PROJECT MANUAL

BUILDING E OFFICE RENOVATIONS

5100 BLACK HORSE PIKE,
MAYS LANDING, NEW JERSEY08330

FOR THE

ATLANTIC CAPE COMMUNITY COLLEGE
5100 BLACK HORSE PIKE,
MAYS LANDING, NEW JERSEY08330

ARCHITECT'S PROJECT NUMBER: 25U012

FOR BID DATE: 09/17/2026
CODE REVIEW: 09/17/2026

spiezle

BUILDING E OFFICE RENOVATIONS

FOR THE

ATLANTIC CAPE COMMUNITY COLLEGE

5100 BLACK HORSE PIKE,

MAYS LANDING, NEW JERSEY08330

ARCHITECTS/PLANNERS:

SPIEZLE ARCHITECTURAL GROUP, INC.

1395 YARDVILLE HAMILTON SQUARE ROAD
SUITE 2A
HAMILTON, NEW JERSEY 08691

21AC00063000

21AI01505400
21AI01674400
21AI01170100
21AI01564200
21AI01046700
21AI01784200

BUILDING E OFFICE RENOVATIONS

FOR THE

ATLANTIC CAPE COMMUNITY COLLEGE
5100 BLACK HORSE PIKE,
MAYS LANDING, NEW JERSEY08330

ARCHITECT'S COMMISSION NUMBER: 25U012

PROCUREMENT AND CONTRACTING REQUIREMENTS

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END OF SECTION 000110

SECTION 000115 - LIST OF DRAWING SHEETS

LIST OF DRAWINGS CONSIST OF THE FOLLOWING CONTRACT DRAWINGS AND OTHER DRAWINGS OF TYPE INDICATED:

LIST OF DRAWINGS

DWG. NO. TITLE CURRENT REVISION

GENERAL

G1.1 COVER

G1.2 NOTES, ABBREVIATIONS, PARTITION TYPES AND LIST OF DRAWINGS

CODE PLANS

LS1.1 LIFE SAFETY PLAN

DEMOLITION

AD1.1 DEMOLITION PLAN

AD1.2 DEMOLITION PLAN

ARCHITECTURAL

A1.1 FLOOR PLAN

A2.0 TOILET ROOM PLANS AND ELEVATIONS

A3.0 ROOF PLAN

A3.1 ROOF PLAN

A4.1 REFLECTED CEILING PLAN AND DETAILS

A5.1 EXTERIOR ELEVATIONS

A7.0 PLAN DETAILS

A8.1 CASEWORK AND EQUIPMENT PLANS AND DETAILS

A8.2 CASEWORK AND EQUIPMENT ELEVATIONS

A9.1 FINISH PLANS AND INTERIOR ELEVATIONS

A9.2 FINISH PLANS AND INTERIOR ELEVATIONS

A9.3 INTERIOR ELEVATIONS

A9.4 INTERIOR ELEVATIONS

A10.1 DOOR AND FRAME SCHEDULES

HEATING, VENTILATION, AND AIR CONDITIONING

M0.0 MECHANICAL GENERAL NOTES, ABBREVIATIONS AND LEGEND

MD1.0 MECHANICAL DEMOLITION PARTIAL FLOOR PLAN

MD1.1 MECHANICAL DEMOLITION PARTIAL FLOOR PLAN

M1.0 MECHANICAL NEW WORK PARTIAL FLOOR PLAN

M1.1 MECHANICAL NEW WORK PARTIAL FLOOR PLAN

M2.0 MECHANICAL NEW WORK PARTIAL FLOOR PLAN

M3.0 MECHANICAL FLOW DIAGRAMS

M4.0 MECHANICAL SCHEDULES

M5.0 MECHANICAL DETAILS

PLUMBING

P0.0 PLUMBING GENERAL NOTES, ABBREVIATIONS AND LEGEND

PD1.0 PARTIAL FLOOR PLAN - DOMESTIC WATER - AREA 'E' DEMOLITION

PD1.1 PARTIAL ROOF PLAN - PLUMBING AREA 'E' DEMOLITION

P1.0 PARTIAL FLOOR PLAN - DOMESTIC WATER - AREA 'E' NEW WORK

P1.1 PARTIAL ROOF PLAN - PLUMBING NEW WORK

P3.0 PLUMBING RISER DIAGRAM - DEMOLITION

P3.1 PLUMBING RISER DIAGRAM - NEW WORK

P4.0 PLUMBING DETAILS

ELECTRICAL

E0.0 ELECTRICAL GENERAL NOTES, ABBREVIATIONS AND LEGEND

ED1.0 ELECTRICAL DEMOLITION PARTIAL FLOOR PLAN

E1.0 ELECTRICAL PARTIAL NEW WORK FLOOR PLAN

FIRE SUPPRESSION

FP0.0 FIRE PROTECTION GENERAL NOTES, ABBREVIATIONS AND LEGEND

FPD1.0 PARTIAL FLOOR PLAN - FIRE PROTECTION - DEMOLITION

FA1.1 FIRE ALARM PARTIAL FLOOR PLANS - DEMOLITION AND NEW WORK

THE ARCHITECT MAY FURNISH ADDITIONAL DRAWINGS AS MAY BE REQUIRED FOR FURTHER EXPLANATION OF DETAILS FOR WORK UNDER THIS CONTRACT, BUT THESE DRAWINGS WILL NOT INCLUDE SHOP DRAWINGS. SHOP DRAWINGS SHALL BE COMPLETED AND SUBMITTED FOR ARCHITECT'S REVIEW FOR COMPLIANCE WITH

THE CONTRACT DOCUMENTS PRIOR TO THE STARTING OF WORK BY THE CONTRACTOR, AS SPECIFIED HEREIN.

END OF SECTION 000115

LEGAL NOTICE TO BIDDERS

NOTICE IS HEREBY GIVEN that Atlantic Cape Community College is accepting electronic sealed bids for:

Bid No. 1884 – Building E Office Renovations

Bid Posting Date: September 17, 2026

Pre-Bid Walkthrough: September 25, 2026, at 10:00 AM in STEM Building Room S201

Questions Due: September 30, 2026, by 2:00 p.m.

Final Addendum Issued: October 8, 2026

Electronic Bid Opening: October 20, 2026 at 11:00AM Prevailing Time.

Place: J Building, Room J206
Atlantic Cape Community College
Mays Landing Campus
5100 Black Horse Pike
Mays Landing, NJ 08330

Bid documents and specifications may be obtained and bids shall be submitted electronically through the College's Bonfire eProcurement Portal at **https://atlanticcape.bonfirehub.com**. No paper bids will be accepted.

Each bid shall be accompanied by the bid security, consent of surety, and all other documents required by the bid specifications. Failure to submit all required documentation may result in rejection of the bid as non-responsive.

Bidders shall comply with the County College Contracts Law, N.J.S.A. 18A:64A-25.1 et seq., the New Jersey Prevailing Wage Act, N.J.S.A. 34:11-56.25 et seq., the Public Works Contractor Registration Act, N.J.S.A. 34:11-56.48 et seq., the Business Registration Act, N.J.S.A. 52:32-44, the New Jersey Division of Property Management and Construction classification requirements, and all other applicable federal and State statutes, rules, and regulations. This project is subject to a Project Labor Agreement.

Bidders shall comply with the requirements of N.J.S.A. 10:5-31 and N.J.A.C. 17:27 concerning affirmative action.

No bidder may withdraw its bid for a period of sixty (60) days after the date of bid opening.

Atlantic Cape Community College reserves the right to reject any or all bids, to waive informalities where permitted by law, and to make such award as is in the best interest of the College in accordance with the County College Contracts Law.

Lindley Thacker

Director of Purchasing

SECTION 002113 - INFORMATION FOR BIDDERS

A. GENERAL TERMS

1. All papers bound or attached to these bid documents are a necessary part hereof. All bids are submitted subject to the requirements and conditions in the bidding documents.
2. Proposals for the Contracts as listed in the Public Notice as hereinafter described will be received for the performance of the Project. The bids shall cover all cost of any nature, incident to and growing out of the Work. In explanation but no in limitation thereof, these costs shall include the cost of all work, labor, materials, equipment, transportation and cost of all else necessary to perform and complete the Project in the manner and within the time required, all incidental expenses in connection therewith, all costs on account of loss by damage or destruction of the Project to the extent that the cost of such loss is not recovered from insurance carried by the Owner and the Contractor, and any additional expenses for unforeseen difficulties encountered, for settlement of damages and for replacement of defective work and materials.
3. Authority of Atlantic Cape Community College. On all questions concerning the interpretation of specifications; the acceptability of quality of materials or items furnished and work performed; the execution of the work; and the determination of payment due or to become due, the decision of the Atlantic Cape Community College Board of Trustees shall be final and binding.
4. Bid Documents and Electronic Submission of Bids. Bid specifications, drawings, addenda, and all related solicitation documents may be accessed through Atlantic Cape Community College's Bonfire eProcurement Portal at: https://atlanticcape.bonfirehub.com

   All bids must be submitted electronically through the College's Bonfire eProcurement Portal by the date and time specified in the Legal Notice. Bidders are responsible for registering with Bonfire, completing all required submission fields, uploading all required bid forms and documentation, and completing their electronic submission prior to the bid closing deadline.

   Bidders are responsible for allowing sufficient time to upload all required documents and complete their submission. A bid will not be considered submitted until the electronic submission process has been successfully completed through Bonfire.

   Physical, paper, mailed, hand-delivered, emailed, or faxed bids will not be accepted. Bids received outside of the Bonfire eProcurement Portal will not be considered.

   Bidders requiring technical assistance with the Bonfire platform should utilize the technical support resources available through the Bonfire portal. Questions concerning the bid specifications or solicitation requirements must be submitted through the Bonfire portal's designated public message board by the deadline established in the bid documents.

   Late submissions will not be accepted. It is solely the bidder's responsibility to ensure that its complete bid is successfully submitted through Bonfire prior to the stated bid opening date and time.

5. Withdrawal of Bids. Any bid may be withdrawn prior to the scheduled time for opening bids or the authorized postponement thereof. No bidder may withdraw a bid within 60 days after the actual date on which it is opened.

6. Qualifications of Bidder. The College may make such investigation as it deems necessary to determine the ability of the bidder to perform the terms of the contract, and the bidder shall furnish the College all the information for this purpose which the College may request. The College reserves the right to reject any bid if its investigation of the bidder reveals that, in the opinion of the College, the bidder is not properly qualified to carry out the obligations of the contract and complete it as outlined herein.

7. Bidding Contractors must be pre-qualified as either "C008 General Construction" or "C009 General Construction / Alterations and Additions". Each bid must be accompanied by an affidavit so certifying.

8. Subcontracts. Each bidder is hereby advised that any person, firm or other party to whom it is proposed to award a sub-contract under the bidder's contract must be acceptable to the College. Evidence of sub-contractor performance security must be submitted with the bid. Subcontractor's performance security can be provided by the Contractor or Subcontractor. All other certifications required of the bidder must also be obtained from any sub-contractor and furnished to the College prior to commencement of work. If Contractor intends and is licensed to also executing plumbing and gas fitting work; heating and ventilating systems and equipment; electrical work; structural steel and ornamental iron work, as applicable to project's scope of work, this must be noted on subcontractor identification form (004336).

9. Under the County College Contracts Law, N.J.S.A. 18A:64A-25.25, all bids submitted shall set forth the name or names of, and evidence of performance security from, all subcontractors to whom the bidder will subcontract the work for general construction, plumbing and gas fitting work, heating and ventilating systems and equipment, or electrical work, or structural steel and ornamental iron work.

10. Interpretations, Clarifications and Addenda. Should any bidder find what appears to be an ambiguity, discrepancy or omission in any of the documents, the bidder shall at once notify the College which will determine whether written interpretations should be sent to all bidders. Every request for interpretation shall be addressed in writing to the College and, to be given consideration, must be received at least nine business days prior to the date fixed for the opening of bids. All such interpretations and supplemental instructions will be issued in the form of written clarifications or addenda which will become part of the contract; and all such interpretations and supplemental instructions will be posted through the Bonfire portal to all prospective bidders on the public notices message board furnished for such purposes not later than seven business days prior to the date fixed for the opening of bids. The failure of any bidder to receive any such addendum or interpretation shall not relieve any such bidder from any obligation under this bid as submitted. No oral interpretations will be made to any Bidder as to the meaning of the drawings and specifications.
    Addenda shall take precedence over the original drawings and specifications insofar as the definition, interpretation and intent of the Work are concerned. With the list of addenda, the order of precedence will be in ascending order of addenda numbering.

11. In the event of inclement weather, the College maintains the right to reschedule the bid opening.

12. New Equipment. All equipment, supplies and materials for which bids are requested shall be new, unless otherwise specified.

13. Obligation of Bidders. All bidders will be presumed to be familiar with the plans and specifications, notice to bidders, and all documents included in the bid documents including all addenda; and to have inspected the site. In addition, all bidders must inform themselves fully of the conditions relating to performance of the contract, any construction involved and the

employment of any labor thereon. Failure to do any of the foregoing will not relieve any bidder of any obligation with respect to the bid as submitted and/or contract.

14. Waiver of Informalities/Rejection of Bids. The College may consider informal any bid not prepared and submitted in accordance with the bid documents and may waive any informalities; or it may for any reason reject any and all bids.

15. Site Visits. Should any potential bidders wish to access the building site, access can be arranged by contacting:

    Michael Tolson
    Email: mtolson@atlanticcape.edu
    Phone: 609-331-6811 (M-F 7:00 AM - 3:00 PM)

B. APPLICABLE LAWS AND REGULATIONS

1. Bidders on service contracts, or on equipment which require installation by the contractor, are advised that the provisions of P.L. 1963, c. 150 (New Jersey Prevailing Wage Act) will apply to and be part of the contract. For job categories not covered under prevailing wage rates, bidders are required to pay to workers at least the legally established minimum wage at all times during the contract period.

2. Bidders are required to comply with the affirmative action requirements of P.L. 1975, c. 127 {NJAC 17:27}. For construction contracts, the successful vendor must submit State of New Jersey Form AA-201 (Initial Manning Report) and subsequent ongoing Manning Reports.

3. All equipment supplied to Atlantic Cape Community College and all installation work performed at Atlantic Cape Community College must comply with PEOSHA regulations and meet PEOSHA standards.

4. The successful bidder is required to keep informed of and to comply with all authorities having jurisdiction over the subject matter of the contract. The Contractor shall secure and pay for any and all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the work which are customarily secured after execution of the Contract, and which are legally required at the time bids are received.

5. Construction Contracts: Each bidder shall be pre-qualified in accordance with the standards of the New Jersey Department of the Treasury, Department of Building and Construction (N.J.A.C. 17:19-2.1 et. seq.), and shall submit with the bid a copy of the current Notice of Classification and Total Amount of Uncompleted Contracts.

6. State of New Jersey – Laws of 1977 Chapter 33: Conflict of Interest: No corporation or partnership shall be awarded any contract or shall any agreement be entered into for the performance of any work or the furnishing of any materials or supplies, the cost of which is to be paid with or out of any public funds, by the State, or any county, municipality or school district, or any subsidiary or agency of the State, or of any county, municipality or school district, or by any authority, board, or commission which exercises governmental functions, unless prior to the receipt of the bid or accompanying the bid of said corporation or said partnership, there is submitted a statement setting forth the names and address of all stockholders in the corporation or partnership who own 10% or more of its stock, or any class or of all individual partners in the partnership who own a 10% or greater interest therein, as the case may be. If one or more such stockholder or partner is itself a corporation or partnership, the stockholders holding 10% or more of that corporation's stock, or the individual partners owning 10% or greater interest in that partnership, as the case may be, shall also be listed. The disclosure shall be continued until names

and addresses of every non-corporate stockholder and individual partner exceeding the 10% ownership criteria established in this act has been listed.

7. Americans with Disabilities Act (A.D.A.) Equal Opportunity for Individuals with Disability: The Contractor and the County College do hereby agree that the provisions of Title II of the Americans With Disabilities Act of 1990 (the "ACT") (42 U.S.C. S12101 et seq.) which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant thereunto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the County College pursuant to this contract, the Contractor agrees that the performance shall be in strict compliance with the Act.

8. Construction Contracts: Required Contractor Registration for Public Works Projects: “The Public Works Contractor Registration Act” (P.L. 1999, c.238), effective April 11, 2000, requires that all contractors and subcontractors must be registered with the New Jersey Department of Labor in order to bid on or engage in any contract for public work. Bidders must include evidence of registration, i.e. certificate from the Department of Labor indicating compliance, or copy of application for registration.

9. The College requires that the contractor demonstrate a safety and health program/plan referencing first aid, fire protection, housekeeping, illumination, sanitation, personal protective equipment, medical, exits and emergency action plans. This document will be site specific for inspection and training and will serve to communicate these work practices to all project contractors.

10. Business Registration Certificate, P.L. 2009, c.315: Effective September 1, 2004, N.J.S.A. 52:32-44 requires mandatory “Business Registration” for any vendor doing business in the State of New Jersey. A copy of the Business Registration Certificate issued by the New Jersey Department of Treasury / Division of Revenue shall be provided with the Bid submission. Please contact New Jersey Department of Treasury / Division of Revenue with any questions or concerns at (609) 292-1730.

    Pursuant to N.J.S.A. 54:49-4.1, a business organization that fails to provide a copy of a business registration, or that provides false business registration information, shall be liable for a penalty of $25 for each day of violation, not to exceed $50,000 for each business registration copy not properly provided under a contract with a contracting agency.

11. Record Retention: N.J.A.C. 17:44-2.2 requires that the selected vendor shall maintain all documentation for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

12. Political Contributions: Any business entity making a contribution of money or any other thing of value, including an in-kind contribution, or pledge to make a contribution of any kind to a candidate for or the holder of any public office having ultimate responsibility for the awarding of public contracts, or to a political party committee, which has received in any calendar year $50,000 or more in the aggregate through agreements or contracts with a public entity, shall file an annual disclosure statement with the New Jersey Election Law Enforcement Commission, established pursuant to section 5 of P.L 1973, c83 (C. 19:44A-5), setting forth all such contributions made by the business entity during the 12 months prior to the reporting deadline.

C. PREPARATION OF BIDS

1. All bids shall be made on the Bid Form which is included in the bid documents. All blanks on the Bid Form must be appropriately filled in with cost amounts. Any alterations or erasures must be initialed by the bidder. Bid prices must be in ink or typewritten, in both words and figures. No conditions, limitations or provision may be placed on a bid.

2. Each bid must give the full business address of the bidder and be signed by the bidder with his/her usual signature. Bids (including all required supporting documents) by partnerships must be signed with the partnership name by one of the members of the partnership or by an authorized representative, followed by the signature and title of the person signing. Bids, including all required supporting documents, by corporation must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and title of the president, secretary, or other person authorized to bind it in the matter. The name of each person signing shall also be typed or printed below the signature. A bid by a person who affixes to his/her signature the word "president," "secretary," "agent," or other title without disclosing his/her principal, may be held to be the bid of the individual signing. When requested by the College, satisfactory evidence of the authority of the officer signing in behalf of a corporation shall be furnished.

3. Prices should include a sufficient amount to cover the cost of any and all work or material called for in addenda to the specifications or other instructions issued during the bidding period. Such additions shall automatically become a part of the contract.

4. Prices quoted shall include freight or other charges incidental to the delivery of the item bid upon.

5. Alternate Bids and Unit Prices for the various portions of the Work or Contracts shall be as stated in other Sections of the Specifications.

6. Attention is called particularly to the requirements for filling in all Alternate Bids called for on the Proposal Form, as the Owner reserves the right to award a Contract based upon the possible inclusion of one or more such Alternate Bids. The amounts of the Alternate Bids shall include any and all modifications to related, adjacent or surrounding work made necessary by use of such Alternate Bids. The Alternate Bids must be stated as additions to or deductions from the Base Bid, unless otherwise noted.

7. The term “No Bid” shall not be used with respect to Alternate Bids requested on the Proposal Form. The Bidder who does not desire to make a change from the Base Bid under a particular Alternate Bid shall so indicate by using the words “No Change”. Failure to bid or use of the term “No Bid” on any Alternate may cause rejection of an entire bid.

8. Conditions, limitations or provisos attached by the Bidder to the Proposal may cause its rejection.

9. The College is established under the authority of the State of New Jersey and is entitled to exemption from Federal, State and local taxes, including the New Jersey Sales Tax. No amount attributable to taxes should be included in bid prices.

10. When a catalog reference follows the description of any item in the specifications, it is intended as a means of more fully describing the item in the shortest possible space and is to be regarded as part of the description of the item. Catalog numbers have been adopted from their respective sources for purposes of identification and to establish minimum requirements for quality and design. The College will consider products of manufacturers which are equal in quality and design to the items specified if such products in all ways meet the specifications. The decision of the College as to whether an alternate or substitute is in fact equal shall be final.

    After Award of Contract, any time and materials expended by the Architect and his engineers for the review of any substitutions will be charged back to Contractor in the form of Change Order.

11. Bids shall be submitted as one complete electronic submission containing all required forms and supporting documentation through Bonfire. Proposal Forms shall not be altered or added to in any way. Lump sum bid or base bid prices shall be filled in, in both words and figures. In case of discrepancy, the amount described in words shall govern.

    a. Form of Bid Proposal (Bid Form, Section 004113 Form).

    b. Certified Check or Form of Bid Bond (Section 004313 Form).

    c. Surety Disclosure Statement and Certification (Form of Proposition of Surety) (Section 004316 Form) and evidence of performance security from the prime bidder all subcontractors to whom the bidder will subcontract the work.

    d. Consent of Surety for prime bidder and/or all subcontractors to whom the bidder will subcontract the work at the time of the bid submittal (Section 004319). Note, if the General Contractor's Consent of Surety covers any or all subcontractors, then the Consent of Surety is not required for subcontractors who are covered by the General Contractor's Consent of Surety. General Contractor to provide proof at the time of bid.

    e. Subcontractor's Identification Form (Section 004336 Form).

    f. Prevailing Wage Compliance Declaration (Section 004343 Form).

    g. Hold Harmless Agreement (Section 004363 Form).

    h. Site Visit Verification (Section 004373 Form).

    i. Affidavit of Non-Collusive (Section 004519 Form), pursuant to N.J.S.A. 52:34-15.

    j. Stockholder Disclosure Certification (Section 004530 Form).

    k. No Material Change of Circumstances Affidavit (Section 004535 Form). Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal.

    l. Affirmative Action Language: Exhibit B and Affirmative Action Acknowledgment (Section 004536 Form).

    m. Disclosure of Investment Activities in Iran (Section 004540 Form).

    n. Bidder's Certification Regarding Debarment / Disqualification / Suspension (Section 004541 Form).

    o. Certification of Non-Debarment for Federal Government Contracts (Section 004542 Form).

    p. Disclosure of Purchasing Support for Russian Federation or Belarusian Owned Companies (Section 004545 Form).

    q. Contractor's Equipment Certification (Section 004550 Form).

    r. Notarized State of New Jersey Form (DBC 701) noting total amount of uncompleted contracts. Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal. This form may be obtained from the New Jersey Department of Treasury website under the Division of Property Management and Construction, Division Pages, Forms.

    s. Certificate by the Department of Labor indicating compliance with "The Public Works Contractor Registration Act" (P.L. 1999, c.238) for compliance with this Act. Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal.

t. Proof of valid DPMC NOTICE OF CLASSIFICATION, as issued by the State of New Jersey, Department of Treasury, Division of Property Management and Construction (DPMC). Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal.

u. Contractor or Trade License required under applicable New Jersey Law for any trade or specialty area (applicable to plumbing, mechanical and electrical trades).

D. METHOD OF AWARD

1. Notification of the acceptance of the bid and award of the contract will be made as soon as practical after the opening of the bids. Contract will be awarded after due consideration of all factors relevant to the bidder's responsibility as well as the price, so that the College, consistent with law, will gain the advantage of a contract which in its judgment will best serve the interests of the College and the public.
2. Award made to a Bidder not a resident of the State of New Jersey is conditioned upon Bidder designating a proper agent in the State of New Jersey on whom service can be made in the event of litigation.
3. If the successful Bidder is a corporation not organized under the laws of New Jersey, the award of contract and payment of consideration there under shall be conditioned upon Corporation promptly filing a certificate of doing business in the State of New Jersey pursuant to N.J.S.A. 14A:13-2 and complying with provisions of N.J.S.A. 14A:13-4.
4. In accordance with N.J.S.A. 40A:11-1, when alternates bids are requested by the contracting unit and included as part of the contract bid package, the College intends to award the alternates bids in the order of ranking indicated, starting with alternate Bid AB-1.
5. The determination of responsive, lowest bidder shall be made by the College based upon the verification that a submitted bid package is complete, the price of the base bid, along with the price indicated for the alternate bids that are accepted by the College.
6. In accordance with N.J.S.A. 18A:64A-25.20, whenever two or more bids of equal amounts are the lowest bids submitted by responsible bidders, the Owner may award the Contract to any one of such bidders as in its discretion it may determine.
7. Within 10 days after the giving of the Notice of Award, the successful Bidder shall be required to execute the Contract with the College. The form of agreement shall be the AIA A101-2017 edition, Standard Form of Agreement between Owner and Contractor, used with the A201-2017 edition, General Conditions of the Contract for Construction.
8. Bidder acknowledges that this bid and the award of a contract are governed by the County College Contracts Law N.J.S.A. 18A:64A-25.1 et. seq. and that any legal challenges to the bidding process, the award or non-award of a contract, or the rejection of any bids, must be pursued before the Board of Trustees in accordance with P.L. 1994 Ch.48, Sec.6(f). The challenge or objection must be presented by filing a petition with the secretary of the Board of Trustees within ten (10) calendar days of the decision to award or not award a contract. Proceedings on the petition shall be governed by the Rules Governing Hearings before the Board of Trustees of Atlantic Cape Community College, which rules may be obtained at the office of the Dean of Administration and Business Services.

E. BID SECURITY

1. Each bid must be accompanied by:

   a. a certified check, or a cashier's check of the bidder in the amount of 10% of the base bid amount made out to "Atlantic Cape Community College," or

   b. a bid bond made payable to the College prepared and duly executed by the bidder as principal, having as a surety thereon a surety company approved by the College in the amount of 10% of the total amount of the bid.

2. The surety company on a bid bond must be acceptable to the College, authorized to transact business in New Jersey, and must be named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. Where an attorney-in-fact has signed the bid bond, a certified and effectively dated copy of the power of attorney must be presented with the bond.

3. Pursuant to N.J.S.A. 18A:64A-25:18, the checks or bid bonds of all except the three lowest bidders will be returned, if requested, after ten days from opening of bids, Sundays and holidays excepted. Within three days after the award of contract and the approval of the Contractor's performance payment bond, the bid security of the remaining unsuccessful bidders will be returned, if requested, Sundays and holidays excepted.

4. The bid security of the successful bidder shall be forfeited and retained as liquidated damages if he/she neglects or refuses to execute the contract and, where applicable, furnish a performance/payment bond within ten (10) days after notice of the award of the contract. Acceptance of forfeiture by the College shall not limit the remedies available to the College upon default, and it may recover full damages including Alternate Bids, which the Owner wishes to accept and that amount for which the Owner is obligated on award to another Bidder, in addition thereto in accordance with law.

5. The proposal guarantee shall similarly be forfeited as liquidated damages if the qualification Questionnaire or Bid Affidavit required to be submitted contains a false, deceptive or fraudulent statement.

F. PERFORMANCE/PAYMENT BOND

1. Pursuant to N.J.S.A. 18A:64A-25.17, Proposals shall be accompanied by a Performance Security in form as bound in these documents, assuring that satisfactory arrangements have been made between the surety and the Bidder by which surety agrees to furnish the Bidder with a Performance Bond and Maintenance Bond to include Surety Disclosure Statement and Certification in form as bound herein. The Performance Security shall be executed by an approved surety company authorized to do business in the State of New Jersey or by the individual if an individual surety is offered by the bidder.

2. Pursuant to N.J.S.A. 18A:64A-25.25, Bidders submitting proposals for this Contract shall include Performance Security in form as bound in these documents, as hereinbefore specified.

3. The Bidder to whom the Contract has been awarded shall, within ten (10) days after notification of award of contract, furnish and deliver a Performance and Payment Bond, equal to one hundred percent (100%) of the Contract Amount. If, at any time after execution and approval of a Contract and Performance-Payment Bond required by the Contract, such Bond shall cease to be adequate security for the Owner, the Contractor shall, within five (5) days after such notice to do so, furnish a new or additional Bond, inform sum and signed by such sureties as shall be

satisfactory to the Owner. No further payment shall be deemed due nor shall any further payment be made to the Contractor unless and until such new or additional Bond be furnished and approved. Surety must be authorized to do business in the State of New Jersey.

4. Each bidder must submit with his bid a certificate from a surety company that it will provide the bidder with the bond described in paragraph F.3.

5. The surety company on a performance/payment bond must be acceptable to the College, must be authorized to transact business in New Jersey, and must be named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. The surety shall comply with all provisions of N.J.S.A. 18A:64A-25.17(c) et. seq. Evidence of compliance must be submitted in the form of the "Surety Disclosure Statement and Certification" which must be included with the bid. Failure to submit this statement will result in rejection of the bid.

