, 55 Hymus Road, Scarborough, ON, M1L2C6, Canada; Toll Free Telephone: 833|456|4291 (toll-free). To request information via Email: shading.cs@legrand.us Website: www.Legrand.us/Solarfective

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ROLLER SHADE TYPE

A. Manually Operated Shades:
   1. Mounting: Surface mounted to storefront frame system.
   3. Solar Shade Clothe:
      a. Fabric: MechoShade's ThermoVeil 1300, 5 percent open, 2 x 2 open basket-weave pattern (or equal)
      b. Color: Selected from manufacturer's standard colors.

2.03 SHADE CLOTH

A. Visually Transparent Shadecloth: Single thickness non-raveling 0.030-inch (0.762 mm) thick vinyl fabric, woven from 0.018-inch (457 mm) diameter extruded vinyl yarn comprising of 21 percent polyester and 79 percent reinforced vinyl.

2.04 SHADE BAND

A. Shade Bands: Construction of shade band includes the fabric, the hem weight, hem-pocket, shade roller tube, and the attachment of the shade band to the roller tube. Sewn hems and open hem pockets are not acceptable.
   1. Hem Pockets and Hem Weights: Fabric hem pocket with RF-welded seams (including welded ends) and concealed hem weights. Hem weights shall be of appropriate size and weight for shade band. Hem weight shall be continuous inside a sealed hem pocket. Hem pocket construction and hem weights shall be similar, for all shades within one room.
   2. Shade Band and Shade Roller Attachment:
      a. Use extruded aluminum shade roller tube of a diameter and wall thickness required to support shade fabric without excessive deflection. Roller tubes less than 1.55 inch (39.37 mm) in diameter for manual shades are not acceptable.
      b. Provide for positive mechanical engagement with drive/brake mechanism.
      c. Provide for positive mechanical attachment of shade band to roller tube; shade band shall be made removable/replaceable with a "snap-on" "snap-off" spline mounting, without having to remove shade roller from shade brackets.
      d. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.
2.05 SHADE FABRICATION
A. Fabricate units to completely fill existing openings from head to sill and jamb to jamb, unless specifically indicated otherwise.

2.06 COMPONENTS
A. Access and Material Requirements:
1. Provide shade hardware allowing for the removal of shade roller tube from brackets without removing hardware from opening and without requiring end or center supports to be removed.
2. Provide shade hardware that allows for removal and re-mounting of the shade bands without having to remove the shade tube, drive or operating support brackets.
3. Use only Delrin engineered plastics by DuPont for all plastic components of shade hardware. Styrene based plastics, and/or polyester, or reinforced polyester will not be acceptable.

B. Manual Operated Chain Drive Hardware and Brackets:
1. Provide for universal, regular and offset drive capacity, allowing drive chain to fall at front, rear or non-offset for all shade drive and brackets. Universal offset shall be adjustable for future change.
2. Provide hardware capable for installation of a removable fascia, for both regular and/or reverse roll, which shall be installed without exposed fastening devices of any kind.
3. Provide positive mechanical engagement of drive mechanism to shade roller tube. Friction fit connectors for drive mechanism connection to shade roller tube are not acceptable.
4. Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel or heavier as required to support 150 percent of the full weight of each shade.
5. Drive Bracket/Brake Assembly:
   a. Drive sprocket and brake assembly shall rotate and be supported on a welded 3/8 inch (9.525 mm) steel pin.
   b. The brake shall be an over-running clutch design which disengages to 90 percent during the raising and lowering of a shade. the brake shall withstand a pull force of 50 lbs. (22 kg) in the stopped position.
   c. The braking mechanism shall be applied to an oil-impregnated hub on to which the brake system is mounted. The oil impregnated hub design includes an articulated brake assembly. The assembly shall be permanently lubricated. Products that require externally applied lubrication and/or not permanently lubricated are not acceptable.
   d. The entire assembly shall be fully mounted on the steel support bracket, and fully independent of the shade tube assembly, which may be removed and reinstalled without effecting the roller shade limit adjustments.
   e. Drive Chain: #10 qualified stainless steel chain rated to 90 lbs. (41 kg) minimum breaking strength. Nickel plate chain shall not be acceptable.

6. Include Mecho / 5 Extended and/or slimline bracket with optional Mecho SnapLoc fascia

PART 3 EXECUTION

3.01 EXAMINATION
A. Do not begin installation until substrates have been properly prepared.

3.02 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.
3.03 INSTALLATION
   A. Install roller shades level, plumb, square, and true 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 proper clearances for window operation hardware.
   B. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or
      malfunction throughout entire operational range.
   C. Clean roller shade surfaces after installation, according to manufacturer's written instructions.

3.04 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 12 30 40
LAMINATE CLAD CASEWORK

PART 1 – GENERAL

1.01 SECTION INCLUDES
A. Fixed modular laminate clad casework and components.
B. Flexible rail mounted laminate clad casework and components.
C. Laminate clad cabinets and custom components.
D. Cabinet hardware including countertop support brackets.
E. Shelving not integral with cabinets.

1.02 RELATED SECTIONS
A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01 78 39 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
C. Section 06 10 00 – Rough Carpentry: Blocking within walls where indicated.
D. Section 09 65 00 – Resilient Flooring: Base molding.
E. Section 22 40 00 – Plumbing Fixtures: Sinks and service fixtures, service waste lines, connections, and vents.
F. Section 26 27 26 – Wiring Devices: Electrical service fixtures:

1.03 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, units with full glass insert doors and/or acrylic doors, and units with wire grille doors.
   2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts.
   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 72 inches above finished floor.
   5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.

1.04 QUALITY ASSURANCE
A. Quality Standard: Unless otherwise indicated, comply with AWI’s Architectural Woodwork Quality Standards for grades of interior architectural woodwork, construction, finishes and other requirements.
B. Manufacturer: Provide products certified as meeting or exceeding ANSI-A 161.1-2000 testing standards.
C. Single Source Manufacturer: Casework, countertops and architectural millwork products must all be engineered and built by a single source manufacturer in order to ensure consistency and quality for these related products. Splitting casework, countertops and/or architectural millwork between multiple manufacturers will not be permitted.
D. Manufacturer: All wood products designated as “FSC Certified” in this specification shall be certified according to the rules of the Forest Stewardship Council (www.fscus.org) with vendor’s Chain-of-Custody (COC) numbers available for each product.
E. The following North American certification bodies are accredited by the FSC to certify forest products:
2. SmartWood (www.smartwood.org <http://www.smartwood.org>)

F. Products in this section must incorporate a label that clearly identifies compliance with the Airborne Toxic Control Measure (ATCM) Title 17, California Code of Regulations 93120.12 as approved by the California Air Resources Board (CARB).

1.05 SUBMITTALS

A. See Section 01 33 00 - Administrative Requirements, for submittal procedures
B. Product Data: Manufacturer's catalog with specifications and construction details.
C. 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.
   2. Indicate locations of plumbing and electrical service field connection by others.
   3. Provide one set of shop drawings which includes all products within this section, engineered and built by a single source manufacturer, with seamless coordination amongst all products.
D. Casework Samples (To be available upon request):
   1. Base cabinet: Cabinet conforming to specifications, with drawer and door.
   2. Wall cabinet: Cabinet conforming to specifications, with door.
   3. Cabinet samples shall be complete with specified hardware for doors, drawers and shelves.
   4. Component samples: Two sets of samples for each of the following:
      a. Decorative laminate color charts / PVC and ABS edgings.
   5. A wire grille door and stay close latch sample in the final finish and color shall be provided upon request.
E. For all wood products designated in this specification as “FSC Certified”, provide evidence of compliance with FSC standards as follows:
   1. Demonstrate that products are FSC Certified by providing vendor invoices. Invoices will contain the vendor’s Chain-of-Custody (COC) number and identify each FSC Certified product on a line-item basis. A ‘vendor’ is defined as the company that furnishes wood products to project contractors and/or subcontractors for on-site installation.
   2. Wood products without submittal of acceptable documentation will be rejected.

1.06 PRODUCT HANDLING

A. Deliver completed laminate clad casework, countertops, and related products 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.
C. Do not deliver or install woodwork until building is enclosed, painting and other wet work is completed, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels, between 25 percent and 55 percent, during the remainder of the construction period.
D. If woodwork must be stored in areas other than final installation location, store only in areas where environmental conditions comply with these requirements.

1.07 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 work.
   1. Locate concealed framing, blocking and reinforcements that support woodwork by field measurements before being enclosed.
   2. Where field dimensions cannot be made without delaying the work, project general contractor will guarantee dimensions in order to proceed with manufacturing of woodwork.

1.08 WARRANTY

A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance and a ten (10) year warranty on the instrument shelf materials and workmanship.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Manufacturer:
   1. TMI Systems Design Corporation is the basis of design.
      a. Drawings and specifications are based on manufacturer’s literature from TMI SYSTEMS DESIGN CORPORATION, 50 South Third Avenue West, Dickinson, North Dakota, 58601, Phone: 800-456-6716, fixed modular, flexible rail mounted, and mobile casework and accessories.
   2. Stevens Advantage Furnishings.
   3. Cabinets by Design Inc.
   4. New Century L44 by LSI Corporation of America
   5. Substitutions: See Section 01 60 00 – Product Requirements. Additionally, other manufacturers shall comply with the minimum levels of material and detailing indicated on the drawings and all specifications noted herein.

2.02 MATERIALS

A. Core Materials:
   1. Particleboard: Wood fiber particleboard with no Urea Formaldehyde added during the manufacturing process.
      a. Up to 7/8 inch thick: Industrial Grade average 45-pound density meeting ANSI A 208.1-2009, M-2 requirements.
      b. 1 inch thick: Industrial Grade average 45-pound density meeting ANSI A 208.1-2009, M-2 requirements.
   2. Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2-2009 requirements.

B. Laminate Color Selection: Maximum 1 color per unit face and 5 colors per project. (See Color Selection in section 3.05).

2.03 SPECIALTY ITEMS

A. Support Members:
   2. Undercounter support frames: Epoxy powder coated - black.

B. Miscellaneous Shelving not Integral with Casework
1. Shelf Material: 3/4 inch thick certified particleboard core.
2. Laminate: High pressure decorative laminate VGS (0.028 thickness) on both faces.
3. Edgebanding: 3mm PVC banding, machine applied and machine profiled to 1/8 inch radius.
4. Shelf Standards and Brackets: KV #87 standards and #187 brackets, or equal.

2.04 CABINET HARDWARE

A. Hinges:
   1. Five knuckle, epoxy powder coated, institutional grade, 2-3/4 inch overlay type with hospital tip. 0.095 inch thick. ANSI-BHMA standard A156.9, Grade 1.
      a. Magnetic door catch with maximum 5 pound pull provided, attached with screws and slotted for adjustment.
      b. Hinges: Concealed 120-degree swing, self-closing, clip-on style.
         1) Doors up to 34 inches in height have 2 hinges per door.
         2) Doors 35 inches to 62 inches in height have 3 hinges per door.
         3) Doors 63 inches to 80 inches in height have 4 hinges per door.
         4) All doors have rubber bumpers.

B. Pulls:
   1. Select from the TMI Vendor Stock Pull Program.
      a. Metal Wire Pull (Finish option: Satin Chrome)
   2. All pulls with 96mm spacing on screws. Pull designs shall comply with the Americans with Disability Act (ADA).

C. Drawer Slides:

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: To be provided on each cabinet.
   1. Removable core, disc tumbler, cam style lock with strike.
   2. Elbow catch or chain bolt used to secure inactive door on all locked cabinets.

F. File Suspension System: Extruded molding integral with top of drawer box sides to accept standard hanging file folders.


2.05 FABRICATION:

A. Complete fabrication, including assembly, finishing, and hardware application, before shipment to project site to maximum extent possible.
   1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled.
   2. Insert dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting.
   3. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on shop drawings before disassembling for shipment.
B. Factory cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items.

C. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.

D. All casework panel components must go through a supplemental sizing process after cutting, producing a panel precisely finished in size and square to within 0.010 inches, ensuring strict dimensional quality and structural integrity in the final fabricated product.

E. 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 of 8 dowels each joint for 39 inch deep cabinets, minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets. (Mechanical or metal hardware fasteners joining cabinet top and bottom panels to the sides will not be accepted.)
      a. Tops, bottoms and sides of all cabinets are Certified particleboard core.
   2. Cabinet backs: 1/4 inch thick medium density fiberboard panel fully captured by the cabinet top, bottom and side panels. Finish to match cabinet interior. 3/4 inch x 4 inch particleboard rails will be placed behind the back panel at the top and bottom, and doweled to the sides utilizing 10mm hardwood fluted dowels. A third intermediate rail will be included on all cabinets taller than 56 inches. Utilize hot melt glue to further secure back and increase overall strength.
      a. Exposed back on fixed or movable cabinets: 3/4 inch thick Certified 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 plywood. Base is 102mm (nominal 4 inch) high unless otherwise indicated on the drawings.
   4. Base units, except sink base units: Full sub-top glued and doweled to cabinet sides. (Mechanical or metal hardware fasteners joining cabinet sub-top panel to the sides will not be accepted.)
      a. 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.
      a. Edging: 3mm ABS/PVC machine applied and machine profiled to 1/8 inch radius.
   7. Adjustable Shelves in Cabinets
      a. Core: Certified Particleboard.
      b. Core Thickness: 3/4 inch up to 36 inches wide, 1 inch over 36 inches wide.
      c. Edge: 3mm ABS/PVC on Front Edge Only.
   8. Interior finish, units with open Interiors:
      a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with high-pressure decorative VGS laminate. Use of TFM on exposed open interiors will not be permitted.
   9. Interior finish, units with closed Interiors:
      a. Top, bottom, back, sides, horizontal and vertical members, and adjustable shelving faces with TFM Thermally Fused Melamine laminate.
   10. Exposed ends:
       a. Faced with high-pressure decorative VGS laminate. Use of TFM on exposed ends will not be permitted.
   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. Drawers:
1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with TFM Thermally Fused Melamine, doweled and glued into sides. Top edge banded with 1mm PVC.
2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with TFM Thermally Fused Melamine, screwed directly to the bottom edges of drawer box.

G. Door/Drawer Fronts:
1. Core: 3/4 inch thick particleboard.
2. High-pressure decorative VGS laminate exterior, balanced with high-pressure cabinet liner CLS. Use of TFM on exterior or interior surfaces of door/drawer fronts will not be permitted.
3. Edges: 3mm ABS/PVC, machine applied, external edges and outside corners machine profiled to 1/8 inch radius.
4. Provide double doors in opening in excess of 24 inches wide.
5. Provide 2 hinges for each door up to 48 inches in height and 3 hinges for each door over 48 inches in height.

PART 3- EXECUTION

3.01 INSPECTION:
A. The casework contractor must examine the job site and the conditions under which the work under this section is to be performed, and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION:
A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION:
A. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
C. Repair minor damage per plastic laminate manufacturer’s recommendations.
D. Provide final protection and maintain environmental conditions in a manner acceptable to manufacturer and installer which insures that without damage or deterioration at the time of substantial completion.
E. Install cabinets without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide easy operation.
F. Anchor countertops securely to base units and other support systems as indicated.
G. Install miscellaneous accessories per manufacturer’s instructions using fasteners appropriate to substrate and recommended by manufacturer. Install units plumb and level, firmly anchored, in locations indicated on drawings.

3.04 CLEANING:
A. Remove and dispose of all packing materials and related construction debris.
B. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

3.05 COLOR SELECTION:

A. Laminate Color Selection:
   1. Selected from the full range of standard Wilsonart® and Formica® stock color charts.
   2. Thermally fused melamine laminate matched to White color.

B. Hardware Color Selection:
   1. Hinge: Chrome.
   2. Pulls: Select from design specific finish options available in the TMI Vendor Stock Pull Program.
   3. Miscellaneous Hardware (support brackets, etc.): Epoxy powder coating color: Black.

C. PVC Edge Banding Color Selection:
   1. 3mm PVC: Selected from the TMI Vendor Stock PVC Program, solid colors matched to Wilsonart® and Formica® laminates.

END OF SECTION
SECTION 21 05 00
COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Pipe, fittings, valves, and connections for sprinkler, standpipe and fire hose, and combination sprinkler and standpipe systems.

1.02 RELATED REQUIREMENTS
A. Section 09 90 00 - Paints and Coatings: Preparation and painting of fire protection piping systems.
C. Section 22 05 53 - Identification for Plumbing Piping and Equipment: Piping identification.
D. Section 21 13 00 - Fire-Suppression Sprinkler Systems: Sprinkler systems design.
E. Section 21 12 00 - Fire-Suppression Standpipes: Standpipe design.

1.03 REFERENCE STANDARDS
A. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators.
C. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300.
D. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250.
E. ASME B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard.
G. ASME B16.11 - Forged Fittings, Socket-welding and Threaded.
H. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
I. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
J. ASME B16.25 - Buttwelding Ends.
K. ASME B36.10M - Welded and Seamless Wrought Steel Pipe.
S. ASTM B75M - Standard Specification for Seamless Copper Tube (Metric).
V. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
W. AWS D1.1/D1.1M - Structural Welding Code - Steel.
X. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
AA. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast.
AC. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems.
AE. UL (DIR) - Online Certifications Directory.
AF. UL 262 - Gate Valves for Fire-Protection Service; Underwriters Laboratories Inc.
AG. UL 312 - Check Valves for Fire-Protection Service; Underwriters Laboratories Inc.

1.04 SUBMITTALS
B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.
C. Project Record Documents: Record actual locations of components and tag numbering.
D. Operation and Maintenance Data: Include installation instructions and spare parts lists.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience. approved by manufacturer.
C. Conform to UL requirements.
D. Valves: Bear UL label or marking. Provide manufacturer's name and pressure rating marked on valve body.
E. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver and store valves in shipping containers, with labeling in place.
B. Provide temporary protective coating on cast iron and steel valves.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

1.07 EXTRA MATERIALS
A. Provide two valve stem packings for each size and type of valve installed.

PART 2 PRODUCTS
2.01 FIRE PROTECTION SYSTEMS
A. Sprinkler Systems: Conform work to NFPA 13.
B. Standpipe and Hose Systems: Conform to NFPA 14.
C. Welding Materials and Procedures: Conform to ASME Code.
2.02 BURIED PIPING

A. Steel Pipe: ASTM A53/A53M Schedule 40, black, with AWWA C105 polyethylene jacket, or double layer, half-lapped polyethylene tape.
   1. Steel Fittings: ASME B16.9, wrought steel, buttwelded; with double layer, half-lapped polyethylene tape.
   4. Casing: Closed glass cell insulation.

B. Copper Tube: ASTM B75 (ASTM B75M), O60 or O50 temper.
   1. Type: Type K (A).
   2. Fittings: ASME B16.18, cast copper alloy, solder joint, pressure type.
   3. Joints: AWS A5.8 Classification BCuP-3 or BCuP-4 copper/silver braze.
   4. Casing: Closed glass cell insulation.

   1. Fittings: AWWA C110, standard thickness.

2.03 ABOVE GROUND PIPING

A. Steel Pipe: ASTM A795 Schedule 10 or ASTM A53 Schedule 40, black.
   4. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.
   5. Mechanical Formed Fittings: Carbon steel housing with integral pipe stop and O-ring pocketed and O-ring, uniformly compressed into permanent mechanical engagement onto pipe.

B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), H58 drawn.
   1. Fittings: ASME B16.18, cast copper alloy, grooved.
   2. Mechanical Grooved Couplings: Ductile iron housing with alkyd enamel paint coating clamps to engage and lock, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers.