6. Where an attorney-in-fact has signed the performance/payment bond, a certified and effectively dated copy of the power of attorney must be presented with the bond.

7. Prior to the start of the guarantee period and before the final payment is made, the Contractor shall provide the Owner with a Maintenance Bond in the amount stipulated in Section 006119, to insure the replacement or repair of defective materials or workmanship during the one-year guarantee period.

8. The cost of all Bonds shall be paid for by the Contractor.

9. Attorneys-in-fact who sign Bid Bonds, Performance-Payment Bonds, Maintenance Bonds and Performance Security forms must accompany each bond or proposition with a certified and effectively dated copy of their power-of-attorney.

G. PERFORMANCE OF CONTRACT

1. Failure of a bidder to execute a contract awarded to him/her, or to comply with any or all of the terms and conditions thereof, may disqualify him/her from receiving future contracts. Such disqualification or the failure to disqualify shall not limit the remedies available to the College upon default and it may recover full damages in addition thereto in accordance with law.

2. Insofar as possible and if applicable, the successful bidder in carrying out the contract must employ such methods or means as will not cause any interruption of, or interference with, the work of any other contractor or any of the customary operations of the College.

3. Bidders shall acquaint themselves with the conditions to be found at the College and shall assume all responsibility for the performance of the contract. The College will not accept deliveries for contractors.

4. Successful bidders will guarantee:

   a. to furnish adequate protection for all work and to repair damage of any kind for which they or their agents or employees are responsible;

   b. to carry adequate insurance, as required by General and Supplementary Conditions, to protect the College from any and all claims on behalf of any person, firm or corporation arising out of any action or work performed by the successful bidders or their agents, or employees relating to the performance of the contract.

5. Indemnification.

a. The successful bidder shall indemnify and hold harmless the College and its agents and employees from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from the performance of the contract, provided that any such claim, damage, loss or expense

1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom, and

2) is caused in whole or in part by any negligent act or omission of the successful bidder, any subcontractor of the successful bidder, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

b. With respect to claims against the College by an employee of the successful bidder, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable the indemnification obligation under this paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the successful bidder or any subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

c. The College may deduct amounts due to it under paragraph H.6 of this document from any sum or sums which may be due to the successful bidder under the contract.

6. The College agrees to make payment for the performance of the contract, subject to additions and deductions, within 60 days after performance has occurred and been found in compliance with the contract. Title to all supplies, materials and equipment shall pass to the College at the time of said payment.

7. Neither the final certificate of payment nor any provision in the bid documents or contract nor partial or entire use of the equipment, supplies or services by the College shall constitute an acceptance thereof if not in accordance with the specifications and other documents included in the Bid, nor relieve the successful bidder of liability in respect to any express warranties or for faulty materials or workmanship. The successful bidder will agree to promptly remedy, without cost to the College, any defect which shall appear within a period of one year from the date of final acceptance if a standard manufacturer's warranty does not apply, unless a longer period is specified or allowed by the manufacturer. The College will give notice of observed defects with reasonable promptness.

8. The work is to be completed as per the schedule indicated in Specification Section 011000 Summary.

H. INSURANCE

1. Before commencing the work, each Contractor shall procure and maintain until completion and final acceptance of the work and shall cause each subcontractor to so procure and maintain, at least the following insurance:

a. Worker's Compensation and Employer's Liability. Worker's Compensation (statutory limits) and Employer's Liability Insurance with a limit of $500,000.00 covering each and every worker employed in connection with the work under contract, as provided for in each and every State and Federal statute applicable to Worker's Compensation.

b. Comprehensive General Liability. Comprehensive General Liability Insurance covering work under the contract (including premises/operations, products/completed operations,

independent contractors, personal injury, broad form property damage and contractual liability coverage) with at least the following limits:

1) Bodily Injury and Personal Injury: $1,000,000.00 per occurrence.

2) Property Damage: $1,000,000.00 per occurrence.

c. Comprehensive Auto Liability. Comprehensive Auto Liability insurance covering all owned, hired and non-owned vehicles with at least the following limits of liability:

1) Bodily Injury: $1,000,000.00 per occurrence.

2) Liability: $1,000,000.00 per occurrence.

3) Property Damage Liability: $1,000,000.00 per occurrence.

2. Excess Liability Limits. Excess Liability coverage for personal injury and property damage shall be provided by the Contractor with a minimum limit of liability of $5,000,000.00.

3. Contractors may carry whatever additional insurance deemed necessary to protect themselves against hazards not covered by the Owner's Property Insurance, including coverage for theft, collapse, water damage, materials and equipment stored on site, and for materials and equipment stored off site, and against loss of owned or rented equipment and tools owned by mechanics or any tools, equipment, scaffolding, staging, towers and forms owned or rented by the Contractor, the value of which is not included in the cost of the work. Owner's "All Risk" Insurance does not cover theft of material unless installed and made an integral part of the building.

4. Subcontractors: Contractors shall require all their subcontractors to provide the aforementioned coverage as well as any other coverage that the Contractors may consider necessary and any deficiencies in their coverage and policy limits will be the sole responsibility of the contractors.

5. Certificates of Insurance. Before commencing operations, Contractor shall furnish to Owner a Certificate of Insurance evidencing:

a. The required coverage and limits written through an insurance company or companies acceptable to the Owner.

b. The effective and expiration dates of the policies.

c. Thirty (30) days written notice of cancellation or material change in any policies.

d. That a Waiver of Subrogation endorsement has been attached to all policies.

e. The fact that the Contractor's policies are primary insurance.

f. The contract number.

g. That Atlantic Cape Community College and their agents, and the Architect and their agents, are listed as additional insured.

6. Waiver of Subrogation: All insurance policies of the Contractor will be endorsed to waive all right of subjugation against the Owner.

7. The Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five (5) days after the occurrence of the loss to the Owner's exercise of this power. The Owner as trustee shall, in that case, make settlement with the insurer.

8. Cancellation, Reduction, or Non-Renewal: If the insurance policies required herein are cancelled, or the coverage is reduced below the minimum specified, or expiration without renewal occurs

before completion of the work, the Owner, at this option, may obtain the said certificates or policies, and charge the cost against money due the Contractor pursuant to the terms of this contract.

9. Builder's Risk Insurance: The Contractor shall be required to secure and maintain Builder's Risk Insurance for the project. Refer to Specification Section 006230 Supplementary Conditions for additional information.

I. UNION LABOR

1. Atlantic Cape Community College encourages Union Labor participation on all construction projects, and encourages bidders to contact the local labor union representatives to discuss the potential for the inclusion of union labor on projects.

END OF SECTION 002113

SECTION 004113 - FORM OF PROPOSAL (BID FORM)

PROPOSAL OF _____ hereinafter called "BIDDER," a/an

☐ corporation

☐ partnership (check applicable term)

☐ individual

organized and existing under the laws of the State of _____and doing business

as _____.

Bidder's Address: _____

_____

_____

Bidder's Phone Number: _____

TO: BOARD OF TRUSTEES OF ATLANTIC CAPE COMMUNITY COLLEGE
5100 Black Horse Pike
Mays Landing, New Jersey 08330 (hereinafter called College.")

Members of the Board:

1. The bidder, in compliance with your Legal Notice inviting bids for the Bid of the BUILDING E OFFICE RENOVATIONS, located at 5100 Black Horse Pike, in Mays Landing, New Jersey for the Atlantic Cape Community College, having examined the specifications, drawings, various forms and related contract documents and the site of the proposed work and being familiar with all the conditions surrounding the proposed contract or the proposed construction, including the availability of materials and labor, hereby proposes to furnish and/or install the equipment, labor, materials and supplies and/or to construct the project in accordance with all the aforesaid documents within the time set forth therein and at the prices stated below. These prices are to cover all expenses incurred in supplying and/or installing the materials and equipment or performing the work required by the Bid of which this Bid Form is a part.

2. The bidder acknowledges receipt of the following Addenda:

Addendum No._____ Dated: _____

Addendum No._____ Dated: _____

Note: Failure to acknowledge all issued Addenda is a material defect to the bid.

Prime Bidders shall be DPMC Classified for trades C008 (General Construction) or C009 (General Construction/Alterations and Additions). Provide proof of valid DPMC Notice of Classification, Total Amount of Uncompleted Contracts, (Form DBC-701), the Certification of No Material Adverse Change in Status Affidavit, Proposition of Surety, Consent of Surety and Trade License (when applicable) for the prime

bidder and the listed subcontractors at the time of the bid submittal. Provide all subcontractor information per 18A:64A-25.25.

3. The bidder agrees to deliver and/or install the materials and equipment and complete the project as described in the contract documents for the following amount.

4. The bidder understands that the College reserves the right to reject for any reason any and all bids and to waive any informalities in the bidding.

5. The bidder agrees that this bid shall be good and may not be withdrawn for a period of 60 days after the actual opening of the bids.

6. Within 10 days after receipt of written notice of acceptance of this bid and the award of the contract, the bidder will execute the contract with the College, and will deliver a performance payment bond and insurance certificate required by the Bid.

7. The bidder hereby certifies that all of the figures, computations and additions used in estimating the bid herein have been carefully checked and are accurate in all respects, and no claim shall be made as the basis for withdrawal of this bid after opening on the grounds of mathematical error.

8. The Forms noted below are part of the Bid package and must be properly completed and submitted with Bid Proposal. Failure to provide any items noted below may cause disqualification of Bid Proposal in accordance with the law. Bids shall be submitted as one complete electronic submission containing all required forms and supporting documentation through Bonfire. Proposal Forms shall not be altered or added to in any way.

a. Form of Bid Proposal (Bid Form, Section 004113 Form).

b. Certified Check or Form of Bid Bond (Section 004313 Form).

c. Surety Disclosure Statement and Certification (Form of Proposition of Surety) (Section 004316 Form) and evidence of performance security from the prime bidder all subcontractors to whom the bidder will subcontract the work.

d. Consent of Surety for prime bidder and/or all subcontractors to whom the bidder will subcontract the work at the time of the bid submittal (Section 004319). Note, if the General Contractor's Consent of Surety covers any or all subcontractors, then the Consent of Surety is not required for subcontractors who are covered by the General Contractor's Consent of Surety. General Contractor to provide proof at the time of bid.

e. Subcontractor's Identification Form (Section 004336 Form)

f. Prevailing Wage Compliance Declaration (Section 004343 Form).

g. Hold Harmless Agreement (Section 004363 Form).

h. Site Visit Verification (Section 004373 Form).

i. Affidavit of Non-Collusive (Section 004519 Form).

j. Stockholder Disclosure Certification (Section 004530 Form).

k. No Material Change of Circumstances Affidavit (Section 004535 Form). Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal.

l. Affirmative Action Language: Exhibit B and Affirmative Action Acknowledgment (Section 004536 Form).

m. Disclosure of Investment Activities in Iran (Section 004540 Form).

n. Bidder's Certification Regarding Debarment / Disqualification / Suspension (Section 004541 Form).

o. Certification of Non-Debarment for Federal Government Contracts (Section 004542 Form).

p. Disclosure of Purchasing Support of Russian Federation or Belarusian Owned Companies (Section 004545 Form).

q. Contractor's Equipment Certification (Section 004550 Form).

r. Notarized State of New Jersey Form (DBC 701) noting total amount of uncompleted contracts. Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal. This form may be obtained from the New Jersey Department of Treasury website under the Division of Property Management and Construction, Division Pages, Forms.

s. Certificate by the Department of Labor indicating compliance with "The Public Works Contractor Registration Act" (P.L. 1999, c.238) for compliance with this Act. Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal.

t. Proof of valid DPMC NOTICE OF CLASSIFICATION, as issued by the State of New Jersey, Department of Treasury, Division of Property Management and Construction (DPMC). Required for Bidder and all specialty trade sub-contractors named on the Form of Bid Proposal.

u. Contractor or Trade License required under applicable New Jersey Law for any trade or specialty area (applicable to plumbing and electrical trades).

CONTINGENCY ALLOWANCE:

The Contractor shall include a Contingency Allowance of $30,000.00 in their bid to cover unforeseen conditions over the course of the project. Any allowance amount unused at the end of the project shall be deducted from the contract amount and returned to the Owner.

UNIT PRICES:

Unit Prices for items provided herein, shall include labor, materials, transportation, tools, equipment, services, installations, insurance, overhead, profit and other costs necessary to complete the work described, in connection therewith, shall prevail for changes in quantity of work when modification to Contract is made by Change Order. Unit prices may be either deducted from or added to the contract value at the stated amount without reduction or modification.

SINGLE OVERALL CONTRACT:

BASE SCOPE COST:_____ Dollars
(To Be Written in Full)

Base Scope Cost: ($_____)
Allowance AL-1: ($_____30,000)

Total Base Bid: ($_____)

TOTAL BASE BID COST:_____ Dollars
(To Be Written in Full)

NOTE: If written amount differs from the Numerical Figures, only the Written amount will be accepted as the correct BID. No conditions, limitations or provision may be placed on a bid.

Written Signature: _____

Printed/Typed Signature: _____

Title: _____

Name of Firm: _____

Address: _____

Telephone Number: _____ Fax Number _____

E-Mail Address: _____ Taxpayer Federal ID Number _____

NOTE: DO NOT FAIL TO EXECUTE THIS OATH OR AFFIDAVIT:

AFFIDAVIT

STATE OF _____)

SS:

COUNTY OF _____)

_____

(Name of Bidder or Bidders, or if Bidder is a corporation, name of Officer or Agent making Affidavit.)

being duly sworn, says that the several declarations and matters stated in the annexed estimate are in all respects true.

I hereby certify that I am the _____ of the bidder submitting this proposal and that I am authorized to submit this bid on behalf of the bidder and that the information contained in all bidding documents submitted by the bidder is true and accurate. I further certify that the bidder and all subcontractors listed herein have sufficient means and experience to complete the work in accordance with the project specifications. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

Signature of:

_____
(Bidder, if Bidder is an Individual)

_____
(Partner, if Bidder is a Partnership)

_____
(Officer, if Bidder is a Corporation)

Sworn and subscribed before me this

_____ day of _____ 20 ____.

NOTARY PUBLIC _____
(Signature)

_____
(Print Name)

SEAL

Notary Public - State of _____

My Commission Expires _____

END OF FORM OF PROPOSAL 004113

SECTION 004313 - FORM OF BID BOND

WE, THE UNDERSIGNED_____, a/an

☐ Corporation

☐ Partnership (check applicable term)

☐ Individual

as Principal and_____, as Surety, are held firmly bound unto Atlantic Cape Community College, as Owner, in the penal sum of $ _____, for the payment of which we hereby jointly and severally bid ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION is such that whereas the Principal has submitted to Atlantic Cape Community College a certain Bid, attached hereto and hereby made apart hereof, to enter into a contract in writing, for the:

BUILDING E OFFICE RENOVATIONS
5100 Black Horse Pike,
Mays Landing, New Jersey 08330

NOW THEREFORE,

(a) If said Bid shall be rejected, or in the alternate,

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract, properly completed in accordance with said Bid, and shall furnish a bond for the faithful performance of said contract and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,then this obligation shall be void; otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunder set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by the proper officers, this

_____day of _____, 20_____.

(continued on next page)

ATTEST:

Principal: _____ (L.S.)

Surety: _____ By: _____

STATE OF)
: SS:
COUNTY OF)

On this _____ day of _____ 20 ___, before me personally came

_____ to me known, who, being by me duly sworn, did dispose and say;

he resides in _____ that he is the _____

of the instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

(SEAL)

_____

Notary Public of _____

My Commission expires _____

END SECTION 004313

SECTION 004316 - SURETY DISCLOSURE STATEMENT AND CERTIFICATION

_____surety(ies) on the attached bond, hereby certifies(y) the following:

1. The surety meets the applicable capital and surplus requirements of R.S. 17:17-6 or R.S. 17:17-7 as of the surety's most current annual filing with the New Jersey Department of Insurance.

2. The capital (where applicable) and surplus, as determined in accordance with the applicable laws of this State, of the surety(ies) participating in the issuance of the attached bond is (are) in the following amount(s) as of the calendar year ended December 31, _____(most recent calendar year for which capital and surplus amounts are available), which amounts have been certified as indicated by certified public accountants (indicating separately for each surety that surety's capital and surplus amounts, together with the name and address of the firm of certified public accounts that shall have certified those amounts):

_____
_____
_____

3. (a) With respect to each surety participating in the issuance of the attached bond that has received from the United States Secretary of the Treasury a certificate of authority pursuant to 31 U.S.C. 9305, the underwriting limitation established therein and the date as of which that limitation was effective is as follows (indicating for each such surety that surety's underwriting limitation and the effective date thereof):

_____
_____
_____

(b) With respect to each surety participating in the issuance of the attached bond that has not received such a certificate of authority from the United States Secretary of the Treasury, the underwriting limitation of that surety as established pursuant to R.S.17:18-9 as of (date on which such limitation was so established) is as follows (indicating for each such surety that surety's underwriting limitation and the date on which that limitation was established):

_____
_____
_____

4. The amount of the bond to which this statement and certification is attached is $_____.

5. If, by virtue of one or more contracts of reinsurance, the amount of the bond indicated under item (4) above exceeds the total underwriting limitation of all sureties on the bond as set forth in items (3)(a) or (3)(b) above, or both, then for each such contract of reinsurance:

(continued on next page)

(a) The name and address of each such reinsurer under that contract and the amount of that reinsurer's participation in the contract is as follows:

_____
_____
_____

(b) Each surety that is party to any such contract of reinsurance certifies that each reinsurer listed under item 5(a) satisfies the credit for reinsurance requirement established under P.L.1993, c.243 (C.17:51B-1 et seq.) and any applicable regulations in effect as of the date on which the bond to which this statement and certification is attached shall have been filed with the appropriate public agency.

(continued on next page)

CERTIFICATE

(to be completed by an authorized certifying agent for each surety on the bond)

I_____(name of agent), as

_____(title of agent), for

_____(name of surety),

a

☐ Corporation

☐ Mutual insurance company (check one)

☐ Other

(indicating type of business organization) domiciled in _____(state of domicile),

DO HEREBY CERTIFY that, to the best of my knowledge, the foregoing statements made by me are true, and ACKNOWLEDGE that, if any of those statements are false, this bond is VOID.

Signature of certifying agent:

_____

Printed name of certifying agent:

_____

Title of certifying agent:

_____

Amended by L.1995, c.384 & 3,eff. Jan. 10, 1996; Section N.J.S.A. 18A:64A-25.17

END OF SECTION 004316

SECTION 004319 - ATLANTIC CAPE COMMUNITY COLLEGE CONSENT OF SURETY

A performance bond will be required from the successful bidder, including all subcontractors, on this project as N.J.S.A. 18A:64A-25.25 requires, and consequently, all bidders/vendors, including all subcontractors, shall submit, with their bid, a consent of surety in substantially the following form:

To: _____
(Owner – Atlantic Cape Community College)

Re: _____
(Bidder/Vendor)

(Project Description)

This is to certify that the _____ will provide to
(Surety Company)

_____ a performance bond in the full amount of the awarded contract in
(Owner)
the event that said vendor is awarded a contract for the above project.

_____
(Bidder/Vendor)

_____
(Authorized Agent of Surety Company)

Date: _____

CONSENT OF SURETY MUST BE SIGNED BY AN AUTHORIZED AGENT OR REPRESENTATIVE OF A SURETY COMPANY AND NOT BY THE INDIVIDUAL OR COMPANY REPRESENTATIVE SUBMITTING THE BID.

THE CONTRACTOR MAY PROVIDE BONDING ON BEHALF OF THE SUBCONTRACTORS.

END OF SECTION 004319

SECTION 004336 - SUBCONTRACTOR'S IDENTIFICATION FORM

County College Contracts Law, N.J.S.A. 18A:64A-25.25, provides that Bidders on public building projects shall provide the name or names of, and evidence of performance security from, all subcontractors to whom the bidder will subcontract the work, including plumbing and gas fitting work; heating and ventilating systems and equipment; electrical work; structural steel and ornamental iron work; all other work and materials required for the completion of the project.

Public Law P.L. 2009, c.315 - Business Registration Certificate requires that all contractors submitting bid proposals for contract work must have their business registered with the New Jersey Department of Treasury in order to contract for public work. With Bid submission, the bidder shall submit a copy of its Business Registration Certificate issued by the New Jersey Department of Treasury, Division of Revenue. The bidder has to have obtained the Business Registration Certificate prior to receipt of bids.

These Contract Documents also require the Bidder to provide the name, address, and description of work to be performed by all subcontractors.

Name of Bidder: _____

Prime Bidders shall be DPMC Classified for trades C008 (General Construction) or C009 (General Construction/Alterations and Additions).

For each prime subcontractor listed below, you are required to provide the following at the time of bid;

- Provide proof of valid DPMC Notice of Classification
- Total Amount of Uncompleted Contracts, (Form DBC-701)
- Certification of No Material Adverse Change in Status Affidavit
- Proposition of Surety*
- Consent of Surety*
- Trade License (as applicable for trade)

*Consent of Surety for subcontractors must be provided with the bid submission, unless the General Contractor's Consent of Surety covers any or all subcontractors. In this case, the Consent of Surety is not required for subcontractors who are covered by the General Contractor's Consent of Surety. General Contractor must provide proof at the time of bid.

The Business Registration Certificate shall be provided as per the timeline indicated in the Information for Bidders – Section 002113.

Provide all other required subcontractor information per 18A:64A-25.25 and as indicated on the Form of Bid Proposal.

(continued on next page)

The undersigned Bidder declares that the following firms will be used as subcontractors to complete certain portions of the work in this project (write "self-performed" if Prime Bidder is executing work):

Subcontractor Name and Address	Nature of Work
	Electrical C047 (if not self-performed)
	Plumbing C030 (if not self-performed)
	HVACR C039 (if not self-performed)

ATTACH ADDITIONAL SHEETS IF NECESSARY.

Signature of Bidder's authorized representative:

Signature: _____

Title: _____

Date: _____

END OF SECTION 004336

SECTION 004343 - PREVAILING WAGE COMPLIANCE DECLARATION - SECTION III

To: Atlantic Cape Community College

Re: BULDING E OFFICE RENOVATIONS
5100 Black Horse Pike,
Mays Landing, New Jersey

The Contractor hereby agrees to comply in all respect with the New Jersey Prevailing Wage Act, Chapter 150, P.L. 1963 as amended. A copy of the prevailing wage rates pertaining to the work and issued by the New Jersey Department of Labor and Industry entitled, "Prevailing Wage Rate Determination," is on file in the Owner's office or may be obtained from the New Jersey Department of Labor and Industry. For job categories not covered under prevailing wage rates, bidders are required to pay to workers at least the legally established minimum wage at all times during the contract period. In the event it is found that any worker employed by the Contractor or any Subcontractor covered by the contract herein has been paid a rate of wages less than the prevailing rate required to be paid by such contract, the Owner may terminate the Contractor's or Subcontractor's right to proceed with the work or such part of the work as to which there has been a failure to pay required wages and to prosecute the work to completion or otherwise. The Contractor and his sureties shall be liable to the Owner for any excess costs occasioned thereby.

Before final payment is made by or on behalf of the Owner of any sum or sums due to the work, the Contractor or Subcontractor shall file with the Owner, written statements in form satisfactory to the commissioner of Labor and Industry certifying to the amounts then due and owing from such contractor or subcontractor filing such statement to any and all workmen for wages due on account of the work, setting forth therein the names of the persons whose wages are unpaid and the amount due to each respectively which statement shall be certified by the oath of the Contractor or Subcontractor as the case may be in accordance with the said New Jersey Prevailing Wage Act.

The prevailing wage rate shall be determined by the Commissioner of Labor and Industry or his duly authorized deputy or representative.

The undersigned is an (individual (partnership) (corporation) under the Laws of the State of

_____having principal offices at _____

BIDDER _____

SIGNATURE _____

NAME _____

TITLE _____

DATE _____

END OF SECTION 004343

SECTION 004353 - STATEMENT OF OWNERSHIP

This is to certify that in accordance with Chapter 33, Laws of 1977, the names and addresses of all stockholders in this corporation or partnership who own 10% or more of its stock, of any class, or of all individual partners in the partnership who own a 10% or greater interest therein, as the case may be, are listed below. If one or more such stockholder or partner is itself a corporation, or partnership, the stockholders holding 10% or more of that corporations, stock, or the individual partners owing 10% or greater interest in that partnership, as the case may be, are also listed.

NAME	ADDRESS
_____	_____
	_____
_____	_____
	_____
_____	_____
	_____
_____	_____
	_____
_____	_____
	_____
_____	_____
	_____

Authorized Person Printed Name: _____

Authorized Person Signature: _____

Representing: _____

Address: _____

_____

END OF SECTION 004353

SECTION 004363 - HOLD HARMLESS AGREEMENT

It is further agreed that the undersigned hereby agrees to defend, indemnify and hold harmless the Board of Trustees, its officers, employees, volunteers, and agents, from and against all claims, damages, losses and expenses including reasonable attorney's fees in case it shall be necessary to file an action, arising out of performance of the work herein, which is; 1) for personal or bodily injury, illness or death, or for property damage, including loss of se, and; 2) caused in whole or in part by

_____ (Name of contractor)

negligent act or omission or that a subcontractor or that of anyone employed by them or for whose acts contractor or subcontractor may be liable. This indemnification and agreement shall apply in all instances whether the Board of Trustees, its officers, employees, volunteers and / or agents, is/are made a party to the action or claim or is subsequently made a party to the action by third-party-inpleading or is made a part to a collateral action arising, in the whole or in part, from any of the issues emanating from the original cause of action or claim.

Full Name of Contractor:_____

Business Address:_____

_____

Zip Code: _____

Telephone Number: _____

Project Description: _____

_____

Authorized Person Printed Name: _____

Authorized Person Signature: _____

Witness Printed Name: _____

Witness Signature: _____

END OF SECTION 004363

SECTION 004519 - AFFIDAVIT OF NON-COLLUSION

Name of Project: BUILDING E OFFICE RENOVATIONS
Atlantic Cape Community College

I, _____ (Name) of the County of _____ (County)

and the State of_____(State), of full age, being duly sworn according to law, on my oath, depose and say that:

I am _____ (Official Position)

of the firm of _____ (Bidder's Name),

the bidder making the Proposal for the above-named project, and that I executed the said Proposal with full authority to do so.

I, and to the best of my knowledge, the Bidder, and any officer, director, employee or other representative of the bidder, have not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project.

All statements contained in said Bid and all Contract Documents and in this affidavit are true and correct, and made with full knowledge that the Board of Trustees of Atlantic Cape Community College relies upon the truth of the statements contained in said Bid and contract documents and in the statements contained in this affidavit in awarding the contract for the said project.

Sworn on behalf of:

_____
Name of Firm (Bidder)

_____
Signature of Official

Subscribed and sworn to me this

_____ day of _____,20____

_____ (name) (Seal)

Notary Public of: _____
(State)

END OF SECTION 004519

SECTION 004530 – STOCKHOLDER DISCLOSURE CERTIFICATION

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization:_____

Organization
Address:_____

City, State, ZIP:_____

Part I Check the appropriate box

☐ I certify that the list below contains the names and home addresses of all stockholders holding 10% or more of the issued and outstanding stock of the undersigned

OR

☐ I certify that no one stockholder owns 10% or more of the issued and outstanding stock of the undersigned.

Part II Check the box that represents the type of business organization:

☐ Sole Proprietorship

☐ Corporation

☐ Partnership

☐ Subchapter S Corporation

☐ Limited Liability Company (LLC)

☐ Limited Partnership

☐ Limited Liability Partnership (LLP)

☐ Other (be specific): _____

Sign and Notarize the form below, and, if necessary, complete the stockholder list below:

Name of Individual or Business Entity	Home Address (for Individuals) or Business Address

Subscribed and sworn before me this _____ day of _____
(day) (month, year)

(Notary Public)

My Commission Expires:

_____
(Affiant)

_____
(Print name and title of Affiant)

END SECTION 004530.

SECTION 004535 - NO MATERIAL CHANGE OF CIRCUMSTANCES AFFIDAVIT

I, _____ being of full age under oath depose and say:

1. I am a(n) owner, partner, shareholder or officer of the company set forth below and am duly authorized to execute this affidavit on its behalf.

2. A statement as to the financial ability, adequacy of plant and equipment, organization and prior experience of [Bidder], has been submitted to the Department of Treasury within one (1) year preceding the date of opening of bids for this contract.

3. I certify, that there has been no material adverse change in the qualification information of [Bidder] since such statement was submitted to the Department of Treasury except:

   _____

   _____.

SEAL

_____
TITLE

_____
COMPANY

Sworn to and subscribed
before me on this day
of , 20___.

_____
Notary Public

END OF SECTION 004535

EXHIBIT B: N.J.S.A. 10.5-31 et seq. (P.L. 1975, c127) N.J.A.C. 17:27-1.1 et seq.

MANDATORY EQUAL OPPORTUNITY LANGUAGE: CONSTRUCTION CONTRACTS

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

a. The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex. Except with respect to affectional or sexual orientation and gender identity or expression , the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity 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 Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

b. The contractor or subcontractor, where applicable 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 age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex;

c. The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

d. The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to **N.J.S.A. 10:5-31 et seq.**, as amended and supplemented from time to time and the Americans with Disabilities Act.

e. When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by **N.J.A.C. 17:27-7.2**; provided, however, that the Department of LWD, Construction EEO Monitoring Program, may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Department of LWD, Construction EEO Monitoring Program is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Department of LWD, Construction EEO Monitoring Program, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal established in accordance with **N.J.S.A. 17:27-7.2**.

The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to **N.J.S.A. 10:5-31 et seq**., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union, at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities, as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(1) To notify the Public Agency Compliance Officer, the Department of LWD, Construction EEO Monitoring Program, and minority and women referral organizations listed by the Division pursuant to **N.J.A.C. 17:27-5.3,** of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as the applicable Federal and State court decisions;

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contractor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the

contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Department of LWD, Construction EEO Monitoring Program. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Department of LWD, Construction EEO Monitoring Program, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the Public Agency Compliance Officer and to the Department of LWD, Construction EEO Monitoring Program.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Department of LWD, Construction EEO Monitoring Program and submitted promptly to the Department of LWD, Construction EEO Monitoring Program upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of the procedures of (B) above, it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

After notification of award, but prior to signing a construction contract, the contractor shall submit to the Public Agency Compliance Officer and the Department of LWD, Construction EEO Monitoring Program an initial project workforce report (Form AA 201) electronically provided to the public agency by the Division, through its website, for distribution to and completion by the contractor, in accordance with **N.J.A.C. 17:27-7.** The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Department of LWD, Construction EEO Monitoring Program and to the Public Agency Compliance Officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for the on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(D) The contractor and its subcontractors shall furnish such reports or other documents to the Department of LWD, Construction EEO Monitoring Program as may be requested by the Department of LWD, Construction EEO Monitoring Program from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Department of LWD, Construction EEO Monitoring Program for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code at N.J.A.C. 17:27**.

_____	_____	_____
Authorized Signature	Name of Firm	Date

END SECTION 004536

SECTION 004541 - BIDDER'S CERTIFICATION REGARDING
DEBARMENT/DISQUALIFICATION/SUSPENSION

INSTRUCTIONS FOR CONTRACTOR CERTIFICATION REGARDING THE QUALIFICATION, DEBARMENT, SUSPENSION, AND DISQUALIFICATION OF PERSON(S) COVERING CONTRACT ADMINISTRATION

1. By signing and submitting Contractor Certification 004541-(3), the Contracting Firm is bound by the representations of this certification.

2. The Certification is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the Contracting Firm knowingly rendered an erroneous Certification, in addition to other remedies available to the Owner, the Owner may pursue available remedies, including qualification, suspension, disqualification and/or debarment.

3. The Contracting Firm shall provide immediate written notice to the Owner if at any time it learns that its Certification was erroneous by reason of changed circumstances.

4. The terms "debarment", "disqualification", "qualification" and "suspension", as used in this clause, have the meanings as defined in N.J.A.C.7:19-1-1 et seq.. You may contact the Atlantic Cape Community College for assistance in obtaining a copy of those regulations.

5. The Contracting Firm further agrees by submitting this Certification that it will include the clause titled "Certification Regarding Qualification, Debarment, Suspension and Disqualification of person(s) concerning Contract Administration," without modification, in all subcontracts to this agreement as authorized by the Owner.

SECTION 004541 - BIDDER'S CERTIFICATION REGARDING
DEBARMENT/DISQUALIFICATION/SUSPENSION

CERTIFICATION REGARDING THE QUALIFICATION, DEBARMENT,
SUSPENSION AND DISQUALIFICATION OF PERSON(S)
CONCERNING CONTRACT ADMINISTRATION

****

I am _____ (Bidder or an Officer or Partner of the Bidder,

and indicate which) of the Firm of _____
(Name of Your Organization)

_____.
(State the Address of Your Organization)

CHOOSE ONE OF THE FOLLOWING
****

( ) A. I hereby certify on behalf of _____
(Name of Your Organization)

that, on the date and time of the bid, neither it nor its principals is/are included on the State Treasurer's, or the Federal Government's List of Debarred, Suspended or Disqualified Bidders as a result of action taken by any State or Federal Agency. If awarded the contract, the Bidder acknowledges and agrees to insert into all its contracts with all Subcontractors and Subconsultants a clause stating that the Contracted Party, its Subcontractors or Subconsultants may be debarred, suspended or disqualified from contracting and/or working on the School Facilities Project if found to have committed any of the acts listed in N.J.A.C. 19:38A-4.1 et seq.

( ) B. I am unable to certify to any of the statements set forth in this Certification. I have attached an explanation to this form.

_____
(Signature)

_____
(Typed Name and Title)

_____
(Date)

Sworn and subscribed before me this

_____ day of _____ 20___.

NOTARY PUBLIC _____
(Signature)

_____
(Print Name)

SEAL

Notary Public - State of _____

My Commission Expires _____

END OF SECTION 004541

SECTION 004542 - CERTIFICATION OF NON-DEBARMENT FOR FEDERAL GOVERNMENT CONTRACTS

N.J.S.A. 52:32-44.1 (P.L. 2019, c.406)

This certification shall be completed, certified to, and submitted to the contracting unit prior to contract award, except for emergency contracts where submission is required prior to payment.

PART I: VENDOR INFORMATION	
Individual or Organization Name	
Address of Individual or Organization	
DUNS Code (if applicable)	
CAGE Code (if applicable)	
Check the box that represents the type of business organization:	

☐Sole Proprietorship (skip Parts III and IV) ☐Non-Profit Corporation (skip Parts III and IV)

☐For-Profit Corporation (any type) ☐Limited Liability Company (LLC) ☐Partnership

☐Limited Partnership ☐Limited Liability Partnership (LLP)

☐Other (be specific): _____

PART II – CERTIFICATION OF NON-DEBARMENT: Individual or Organization			
I hereby certify that the **individual or organization listed above in Part I** is not debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***<name of contracting unit>*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by ***<type of contracting unit>*** to notify the ***<type of contracting unit>*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the ***<type of contracting unit>***, permitting the ***<type of contracting unit>*** to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		Title:	
Signature:		Date:	

PART III – CERTIFICATION OF NON-DEBARMENT: Individual or Entity Owning Greater than 50 Percent of Organization	
Section A (Check the Box that applies)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of its voting stock, or of the partner in the partnership who owns more than 50 percent interest therein, or of the member of the limited liability company owning more than 50 percent interest therein, as the case may be.
Name of Individual or Organization	
Home Address (for Individual) or Business Address	
OR	
☐	No one stockholder in the corporation owns more than 50 percent of its voting stock, or no partner in the partnership owns more than 50 percent interest therein, or no member in the limited liability company owns more than 50 percent interest therein, as the case may be.
Section B (Skip if no Business entity is listed in Section A above)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of the voting stock of the organization's parent entity, or of the partner in the partnership who owns more than 50 percent interest in the organization's parent entity, or of the member of the limited liability company owning more than 50 percent interest in organization's parent entity, as the case may be.
Stockholder/Partner/Member Owning Greater Than 50 Percent of Parent Entity	
Home Address (for Individual) or Business Address	
OR	
☐	No one stockholder in the parent entity corporation owns more than 50 percent of its voting stock, no partner in the parent entity partnership owns more than 50 percent interest therein, or no member in the parent entity limited liability company owns more than 50 percent interest therein, as the case may be.
Section C – Part III Certification	
I hereby certify that no individual or organization that is debarred by the federal government from contracting with a federal agency owns greater than 50 percent of the **Organization listed above in Part I** or, if applicable, owns greater than 50 percent of a parent entity of **<name of organization>**. I further	

acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***<name of contracting unit>*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award ***<type of contracting unit>*** to notify the ***<type of contracting unit>*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the ***<type of contracting unit>***, permitting the ***<type of contracting unit>*** to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		Title:	
Signature:		Date:	

Part IV – CERTIFICATION OF NON-DEBARMENT: Contractor – Controlled Entities		
Section A		
☐	Below is the name and address of the corporation(s) in which the **Organization listed in Part I** owns more than 50 percent of voting stock, or of the partnership(s) in which the **Organization listed in Part I** owns more than 50 percent interest therein, or of the limited liability company or companies in which the **Organization listed above in Part I** owns more than 50 percent interest therein, as the case may be.	
Name of Business Entity		**Business Address**
Add additional sheets if necessary		
OR		
☐	The **Organization listed above in Part I** does not own greater than 50 percent of the voting stock in any corporation and does not own greater than 50 percent interest in any partnership or any limited liability company.	

Section B (skip if no business entities are listed in Section A of Part IV)	
☐	Below are the names and addresses of any entities in which an entity listed in Part III A owns greater than 50 percent of the voting stock (corporation) or owns greater than 50 percent interest (partnership or limited liability company).

Name of Business Entity Controlled by Entity Listed in Section A of Part IV	Business Address

Add additional Sheets if necessary

OR

☐	No entity listed in Part III A owns greater than 50 percent of the voting stock in any corporation or owns greater than 50 percent interest in any partnership or limited liability company.

Section C – Part IV Certification

I hereby certify that the **Organization listed above in Part I** does not own greater than 50 percent of any entity that that is debarred by the federal government from contracting with a federal agency and, if applicable, does not own greater than 50 percent of any entity that in turns owns greater than 50 percent of any entity debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the ***<name of contracting unit>*** is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by ***<type of contracting unit>*** to notify the ***<type of contracting unit>*** in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the ***<type of contracting unit>***, permitting the ***<type of contracting unit>*** to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

END OF SECTION 004542

SECTION 004550 - CONTRACTOR'S EQUIPMENT CERTIFICATION

CERTIFICATION TO DEMONSTRATE THE CONTRACTOR'S ABILITY TO PERFORM THE WORK WITH THE NECESSARY EQUIPMENT REQUIRED

****

I am _____ (an Owner, a Partner, or an Officer of the Company or Corporation and indicate which) of the Firm

_____

(Name of the Firm)

_____.

(State the Address of the Firm)

CHOOSE ONE OF THE FOLLOWING

****

( ) A. I hereby certify on behalf of _____

(Name of the Firm)

that we are the actual Owner, Lessee or control all equipment necessary to perform the work of this Project.

( ) B. I hereby certify on behalf of _____

(Name of the Firm)

that we are not the actual Owner or Lessee of the equipment necessary to perform the work of this Project. The source from which the equipment will be obtained is as follows: (Provide Names, Addresses and Telephone Numbers)

_____

_____

_____

_____

NOTE: Should additional Names, Addresses and Telephone Numbers be required, please list them on a separate sheet and attach to this document.

Certificates from the Owner or Person in control of the equipment clearly granting our Firm the control of the equipment required for such time as may be required to perform the work of this Project are included and attached to this Certification.

_____
(Signature)

_____
(Typed Name and Title)

_____
(Date)

END OF SECTION 004550

SECTION 005611 - FORM OF PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, the undersigned _____

as Principal and _____,

as Surety, are held and firmly bound unto the Atlantic Cape Community College, Mays Landing, Atlantic County, New Jersey, in the penal sum of

_____ Dollars

(Written Amount)

($ _____).

(Figures)

for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns. Signed this _____ day of _____, 20____. THE CONDITION of the above obligation is such that whereas the Principal did on the _____ day of _____, 20___, enter into a contract with the Atlantic Cape Community College which said contract is made part of this bond, the same as though set forth herein:

NOW, if the said _____ shall well and faithfully do and perform the things agreed by _____ to be done performed according to the terms of said contract then this obligation shall be void, otherwise the same shall remain in effect. It being expressly understood and agreed that the liability of the surety for all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

By accepting this obligation to ensure the faithful performance of the proper fulfillment of the Contract, the Surety agrees to all cost required to furnish additional manpower, materials, facilities, equipment as may be necessary to ensure the prosecution and completion of the work in accordance with the phased substantial completion dates established in the Contract.

The Surety further agrees to reimburse and repay the Owner for all reasonable attorney's fees, additional consequential Architectural fees incurred by the Owner resulting from the failure of faithful performance and proper fulfillment of the Contract.

The said Surety stipulates and agrees that no modifications, omissions, or additions in or to terms of said contract or in or to the plans and specifications, therefore, shall in anywise effect the obligations of said Surety on its bond.

This bond is given in compliance with the requirements of the statutes of the State of New Jersey in its respect to bonds of contractors on public works.

SIGNED, SEALED AND DATED THIS _____ DAY OF_____, 20___.

Signed by the Principal in the presence of (SEAL)

_____

(Principal)

Signed by the Surety in the presence of (SEAL)

_____

(Surety)

BY _____

(Attorney-in-fact)

SECTION 005612 - FORM OF PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, the undersigned _____,

as Principal and _____,

as Surety, are held and firmly bound unto the Atlantic Cape Community College, Mays Landing, Atlantic County, New Jersey, in the penal sum of

_____ Dollars

(Written Amount)

($ _____).

(Figures)

for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this _____ day of _____, 20____. THE CONDITION of the above obligation is such that whereas the Principal did on the _____ day of _____, 20___, enter into a contract with the Atlantic Cape Community College which said contract is made part of this bond, the same as though set forth herein:

NOW, if the said _____shall well and faithfully do and perform the things agreed by _____ to be done and performed according to the terms of said contract, and shall pay all lawful claims of beneficiaries for labor performed or materials, provisions, provender or other supplies or teams, fuels, oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said contract, we agreeing and assenting that this undertaking shall be for the benefit of any beneficiary having a just claim, as well as for the obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The said Surety stipulates and agrees that no modifications, omissions or additions in or to terms of said contract or in or to the plans and Specifications, therefore, shall in anywise effect the obligations of said Surety on its bond.

Recovery of any claimant under the bond shall be subject to the conditions and provisions of this article to the same extent as if such conditions and provisions were fully incorporated in the form set forth above.

This bond is given in compliance with the requirements of the statutes of the State of New Jersey in its respect to bonds of contractors on public works.

SIGNED, SEALED AND DATED THIS _____ DAY OF_____, 20___.

Signed by the Principal In the presence of (SEAL)

_____

(Principal)

Signed by the Surety in the presence of (SEAL)

_____

(Surety)

BY _____

(Attorney-n-fact)

SECTION 005620 - FORM OF MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we,

_____as Principal and

_____as Surety, are held and firmly bound unto the Atlantic Cape Community College, as Owner, in the amount of ONE HUNDRED PERCENT (100%) OF THE CONTRACT SUM.

_____ Dollars

(Written Amount)

($_____)

(100% of Contract Sum)

for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas, the Principal did on _____, _____, 20____, enter into a Contract for:

RENOVATIONS

Building E Office Renovations

5100 Black Horse Pike,

Mays Landing, New Jersey 08330

FOR THE

Atlantic Cape Community College

5100 Black Horse Pike,

Mays Landing, New Jersey 08330

WHICH said Contract is made a part of this Bond as though set forth herein: NOW, if the said Principal shall remedy without cost to the Owner any defects which may develop during a period of two (2) years from the date established in the Final Certificate of Substantial Completion for the work performed under the said Contract, provided such defects, in the judgment of the Owner, are caused by defective or inferior materials or workmanship.

The said Surety hereby stipulates and agrees that no modification, deletions or additions in or to the terms of the said Contract or the Drawings or Project Manual therefore shall in any way affect its obligation on this Bond.

IN WITNESS WHEREOF, the said Principal and Surety have duly executed this bond under seal this _____ day of _____, 20____.

ATTEST: _____

(Principal)

_____

(Principal) Secretary

(SEAL)

BY: _____ (S)

_____

_____

(Address-Zip Code)

_____

(Witness as to Principal)

_____

_____

(Address-Zip Code)

_____

(Surety)

BY: _____

(Attorney-in-fact)

_____

_____

(Address - Zip Code)

_____

(Surety) Secretary

(SEAL)

_____

(Witness as to Surety)

_____

_____

(Address-Zip Code)

SECTION 006000 - PROJECT FORMS

Project Forms included in this section are provided for the Contractor's use. Contractors shall use these forms exclusively, unless preapproved by the Architect.

Included in this Project Manual are the following:

1. Form 006010 – Request for Information (RFI)
2. Form 006020 – Job Meeting Report
3. Form 006030 – Submittal Cover Sheet
4. Form 006040 – Substitution Matrix
5. Form 006050 – Ready for Closeout

REQUEST FOR INFORMATION

RFI No: _____ CONTRACT No:_____

RFI Title:_____ Date Needed: _____

Requested by Company: _____ Date: _____

Response:

Response Prepared By: _____ Date: _____

END OF SECTION 006010

spiezle

JOB MEETING REPORT

Project:_____ Commission No:_____

Contractor:_____ Date : _____

Job Meeting Report No.: _____

Contract No./Work: _____

Work accomplished during previous period:

Work scheduled over next period:

Signed: _____ Date: _____

END OF SECTION 006020

SUBMITTAL COVER SHEET

NOTE:

The following information is required and shall accompany all project submittals.

Submittals received without this cover sheet shall be deemed incomplete and will not be reviewed.

CONTRACTOR'S SUBMITTAL NO:	
SUBMITTED ITEM(S) / TITLE:	
SPEC. SECTION / DRAWING REF.:	
SUBMITTING CONTRACTOR:	
SUBCONTRACTOR / MANUF.:	

YES	NO	
		Is submittal a substitution? If yes, provide required Substitution Matrix.

CONTRACTORS COMMENTS:

SUBMITTED AND APPROVED BY:

Signature	Company	Date

REVIEWERS COMMENTS:

END OF SECTION 006030

SUBMITTAL MATRIX FOR SUBSTITUTION EVALUATION AS APPROVED EQUAL

The following is being submitted for evaluation of a substitution as an approved equal.

(Manufacturer's literature must be attached for verification)

Specification Data (1):	Specified Product (2):	Proposed Equal (3):

1. The 1st column shall list data derived from the specific specification section (i.e. doors, windows, etc.).
2. The 2nd column shall list data values for the product from the specific specification section (i.e. size, load capacity, material thickness, etc.)
3. The 3rd column shall list data values for the 'proposed equal' product and MUST be accompanied by the manufacturer's written product data and/or other applicable literature for the Architect to conduct a full review.

END OF SECTION 006040

READY FOR CLOSEOUT

Contractor shall submit a copy of this document with the completed punchlist, signed and sealed by the Contractor's authorized representative and notarized, to the Architect indicating that the Work has been completed as required in accordance with the Contract Documents and after which the Contractor shall notify the Architect when re-inspection is requested.

The undersigned certifies that all items of work noted herein, and all other required scope of Work have been completed in accordance with Contract Documents and is further certifying that the project is ready for final inspection by the Architect. The undersigned acknowledges providing all required close-out documents, including, but not limited to, all affidavits, warranties and a release of liens, to the Architect.

Items not completed shall be summarized by the Contractor in letter form and attached herewith.

The undersigned hereby certifies that he/she shall pay the Owner for any and all expenses incurred by theArchitect due to the Contractor's misrepresentation of completion of punch list items.

_____

Authorized Representative of the Contractor (Print/Type)

_____

Title

_____ _____

Signature Date

THE CONTRACTOR SHALL SEAL THIS PUNCHLIST AS NOTED BELOW:

_____ _____

Contractor's Corporate Seal Notary Seal

Prepared by: _____ Date: _____

END OF SECTION 006050

SECTION 006111 – STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

The Contract to be used for this Project will be the *2017 Edition* of AIA Document A101 - STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR, with modifications set forth in Section 006150 – SUPPLEMENT TO THE FORM OF AGREEMENT included herein.

The *2017 Edition* of AIA Document A101 - STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR is included herein as reference. The actual agreement will include the provisions/modifications as noted in Section 006112 – SUPPLEMENT TO THE FORM OF AGREEMENT also included herein.

END OF SECTION 006111

AIA® Document A101™ – 2017

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

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

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

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

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

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.

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TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

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7 TERMINATION OR SUSPENSION

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9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

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

[ ] The date of this Agreement.

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

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

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

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

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

[ ] By the following date:

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

Portion of Work	Substantial Completion Date

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

ARTICLE 4 CONTRACT SUM

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

§ 4.2 Alternates

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

Item	Price

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

Item	Price	Conditions for Acceptance

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

Item	Price

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

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

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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.)

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

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

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

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

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

§ 5.2 Final Payment

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

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

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

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

§ 5.3 Interest

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

%

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.)

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§ 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)

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§ 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

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds

.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

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

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

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

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[ ] 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)*

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SECTION 006112 – SUPPLEMENT TO THE FORM OF AGREEMENT

STANDARD AIA FORM

Work will be subject to provisions set forth by the American Institute of Architect's Standard AIA Document A101 "STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR", *2017 Edition*, Articles 1 thru 8 inclusive, which are hereby made a part of this Contract.

MODIFICATION OF AIA FORM A101

The following supplements modify, delete from, and/or add to AIA Form A101 “Standard Form of Agreement Between Owner and Contractor” as indicated by the following articles, paragraphs, etc. as noted below:

1. Following the title of the first page, delete the third paragraph in the right side margin “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.”
2. Articles, or portions thereof, that are not specifically modified, deleted, or superseded hereby, remain in full effect.
3. The Form of Agreement also may be supplemented elsewhere in the Contract Documents by provisions located in, but not necessarily limited to, the Project Manual.

ARTICLE 5 –PAYMENTS

5.1.8 Following the text: “Reduction or limitation of retainage, if any, shall be as follows:” insert “None.”

ARTICLE 8 – MISCELLANEOUS PROVISIONS

8.2 Delete the text of 8.2 and substitute the following: No Interest will be paid by the Owner for sums due and unpaid under the Contract.

8.6 Following the text: “Other Provisions:” insert “none”:

END OF SECTION 006112

SECTION 006113 - FORM OF PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT: That

we/I _____
(Name of Contractor)

A _____
(Corporation, Partnership or Individual)

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

of _____ State of _____,

hereinafter called the "Surety", are held and firmly bound unto the ATLANTIC CAPE COMMUNITY COLLEGE, Mays Landing, Atlantic County, New Jersey, hereinafter called "Owner", in the penal sum of

_____Dollars
(Written Amount)

($ _____).
(Figures)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally to the Owner, firmly by these presents for the performance of the Construction Contract which is incorporated herein by reference and to pay for all labor, materials and equipment furnished for use in the performance of said Construction Contract.

THE CONDITION OF THIS OBLIGATION IS such that Whereas the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for the construction of all work under Contract covering work for:

BUILDING E OFFICE RENOVATIONS

FOR THE

ATLANTIC CAPE COMMUNITY COLLEGE
5100 Black Horse Pike,
Mays Landing, NEW JERSEY, 08330

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties all the undertakings, covenants, terms, conditions and agreements of said Contract including the payment for labor, materials and equipment furnished for use in the performance of said contract. During the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that by accepting this obligation to ensure the faithful performance and proper fulfillment of the Contract, the Bonding Company agrees to assume all costs required to furnish additional manpower, materials, facilities, equipment, means and incidentals necessary, including night shifts, overtime operations, Sundays and holidays as may be necessary to insure the prosecution and completion of the work in accordance with phased substantial completion dates established in the Contract. The Bonding Company further agrees to reimburse and repay the Owner for all reasonable attorney's fees, additional consequential Architectural, Engineering fees incurred by the Owner for consequential losses or damages including, but not limited to, additional design work, submittal reviews, correspondence, job meetings, reviewing applications for payment, punch lists and similar services by reason of Contractor's default.

PROVIDED, FURTHER, that the Surety, for value received hereby stipulates and agrees that no change, extension of time, alterations or additions to the terms of the Contract or to the work to be performed thereunder or the Project Manual accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any change, extension of time, alterations or additions to the terms of the Contract or to the work or to the Project Manual.

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

IN WITNESS WHEREOF, this instrument is executed in _____counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20____.

ATTEST:

_____
(Principal)

_____
(Principal) Secretary

(SEAL)

BY: _____ (S)

_____

_____
(Address-Zip Code)

_____
(Witness as to Principal)

_____

_____
(Address-Zip Code)

ATTEST:

_____
(Surety)

BY:_____
(Attorney-in-fact)

_____

_____
(Address - Zip Code)

_____
(Surety) Secretary

(SEAL)

_____
(Witness as to Surety)

_____

_____
(Address-Zip Code)

NOTE: Date of Bond must be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

The rate of premium on this Bond is $ _____ per Thousand.

The total amount of premium charges is $ _____. (The above must be filled in by the Corporate Surety)

IMPORTANT NOTE

Surety Company executing Bond must be authorized to transact business in the State of New Jersey and rated as "A" or better as determined by A.M. Best Company.

END OF SECTION 006113

SECTION 006119 - FORM OF MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, That we,

_____

as Principal and

_____

as Surety, are held and firmly bound unto the ATLANTIC CAPE COMMUNITY COLLEGE, as Owner, in the amount of ONE HUNDRED PERCENT (100%) OF THE CONTRACT SUM.

_____

($_____)
(100% of the Contract)

for the payment of which well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas, the Principal did on _____, _____, 20____, enter into a Contract for:

BUILDING E OFFICE RENOVATIONS

FOR THE

ATLANTIC CAPE COMMUNITY COLLEGE
5100 Black Horse Pike
Mays Landing, New Jersey, 08330

WHICH said Contract is made a part of this Bond as though set forth herein: NOW, if the said Principal shall remedy without cost to the Owner any defects which may develop during a period of Two (2) years from the date established in the Final Certificate of Substantial Completion for the work performed under the said Contract, provided such defects, in the judgment of the Owner are caused by defective or inferior materials or workmanship.

The said Surety hereby stipulates and agrees that no modification, deletions or additions in or to the terms of the said Contract or the Drawings or Project Manual therefore shall in any way affect its obligation on this Bond.

(continued on next page)

IN WITNESS WHEREOF, the said Principal and Surety have duly executed this bond under seal this

_____ day of _____, 20___.

ATTEST:

_____
(Principal)

_____
(Principal) Secretary

(SEAL)

BY: _____ (S)

_____

_____
(Address-Zip Code)

_____
(Witness as to Principal)

_____

_____
(Address-Zip Code)

ATTEST:

_____
(Surety)

BY:_____
(Attorney-in-fact)

_____

_____
(Address - Zip Code)

_____
(Surety) Secretary

(SEAL)

_____
(Witness as to Surety)

_____

_____
(Address-Zip Code)

END OF SECTION 006119

SECTION 006211 – GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

The General Conditions for the Contract for Construction to be used for this Project will be the *2017 Edition* of AIA Document A201 – GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION included herein, together with modifications set forth in Section 006230– SUPPLEMENTARY CONDITIONS included herein.

END OF SECTION 006211

AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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.

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.2 Correlation and Intent of the Contract Documents

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

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§ 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

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G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

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

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

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

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

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

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

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

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.4 Labor and Materials

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

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

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§ 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.

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§ 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

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delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

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

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely

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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.

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§ 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.

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§ 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.

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ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

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

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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.

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§ 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:

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.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.

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§ 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.

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§ 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;

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.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.

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§ 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.

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§ 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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

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

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

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

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expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

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

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

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

§ 11.3 Waivers of Subrogation

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

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

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§ 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

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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.

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§ 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.

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

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

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

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

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

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

§ 14.3 Suspension by the Owner for Convenience

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

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

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

§ 14.4 Termination by the Owner for Convenience

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

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

- **.1** cease operations as directed by the Owner in the notice;

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.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.

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§ 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.

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§ 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.

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§ 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.

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SECTION 006230 – SUPPLEMENTARY CONDITIONS

STANDARD AIA FORM:

Work will be subject to provisions set forth by the American Institute of Architect's Standard AIA Document A201 "General Conditions of the Contract for Construction", *2017 Edition*, Articles 1 thru 15 inclusive, which are hereby made a part of this Specification.

MODIFICATION OF AIA FORM A201

Modify, supplement and/or add the following articles, paragraphs, etc. as noted below:

ARTICLE 1 – GENERAL PROVISIONS

1.1 BASIC DEFINITIONS add the following:

1.1.1 Delete the text of the paragraph and substitute the following:

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 minor change in the Work issued by the Architect. The Contract Documents include the advertisement or invitation to bid, Instruction to bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposal or the Contractor’s bid or proposal and portions of Addenda relating to bidding or proposal requirements.

1.1.2.1 The Owner reserves the right to hire a Construction Manager for the project. In the event the Construction Manager is hired by the Owner, the Owner may substitute the CMA version of the AIA Documents A101 and A201 (2017), and the Contractor shall be bound thereby.

1.1.2.2 Assignment of the Work: Neither this Agreement nor any part thereof shall be assigned by a Contractor to any person, firm, or corporation, without prior written approval of the Owner to such assignment. This provision shall not preclude the Contractor from subletting parts of the work to Subcontractors in accordance with general practices of the trade.