   3. Mechanical Grooved Couplings: Malleable iron housing clamps to engage and lock, "C" shaped composition sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

2.04 PIPE HANGERS AND SUPPORTS

A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
D. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
E. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
F. Vertical Support: Steel riser clamp.
G. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

H. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.05 GATE VALVES
A. Up to and including 2 inches:
   1. Bronze body, bronze trim, rising stem, handwheel, solid wedge or disc, threaded ends.

B. Over 2 inches:
   1. Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, handwheel, OS&Y, solid rubber covered bronze or cast iron wedge, flanged ends.

C. Over 4 inches:
   1. Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged ends, iron body indicator post assembly.

2.06 GLOBE VALVES
A. Up to and including 2 inches:
   1. Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable rubber disc, threaded ends, with backseating capacity repackable under pressure.

B. Over 2 inches:
   1. Iron body, bronze trim, rising stem, handwheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

2.07 BALL VALVES
A. Up to and including 2 inches:
   1. Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing Stops, threaded ends.

B. Over 2 inches:
   1. Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle or gear drive handwheel for sizes 10 inches and over, flanged.

2.08 BUTTERFLY VALVES
A. Bronze Body:
   1. Stainless steel disc, resilient replaceable seat, threaded or grooved ends, extended neck, handwheel and gear drive and integral indicating device, and built-in tamper proof switch rated 10 amp at 115 volt AC.

B. Cast or Ductile Iron Body
   1. Cast or ductile iron, chrome or nickel plated ductile iron or aluminum bronze disc, resilient replaceable EPDM seat, wafer, lug, or grooved ends, extended neck, handwheel and gear drive and integral indicating device, and internal tamper switch rated 10 amp at 115 volt AC.

2.09 CHECK VALVES
A. Up to and including 2 inches:
   1. Bronze body and swing disc, rubber seat, threaded ends.

B. Over 2 inches:
   1. Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends with automatic ball check.

C. 4 inches and Over:
   1. Iron body, bronze disc, stainless steel spring, resilient seal, threaded, wafer, or flanged ends.
2.10 DRAIN VALVES

A. Compression Stop:
   1. Bronze with hose thread nipple and cap.

B. Ball Valve:

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and foreign material, from inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13.
B. Install standpipe piping, hangers, and supports in accordance with NFPA 14.
C. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
D. Install piping to conserve building space, to not interfere with use of space and other work.
E. Group piping whenever practical at common elevations.
F. Sleeve pipes passing through partitions, walls, and floors.
G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
H. Inserts:
   1. Provide inserts for placement in concrete formwork.
   2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
   3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
   4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
   5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.
I. Pipe Hangers and Supports:
   1. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   2. Place hangers within 12 inches of each horizontal elbow.
   3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
   6. Provide copper plated hangers and supports for copper piping.
   7. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
J. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
K. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding. Refer to Section 09 90 00.

L. Do not penetrate building structural members unless indicated.

M. Provide sleeves when penetrating footings, floors, and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.

N. Escutcheons:
   1. Install and firmly attach escutcheons at piping penetrations into finished spaces.
   2. Provide escutcheons on both sides of partitions separating finished areas through which piping passes.
   3. Use chrome plated escutcheons in occupied spaces and to conceal openings in construction.

O. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

P. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.

Q. Install valves with stems upright or horizontal, not inverted. Remove protective coatings after installation.

R. Provide gate, ball, or butterfly valves for shut-off or isolating service.

S. Provide drain valves at main shut-off valves, low points of piping and apparatus.

END OF SECTION
SECTION 21 05 48
VIBRATION AND SEISMIC CONTROLS FOR EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Equipment support bases.
B. Vibration isolators.
C. Seismic restraints.

1.02 SUBMITTALS
A. Product Data:
B. Shop Drawings: Indicate inertia bases and locate vibration isolators, with static and dynamic load on each. Indicate seismic control measures.
C. Manufacturer's Instructions: Indicate installation instructions with special procedures and setting dimensions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 PERFORMANCE REQUIREMENTS
A. General:
   1. All vibration isolators, base frames and inertia bases to conform to all uniform deflection and stability requirements under all operating loads.

2.03 EQUIPMENT SUPPORT BASES

2.04 VIBRATION ISOLATORS
A. Open Spring Isolators:
   1. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection. Color code springs for load carrying capacity.
   2. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads, and zinc chromate plated hardware.
   3. Sound Pads: Size for minimum deflection of 0.05 inch; meet requirements for neoprene pad isolators.
   4. For Exterior and Humid Areas: Hot dipped galvanized housings and neoprene coated springs.
B. Restrained Open Spring Isolators:
   1. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection. Color code springs for load carrying capacity.
   2. Spring Mounts: Provide with leveling devices, minimum 0.25 inch thick neoprene sound pads, and zinc chromate plated hardware.
   3. Sound Pads: Size for minimum deflection of 0.05 inch; meet requirements for neoprene pad isolators.
   4. Restraint: Provide heavy mounting frame and limit stops.
   5. For Exterior and Humid Areas: Hot dipped galvanized housings and neoprene coated springs.
C. Closed Spring Isolators:
   1. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
   2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection. Color code springs for load carrying capacity.
   3. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 0.25 inch clearance.
   4. For Exterior and Humid Areas: Hot dipped galvanized housings and neoprene coated springs.

D. Restrained Closed Spring Isolators:
   1. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
   2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection. Color code springs for load carrying capacity.
   3. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum 0.25 inch clearance and limit stops.
   4. For Exterior and Humid Areas: Hot dipped galvanized housings and neoprene coated springs.

E. Spring Hanger:
   1. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection. Color code springs for load carrying capacity.
   2. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators.
   4. For Exterior and Humid Areas: Hot dipped galvanized housings and neoprene coated springs.

F. Neoprene Pad Isolators:
   1. Rubber or neoprene waffle pads.
      a. Hardness: 30 durometer.
      b. Thickness: Minimum 1/2 inch.
      c. Maximum Loading: 50 psi.
      d. Rib Height: Maximum 0.7 times width.
   3. Configuration: 1/2 inch thick waffle pads bonded each side of 1/4 inch thick steel plate.

G. Rubber Mount or Hanger: Molded rubber designed for 0.4 inch deflection with threaded insert.

H. Glass Fiber Pads: Neoprene jacketed pre-compressed molded glass fiber.

I. Seismic Snubbers:
   1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
   2. Elements: Replaceable neoprene, minimum of 0.75 inch thick with minimum 1/8 inch air gap.
   3. Capacity: 4 times load assigned to mount groupings at 0.4 inch deflection.
   4. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.
PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Install in accordance with manufacturer's instructions.
B. Comply with the requirements of NFPA 13.
C. Bases:
   1. Set steel bases for one inch clearance between housekeeping pad and base.
   2. Set concrete inertia bases for 2 inches clearance between housekeeping pad and base.
   3. Adjust equipment level.
D. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
E. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
F. Provide seismic snubbers for all equipment, piping, and ductwork mounted on isolators. Each inertia base shall have minimum of four seismic snubbers located close to isolators. Snub equipment designated for post-disaster use to 0.05 inch maximum clearance. Other snubbers shall have clearance between 0.15 inch and 0.25 inch.
G. Support piping connections to equipment mounted on isolators using isolators or resilient hangers for scheduled distance.
   1. Up to 4 Inches Pipe Size: First three points of support.
   2. 5 to 8 Inches Pipe Size: First four points of support.
   3. 10 inches Pipe Size and Over: First six points of support.
   4. Select three hangers closest to vibration source for minimum 1.0 inch static deflection or static deflection of isolated equipment. Select remaining isolators for minimum 1.0 inch static deflection or 1/2 static deflection of isolated equipment.

3.02 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect isolated equipment after installation and submit report. Include static deflections.

3.03 SCHEDULES

A. Pipe Isolation Schedule.
   1. 1 Inch Pipe Size: Isolate 120 diameters from equipment.
   2. 2 Inch Pipe Size: Isolate 90 diameters from equipment.
   3. 3 Inch Pipe Size: Isolate 80 diameters from equipment.
   4. 4 Inch Pipe Size: Isolate 75 diameters from equipment.
   5. 6 Inch Pipe Size: Isolate 60 diameters from equipment.
   6. 8 Inch Pipe Size: Isolate 60 diameters from equipment.
   7. 10 Inch Pipe Size: Isolate 54 diameters from equipment.
   8. 12 Inch Pipe Size: Isolate 50 diameters from equipment.
   9. 16 Inch Pipe Size: Isolate 45 diameters from equipment.
  10. 24 Inch Pipe Size: Isolate 38 diameters from equipment.
  11. Over 24 Inch Pipe Size: As indicated.

END OF SECTION
SECTION 21 05 53
IDENTIFICATION FOR FIRE SUPP. PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Nameplates.
B. Tags.
C. Stencils.
D. Pipe Markers.

1.02 RELATED REQUIREMENTS
A. Section 09 90 00 - Paints and Coatings: Identification painting.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
C. Product Data: Provide manufacturers catalog literature for each product required.
D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
E. Project Record Documents: Record actual locations of tagged valves.

PART 2 PRODUCTS

2.01 MANUFACTURERS
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 NAMEPLATES
A. Description: Laminated three-layer plastic with engraved letters.
   2. Letter Height: 1/4 inch.

2.03 TAGS
A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.
B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
C. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.04 STENCILS
A. Stencils: With clean cut symbols and letters of following size:
   1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
   2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
4. 8 to 10 inch Outside Diameter of Insulation or Pipe: 24 inch long color field, 2-1/2 inch high letters.
5. Over 10 inch Outside Diameter of Insulation or Pipe: 32 inch long color field, 3-1/2 inch high letters.

B. Stencil Paint: As specified in Section 09 90 00, semi-gloss enamel, colors conforming to ASME A13.1.

2.05 PIPE MARKERS
B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
C. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
D. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

2.06 CEILING TACKS
A. Description: Steel with 3/4 inch diameter color coded head.

PART 3 EXECUTION
3.01 PREPARATION
A. Degrease and clean surfaces to receive adhesive for identification materials.
B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.02 INSTALLATION
A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
B. Install tags with corrosion resistant chain.
C. Apply stencil painting in accordance with Section 09 90 00.
D. Install plastic pipe markers in accordance with manufacturer's instructions.
E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
G. Identify pumps and valves with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.
H. Identify control panels and major control components outside panels with plastic nameplates.
I. Identify thermostats relating to terminal boxes or valves with nameplates.
J. Identify valves in main and branch piping with tags.
K. Tag automatic controls, instruments, and relays. Key to control schematic.
L. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including
risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

M. Locate ceiling tacks to locate valves above T-bar type panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION
SECTION 21 13 00
FIRE SUPPRESSION SPRINKLERS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Wet-pipe sprinkler system.
   B. System design, installation, and certification.

1.02 RELATED REQUIREMENTS
   A. Section 28 46 00 - Fire Detection and Alarm.
   B. Section 21 05 00 - Common Work Results for Fire Suppression: Pipe, fittings, and valves.
   C. Section 21 05 48 - Vibration and Seismic Controls for Equipment.
   D. Section 21 05 53 - Identification for Fire Supp. Piping and Equipment.
   E. Section 21 30 00 - Fire Pumps.
   F. Section 21 12 00 - Fire-Suppression Standpipes.
   G. Section 14 91 00 - Facility Chutes: Sprinkler heads inside chutes.
   H. Section 22 05 48 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
   I. Section 22 05 53 - Identification for Plumbing Piping and Equipment.
   J. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS
   A. FM P7825 - Approval Guide; Factory Mutual Research Corporation.
   B. ITS (DIR) - Directory of Listed Products.
   E. UL (DIR) - Online Certifications Directory.

1.04 SUBMITTALS
   A. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
   B. Shop Drawings:
      1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
      2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
   C. Samples: Submit one of each style of sprinkler specified.
   D. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
   E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
   F. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
   2. Sprinkler Wrenches: For each sprinkler type.

1.05 QUALITY ASSURANCE
A. Maintain one copy of referenced design and installation standard on site.
B. Conform to UL requirements.
C. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
D. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
E. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience approved by manufacturer.
F. Equipment and Components: Provide products that bear UL label or marking.
G. Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories Inc. or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.06 PRE-INSTALLATION MEETING
A. Convene one week before starting work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.08 EXTRA MATERIALS
A. Provide extra sprinklers of type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
B. Provide suitable wrenches for each sprinkler type.
C. Provide metal storage cabinet located adjacent to alarm valve.

PART 2 PRODUCTS
2.01 SPRINKLER SYSTEM
A. Sprinkler System: Provide coverage for building areas noted.
B. Occupancy: comply with NFPA 13.
C. Water Supply: Determine volume and pressure from water flow test data.
   1. Revise design when test data available prior to submittals.
D. Interface system with building fire and smoke alarm system.
E. Provide fire department connections where indicated.
F. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

2.02 SPRINKLERS
A. Suspended Ceiling Type: Standard, Semi-recessed, Recessed or Concealed pendant type with matching push on, clamp on or screw on escutcheon plate.
   1. Finish: Brass or Chrome plated.
      a. Within Standard Acoustical Tile Ceilings: White with White Estucheon Plate
b. Within Wooden Finish Acoustical Clouds: Chrome Plated with Chrome Plated Estucheon Plate
   2. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

B. Exposed Area Type: Standard upright type with guard.
   1. Finish: Chrome plated.
   2. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

C. Sidewall Type: Standard, Semi-recessed or Recessed horizontal sidewall type with matching push on escutcheon plate and guard.
   1. Finish: Chrome plated.
   2. Escutcheon Plate Finish: Chrome plated.
   3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

D. Dry Sprinklers: Standard, Recessed or Exposed pendant type with matching push on escutcheon plate.
   1. Finish: Chrome plated.
   2. Escutcheon Plate Finish: Chrome plated.
   3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

E. Guards: Finish to match sprinkler finish.

F. Spray Nozzles: Brass with solid cone discharge, 30 degrees of arc with blow-off dust cap.

2.03 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm and electric alarm, with pressure retard chamber and variable pressure trim; with test and drain valve.

B. Flooding Deluge Valve: Gate type valve with rubber faced disc actuated manually with water motor alarm and electric alarm, with alarm testing trim.

C. Water Motor Alarm: Hydraulically operated impeller type alarm with aluminum alloy chrome plated gong and motor housing, nylon bearings, and inlet strainer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.

B. All sprinkler heads are to be replaced within the area of work with new flexible heads. All new heads are to be centered in ceiling tiles.

C. The existing sprinkler system within the area of work is to be cleaned and modified to suit the new layout.

D. Install equipment in accordance with manufacturer's instructions.

E. Place pipe runs to minimize obstruction to other work.

F. Place piping in concealed spaces above finished ceilings.

G. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.

H. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
   I. Install and connect to fire pump system in accordance with Section 21 30 00.

J. Flush entire piping system of foreign matter.

K. Install guards on sprinklers where indicated.

L. Hydrostatically test entire system.
M. Require test be witnessed by Fire Marshal and authority having jurisdiction.

3.02 INTERFACE WITH OTHER PRODUCTS
A. Ensure required devices are installed and connected as required to fire alarm system.

END OF SECTION
SECTION 22 07 19
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Piping insulation.
   B. Jackets and accessories.

1.02 RELATED REQUIREMENTS
   A. Section 07 84 00 - Firestopping.
   B. Section 22 10 05 - Plumbing Piping: Placement of hangers and hanger inserts.

1.03 REFERENCE STANDARDS
   A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   L. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing.
1.04 SUBMITTALS
   A. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
   B. Samples: Submit two samples of any representative size illustrating each insulation type.
   C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of experience.
   B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum 3 years of experience, or and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.07 FIELD CONDITIONS
   A. Maintain ambient conditions required by manufacturers of each product.
   B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION
   A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, NFPA 255, or UL 723.

2.02 GLASS FIBER
   A. Manufacturers:
   B. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
      1. 'K' value: ASTM C177, 0.24 at 75 degrees F.
      2. Maximum service temperature: 850 degrees F; 1200 degrees F; 1600 degrees F.
      3. Maximum moisture absorption: 0.2 percent by volume.
   C. Insulation: ASTM C547; semi-rigid, noncombustible, end grain adhered to jacket.
      1. 'K' value: ASTM C177, 0.24 at 75 degrees F.
      2. Maximum service temperature: 650 degrees F.
      3. Maximum moisture absorption: 0.2 percent by volume.
   D. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches.
   E. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
   F. Vapor Barrier Lap Adhesive:
      1. Compatible with insulation.
   G. Insulating Cement/Mastic:
      1. ASTM C195; hydraulic setting on mineral wool.
H. Fibrous Glass Fabric:
   1. Cloth: Untreated; 9 oz/sq yd weight.
   2. Blanket: 1.0 lb/cu ft density.
   3. Weave: 5x5; 10x10; or 10x20.

I. Indoor Vapor Barrier Finish:
   1. Cloth: Untreated; 9 oz/sq yd weight.
   2. Vinyl emulsion type acrylic, compatible with insulation, black or white color.

J. Outdoor Vapor Barrier Mastic:
   1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

K. Outdoor Breather Mastic:
   1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

L. Insulating Cement:
   1. ASTM C449/C449M.

2.03 CELLULAR GLASS

A. Manufacturers:
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulation: ASTM C552, Grade 1.
   1. 'K' value: 0.37 at 100 degrees F.
   2. Service Temperature: Up to 900 degrees F.
   3. Water Vapor Permeability: 0.005 perm inch.
   4. Water Absorption: 0.2 percent by volume, maximum.

2.04 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturer:
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C 534 Grade 3; grade 2; grade 1 use molded tubular material wherever possible.
   1. Minimum Service Temperature: -40 degrees F.
   2. Maximum Service Temperature: 220 degrees F.

C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.05 JACKETS

A. PVC Plastic.
   1. Manufacturers:
      b. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Jacket: One piece molded type fitting covers and sheet material, off-white color.
      a. Minimum Service Temperature: 0 degrees F.
      b. Maximum Service Temperature: 150 degrees F.
      c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 20 mil; 30 mil.
      e. Connections: Brush on welding adhesive, tacks, pressure sensitive color matching vinyl tape.
   3. Covering Adhesive Mastic:

1. Thickness: 0.016 inch, 0.020 inch sheet.
2. Finish: Smooth, embossed.
4. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
5. Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that piping has been tested before applying insulation materials.
B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Install in accordance with NAIMA National Insulation Standards.
C. Exposed Piping: Locate insulation and cover seams in least visible locations.
D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
E. Glass fiber insulated pipes conveying fluids below ambient temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
F. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
G. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
H. Glass fiber insulated pipes conveying fluids above ambient temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
I. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert location: Between support shield and piping and under the finish jacket.
   4. Insert configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
   5. Insert material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
J. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 84 00.
K. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
L. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.

M. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material, thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.03 SCHEDULES

3.04 INTERIOR INSULATION APPLICATION SCHEDULE

A. Service: Domestic hot, recirculated hot water.
   1. Operating Temperature: 60 to 140 deg F.
   2. Insulation Material: Flexible elastomeric or glass fiber.
   3. Insulation Thickness: Apply the following insulation thicknesses:
      a. Pipe, All Sizes: 1.0 inch.
   4. Jacket:
      a. Exposed Spaces (mechanical rooms, closets, etc.) = PVC
      b. Concealed Spaces = None
   5. Vapor Retarder Required: No.
   6. Finish: None.