1.1.6.1 THE PROJECT MANUAL

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

1.1.8 The term “Architect” shall include the Architect, its consultants and subconsultants, and the owners, principals and employees of each of them.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS add the following:

1.2.1.2 In the event of any conflict among or within the Drawings, Specifications, or Schedules, the provisions specifying a better quality or greater quantity of work or materials or comply with more stringent requirements shall take precedence and shall be the provision used in estimating bids and performing the contract, unless otherwise directed in writing by the Architect. The Architect shall determine which of the conflicting items represents the work of better quality or greater quantity or more stringent requirements. Information not shown on the drawings but included in the specifications, and vice versa, is included and required in the base bid Contract and shall be furnished and installed by the Contractor at no additional cost.

1.2.1.3 During the course of the Work, should any ambiguities or discrepancies be found in the Drawings, Specifications, or Schedules to which the Contractor has failed to call attention before submitting his bid, then the Architect will interpret the intent of the Drawings, Specifications or Schedules and the Contractor hereby agrees to abide by the Architect’s interpretation and to carry out the work in accordance with the decision of the Architect.

ARTICLE 2 - OWNER

2.1 GENERAL add the following:

2.1.1 Delete the text of the paragraph and substitute the following:

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 the following authority as delegated by the Owner. The term "Owner" means the Owner or the Owner’s authorized representative:

Owner is to mean ATLANTIC CAPE COMMUNITY COLLEGE.

Owner's authorized representative is to mean the ATLANTIC COUNTY IMPROVEMENT AUTHORITY.

2.1.1.1 The Owner’s Representative shall have the same access to the Work provided to the Architect. He shall be consulted by the Contractor’s Superintendent on all matters pertaining to the Work and shall transmit all instructions of the Architect regarding the Work to the Contractor’s Superintendent.

2.1.1.2 The Owner’s Representative may, in addition to inspection by others required elsewhere in the Contract Documents, inspect all Work under this Contract. While he will assist the Contractor’s Superintendent in obtaining additional information in explanation of the Contract Documents and will serve as liaison between the Contractor’s Superintendent and the Architect, he is not empowered to authorize deviations from the Contract nor to enter into the Contractor’s area of responsibility for supervision and construction means, methods, techniques, sequences, procedures or coordination or for safety of persons and property. The fact that he may have permitted faulty Work or Work not in accordance

with the Contract Documents to be performed shall not relieve the Contractor from any responsibility to perform fully in accordance with the Contract.

2.1.1.3 The Architect is to mean SPIEZLE ARCHITECTURAL GROUP, INC.

2.1.2 Delete the text of the paragraph and substitute the following:

The Owner shall furnish to the Contractor within a reasonable time 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.

2.1.2.1 **Prohibited Interests:** No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept, or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction, or material supply contract or any subcontract in connection with the construction of the Project shall become directly or indirectly interested personally in this Contract or in any part thereof. No officer, employee, architect, attorney, engineer, or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory, or other similar functions in connection with the construction of the Project, shall be directly or indirectly interested personally in this Contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the Project.

2.1.2.2 Owner's authorized representative is to mean SPIEZLE ARCHITECTURAL GROUP, INC.

2.2 EVIDENCE OF THE OWNER'S FINANCIAL ARRANGEMENTS

Delete Article 2.2 in its entirety.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.3 Delete the text of paragraph 2.3.3 and substitute the following:

If the employment of the Architect terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Architect.

2.3.6 Delete the text of paragraph 2.3.6 and substitute the following:

Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor electronic documents for the purpose of making reproductions pursuant to Section 1.5.2

2.5 OWNER'S RIGHT TO CARRY OUT THE WORK delete the text of paragraph 2.5 and substitute the following:

2.5.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-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 . In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor 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 included but not limited to reasonable attorney's fees. The Architect may, pursuant to section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the Change Order. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor and/or its surety 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.

2.5.2 If, in the opinion of the Architect, work to be corrected by the Owner is judged to be critical or time critical, the Architect, will inform the Owner and Contractor of the crucial nature of the work. Upon notification, the seven day periods noted in Article 2.5.1 will each be reduced to three days.

2.6 INSPECTION, CONDEMNATION, AND REJECTION OF WORK AND MATERIALS (new section)

2.6.1 The Owner reserves the right to inspect all goods and services provided or performed on the Project and condemn any goods or services which in its sole judgment do not conform to the specifications of the contract therefore.

ARTICLE 3 - CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR add the following:

3.2.1 Delete the text of the paragraph and substitute the following:

Execution of the Contract by the Contractor is a representation that (1) the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed, has submitted any discrepancy to the Architect prior thereto and correlated personal observations with requirements of the Contract Documents; (2) prior to the execution of the Agreement, the Contractor and each subcontractor evaluated and satisfied themselves as to the conditions and limitations under which the Work is to be performed, including without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, (iv) availability and cost of materials, tools and equipment, and (v) other similar issues. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project site. Except as set forth in Paragraph 10.3, the Contractor shall be solely responsible for providing a safe place for the performance of the work. The Owner shall not be required to make any adjustments in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any subcontractor to have complied with the requirements of this subparagraph 3.2.1.

3.2.2 Delete the text of the paragraph and substitute the following:

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. Dimensions given at full-size or large-scale details shall take precedence over smaller scaled measurements. These obligations are for the purpose of facilitating coordination and construction by the Contractor, as well as for discovering errors, omissions, and inconsistencies in the Contract Documents; as such, discrepancies shall be referred to the Architect in writing for adjustments before any work affected thereby has been performed.

3.2.2.1 Where compliance with two or more industry standards or sets of requirements is indicated within Contract Documents, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement (which is generally recognized to be the most costly) is intended and will be enforced. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Architect/Engineer in writing for a decision before proceeding. These may be shown on any plan, partial plan, in the Project Manual or in any Addenda.

3.2.2.2 The general character of the detail work is indicated on drawings and in specifications. The term “similar” shall be used on the drawings in its general sense and not as meaning identical, and all details shall be worked out in relation to their location and their connection to other parts of the work. Where on any drawings a portion of the work is drawn out and the remainder is indicated in outline, the parts drawn out shall apply also to other like portions of the work. When a detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts in the work unless otherwise indicated. In case of differences between small and large scale drawings, the larger scale drawings shall take precedence. Any discrepancies shall be referred to the Architect for adjustment before any work affected thereby has been performed.

3.2.2.3 Since the Contractor, as Bidder, was afforded the opportunity to visit the Project Site, Contractor shall be held responsible for cognizance and knowledge of existing features and conditions ascertainable by such site visit, and costs of the Work associated therewith.

3.2.2.4 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. If any errors, inconsistencies or omissions appear in the Drawings, Specifications, or other Contract Documents, which should reasonably have been discovered and concerning which interpretation had not been obtained during the Bidding or Proposal Period, the Contractor shall within ten (10) days after receiving written "Notice to Proceed" notify the Architect in writing of such error, inconsistency or omission. In the event the Contractor fails to give such notice, he will be responsible for the results of any such errors, inconsistencies or omissions and the cost

of rectifying same. At the end of the ten (10) day period, Interpretations of this procedure shall be made by the Architect and its decision will be final.

3.2.4 Delete the text of the paragraph and substitute the following:

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, including a failure to recognize or should have reasonably recognized any error, inconsistency, omission or difference in the Contract Documents, then the Contractor shall pay such costs and damages to the Owner 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. The Contractor shall be liable to the Owner and/or Architect for any and all damage resulting from any error, inconsistency, omission or difference which he knew or reasonably should have known but failed to report to the Architect. If the Contractor performs any work when he knows or should have known that it involves any error, inconsistency, omission or difference, without notice to the Architect and the Owner, the Contractor shall assume full responsibility for such work and shall bear an appropriate amount of the attributable costs for correction.

3.2.5 The Contractor shall forward to the Architect a written request for supplementary drawings and data needed by him to carry on his work. Such request shall be timed so as to enable the Architect to properly act well in advance of need at the site.

3.2.6 If the Architect must prepare "responses to Contractor's Requests for Information" (RFI's) where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or Project correspondence or documentation the Owner will back-charge the Contractor for all costs associated with the additional Contract Administration Services provided by the Architect.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES add the following:

3.3.1.1 At the preconstruction meeting, Contractors shall identify those individuals who shall supervise and direct the Work including both office and field supervisors. The on-site supervisor shall be present at all times that the Contractor's forces are present to perform work, shall attend all progress meetings, shall attend all coordination and scheduling meetings and such other meetings as may be reasonably requested and scheduled by the Architect. Upon the Architect's request, where there is a concern as to the progress of quality of the Contractor's work, the Contractor shall cause the President or other similarly authorized representative of the Contractor with the power to make decisions of financial consequence to the Contractor, to attend meetings scheduled by the Architect.

3.3.1.2 The attendance at all meetings set forth above by a qualified representative of the Contractor is mandatory. Any Contractor who is not represented at these meetings

without previously being excused by the Architect, or who is not present at the appointed starting time of the meeting, will be assessed a late fee in the amount of $250.00 per occurrence. The amount of this fee will be deducted from the Contractor's account through the issuance of a Change Order.

3.3.2.1 All personnel or agents of the Contractor shall observe all rules and regulations in effect at the Owner's premises. Employees, agents and Subcontractors of the Contractor, while on the Owner's property, shall be subject to the control of the Owner, but under no circumstances shall such persons be deemed to be employees or agents of the Owner. The Contractor's personnel are required on a daily basis to report and sign in, at a location to be determined by the Owner, each time they report for service and sign out when leaving the premises. Nothing herein shall limit the Contractor's duty to provide onsite safety and to secure the site.

3.3.2.2 Contractor's personnel and agents are not to engage in any activities with the building occupants, owner's personnel or agents of the Owner unless duly authorized to do so in a prior writing by the Owner's authorized representative. All contractor's personnel and agents are required to wear identification badges identifying the individual and the firm for which they are employed. The Contractor shall assume full responsibility for the actions of all personnel and agents in its employ. The Contractor shall maintain proper supervision of the work in progress at all times.

3.3.2.3 All personnel and agents used by the Contractor for the performance of its work shall be properly trained and qualified for the type of work being performed and shall have the minimum ability and experience for its classification. The Owner reserves the right to reasonably refuse to accept services from any personnel. The Contractor shall provide evidence of qualifications for any personnel performing work under its contract upon request.

3.3.2.4 The Owner (and/or the Owner's Representatives) reserves the right to direct the removal from the site of any person, equipment and or entity which displays inappropriate behavior, including but not limited to, smoking, alcohol consumption, drugs, fighting, intimidating behavior, vandalism, theft, improper storage, improper or illegal acts, unfit persons etc.

3.3.2.5 Owner has the sole right to modify any and all security requirements at the Project Site.

3.3.4 The Contractor shall locate benchmarks and establish primary lines, level and plumb. The Contractor shall be responsible for layout, and elevations specifically relating to its work. It will verify all dimensions, elevations, levels, and plumb shown on the Drawings, and report any discrepancies or inconsistencies in the above in writing to the Architect before commencing work. The Contractor shall carefully protect benchmarks, from displacement or removal.

3.4 LABOR AND MATERIALS add the following:

3.4.4 Insofar as practical or required to obtain a full warranty, except as otherwise specified or shown, the material or product of one Manufacturer shall be used throughout the work for each specified purpose.

3.4.5 All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in strict accordance with the Manufacturer's directions. Should such directions conflict with the Specifications, the Contractor shall request (in writing) clarification from the Architect before proceeding.

3.4.6 All workmanship, equipment, materials, and articles incorporated in the work are to be of the best grade of their respective kinds for the purpose. Where equipment, materials or articles are referred to in the Specification as "equal to" any particular standard, the Architect shall decide the question of equality. Contractor shall immediately furnish to the Architect for its approval the name of the Manufacturer of material, machinery, mechanical and other equipment which he contemplates installing, together with their respective performance capacities and other pertinent information to avoid delays. When required, Contractor shall furnish, for the Architect's approval, full information concerning materials, or articles which he contemplates incorporating in the work. Samples of materials shall be submitted for approval when and as directed. Material, machinery, equipment, and articles installed or used without such written approval shall be at the risk of subsequent rejection.

3.4.7 No previous inspection or certificate of payment shall be held as an acceptance of defective work or materials or to relieve Contractor from the obligation to furnish sound materials and to perform good satisfactory work. The Architect shall be the sole judge of the materials and work furnished.

3.4.8 If the Architect deems it inexpedient to correct defective work not otherwise performed or completed in strict accordance with the Contract Documents, the difference in value between such work and that of the work, materials and conditions as specified, together with a fair allowance for damage shall be deducted from the Contract price.

3.4.9 Materials and equipment stored on the site shall not be placed directly on the ground and shall be completely covered and suitably protected to the Architect’s and Owner’s satisfaction.

3.4.10 Only manufactured products of the United States, wherever available, shall be used on the Project.

3.4.11 No later than seven (7) days from the date of this Agreement, the Contractor shall provide a list showing the name(s) of the manufacturer(s) proposed to be used for the Project. The Architect will promptly reply in writing to the Contractor stating whether the Owner or the Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer is not available, the Architect may state that action will be deferred until the Contractor provides further data. The Owner’s or Architect’s failure to reply within fourteen (14) days shall constitute acceptance of the proposal. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents, and all products furnished by the listed manufacturer must conform to such requirements.

3.4.12 Any request by the Contractor which is made after the completion of bidding, to substitute any labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, or other facilities or services which is contrary to the provisions of the Drawings, Specifications, or Schedules, shall be reviewed and approved

or rejected by the Architect. The Contractor shall be solely responsible for any delay caused by the request, and for the costs and expenses of the Architect's review of the request. The Architect shall be entitled to reject the request for any reason, including the Architect's or the Owner's subjective determination of the relative quality, compatibility or desirability of the substitution.

3.5 WARRANTY Delete the text of the paragraphs 3.5.1 and 3.5.2 and substitute the following:

3.5.1 In addition to the warranties set forth in the Contract Documents, the Contractor warrants that:

3.5.2 All materials and equipment furnished under this contract shall be of good quality and new unless otherwise authorized by the Owner. Any applicable manufacturer's warranties shall be transferred to the Owner.

3.5.3 Title to all work, materials, and equipment will pass to the Owner free and clear of all liens, claims, security interests, or encumbrances.

3.5.4 The Work will be free from defects not inherent in the quality of the Work in the Contract Documents required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. A **two (2) year** warranty of the materials, equipment, and work shall commence from the date established by the Owner as of the date of substantial completion for the entire project. This will apply to all materials and equipment (including but not limited to HVAC equipment) that the Owner may begin to use prior to the established date of substantial completion.

3.5.5 During the **twenty-third** month after the date of substantial completion of the work, the Owner, Architect, and the Contractor shall review the work to confirm the requirements of the Contract have been satisfied. Any corrective work necessary will be addressed at that time, prior to expiration of the warranty. The requirement will not modify any of the Contractor's obligations relative to warranties that are in effect for a period greater than one year.

3.5.6 If within the warranty period, any portion of the materials, equipment, and work is found to be defective or not in accordance with the contract documents, the Contractor shall correct the problem at his own cost and expense. The payment of the contract sum shall not constitute an acceptance of the work not performed in conformance with the contract documents.

3.5.7 Any applicable warranties shall be transferred to the Owner by the Contractor at no additional cost or expense to the Owner.

3.6 TAXES renumber first paragraph to 3.6.1 and add the following:

3.6.2 The Owner is exempt under the provisions of the New Jersey Sales and Use Tax Act. Bidders are expected to comply with the provisions of the Act and rules and regulations promulgated pursuant thereto to qualify for exemptions with reference to any and all labor, service and materials supplied to or furnished in connection with the work to be performed. New Jersey State Sales and Use Tax on labor, service and materials provided by the Contractor, its Subcontractors, and suppliers used in this Project shall not be included in its Bid.

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS add the following:

3.7.1.1 The Contractor shall secure and pay for the plan review fees to the local township and be reimbursed by the Owner. The Owner is not charged for building permits by the local township. All other costs shall be the responsibility of the Contractor and those items shall be included in his base bid.

3.7.1.2 The General Contractor will be responsible to take out and pay for any Bonds and insurance certificates required by the local Building Official, the County, the Municipality and all governmental authorities with jurisdiction over this project. Each Prime Contractor shall be responsible for filling out permits for its work under contract.

3.7.1.3 The code reviews and costs associated with code reviews have been paid or will be paid by the Owner to the New Jersey Department of Community Affairs or to the Local Code Official. Approved sets will be provided to the Contractor to file with the Local Officials and fill out permit information. Permits will be issued based upon the previously reviewed and approved drawings.

3.7.3.1 The Contractor is responsible for the scheduling and coordination of any inspections covered by local Code enforcement officials or agencies. The Architect is to be notified of all scheduled inspections when they are ordered. The Contractor must further ensure that the work to be inspected is properly completed and ready for inspection and that all equipment necessary to conduct the inspection (i.e. gauges, meters, etc.) is in place and in proper working order.

3.7.3.2 The Contractor shall be solely responsible for the coordination and scheduling of the Utility Company. The Contractor must plan to allow a minimum of 60 days notice when the Utility Company is to furnish new poles or equipment. In the event the Owner is required to enter into a formal agreement with the Utility Company, the Contractor agrees to be bound by the terms thereof and to assume full responsibility for all requirements and obligations imposed upon the Owner by the Utility Company, including but not limited to any indemnification provisions.

3.7.4 Concealed or Unknown Conditions: renumber the first paragraph to 3.7.4.1 and add the following

In condition (1) add the words “elevational, dimensional,” before the words at the beginning of the sentence.

3.7.4.2 No adjustment in Contract Time or Contract Sum shall be permitted, however, in connection with a concealed or unknown condition that does not differ materially from those conditions disclosed or that reasonably should have been disclosed by the

Contractor's (i) prior inspections, tests, reviews, and pre-construction services for the Project, or (ii) inspections, tests, reviews, and pre-construction services that the Contractor had the opportunity to make or should have performed in connection with the Project.

3.9 SUPERINTENDENT add the following:

3.9.1.1 The superintendent shall have a minimum of 15 years of experience in construction. The Contractor's superintendent shall perform only supervisory work and shall not be an active tradesman or be assigned to do manual work on the Project. Communications which the Contractor intends to rely upon shall be confirmed in writing.

3.9.1.2 When the project involves multiple project sites the Contractor is to assign a separate superintendent to each site who will be responsible for that particular site only.

3.9.1.3 The number of necessary assistants to the superintendent shall be such that work in progress shall be adequately supervised by each Contractor's superintendent or one of his assistants. If, in the Architect's opinion, the quality or progress of work is adversely affected by lack of adequate supervision, the Contractor shall increase the number of supervisory personnel at no increase to the Contract sum.

3.9.2. Delete the text of the paragraph and substitute the following:

The Contractor, as soon as practicable after award of the Contract, shall submit the name and qualifications of the Superintendent to the Owner for its approval. The Owner may conduct an interview of the Superintendent. Once approved, the Superintendent shall not be changed without the prior written approval of the Owner.

3.9.3 Delete the text of the paragraph and substitute the following:

The Superintendent shall not be removed from the work until all corrective and punch list items are completed to the Owner's satisfaction.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES add the following:

3.10.1.1 Contractor shall, within fourteen (14) calendar days after issuance of a Notice of Award, submit a draft Construction Schedule detailing logic, tasks and durations along with a detailed submittal schedule to the Architect and Owner, for the Architect's and Owner's information prepared in accordance with Section 013200 Construction Progress Documentation or approved equal along with a coordinated, detailed submittal schedule in accordance with Article 3.12.12, for work of the entire Project.

3.10.1.2 Seven (7) calendar days after the Architect and Owner receive the Contractor's coordinated, detailed draft Construction Schedule, the President of the Company or Corporation shall meet to review, and sign off on the coordinated detailed Contractor's Construction Schedule in the presence of the Architect and Owner's designee. Failure of the Contractor to sign off on the Contractor's Construction Schedule shall result in the assessment of liquidated damages as outlined in article 8.4. The schedule shall not exceed time limits current under the Contract Documents for substantial completion of any phases and that of the entire Project. The Contractor's Construction Schedule shall

be updated by the Contractor to reflect the status of its work in relation to the Contractor's Construction Schedule, and any recommended changes in the sequencing and scheduling. The Contractor's Construction Schedule shall be updated at least every 30 calendar days or updated as often as deemed necessary by the Architect. Upon 4 working days of such request by the Architect, the Contractor shall submit a revised draft Construction Schedule update to the Architect. The updated Contractor's Construction Schedule will be reviewed at each Job Meeting and the Contractor is required to have a representative present at the Job Meeting with written authorization from the President of the Company or Corporation to review, agree upon, and sign-off on any approved and agreed upon changes to the updated Contractor's Construction Schedule. Failure by Contractor to correct the scheduled update in the time required shall result in a reduction in the Contractor's Contract Amount of FIVE HUNDRED ($500.00) per each occurrence as liquidated damages. In addition, payment to the Contractor may result in the withholding of payments to the Contractor, and in the liability of the Contractor for liquidated damages for the failure of the Project to be completed within the designated time. Any acceleration of the Contractor's Construction Schedule shall be agreed upon and approved by the Architect and Owner's designee.

3.10.1.3 Reference to procedures concerning Submittals shall be construed to incorporate all submittals including Contractor's Submittal Schedule of all products (to be received by the Architect within the time designated form the Notice to Proceed as indicated in article 3.10.1), Submittal Matrix (for substitute products and materials and included in Section 009000 Project Forms), Manufacturer's published literature, shop drawings, samples, design and other data. Each submittal is required to be accompanied by a fully completed submittal cover sheet, Section 009000 – Project Forms, Form 009310 – Submittal Cover Sheet, included in the Project Manual, or alternate form that includes the equivalent information approved by the Owner and Architect.

3.10.1.4 Submittal Schedules shall be prepared and incorporated into the Contractor's Construction Schedule as indicated in Section 013300 – Submittal Procedures. Contractor shall include the following considerations when preparing the submittal schedule so that approved products are at the project site ready for installation in accordance with the time established in the Contractors' Construction Schedule to avoid delays.

3.10.1.5 In the absence of a signed change order approving an extension of time, the Contractor Construction Schedule updates must show substantial completion date consistent with the date required in paragraph 8.1.5 of these Supplementary Conditions. Changes in logistics or duration shall not be made, except for good cause, and shall not result in an extension of the time for substantial completion. In the event certain aspects of the work fall behind the Contractor's Construction Schedule, the Contractor shall develop a recovery plan to revise logistics, add manpower resources to reduce durations, expedite procurement or advance start of activities, to get the project back on a schedule that will assure completion in accordance with the substantial completion date, which shall be agreed upon and approved by the Architect and Owner's designee.

3.10.1.6 When the schedule is complete and in compliance with 3.10.1.2, the schedule will become part of the construction documents, and shall be altered only in accordance with duly authorized change orders for extension of time in accordance with Article 8.3.

3.10.1.7 All work that may, as determined by the owner and/or Architect, be disruptive or interfere with sanitary conditions, plumbing, mechanical, electrical or the safety or activities of the building's occupants and/or may include noisy work, shall be performed after business hours, on weekends, and/or holidays so as not to interfere with scheduled activities and public safety, at no additional cost to the owner. In the event the Contractor does not meet the substantial completion date, the Contractor shall be responsible for fully cleaning all areas utilized by the owner's operations and where work is being performed at the end of each Contractors work session, to the owner's satisfaction so the area can be used for scheduled activities the following day. In the event the areas are not cleaned to the owner's satisfaction, the owner will clean the said areas as deemed necessary prior to the next regularly scheduled opening of operations for the next business day and deduct all associated costs of cleaning from the contract amount.

3.10.2.1 The Contractor shall deliver written evidence to the Architect that materials and equipment necessary for the timely installation and completion of the Work will be available, provided that failure to deliver such written evidence shall not excuse Contractor's obligation to timely furnish and install materials and equipment and to complete the Work.

3.10.3 Delete this paragraph and replace with the following:

The Contractor shall cooperate with the Owner in providing schedules updates and notification notices which may impact the Owner's operations. The Contractor will coordinate with the Owner to provide school bus companies, trash hauling companies, and others with the proposed construction schedules, anticipated detours and duration.

3.10.4 The Contractor shall work his forces overtime, at his expense, if required to maintain the Progress Schedule established.

3.10.5 The Contractor shall make proper assignments of employees in order to preclude labor, jurisdiction or like dispute, and if such disputes arise, do all things necessary to effect a prompt settlement thereof, including reference of such disputes to labor representatives or other established construction industry agencies for resolution, and be bound by their decisions.

3.10.6 The Contractor shall, within 24 hours after rejection of Work pursuant to Subparagraph 4.2.6 of the General Conditions, remove all materials and equipment so rejected and immediately replace said Work, at his cost, to the satisfaction of the Architect. Should the Work of the Owner or other contractors be damaged by such removal or replacement, the Contractor shall reimburse the Owner and other contractors and subcontractors for all costs incurred by them for correcting said damage.

3.10.7 The Contractor shall perform the work in accordance with the most recent schedule submitted to the Architect. In the event the Contractor fails to perform work in accordance with the schedule, at the Architect's request, the Contractor shall provide a recovery schedule, reflecting the Contractor's commitment to complete the work in accordance with the contract documents, including but not limited to double shifts, overtime, evening, and weekend work; at the Contractor's expense. Nothing contained herein shall be construed so as to prevent the Owner from resorting to its contractual remedies, including but not limited to liquidated damages, withholding of certification of

payment, and termination due to Contractor's failure to perform work in accordance with the schedule.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES add the following:

3.12.1.1 Should Contractor wish to substitute a specified item, Contractor will submit a complete Submittal Matrix For Substitution Evaluation as Approved Equal form as provided in Section 009000 – PROJECT FORMS prior to the Architect/Engineer's consideration of a substitution.

3.12.4.1 Architect's review is for general conformance with the Design Concept and Contract Documents. Markings or comments shall not be construed as relieving the Contractor from compliance with all requirements of the Project Manual, Drawings, and Addenda. No departures there from, are to be considered as authorizing extra work or relieving the Contractor of work required within the contract. The Contractor remains responsible for materials, dimensions, details and accuracy for confirming and correlating all quantities and dimensions, and warranty/guarantee requirements and other conditions of the contract, etc. for selecting fabrication process and techniques of assembly, for performing this work in a safe and satisfactory manner, and of coordinating this work with that of all other trades.

3.12.5 Delete this paragraph and replace with the following:

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 or otherwise required by the Owner or Architect 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. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action. The following submittal scheduled will be mandatory; time is from the date of the notice to proceed in consecutive calendar days: All contracts and trades - thirty (30) days.

3.12.7.1 Submittals that require coordination with other products, installation of other products, or owner operations, etc. shall be submitted together as a coordinated package or they will not be reviewed by the Architect. Coordination of all items is the responsibility of the Contractor. Contractor will replace non-compatible components to the Architect's satisfaction at no additional cost.

3.12.8.1 Work performed contrary to the procedures set forth in this Article 3.12 shall be at the risk and expense of the Contractor. All shop drawings used for fabrication and erection shall be those reviewed by the Architect, without change. If change is found to be necessary on any reviewed shop drawing, product data or sample, it shall be resubmitted for further review.

3.12.10 & 3.12.10.1 &3.12.10.2 Delete these paragraphs and replace with the following:

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. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly 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. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, 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. The Contractor shall bear full responsibility for any and all costs incurred by the Owner, including architectural fees and reasonable attorneys' fees in connection with any and all deviations to the Contractor's submittals which were not approved by the Architect.

3.12.11 Submittals shall indicate materials, dimensions, seismic bracing in accordance with IBC International Building Code 2015, New Jersey Edition for Architectural, Mechanical and Electrical Component Seismic Design Requirements, and job conditions, including clearances required in relationship with the work of their trades. Contractor shall be responsible for verification of existing conditions and coordinating with the work of other trades. Drawings shall be of sufficient size and drawn to sufficient scale to clearly show all details.

3.12.12 Submittals shall indicate compliance with seismic design requirements in accordance with IBC International Building Code 2018, New Jersey Edition for Architectural, Mechanical and Electrical Component Seismic Design Requirements. Provide seismic calculations signed and sealed by a Professional Engineer licensed in the state where the Project is located as required.

3.12.13 Submittals of Shop Drawings and other data, where possible, shall be submitted electronically in PDF Format.

3.12.14 Material Safety Data Sheets (MSDS): Submit Material Safety Data Sheets directly to the Owner; do not submit to the Architect/Engineer unless otherwise indicated. Architect/Engineer will not review submittals that include MSDS and will return entire submittal for resubmission.

3.12.15 American goods and products are to be used where possible.

3.12.16 Submittals shall contain a Contractor's stamp of approval, signed and dated by the submitting Contractor, prior to submission to the Architect. Such stamp of approval by the Contractor shall be confirmation that he has determined and verified materials, field measurements, and field construction criteria related thereto, and has checked and coordinated the information contained within such submittals. The Contractor shall also note in writing to the Architect, all deviations to the Contract Documents. Submittals will not be reviewed by the Architect/Engineer unless they contain such a stamp containing the words "Reviewed and Approved" accompanied by the Contractor's signature and date.

3.12.17 When brand, make, quality, etc., is not specified definitely, Contractor shall submit written documentation to the Architect for the particular kind of brand which he desires to use, altering or substituting others if not satisfactory.

3.12.18 If a substitution submittal differs from the design intent of the Contract documents, and all associated modifications to the design intent are not identified and included with the submission, all consequential additional costs associated with the substitution including, but not limited to, modifications to existing and new construction, building structure, plumbing, HVAC, electrical systems and all other modifications to not yet constructed work shall be borne by the contractor responsible for the submittal.

3.12.19 Consequential Substitution Impact Fees: If the Contractor makes, or causes to be made, due to impact from approval of substitutions of other than specified equipment and components, any substantial change in the form, type, system, and details of construction from those indicated in the Contract Documents, the Contractor shall be responsible for payment of all impact costs arising from such changes. Impact costs include, but are not limited to, any additional costs to the Owner inclusive of Architectural, Engineering, and Attorney fees, Code Review and Permit fees as well as all documented impact costs borne by other Contractors resulting from such substitutions. Impact cost shall also include associated re-design, demolition and re-construction work, additional new construction work as may be required, and compliance with and maintenance of existing warranties, etc.

3.13 USE OF SITE add the following:

3.13.1 Add 3.13.1 prior to first paragraph.

3.13.2 Contractors shall use the site in a manner that will cause minimum interference and maximum safety to the occupants of the building and the general public. Contractor must have prior approval of the Architect and Owner for locations of stored materials, access, trailer locations, etc.

3.13.3 In addition to site utilization limitations and requirements shown on Drawings and indicated by the Contract Documents, the Contractor shall administer allocation of available space within Construction area so as to produce best overall efficiency in performance of total work of Project. The Contractor shall schedule deliveries so as to minimize time and space requirements for storage of materials and equipment on site.

3.13.4 Contractors may seek approval from the Owner to work weekdays, evenings, nights, weekends, and may be subject to reimburse/pay for all costs, i.e., custodial fees/OT, etc. Refer to the summary section 011000 for additional work restrictions. It is the Contractor's responsibility to ensure that his work is performed at times permitted by local ordinances and within such noise levels as may be mandated by the Township. The Contractor shall assume full responsibility for any violations committed in whole or in part by the Contractor or its subcontractors which may be charged to or assessed against the Owner and shall indemnify and hold harmless the Owner for any and all fines, costs and expenses of any kind, including reasonable attorney's fees, which may be charged to, assessed against, or incurred by the Owner in connection with such violations.

3.15 CLEANING UP add the following:

3.15.1.1 The Contractor shall maintain the Project construction area, streets, sidewalks and adjacent property clean, free of debris, dirt, unusable materials, garbage, etc. at all times until the Project is accepted by the Owner. The Contractor shall clean and provide maintenance on completed construction included in their scope of work, after installation, and as frequently as necessary through the remainder of the construction period. The Contractor shall be held responsible for removal of all their debris and excess material from the work area to dumpsters furnished by the Contractor.

3.15.1.2 The Contractor shall supervise its construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.15.2 Delete this paragraph and replace with the following:

The Contractor will be given 24 hours' notice to clean up as directed by the Architect and required by the contract, and if he does not comply, the Architect will arrange for other means to achieve the daily clean up and the Contractor will be back charged.

3.18 INDEMNIFICATION add the following:

3.18.1 Delete this paragraph and replace with the following:

To the fullest extent permitted by law the Contractor shall defend and 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 directly or indirectly from performance of the Work, including but not limited to:

(1) the acts or omissions of the Contractor, its agents, servants, officers, employees, subcontractors, subconsultants or any other person working at the Contractor's request, subject to its direction, or on its behalf;

(2) the loss of life or property, or injury or damage to the person, body or property of any person or persons whatsoever, that arises or results directly or indirectly from performance of the work or delivery of deliverables by the Contractor, its agents, servants, officers, employees, subcontractors, subconsultants, or any other person acting at the Contractor's request, subject to its direction, or on its behalf;

(3) any negligence, default, breach, or errors or omissions of the Contractor, its agents, servants, officers, employees, subcontractors, subconsultants, or any other person acting at the Contractor's request, subject to its direction, or on its behalf;

(4) violation or non-compliance with federal, state, local, municipal laws and regulations, ordinances, building codes (including without limitation the Americans with Disabilities Act, OSHA, Environmental Protection Act) arising from the performance or non-performance of; or arising out of conditions created or caused to be created by, the Contractor, its agent, servants, officers, employees, subcontractors, subconsultants, or any other person acting at the Contractor's request, subject to its direction, or on its behalf; and

(5) the use of copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used in the 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), or willful acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, including 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 which would otherwise exist as to a party or person described in this Section 3.18.

3.18.2.1 The Contractor's defense and indemnification obligation is not limited by, but is in addition to the insurance obligations contained in the contractual documents.

3.18.3 The Contractor agrees that any approval by the Owner of the work performed, and/or reports, plans, or specifications provided by the Contractor shall not operate to limit the obligations of the Contractor under the Contract Documents; and that the Owner assumes no obligations to indemnify or save harmless the Contractor, its agents, servants, officers, employees, subcontractors, subconsultant, against all claims that may arise out of its performance or nonperformance under the Contract Documents; and that the provisions of this defense and indemnification clause shall in no way limit the Contractor's obligations under the Contract Documents, nor shall they be construed to relieve the Contractor from any liability, nor preclude the Owner from taking any other actions available to it under any other provisions of the Contract Documents or otherwise at law or equity.

3.18.4 The provision of this section shall survive the termination of the Contract Documents.

ARTICLE 4 – ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT Add the following:

4.2.4.1 Any correspondence received after 4:00 PM prevailing time (the end of the business day) will be recognized as being received on the beginning of the next business day, Saturdays, Sundays, or holidays excepted and correspondence received on Saturdays,

Sundays, and holidays will be recognized as received on the beginning of the next business day.

4.2.7.1 Whenever a material, article or piece of equipment is identified on the Plans or in the Specifications by reference to Manufacturers' or Vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard, and any material article, or equipment of other manufacturers and vendors which will perform adequately equal to or better than, the duties imposed by the general design, will be considered equally acceptable provided the material, article, or equipment so proposed is, in the opinion of the Architect of equal or better substance and function. The material, article or equipment so proposed shall not be purchased or installed by the Contractor without the Architect's written approval.

4.2.7.2 The acceptance of any material or method shall be understood as an acceptance only insofar as conforming to Specification requirements, and not as an absolute acceptance without respect to the requirements of the Specifications.

4.2.7.3 The typical time frame is three weeks for the Architect to review, and four weeks for the Architect and Engineer to review when an Engineer is also involved in the review.

4.2.10 Delete this paragraph and replace with the following:

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 duties, responsibilities and limitations of authority of such project representatives shall be as set forth in the Agreement between the Owner and Architect.

4.2.11 Delete this paragraph and replace with the following:

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 limit agreed upon or otherwise with reasonable promptness, but in no event more than fifteen (15) days after receipt of the request by the Architect.

4.2.14.1 All requests for information shall be submitted by the Contractor, in the Architect’s discretion, on the Request for Information form provided by the Architect The Contractor shall clearly and concisely set forth the issue for which the clarification or interpretation is sought and why a response is needed from the Architect. In the Request for Interpretation, the contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.

4.2.14.2 The Contractor shall bear all costs associated with the Request for Information including but not limited to architectural fees where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor prepared coordination drawings, or prior Project correspondence or documentation.

4.2.14.3 The Architect will review all Requests for Information to determine whether they are Requests for Information with the meaning of this term. If the Architect determines that

the document is not a Request for Information, it will be returned to the Contractor, un-reviewed as to content, for resubmittal on the proper form and in the proper manner.

4.2.14.4 Responses to Requests for Information shall be issued within five (5) working days of receipt of the request from the Contractor unless the Architect determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Owner, the Architect will within five (5) working days of the receipt of the request, notify the Contractor of the anticipated response time. The Contractor shall not be entitled to any time extension due to the time it takes the Architect to respond to the Request for Information provided that the Architect responds within reasonable promptness.

4.2.14.5 Responses from the Architect will not change any requirement in the Contract Documents. In the event the Contractor believes that a response to a Request for Information will cause a change to the requirements of the Contract Documents, the Contractor shall immediately give written notice to the Owner stating that the Contractor considers the response to be a Change Order. Failure to give such written notice immediately shall waive the contractor's right to seek additional time or cost under these General Conditions.

ARTICLE 5 - SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK add the following:

5.2.1 Delete this paragraph and replace with the following:

Within twenty (20) days after the Notice to Proceed, the Contractor shall furnish to the Architect in writing, for review by the Owner and the Architect, a list of the names of all subcontractors, sub-subcontractors, fabricators, manufacturers, sources of supply, articles, devices, fixtures, pieces of equipment, materials and processes proposed for each item of work on List of Subcontractors, AIA Document G805. The Architect will promptly notify the Contractor, in writing, if either the Owner or the Architect, after due investigation, has any objection to any names on such list. Failure of the Owner or Architect to make objection promptly to any name on the list shall constitute acceptance of such name. In no event shall the Contractor substitute a subcontractor who is named by the Contractor in the bid documents. A Business Registration Certificate and a Public Works Contactor Registration Act Certificate must be furnished for each subcontractor as required by applicable law.

5.2.2.1 In submitting the names of subcontractors, the Contractor shall list 1) the extent of limitations of the trades or work included by specifications paragraph number, 2) the name and address of the subcontractor; 3) the name and address of all sub-subcontractors for each significant subdivision of the trade or work, and if required by the Architect, 4) reference in the form of a list of at least three (3) jobs similar in size and quality to this Project performed in the last five (5) years, with name and location of work, dollar value and names of the Owner and Architect.

5.2.2.2 In submitting sources in supply of materials, articles and pieces of equipment including those under subcontracts and sub-subcontracts, the Contractor shall list 1) the extent or

limitations of the trades or work included by Specifications, paragraph number 2) the name and address of the source of supply 3) the name of the manufacturer of the items.

5.2.3 Delete this paragraph and replace with the following:

If the Owner or Architect has objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no objection.

5.2.4 Delete this paragraph and replace with the following:

The Contractor shall not substitute a Subcontractor, person or entity previously selected without the consent of the Owner.

5.2.5 Contractor shall defend, indemnify, and hold the Owner harmless against any claims brought by a subcontractor, supplier or any other entity, claiming a violation of **N.J.S.A. 18A:64A-25,** or the improper or illegal substitution of a subcontractor, supplier or other entity.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS delete the following:

5.4.2 Delete this paragraph in its entirety.

5.4.3 Renumber paragraph to 5.4.2.

ARTICLE 6 - CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND AWARD SEPARATE CONTRACTS add the following:

6.1.4 Delete this paragraph and replace with the following:

Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12, provisions relating to Construction Schedules, and Supplemental Project Requirements relating to coordination and cooperation among Prime Contractors.

6.1.4.1 The Contractor shall coordinate all phases of the Work with the Architect and the Owner's representatives and own forces.

6.2 MUTUAL RESPONSIBILITY add the following:

6.2.3 Delete this paragraph and replace with the following:

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 of the contracts, or any other cause or reason within the Contractor's contract.

6.2.4 Delete this paragraph and replace with the following:

The Contractor shall promptly remedy damage the Contractor or any of the Contractor's Subcontractors wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

6.2.4.1 Should a Contractor cause damage to the work or property of any other Contractor or Vendor on the project, the Contractor shall, upon due notice, promptly settle with such other Contractor or Vendor by agreement or otherwise resolve the dispute. If such other Contractor or Vendor sues or institutes arbitration proceedings against the Owner on account of any damage alleged to have been sustained, the Contractor shall indemnify and hold harmless the Owner and Architect and defend them in such proceeding at its own expense, and if any judgment against the Owner or Architect arises therefrom, the Contractor shall pay or satisfy it, and shall also reimburse the Owner or Architect for any Architect's, Engineer's, and Attorney's fees and Court costs which the Owner or Architect has incurred.

6.2.6 The Contractor shall be responsible for proceeding with work in a manner that will not void any and all guarantees and warranties held by the Owner on the existing systems and facility. Contractors shall include in their Bid sufficient cost to hire a representative of the Manufacturer or Contractor covering a warranty or guaranty on existing materials to advise on, and oversee work being done that affects the warranties and guaranties so as not to void existing warranties and/or guaranties. Contractor shall comply with the Manufacturer's/Contractor's representative's requirements to maintain guaranties and warranties intact.

6.3 OWNER'S RIGHT TO CLEAN UP add the following:

Add 6.3.1 before the first paragraph.

6.3.2 This obligation shall apply to clean-ups required not only during the course of construction, but also as of completion of work. In the event that the Owner is required to incur extra costs, by way of overtime charges or otherwise in the execution of its rights under this provision, those costs shall be chargeable to the Contractor.

ARTICLE 7 - CHANGES IN THE WORK

7.1 GENERAL add the following:

7.1.4 Wherever the estimated quantities of work to be done and materials to be furnished on a unit price basis under this Contract are shown in any of the Documents including the Proposal, they are given for use in comparing Bids, and the right is expressly reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this Contract and such increase or diminution shall in no way invalidate

this Contract, nor shall any such increase or diminution give cause for claims or liability for damages.

7.1.5 The allowance for overhead and profit combined may vary according to the nature, extent and complexity of the work, but shall in no event exceed the following schedule:

.1	For the Contractor, for Work performed by his own forces	10% of cost
.2	For each Subcontractor, for Work performed by his own forces	10% of cost
.3	For the Contractor, for Work performed by a Subcontractor	5% of cost

In no event shall the total allowance for overhead and profit exceed 15% of the net cost of the work, including all lower tiered sub-subcontractors.

7.1.6 If the net value of a change results in a credit from the Contractor or Subcontractor, the credit given shall be the net cost without overhead or profit. The cost as used herein shall include all items of labor, materials, and equipment together with the cost of all insurance, bonds, use of small tools, incidental job burdens, general office expenses, engineering, cleaning, transportation and all other conditions referenced in the Contract Documents. No percentages for overhead and profit will be allowed on employment taxes under FICA and FUTA that will be based on the Contractor's last quarterly 941 form. When both additions and credits are involved in any one change, the allowance for overhead and profit shall be figured on the basis of net increase, if any.

7.1.7 Where they apply, unit prices for additions or deductions as stated in the Contract Documents shall always be used as the basis for determining the cost or credit to the Owner for any changes made no matter what overall method is used for such determination.

7.1.8 Lump sum quotations for changes in the Work will not be accepted. Proposals shall be completely itemized and broken down. They shall be accompanied by such supporting data as the Architect may require such as copies of Subcontractors or Vendor's quotations quantity take-off sheets or other similar information. The Owner has the right to audit all changes and claims.

7.5 RIGHT TO AUDIT THE CONTRACTOR'S BOOKS AND RECORDS New Article:

7.5.1 The Owner shall have the right to appoint an auditor to audit and review the Contractor's financial books and records of account in connection with any claim by the Contractor, Change Order, or Construction Change Directive.

ARTICLE 8 - TIME

8.1 DEFINITIONS add the following:

8.1.5 <u>All time limits set forth in the Agreement are of the essence.</u> By executing the Agreement, the Contractor confirms that the contract time is a reasonable period for performing the Work. Work will commence within TEN (10) CALENDAR DAYS after issuance of written "Notice to Proceed" and be substantially completed in accordance with the Contract Documents and Contractors' Coordinated Construction Schedule for substantial completion of the entire Project in accordance with Section 011000 –

Summary, Article 1.5 Work Phases. All time limits stated in the contract are of the essence.

8.2 PROGRESS AND COMPLETION add the following:

8.2.4 The Contractor shall furnish such manpower, materials, facilities, and equipment and shall work such hours, including night shifts, overtime operations and Sundays and holidays, as may be necessary to insure the performance and completion of the Work in accordance with the approved and currently updated and approved Schedule. Should it become apparent from the current Schedule that the Work will not be completed within the Contract Time, the Contractor agrees that he will, as necessary, take some or all of the following actions at no additional cost to the Owner or Architect and reimburse/pay for all costs, i.e., custodial fees/OT, etc. (Refer to the summary section 011000 for additional work restrictions) to improve the progress of the Project.

8.2.4.1 Increase manpower in such quantities and crafts as will substantially eliminate, in the judgment of the Architect, the backlog of Work;

8.2.4.2 Increase the number of working hours per shift, shifts per working day, working days per week, the amount of equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the Architect, the backlog of Work; and,

8.2.4.3 Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

8.2.5 The Architect may require the Contractor to suggest revisions to the Schedule in writing demonstrating its program and proposed plan to make up the delay to ensure completion of the Work within the Contract Time. If the Architect finds the proposed plan not acceptable, the Architect may require the Contractor to take any of the actions set forth in this Article without additional cost to the Owner to make up the lag in scheduled progress.

8.2.6 Should the Contractor fail to achieve Substantial Completion in accordance with the date established in the Contract Documents, the Contractor shall reimburse the Owner for all professional fees plus expenses incurred by the Owner for additional services required of the Architect, Engineer, and Owner's Attorney resulting from the failed performance by the Contractor to meet the Contract Substantial Completion Date.

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, or of an employee of either, or of a separate contractor employed by the Owner; or (2) by changes ordered in the Work; or (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; or (4) by delay authorized by the Owner pending litigation or mediation; or (5) by other causes that the Contractor asserts, and the Architect determines justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine and the Owner approve.

8.3.3 In accordance with **N.J.S.A. 18A:64A-25**, in no event shall the Contractor be entitled to collect damages from the Owner or Architect as a result of any Project delay not solely caused by the Owner's negligence, bad faith, active interference, tortuous conduct, or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4. The Contractor is aware that its ability to complete its portion of the Project could be hindered or delayed by the actions or inactions of other Contractors on the Project or other causes not attributable to the Owner's negligence, bad faith, active interference or tortuous conduct or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4. The Contractor's sole remedy for delays by the Owner's negligence, bad faith, active interference, tortuous conduct or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4 shall be the actual out of pocket expenses incurred by the Contractor directly attributable to the delays caused solely by the Owner or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4. The Contractor's sole remedy for delays caused by any reason other than the Owner's negligence, bad faith, active interference, tortuous conduct or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4 shall be an extension of time to complete the Project.

8.3.4 To the fullest extent permitted by law, no payment, compensation or adjustment of any kind (other than the extensions of time provided for in Paragraph 8.3.1) shall be made to the Contractor by the Owner or Architect for direct, indirect, or impact damages, including but not limited to costs of acceleration or loss of revenue, overhead or profit, arising because of hindrances or delays being avoidable or unavoidable, reasonable or unreasonable, other than delays adjudicated as attributable to solely the Owner's negligence, bad faith, active interference, or tortuous conduct or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4. The Contractor agrees that he will make no claim against the Owner or Architect for payment, compensation, damages, mitigation of liquidated damages, or adjustment of any kind for such hindrances or delays, and will accept such extensions of time in full satisfaction for any and all alleged claims against the Owner and Architect for any and all such hindrances or delays in all cases where the Owner's negligence, bad faith, active interference, or tortuous conduct or unforeseen circumstances uncontemplated by the parties, which were not otherwise foreseeable, as more particularly described in Article 8.4.4, is not the sole cause of the delay. No additional payment will be made for reason of extension of time to any contractor in the completion of work. No claims for extra cost by any contractor will be granted by reason of the construction not being completed within the contract time.

8.3.5 The provisions of this Article shall not be so interpreted or construed as to preclude or prevent the Contractor from making and prosecuting any claim against any separate Contractor engaged by the Owner for damages alleged to have been caused or occasioned by any such separate Contractor. Any delay attributable to another contractor shall be brought by the contractor as a direct action against the delaying contractor.

8.3.6 Any delay attributable to lack of coordination or cooperation by and between the Contractor or his Subcontractors, if any, will not be recognized by the Owner as the basis

for any claim for increase in any Contract Sum, but shall be settled as provided in the General and Supplementary Conditions.

8.3.7 An extension of time shall be allowed equal to the total period of any delay caused by injunction or other legal proceedings, insofar as such proceedings prevent the Contractor from proceeding with the work, but no extension shall be allowed unless such legal proceedings shall be diligently prosecuted by the Contractor and, provided further that, in no case shall such delay be deemed to begin until the Contractor shall have given written notice to the Owner of the injunction or other action of delay and shall have delivered to the Owner a copy of the injunction or other orders and the papers upon which the time shall have been granted.

8.3.8 The Owner may suspend the whole or any part of the work, if it shall deem it for the best interest of the Owner to do so, without compensation to the Contractor for such suspension other than extending the time for completion of the work as much as it may have been delayed by such suspension. During such suspension, all materials delivered upon but not placed in the work, shall be neatly piled by the Contractor so as not to obstruct public travel or shall be removed from the line of work at the direction of the Owner and, unless the materials be moved by the Contractor upon such direction, the materials shall be removed by the Owner and expense thereof will be charged to the Contractor.

8.3.9 Nothing contained herein shall preclude the Owner from recovering damages for delays pursuant to the terms of the Contract Documents, except as specifically provided herein.

8.4 LIQUIDATED DAMAGES new article add the following:

8.4.1 The Contractor shall substantially complete all of his Work included in the Contract Documents ready for the Owner's occupancy as defined in the General Conditions, in accordance with the allotted time indicated in the Contract Documents, subject to extensions of contract time as provided in the General Conditions.

8.4.2 In the event of the failure of the Contractor to complete the said work within the time stated in its proposal, and in accordance with article 8.1.5, the Contractor shall be liable to the Owner in the sum of **SEVEN HUNDRED FIFTY DOLLARS ($750.00)** per day for each and every calendar day that the work remains incomplete in accordance with designated phased completions. This sum shall be treated as liquidated damages (and not a penalty) for the loss to the Owner of the use of premises in a completed state of construction, alteration or repair, and for added administration and inspection costs to the Owner on account of the delay; provided, however, that the said liquidated damages shall be in addition to other consequential losses or damages that the Owner may incur by reason of such delay, such as, but not limited to, reasonable attorney's fees, all additional consequential Architectural and Engineering fees incurred including, but not necessarily limited to, additional design work, submittal reviews, correspondence, inspections, job meetings, reviewing applications for payment, punchlists, and similar services, etc. by the Owner after the scheduled date of substantial completion as indicated in article 8.1.5, other added costs of the project and the cost of furnishing temporary services, if any. Any such sums for which the Contractor is liable may be deducted by the Owner from any monies due or to become due to the Contractor.

8.4.2.1 The Contractor agrees that said work shall be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will ensure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work herein is a reasonable time, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality. If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration of the awarding of its contract, to pay the Owner the amount specified in the contract, not as a penalty but as liquidated damages for breach of contract as hereinafter set forth, for each and every calendar day that the contractor may be held in default after the stipulated date in the contract for completing the work.

8.4.2.2 The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain, and said amounts shall be retained by the Owner as necessary to cover projected untimely completion of the contract work due to Contractor-caused delays.

8.4.2.3 It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time if fixed for the performance of any act whatsoever; and where under the contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract.

8.4.3 Inasmuch as certain of the expenses, inconvenience, and other damages the Owner will sustain in the event that the Contractor does not achieve Substantial Completion, within the Contract Time or extensions thereof approved by Change Order, will include all elements of loss attributable to the delay, including but not limited to amounts actually paid by the Owner for attorneys' fees, the Architect's additional services and expenses, and for other Contractor's claims for additional costs incurred as a result of the Contractor's failure to achieve Substantial Completion within the Contract Time. It will also include all other damages to the Owner for delay in completion of the Work by the Contractor, which shall be liquidated in the sum as stipulated above for each calendar day by which the Contractor shall fail to complete the Work within the Contract Time and any extensions thereof approved by Change Order. Such liquidated damages shall not be considered as a penalty. The Owner shall deduct and retain out of any money due, or become due hereunder, the amount of the liquidated damages.

8.4.4 The Contractor shall not be charged with liquidated damages, or any excess cost when the Owner determines that the contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; provided further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in the completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the government;

(b) To unforeseen cause(s) beyond the control and without the fault or negligence of the Contractor including, but not restricted to, acts of God or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner which acts are contrary to the terms of such contract, fires, flood, epidemics, quarantine restrictions, strikes, freight embargoes and severe weather; and

(c) To any delays of Subcontractors or Suppliers occasioned by any of the causes specified in the immediately preceding subsection (a) and (b).

(d) Unforeseen circumstances shall not include situations which are reasonably foreseeable in construction projects of similar scope and type, such as delays in connection with responses to RFI's and change orders, delays in payment to the Contractor, withholding of payment to the contractor, emergency and scheduled tests, inspections and/or abatement activities, the discovery of hazardous materials and such other circumstances which are addressed in the Project Manual, the Project Specifications or this Agreement. To the extent provided in this Agreement, such circumstances, including but not limited to those specified in this Article 8.4.4, may entitle the Contractor to an extension of time, provided said delay is beyond the control of and without the fault or negligence of the Contractor, but in no event will such circumstances entitle Contractor to pursue a claim for delay as against the Owner as they are not considered "reasons not contemplated by the parties" as referenced in **N.J.S.A. 18A:64A-25**.

8.4.5 The Contractor shall, within five calendar days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner in writing of the causes of the delay. The Owner shall first ascertain the facts and the extent of the delay and shall notify the Contractor within a reasonable time that good cause has been shown to warrant the granting of such extension. The Owner's determination shall be final and binding upon all parties, providing that said discretion is done in good faith and consistent with all of the terms herein.

8.4.6 Estimated liquidated damages may, at the Owner's option, be withheld from any payments otherwise due the contractor if the Contractor has failed to timely complete a critical activity, which failure has a substantial likelihood of delaying substantial completion of the project beyond the date set forth in the Contract Documents. Estimated liquidated damages shall be based on a reasonable projection, in light of the Construction Schedule, of the number of days substantial completion will be delayed beyond the scheduled substantial completion date set forth in the Contract Documents. Failure of the Owner to withhold estimated liquidated damages from payments due the Contractor shall not be deemed a waiver of liquidated or estimated liquidated damages.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.1 CONTRACT SUM append the following to section 9.1.1:

The Contract sum shall include the cost of all work, labor, materials, equipment, transportation and all other things necessary to perform and complete the Project in a manner acceptable to the Owner and within the required time; all incidental expenses in connection therewith; all costs on account of loss by damage of destruction of the Work, to the extent that the Owner and Contractor do not recover the cost of such loss from insurance carrier; and any additional expenses for unforeseen difficulties encountered, settlement of damages and replacement of defective work and materials.

9.2 SCHEDULE OF VALUES add the following:

Delete the paragraph and substitute the following:

9.2.1 Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and showing a complete breakdown of labor and materials of all components of Work, including that of all Subcontractors named on the Contractor's bid form with signed affidavits from each of the said Subcontractors, and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. The Contractor shall amend the schedule of values as requested by the Architect. Any changes to the schedule of values and 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. The Architect's decision shall be final.

9.2.2 Claims for escalation from prices submitted at the time of bid for work included in the original scope of work at the time of bid, including alternate bid and unit prices, will be prohibited.

9.3 APPLICATION FOR PAYMENT add the following:

9.3.1.3 Applications for payment shall be made monthly based upon labor and materials completed and materials suitably stored on site. Two-Percent (2%) of the amount due on each partial payment shall be withheld by the Owner when the outstanding balance of the Contract exceeds $500,000.00, and Five percent (5%) of the amount due on each partial payment shall be held by the Owner when the outstanding balance of the contract is $500,000.00 or less in accordance with **N.J.S.A. 18A:18A-40.3**. Requisitions for all payments will be made on AIA Document G702 Application and Certificate for Payment, in addition to the Owner's Invoice Forms as required. Contractor will be required to submit an itemized, detailed cost breakdown showing quantities, unit costs, and totals to the Architect within twenty (20) days after Notice to Proceed. Form to be in conformance with Architect's requirements.

9.3.2 Delete this paragraph and substitute the following:

Payments on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site, or at some other location agreed upon in writing,

may be made electively and purely upon the discretion of the Owner with the advice of the Architect and subject to the following conditions:

.1 Such materials or equipment shall have been fabricated or assembled specifically for the Project and delivered to storage no earlier than needed for the orderly progress of the Work as demonstrated by the Progress Schedule.

.2 Title to such materials or equipment shall pass to the Owner pursuant to the Contractor's bill of sale which shall contain guarantee of replacement thereof in the event of damage thereto or disappearance thereof due to any cause. The Contractor shall also affirm that he will pay for such materials or equipment immediately upon receipt of payment therefor from the Owner.

.3 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.

.4 Raw materials or other materials or equipment readily duplicated or usable on other projects will be paid only after the materials are incorporated in the construction.

.5 The Owner reserves the right to deny a request, without explanation, for payment for stored materials or equipment. The failure of the Owner to respond to a request by a Contractor for payment for stored materials shall be deemed as a denial of that request.

.6 Payments which are made for stored materials or equipment shall include only the net cost of the materials or equipment plus cost of delivery, if applicable to the point of storage. Payments for overhead, profit and other job costs shall be made only in accordance with Section 9.3.1.

.7 Affidavits, in form acceptable to the Architect, shall be furnished with each application for payment in which payment is being requested for stored materials. Separate affidavits shall be furnished for each location where items are being stored.