B. Service: Domestic water.
   1. Operating Temperature: 35 to 60 deg F.
   2. Insulation Material: Flexible elastomeric or glass fiber.
   3. Insulation Thickness: Apply the following insulation thicknesses:
      a. Pipe, 1” or less: 0.5 inch.
      b. Pipe, 1¼” to 2”: 0.5 inch.
      c. Pipe, 2-1/2” to 4”: 1.0 inch.
      d. Pipe, 5” and up: 1.0 inch.
   4. Jacket:
      a. Exposed Spaces (mechanical rooms, closets, etc.) = PVC
      b. Concealed Spaces = None
   5. Vapor Retarder Required: Yes.
   6. Finish: None.

C. Service: Sanitary waste piping where heat tracing is installed.
   1. Operating Temperature: 35 to 100 deg F.
   2. Insulation Material: Mineral fiber.
   3. Insulation Thickness: Apply the following insulation thicknesses:
      a. Pipe, 1-1/4” and up: 1.0 inch.
   5. Vapor Retarder Required: Yes.
   6. Finish: None.

D. Service: Exposed sanitary drains and domestic water supplies and stops for fixtures for the disabled.
   1. Operating Temperature: 35 to 120 deg F.
   2. Insulation Material: Molded closed cell vinyl.
   3. Insulation Thickness: 3/16 inch.
   4. Vapor Retarder Required: No.
   5. Finish: None.

END OF SECTION
SECTION 22 10 05
PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for piping systems.
   1. Sanitary sewer.
   2. Domestic water.
   3. Flanges, unions, and couplings.
   4. Pipe hangers and supports.
   5. Valves.

1.02 REFERENCE STANDARDS

C. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300.
D. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250.
E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
F. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
G. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.
H. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
I. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
J. ASME B31.1 - Power Piping.
K. ASME B31.2 - Fuel Gas Piping; The American Society of Mechanical Engineers.
L. ASME B31.9 - Building Services Piping.
N. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators.
V. ASTM B68/B68M - Standard Specification for Seamless Copper Tube, Bright Annealed.
W. ASTM B68M - Standard Specification for Seamless Copper Tube, Bright Annealed (Metric).
X. ASTM B75/B75M - Standard Specification for Seamless Copper Tube.
Y. ASTM B75M - Standard Specification for Seamless Copper Tube (Metric).
AA. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric).
AF. ASTM C14 - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe.
AG. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, Culvert Pipe and (Metric).
AP. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
BB. ASTM D2683 - Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
BF. ASTM D2855 - Standard Practice for the Two-Step (Primer & Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.
BG. ASTM D2996 - Standard Specification for Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
BH. ASTM D2997 - Standard Specification for Centrifugally Cast "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
BJ. ASTM D3262 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
BK. ASTM D3517 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe.
BL. ASTM D3754 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe.


BY. ASTM F1282 - Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe.

BZ. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

CA. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems.


CC. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

CD. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast.

CE. AWWA C651 - Disinfecting Water Mains.

CF. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In. (100 mm Through 300 mm), for Water Transmission and Distribution.

CG. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) Through 3 In. (76 mm), for Water Service.

CH. AWWA C950 - Fiberglass Pressure Pipe.


CL. MSS SP-67 - Butterfly Valves.

CM. MSS SP-69 - Pipe Hangers and Supports - Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc..

CN. MSS SP-70 - Cast Iron Gate Valves, Flanged and Threaded Ends.

CO. MSS SP-71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.

CP. MSS SP-78 - Cast Iron Plug Valves, Flanged and Threaded Ends.

CQ. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves.


CS. MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc..

CT. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.


CW. NSF 61 - Drinking Water System Components - Health Effects.

CX. NSF 372 - Drinking Water System Components - Lead Content.

1.03 SUBMITTALS

A. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
1.04 QUALITY ASSURANCE
A. Perform Work in accordance with local standards.
   1. Maintain one copy on project site.
B. Valves: Manufacturer's name and pressure rating marked on valve body.
C. Welding Materials and Procedures: Conform to ASME (BPV IX) and applicable state labor regulations.
D. Welder Qualifications: Certified in accordance with ASME (BPV IX).
E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

1.05 REGULATORY REQUIREMENTS
A. Perform Work in accordance with local plumbing code.
B. Conform to applicable code for installation of backflow prevention devices.
C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
B. Provide temporary protective coating on cast iron and steel valves.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.07 FIELD CONDITIONS
A. Do not install underground piping when bedding is wet or frozen.

1.08 EXTRA MATERIALS
A. Provide two repacking kits for each size valve.

PART 2 PRODUCTS
2.01 GENERAL REQUIREMENTS
A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING
A. Cast Iron Pipe: ASTM A74 service weight.
   1. Fittings: Cast iron.
   2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.
B. Cast Iron Pipe: CISPI 301, hubless.
   1. Fittings: Cast iron.
   2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.

2.03 SANITARY SEWER PIPING, ABOVE GRADE
A. Cast Iron Pipe: ASTM A74, service weight.
   1. Fittings: Cast iron.
   2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.
B. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.

C. PVC Pipe: ASTM D1785 Schedule 40, or ASTM D2241 SDR 26 for not less than 150 psi pressure rating.
   1. Fittings: ASTM D2466, PVC.

2.04 WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
      a. ProPress fittings 1/2-inch thru 4-inch for use with ASTM B88 copper tube type K, L, or M and 1/2-inch up to include 1-1/4-inch annealed copper tube. ProPress fittings shall have an EPDM sealing element and Smart Connect (SC) feature, 2-1/2-inch thru 4-inch shall have a 420 stainless steel grip ring, PBT separator ring, EPDM sealing element and Smart Connect (SC) feature.

2.05 BALL VALVES

A. Manufacturers:

B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze, two piece body, chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, solder ends with union.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

A. The entire building is to be drained of domestic water during a coordinated, off-hours shutdown and isolation valves installed for new branch piping.
B. Sanitary tie-ins are to occur during a coordinated, off-hours plumbing shutdown.
C. Install in accordance with manufacturer's instructions.
D. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
E. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
F. Install piping to maintain headroom, conserve space, and not interfere with use of space.
G. Group piping whenever practical at common elevations.
H. Establish elevations of buried piping outside the building to ensure not less than 3 ft of cover.
I. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.

J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

K. Provide support for utility meters in accordance with requirements of utility companies.

L. Install bell and spigot pipe with bell end upstream.

M. Install valves with stems upright or horizontal, not inverted.

N. Pipe vents from gas pressure reducing valves to outdoors and terminate in weather proof hood.

O. Install water piping to ASME B31.9.

P. Install fuel oil piping to ASME B31.9.

Q. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

R. Sleeve pipes passing through partitions, walls and floors.

S. In all kitchen/cooking areas, any piping that is run exposed along walls shall maintain at least a 1" gap to the walls to allow for cleaning per codes.

T. Inserts:
   1. Provide inserts for placement in concrete formwork.
   2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
   3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
   4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
   5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut flush with top of slab.

U. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Support horizontal piping as scheduled.
   3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   4. Place hangers within 12 inches of each horizontal elbow.
   5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
   8. Provide copper plated hangers and supports for copper piping.
   9. Support cast iron drainage piping at every joint.

V. Viega, ProPress Fittings:
   1. Viega, ProPress bronze, or copper fittings: Tube ends shall be cut on a right angle (square) to the tube. Tube ends shall be reamed and chamfered, all grease, oil or dirt shall be removed from the tube end with a clean rag. Visually examine the fitting sealing element to insure there is no damage, and it is properly seated into the fitting. Insert tube fully into the fitting. Make a mark with a felt tip pen on the tube wall at the face of the fitting. Always examine the tube to insure it is fully inserted into the fitting prior to pressing the joint. ProPress fittings 1/2-inch thru 4-inch shall be joined using Ridgid ProPress Tools. 2-1/2-inch thru 4-inch ProPress copper fittings shall utilize Ridgid ProPress XLC Rings. ProPress fittings shall be installed according to the most current edition of the Viega installation guidelines. Installers shall attend a Viega ProPress installation training class. Sealing elements shall be verified for the intended use.
2. Testing: After ProPress fittings have been installed a "step test" shall be followed. Pressurize the system with air, or dry nitrogen between 0.5 psi and 45 psi, or with water between 15 psi and 85 psi. Check the pressure gauge for pressure loss. If the system does not hold pressure, walk the system and check for un-pressed fittings. When you identify the un-pressed fitting/s insure the pipe is fully inserted into the fitting and press the fitting. After appropriate repairs have been made, retest the system per local code or specification requirements.

3.04 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.
B. Install unions downstream of valves and at equipment or apparatus connections.
C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
D. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
E. Install globe valves for throttling, bypass, or manual flow control services.
F. Provide lug end butterfly valves adjacent to equipment when provided to isolate equipment.
G. Provide spring loaded check valves on discharge of water pumps.
H. Provide plug valves in natural gas systems for shut-off service.
I. Provide flow controls in water recirculating systems where indicated.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, verify system is complete, flushed and clean.
B. Ensure Ph of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
C. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.
D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
E. Maintain disinfectant in system for 24 hours.
F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.06 SCHEDULES

A. Pipe Hanger Spacing:
   1. Metal Piping:
      a. Pipe size: 1/2 inches to 1-1/4 inches:
         1) Maximum hanger spacing: 6.5 ft.
         2) Hanger rod diameter: 3/8 inches.
      b. Pipe size: 1-1/2 inches to 2 inches:
         1) Maximum hanger spacing: 10 ft.
         2) Hanger rod diameter: 3/8 inch.
      c. Pipe size: 2-1/2 inches to 3 inches:
         1) Maximum hanger spacing: 10 ft.
         2) Hanger rod diameter: 1/2 inch.
      d. Pipe size: 4 inches to 6 inches:
         1) Maximum hanger spacing: 10 ft.
2) Hanger rod diameter: 5/8 inch.

e. Pipe size: 8 inches to 12 inches:
   1) Maximum hanger spacing: 14 ft.
   2) Hanger rod diameter: 7/8 inch.

f. Pipe size: 14 inches and Over:
   1) Maximum hanger spacing: 20 ft.
   2) Hanger rod diameter: 1 inch.

2. Plastic Piping:
   a. Pipe Size 1" to 6":
      1) Maximum hanger spacing: 6 ft.
      2) Hanger rod diameter: 3/8 inch.
   b. Pipe Size 8" and Over:
      1) Maximum hanger spacing: 6 ft.
      2) Hanger rod diameter: 7/8 inch.

END OF SECTION
SECTION 22 40 00
PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Sinks.
   B. Mop sinks.

1.02 REFERENCE STANDARDS
   A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
   B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures.
   C. ASME A112.6.1M - Supports for Off-the-Floor Plumbing Fixtures for Public Use.
   D. ASME A112.19.1M - Enameled Cast Iron Plumbing Fixtures; The American Society of Mechanical Engineers.
   E. ASME A112.19.2 - Ceramic Plumbing Fixtures.
   F. ASME A112.19.3 - Stainless Steel Plumbing Fixtures.

1.03 SUBMITTALS
   A. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
   B. Manufacturer's Instructions: Indicate installation methods and procedures.
   C. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
   D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 CLOSEOUT SUBMITTALS
   A. Operation and Maintenance Data: Submit fixture, trim, exploded view and replacement parts list.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Accept fixtures on site in factory packaging. Inspect for damage.
   B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.07 WARRANTY
   A. Provide five year manufacturer parts only warranty for all plumbing fixtures.

1.08 EXTRA MATERIALS
   A. Supply two (2) faucet rebuild kits per faucet supplied.

PART 2 PRODUCTS

2.01 SINKS
   A. See drawings
   B. Sink Manufacturers:
4. Substitutions:  See Section 01 60 00 - Product Requirements.

C. Single Compartment Bowl:  ASME A112.19.3; 25 by 21.25 by 6.5 inch outside dimensions 20 gage, 0.0359 inch thick, Type 302 stainless steel, self rimming and undercoated, with ledge back drilled for trim.
   1. Drain:  1-1/2 inch chromed brass drain.
   2. Drain:  3-1/2 inch crumb cup and tailpiece.

2.02 MOP SINKS

A. Terrazzo Mop Sink Manufacturers:
   4. Substitutions:  See Section 01 60 00 - Product Requirements.

B. Material:  Precast terrazzo composed of marble chips cast in Portland cement.

C. Type:  Rectilinear, standard height.

D. Tiling Flange Construction:  Galvanized steel.

E. Grid strainer:  Stainless steel; integral; removable.

F. Dimensions:  As indicated on drawings.

G. Accessories:
   1. 5 feet of 1/2 inch diameter plain end reinforced plastic hose.
   2. Hose clamp hanger.
   3. Mop hanger.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

B. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.02 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.

B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.

C. Install components level and plumb.

D. Seal fixtures to counter surface with clear sealant.

3.04 INTERFACE WITH WORK OF OTHER SECTIONS

A. Review millwork shop drawings.  Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.
3.06 CLEANING
   A. Clean plumbing fixtures and equipment.

3.07 PROTECTION
   A. Protect installed products from damage due to subsequent construction operations.
   B. Repair or replace damaged products before Date of Substantial Completion.
   C. Do not permit use of fixtures before final acceptance.

3.08 SCHEDULES
   A. See drawings.

END OF SECTION
SECTION 23 05 53
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Nameplates.
B. Tags.
C. Ceiling tacks.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer’s name and model number.
C. Product Data: Provide manufacturers catalog literature for each product required.
D. Samples: Submit two labels or tags 1/2 x 4 inch in size.
E. Manufacturer’s Installation Instructions: Indicate special procedures, and installation.
F. Project Record Documents: Record actual locations of tagged valves.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS
A. Fans: Nameplates.
B. Dampers: Ceiling tacks, where located above lay-in ceiling.
C. Instrumentation: Tags.
D. Piping: Tags.

2.02 MANUFACTURERS

2.03 NAMEPLATES
A. Description: Laminated three-layer plastic with engraved letters. Provide nameplates for new and existing equipment within the area of work.
2. Letter Height: 1/2 inch.

2.04 TAGS
A. Metal Tags: Aluminum with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.
B. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.05 CEILING TACKS
A. Description: Steel with 3/4 inch diameter color coded head.
B. Color code as follows: Coordinate with owner
1. Provide ceiling tacks for new and existing equipment in the area of work.
PART 3 EXECUTION

3.01 PREPARATION
A. Degrease and clean surfaces to receive adhesive for identification materials.
B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.02 INSTALLATION
A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
B. Install tags with corrosion resistant chain.
C. Apply stencil painting in accordance with Section 09 90 00.
D. Install plastic pipe markers in accordance with manufacturer's instructions.
E. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.
F. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.
G. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.
H. Identify control panels and major control components outside panels with plastic nameplates.
I. Identify thermostats relating to terminal boxes or valves with nameplates.
J. Identify valves in main and branch piping with tags.
K. Identify air terminal units and radiator valves with numbered tags.
L. Tag automatic controls, instruments, and relays. Key to control schematic.
M. Identify piping, concealed or exposed, with plastic pipe markers, plastic tape pipe markers or stencilled painting. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.
N. Identify ductwork with plastic nameplates or stencilled painting. Identify with air handling unit identification number and area served. Locate identification at air handling unit, at each side of penetration of structure or enclosure, and at each obstruction.
O. Locate ceiling tacks to locate valves, units, or dampers above lay-in panel ceilings. Locate in corner of panel closest to equipment.

END OF SECTION
SECTION 23 05 93
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Testing, adjustment, and balancing of air systems.
B. Measurement of final operating condition of HVAC systems.

1.02 REFERENCE STANDARDS
A. AABC MN-1 - AABC National Standards for Total System Balance; Associated Air Balance Council.
C. NEBB (TAB) - Procedural Standards for Testing Adjusting and Balancing of Environmental Systems.
D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing.

1.03 SUBMITTALS
A. Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.
B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
   1. Submit to Architect.
   2. Submit to the Commissioning Authority, Construction Manager, and HVAC controls contractor.
   3. Submit six weeks prior to starting the testing, adjusting, and balancing work.
   4. Include certification that the plan developer has reviewed the contract documents, the equipment and systems, and the control system with the Architect and other installers to sufficiently understand the design intent for each system.
   5. Include at least the following in the plan:
      a. Preface: An explanation of the intended use of the control system.
      b. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
      c. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
      d. Identification and types of measurement instruments to be used and their most recent calibration date.
      e. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
      f. Final test report forms to be used.
      g. Detailed step-by-step procedures for TAB work for each system and issue, including:
         1) Terminal flow calibration (for each terminal type).
         2) Diffuser proportioning.
         3) Branch/submain proportioning.
         4) Total flow calculations.
         5) Rechecking.
         6) Diversity issues.
      h. Expected problems and solutions, etc.
      i. Criteria for using air flow straighteners or relocating flow stations and sensors.
j. Details of how TOTAL flow will be determined; for example:
   1) Air: Sum of terminal flows via control system calibrated readings or via hood
      readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA
      flow stations.

k. Specific procedures that will ensure that both air and water side are operating at the
   lowest possible pressures and methods to verify this.

l. Confirmation of understanding of the outside air ventilation criteria under all
   conditions.

m. Method of verifying and setting minimum outside air flow rate will be verified and set
   and for what level (total building, zone, etc.).

n. Method of checking building static and exhaust fan and/or relief damper capacity.

o. Proposed selection points for sound measurements and sound measurement
   methods.

p. Methods for making coil or other system plant capacity measurements, if specified.

q. Time schedule for TAB work to be done in phases (by floor, etc.).

r. Description of TAB work for areas to be built out later, if any.

s. Time schedule for deferred or seasonal TAB work, if specified.

t. False loading of systems to complete TAB work, if specified.

u. Exhaust fan balancing and capacity verifications, including any required room
   pressure differentials.

v. Interstitial cavity differential pressure measurements and calculations, if specified.

w. Procedures for field technician logs of discrepancies, deficient or uncompleted work
   by others, contract interpretation requests and lists of completed tests (scope and
   frequency).

x. Procedures for formal progress reports, including scope and frequency.

y. Procedures for formal deficiency reports, including scope, frequency and distribution.

C. Field Logs: Submit at least once a week to Commissioning Authority and Construction
   Manager.

D. Control System Coordination Reports: Communicate in writing to the controls installer all
   setpoint and parameter changes made or problems and discrepancies identified during TAB
   that affect, or could affect, the control system setup and operation.

E. Progress Reports.

F. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and
   balancing of systems and equipment to achieve specified performance.
   1. Submit to the Commissioning Authority, Construction Manager, and HVAC controls
      contractor within two weeks after completion of testing, adjusting, and balancing.
   2. Revise TAB plan to reflect actual procedures and submit as part of final report.
   3. Submit draft copies of report for review prior to final acceptance of Project. Provide final
      copies for Architect and for inclusion in operating and maintenance manuals.
   4. Provide reports in soft cover, letter size, 3-ring binder manuals, complete with index page
      and indexing tabs, with cover identification at front and side. Include set of reduced
      drawings with air outlets and equipment identified to correspond with data sheets, and
      indicating thermostat locations.
   5. Include actual instrument list, with manufacturer name, serial number, and date of
      calibration.
   6. Form of Test Reports: Where the TAB standard being followed recommends a report
      format use that; otherwise, follow ASHRAE Std 111.
   7. Units of Measure: Report data in I-P (inch-pound) units only.
   8. Include the following on the title page of each report:
      a. Name of Testing, Adjusting, and Balancing Agency.
      b. Address of Testing, Adjusting, and Balancing Agency.
c. Telephone number of Testing, Adjusting, and Balancing Agency.
d. Project name.
e. Project location.
f. Project Architect.
g. Project Engineer.
h. Project Contractor.
i. Project altitude.
j. Report date.

G. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

PART 3 EXECUTION

2.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:
   1. AABC MN-1, AABC National Standards for Total System Balance.
   5. Maintain at least one copy of the standard to be used at project site at all times.

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

D. TAB Agency Qualifications:
   1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
   2. Having minimum of three years documented experience.
   3. Certified by one of the following:
      b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.

E. TAB Supervisor Qualifications: Certified by same organization as TAB agency.

F. TAB Supervisor Qualifications: Professional Engineer licensed in the State in which the Project is located.

2.02 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.
   7. Fire and volume dampers are in place and open.
8. Air coil fins are cleaned and combed.
9. Access doors are closed and duct end caps are in place.
10. Air outlets are installed and connected.
11. Duct system leakage is minimized.
12. Hydronic systems are flushed, filled, and vented.
13. Pumps are rotating correctly.
14. Proper strainer baskets are clean and in place.
15. Service and balance valves are open.

B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.
C. Beginning of work means acceptance of existing conditions.

2.03 PREPARATION
A. Hold a pre-balancing meeting at least one week prior to starting TAB work.
   1. Require attendance by all installers whose work will be tested, adjusted, or balanced.
B. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect to facilitate spot checks during testing.
C. Provide additional balancing devices as required.

2.04 ADJUSTMENT TOLERANCES
A. Air Handling Systems: Adjust to within plus or minus 10 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 10 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

2.05 RECORDING AND ADJUSTING
A. Field Logs: Maintain written logs including:
   1. Running log of events and issues.
   2. Discrepancies, deficient or uncompleted work by others.
   4. Lists of completed tests.
B. Ensure recorded data represents actual measured or observed conditions.
C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
D. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
G. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.
H. Check and adjust systems approximately six months after final acceptance and submit report.

2.06 AIR SYSTEM PROCEDURE
A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities.
B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
C. Measure air quantities at air inlets and outlets.
D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
F. Vary total system air quantities by adjustment of fan speeds. Provide drive and sheave changes required. Vary branch air quantities by damper regulation.
G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.
H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.
M. Check multi-zone units for motorized damper leakage. Adjust air quantities with mixing dampers set first for cooling, then heating, then modulating.
N. For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.
O. On fan powered VAV boxes, adjust air flow switches for proper operation.
P. For laboratories, lab classrooms, and prep rooms, offset CFM values (differential between exhaust/return and supply airflows) shall be required to maintain a plus 10% minus 5% offset.

2.07 SCOPE
A. Test, adjust, and balance the following:
   1. Fans.
   2. Air Inlets and Outlets

2.08 MINIMUM DATA TO BE REPORTED
A. Electric Motors:
   1. Manufacturer
   2. Model/Frame
   3. HP/BHP
   4. Phase, voltage, amperage; nameplate, actual, no load
   5. RPM
   6. Service factor
   7. Starter size, rating, heater elements
   8. Sheave Make/Size/Bore
B. V-Belt Drives:
1. Identification/location
2. Required driven RPM
3. Driven sheave, diameter and RPM
4. Belt, size and quantity
5. Motor sheave diameter and RPM
6. Center to center distance, maximum, minimum, and actual

C. Air Moving Equipment:
1. Location
2. Manufacturer
3. Model number
4. Serial number
5. Arrangement/Class/Discharge
6. Air flow, specified and actual
7. Return air flow, specified and actual
8. Outside air flow, specified and actual
9. Total static pressure (total external), specified and actual
10. Inlet pressure
11. Discharge pressure
12. Sheave Make/Size/Bore
13. Number of Belts/Make/Size
14. Fan RPM

D. Return Air/Outside Air:
1. Identification/location
2. Design air flow
3. Actual air flow
4. Design return air flow
5. Actual return air flow
6. Design outside air flow
7. Actual outside air flow
8. Return air temperature
9. Outside air temperature
10. Required mixed air temperature
11. Actual mixed air temperature
12. Design outside/return air ratio
13. Actual outside/return air ratio

E. Exhaust Fans:
1. Location
2. Manufacturer
3. Model number
4. Serial number
5. Air flow, specified and actual
6. Total static pressure (total external), specified and actual
7. Inlet pressure
8. Discharge pressure
9. Sheave Make/Size/Bore
10. Number of Belts/Make/Size
11. Fan RPM
12. Associated with Fume Hoods, Include:
   a. Face velocity test at max/min sash position.

F. Duct Traverses:
1. System zone/branch
2. Duct size
3. Area
4. Design velocity
5. Design air flow
6. Test velocity
7. Test air flow
8. Duct static pressure
9. Air temperature
10. Air correction factor

G. Air Distribution Tests:
1. Air terminal number
2. Room number/location
3. Terminal type
4. Terminal size
5. Area factor
6. Design velocity
7. Design air flow
8. Test (final) velocity
9. Test (final) air flow
10. Percent of design air flow

END OF SECTION
SECTION 23 07 13
DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Duct insulation.

1.02 REFERENCE STANDARDS
K. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.

1.03 SUBMITTALS
A. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
B. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

1.04 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.
B. Applicator Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of experience and approved by manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.06 FIELD CONDITIONS
A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
B. Maintain temperature during and after installation for minimum period of 24 hours.
PART 2 PRODUCTS

2.01 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, NFPA 255, or UL 723.

2.02 GLASS FIBER, FLEXIBLE

A. Manufacturer:

B. Insulation: ASTM C553; flexible, noncombustible blanket.
   1. Minimum "R" Value: Minimum R value of (6) is required for interior installations and a minimum R value of (8) is required for exterior installations.
   2. Maximum Service Temperature: 450 degrees F.
   3. Maximum Water Vapor Sorption: 5.0 percent by weight.

C. Vapor Barrier Jacket:
   1. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
   2. Secure with pressure sensitive tape.

D. Vapor Barrier Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

E. Outdoor Vapor Barrier Mastic:
   1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

F. Tie Wire: Annealed steel, 16 gage.

2.03 GLASS FIBER, RIGID

A. Manufacturer:

B. Insulation: ASTM C612; rigid, noncombustible blanket.
   1. Minimum "R" Value: Minimum R value of (6) is required for interior installations and a minimum R value of (8) is required for exterior installations.
   2. Maximum service temperature: 450 degrees F.
   3. Maximum Water Vapor Sorption: 5.0 percent.

C. Vapor Barrier Jacket:
   1. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
   2. Secure with pressure sensitive tape.

D. Vapor Barrier Tape:
   1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

E. Indoor Vapor Barrier Finish:
   2. Vinyl emulsion type acrylic, compatible with insulation, black color.
PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that ducts have been tested before applying insulation materials.
B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install in accordance with NAIMA National Insulation Standards.
C. Insulated ducts conveying air below ambient temperature:
   1. Provide insulation with vapor barrier jackets.
   2. Finish with tape and vapor barrier jacket.
   3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
   4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
D. Insulated ducts conveying air above ambient temperature:
   1. Provide with or without standard vapor barrier jacket.
   2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
E. Ducts Exposed in Mechanical Equipment Rooms or Finished Spaces: Finish with aluminum jacket.
F. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with with calked aluminum jacket with seams located on bottom side of horizontal duct section.
G. External Duct Insulation Application:
   1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
   2. Secure insulation without vapor barrier with staples, tape, or wires.
   3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
   4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
   5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

3.03 SCHEDULES

A. INDOOR DUCT AND PLENUM APPLICATION SCHEDULE
   1. NOTE: Apply duct lagging where indicated on drawings.
   2. Service: Round, supply-air ducts, concealed.
      b. Thickness: 2 inches.
      d. Jacket: Foil and paper.
      e. Vapor Retarder Required: Yes.
      b. Thickness: 2 inches.
      d. Jacket: Foil and paper.
      e. Vapor Retarder Required: No.
   4. Service: Rectangular, supply-air ducts, concealed.
      a. Material: Mineral-fiber blanket
b. Thickness: 2 inches.
d. Jacket: Foil and paper.
e. Vapor Retarder Required: Yes.

5. Service: Rectangular, return-air ducts, concealed.
   a. Material: Mineral-fiber blanket
   b. Thickness: 2 inches.
   d. Jacket: Foil and paper.
   e. Vapor Retarder Required: No.

END OF SECTION
SECTION 23 31 00
HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Metal ductwork.
B. Duct cleaning.

1.02 REFERENCE STANDARDS
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
I. ASTM C14M - Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, Culvert Pipe and (Metric).
O. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; Sheet Metal and Air Conditioning Contractors’ National Association.
P. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.
Q. SMACNA (FGD) - Fibrous Glass Duct Construction Standards.
R. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors.
1.03 PERFORMANCE REQUIREMENTS
   A. No variation of duct configuration or sizes permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.04 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data for duct materials and duct connections.
   C. Shop Drawings: Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work for all systems.
   D. MANDATORY Test Reports: Pressure test all ductwork. Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual.
      1. Utilize standard equation CL=FP^0.65 where F= Measured leakage rate in CFM per 100 square feet of duct surface, and P = Static Pressure of the test. Leakage rate shall not exceed 4.0 in that equation.
   E. Manufacturer's Certificate: Certify that installation of glass fiber ductwork meet or exceed recommended fabrication and installation requirements.
   F. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
   B. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum five years of documented experience.

1.06 REGULATORY REQUIREMENTS
   A. Construct ductwork to NFPA 90A, NFPA 90B, and NFPA 96 standards.

1.07 FIELD CONDITIONS
   A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
   B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS
2.01 DUCT ASSEMBLIES
2.02 MATERIALS
   A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G90/Z275 coating.
   C. Stainless Steel for Ducts: ASTM A 240/A 240M, Type 304.
   D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
   E. Flexible Ducts:
      1. Two ply vinyl film supported by helically wound spring steel wire.
         a. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
         b. Maximum Velocity: 4000 fpm.
c. Temperature Range: -10 degrees F to 160 degrees F.

F. Insulated Flexible Ducts:
   1. Two ply vinyl film supported by helically wound spring steel wire; fiberglass insulation; polyethylene vapor barrier film.
      a. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
      b. Maximum Velocity: 4000 fpm.
      c. Temperature Range: -10 degrees F to 160 degrees F.

G. All Ducts: Galvanized steel, unless otherwise indicated.

H. Low Pressure Supply (Heating Systems): 1 inch w.g. pressure class, galvanized steel.

I. Low Pressure Supply (System with Cooling Coils): 1 inch w.g. pressure class, galvanized steel.

J. Medium and High Pressure Supply (All VAV Primary Supply Duct between AHU and VAV Terminal Unit): 2 inch w.g. pressure class, galvanized steel.

K. Return and Relief: 1 inch w.g. pressure class, galvanized steel.

L. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
   1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
   2. VOC Content: Not more than 250 g/L, excluding water.

### 2.03 DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards and as indicated.

B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide turning vanes.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

E. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA HVAC Duct Construction Standards.

F. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Joints shall be minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.

G. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

H. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

### 2.04 MANUFACTURED DUCTWORK AND FITTINGS

A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

B. Transverse Duct Connection System: SMACNA "J" rated rigidly class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips.
PART 3 EXECUTION

3.01 INSTALLATION

A. Install, support, and seal ducts in accordance with SMACNA HVAC Duct Construction Standards.
B. Install in accordance with manufacturer's instructions.
C. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
D. Install and seal metal and flexible ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
E. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
F. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
G. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
H. Use double nuts and lock washers on threaded rod supports.
I. Tape joints of PVC coated metal ductwork with PVC tape.
J. Connect terminal units to supply ducts with one foot maximum length of flexible duct. Do not use flexible duct to change direction.
K. Connect diffusers or light troffer boots to low pressure ducts with 5 feet maximum length of flexible duct held in place with strap or clamp.
L. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws.
M. Set plenum doors 6 to 12 inches above floor. Arrange door swings so that fan static pressure holds door in closed position.
N. Use stainless steel for ductwork exposed to view and stainless steel or carbon steel for ducts where concealed.
O. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
P. At exterior wall louvers, seal duct to louver frame and install blank-out panels as required.

3.02 CLEANING AND TESTING

A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.
B. Clean supply, return, and exhaust systems.
C. Conduct required duct-leakage testing as defined within this specification and otherwise noted in the contract documents.

3.03 SCHEDULES

A. Ductwork Material:
   2. Low Pressure Supply (System with Cooling Coils): Steel, Aluminum.
   4. Return and Relief: Steel, Aluminum.
   5. General Exhaust: Steel, Aluminum.
B. Ductwork Pressure Class:
1. Supply (Heating Systems): 2 inch
2. Supply (System with Cooling Coils): 2 inch.
3. Return and Relief: 2 inch.
4. General Exhaust: 1 inch.

END OF SECTION
SECTION 23 33 00
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Air turning devices/extractors.
B. Backdraft dampers.
C. Combination fire and smoke dampers.
D. Fire dampers.
E. Flexible duct connections.
F. Smoke dampers.
G. Volume control dampers.

1.02 RELATED REQUIREMENTS
A. Section 23 31 00 - HVAC Ducts and Casings.
B. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS
D. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.
E. UL 33 - Safety Heat Responsive Links for Fire-Protection Service.
F. UL 555 - Standard for Fire Dampers.
G. UL 555S - Standard for Smoke Dampers.

1.04 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide for shop fabricated assemblies including volume control dampers, duct access doors, duct test holes, and hardware used. Include electrical characteristics and connection requirements.
C. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers, duct access doors, and duct test holes.
D. Manufacturer's Installation Instructions: Provide instructions for fire dampers and combination fire and smoke dampers.

1.05 PROJECT RECORD DOCUMENTS
A. Record actual locations of access doors and test holes.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.
B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Protect dampers from damage to operating linkages and blades.
1.08 EXTRA MATERIALS
   A. See Section 01 6000 - Product Requirements, for additional provisions.
   B. Provide two of each size and type of fusible link.

PART 2 PRODUCTS

2.01 AIR TURNING DEVICES/EXTRACTORS
   A. Manufacturers:
      4. Substitutions: See Section 01 60 00 - Product Requirements.
   B. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.

2.02 BACKDRAFT DAMPERS
   A. Manufacturers:
      4. Substitutions: See Section 01 60 00 - Product Requirements.
   B. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: Galvanized steel, with center pivoted blades of maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.03 COMBINATION FIRE AND SMOKE DAMPERS
   A. Manufacturers:
      4. Substitutions: See Section 01 60 00 - Product Requirements.
   B. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.
   C. Provide factory sleeve and collar for each damper.
   D. Multiple Blade Dampers: Fabricate with 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.
   E. Operators: UL listed and labelled spring return electric type suitable for 120 volts, single phase, 60 Hz. Provide end switches to indicate damper position. Locate damper operator on interior of duct and link to damper operating shaft.
   F. Normally Closed Smoke Responsive Fire Dampers: Curtain type, opening by gravity upon actuation of electro thermal link, flexible stainless steel blade edge seals to provide constant sealing pressure.
   G. Normally Open Smoke Responsive Fire Dampers: Curtain type, closing upon actuation of electro thermal link, flexible stainless steel blade edge seals to provide constant sealing pressure, stainless steel springs with locking devices to ensure positive closure for units mounted horizontally.
   H. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.
2.04 DUCT ACCESS DOORS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards and as indicated.

C. Fabrication: Rigid and close-fitting of galvanized steel with sealing gaskets and quick-fastening locking devices. For insulated ducts, install minimum 1 inch thick insulation with sheet metal cover.
   1. Less Than 12 inches Square: Secure with sash locks.
   2. Up to 18 inches Square: Provide two hinges and two sash locks.
   3. Up to 24 x 48 inches: Three hinges and two compression latches with outside and inside handles.
   4. Larger Sizes: Provide an additional hinge.

D. Access doors with sheet metal screw fasteners are not acceptable.

2.05 DUCT TEST HOLES

A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.06 FIRE DAMPERS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

C. Ceiling Dampers: Galvanized steel, 22 gage frame and 16 gage flap, two layers 0.125 inch ceramic fiber on top side and one layer on bottom side for round flaps, with locking clip.

D. Horizontal Dampers: Galvanized steel, 22 gage frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.

E. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations or closure under air flow conditions. Configure with blades out of air stream except for 1.0 inch pressure class ducts up to 12 inches in height.

F. Multiple Blade Dampers: 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.

G. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.07 FLEXIBLE DUCT CONNECTIONS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards and as indicated.

B. Flexible Duct Connections: Fabric crimped into metal edging strip.
   1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd.
2. Metal: 3 inches wide, 24 gage thick galvanized steel.

C. Leaded Vinyl Sheet: Minimum 0.55 inch thick, 0.87 lbs per sq ft, 10 dB attenuation in 10 to 10,000 Hz range.

2.08 SMOKE DAMPERS
A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Fabricate in accordance with NFPA 90A and UL 555S, and as indicated.
C. Dampers: UL Class 1 multiple blade type fire damper, normally closed automatically operated by electric actuator, 120 volts, single phase; UL listed and labeled.

2.09 VOLUME CONTROL DAMPERS
A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Fabricate in accordance with SMACNA HVAC Duct Construction Standards and as indicated.
C. Splitter Dampers:
   1. Material: Same gage as duct to 24 inches size in either direction, and two gages heavier for sizes over 24 inches.
   2. Blade: Fabricate of double thickness sheet metal to streamline shape, secured with continuous hinge or rod.
D. Single Blade Dampers: Fabricate for duct sizes up to 6 x 30 inch.
E. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
F. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
G. Quadrants:
   1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
   2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

PART 3 EXECUTION
3.01 PREPARATION
A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION
A. Install accessories in accordance with manufacturer’s instructions, NFPA 90A, and follow SMACNA HVAC Duct Construction Standards. Refer to Section 23 31 00 for duct construction and pressure class.
B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide for cleaning kitchen exhaust ducts in accordance with NFPA 96. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated. Provide 4 x 4 inch for balancing dampers only. Review locations prior to fabrication.

D. Provide duct test holes where indicated and required for testing and balancing purposes.

E. Provide fire dampers, combination fire and smoke dampers, and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

F. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92. 1. Smoke dampers shall be integrated into the "smoke purge control system". Dampers in the return ductwork shall be overridden to the open position when the smoke purge is activated.

G. Demonstrate re-setting of fire dampers to Owner’s representative.

H. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.

I. For fans developing static pressures of 5.0 inches and over, cover flexible connections with leaded vinyl sheet, held in place with metal straps.

J. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.

K. Use splitter dampers only where indicated.

L. Provide balancing dampers on high velocity systems where indicated. Refer to Section 23 36 00 - Air Terminal Units.

M. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION
SECTION 23 34 23
HVAC POWER VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Utility vent set.