.8 With each affidavit the Contractor shall submit sufficient documentation to demonstrate that the stored materials have been received by the Contractor. The Architect shall be the sole judge as to the adequacy of this documentation and shall, at his option, be permitted access to all areas where these materials are to be stored to perform any inspections he deems necessary.

.9 Payment will NOT be made for materials stored off-site.

9.3.4 Contractor further warrants that upon submittal of an Application for Payment, all Subcontractors and Sub-Subcontractors who performed work for which certificates of payment have been previously issued and payments received from the owner have in fact been paid for such work.

.1 Contractor hereby waives any right which it may have to assert a mechanics' or other lien against the work, the project site, and any improvements thereon. Further, the Contractor shall cause a similar waiver to be included in all of its

Subcontract and Sub-Subcontracts. Contractor shall also execute a separate waiver of liens if so requested by the Owner.

.2 Contractor shall defend, indemnify, and hold Owner and Architect harmless from and against any and all claims, actions and proceedings arising out of or related to any liens asserted against the work, the project site and any improvements thereon, or the payments due the Contractor under this agreement. As complete indemnification is intended, all costs and expenses, including reasonable attorney's fees, incurred by the Owner, and Architect in enforcing this provision shall be reimbursed by the Contractor to the Owner.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 Delete the entire paragraph and substitute the following:

Provided the Prime Contractor has performed work in accordance with the provisions of its Contract with the Owner, the Architect will, after receipt of the Contractor's Certified Application for Payment (not the preliminary pencil copy), either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Owner and Contractor in writing of the Architects reasons for withholding certification in whole or in part as provided in paragraph 9.5.1 of the General Conditions of the Contract for Construction. Provided the Contractor's Certified Application for Payment (not the preliminary pencil copy) is received no less than 20 days prior to the next scheduled meeting of the entity's governing body the amount due may be approved and certified at the scheduled meeting of the entity to be paid during the entity's subsequent payment cycle, not to exceed 30 days. If an Application for Payment is received by the Owner and Architect after the 20 day period prior to the scheduled meeting of the entity's governing body, the amount due may be approved and certified at the next subsequent scheduled meeting of the entity's governing body and subsequent payment cycle.

9.5 DECISIONS TO WITHHOLD CERTIFICATION add the following:

9.5.1.7 Delete the entire paragraph and substitute the following:

repeated failure to carry out the Work in accordance with the Contract Documents; or

9.5.1.8 failure to maintain the site in a safe and satisfactory manner in accordance with the Contract Documents and/or law as determined by the Architect.

9.5.2.1 If the Owner is entitled to any reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Unless otherwise stated in the Contract Documents, if the Contractor fails to promptly make any payment due the Owner, or the Owner incurs any expenses due to the Contractor's acts and omissions, the Contractor, including but not limited to additional services of the Architect and reasonable attorney's fees, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to: (1) deduct an amount equal to that which the Owner is entitled from any payment due the Contractor, or (2) issue a written notice to the

Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

9.7 FAILURE OF PAYMENT Delete the entire paragraph and substitute the following::

9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within the time specified in 9.4.1, or if the Owner does not pay the Contractor by 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 (7) additional days' written notice to the Owner and Architect, suspend performance of the Construction Contract 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 shut-down, delay and start-up which shall be accomplished as provided in Article 7.

9.7.1.1 This provision is a permissible exception to the requirements set forth in N.J.S.A. 2A:30A-2. All disputes regarding whether a party has failed to make payments pursuant to N.J.S.A. 2A:30A-1 et seq. may be submitted to a process of alternative dispute resolution.

9.8 SUBSTANTIAL COMPLETION add the following:

9.8.1.1 When the work, or designated portion thereof is determined by the Architect in conjunction with the Owner to be substantially complete and has received a temporary or permanent Certificate of Occupancy or Certificate of Approval, the Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to Work and insurance, and shall 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 day of the Substantial Completion of the Work or designated portion thereof unless provided in the Certificate of Substantial Completion. The Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such certificate.

9.8.2 Delete the entire paragraph and substitute the following:

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 all items to be completed or corrected. Failure to include any item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Together with this list, the Contractor shall provide a written request to the Architect to perform an inspection of the Work.

9.8.3 Delete the entire paragraph and substitute the following:

Upon receipt of the Contractor's request, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses additional items, whether or not included on the

Contractor's list, which are not sufficiently completed or corrected in accordance with the Contract Documents, the Contractor shall, before issuance of the Certificate of Substantial Completion, promptly complete or correct such items. All items must be corrected by the Contractor within fourteen (14) days after receipt of the list from the Architect or within an acceptable time frame established by the Contractor and Architect and approved by the Architect. Upon completion of those items the Contractor shall request, in writing, a re-inspection of the Work. This re-inspection shall commence within fourteen (14) days after receipt of notice. If upon the re-inspection, the Architect finds that the previous items, or new items, do not conform to the Construction Documents, a revised list shall be provided to the Contractor within seven (7) days. This sequence of actions shall take place until all items conform to the Contract Documents. The Contractor shall be liable to reimburse the Owner, by means of a Change Order, for all costs and fees of the Architect, Engineers, and all professionals associated with re-inspections of Work beyond one (1) initial inspection and one (1) re-inspection of the Work.

9.8.3.1 If during the sequences of inspection and correction of Work, the Contractor defaults or neglects to carry out the correction of Work in accordance with the time frames established in 9.8.2 or in accordance the approved schedule of correction, the Contractor shall be considered in default and the Owner may exercise all rights under these Contract Documents. This shall also include Article 2.4 – Owner's Right To Carry Out The Work.

9.9 PARTIAL OCCUPANCY OR USE add the following:

9.9.3 Delete the entire paragraph and substitute the following:

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, nor does it waive the Owner's right to liquidated and actual damages described in Article 8.4.5 because Final Acceptance of the Work shall be for the entire work only and not in part.

9.10 FINAL COMPLETION AND FINAL PAYMENT add the following:

9.10.4 Delete these sub paragraphs and substitute the following:

.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 insufficiency of or failure to provide requisite close-out documents.

9.10.6 Prior to final payment, Contractor will submit, but not limited to the following:

.1 Supplemental Attachment for Accord Certificate of Insurance - AIA Document G715.

.2 Affidavit of Payment of Debts and Claims - AIA Document G706.

.3 Affidavit of Release of Liens - AIA Document G706A.

.4 Consent of Surety to Final Payment - AIA Document G707.

.5 Certification of Paid Wages in accordance with New Jersey Prevailing Wage Act.

.6 Maintenance Bond in form as bound herein.

.7 Contractor's "As-Built" drawings on CD.

.8 Maintenance Manuals and Instructions.

.9 Special written guarantees and warranties in addition to the guarantee covered by Maintenance Bond. Guarantee shall be signed and sealed by Officer of the Contracting Firm and shall be notarized.

.10 Fully Executed AIA Substantial Completion Form G-704.

9.10.7 Upon completion of the punchlist and all other required scope of work have been completed in accordance with the Contract Documents, the Contractor shall submit a written request certifying that the project is ready for final inspection by the Architect. A copy of the "Ready For Closeout" form is included in 009000 – Project Forms.

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS add the following:

10.1.1 The Contractor is required to establish, maintain, and implement effective programs to ensure compliance with all OSHA regulations, in addition to the Hazard Communication Standard, and advise the Architect regarding the location, on site, where the Contractor's SDS sheets are kept. The Contractor will provide the Architect (for informational purposes only) with all information regarding any precautionary measures that the relative Contractor must employ to protect employees, any foreseeable emergency situations, and the relative Contractor's labeling system used at the work site. The Contractor is also required to provide this information to the Owner and other entities operating at the site, and to secure similar information from the other entities operating at the site, for the protection of all employees.

10.1.2 Neither the Owner, nor the Architect will be responsible for providing, maintaining or enforcing a safe working place for the Contractors, their Subcontractors or their employees, or any individual responsible to them for the work.

10.1.3 Neither the professional activities of the Architect, nor the presence of the Architect or the Architect's employees and sub-consultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties, and responsibilities including, but not limited to, construction means, methods, sequences, techniques, or procedures necessary for performing, superintending, or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect and Architect's personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for job site safety, and warrants that this intent shall be made evident in the Owner's agreement with the Contractor. The Owner, the Architect and the Architect's consultants shall be defendant and indemnified and shall be made additional insured under the Contractor's general liability insurance policy.

10.1.4 The Contractor shall enforce strict discipline and good order at all times among Contractor's employees and all subcontractors. Contractor's employees and subcontractors shall dress in clothing appropriate to the work they perform. Contractor shall not engage any employee not skilled in a task assigned. All employees assigned to the Work by Contractor shall perform in the best manner and shall cooperate fully with the Owner and all other representatives of the Owner.

10.1.5 Smoking on the Owner's Property/Project Limits shall be prohibited. Contractor's employees shall avoid communications with students or teachers except to the extent necessary to implement safety measures.

10.1.6 At no time will the Contractor be permitted to work in any manner above occupied areas.

10.1.7 Contractor understands that the Project is an educational facility which may be fully or partially occupied and utilized by teachers and students. The Contractor shall take into consideration that the students utilizing or attending the educational facility are susceptible to the hazards of attractive nuisance or other hazards present on construction sites and shall take any and all necessary precautions.

10.1.8 It is absolutely prohibited for any worker to act in any manner which would be deemed injurious to the students or faculty or inappropriate within the school facility or setting. At the request of the Owner, which shall only be made for cause, the Contractor shall remove any employee from the Work, Project and site. No alcoholic beverages or other prohibited substances shall be permitted or consumed on school property.

10.2 SAFETY OF PERSONS AND PROPERTY add the following:

10.2.2 Delete the entire paragraph and substitute the following:

The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, including, but not limited to, the Federal Occupational Safety and Health Act of 1970 and amendments thereto, bearing on safety of persons or property or their protection from damage, injury or loss. The Contractor shall conform to requirements of the Federal Occupational Safety and Health Act, and the Construction Safety Code. The requirements of the State, Local and Association Codes shall apply where they are equal to or more restrictive than the requirements of the Federal Act.

10.2.2.1 The Contractor will be responsible for providing general safeguarding as well as gaining compliance with the requirements of safety codes and ordinances and coordinating with all Contractors on the Project in accordance with N.J.S.A. 34:5-166 et seq. the State of New Jersey Construction Safety Code.

10.2.2.2 The Contractor shall comply with the requirements of the latest edition of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, Inc., provided that if any such provisions disagrees with that of an applicable law, regulation or code, the Contractor shall comply with the safer or more stringent provisions.

10.2.2.3 The Contractor shall submit with its bid an OSHA Safety Certification on the form included in these specifications, certifying evidence that a full time representative shall be on site who shall have completed or be currently enrolled in an OSHA safety training program (30 hour OSHA certified program or equivalent program) which shall be acceptable to the Owner.

10.2.2.4 The Contractor shall obtain Safety Data Sheets (S.D.S.) for all material to be used on site and prior to material being brought on site. The Contractor shall maintain Material Safety Data Sheets and make them available for inspection to everyone as required by law.

10.2.2.5 The Contractor shall hold weekly safety meetings with its subcontractors to provide for the safeguarding of persons and property. The Contractor shall record minutes of the meetings and submit copies to the owner on a weekly basis for the record.

10.2.2.6 The Contractor shall provide the Owner, at the initial project meeting, a written safety program and hazard communication program as required by OSHA.

10.2.3.1 The General Contractor is responsible for maintaining the fenced construction area for the duration of the project including general trash removal and maintaining the grass if applicable.

10.2.4.1 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing. The work shall not be resumed except by written directive by the Owner.

10.2.5.1 The Contractor shall protect all materials and equipment for which he is responsible, which is stored at the Project Site for incorporation in the work, or which has been incorporated into the work. He shall replace all such materials and equipment which may be lost, stolen, or damaged at his expense, whether or not such materials or equipment have been entirely or partially paid for by the Owner.

10.2.6.1 In an effort to promote a safe and drug free workplace, contractor and its subcontractors shall be required to have a drug and alcohol testing program whereby employees will be required to submit to random drug and alcohol testing to the extent permitted by law. The contractor shall provide signs (12" x 24") at all pedestrian points of entry into the construction site which states, "All workers entering this site acknowledge that this is a drug and alcohol free environment and may be subject to random drug and alcohol testing". Drug and alcohol testing shall also be conducted by contractor or subcontractor at the Owner’s request, where the Owner or its representative has a reasonable suspicion to believe that an employee of the contractor or subcontractor is under the influence of drugs or alcohol. All testing shall be done at the contractor or subcontractor’s sole expense.

10.2.7 Delete the entire paragraph and substitute the following:

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. Prior to bringing any fill material onto the

Project, the Contractor shall have the material tested and provide certification that the material is clean and free from environmental contamination.

10.2.7.1 The Contractor shall conduct daily comprehensive safety inspections of the work site and submit to the Architect weekly reports indicating the results conclusions and actions taken as a result of the inspections and any findings of non-conformance with current O.S.H.A. standards.

10.2.7.2 The Contractor shall stop work and immediately remedy any and all safety infractions brought to their attention by the Owner or Architect or governing authorities having jurisdiction over the project. Any time lost as a result of safety violations shall not be grounds for delay or time extensions to the contract.

10.2.7.3 The Contractor shall remove snow or ice from the site, as required to provide safe access to the work.

10.2.7.4 It is a requirement of this Contract that there is an absence of mold in the final product, and that best practices for prevention be followed. Actual remediation, if required, shall be performed by mold remediation experts hired by the responsible Contractor.

10.2.7.5 The General Contractor is responsible for maintaining the fenced construction area for the duration of the project including general trash removal and maintaining the grass if applicable.

10.2.8 Substitute “48 hours” in place of “21 days”.

10.3 HAZARDOUS MATERIALS Add the following:

10.3.1.1 Add the following:

The Contractor will report the condition to the Owner and Architect in writing. The Work in the affected area shall not thereafter be resumed except by written directive of the Owner.

10.3.2 Delete the entire paragraph and substitute the following:

Upon receipt of the Contractor’s written 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. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately.

10.3.3 Delete the entire paragraph and substitute the following:

To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death

as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity, including, but not limited to, the Contractor, Architect, Architect's consultants and/or agents and employees of any of them.

10.3.4 Delete the last sentence of the paragraph.

10.3.6 Append the following:

Nothing contained herein shall be construed to require the Owner to indemnify the Contractor where the Contractor performs the work out of sequence or at a time other than that indicated in the Construction Schedule.

10.3.7 ASBESTOS

10.3.7.1 Any Contractor performing any type of renovation or construction in or around existing buildings must contact the environmental services department of the Owner to be informed of the district's asbestos procedures.

10.3.7.2 Each Contractor shall anticipate in his bid, extra time required to coordinate with the Owner for removal of any asbestos encountered during demolition work associated with this project.

10.3.7.3 Any Contractor disturbing or damaging any asbestos identified will be totally responsible for its repair and/or removal in accordance with applicable laws and regulations at no additional cost to the Owner and in conformance with N.J.A.C. 5:23-8.1 et seq. Asbestos Hazard Abatement Subcode. The Contractor shall be solely responsible for the payment of any and all fines and penalties which may be assessed against the Owner in connection with the disturbance or damaging of any asbestos containing materials.

10.3.8 VOLATILE ORGANIC COMPOUNDS (VOC)

10.3.8.1 All materials used on this Project shall comply with all applicable governmental and local VOC requirements.

10.4 EMERGENCIES add the following:

Prior to first paragraph add 10.4.1

10.4.2 The Contractor must provide, with their executed Contract Agreement, a list of home or mobile telephone numbers for those personnel who would be contacted in the event of any emergency at the project during non-business working hours.

ARTICLE 11 – INSURANCE AND BONDS delete the entire contents of the Article and replace with the following paragraphs:

11.1 CONTRACTOR'S INSURANCE AND BONDS add the following:

11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located and rated "A" or better by A.M. Best Company such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, including acts of joint negligence between the Owner and/or Architect and those entities previously mentioned:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed, including private entities performing Work at the site and exempt from the coverage on account of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees, or persons or entities excluded by statute from the requirements of Clause 11.1.1.1 but required by the Contract Documents to provide the insurance required by the Clause;

.4 Claims for damages insured by usual personal injury liability coverage;

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

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 Claims for bodily injury or property damage arising out of completed operations;

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18; and

.9 claims for damage because of hazardous operations including but not limited to, explosion, collapse and underground property damage.

11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. The policy shall be written on an occurrence basis, not on a claims made basis.

11.1.3 Certificates of insurance and endorsements indicating that the coverage is primary, noncontributory (meaning the insurance provides primary coverage in connection with

personal injury, death and/or property damage caused in whole or in part by the Contractor, its employees, agents, officers and/or subcontractors in connection with the project), which are acceptable to the Owner within seven (7) days of the Agreement and shall be filed with the Owner (with copies to the Architect) prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire and the limits will not be reduced until at least thirty (30) days' prior written notice has been given to the Owner via certified mail, return receipt requested. Additionally, these certificates and policies shall name the Owner, the Architect and the Engineer and their consultants, as additional named insureds and the certificate(s) of insurance or policy endorsements, as appropriate, shall indicate that coverage provided to the additional insureds is primary, non-contributory coverage. In the event of cancellation, the Contractor shall obtain insurance in the same amount and for the same coverage from another carrier prior to the date of cancellation. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning change in coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor no later than the effective date of the change in coverage.

11.1.4 The Contractor shall ensure that each of his subcontractors, procures and maintains during the life of his subcontract the insurance coverages of the type and in the same amounts as specified in this Article or shall insure the activities of his subcontractors in his own policy. Proof of insurance by way of certificates to be supplied to the Owner and copies to the Architect as required by section 11.1.3.

11.1.4.1 The Contractor shall defend and indemnify the Owner, the Architect, and the Engineers and their consultants and respective officers, agents and employees as provided in Article 3.18. The indemnified parties may defend themselves, at the Contractor's expense, from any claim or lawsuit which may arise out of the Contractor's performance or lack of performance under the terms of this contract or they may elect to have the Contractor provide them with legal representation at the Contractor's own expense.

11.1.5 The insurance required pursuant to this Article shall be written in the following minimum limits of liability and shall be in the names of the Contractor, the Owner, the Architect and the Engineers, as their interest may appear. The amounts set forth in this section may be increased, in which case a Supplementary Schedule of Minimum Insurance Limits of Liability shall be included in the Contract Documents setting forth such increased limits.

The minimum insurance coverage required by the Board to be maintained by the successful bidder through either insurance policies from insurance companies licensed to do business in the State and rated A or better by A.M. Best Company, or through formal fully funded self-insurance programs authorized by law as follows:

.1 Workers Compensation: (in accordance with the laws of New Jersey and any other jurisdiction required to protect employees of the Board and any and all Contracted Parties who will be engaged in the performance of the work on this project)

Applicable Federal, State:	Statutory
Employers' Liability	$1,000,000.00 (each accident)
Disease - Each Employee	$1,000,000.00
Disease – Policy Limit	$1,000,000.00

.2 Contractor's Liability Insurance: covering any and all bodily injury and property damage arising out of or in connection with the work performed hereunder (including coverage for premises, operations, explosions, collapse and underground operations, independent contractor protection, sublet work, elevators, contractual liability, broad form property damage, products liability and completed operations) and personal injury (with employment exclusion deleted):

a. Comprehensive General Liability and Comprehensive Automobile Liability:

General Liability - Combined single limit as follows:

Each Occurrence	$1,000,000.00
Aggregate	$2,000,000.00

Automobile Liability (Owned, Non-Owned and Hired/ Combined Single Limit):

Each Occurrence	$1,000,000.00
Each Person	$1,000,000.00

.3 Excess Umbrella Liability: $5,000,000.00

Excess liability shall have a drop down provision to cover over $1,000,000 of Employers' Liability section of Workers' Compensation listed above.

.4 Contractual Liability Endorsement (Bodily Injury and Property Damage Combined):

Each Occurrence	$2,000,000.00

.5 Completed Operations & Products Liability*:

Aggregate	$2,000,000.00

*Maintain until one year after issuance of Final Certificate of Payment.

.6 Asbestos Abatement Liability Insurance:

In addition to the insurance requirements in the General Conditions, the Contractor licensed to perform Asbestos Abatement work shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project site is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by anyone directly employed by any of them, or

by anyone for whose acts any of them may be liable. Provide Contractor's Asbestos Abatement Liability in the occurrence form as follows:

Each Occurrence	$1,000,000.00
Aggregate	$1,000,000.00
Excess Umbrella Liability:	$5,000,000.00

All insurance required by this Section or any other insurance required by the Contract Documents shall identify the Owner, the Owner's Architect, and the Asbestos Abatement Consultant each as an "additional insured".

11.1.6 The above insurance policies shall:

(a) include an indemnification provision as specified in Article 3.18,

(b) include completed operation coverage, and

(c) Not be subject to any of the special property damage liability exclusions: explosion, collapse, damage to underground wires, piping and conduits which are commonly referred to as the XCU exclusions, and Certificates of Insurance furnished by the Contractor shall show by specific reference that each of the foregoing items has been provided for.

11.1.7 The insurance required by paragraph 11.1 is not intended to cover machinery, tools or equipment owned or rented by the Contractor which are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's expense, provide insurance coverage for owned or rented machinery, tools or equipment.

11.1.8 The above policies for Comprehensive General Liability must be so written as to include Contingent Contractor's Insurance to protect the Contractor against claims arising from the operations of Subcontractors.

11.1.9 The Certificates of Insurance furnished by the Contractor and Subcontractor shall include a clause obligating the insurer to give the Owner and each additional insured thirty (30) days prior to written notice of the cancellation of or any material change in the insurance coverage and endorsements to the policies. Policies expiring on a fixed date before Final Acceptance shall be renewed and filed with the Owner before the expiration date.

11.1.10 Nothing contained herein shall be interpreted to relieve the Contractor of his obligation to complete the work without additional cost to the Owner beyond the Contract Amount. Any loss or cost of repair not covered or not fully covered by insurance shall be borne by the Contractor without additional cost to the Owner beyond the Contract Amount. The Contractor will be responsible to cover all theft or vandalism costs to repair or replace materials including labor.

11.1.11 Contractor shall assume full responsibility and liability for any and all injuries to any person and any and all damages to any property resulting from or in connection with the project which are caused by any error, omission, or negligent act of the Contractor, its agents and employees, and any Subcontractor which he may employ.

11.1.12 To the extent that any of the foregoing provisions are inconsistent with the insurance requirements set forth in the Project Manual, the foregoing provisions shall govern. The insurance provided by the Contractor and its subcontractors shall comply with all requirements which may be imposed by the State of New Jersey or any of its agencies with jurisdiction over this Project. In the event the contractor is required by the Owner or the State of New Jersey or its agencies to provide additional insurance, said insurance shall be provided by contractor at contractor's expense.

11.1.13 Builders Risk Insurance: T**he Contractor** shall obtain and maintain Builder's Risk Insurance, providing coverage for (all risk) of physical loss or damage to the property described hereunder in an amount equal to 100% of the completed value of the work contracted herein; excepting excavations, foundations and other structures customarily excluded by such insurance. The policy shall name the Owner as additional insured and loss payee as their interests may appear.

11.2 OWNER'S LIABILITY INSURANCE

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

11.3 PROPERTY INSURANCE

11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

11.3.1.1.1 The term "extended coverage" shall be deemed to include coverage against lightning, wind, hail, riots and civil commotion, vehicle damage, aircraft damage and smoke, exclusive of theft and vandalism. The "All Risk" Insurance coverage shall also include the interests of the Architect.

11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.3.1.6 The fact that the Owner is furnishing All Risk Insurance shall not be interpreted to relieve the Contractor of its obligation to complete the work without additional cost to the Owner beyond the Contract Amount. Any loss or cost of repair not covered or not fully covered by insurance shall be borne by the Contractor without additional cost to the Owner beyond the Contract Amount. The Contractor will be responsible to cover all theft or vandalism costs to repair or replace materials including labor.

11.3.1.7 The Contractor may carry whatever additional insurance he deems necessary to protect himself against hazards [not covered by the Owner's All Risk Insurance] and against loss of owned or rented capital equipment and tools owned by mechanics or any tools, equipment, scaffolding, staging, towers, and forms owned or rented by the Contractor, the capital value of which is not included in the cost of work.

11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused.

11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

11.3.5 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, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, 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 covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.3.7.1 If during the Project construction. 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 three policy or policies other than those insuring the Project during the construction period, the Owner waives all rights in accordance with the terms of section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance.

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.1 The Contractor shall furnish a Performance Bond and a Labor and Material Payment Bond each in the full amount of the Contract sum for faithful performance and payment obligations arising thereunder as stipulated in the bidding requirements, in a form satisfactory to the Owner and consistent with New Jersey Statutes.

11.4.2 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.

The Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his Power of Attorney.

11.4.2.1 Each Contractor will be required to furnish the Owner with a **two (2) year** maintenance bond in the amount of 100% of the final adjusted Contract Sum commencing upon the date the Final Application for Payment is accepted by the Owner.

11.4.3 Additional or Substitute Bond

11.4.3.1 If at any given time the Owner, for justifiable cause, shall be or become dissatisfied with the Surety or Sureties for the Performance and/or Payment Bonds, the Contractor shall within five (5) days after notice from the Owner to do so, substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such Bond shall be paid by the Contractor. No further sums shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished such an acceptable Bond to the Owner.

ARTICLE 12 – UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK add the following:

12.1.1 Delete the entire paragraph and substitute the following:

If any portion of the Work should be covered contrary to the request of the Architect or to requirements specifically expressed in the Contract Documents, it shall, if required by public authority or the Architect, be uncovered for observation, inspection, testing or approval and the work shall be replaced at the Contractor's expense without change in the contract time.

12.2 CORRECTION OF WORK add the following:

12.2.1 Append the following to the end of the paragraph;

Nothing contained herein shall be construed so as to prohibit the Owner from withholding payment to the extent as may be necessary to protect against loss on account of defective work not remedied or any form of payment claims against the Contractor that may subsequently have accrued

12.2.2.1 Delete the entire paragraph and substitute the following:

In addition to the Contractor's obligations under Section 3.5, if, within two-year after the date of the Final Application for Payment is accepted by the Owner or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an 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 written 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 two-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. 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 2.4.

12.2.2.2 Delete the entire paragraph and substitute the following:

The **two-year** period for correction of Work shall be extended with respect to portions of Work first performed after the date the Final Application for Payment is accepted by the Owner by the period of time between the date the Final Application for Payment is accepted by the Owner and the actual completion of that portion of the Work.

12.2.4.1 The Contractor shall protect all material and equipment for which he is responsible, stored at the site for incorporation or which has been incorporated in the work. The Contractor shall replace all material and equipment, which may be lost or stolen at his expense whether or not it has been entirely or partially paid for by the Owner.

ARTICLE 13 – MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW delete the text of the paragraph 13.1 and substitute and add the following:

13.1.1 The Contract shall be governed by the laws of the State of New Jersey.

13.1.2 The Contractor shall comply with all applicable federal, state and local laws, statutes, regulations and ordinances and any order issued by every governmental entity with jurisdiction over the Project.

13.1.3 Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and, if through mistake or otherwise, and any provisions is not inserted, or is not correctly inserted, then upon the application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

13.2 SUCCESSORS AND ASSIGNS

13.2.2 Delete the text of the paragraph and substitute the following:

The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project or to the State of New Jersey or any subsidiary Department or Agency without consent of the Contractor. In such event, the assignee shall assume the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

13.5 INTEREST

Delete the text of the paragraph and substitute the following:

13.5.1 No interest shall be paid on unpaid balances except to the extent required by and, in that event, in such amounts as specified in P.L. 2006, Ch. 96, codified as N.J.S.A. 2A:30A-1 to -2.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT.

14.1 TERMINATION BY THE CONTRACTOR

14.1.1.3 Delete the entire paragraph.

14.1.1.4 Delete the entire paragraph.

14.1.2 Delete the entire paragraph.

14.1.3 Delete the text of the paragraph and substitute the following:

If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, but under no circumstances shall the Contractor entitled to recover any overhead and profit on Work not executed or costs incurred by reason of such termination.

14.1.4 Delete the entire paragraph.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 Add the following:

.5 If Contractor is adjudged bankrupt or insolvent, subject to the provision of the National Bankruptcy Act, specifically 11 U.S.C. 101 et seq.

.6 If Contractor makes a general assignment for the benefit of creditors.

.7 If a trustee or receiver is appointed for Contractor or for any of Contractor's property.

.8 If Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws.

.9 If Contractor disregards the authority of the Architect or directives of the Architect.

.10 If the Contractor interferes with the work of, or otherwise fails to cooperate with, any other contractor on the Project or the Owner's own forces.

.11 If the Contractor fails to comply with the directives of the Owner or otherwise fails to perform its obligations in accordance with the Owner's concept of the Project.

.12 If the Contractor fails to adhere to the Contract Schedule or otherwise disregards any provision of the Contract Documents which makes time of the essence.