1.02 RELATED REQUIREMENTS
   A. Section 23 05 13 - Common Motor Requirements for HVAC Equipment.
   B. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping Equipment.
   C. Section 23 33 00 - Air Duct Accessories: Backdraft dampers.
   D. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS
   B. AMCA 204 - Balance Quality and Vibration Levels for Fans.
   D. AMCA (DIR) - [Directory of] Products Licensed Under AMCA International Certified Ratings Program; Air Movement and Control Association International, Inc..
   E. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
   F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data.
   G. NEMA MG 1 - Motors and Generators.
   I. UL 705 - Power Ventilators.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.
   C. Manufacturer's Instructions: Indicate installation instructions.
   D. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum 5 years of documented experience.
   B. Kitchen Range Hood Exhaust Fans: Comply with requirements of NFPA 96.
   C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 FIELD CONDITIONS
   A. Permanent ventilators may be used for ventilation during construction only after ductwork is clean, filters are in place, bearings have been lubricated, and fan has been test run under observation.
1.07 EXTRA MATERIALS
A. See Section 01 6000 - Product Requirements, for additional provisions.
B. Supply two sets of belts for each fan.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Greenheck: www.greenheck.com/#sle.
B. Loren Cook Company: www.lorencook.com/#sle.
C. PennBarry: www.pennbarry.com/#sle.
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 POWER VENTILATORS - GENERAL
A. Static and Dynamically Balanced: AMCA 204 - Balance Quality and Vibration Levels for Fans.
B. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
C. Sound Ratings: AMCA 301, tested to AMCA 300, and bearing AMCA Certified Sound Rating Seal.
D. Fabrication: Conform to AMCA 99.
E. Electrical Components: Conform and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.03 UTILITY VENT SET
A. Belt Drive Fan:
1. Fan Wheel:
   a. Type: Non-overloading, backward inclined centrifugal.
   b. Material: Aluminum with non-stick coating.
2. Statically and dynamically balanced.
3. Motors:
   a. Open drip-proof (ODP).
   b. Heavy duty ball bearing type.
   c. Mount on vibration isolators or resilient cradle mounts, out of air stream.
   d. Fully accessible for maintenance.
4. Housing:
   a. Construct of heavy gage aluminum including curb cap, windband, and motor compartment.
   b. Rigid internal support structure.
   c. One-piece fabricated or fully welded curb-cap base to windband for leak proof construction.
   d. Construct drive frame assembly of heavy gage steel, mounted on vibration isolators.
   e. Provide breather tube for fresh air motor cooling and wiring.
B. Shafts and Bearings:
1. Fan Shaft:
   a. Ground and polished steel with anti-corrosive coating.
   b. First critical speed at least 25 percent over maximum cataloged operating speed.
2. Bearings:
   a. Permanently sealed or pillow block type.
   b. Minimum L10 life in excess of 100,000 hours (equivalent to L50 average life of 500,000 hours), at maximum cataloged operating speed.
   c. 100 percent factory tested.
C. Drive Assembly:
   1. Belts, pulleys, and keys oversized for a minimum of 150 percent of driven horsepower.
   2. Belts: Static free and oil resistant.
   3. Fully machined cast iron type, keyed and securely attached to the wheel and motor shafts.
   4. Motor pulley adjustable for final system balancing.
   5. Readily accessible for maintenance.

D. Disconnect Switches:
   1. Factory mounted and wired.
   2. Finish for Painted Steel Enclosures: Provide manufacturer's standard or factory applied gray unless otherwise indicated.
   3. Positive electrical shutoff.
   4. Wired from fan motor to junction box installed within motor compartment.

E. Drain Trough: Allows for single-point drainage of water, grease, and other residues.

F. Options/Accessories:
   1. Automatic Belt Tensioner: Automatic device that adjusts for correct belt tension for single drives.
   2. Clean Out Port: Removable grease repellent compression rubber plug allows access for cleaning wheel through windband.
   3. Dampers: Provide motorized type with transformer, wire whip and j-box to open damper upon fan activation.
   5. Tie-down Points: Four brackets located on windband secures fan in heavy wind applications.
   6. External motor speed controllers for field mounting.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Secure roof or wall exhausters with aluminum lag screws to roof curb or structure.
C. Extend ducts to roof or wall exhausters into roof curb or structure. Counterflash duct to roof or wall opening.
D. Hung Cabinet Fans:
   1. Install fans with resilient mountings and flexible electrical leads.
   2. Install fans with resilient mountings and flexible electrical leads. Refer to Section 23 05 48.
   3. Install flexible connections specified in Section 23 33 00 between fan and ductwork.
   Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
E. Provide sheaves required for final air balance.
F. Install backdraft dampers on inlet to roof and wall exhausters.
G. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

END OF SECTION
SECTION 23 37 00
AIR OUTLETS AND INLETS

PART 1  GENERAL

1.01  SECTION INCLUDES
A.  Diffusers.
   1.  Perforated ceiling diffusers.
B.  Rectangular ceiling diffusers.
C.  Slot ceiling diffusers.
D.  Registers/grilles.
   1.  Ceiling-mounted, exhaust and return register/grilles.
   2.  Ceiling-mounted, supply register/grilles.
   3.  Wall-mounted, supply register/grilles.

1.02  RELATED REQUIREMENTS
A.  Section 09 90 00 - Paints and Coatings: Painting of ducts visible behind outlets and inlets.

1.03  REFERENCE STANDARDS
A.  AMCA 500-L - Laboratory Methods of Testing Louvers for Rating.
B.  ARI 890 - Standard for Air Diffusers and Air Diffuser Assemblies; Air-Conditioning and Refrigeration Institute.
C.  ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Inlets.
D.  SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible.

1.04  SUBMITTALS
A.  See Section 01 30 00 - Administrative Requirements for submittal procedures.
B.  Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
C.  Samples: Submit one of each required air outlet and inlet type.
D.  Project Record Documents: Record actual locations of air outlets and inlets.

1.05  QUALITY ASSURANCE
A.  Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.
B.  Test and rate louver performance in accordance with AMCA 500-L.

1.06  QUALITY ASSURANCE
A.  Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum five years of documented experience.

1.07  MOCK-UP
A.  Provide mock-up of typical exterior or exterior ceiling module with supply and return air outlets.
B.  Locate where directed.
C.  Mock-up may remain as part of the Work.

PART 2  PRODUCTS

2.01  MANUFACTURERS
F. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 RECTANGULAR CEILING DIFFUSERS
A. Type: Square, stamped, multi-core diffuser to discharge air in 360 degree, one way, two way, three way or four way pattern as shown on drawings and with sectorizing baffles where indicated.
B. Frame: Surface mount or inverted T-bar as indicated on drawings. In plaster ceilings, provide plaster frame and ceiling frame.
C. Fabrication: Aluminum with baked enamel off-white finish.
D. Accessories: Radial opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face.

2.03 PERFORATED FACE CEILING DIFFUSERS
A. Type: Perforated face with fully adjustable pattern and removable face.
B. Frame: Surface mount or Inverted T-bar as indicated on drawings. In plaster ceilings, provide plaster frame and ceiling frame.
C. Fabrication: Aluminum with baked enamel off-white finish.
D. Accessories: Radial opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face.

2.04 CEILING SLOT DIFFUSERS
A. Fabrication: Aluminum extrusions with factory clear lacquer finish.
B. Color: To be selected by Architect from manufacturer's standard range.
C. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket, mitered end border.

2.05 CEILING SUPPLY REGISTERS/GRILLES
A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, two-way deflection.
B. Frame: 1 inch margin with countersunk screw mounting and gasket.
C. Fabrication: Aluminum extrusions with factory off-white enamel or prime coat finish as indicated on drawings or selected by architect.
D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.06 CEILING EXHAUST AND RETURN REGISTERS/GRILLES
A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, horizontal face.
B. Frame: 1 inch margin with countersunk screw mounting.
C. Fabrication: Aluminum extrusions, with factory off-white enamel, baked enamel, or prime coated finish as indicated on drawings or selected by architect.
D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.
E. Gymnasiums: Provide front pivoted or welded in place blades, securely fastened to be immobile.
2.07 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

A. Type: Fixed grilles of 1/2 x 1/2 x 1/2 inch louvers.
B. Fabrication: Acrylic plastic with off-white finish.
C. Frame: Channel lay-in frame for suspended grid ceilings.
D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.08 WALL SUPPLY REGISTERS/GRILLES

A. Type: Streamlined and individually adjustable blades, 3/4 inch minimum depth, 3/4 inch maximum spacing with spring or other device to set blades, horizontal face, single deflection.
B. Frame: 1 inch margin with countersunk screw mounting and gasket.
C. Fabrication: Aluminum extrusions, with factory baked enamel, or clear lacquer finish as indicated on drawings or selected by architect.
D. Damper: See drawings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
C. Install diffusers to ductwork with air tight connection.
D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.
E. Insulate top of pan as specified for supply ducts on all ceiling diffusers.
F. Paint ductwork visible behind air outlets and inlets matte black. Refer to Section 09 90 00.

3.02 AIR OUTLET AND INLET SCHEDULE

A. See Drawings
SECTION 26 05 01
MINOR ELECTRICAL DEMOLITION

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Electrical demolition.

1.02 RELATED REQUIREMENTS
   A. Section 01 70 00 - Execution and Closeout Requirements: Additional requirements for alterations work.

1.03 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS
2.01 MATERIALS AND EQUIPMENT
   A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify field measurements and circuiting arrangements are as shown on Drawings.
   B. Verify that abandoned wiring and equipment serve only abandoned facilities.
   C. Demolition drawings are based on casual field observation and existing record documents.
   D. Report discrepancies to Owner before disturbing existing installation.
   E. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION
   A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
   B. Coordinate utility service outages with utility company.
   C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
   D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
      1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
      2. Make temporary connections to maintain service in areas adjacent to work area.
   E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Minimize outage duration.
      1. Notify Owner before partially or completely disabling system.
      2. Notify local fire service.
      3. Make notifications at least 24 hours in advance.
      4. Make temporary connections to maintain service in areas adjacent to work area.
   F. Existing Telephone System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
      1. Notify Owner at least 24 hours before partially or completely disabling system.
      2. Notify telephone utility company at least 24 hours before partially or completely disabling system.
3. Make temporary connections to maintain service in areas adjacent to work area.

### 3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

I. Repair adjacent construction and finishes damaged during demolition and extension work.

J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

### 3.04 CLEANING AND REPAIR

A. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

B. Clean and repair existing materials and equipment that remain or that are to be reused.

C. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

D. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts and broken electrical parts.

**END OF SECTION**
SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1  GENERAL

1.01 SECTION INCLUDES
A. Single conductor building wire.
B. Metal-clad cable.
C. Wiring connectors.
D. Electrical tape.
E. Wire pulling lubricant.
F. Cable ties.

1.02 RELATED REQUIREMENTS
A. Section 07 84 00 - Firestopping.
B. Section 26 05 01 - Minor Electrical Demolition: Disconnection, removal, and/or extension of existing electrical conductors and cables.
C. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire.
F. NECA 1 - Standard for Good Workmanship in Electrical Construction.
G. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC).
J. NFPA 70 - National Electrical Code.
K. UL 44 - Thermoset-Insulated Wires and Cables.
L. UL 83 - Thermoplastic-Insulated Wires and Cables.
M. UL 486A-486B - Wire Connectors.
N. UL 486C - Splicing Wire Connectors.
O. UL 486D - Sealed Wire Connector Systems.
P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape.
Q. UL 1569 - Metal-Clad Cables.
1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

C. Manufactured Wiring System Shop Drawings: Provide plan views indicating proposed system layout with components identified; indicate branch circuit connections.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
C. Metal-clad cable is permitted only as follows:
   1. Where not otherwise restricted, may be used:
      a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
         1) Maximum Length: 6 feet.
      b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
         1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Provide new conductors and cables manufactured not more than one year prior to installation.
D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
E. Comply with NEMA WC 70.
F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
H. Conductors and Cables Installed Where Exposed to Direct Rays of Sun: Listed and labeled as sunlight resistant.
I. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
J. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.
K. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
         2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
         3) 20 A, 277 V circuits longer than 150 feet: 10 AWG, for voltage drop.
   2. Control Circuits: 14 AWG.
L. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
M. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
2) Phase B: Orange.
3) Phase C: Yellow.
4) Neutral/Grounded: Gray.

b. 208Y/120 V, 3 Phase, 4 Wire System:
   1) Phase A: Black.
   2) Phase B: Red.
   3) Phase C: Blue.
   4) Neutral/Grounded: White.

c. Equipment Ground, All Systems: Green.

d. For control circuits, comply with manufacturer's recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
   1. Copper Building Wire:
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:
   1. Feeders and Branch Circuits:
      b. Size 8 AWG and Larger: Stranded.
   2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
      a. Size 4 AWG and Larger: Type XHHW-2.

2.04 METAL-CLAD CABLE

A. Manufacturers:
   1. AFC Cable Systems Inc: www.afcweb.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

C. Conductor Stranding:
   2. Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

F. Provide dedicated neutral conductor for each phase conductor where indicated or required.

G. Grounding: Full-size integral equipment grounding conductor.

H. Armor: Steel, interlocked tape.

I. Provide PVC jacket applied over cable armor where indicated or required for environment of installed location.
2.05 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.

C. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Wiring Connectors for Terminations:
   1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
   2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
   3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
   4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
   5. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
   6. Conductors for Control Circuits: Use crimped terminals for all connections.

E. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      c. NSI Industries LLC: www.nsiindustries.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

F. Mechanical Connectors: Provide bolted type or set-screw type.
   1. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.

G. Compression Connectors: Provide circumferential type or hex type crimp configuration.
   1. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.

H. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
   1. Manufacturers:
2.06 WIRING ACCESSORIES

A. Electrical Tape:
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Vinyl Color Coding Electrical Tape: Integ rally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
   3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

B. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cable Ties: Material and tensile strength rating suitable for application. Provide plenum rated cable ties where installed in plenums.
   1. Manufacturers:
      b. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.
B. Verify that work likely to damage wire and cable has been completed.
C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
D. Verify that field measurements are as shown on the drawings.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated and routing is not shown, determine exact routing required.
   3. Arrange circuiting to minimize splices.
   4. Include circuit lengths required to install connected devices within 10 ft of location shown.
   5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
   6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are shown as separate, combining them together in a single raceway is not permitted.

8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.
C. Perform work in accordance with NECA 1 (general workmanship).
D. Install metal-clad cable (Type MC) in accordance with NECA 120.

E. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

F. Exposed Cable Installation (only where specifically permitted):
   1. Route cables parallel or perpendicular to building structural members and surfaces.
   2. Protect cables from physical damage.

G. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

H. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

I. Terminate cables using suitable fittings.
   1. Metal-Clad Cable (Type MC):
      a. Use listed fittings.
      b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

J. Install conductors with a minimum of 12 inches of slack at each outlet.

K. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

L. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

M. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
   2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   3. Do not remove conductor strands to facilitate insertion into connector.
   4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
   5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
N. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

O. Insulate ends of spare conductors using vinyl insulating electrical tape.

P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

Q. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION
SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1  GENERAL

1.01  SECTION INCLUDES
A.  Grounding and bonding requirements.
B.  Conductors for grounding and bonding.
C.  Connectors for grounding and bonding.
D.  Ground bars.

1.02  RELATED REQUIREMENTS
A.  Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
B.  Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03  REFERENCE STANDARDS
B.  NECA 1 - Standard for Good Workmanship in Electrical Construction.
D.  NFPA 70 - National Electrical Code.
E.  UL 467 - Grounding and Bonding Equipment.

1.04  ADMINISTRATIVE REQUIREMENTS
A.  Coordination:
   1.  Verify exact locations of underground metal water service pipe entrances to building.
   2.  Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05  SUBMITTALS
A.  See Section 01 30 00 - Administrative Requirements for submittals procedures.
B.  Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.
C.  Shop Drawings:
D.  Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06  QUALITY ASSURANCE
A.  Conform to requirements of NFPA 70.
B.  Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C.  Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D.  Installer Qualifications for Signal Reference Grids: Company with minimum five years documented experience with high frequency grounding systems.
E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store products in accordance with manufacturer’s instructions.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS
A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using “fall-of-potential” method.
   3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using “point-to-point” methods.
F. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
   2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
   3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
   4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
   5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
   6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
   7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
      a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
      b. Metal gas piping.
      c. Metal process piping.
2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Bars:
   1. Description: Copper rectangular ground bars with mounting brackets and insulators.
   2. Size: As indicated.
   3. Holes for Connections: As indicated or as required for connections to be made.
   4. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as shown on the drawings.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer’s instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer’s recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer’s recommended torque settings.
5. Compression Connectors: Secure connections using manufacturer’s recommended tools and dies.

D. Identify grounding and bonding system components in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.13.
D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION
SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Support and attachment components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS
A. Section 26 05 34 - Conduit: Additional support and attachment requirements for conduits.
B. Section 26 05 37 - Boxes: Additional support and attachment requirements for boxes.
C. Section 26 51 00 - Interior Lighting: Additional support and attachment requirements for interior luminaires.

1.03 REFERENCE STANDARDS
D. MFMA-4 - Metal Framing Standards Publication.
E. NECA 1 - Standard for Good Workmanship in Electrical Construction.
F. NFPA 70 - National Electrical Code.
G. UL 5B - Strut-Type Channel Raceways and Fittings.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 30 00.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.
C. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.
D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 QUALITY ASSURANCE
A. Comply with NFPA 70.
B. Comply with applicable building code.
C. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
D. Installer Qualifications for Powder-Actuated Fasteners (when specified): Certified by fastener system manufacturer with current operator's license.
E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 SUPPORT AND ATTACHMENT COMPONENTS
A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
      a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
A. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.
   3. Manufacturers:
      e. Substitutions: See Section 01 60 00 - Product Requirements.
C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
1. Manufacturers:
   e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   2. Channel (Strut) Used as Raceway (only where specifically indicated): Listed and labeled as complying with UL 5B.
   3. Channel Material:
      a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
   4. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch.
   6. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.
      e. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch diameter.
      b. Busway Supports: 1/2 inch diameter.
      c. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
      d. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch diameter.
      e. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
      f. Outlet Boxes: 1/4 inch diameter.
      g. Luminaires: 1/4 inch diameter.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
   3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
   6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
   7. Sheet Metal: Use sheet metal screws.
   8. Wood: Use wood screws.
   9. Plastic and lead anchors are not permitted.
   10. Powder-actuated fasteners are not permitted.
   11. Hammer-driven anchors and fasteners are not permitted.
   12. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
b. Channel Material: Use galvanized steel.
   c. Manufacturer: Same as manufacturer of metal channel (strut) framing system.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that field measurements are as shown on the drawings.
B. Verify that mounting surfaces are ready to receive support and attachment components.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
H. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
I. Conduit Support and Attachment: Also comply with Section 26 05 34.
J. Box Support and Attachment: Also comply with Section 26 05 37.
K. Interior Luminaire Support and Attachment: Also comply with Section 26 51 00.
L. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.
M. Secure fasteners according to manufacturer's recommended torque settings.
N. Remove temporary supports.
O. Identify independent electrical component support wires above accessible ceilings (only where specifically indicated or permitted) with color distinguishable from ceiling support wires in accordance with NFPA 70.

3.03 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect support and attachment components for damage and defects.
C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION
SECTION 26 05 34
CONDUIT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Galvanized steel rigid metal conduit (RMC).
B. Flexible metal conduit (FMC).
C. Liquidtight flexible metal conduit (LFMC).
D. Electrical metallic tubing (EMT).
E. Conduit fittings.
F. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 03 30 00 - Cast-in-Place Concrete: Concrete encasement of conduits.
B. Section 07 84 00 - Firestopping.
C. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Metal clad cable (Type MC), armored cable (Type AC), and manufactured wiring systems, including uses permitted.
D. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   1. Includes additional requirements for fittings for grounding and bonding.
E. Section 26 05 29 - Hangers and Supports for Electrical Systems.
F. Section 26 05 37 - Boxes.
G. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC).
B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S).
C. NECA 1 - Standard for Good Workmanship in Electrical Construction.
D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT).
E. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
F. NFPA 70 - National Electrical Code.
G. UL 1 - Flexible Metal Conduit.
H. UL 6 - Electrical Rigid Metal Conduit-Steel.
I. UL 360 - Liquid-Tight Flexible Steel Conduit.
J. UL 514B - Conduit, Tubing, and Cable Fittings.
K. UL 797 - Electrical Metallic Tubing-Steel.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 SUBMITTALS
   A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
   B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
   C. Shop Drawings:
      1. Indicate proposed arrangement for conduits to be installed within structural concrete slabs, where permitted.
      2. Include proposed locations of roof penetrations and proposed methods for sealing.
   D. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2 inch (53 mm) trade size and larger.

1.06 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
   C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 CONDUIT APPLICATIONS
   A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
   B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
   C. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
   D. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
   E. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
   F. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.
G. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).

H. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
   1. Locations subject to physical damage include, but are not limited to:
      a. Where exposed below 8 feet, except within electrical and communication rooms or closets.

I. Exposed, Exterior: Use galvanized steel rigid metal conduit or PVC-coated galvanized steel rigid metal conduit.

J. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit.

K. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
   3. Maximum Length: 6 feet unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Transformers.
      b. Motors.

L. Fished in Existing Walls, Where Necessary: Use flexible metal conduit.

2.02 CONDUIT REQUIREMENTS

A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.

B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Minimum Conduit Size, Unless Otherwise Indicated:
   1. Branch Circuits: 3/4 inch (21 mm) trade size.
   2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
   3. Control Circuits: 1/2 inch (16 mm) trade size.
   4. Flexible Connections to Luminaires: 1/2 inch (16 mm) trade size.
   5. Underground, Interior: 3/4 inch (21 mm) trade size.
   6. Underground, Exterior: 1 inch (27 mm) trade size.

E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

C. Fittings:
   1. Manufacturers:
d. Substitutions: See Section 01 60 00 - Product Requirements.
2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 FLEXIBLE METAL CONDUIT (FMC)
A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
C. Fittings:
   1. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.

2.05 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)
A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
C. Fittings:
   1. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.

2.06 ELECTRICAL METALLIC TUBING (EMT)
A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Fittings:
   1. Manufacturers:
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
   4. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.
   5. Damp or Wet Locations (where permitted): Use fittings listed for use in wet locations.

2.07 ACCESSORIES
   A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil.
   B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
   C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
   D. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.
   E. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
   F. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as shown on drawings.
   B. Verify that mounting surfaces are ready to receive conduits.
   C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer’s instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
   D. Conduit Routing:
      1. Unless dimensioned, conduit routing indicated is diagrammatic.
      2. When conduit destination is indicated and routing is not shown, determine exact routing required.
      3. Conceal all conduits unless specifically indicated to be exposed.
      4. Conduits in the following areas may be exposed, unless otherwise indicated:
         a. Electrical rooms.
         b. Mechanical equipment rooms.
         c. Within joists in areas with no ceiling.
      5. Unless otherwise approved, do not route conduits exposed:
         a. Across floors.
b. Across roofs.

c. Across top of parapet walls.

d. Across building exterior surfaces.

6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.

7. Arrange conduit to maintain adequate headroom, clearances, and access.

8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.

9. Arrange conduit to provide no more than 150 feet between pull points.

10. Route conduits above water and drain piping where possible.

11. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.

12. Maintain minimum clearance of 6 inches between conduits and piping for other systems.

13. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:

   a. Heaters.

   b. Hot water piping.

   c. Flues.

14. Group parallel conduits in the same area together on a common rack.

E. Conduit Support:

1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.

2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.

4. Use conduit strap to support single surface-mounted conduit.

   a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.

5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.

6. Use conduit clamp to support single conduit from beam clamp or threaded rod.

7. Use non-penetrating rooftop supports to support conduits routed across rooftops (only where approved).

8. Use of spring steel conduit clips for support of conduits is not permitted.

9. Use of wire for support of conduits is not permitted.

F. Connections and Terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.

2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.

3. Use suitable adapters where required to transition from one type of conduit to another.

4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.

5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.

6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

G. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Provide suitable modular seal where conduits penetrate exterior wall below grade.
7. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
8. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
9. Provide metal escutcheon plates for conduit penetrations exposed to public view.
10. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

H. Embedment Within Structural Concrete Slabs (only where approved by Structural Engineer):
1. Include proposed conduit arrangement with submittals.
2. Maximum Conduit Size: 1 inch (27 mm) unless otherwise approved.
3. Install conduits within middle one third of slab thickness.
4. Secure conduits to prevent floating or movement during pouring of concrete.

I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
2. Where conduits are subject to earth movement by settlement or frost.

J. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

K. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

L. Provide grounding and bonding in accordance with Section 26 05 26.
M. Identify conduits in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
C. Correct deficiencies and replace damaged or defective conduits.
3.04 CLEANING
   A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION
   A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION
SECTION 26 05 37
BOXES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
   B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.

1.02 RELATED REQUIREMENTS
   A. Section 07 84 00 - Firestopping.
   B. Section 08 31 00 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
   C. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   D. Section 26 05 29 - Hangers and Supports for Electrical Systems.
   E. Section 26 05 34 - Conduit:
      1. Conduit bodies and other fittings.
      2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
   F. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
   G. Section 26 27 26 - Wiring Devices:
      1. Wall plates.
      2. Additional requirements for locating boxes for wiring devices.

1.03 REFERENCE STANDARDS
   A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
   B. NECA 130 - Standard for Installing and Maintaining Wiring Devices.
   C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
   D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
   E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
   F. NFPA 70 - National Electrical Code.
   G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
   H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
   I. UL 508A - Industrial Control Panels.
   J. UL 514A - Metallic Outlet Boxes.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
      2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
      3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.
C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
D. Project Record Documents: Record actual locations for outlet and device boxes, pull boxes, cabinets and enclosures, floor boxes, and underground boxes/enclosures.
E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Keys for Lockable Enclosures: Two of each different key.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 BOXES
A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
   1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use suitable concrete type boxes where flush-mounted in concrete.
4. Use suitable masonry type boxes where flush-mounted in masonry walls.
5. Use raised covers suitable for the type of wall construction and device configuration where required.
6. Use shallow boxes where required by the type of wall construction.
7. Do not use "through-wall" boxes designed for access from both sides of wall.
8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
12. Minimum Box Size, Unless Otherwise Indicated:
   a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 2-1/8 inch deep (100 by 54 mm) trade size.
   b. Ceiling Outlets: 4 inch octagonal or square by 2-1/8 inch deep (100 by 54 mm) trade size.
14. Manufacturers:
   e. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
2. NEMA 250 Environment Type, Unless Otherwise Indicated:
   a. Indoor Clean, Dry Locations: Type 1, painted steel.
   b. Outdoor Locations: Type 3R, painted steel.
3. Junction and Pull Boxes Larger Than 100 cubic inches:
   a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
   b. Boxes 6 square feet and Larger: Provide sectionalized screw-cover or hinged-cover enclosures.
4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
   a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
   c. Terminal Blocks: Provide voltage/current ratings and terminal quantity suitable for purpose indicated, with 25 percent spare terminal capacity.
5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
6. Manufacturers:
PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on drawings.
B. Verify that mounting surfaces are ready to receive boxes.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Box Locations:
   1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as required where approved by the Architect.
   2. Unless dimensioned, box locations indicated are approximate.
   3. Locate boxes as required for devices installed under other sections or by others.
      a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
   4. Locate boxes so that wall plates do not span different building finishes.
   5. Locate boxes so that wall plates do not cross masonry joints.
   6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
   8. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 34.
   9. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
      a. Concealed above accessible suspended ceilings.
      b. Within joists in areas with no ceiling.
      c. Electrical rooms.
      d. Mechanical equipment rooms.

E. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

F. Install boxes plumb and level.

G. Flush-Mounted Boxes:
   1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
   2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

H. Install boxes as required to preserve insulation integrity.
I. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
J. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.
K. Close unused box openings.
L. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
M. Provide grounding and bonding in accordance with Section 26 05 26.
N. Identify boxes in accordance with Section 26 05 53.

3.03 CLEANING
A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION
A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION
SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Electrical identification requirements.
B. Identification nameplates and labels.
C. Wire and cable markers.
D. Voltage markers.
E. Floor marking tape.
F. Warning signs and labels.

1.02 RELATED REQUIREMENTS
A. Section 09 91 23 - Interior Painting.
B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
C. Section 26 27 26 - Wiring Devices - Lutron: Device and wallplate finishes; factory pre-marked wallplates.

1.03 REFERENCE STANDARDS
C. NFPA 70 - National Electrical Code.
D. UL 969 - Marking and Labeling Systems.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
B. Sequencing:
   1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
   2. Do not install identification products until final surface finishes and painting are complete.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
C. Shop Drawings: Provide schedule of items to be identified indicating proposed designations, materials, legends, and formats.
D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
1.07 FIELD CONDITIONS
   A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS
2.01 IDENTIFICATION REQUIREMENTS
   A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.
   B. Identification for Equipment:
      1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
         a. Switchboards:
            1) Identify power source and circuit number. Include location when not within sight of equipment.
            2) Use identification nameplate to identify main overcurrent protective device.
            3) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
         b. Panelboards:
            1) Identify ampere rating.
            2) Identify voltage and phase.
            3) Identify power source and circuit number. Include location when not within sight of equipment.
            4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
            5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
            6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
         c. Transformers:
            1) Identify kVA rating.
            2) Identify voltage and phase for primary and secondary.
            3) Identify power source and circuit number. Include location when not within sight of equipment.
            4) Identify load(s) served. Include location when not within sight of equipment.
         d. Enclosed switches, circuit breakers, and motor controllers:
            1) Identify voltage and phase.
            2) Identify power source and circuit number. Include location when not within sight of equipment.
            3) Identify load(s) served. Include location when not within sight of equipment.
         e. Busway:
            1) Identify ampere rating.
            2) Identify voltage and phase.
            3) Identify power source and circuit number. Include location when not within sight of equipment.
            4) Provide identification at maximum intervals of 40 feet.
            5) Use identification nameplate to identify load(s) served for each plug-in unit. Include location when not within sight of equipment.
   2. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
a. Service equipment.
b. Industrial control panels.
c. Motor control centers.
d. Elevator control panels.
e. Industrial machinery.

C. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
   2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
   3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
      a. At each source and load connection.
      b. Within boxes when more than one circuit is present.
      c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
      d. In cable tray, at maximum intervals of 20 feet.
   4. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
   5. Use underground warning tape to identify direct buried cables.

D. Identification for Raceways:
   1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet.
   2. Use voltage markers or color coded bands to identify systems other than normal power system for accessible conduits at maximum intervals of 20 feet.
      a. Color-Coded Bands: Use field-painting or vinyl color coding electrical tape to mark bands 3 inches wide.
         1) Color Code:
            (a) Emergency Power System: Red.
            (b) Fire Alarm System: Red.
         2) Field-Painting: Comply with Section 09 91 23 and 09 91 13.
         3) Vinyl Color Coding Electrical Tape: Comply with Section 26 05 19.
   3. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify circuits enclosed for accessible conduits at wall penetrations, at floor penetrations, at roof penetrations, and at equipment terminations when source is not within sight.

E. Identification for Boxes:
   1. Use voltage markers to identify highest voltage present.
   2. Use voltage markers or color coded boxes to identify systems other than normal power system.
      a. Color-Coded Boxes: Field-painted in accordance with Section 09 91 23 and 09 91 13 per the same color code used for raceways.
   3. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.
   4. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

F. Identification for Devices:
2. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
3. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.
4. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

G. Identification for Luminaires:
   1. Use permanent red dot on luminaire frame to identify luminaires connected to emergency power system.

2.02 IDENTIFICATION NAMEPLATES AND LABELS
A. Identification Nameplates:
   1. Manufacturers:
      d. Substitutions:  See Section 01 60 00 - Product Requirements.
   2. Materials:
      a. Indoor Clean, Dry Locations:  Use plastic nameplates.
      b. Outdoor Locations:  Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
   3. Plastic Nameplates:  Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
   4. Stainless Steel Nameplates:  Minimum thickness of 1/32 inch; engraved or laser-etched text.
   5. Aluminum Nameplates:  Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
   6. Mounting Holes for Mechanical Fasteners:  Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Manufacturers:
      d. Substitutions:  See Section 01 60 00 - Product Requirements.
   3. Text:  Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
   1. Minimum Size:  1 inch by 2.5 inches.
   2. Legend:
      a. System designation where applicable:
         1) Emergency Power System:  Identify with text "EMERGENCY".
         2) Fire Alarm System:  Identify with text "FIRE ALARM".
      b. Equipment designation or other approved description.
   3. Text:  All capitalized unless otherwise indicated.
   4. Minimum Text Height:
      a. System Designation:  1 inch.
b. Equipment Designation: 1/2 inch.
c. Other Information: 1/4 inch.
d. Exception: Provide minimum text height of 1 inch for equipment located more than 10 feet above floor or working platform.

5. Color:

D. Format for General Information and Operating Instructions:
1. Minimum Size: 1 inch by 2.5 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
5. Color: Black text on white background unless otherwise indicated.

E. Format for Caution and Warning Messages:
1. Minimum Size: 2 inches by 4 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/2 inch.
5. Color: Black text on yellow background unless otherwise indicated.

F. Format for Receptacle Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Power source and circuit number or other designation indicated.
3. Text: All capitalized unless otherwise indicated.
5. Color: Black text on clear background.

G. Format for Control Device Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Load controlled or other designation indicated.
3. Text: All capitalized unless otherwise indicated.
5. Color: Black text on clear background.

H. Format for Fire Alarm Device Identification:
1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Designation indicated and device zone or address.
3. Text: All capitalized unless otherwise indicated.
5. Color: Red text on white background.

2.03 WIRE AND CABLE MARKERS

A. Manufacturers:
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Legend: Power source and circuit number or other designation indicated.

E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

F. Minimum Text Height: 1/8 inch.

G. Color: Black text on white background unless otherwise indicated.

2.04 VOLTAGE MARKERS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

C. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

D. Minimum Size:
   1. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
   2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.

E. Legend:
   1. Markers for Voltage Identification: Highest voltage present.
   2. Markers for System Identification:

F. Color: Black text on orange background unless otherwise indicated.

2.05 WARNING SIGNS AND LABELS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

C. Warning Signs:
   1. Materials:
   2. Minimum Size: 7 by 10 inches unless otherwise indicated.

D. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.
3.02 INSTALLATION

A. Install products in accordance with manufacturer’s instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
   3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
   4. Elevated Equipment: Legible from the floor or working platform.
   5. Branch Devices: Adjacent to device.
   6. Interior Components: Legible from the point of access.
   7. Conduits: Legible from the floor.
   8. Boxes: Outside face of cover.
   9. Conductors and Cables: Legible from the point of access.
  10. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Secure rigid signs using stainless steel screws.

G. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION
SECTION 26 09 23
LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Occupancy sensors.
B. Control accessories.

1.02 RELATED REQUIREMENTS
A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 37 - Boxes.
D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
E. Section 26 27 26 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, and fan speed controllers.
F. Section 26 28 13 - Fuses.
G. Section 26 51 00 - Interior Lighting.

1.03 REFERENCE STANDARDS
A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
B. NECA 130 - Standard for Installing and Maintaining Wiring Devices.
C. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts.
D. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
E. NFPA 70 - National Electrical Code.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
   3. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
C. Shop Drawings:
   1. Occupancy Sensors: Provide lighting plan indicating location, model number, and orientation of each occupancy sensor and associated system component.
D. Field Quality Control Reports.
E. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
F. Operation and Maintenance Data: Include detailed information on device programming and setup.

G. Project Record Documents: Record actual installed locations and settings for lighting control devices.

### 1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

### 1.07 DELIVERY, STORAGE, AND PROTECTION

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

### 1.08 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

### 1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for all occupancy sensors.

### PART 2 PRODUCTS

#### 2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

C. Products for Switching of Electronic Ballasts/Drivers: Tested and rated to be suitable for peak inrush currents specified in NEMA 410.

#### 2.02 OCCUPANCY SENSORS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. All Occupancy Sensors:
   1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
   2. Sensor Technology:
      a. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.
3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
5. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
6. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.

2.03 CONTROL ACCESSORIES

A. Auxiliary Contacts:
   1. Comply with NEMA ICS 5.
   2. Provide number and type of contacts indicated or required to perform necessary functions, including holding (seal-in) circuit and interlocking, plus one normally open (NO) and one normally closed (NC) spare contact for each lighting contactor, minimum.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.
D. Verify that final surface finishes are complete, including painting.
E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.
G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
B. Coordinate locations of outlet boxes provided under Section 26 05 37 as required for installation of lighting control devices provided under this section.
   1. Mounting Heights: Unless otherwise indicated, as follows:
      a. Wall Switch Occupancy Sensors: 48 inches above finished floor.
C. Install lighting control devices in accordance with manufacturer’s instructions.
D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
E. Install lighting control devices plumb and level, and held securely in place.
F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 27 26.

G. Provide required supports in accordance with Section 26 05 29.

H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

3.04 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect each lighting control device for damage and defects.
C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area. Record test results in written report to be included with submittals.
D. Correct wiring deficiencies and replace damaged or defective lighting control devices.

3.05 ADJUSTING
A. Adjust devices and wall plates to be flush and level.
B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.
C. Adjust position of directional occupancy sensors and outdoor motion sensors to achieve optimal coverage as required.
D. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.

3.06 CLEANING
A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.07 CLOSEOUT ACTIVITIES
A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

END OF SECTION
SECTION 26 24 16
PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Power distribution panelboards.
   B. Lighting and appliance panelboards.
   C. Overcurrent protective devices for panelboards.

1.02 RELATED REQUIREMENTS
   A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
   C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
   D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
   E. Section 26 22 00 - Low-Voltage Transformers: Small power centers with integral primary breaker, transformer, and panelboard.
   F. Section 26 28 13 - Fuses: Fuses for fusible switches and spare fuse cabinets.

1.03 REFERENCE STANDARDS
   A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service.
   B. NECA 1 - Standard for Good Workmanship in Electrical Construction.
   C. NECA 407 - Standard for Installing and Maintaining Panelboards.
   D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
   E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts.
   F. NEMA PB 1 - Panelboards.
   G. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
   I. NFPA 70 - National Electrical Code.
   J. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
   K. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
   L. UL 67 - Panelboards.
   M. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
      2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
      3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted panelboards where indicated.
4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of overcurrent protective device upon request.
C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of panelboards and adjacent equipment with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.
   3. Clearly indicate whether proposed short circuit current ratings are fully rated or, where acceptable, series rated systems.
   4. Include documentation of listed series ratings upon request.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.
F. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Panelboard Keys: Two of each different key.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.
1.08 FIELD CONDITIONS

A. Maintain ambient temperature within the following limits during and after installation of panelboards:
   1. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.

PART 2 PRODUCTS

2.01 MANUFACTURERS

C. Schneider Electric; Square D Products: www.schneider-electric.us.
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PANELBOARDS - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.
B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature:
      a. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.
C. Short Circuit Current Rating:
   1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
   2. Label equipment utilizing series ratings as required by NFPA 70.
D. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
E. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
F. Bussing: Sized in accordance with UL 67 temperature rise requirements.
   1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
   2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
G. Conductor Terminations: Suitable for use with the conductors to be installed.
H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
   2. Boxes: Galvanized steel unless otherwise indicated.
      a. Provide wiring gutters sized to accommodate the conductors to be installed.
   3. Fronts:
      a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
      b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
      c. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
   4. Lockable Doors: All locks keyed alike unless otherwise indicated.
I. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.
2.03 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:
   1. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
   2. Main and Neutral Lug Type: Mechanical.

C. Bussing:
   1. Phase and Neutral Bus Material: Copper.
   2. Ground Bus Material: Copper.

D. Circuit Breakers:
   1. Provide bolt-on type or plug-in type secured with locking mechanical restraints.

E. Enclosures:
   1. Provide surface-mounted enclosures unless otherwise indicated.
   2. Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring gutters, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
   3. Provide metal circuit directory holder mounted on inside of door.