14.2.3 Delete the text of the paragraph and substitute the following:

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. In addition to the Owner's other legal remedies, in the event the Contractor otherwise violates any provisions of the Contract Documents, the Owner may, after giving Contractor and his Surety seven (7) days' written notice, terminate the services of Contractor, exclude Contractor from the site and take possession of the Work and of all Contractor's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion), incorporate in the Work, all materials and equipment stored elsewhere, and finish the Work as Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Work, including compensation for additional professional services, such excess shall be paid to Contractor. If such costs exceed such unpaid balance, Contractor shall pay the difference to Owner. Such costs incurred by Owner shall be verified by Architect and incorporated in a Change Order, but in finishing the Work, Owner shall not be required to obtain the lowest figure for the Work performed.

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

14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE add the following:

14.3.3 Should the Owner be prevented or enjoined from proceeding with work or from authorizing its performance either before or after its performance, by reason of any litigation, labor dispute, etc., the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, but Time for completion of the Work will be extended to such reasonable time as the Architect may determine will compensate for time lost by such delay with such determination to be set forth in writing.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.3 Append the following:

No other payment of any kind shall be due from Contractor.

ARTICLE 15 – CLAIMS AND DISPUTES.

15.1 CLAIMS add the following subparagraphs:

15.1.6.3 Any claim for an extension, or extensions, of time must be fully substantiated by incorporation of the impact from the changed condition into an update of the Contractor's project schedule. This update must also reflect any other impacts to the schedule resulting from delays, concurrent or non-concurrent, for which any Contractor is responsible. No claims will be evaluated or accepted without inclusion of the substantiation requirements set forth in this section.

15.1.7 Delete Waiver of Claims for Consequential Damages in its entirety and substitute the following:

The Contractor waives claims against Owner, Architect, Architect's consultants, and agents and employees of any of them for consequential damages arising out of or relating to this Contract or Agreement. This waiver includes damages incurred by the Contractor including but not limited to principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit. This waiver is applicable, without limitation, to all consequential damages claims due to any termination of the Contractor in accordance with Article 14.

Nothing contained in this section shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

15.2 INITIAL DECISION add the following subparagraphs:

15.2.1 Delete the text of the paragraph and substitute the following:

Claims, excluding those 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 expressly 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 and initial decision is 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 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 (and its consultants).

15.2.5 Delete the text of the paragraph and substitute the following:

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 litigation in a court of competent jurisdiction.

15.2.9 If the initial decision of the Architect is not satisfactory to the Contractor making the claim, the Contractor shall diligently perform the work as directed and shall keep an accurate accounting of all time and materials required to perform the contract.

15.3 MEDIATION add the following:

Substitute "litigation" for "finding dispute resolution" throughout

15.4 ARBITRATION

Delete this Article titled “Arbitration” and all references to Arbitration as set forth in A.I.A. Document A201, as this article is hereby deleted from the said document and this Agreement.

After the parties have complied with the previous sections of the agreement and they still have not resolved the issue, the exclusive and sole jurisdiction for all disputes shall be in the Superior Court of New Jersey and will not be subject to arbitration. Unless otherwise agreed in writing, the Contractor shall carry on the Work and maintain its progress during any mediation or legal proceedings. The prevailing party will be entailed to receive attorney fees and all costs associated with such dispute.

END SECTION 006230.

SECTION 007120 - PREVAILING WAGES

The State of New Jersey Prevailing Wage Act, Chapter 150 Laws of 1963 with applicable wage rates for Atlantic County County as published by the Department of Labor and Industry in conformance with N.J.S.A. 34:11-56:25 et seq. is hereby made a part of these Contract Documents. Copies of these wage rates may be obtained from the New Jersey State Department of Workforce Development, is on file in the Office of the Owners Rep's Title and attached hereto.

Should workmen employed by the Contractor, or any Subcontractor covered by this Contract be paid less than required wage rates, the Contractor or Subcontractor will be in violation of Specifications and the Atlantic Cape Community College, Mays Landing, New Jersey, may terminate the Contractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages, and to prosecute the work to completion or otherwise. Contractor and his Sureties shall be liable to the Atlantic Cape Community College.

Contractor agrees to submit to the Atlantic Cape Community College, a certified payroll for each payroll period within ten (10) days of the payment of wages. Contractor further agrees that no payments will be made to the Contractor if certified payrolls are not received. It is the Contractor's responsibility to insure timely receipt by the district of certified payrolls.

Before final payment, furnish Owner with an affidavit stating that all workmen have been paid the prevailing rate of wages in accordance with State requirements.

Keep an accurate record showing the name, craft, or trade and actual hourly rate of wages paid to each workman employed by him in connection with this work. Each Contractor and Subcontractor shall submit Manning Reports showing all information noted above on a weekly basis to the Owner.

Upon request, the Contractor(s) and each Subcontractor shall file written statements certifying to the amounts then due and owing to any and all workmen for wages due on account of the work. The statements shall be verified by the oaths of the Contractor or Subcontractor, as the case may be.

Post the prevailing wage rates for each craft and classification involved in the work, including the effective date of any changes thereof, in prominent and easily accessible places at the Site of the work and in such place or places as used to pay workmen their wages.

Effective April 11, 2000, in accordance with "The Public Works Contractor Registration Act" (P.L. 1999, c.238), no contractor/subcontractor will be permitted to bid on or engage in any contract for public work, as defined in section 2 of P.L. 1963, c.150 (C.34:11-56.26) unless that contractor/subcontractor is registered with the Department of Labor.

Attached hereto and incorporated herein is(are) the Department of Labor and Workforce Development prevailing wage determination(s) for the locality and craft(s) that will be employed in the performance of work under this contract. It is hereby stipulated that each individual who performs work under this contract shall be paid not less than the prevailing wage rate to which that worker is entitled under the New Jersey Prevailing Wage Act, as reflected in the appropriate Department of Labor and Workforce Development prevailing wage determination"; and

In the event it is found that any worker employed by the contractor or any subcontractor covered by this contract has been paid a rate of wages less than the prevailing wage rate required to be paid by this contract, the public body, the lessee to whom the public body is leasing a property or premises or the lessor from whom the public body is leasing or will be leasing a property or premises may terminate the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages, and to prosecute the work to completion or otherwise. The contractor and his sureties shall be liable to

the public body, any lessee to whom the public body is leasing a property or premises, or to any lessor from whom the public body is leasing or will be leasing a property or premises for any excess costs occasioned by the termination of the contractor's or subcontractor's right to proceed with the work, or such part of the work as to which there has been a failure to pay required wages.

The following Certification is to be submitted by the low Bidder after the Bid opening, only when the low Bidder is more than 10% under the next lowest Bidder. It is not a Bid Form that needs to be submitted with the Bid.

54 N.J.R. 1009(a)

LOWEST BIDDER PREVAILING WAGE CERTIFICATION

In the matter of an award of a	)	STATE OF NEW JERSEY
contract for public work for a	)	DEPARTMENT OF LABOR AND
project described as:	)	WORKFORCE DEVELOPMENT
	)	DIVISION OF WAGES &
RENOVATIONS	)	HOUR COMPLIANCE
Building E Renovations	)	
	)	
	)	Certification of Lowest Bidder

_____, of full age and under oath, duly provides the following sworn statement:

(1). I am the owner and/or highest-ranking official or officer of a company or firm named _____, which holds a currently valid public works contractor registration pursuant to the New Jersey Public Works Contractor Registration Act, N.J.S.A. 34:11-56.48 et seq., certificate number _____.

(2). I submitted a bid for a contract award in the above identified project and the public body has informed me that I am the lowest bidder by 10 percent or more as compared to the next lowest bid submitted.

(3). The amount of my bid does include paying the prevailing wage rate to all workers who perform work on the project at rates of pay, including both base wage and fringe benefits, set forth in applicable Wage Determinations, (1) for the appropriate locality, (2) for the appropriate work classification (e.g., carpenter, electrician, mason, plumber), and (3) for the appropriate job title (e.g., Apprentice, Journeyman, Forman), published by the New Jersey Department of Labor and Workforce Development (NJDOL) pursuant to the New Jersey Prevailing Wage Act (NJPWA), N.J.S.A. 34:11-56.25 et seq., and corresponding NJDOL rules, N.J.A.C. 12:60.

I certify under penalty of perjury that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are false, I am subject to punishment. See N.J.S.A. 2C:28-1 et seq., specifically, N.J.S.A. 2C:28-3, within the New Jersey Code of Criminal Justice.

Dated:_____ Signature:_____ Title: _____

END OF SECTION 007120



STATE OF NEW JERSEY
Department of Labor and Workforce Development
Division of Wage and Hour Compliance - Public Contracts Section
PO Box 389
Trenton, NJ 08625-0389

PREVAILING WAGE RATE DETERMINATION

The New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.) requires that the Department of Labor and Workforce Development establish and enforce a prevailing wage level for workers engaged in public works in order to safeguard their efficiency and general well being and to protect them as well as their employers from the effects of serious and unfair competition.

Prevailing wage rates are wage and fringe benefit rates based on the collective bargaining agreements established for a particular craft or trade in the locality in which the public work is performed. In New Jersey, these rates vary by county and by the type of work performed.

Applicable prevailing wage rates are those wages and fringe benefits in effect on the date the contract is awarded. All pre-determined rate increases listed at the time the contract is awarded must also be paid, beginning on the dates specified. Rates that have expired will remain in effect until new rates are posted.

Prevailing Wage Rate

The prevailing wage rate for each craft will list the effective date of the rate and the following information:

W = Wage Rate per Hour **B** = Fringe Benefit Rate per Hour* **T** = Total Rate per Hour

* Fringe benefits are an integral part of the prevailing wage rate. Employers not providing such benefits must pay the fringe benefit amount directly to the employee each payday. Employers providing benefits worth less than the fringe benefit amount must pay the balance directly to the employee each payday.

Unless otherwise stated in the Prevailing Wage Rate Determination, the fringe benefit rate for overtime hours remains at the straight time rate.

When the Overtime Notes in the Prevailing Wage Rate Determination state that the overtime rates are "inclusive of benefits," the benefit rate is increased by the same factor as the wage rate (i.e. multiplied by 1.5 for time and one-half, multiplied by 2 for double time, etc.).

Apprentice Rate Schedule

An “apprentice” is an individual who is registered with the United States Department of Labor - Office of Apprenticeship and enrolled in a certified apprenticeship program during the period in which they are working on the public works project.

The apprentice wage rate is a percentage of the journeyman wage rate, unless otherwise indicated. The apprentice benefit rate is the full journeyman benefit rate, unless otherwise indicated.

If there is no apprentice rate schedule listed, the individual must be paid at least the journeyman rate even if that individual is in a certified apprentice program for that trade.

If there is no ratio of apprentices to journeymen listed for a particular craft, then the ratio shall be one (1) apprentice to every four (4) journeymen.

Comments/Notes

For each craft listed there will be comments/notes that cover the definition of the regular workday, shift differentials, overtime, recognized holidays, and any other relevant information.

Public Works Contractor Registration

The Public Works Contractor Registration Act (N.J.S.A. 34:11-56.48, et seq.) requires that **all** contractors, subcontractors, or lower tier subcontractors who are working on or who bid on public works projects register with the Department of Labor and Workforce Development. Applications are available at *www.nj.gov/labor* (click on Wage & Hour and then go to Registration & Permits).

Pursuant to N.J.S.A. 34:11-56.51:

No contractor shall bid on any contract for public work as defined in section 2 of P.L.1963, c. 150 (C.34:11-56.26) unless the contractor is registered pursuant to this act. No contractor shall list a subcontractor in a bid proposal for the contract unless the subcontractor is registered pursuant to P.L.1999, c.238 (C.34:11-56.48 et seq.) at the time the bid is made. No contractor or subcontractor, including a subcontractor not listed in the bid proposal, shall engage in the performance of any public work subject to the contract, unless the contractor or subcontractor is registered pursuant to that act.

Snow Plowing

Snow plowing contracts are <u>not</u> subject to the New Jersey Prevailing Wage Act or the Public Works Contractor Registration Act.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Air Conditioning & Refrigeration - Service and Repair **PREVAILING WAGE RATE**

	05/12/26
Journeyman (Mechanic)	W48.73 B32.97 T81.70

Craft: Air Conditioning & Refrigeration - Service and Repair **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
As Shown	1st Year	2nd Year	3rd Year	4th Year	5th Year	Wage = %	of Jnymn	Wage		
Wage and Bene	40%	50%	60%	70%	80%	Bene = %	of Jnymn	Bene		

Ratio of Apprentices to Journeymen - 1:4

Craft: Air Conditioning & Refrigeration - Service and Repair **COMMENTS/NOTES**

THESE RATES MAY BE USED FOR THE FOLLOWING:
- Service/Repair/Maintenance Work to EXISTING facilities.
- Replacement or Installation of air conditioning and refrigeration equipment when the combined tonnage does not exceed 15 tons for refrigeration, or 25 tons for air conditioning.
- Replacement or Installation of "packaged" or "unitary" rooftop-type units when the combined tonnage of the units does not exceed 75 tons.

NOTE: These rates may NOT be used for any work in new construction (including work on new additions).

The regular workday shall consist of 8 hours, starting between 6:00 AM and 10:00 AM, Monday through Friday.

SHIFT DIFFERENTIALS:
- The second and third shifts shall be paid an additional 15% of the hourly rate.
- All shifts must run for a minimum of 5 consecutive days.

OVERTIME:
Hours worked in excess of 8 per day or before or after the regular workday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Boilermaker **PREVAILING WAGE RATE**

	01/12/24
Foreman	W54.11 B47.08 T101.19
General Foreman	W56.11 B48.14 T104.25
Journeyman	W49.11 B45.31 T94.42

Craft: Boilermaker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	65%	70%	75%	80%	85%	90%	95%			
Benefit =	38.33	39.30	40.32	41.31	42.32	43.32	44.30			

Ratio of Apprentices to Journeymen - *

* 1 apprentice will be allowed for the first 5 journeymen, 1 apprentice for the next 10 journeymen and 1 apprentice for each succeding 20 journeymen up to a maximum of 5 apprentices per contractor on any one job

Craft: Boilermaker **COMMENTS/NOTES**

HIGH WORK: All apprentices working on the erection, repair, or dismantling of smoke stacks, standpipes, or water towers shall be paid the Journeyman rate.

The regular workday shall consist of 8 hours, between 8:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall work 7.5 hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 10%.
- The third shift shall work 7 hours and receive 8 hours pay, at a rate equal to the regular hourly rate plus 20%.
- For "Municipal Water Works" projects only, the following shall apply: Two, four day, 10 hour shifts may be worked at straight time Monday through Thursday. The day shift shall work four days, at 10 hours, for 10 hours pay. The second shift shall work four days, at nine and a half hours, for 10 hours pay, plus 10% the hourly rate for new work and .25 cents on repair work. Friday may be used as a make-up day at straight time, due to weather conditions, hoilday or any other circumstances beyond the employer's control.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.
- If any other craft employed by the same contractor, or a subcontractor thereof, receives double time in lieu of time and one-half, then the Boilermaker shall receive double time in lieu of time and one-half.
- For "Municipal Water Works" projects only, the following shall apply: Four 10 hour days may be worked Monday through Thursday at straight time. Friday may be used as a make-up day for a day lost to inclement weather, holiday or other conditions beyond the control of the employer. Overtime shall be paid for any hours that exceed 10 hours per day or 40 hours per week.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Boilermaker - Minor Repairs **PREVAILING WAGE RATE**

	01/12/24
Foreman	W35.88 B17.89 T53.77
General Foreman	W36.38 B17.89 T54.27
Mechanic	W34.38 B17.89 T52.27

Craft: Boilermaker - Minor Repairs **COMMENTS/NOTES**

NOTE: These rates apply to MINOR REPAIR WORK ONLY (repair work in the field for which the contract amount does not exceed $125,000.00), for boilers that do not produce electric or are not used in the heating of petroleum products.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays (except Labor Day) shall be paid at double the hourly rate. All hours on Labor Day shall be paid at four times the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Bricklayer, Stone Mason **PREVAILING WAGE RATE**

	07/07/26
* Mason Helper	W40.70 B34.92 T75.62
Deputy Foreman	W52.60 B40.43 T93.03
Foreman	W57.35 B40.43 T97.78
Journeyman	W49.60 B40.43 T90.03

Craft: Bricklayer, Stone Mason **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	40%	50%	55%	60%	65%	70%	75%	80%		
Benefits	5.36	6.70	7.37	8.04	27.04	28.95	30.88	32.78		

Ratio of Apprentices to Journeymen - 1:5

Craft: Bricklayer, Stone Mason **COMMENTS/NOTES**

The regular workday shall consist of 8 hours, between 6:00 AM and 4:30 PM.

* The Mason Helper classification shall include all work required to assist masons in the completion of their work. This classification may include the installation of foam for EIFS (Exterior Insulation and Finish Systems); grouting; washing; and rub down of masonry; snapping ties; grinding, chipping, patching of concrete; wall tie installation; mixing and placing materials; pump hoses; exterior spray insulation; installation of lathe; waterproofing; damp proofing; air barriers; installation of various forms of track to receive materials; restoration demolition; form work including foam structures; all support and tending for masons, cavity insulation, masonry wall rebar; anchors and saws.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the first, or day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10%, inclusive of benefits, and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 10%, inclusive of benefits.

OVERTIME:
- The first 2 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. The first 10 hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. Any additional overtime shall be paid at double the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday may be used as a make-up day for hours lost to inclement weather.
- When Bricklayers/Stone Masons work on Saturday with Laborers, and no other crafts are working on the project for the day, benefits may be paid at straight time. If other crafts are present, the applicable overtime rate for benefits shall be paid.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Carpenter **PREVAILING WAGE RATE**

	05/08/26
Foreman	W67.30 B40.45 T107.75
General Foreman	W76.08 B45.65 T121.73
Journeyman	W58.52 B35.25 T93.77

Craft: Carpenter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	40%	55%	65%	80%						
Benefit	59.25% of	Appren	tice Wage	Rate	for all	intevals	+ $0.58			

Ratio of Apprentices to Journeymen - 1:3

For Solar installation- all work on solar projects that fall under the jurisdiction of the carpenters, and does not require an electrician, the ratio of Apprentices to Journeymen shall be 1:1.

Craft: Carpenter **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Carpenters on a job, 1 shall be designated as a Foreman.
- When there are 21 or more Carpenters on a job, 2 shall be designated as Foremen.
- When there are 36 or more Carpenters on a job, there shall be 1 General Foreman and 2 Foremen. Thereafter, an additional Foreman shall be required for each additional 10 Carpenters on a job.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 10%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 10% and the third shift shall receive the regular rate plus 15%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.
- All time worked before and after a regularly established shift shall be paid at the applicable overtime rate. When a portion of the regularly established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at

double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Carpenter - Resilient Flooring **PREVAILING WAGE RATE**

	05/08/26
Foreman	W67.30 B40.37 T107.67
Journeyman	W58.52 B35.17 T93.69

Craft: Carpenter - Resilient Flooring **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	40%	55%	65%	80%						
Benefit =	59.25% of	Appren	tice	Wage Rate	for all	intervals	+ $0.50			

Ratio of Apprentices to Journeymen - *

* Ratio is 1 apprentice to 2 journeymen. No more than 3 apprentices may be on any 1 project

Craft: Carpenter - Resilient Flooring **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- On any job where there are 4 or more Carpenters of Resilient Flooring, 1 must be designated a Foreman.

FOR SYNTHETIC TURF INSTALLATION ONLY:
- The rate shall be 90% of the wage and benefit rate.

The regular workday consists of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift, shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular wage rate plus 10%.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular wage rate, the second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular wage rate plus 10% and the third shift shall receive the regular wage rate plus 15%.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:
- Hours in excess of 8 per day or 40 per week, or before or after the regular workday, Monday through Friday, shall be paid at time and one-half the wage rate. Saturday may be used as a make-up day, at straight time, up to 8 hours, for hours lost to reasons beyond the control of the employer, up to a total of 40 hours per week; hours in excess of 8 on Saturday shall then be paid at time and one-half the wage rate. If Saturday is not a make-up day, all hours on Saturday shall be paid at time and one-half the wage rate. All hours on Sundays and holidays shall be paid at double the wage rate.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for hours lost to reasons beyond the control of the employer. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day,

Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

County - ATLANTIC

Craft: Cement Mason **PREVAILING WAGE RATE**

See " Bricklayer, Stone Mason" Rates

Craft: Cement Mason **COMMENTS/NOTES**

See " Bricklayer, Stone Mason" Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Commercial Painter **PREVAILING WAGE RATE**

	05/08/26
Foreman	W51.43 B33.41 T84.84
General Foreman	W56.10 B33.41 T89.51
Journeyman	W46.75 B33.41 T80.16

Craft: Commercial Painter **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	23.38	28.05	32.73	37.40						
Benefits	18.35	18.35	18.35	18.35						

Ratio of Apprentices to Journeymen - 1:4

Craft: Commercial Painter **COMMENTS/NOTES**

* Commercial Painters perform work on all commercial structures such as offices, schools, hotels, shopping malls, restaurants, condominiums, etc.

Spraying, sandblasting, lead abatement work on commercial buildings, work performed above 3 stories or 30 feet in height, or using swing scaffolds requires an additional 10% of the wage rate.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day,

Veterans' Day, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Diver **PREVAILING WAGE RATE**

	05/08/26
Diver	W61.88 B45.62 T107.50
Tender	W49.50 B45.62 T95.12

Craft: Diver **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1500 hours	70%	75%	80%	85%						
Benefits	32.98	34.10	35.22	36.35						

Ratio of Apprentices to Journeymen - 1:4

Craft: Diver **COMMENTS/NOTES**

NOTE: All dive crews must consist of a Tender, a Diver, and a Standby Diver (Standby Diver is the same rate as a Diver).

- Diver- will perform all Dive related tasks at hand.
- Tender- will provide Tending support to the in water Diver and who may also be designated as a Standby Diver .

Diving in Contaminated Water (including, but not limited to, radioactively contaminated water, sewer effluent combined sanitary and storm sewers, or any environment known to be harmful to those with skin contact): Shall receive an additional 20% of the hourly rate.

OVERTIME:
- The first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 per day on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, the first 10 hours on Friday shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Saturday holidays will be observed the preceeding Friday and Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Dockbuilder/Pile Driver **PREVAILING WAGE RATE**

	05/08/26
Foreman	W59.40 B45.62 T105.02
Journeyman	W49.50 B45.62 T95.12

Craft: Dockbuilder/Pile Driver **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1500 hours	40%	50%	65%	80%						
Benefits	26.31	28.57	31.78	35.11						

Ratio of Apprentices to Journeymen - 1:3

Craft: Dockbuilder/Pile Driver **COMMENTS/NOTES**

NOTE: The following shall be required for type of work indicated-
- There shall be one foreman and four journeymen on all land pile driving rigs. As part of the crew, one may be an apprentice.
- There shall be one foreman and two journeymen on self-contained hydraulic driving rigs. As part of the crew, one may be an apprentice.
- There shall be one foreman and two journeymen when driving sheeting with an excavator. As part of the crew, one may be an apprentice.
- When utilizing a drill rig to install Auger cast piles there shall be one foreman and two journeymen. As part of the crew , one may be an apprentice.
- There shall be one journeyman on drilled or bored soldier piles.
- There shall be not less than one journeyman per rig on all drilled shaft and caissons.
- There shall be not less than one journeyman per rig on all earth retention tie-back and anchors.

Creosote Handling:
May 1st to Sept. 30th: + $0.50 above hourly rate
Oct. 1st to April 30th: + $0.25 above hourly rate

Harzardous Material Work:
-On hazardous material work on a state or federally designated hazardous work site where the worker is required to wear Level A, B or C personal protection, the worker shall receive an additional 20% of the hourly rate, per hour.
- A Dockbuilder/Pile Driver working on a hazardous waste removal project, or site requiring hazardous waste related certification, but who is not working in a zone requiring level A, B or C personal protection, shall receive the hourly rate plus an additional $1.00 per hour. This type of work does not include the handling of creosote or CCA materials; coated materials such as bitumastic, or galvanized; painted materials or any products designed to be used in the industry.

FOREMAN REQUIREMENTS:
- When there are 3 or more Dockbuilders/Pile Drivers on a job, 1 shall be designated as a Foreman.

SHIFT WORK:

- Shift work pertains to both land and water work.
- When a 2 shift schedule (including a day shift) is established, the first shift shall start between 5:00 am and 8:00 am and work for 7 and one-half hours and receive 8 hours pay. The second shift shall start when the first shift ends and shall work for 7 and one-half hours and receive 8 hours pay.
- When a three shift schedule is established, all shifts shall work 7 and one-half hours and receive 8 hours pay.
- When there is no day shift, and a second or third shift is established, a worker shall be paid at time and one-half of the hourly rate.

OVERTIME:
- The first 2 hours in excess of 8 per day (9th and 10th hours), Monday through Friday, and the first 8 hours on Saturdays shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day, Monday through Friday, hours in excess of 8 per day on Saturdays, and all hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, the first 10 hours on Friday shall be paid at time and one-half the hourly rate. Hours in excess of 10 per day shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Saturday holidays will be observed the preceeding Friday and Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Drywall Finisher **PREVAILING WAGE RATE**

	05/08/26
Foreman	W50.63 B32.49 T83.12
General Foreman	W52.93 B32.49 T85.42
Journeyman	W46.03 B32.49 T78.52

Craft: Drywall Finisher **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	23.02	29.92	36.82	41.43						
Benefits	18.82	18.82	18.82	18.82						

Ratio of Apprentices to Journeymen - 1:4

Craft: Drywall Finisher **COMMENTS/NOTES**

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- Shift work must run for a minimum of 5 consecutive workdays.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Electrician **PREVAILING WAGE RATE**

	12/18/25	09/28/26
Asst. General Foreman	W68.80 B60.51 T129.31	W71.06 B62.98 T134.04
Foreman	W64.21 B56.93 T121.14	W66.33 B59.23 T125.56
General Foreman	W74.53 B65.00 T139.53	W76.99 B67.68 T144.67
Journeyman, Cable Splicer	W57.33 B51.54 T108.87	W59.22 B53.60 T112.82
Lead Foreman	W65.93 B58.28 T124.21	W68.10 B60.63 T128.73
Working Foreman, Welder, Crane Operator (all types)	W60.20 B53.79 T113.99	W62.18 B55.95 T118.13

Craft: Electrician **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	17.30	21.70	24.40	28.63	32.87					
Benefits	9.22	10.67	11.56	12.96	14.36					

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician **COMMENTS/NOTES**

THESE RATES ALSO APPLY TO THE FOLLOWING:
- All fire and burglar alarm work.
- All fiber optic work.
- Teledata work in new construction (including additions).
- Teledata work involving 16 or more instruments or voice/data lines.
- All camera installations.

Height Work: 40 feet above ground/floor: +10% of the wage and benefit amount.

FOREMAN REQUIREMENTS (number of Electricians on site):
(2 to 10) - a Working Foreman; (11 to 22) - a Foreman; (23 to 44) - a Lead Foreman; (35 to 48) - an Assistant General Foreman; (49 or more) - a General Foreman.

The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays
- 2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

OVERTIME:
The first 4 hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and the first 8 hours on Saturdays, shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 12 per day, Monday through Friday, in excess of 8 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **PREVAILING WAGE RATE**

	01/28/26
Master Technician/Gen. Foreman (31+ Workers on Job)	W53.48 B41.57 T95.05
Senior Technician/Lead Foreman (21-30 Workers on Job)	W49.14 B39.90 T89.04
Technician A/Foreman (11-20 Workers on Job)	W47.12 B39.13 T86.25
Technician B/Working Foreman (4-10 Workers on Job)	W45.93 B37.68 T83.61
Technician C/Journeyman (1-3 Workers on Job)	W42.21 B35.25 T77.46

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	17.26	17.26	20.54	20.54	25.48	25.48	30.02	30.02		
Benefits	9.72	9.72	10.67	10.67	12.58	12.58	14.89	14.89		

Ratio of Apprentices to Journeymen - 2:3

Craft: Electrician - Teledata (15 Voice/Data Lines & Less) **COMMENTS/NOTES**

NOTES: These rates are for service, maintenance, moves and/or changes affecting 15 voice/data lines or less. These rates may NOT be used for any new construction or fiber optic work.

FOREMAN REQUIREMENTS:
The number of workers on the jobsite is the determining factor for which Foreman category applies.

HIGH WORK: Any work performed 40 feet above ground or floor: +10% of the wage and benefit amount.