2.04 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:
   1. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
   2. Main and Neutral Lug Type: Mechanical.

C. Bussing:
   2. Phase and Neutral Bus Material: Copper.

D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.

E. Enclosures:
   1. Provide surface-mounted or flush-mounted enclosures as indicated.
   2. Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring gutters, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
   3. Provide metal circuit directory holder mounted on inside of door.

2.05 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:
   1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

   2. Interrupting Capacity:
      a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
         1) 14,000 rms symmetrical amperes at 240 VAC or 208 VAC.
         2) 22,000 rms symmetrical amperes at 480 VAC.
b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.

3. Conductor Terminations:
   a. Provide mechanical lugs unless otherwise indicated.
   b. Lug Material: Copper, suitable for terminating copper conductors only.

4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
   a. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
   b. Provide interchangeable trip units for circuit breaker frame sizes 400 amperes and larger.

5. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
   a. Provide the following field-adjustable trip response settings:
      1) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
      2) Long time delay.
      3) Short time pickup and delay.
      4) Instantaneous pickup.
      5) Ground fault pickup and delay where ground fault protection is indicated.


2.06 SOURCE QUALITY CONTROL
   A. Factory test panelboards according to NEMA PB 1.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
   C. Verify that mounting surfaces are ready to receive panelboards.
   D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Perform work in accordance with NECA 1 (general workmanship).
   B. Install products in accordance with manufacturer's instructions.
   C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.
   D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
   E. Provide required supports in accordance with Section 26 05 29.
   F. Install panelboards plumb.
   G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.
   H. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform.
   I. Provide minimum of six spare 1 inch trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling and below floor.
   J. Provide grounding and bonding in accordance with Section 26 05 26.
K. Install all field-installed branch devices, components, and accessories.

L. Provide filler plates to cover unused spaces in panelboards.

M. Provide circuit breaker lock-on devices to prevent unauthorized personnel from de-energizing essential loads where indicated. Also provide for the following:
   1. Emergency and night lighting circuits.
   2. Fire detection and alarm circuits.
   3. Communications equipment circuits.
   4. Intrusion detection and access control system circuits.
   5. Video surveillance system circuits.

N. Identify panelboards in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

B. Adjust alignment of panelboard fronts.

C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

3.05 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION
SECTION 26 27 17
EQUIPMENT WIRING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Electrical connections to equipment.

1.02 RELATED REQUIREMENTS
A. Section 26 05 34 - Conduit.
B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables (600 V and Less).
C. Section 26 05 37 - Boxes.
D. Section 26 27 26 - Wiring Devices.
E. Section 26 28 16.16 - Enclosed Switches.
F. Section 26 29 13 - Enclosed Controllers.

1.03 REFERENCE STANDARDS
A. NEMA WD 1 - General Color Requirements for Wiring Devices.
B. NEMA WD 6 - Wiring Devices - Dimensional Specifications.
C. NFPA 70 - National Electrical Code.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
   2. Determine connection locations and requirements.
B. Sequencing:
   1. Install rough-in of electrical connections before installation of equipment is required.
   2. Make electrical connections before required start-up of equipment.

1.05 SUBMITTALS
A. See Section 01 33 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide wiring device manufacturer's catalog information showing dimensions, configurations, and construction.
C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 COORDINATION
A. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
B. Determine connection locations and requirements.
C. Sequence rough-in of electrical connections to coordinate with installation of equipment.
D. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

2.01 MATERIALS
A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Conform to NEMA WD 1.
   2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
   3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
   4. Product:
   5. Substitutions: See Section 01 60 00 - Product Requirements.
B. Disconnect Switches: As specified in Section and in individual equipment sections.
C. Wiring Devices: As specified in Section 26 27 26- Wiring Devices.
D. Flexible Conduit: As specified in Section 26 05 34 - Conduit.
E. Wire and Cable: As specified in Section 26 05 19 - Low Voltage Electrical Power Conductors and Cables.
F. Boxes: As specified in Section 26 05 37 - Boxes.

2.02 EQUIPMENT CONNECTIONS
A. As required by equipment manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS
A. Make electrical connections in accordance with equipment manufacturer's instructions.
B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
D. Provide receptacle outlet to accommodate connection with attachment plug.
E. Provide cord and cap where field-supplied attachment plug is required.
F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
H. Install terminal block jumpers to complete equipment wiring requirements.
I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.
J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

END OF SECTION
SECTION 26 27 26
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Wall switches.
B. Wall dimmers.
C. Receptacles.
D. Wall plates.

1.02 RELATED REQUIREMENTS
A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.
B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
C. Section 26 05 37 - Boxes.
D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
E. Section 26 27 17 - Equipment Wiring: Cords and plugs for equipment.

1.03 REFERENCE STANDARDS
B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification).
C. NECA 1 - Standard for Good Workmanship in Electrical Construction.
D. NECA 130 - Standard for Installing and Maintaining Wiring Devices.
E. NEMA WD 1 - General Color Requirements for Wiring Devices.
F. NEMA WD 6 - Wiring Devices - Dimensional Specifications.
G. NFPA 70 - National Electrical Code.
H. UL 20 - General-Use Snap Switches.
I. UL 498 - Attachment Plugs and Receptacles.
J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices.
K. UL 943 - Ground-Fault Circuit-Interrupters.
L. UL 1472 - Solid-State Dimming Controls.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
   3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
   4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
   5. Coordinate the core drilling of holes for poke-through assemblies with the work covered under other sections.
6. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

B. Sequencing:
   1. Do not install wiring devices until final surface finishes and painting are complete.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
   1. Wall Dimmers: Include derating information for ganged multiple devices.
C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
D. Operation and Maintenance Data:
   1. Wall Dimmers: Include information on operation and setting of presets.
   2. GFCI Receptacles: Include information on status indicators.
E. Project Record Documents: Record actual installed locations of wiring devices.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Products: Listed, classified, and labeled as suitable for the purpose intended.
E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION
A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS
2.01 WIRING DEVICE APPLICATIONS
A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
D. Provide GFCI protection for receptacles installed within 6 feet of sinks.
E. Provide GFCI protection for receptacles installed in kitchens.
F. Provide GFCI protection for receptacles serving electric drinking fountains.

2.02 WIRING DEVICE FINISHES
A. Provide wiring device finishes as described below unless otherwise indicated.
B. Wiring Devices, Unless Otherwise Indicated: Black with Stainless Steel nylon wall plate.

2.03 WALL SWITCHES
A. Manufacturers:
3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

C. Standard Wall Switches: Commercial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.04 WALL DIMMERS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

C. Control: Slide control type with separate on/off switch.

D. Power Rating, Unless Otherwise Indicated or Required to Control the Load Indicated on the Drawings:
   1. LED 1200 watts

2.05 RECEPTACLES

A. Manufacturers:
   4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
2. NEMA configurations specified are according to NEMA WD 6.

C. Convenience Receptacles:
   1. Standard Convenience Receptacles: Commercial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.

D. GFCI Receptacles:
   1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
      a. Provide test and reset buttons of same color as device.

2.06 WALL PLATES

A. Manufacturers:
   4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall Plates: Comply with UL 514D.
   1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
   3. Screws: Metal with slotted heads finished to match wall plate finish.

C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on the drawings.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
D. Verify that final surface finishes are complete, including painting.
E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
B. Coordinate locations of outlet boxes provided under Section 26 05 37 as required for installation of wiring devices provided under this section.
   1. Mounting Heights: Unless otherwise indicated, as follows:
      a. Wall Switches: 48 inches above finished floor.
      b. Receptacles: 18 inches above finished floor or 6 inches above counter.
   2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
   3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
   4. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect to obtain direction prior to proceeding with work.
C. Install wiring devices in accordance with manufacturer’s instructions.
D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Install wiring devices plumb and level with mounting yoke held rigidly in place.

I. Install wall switches with OFF position down.

J. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

K. Do not share neutral conductor on branch circuits utilizing wall dimmers.

L. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

M. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

N. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

O. Identify wiring devices in accordance with Section 26 05 53.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect each wiring device for damage and defects.

C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.

D. Test each receptacle to verify operation and proper polarity.

E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

F. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.06 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION
SECTION 26 28 13
FUSES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fuses.

1.02 RELATED REQUIREMENTS
A. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
B. Section 26 24 16 - Panelboards: Fusible switches.
C. Section 26 28 16.16 - Enclosed Switches: Fusible switches.

1.03 REFERENCE STANDARDS
A. NEMA FU 1 - Low Voltage Cartridge Fuses.
B. NFPA 70 - National Electrical Code.
D. UL 248-4 - Low-Voltage Fuses - Part 4: Class CC Fuses.
E. UL 248-10 - Low-Voltage Fuses - Part 10: Class L Fuses.
F. UL 248-12 - Low-Voltage Fuses - Part 12: Class R Fuses.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate fuse clips furnished in equipment provided under other sections for compatibility with indicated fuses.
   2. Coordinate fuse requirements according to manufacturer's recommendations and nameplate data for actual equipment to be installed.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.
C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Fuses: One set(s) of three for each type and size installed.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MANUFACTURERS
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 APPLICATIONS
A. Feeders:
   1. Fusible Switches up to 600 Amperes: Class RK1, time-delay.
   2. Fusible Switches Larger Than 600 Amperes: Class L, time-delay.
B. Individual Motor Branch Circuits: Class RK1, time-delay.
C. In-Line Protection for Pole-Mounted Luminaires: Class CC, time-delay.

2.03 FUSES
A. Provide products listed, classified, and labeled as suitable for the purpose intended.
B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.
C. Provide fuses of the same type, rating, and manufacturer within the same switch.
D. Comply with UL 248-1.
E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.
F. Voltage Rating: Suitable for circuit voltage.
G. Class R Fuses: Comply with UL 248-12.
H. Class L Fuses: Comply with UL 248-10.
I. Class CC Fuses: Comply with UL 248-4.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that fuse ratings are consistent with circuit voltage and manufacturer’s recommendations and nameplate data for equipment.
B. Verify that mounting surfaces are ready to receive spare fuse cabinet.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Do not install fuses until circuits are ready to be energized.
B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION
SECTION 26 28 16.13
ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Enclosed circuit breakers.

1.02 RELATED REQUIREMENTS
A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service.
B. NECA 1 - Standard for Good Workmanship in Electrical Construction.
C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
E. NFPA 70 - National Electrical Code.
F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
H. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures.
I. UL 943 - Ground-Fault Circuit-Interrupters.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted enclosed circuit breakers where indicated.
   4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for circuit breakers, enclosures, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of circuit breaker upon request.
C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Clearly indicate whether proposed short circuit current ratings are fully rated or, where acceptable, series rated systems.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
E. Project Record Documents: Record actual installed locations of enclosed circuit breakers.
F. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed circuit breaker internal components, enclosure, and finish.

1.08 FIELD CONDITIONS
A. Maintain ambient temperature between 23 degrees F and 104 degrees F during and after installation of enclosed circuit breakers.

PART 2 PRODUCTS
2.01 MANUFACTURERS
C. Schneider Electric; Square D Products: www.schneider-electric.us.

2.02 ENCLOSED CIRCUIT BREAKERS
A. Description: Units consisting of molded case circuit breakers individually mounted in enclosures.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature: Between 23 degrees F and 104 degrees F.
D. Short Circuit Current Rating:
   1. Provide enclosed circuit breakers with listed short circuit current rating not less than the available fault current at the installed location indicated on the drawings.
   2. Listed series ratings are acceptable, except where not permitted by motor contribution according to NFPA 70.
   3. Label equipment utilizing series ratings as required by NFPA 70.
E. Conductor Terminations: Suitable for use with the conductors to be installed.
F. Provide thermal magnetic circuit breakers unless otherwise indicated.
G. Provide solidly bonded equipment ground bus in each enclosed circuit breaker, with a suitable lug for terminating each equipment grounding conductor.

H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:

I. Provide externally operable handle with means for locking in the OFF position.

2.03 MOLDED CASE CIRCUIT BREAKERS

A. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

B. Interrupting Capacity:
   1. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
      a. 14000 rms symmetrical amperes at 240 VAC or 208 VAC.
      b. 22000 rms symmetrical amperes at 480 VAC.
   2. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
   3. Series Rated Systems: Provide circuit breakers listed in combination with upstream devices to provide interrupting rating not less than the short circuit current rating indicated.

C. Conductor Terminations:
   1. Lug Material: Copper, suitable for terminating copper conductors only.

D. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
   1. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
   2. Provide interchangeable trip units for circuit breaker frame sizes 400 amperes and larger.

E. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
   1. Provide the following field-adjustable trip response settings:
      a. Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
      b. Long time delay.
      c. Short time pickup and delay.
      d. Instantaneous pickup.

F. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

G. Provide the following circuit breaker types where indicated:
   1. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
   2. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the ratings of the enclosed circuit breakers are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive enclosed circuit breakers.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
   D. Provide required supports in accordance with Section 26 05 29.
   E. Install enclosed circuit breakers plumb.
   F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed circuit breakers such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
   G. Provide grounding and bonding in accordance with Section 26 05 26.
   H. Identify enclosed circuit breakers in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL
   A. See Section 01 40 00 - Quality Requirements, for additional requirements.
   B. Inspect and test in accordance with manufacturer's instructions and NETA ATS, except Section 4.
   C. Test GFCI circuit breakers to verify proper operation.
   D. Correct deficiencies and replace damaged or defective enclosed circuit breakers.

3.04 ADJUSTING
   A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING
   A. Clean dirt and debris from circuit breaker enclosures and components according to manufacturer's instructions.
   B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION
SECTION 26 28 16.16
ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Enclosed safety switches.

1.02 RELATED REQUIREMENTS
A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
D. Section 26 28 13 - Fuses.

1.03 REFERENCE STANDARDS
A. NECA 1 - Standard for Good Workmanship in Electrical Construction.
B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
C. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum).
E. NFPA 70 - National Electrical Code.
F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations.
G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations.
H. UL 98 - Enclosed and Dead-Front Switches.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of enclosed switches and adjacent equipment with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.
E. Project Record Documents: Record actual locations of enclosed switches.
F. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

1.08 FIELD CONDITIONS
A. Maintain ambient temperature between -22 degrees F and 104 degrees F during and after installation of enclosed switches.

PART 2 PRODUCTS
2.01 MANUFACTURERS
C. Schneider Electric; Square D Products: www.schneider-electric.us.
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ENCLOSED SAFETY SWITCHES
A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature: Between -22 degrees F and 104 degrees F.
D. Horsepower Rating: Suitable for connected load.
E. Voltage Rating: Suitable for circuit voltage.
F. Short Circuit Current Rating:
   1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
   2. Minimum Ratings:
a. Heavy Duty Single Throw Switches Protected by Class R, Class J, Class L, or Class T Fuses: 200,000 rms symmetrical amperes.

G. Provide with switch blade contact position that is visible when the cover is open.

H. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
   1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.

I. Conductor Terminations: Suitable for use with the conductors to be installed.

J. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

K. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
      b. Outdoor Locations: Type 3R.

L. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

M. Heavy Duty Switches:
   2. Conductor Terminations:
      a. Lug Material: Copper, suitable for terminating copper conductors only.
   3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

N. Provide the following features and accessories where indicated or where required to complete installation:
   1. Hubs: As required for environment type; sized to accept conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive enclosed safety switches.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer’s instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances in accordance with manufacturer’s instructions and NFPA 70.
D. Provide required supports in accordance with Section 26 05 29.
E. Install enclosed switches plumb.
F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
G. Provide grounding and bonding in accordance with Section 26 05 26.
H. Provide fuses complying with Section 26 28 13 for fusible switches as indicated or as required by equipment manufacturer's recommendations.
I. Identify enclosed switches in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS, except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.04 ADJUSTING
A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING
A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.
SECTION 26 29 13
ENCLOSED CONTROLLERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Enclosed NEMA controllers for low-voltage (600 V and less) applications:
   1. Magnetic motor starters.
B. Overcurrent protective devices for motor controllers, including overload relays.
C. Control accessories:
   1. Auxiliary contacts.
   2. Pilot devices.
   3. Control and timing relays.
   4. Control power transformers.
   5. Control terminal blocks.

1.02 RELATED REQUIREMENTS
A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
D. Section 26 28 13 - Fuses: Fuses for fusible switches.

1.03 REFERENCE STANDARDS
B. NECA 1 - Standard for Good Workmanship in Electrical Construction.
C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
D. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts.
E. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
F. NEMA ICS 6 - Industrial Control and Systems: Enclosures.
G. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum).
I. NFPA 70 - National Electrical Code.
J. UL 98 - Enclosed and Dead-Front Switches.
L. UL 60947-4-1 - Low-Voltage Switchgear and Controlgear - Part 4-1: Contactors and Motor-starters - Electromechanical Contactors and Motor-starters.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.
   2. Coordinate the work to provide motor controllers and associated overload relays suitable for use with the actual motors to be installed.
3. Coordinate the work to provide controllers and associated wiring suitable for interface with control devices to be installed.
4. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
5. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
6. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for motor controllers, enclosures, overcurrent protective devices, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of overcurrent protective device upon request.
C. Shop Drawings: Indicate dimensions, voltage, controller sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of enclosed controllers and adjacent equipment with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.
   3. Clearly indicate whether proposed short circuit current ratings are fully rated or, where acceptable, series rated systems.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Project Record Documents: Record actual installed locations of controllers and final equipment settings.
   1. Include nameplate data of actual installed motors and associated overload relay selections and settings.
F. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to internal components, enclosure, and finish.

1.08 FIELD CONDITIONS
A. Maintain field conditions within required service conditions during and after installation.
PART 2 PRODUCTS

2.01 MANUFACTURERS
C. Schneider Electric; Square D Products: www.schneider-electric.us.
D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ENCLOSED CONTROLLERS
A. Provide enclosed controller assemblies consisting of all required components, control power
transformers, instrumentation and control wiring, accessories, etc. as necessary for a complete
operating system.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Description: Enclosed controllers complying with NEMA ICS 2, and listed and labeled as
complying with UL 60947-1 and UL 60947-4-1; ratings, configurations and features as indicated
on the drawings.
D. Service Conditions:
   1. Provide controllers and associated components suitable for operation under the following
      service conditions without derating:
      a. Altitude:
         1) Class 1 Km Equipment (devices utilizing power semiconductors, e.g. variable
            frequency controllers): Less than 3,300 feet.
         2) Class 2 Km Equipment (electromagnetic and manual devices): Less than 6,600
            feet.
      b. Ambient Temperature: Between 32 degrees F and 104 degrees F.
   2. Provide controllers and associated components suitable for operation at indicated ratings
      under the service conditions at the installed location.
E. Short Circuit Current Rating:
   1. Provide controllers with listed short circuit current rating not less than the available fault
      current at the installed location as indicated on the drawings.
F. Conductor Terminations: Suitable for use with the conductors to be installed.
G. Enclosures:
   2. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the
      following installation locations:
      a. Indoor Clean, Dry Locations: Type 1 or Type 12.
      b. Outdoor Locations: Type 3R or Type 4.
   3. Finish: Manufacturer's standard unless otherwise indicated.
H. Instrument Transformers:
   2. Select suitable ratio, burden, and accuracy as required for connected devices.
I. Magnetic Motor Starters: Combination type unless otherwise indicated.
   1. Combination Magnetic Motor Starters: NEMA ICS 2, Class A combination motor
      controllers with magnetic contactor(s), externally operable disconnect and overload
      relay(s).
   2. Configuration: Full-voltage non-reversing unless otherwise indicated.
4. Disconnects: Disconnect switch type.
   a. Disconnect Switches: Fusible type unless otherwise indicated.
   b. Provide externally operable handle with means for locking in the OFF position.
      Provide safety interlock to prevent opening the cover with the disconnect in the ON
      position with capability of overriding interlock for testing purposes.
   c. Provide auxiliary interlock for disconnection of external control power sources where
      applicable.
5. Overload Relays: Bimetallic thermal type unless otherwise indicated.
6. Pilot Devices Required:
   a. Furnish local pilot devices for each unit as specified below unless otherwise indicated
      on drawings.
   b. Single-Speed, Non-Reversing Starters:
      1) Selector Switches: HAND/OFF/AUTO.
      2) Indicating Lights: Red ON, Green OFF.
J. Manual Motor Starters:
   1. Description: NEMA ICS 2, Class A manually-operated motor controllers with overload
      relay(s).
   2. Configuration: Non-reversing unless otherwise indicated.
   3. Fractional-Horsepower Manual Motor Starters:
      a. Furnish with toggle operator.
      b. Overload Relays: Bimetallic or melting alloy thermal type.
      c. Provide means for locking operator in the OFF position.
      d. Furnish Red ON indicating light where not within sight of equipment.
   2.03 OVERCURRENT PROTECTIVE DEVICES
A. Overload Relays:
   1. Provide overload relays and, where applicable, associated current elements/heaters,
      selected according to actual installed motor nameplate data, in accordance with
      manufacturer's recommendations and NFPA 70; include consideration for motor service
      factor and ambient temperature correction, where applicable.
   2. Inverse-Time Trip Class Rating: Class 20 unless otherwise indicated or required.
   3. Trip-free operation.
   4. Visible trip indication.
   5. Resettable.
      a. Employ manual reset unless otherwise indicated.
      b. Do not employ automatic reset with two-wire control.
   6. Bimetallic Thermal Overload Relays:
      a. Interchangeable current elements/heaters.
      b. Adjustable trip; plus/minus 10 percent of nominal, minimum.
      c. Trip test function.
   7. Melting Alloy Thermal Overload Relays:
      a. Interchangeable current elements/heaters.
B. Fusible Disconnect Switches:
   1. Description: Quick-make, quick-break, dead-front fusible switch units complying with
      NEMA KS 1, and listed and labeled as complying with UL 98; ratings, configurations, and
      features as indicated on the drawings.
   2. Fuse Clips: As required to accept indicated fuses.
      a. Where NEMA Class R fuses are installed, provide rejection feature to prevent
         installation of fuses other than Class R.
   3. Provide externally operable handle with means for locking in the OFF position. Provide
      means for locking switch cover in the closed position. Provide safety interlock to prevent
opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

2.04 CONTROL ACCESSORIES
A. Auxiliary Contacts:
   1. Comply with NEMA ICS 5.
   2. Provide number and type of contacts indicated or required to perform necessary functions, including holding (seal-in) circuit and interlocking, plus one normally open (NO) and one normally closed (NC) spare contact for each magnetic motor starter, minimum.
B. Pilot Devices:
   1. Comply with NEMA ICS 5; heavy-duty type.
   2. Pushbuttons: Unless otherwise indicated, provide momentary, non-illuminated type with flush button operator; normally open or normally closed as indicated or as required.
   3. Selector Switches: Unless otherwise indicated, provide maintained, non-illuminated type with knob operator; number of switch positions as indicated or as required.
   4. Indicating Lights: Push-to-test type unless otherwise indicated.
   5. Provide LED lamp source for indicating lights and illuminated devices.
C. Control and Timing Relays:
   1. Comply with NEMA ICS 5.
   2. Provide number and type of relays indicated or required to perform necessary functions.
D. Control Power Transformers:
   1. Size to accommodate burden of contactor coil(s) and all connected auxiliary devices, plus 25 VA spare capacity.
   2. Include primary and secondary fuses.
E. Control Terminal Blocks: Include 25 percent spare terminals.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that ratings of enclosed controllers are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive enclosed controllers.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer’s instructions.
B. Install controllers in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances in accordance with manufacturer’s instructions and NFPA 70.
D. Provide required support and attachment components in accordance with Section 26 05 29.
E. Install enclosed controllers plumb and level.
F. Provide grounding and bonding in accordance with Section 26 05 26.
G. Install all field-installed devices, components, and accessories.
H. Provide fuses complying with Section 26 28 13 for fusible switches as indicated.
I. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
J. Set field-adjustable controllers and associated components according to installed motor requirements, in accordance with manufacturer’s recommendations and NFPA 70.
K. Identify enclosed controllers in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL
   A. See Section 01 40 00 - Quality Requirements, for additional requirements.
   B. Inspect and test in accordance with NETA ATS, except Section 4.
   C. Motor Starters: Perform inspections and tests listed in NETA ATS, Section 7.16.1.1. Tests listed as optional are not required.
   D. Fusible Switches: Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
   E. Correct deficiencies and replace damaged or defective enclosed controllers or associated components.

3.04 ADJUSTING
   A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING
   A. Clean dirt and debris from controller enclosures and components according to manufacturer's instructions.
   B. Repair scratched or marred exterior surfaces to match original factory finish.

3.06 CLOSEOUT ACTIVITIES
   A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

3.07 PROTECTION
   A. Protect installed enclosed controllers from subsequent construction operations.

END OF SECTION
SECTION 26 51 00
INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Interior luminaires.
B. Emergency lighting units.
C. Exit signs.
D. Ballasts and drivers.
E. Lamps.
F. Luminaire accessories.

1.02 RELATED REQUIREMENTS
A. Section 26 05 37 - Boxes.
B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
C. Section 26 27 26 - Wiring Devices: Manual wall switches and wall dimmers.

1.03 REFERENCE STANDARDS
A. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information.
D. NECA 1 - Standard for Good Workmanship in Electrical Construction.
E. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems.
G. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts.
H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility.
I. NFPA 70 - National Electrical Code.
K. UL 924 - Emergency Lighting and Power Equipment.
L. UL 1598 - Luminaires.
M. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
   2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Shop Drawings:
   1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
   2. Provide photometric calculations where luminaires are proposed for substitution upon request.
C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
      a. Include estimated useful life, calculated based on IES LM-80 test data.
      2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IESNA LM-63 standard format upon request.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Operation and Maintenance Data: Instructions for each product including information on replacement parts.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Lenses and Louvers: Two percent of total quantity installed for each type, but not less than one of each type.
G. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION
A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.
B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.
1.08 FIELD CONDITIONS
A. Maintain field conditions within manufacturer’s required service conditions during and after installation.

1.09 WARRANTY
A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
B. Provide min 10 year manufacturer warranty for all LED luminaires, including drivers.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES
A. Furnish products as indicated in luminaire schedule included on the drawings.
B. Substitutions: See Section 01 60 00 - Product Requirements, except where individual luminaire types are designated with substitutions not permitted.

2.02 LUMINAIREs
A. Manufacturers:
   2. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Provide products that comply with requirements of NFPA 70.
C. Provide products that are listed and labeled as complying with UL 1598, where applicable.
D. Provide products listed, classified, and labeled as suitable for the purpose intended.
E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
H. Recessed Luminaires:
I. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
J. Luminaires Mounted in Continuous Rows: Provide quantity of units required for length indicated, with all accessories required for joining and aligning.
K. Extra Materials - General contractor to provide 5 light fixtures (type L1) for attic stock.

2.03 EMERGENCY LIGHTING UNITS
A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.
B. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

C. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

D. Battery:
   1. Size battery to supply all connected lamps, including emergency remote heads where indicated.

E. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.

F. Provide low-voltage disconnect to prevent battery damage from deep discharge.

G. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101 where indicated; provide indicator light(s) to report test and diagnostic status.

H. Accessories:
   1. Provide compatible accessory mounting brackets where indicated or required to complete installation.
   2. Where indicated, provide emergency remote heads that are compatible with the emergency lighting unit they are connected to and suitable for the installed location.

2.04 EXIT SIGNS

A. Manufacturers - Powered and Self-Luminous Signs:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Description: Internally illuminated exit signs with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
   1. Number of Faces: Single or double as indicated or as required for the installed location.
   2. Directional Arrows: As indicated or as required for the installed location.

C. Accessories:
   1. Provide compatible accessory high impact polycarbonate vandal shields where indicated.
   2. Provide compatible accessory wire guards where indicated.

2.05 BALLASTS AND DRIVERS

A. Manufacturers:
   5. Substitutions: See Section 01 60 00 - Product Requirements.
   6. Manufacturer Limitations: Where possible, for each type of luminaire provide ballasts produced by a single manufacturer.

B. Ballasts/Drivers - General Requirements:
   1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
   2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

C. Dimmable LED Drivers:
   1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
   2. Control Compatibility: Fully compatible with the dimming controls to be installed.

### 2.06 LAMPS

A. Manufacturers:
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Lamps - General Requirements:
   1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
   2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
   3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
   4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect to be inconsistent in perceived color temperature.

### 2.07 ACCESSORIES

A. Stems for Suspended Luminaires: Steel tubing, minimum 1/2" size, factory finished to match luminaire or field-painted as directed.

B. Threaded Rods for Suspended Luminaires: Zinc-plated steel, minimum 1/4" size, field-painted as directed.

C. Provide accessory plaster frames for luminaires recessed in plaster ceilings.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

#### 3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

#### 3.03 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 05 37 as required for installation of luminaires provided under this section.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install products in accordance with manufacturer's instructions.
D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Suspended Ceiling Mounted Luminaires:
   1. Do not use ceiling tiles to bear weight of luminaires.
   2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
   3. Secure surface-mounted and recessed luminaires to ceiling support channels or framing members or to building structure.
   4. Secure pendant-mounted luminaires to building structure.
   5. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
   6. In addition to ceiling support wires, provide two galvanized steel safety wire(s), minimum 12 gage, connected from opposing corners of each recessed luminaire to building structure.
   7. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

G. Recessed Luminaires:
   1. Install trims tight to mounting surface with no visible light leakage.
   2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
   3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.

H. Suspended Luminaires:
   1. Unless otherwise indicated, specified mounting heights are to bottom of luminaire.
   2. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
   3. Provide minimum of two supports for each luminaire equal to or exceeding 4 feet nominal length, with no more than 4 feet between supports.
   4. Install canopies tight to mounting surface.

I. Install accessories furnished with each luminaire.

J. Bond products and metal accessories to branch circuit equipment grounding conductor.

K. Emergency Lighting Units:
   1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
   2. Install lock-on device on branch circuit breaker serving units.

L. Exit Signs:
   1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
   2. Install lock-on device on branch circuit breaker serving units.

M. Install lamps in each luminaire.

### 3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.
D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.
E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.05 ADJUSTING
A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect or authority having jurisdiction.
C. Exit Signs with Field-Selective Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

3.06 CLEANING
A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 CLOSEOUT ACTIVITIES
A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
B. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.

3.08 PROTECTION
A. Protect installed luminaires from subsequent construction operations.

END OF SECTION
SECTION 27 10 05
STRUCTURED CABLING FOR VOICE AND DATA - INSIDE-PLANT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Communications system design requirements.
B. Copper cable and terminations.
C. Communications equipment room fittings.
D. Communications outlets.
E. Communications grounding and bonding.
F. Communications identification.

1.02 RELATED REQUIREMENTS

A. Section 07 84 00 - Firestopping.
B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
C. Section 26 05 34 - Conduit.
D. Section 26 05 37 - Boxes.
E. Section 26 05 53 - Identification for Electrical Systems: Identification products.
F. Section 26 27 26 - Wiring Devices.

1.03 REFERENCE STANDARDS

A. EIA/ECA-310 - Cabinets, Racks, Panels, and Associated Equipment.
C. NFPA 70 - National Electrical Code.
D. TIA-568 (SET) - Commercial Building Telecommunications Cabling Standard Set.
E. TIA-568-C.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standards.
F. TIA-569-D - Telecommunications Pathways and Spaces.
G. TIA-606 - Administration Standard for Telecommunications Infrastructure.
H. TIA-606-B - Administration Standard for Telecommunications Infrastructure.
I. TIA-607-C - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises.
J. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications equipment.
   2. Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
C. Evidence of qualifications for installer.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
E. Field Test Reports.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: At least 3 years experience manufacturing products of the type specified.
B. Installer Qualifications: A company having at least 3 years experience in the installation and testing of the type of system specified, and:
   1. Employing a BICSI Registered Communications Distribution Designer (RCDD).
   2. Supervisors and installers factory certified by manufacturers of products to be installed.
C. Products: Listed, classified, and labeled as suitable for the purpose intended.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.
B. Keep stored products clean and dry.

1.08 WARRANTY
A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a 2 year period after Date of Substantial Completion.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Cabling and Equipment:
   1. Panduit: www.panduit.com
   2. MowawhL www.mohawk-cable.com
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SYSTEM DESIGN
A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
   1. Comply with TIA-568 (SET) (cabling) and TIA-569-D (pathways), latest editions (commercial standards).
   2. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607-C and are UL listed or third party independent testing laboratory certified.
   3. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F at relative humidity of 0 to 95 percent, noncondensing.
   4. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors, and other air-handling spaces.
B. System Description:
   1. Provide outlets where indicated on drawings.
C. Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".
2.03 COPPER CABLE AND TERMINATIONS

A. Copper Horizontal Cable:
   1. Description: 100 ohm, balanced twisted pair cable complying with TIA-568-C.2 and listed and labeled as complying with UL 444.
   2. Cable Type - Voice and Data: TIA-568-C.2 Category 6e+ UTP (unshielded twisted pair); 23 AWG.
   3. Cable Capacity: 4-pair.
   4. Cable Applications: Use listed NFPA 70 Type CMP plenum cable unless otherwise indicated.
   5. Cable Jacket Color - Voice and Data Cable: Blue.
   6. Product(s):

B. Copper Cable Terminations: Insulation displacement connection (IDC) type using appropriate tool; use screw connections only where specifically indicated.

C. Jacks and Connectors: Modular RJ-45; high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
   1. Performance: 2500 mating cycles.
   2. Voice and Data Jacks: 8-position modular jack, color-coded for both T568A and T568B wiring configurations.
   3. Product(s): Refer to drawings

2.04 COMMUNICATIONS EQUIPMENT ROOM FITTINGS

A. Copper Cross-Connection Equipment:
   1. Patch Panels for Copper Cabling: Sized to fit EIA/ECA-310 standard 19 inch wide equipment racks; 0.09 inch thick aluminum; cabling terminated on Type 110 insulation displacement connectors; printed circuit board interface.
   2. Patch Panels: Refer to drawings for manufacturer and model(s)
      a. Jacks: Non-keyed RJ-45, suitable for and complying with same standard as cable to be terminated; maximum 48 ports per standard width panel.
      b. Capacity: Provide ports sufficient for cables to be terminated plus 25 percent spare.
      c. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively, comply with TIA-606.
      d. Provide incoming cable strain relief and routing guides on back of panel.

2.05 COMMUNICATIONS OUTLETS

A. Outlet Boxes: Comply with Section 26 05 37.
   1. Provide depth as required to accommodate cable manufacturer's recommended minimum conductor bend radius.
   2. Minimum Size, Unless Otherwise Indicated:
      a. Data or Combination Voice/Data Outlets: 4 inch square by 2-1/8 inch deep (100 by 54 mm) trade size.

B. Wall Plates:
   1. Comply with system design standards and UL 514C.
   2. Accepts modular jacks/inserts.
   3. Capacity: as indicated on drawings

2.06 GROUNDING AND BONDING COMPONENTS

A. Comply with TIA-607-C.
2.07 IDENTIFICATION PRODUCTS
   A. Comply with TIA-606.
   B. Comply with TIA-606-B.
   C. Comply with Section 26 05 53.

2.08 SOURCE QUALITY CONTROL
   A. See Section 01 40 00 - Quality Requirements, for additional requirements.
   B. Factory test cables according to TIA-568.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL
   A. Comply with latest editions and addenda of TIA-568 (cabling), TIA-569-D (pathways), TIA-607-C (grounding and bonding), NECA/BICSI 568, NFPA 70, and SYSTEM DESIGN as specified in PART 2.
   B. Comply with Communication Service Provider requirements.
   C. Grounding and Bonding: Perform in accordance with TIA-607-C and NFPA 70.
   D. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

3.02 INSTALLATION OF PATHWAYS
   A. Install pathways with the following minimum clearances:
      1. 48 inches from motors, generators, frequency converters, transformers, x-ray equipment, and uninterruptible power systems.
      2. 12 inches from power conduits and cables and panelboards.
      3. 5 inches from fluorescent and high frequency lighting fixtures.
      4. 6 inches from flues, hot water pipes, and steam pipes.
   B. Conduit, in Addition to Requirements of Section 26 05 34:
      1. Arrange conduit to provide no more than the equivalent of two 90 degree bend(s) between pull points.
      2. Conduit Bends: Inside radius not less than 10 times conduit internal diameter.
      3. Arrange conduit to provide no more than 100 feet between pull points.
   C. Outlet Boxes:
      1. Coordinate locations of outlet boxes provided under Section 26 05 37 as required for installation of telecommunications outlets provided under this section.
         a. Mounting Heights: Unless otherwise indicated, as follows:
            1) Telephone and Data Outlets: 18 inches above finished floor.
            2) Telephone Outlets for Side-Reach Wall-Mounted Telephones: 48 inches above finished floor to top of telephone.
            3) Telephone Outlets for Forward-Reach Wall-Mounted Telephones: 48 inches above finished floor to top of telephone.
         b. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
         c. Provide minimum of 12 inches horizontal separation between flush mounted outlet boxes installed on opposite sides of fire rated walls.
         d. Unless otherwise indicated, provide separate outlet boxes for line voltage and low voltage devices.
         e. Locate outlet boxes so that wall plate does not span different building finishes.
3.03 INSTALLATION OF EQUIPMENT AND CABLING

A. Cabling:
   1. Do not bend cable at radius less than manufacturer's recommended bend radius; for
      unshielded twisted pair use bend radius of not less than 4 times cable diameter.
   2. Do not over-cinch or crush cables.
   3. Do not exceed manufacturer's recommended cable pull tension.
   4. When installing in conduit, use only lubricants approved by cable manufacturer and do not
      chafe or damage outer jacket.

B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
   1. At Distribution Frames: 120 inches.
   2. At Outlets - Copper: 12 inches.

C. Copper Cabling:
   1. Category 5e and Above: Maintain cable geometry; do not untwist more than 1/2 inch from
      point of termination.
   2. For 4-pair cables in conduit, do not exceed 25 pounds pull tension.
   3. Use T568B wiring configuration.

D. Identification:
   1. Use wire and cable markers to identify cables at each end.
   2. Use manufacturer-furnished label inserts, identification labels, or engraved wallplate to
      identify each jack at communications outlets with unique identifier.
   3. Use identification nameplate to identify cross-connection equipment, equipment racks, and
      cabinets.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Comply with inspection and testing requirements of specified installation standards.
C. Visual Inspection:
   1. Inspect cable jackets for certification markings.
   2. Inspect cable terminations for color coded labels of proper type.
   3. Inspect outlet plates and patch panels for complete labels.
D. Testing - Copper Cabling and Associated Equipment:
E. Final Testing: After all work is complete, including installation of telecommunications outlets,
   and telephone dial tone service is active, test each voice jack for dial tone.

END OF SECTION