SHIFT DIFFERENTIAL:
- 2nd Shift (4:30 PM to 12:30 AM) - 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.
- 3rd Shift (12:30 AM to 8:00 AM) - 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

County - ATLANTIC

Craft: Electrician - Teledata (16 Instruments & More) **PREVAILING WAGE RATE**

See "Electrician" Rates

Craft: Electrician - Teledata (16 Instruments & More) **COMMENTS/NOTES**

See ELECTRICIAN Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Electrician- Outside Commercial **PREVAILING WAGE RATE**

	09/29/25	09/28/26
Assistant General Foreman	W68.80 B60.48 T129.28	W71.06 B62.96 T134.02
Foreman	W64.21 B56.86 T121.07	W66.33 B59.18 T125.51
General Foreman	W74.53 B65.01 T139.54	W76.99 B67.71 T144.70
Groundhand, Truck Driver, Conduit Installer (1 year or more experience)	W28.67 B28.62 T57.29	W29.61 B29.80 T59.41
Groundhand, Truck Driver, Conduit Installer (2 years or more experience)	W40.13 B37.61 T77.74	W41.45 B39.27 T80.72
Groundhand, Truck Driver, Conduit Installer (3 years or more experience)	W48.73 B43.78 T92.51	W50.34 B46.39 T96.73
Groundhand, Truck Driver, Conduit Installer (less than 1 year exp.)	W22.93 B1.57 T24.50	W23.69 B1.60 T25.29
Journeyman Lineman	W57.33 B51.42 T108.75	W59.22 B53.50 T112.72
Lead Foreman	W65.93 B58.21 T124.14	W68.10 B60.59 T128.69
Working Foreman	W60.20 B52.19 T112.39	W62.18 B55.86 T118.04

Craft: Electrician- Outside Commercial **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	26.52	28.63	30.75	32.87	34.99	37.11	39.22			
Benefits	12.07	12.77	13.49	14.21	14.92	15.63	16.35			

Craft: Electrician- Outside Commercial **COMMENTS/NOTES**

* FOR UTILITY WORK PLEASE SEE STATEWIDE RATES

FOREMAN REQUIREMENTS (number of Electricians on site):
(1 to10)- one Working Foreman.
(11 to 20)- one Working Foreman and one Foreman.
(21 to 30)- one Working Foreman, one Foreman and one Lead Foreman.
(31 to 40) - one Working Foreman, two (2) Foremen and one Lead Foreman.
(41 to 50)- one Working Foreman, four (4) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman.
(51 to 60)- one Working Foreman, five (5) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman
(runs one foreman).
(61 to 70)- one Working Foreman, six (6) Foremen, one Assistant General Foreman (runs 5 foremen), and one General Foreman
(runs two foremen).
(71 to 80)- one Working Foreman, seven (7) Foremen, two (2) Assistant General Foremen and one General Foreman.
(81 to 90)- one Working Foreman, eight (8) Foremen, two (2) Assistant General Foremen, and one General Foreman.
(91 to 100)- one Working Foreman, nine (9) Foremen, two (2) Assistant General Foremen and one General Foreman.

The regular workday consists of 8 hours, between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
2nd Shift (4:30 PM to 12:30 AM): 8 hrs. pay for 7.5 hrs. work + an additional 10% of the wage rate, inclusive of benefits.
3rd Shift (12:30 AM to 8:00 AM): 8 hrs. pay for 7 hrs. work + an additional 15% of the wage rate, inclusive of benefits.

OVERTIME:
All hours in excess of 8 per day, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and Holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS:
New Year's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Electrician-Utility Work (North) **PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (North) **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
* 6 Months	60%	65%	70%	75%	80%	85%	90%			
Benefits	70% of	Appren	tice	Wage	Rate	for all	intervals			

Craft: Electrician-Utility Work (North) **COMMENTS/NOTES**

Electrician-Utility Work (North) rates are located in the "Statewide" rate package.

* The apprentice wage rate is paid at the percentage of the Journeyman Lineman wage rate located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Electrician-Utility Work (South) **PREVAILING WAGE RATE**

Rates are located in the "Statewide" rate package

Craft: Electrician-Utility Work (South) **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	34.59	37.47	40.36	43.24	46.12	49.00	51.89			
Benefits	31.56	33.45	35.32	37.21	39.08	40.98	42.85			

Craft: Electrician-Utility Work (South) **COMMENTS/NOTES**

Electrician-Utility Work (South) rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Elevator Constructor **PREVAILING WAGE RATE**

	02/04/26
Helper over 5 years	W52.40 B45.07 T97.47
Helper under 5 years	W52.40 B44.02 T96.42
Mechanic (Journeyman) over 5 years	W74.86 B46.87 T121.73
Mechanic (Journeyman) under 5 years	W74.86 B45.37 T120.23
Mechanic in Charge (Foreman) over 5 years	W84.22 B47.62 T131.84
Mechanic in Charge (Foreman) under 5 years	W84.22 B45.93 T130.15
Probationary Helper (1st 6 months)	W37.43 B43.13 T80.56

Craft: Elevator Constructor **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	55%	65%	70%	80%						
Benefits	full	journeyman	benefit	rate for	all	intervals				

Ratio of Apprentices to Journeymen - *

* Total number of helpers and apprentices shall not exceed the number of mechanics on the job , except where 2 teams are working, 1 additional helper or apprentice may be employed for first 2 teams and an extra helper or apprentice for each additional 3 teams. Further, the employer may use as many helpers or apprentices as needed under the direction of a mechanic in wrecking old plants, handling and hoisting material, and on foundation work. When replacing cables on existing elevators, employer may use 2 helpers or apprentices to 1 mechanic.

Craft: Elevator Constructor **COMMENTS/NOTES**

SHIFT DIFFERENTIALS:
- 2nd Shift (4:30 PM to 12:30 AM) shall be established on the basis of 7.5 hours of work for 8 hours of pay, plus an additional 10% per hour.
- 3rd Shift (12:30 AM to 8:00 AM) shall be established on the basis of 7 hours of work for 8 hours of pay, plus an additional 15% per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday to Thursday or Tuesday to Friday, at straight time. When working a 4-10 hour day schedule, all hours worked on a day other than the days established for the 4-10 hour schedule shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and day after, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Glazier **PREVAILING WAGE RATE**

	05/01/26
Foreman	W55.30 B39.37 T94.67
Journeyman	W51.30 B39.37 T90.67

Craft: Glazier **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	24.09	25.63	28.70	32.29						
Benefits	21.22	23.99	25.51	27.96						

Ratio of Apprentices to Journeymen - 1:3

Craft: Glazier **COMMENTS/NOTES**

HIGH WORK (30 feet above ground /floor or using a swing stage): +$1.00/hr

FOREMAN REQUIREMENT:
- When 4 or more Glaziers are working on a job that runs for 10 days or more, 1 shall be designated a Foreman.

The regular workday shall be 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Second and Third shift shall receive the regular hourly rate, plus 15% per hour.

OVERTIME:
- The first 2 hours in excess of 8 per day (9th and 10th hours), or outside the regular workday, Monday through Friday, that are not shift work, and the first 8 hours on Saturdays shall be paid at time and one-half the regular rate. All other daily overtime, and all hours on Sundays and holidays shall be paid at double the regular rate.
- Four 10-hour days may be worked at straight time, Monday through Friday. The 11th and 12th hours on the 4 days worked, and the first 12 hours on the fifth day shall be paid at time and one-half the regular rate. All other daily overtime, and all hours on Saturdays, Sundays, and holidays shall be paid at double the regular rate.
- Benefits on overtime hours are as follows:
  Time and one-half = $48.65/hr.
  Double time = $57.93/hr.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Thanksgiving Day, Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Heat & Frost Insulator **PREVAILING WAGE RATE**

	07/01/26
Foreman	W59.15 B43.35 T102.50
Journeyman	W57.65 B43.35 T101.00

Craft: Heat & Frost Insulator **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	45%	55%	65%	75%	80%					
Benefit	38.60	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* Ratio = 1:4 on a "company-wide" basis (i.e. the total number of apprentices and journeymen employed by the company).
There is no limit to the number of apprentices allowed on any one job, provided there is at least 1 journeyman on the job.

Craft: Heat & Frost Insulator **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- If there is only 1 Insulator on the job, he must be designated a Foreman.
- If there are 2 to 10 Insulators on the job, 1 must be designated a Foreman.
- If there are 11 or more Insulators on the job, 1 must be designated a General Foreman and receive the following additional pay (% above Journeyman wage rate):
  11 - 20 Insulators on site: 10%; 21 - 30 Insulators on site: 15%;
  31 - 40 Insulators on site: 20%; 41 - 50 Insulators on site: 25%

The regular workday shall be 8 hours between 7:00 AM and 3:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of two (2) consecutive days and a minimum of two (2) shifts per day must be worked. Additionally, no less than two (2) employees may work on any one (1) shift. If these requirements are not met then shift work would not apply and the applicable overtime rate shall be paid.
- 1st Shift- Monday through Friday (7:00 AM- 3:00 PM).
- 2nd Shift- Monday through Friday (3:00 PM - 11:00 PM): additional 15% of the regular rate, inclusive of benefits.
- 3rd Shift- Monday through Friday (11:00 PM - 7:00 AM): additional 20% of the regular rate, inclusive of benefits.
- When a single night shift is established by the project owner for work not accessible during the day (due to the building being occupied), Monday through Friday, work performed during a second shift (3:00 PM-11:00 PM) shall be paid an additional 20% of the regular rate, inclusive of benefits, and work performed during a third shift (11:00 PM-7:00 AM) shall be paid an additional 25% of the regular rate, inclusive of benefits.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday Monday through Friday, that are not shift work, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

County - ATLANTIC

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veteran's Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Heat & Frost Insulator - Asbestos Worker **PREVAILING WAGE RATE**

	07/01/26
Foreman	W59.15 B43.35 T102.50
Journeyman	W57.65 B43.35 T101.00

Craft: Heat & Frost Insulator - Asbestos Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
	SEE	Heat &	Frost	Insulator						

Craft: Heat & Frost Insulator - Asbestos Worker **COMMENTS/NOTES**

NOTE: These rates apply only to the REMOVAL of insulation materials/asbestos from mechanical systems, including containment erection and demolition, and placing material in appropriate containers.

FOREMAN REQUIREMENTS:
- If there is only 1 Asbestos Worker on the job, he must be designated an Abatement Foreman.
- If there are 2 to 10 Asbestos Workers on the job, 1 must be designated an Abatement Foreman.
- If there are 11 or more Asbestos Workers on the job, 1 must be designated a General Foreman and receive the following additional pay (% above Abatement Mechanic wage rate):

11 - 20 Insulators on site: 10%; 21 - 30 Insulators on site: 15%;
31 - 40 Insulators on site: 20%; 41 - 50 Insulators on site: 25%

MECHANIC-TO-APPRENTICE RATIO:
- Maximum of 5 Apprentices for each Abatement Mechanic on the job.

OVERTIME:
- Hours in excess of 8 per day, and all hours on Saturday, shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays (except Labor Day) shall be paid at double the regular rate, inclusive of benefits. All hours on Labor Day shall be paid at triple the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Veteran's Day, Presidential Election Day, Thanksgiving Day, Christmas Day. Saturday holidays observed the preceding Friday, Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Industrial Painter- Bridges **PREVAILING WAGE RATE**

	02/20/26
Foreman	W65.07 B39.13 T104.20
General Foreman	W67.57 B39.13 T106.70
Journeyman	W60.07 B39.13 T99.20

Craft: Industrial Painter- Bridges **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	50%	70%	90%							
Benefits	14.94	22.01	28.91							

Ratio of Apprentices to Journeymen - 1:3

Craft: Industrial Painter- Bridges **COMMENTS/NOTES**

* Industrial Painters perform work on all industrial structures, such as bridges.

These rates apply to: All bridges that span waterways, roadways, railways and canyons. All tunnels, overpasses, viaducts and all appurtenances.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate, except Veterans Day, which shall be paid at time and one-half the regular rate.
- During a regular work week schedule, Saturday may be used as a make-up day lost to inclement weather, paid at the regular rate.
- Four 10-hour days may be worked, at the regular rate, Monday through Thursday. When the four 10-hour day schedule is used, the 11th and 12th hours shall be paid at time and one-half the regular rate. After the 12th hour, a worker shall be paid at double the regular rate. Friday may be used as a make-up day lost to inclement weather, paid at the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Industrial Painter- Structural Steel **PREVAILING WAGE RATE**

	02/20/26
Foreman	W53.81 B36.78 T90.59
General Foreman	W56.31 B36.78 T93.09
Journeyman	W48.81 B36.78 T85.59

Craft: Industrial Painter- Structural Steel **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
	SEE	INDUST	RIAL	PAINTER	BRIDGES					

Ratio of Apprentices to Journeymen - 1:3

Craft: Industrial Painter- Structural Steel **COMMENTS/NOTES**

* Industrial Painters perform work on all industrial structures, such as water tanks, waste water facilitites, refineries, any structural steel work, etc.

These rates apply to: All work in power plants (any aspect). On steeples, on dams, on hangers, transformers, substations, on all open steel, in refineries, tank farms, water/sewerage treatment facilities and on pipelines.

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate, except for Veterans Day, which shall be paid at time and one-half the regular rate.
- During the regular work week schedule, Saturday may be used to make-up a day lost to inclement weather, paid at the regular rate.
- Four 10-hour days may be worked, at the regular rate, Monday through Thursday. When the four 10-hour day schedule is used, the 11th and 12th hours shall be paid at time and one-half the regular rate. After the 12th hour, a worker shall be paid at double the regular rate. Friday may be used as a make-up day lost to inclement weather, paid at the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Industrial Painter- Water Tanks **PREVAILING WAGE RATE**

	02/20/26
Foreman	W54.86 B36.43 T91.29
General Foreman	W57.36 B36.43 T93.79
Journeyman	W49.86 B36.43 T86.29

Craft: Industrial Painter- Water Tanks **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	50%	70%	90%							
Benefits	14.94	22.01	28.91							

Ratio of Apprentices to Journeymen - 1:3

Craft: Industrial Painter- Water Tanks **COMMENTS/NOTES**

* Industrial Painters perform work on all industrial structures, such as water tanks, waste water facilitites, refineries, any structural steel work, etc.

These rates apply to: All new and repaint water tanks (interior and exterior).

FOREMEN REQUIREMENTS:
- When there are 4 or more Painters on a job, 1 shall be designated a Foreman.
- When there are 15 or more Painters on a job, 1 shall be designated a General Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at double the regular rate, except Veterans Day, which shall be paid at time and one-half the regular rate.
- During a regular work week schedule, Saturday may be used to make-up a day lost to inclement weather, paid at the regular rate.
- Four 10-hour days may be worked, at the regular rate, Monday through Thursday. When the four 10-hour day schedule is used, the 11th and 12th hours shall be paid at time and one-half the regular rate. After the 12th hour, a worker shall be paid at double the regular rate. Friday may be used as a make-up day lost to inclement weather, paid at the regular rate.

County - ATLANTIC

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Saturday holiday observed the preceding Friday. Sunday holiday observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Ironworker **PREVAILING WAGE RATE**

	07/01/26
Foreman-Fence and Guardrail	W58.34 B40.19 T98.53
Foreman-Rod/Mesh	W63.81 B40.97 T104.78
Foreman-Structural	W64.96 B40.97 T105.93
Journeyman- Fence and Guardrail	W54.02 B40.19 T94.21
Journeyman-Rod/Mesh	W55.49 B40.97 T96.46
Journeyman-Structural	W56.49 B40.97 T97.46

Craft: Ironworker **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	66%	79%	88%							

Ratio of Apprentices to Journeymen - *

* On all work EXCEPT Ornamental Iron and Bridge Cable Spinning Work 1:4; On Ornamental Iron and Bridge Cable Spinning Work 1:1.

Craft: Ironworker **COMMENTS/NOTES**

ROD/MESH (REINFORCING): All work performed in connection with bending, burning, cutting, field fabrication, handling, hoisting, placing, racking, sorting, tying and welding of all materials, including composites used in reinforced concrete construction, all realigning of reinforcing steel and wire mesh and the placement of reinforcing dowels.
The installation, fabrication and distribution of all materials associated with post tensioning and pre-stressing procedures on reinforced concrete jobs.
All prefabricated mates, caissons, columns, beams and walls.
The installation of reinforcing dowels into pre-drilled holes by any means necessary, including epoxy, glue, compounds or tying.
STRUCTURAL: All work performed in connection with bending, burning, cutting, field fabrication, handling, hoisting, placing, racking, sorting, tying and welding of all materials, including composites and mass timbers used in structural frame construction, and realigning of structural framing members.
The installation, fabrication and distribution of all materials associated with structural framework, regardless of material composition, including mass timbers.

All prefabricated columns, beams and walls.
When precast, prestressed or reinforced concrete structural members (beams, columns, girders, slabs, etc.) are used in construction of bridges, buildings and other structures, and power equipment such as cranes, derricks, jacks and/or rigging used, the work of loading, unloading, moving, and placing to complete erection.
Solar canopy erection, ground mounted installation and erection of photovoltaic array assemblies.
Unitized curtain wall systems, including erection and rigging of such, regardless of material composition.
Pre-engineered metal building systems.
Steel decking and siding for building structures and canopy systems.
Offshore wind erection, fabrication, and rigging of all related components.
FENCE AND GUARDRAIL: All work performed in connection with bending, burning, cutting, field fabrication, handling, hoisting, placing, racking, digging and anchoring, sorting, tying, welding and installation of all materials, including composites, security style fencing, regardless of materials used.
Installation, fabrication and distribution of all materials associated with Fence and Guardrail work scope, regardless of material composition.
All prefabricated fencing, permanent, temporary or otherwise.

Note: For work on hazardous waste sites, workers shall receive an additional $3.00 per hour.

The regular workday shall consist of 8 hours between 6:00 AM and 5:00 PM.

SHIFT DIFFERENTIALS:
- Second shift shall receive an additional 10% per hour.
- Third shift shall receive an additional 15% per hour.
- An irregular shift (shift starting after 6:00 PM) shall receive an additional 15% per hour.

OVERTIME:
- Time and one-half the wage rate for hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and for all hours on Saturdays. Double the wage rate for all hours on Sundays and holidays.
- Employees may work four 10-hour days, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours worked on Friday shall be paid at time and one-half the wage rate.
- Benefits on overtime hours shall be paid at the following rates:

Rod/Mesh and Structural
When wages are time and one-half, benefits = $47.68
When wages are double, benefits = $54.39

Fence and Guardrail
When wages are time and one-half, benefits = $46.51
When wages are double, benefits = $52.83

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, General and Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Laborer - Asbestos & Hazardous Waste Removal **PREVAILING WAGE RATE**

	08/11/26
Foreman	W48.12 B27.72 T75.84
Journeyman (Handler)	W42.77 B27.72 T70.49

Craft: Laborer - Asbestos & Hazardous Waste Removal **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	25.66	29.94	34.22	38.49						
Benefit	23.07	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than one (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Asbestos & Hazardous Waste Removal **COMMENTS/NOTES**

NOTE: These rates apply to work in connection with Asbestos, Radiation, Hazardous Waste, Lead, Chemical, Biological, Mold Remediation and Abatement.

The regular workday shall be 8 hours.

OVERTIME:
- Hours in excess of 8 per day, Monday through Saturday, and all hours on Sunday and holidays shall be paid at time and one-half the regular rate.
- Benefits on ALL overtime hours shall be paid at straight time.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Easter, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. (Holidays start at 12:00 am).

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Laborer - Building **PREVAILING WAGE RATE**

	07/07/26
Class A Journeyman	W40.97 B34.85 T75.82
Class B Journeyman	W39.97 B34.85 T74.82
Class C Journeyman	W33.97 B34.85 T68.82
Foreman	W46.09 B34.85 T80.94
General Foreman	W51.21 B34.85 T86.06

Craft: Laborer - Building **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	60%	70%	80%	90%	of Class B	wage rate				
Benefit	31.60	31.60	31.60	31.60						

Ratio of Apprentices to Journeymen - *

* Ratio of apprentices to journeymen shall not be more than one apprentice for the first journeyman and no more than one (1) apprentice for each additional three (3) journeymen.

Craft: Laborer - Building **COMMENTS/NOTES**

CLASS A: Specialist laborer including mason tender or concrete pour crew; scaffold builder (scaffolds up to 14 feet in height); operator of forklifts, Bobcats (or equivalent machinery), jack hammers, tampers, motorized tampers and compactors, vibrators, street cleaning machines, hydro demolition equipment, riding motor buggies, conveyors, burners; and nozzlemen on gunite work.
CLASS B: Basic laborer - includes all laborer work not listed in Class A or Class C.
CLASS C: Janitorial-type light clean-up work associated with the TURNOVER of a project, or part of a project, to the owner. All other clean-up work is Class B.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- When a 2-shift schedule is worked, including a day shift, both shifts shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%.
- When a 3-shift schedule is worked, the day shift shall be established on the basis of 8 hours pay for 8 hours worked, the second shift shall be established on the basis of 8 hours pay for 7.5 hours worked, and the third shift shall be established

on the basis of 8 hours pay for 7 hours worked. The day shift shall receive the regular rate, the second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.
- When a second or third shift is worked with no day shift, the second or third shift shall be established on the basis of 8 hours pay for 8 hours worked. The second shift shall receive the regular rate plus an additional 10%, and the third shift shall receive the regular rate plus an additional 15%.
- When an irregular shift must be established this shift shall receive the regular rate plus an additional 10%.

OVERTIME:
- Hours in excess of 8 per day, or outside the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. Saturday may be used as a make-up day (paid at straight time) for a day lost to inclement weather, or for a holiday that is observed during the work week, Monday through Friday. All hours on Sundays and holidays shall be paid at double the regular rate.
- Four 10-hour days may be worked Monday to Thursday, at straight time, with Friday used a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the regular rate.
- Benefits on ALL overtime hours shall be paid at time and one-half.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Laborer - Heavy & General **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Craft: Laborer - Heavy & General **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	60%	70%	80%	90%						
Benefits	25.08	for	all	intervals						

Ratio of Apprentices to Journeymen - *

* No more than 1 apprentice for the first journeyman and no more than 1 apprentice for each additional 3 journeymen.

As of 3-1-25, benefits shall be 26.13.
As of 3-1-26, benefits shall be 27.13.

Craft: Laborer - Heavy & General **COMMENTS/NOTES**

Heavy & General Laborer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Laborer-Residential and Modular Construction **PREVAILING WAGE RATE**

	04/01/26	04/01/27
* Skilled Tradesman (only applies to Modular Construction)	W36.50 B5.45 T41.95	W37.00 B5.45 T42.45
Foreman (person directing crew, regardless of his skill classification)	W38.50 B5.45 T43.95	W39.00 B5.45 T44.45
Residential and Modular Construction Laborer	W32.50 B5.45 T37.95	W33.00 B5.45 T38.45

Craft: Laborer-Residential and Modular Construction **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
As shown	800 hours	600 hours	600 hours							
wage & benefit	70%	80%	90%							

Ratio of Apprentices to Journeymen-

One (1) apprentice shall be allowed for the first journeyman on site and no more than one (1) additional apprentice for each additional three (3) journeymen on site.

Craft: Laborer-Residential and Modular Construction **COMMENTS/NOTES**

* SKILLED TRADESMAN-
any worker doing work not typically done by a Building Laborer. Some examples are installing interior doors, sheet rock, hooking up appliances, installing light fixtures, installing railing systems, etc. Please note where local building codes require that certain work be performed under the supervision of a licensed tradesman (i.e. Plumber, Electrician, etc.) Laborers shall work under such supervision.

RESIDENTIAL CONSTRUCTION- All residential construction (not commercial), single-family, stand-alone duplex houses, townhouses and multi-family buildings of not more than four (4) floors. Each housing unit must be fully and independently functional; each housing unit must have its own kitchen and bathroom. The definition includes all incidental items such as site work, parking areas, utilities, streets and sidewalks. Please note the construction must be Residential in nature. A First Floor at or below grade may contain commercial space not to exceed 50% square footage of the floor; at least 50% of the First Floor must contain living accommodations or related nonresidential uses (e.g. laundry space, recreation/hobby rooms, and/or corridor space). Basement stories below grade used for storage, parking, mechanical systems/equipment, etc., are considered basement stories which are not used in determining the building's height. An attic is an unfinished space located immediately below the roof. Such space is not used in determining a building's height even if used for storage purposes. In addition, barracks and dormitories are not considered residential projects.

MODULAR RESIDENTIAL CONSTRUCTION- all aspects of modular residential construction (not commercial) at the site of installation of structures of no more than four (4) stories, including all excavation and site preparation, footings and foundation systems whether poured on-site or prefabricated, all underground waterproofing, underground utilities, concrete slabs, sidewalks, driveways, paving, hardscape and landscaping. Please note the construction must be Residential as defined above. All work performed by the Set Crew (the crew of workers who set the modular boxes on the foundation), including the rigging, setting, attaching and assembly of all modules and structural members, preparation of the foundation

to accept modules, such as sill plates, connection of all in-module and under-module connections including, but not limited to, plumbing, electrical, HVAC, fire suppression, CAT5, telephone, television/internet, and fiber optic, the building or installation of any porches or decks regardless of material or method of construction, the on-site installation of, or completion of any roof system, doors, windows and fenestrations, including flashing, gutter and soffit systems, waterproofing, insulation and interior and exterior trim work, and painting. Please note that modular construction does not include on-site stick built construction, tip up construction or panel built construction.

The regular workday shall be 8 hours between 6:00 AM and 6:00 PM.

OVERTIME:
Hours worked in excess of 8 per day/40 per week, Monday through Saturday, and all hours worked on Sunday and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOILDAYS:
New Year's Day, Martin Luther King Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Millwright **PREVAILING WAGE RATE**

	05/01/26
Foreman	W68.93 B41.47 T110.40
Journeyman	W59.94 B36.15 T96.09

Craft: Millwright **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
6 Months	40%	55%	65%	80%	90%					
Benefits	59.25% of	Appren	tice	Wage	Rate	for all	intervals	+ $0.63		

Ratio of Apprentices to Journeymen - 1:3

Craft: Millwright **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- When there are 2 or more Millwrights on a job, 1 shall be designated as a Foreman.

The regular workday shall consist of 8 hours, starting between 6:00 AM and 9:00 AM.

SHIFT DIFFERENTIALS:
- When a 2 shift schedule (including a day shift) is established, the day shift shall be established on an 8 hour basis. The second shift shall be established on an 8 hour basis, and receive the regular rate plus 15%, inclusive of benefits.
- When a three shift schedule is established, the first shift shall be established on an 8 hour basis, the second shift on a 7.5 hour basis, and the third shift on a 7 hour basis. The first shift shall receive the regular hourly rate, the second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When there is no day shift, and a second or third shift is established, it shall be established on an 8 hour basis. The second shift shall receive the regular rate plus 15% and the third shift shall receive the regular rate plus 20%, inclusive of benefits.
- When an irregular shift must be established, this shift shall receive the regular rate plus 15%, inclusive of benefits.

OVERTIME:
- All hours in excess of 8 per day, or before or after an established shift that are not shift work, and all hours on Saturdays shall be paid at time and one-half the hourly rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday to Thursday, at straight time. Friday may be used as a make-up day for a day lost due to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday. Veterans' Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Operating Engineer **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Craft: Operating Engineer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	60%	70%	80%	90%						

Ratio of Apprentices to Journeymen - *

* 1 apprentice for each piece of heavy equipment. At least 10 pieces of heavy equipment or a minimum of 5 Operating Engineers must be on site.

Craft: Operating Engineer **COMMENTS/NOTES**

Operating Engineer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Operating Engineer - Field Engineer **PREVAILING WAGE RATE**

Rates are located in the
"Statewide" rate package

Craft: Operating Engineer - Field Engineer **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	70%	75%	of Rod/	Chainman	Wage					
Yearly			80%	90%	Transit/	Instrument	man	Wage		

Ratio of Apprentices to Journeymen - *

* No more than 1 Field Engineer Apprentice per Survey Crew.

Craft: Operating Engineer - Field Engineer **COMMENTS/NOTES**

Operating Engineer - Field Engineer rates are located in the "Statewide" rate package.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Painter - Line Striping **PREVAILING WAGE RATE**

	12/01/25
Apprentice (1st year)	W32.04 B17.68 T49.72
Apprentice (2nd year)	W36.55 B28.63 T65.18
Foreman (Charge Person)	W46.12 B29.41 T75.53
Journeyman 1 (at least 1 year of working exp. as a journeyman)	W41.35 B29.41 T70.76
Journeyman 2 (at least 2 years of working exp. as a journeyman)	W45.12 B29.41 T74.53

Craft: Painter - Line Striping **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									

Ratio of Apprentices to Journeymen - 1:1

Craft: Painter - Line Striping **COMMENTS/NOTES**

OVERTIME:
Hours in excess of 8 per day, Monday through Saturday, and all hours on Sundays and holidays shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day and Christmas Day. Veterans Day may be substituted for the day after Thanksgiving.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Paperhanger **PREVAILING WAGE RATE**

	05/08/26
Foreman	W56.57 B33.41 T89.98
General Foreman	W61.72 B33.41 T95.13
Journeyman	W51.43 B33.41 T84.84

Craft: Paperhanger **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	25.72	30.86	36.00	41.14						
Benefits	18.35	18.35	18.35	18.35						

Craft: Paperhanger **COMMENTS/NOTES**

FOREMEN REQUIREMENTS:
- When there are 4 or more Paperhangers on a job, 1 shall be designated a Foreman.

The regular workday shall consist of 8 hours between 7:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- The second shift shall receive an additional 10% of the hourly rate, per hour, and the third shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Saturday or Sunday may be used to make up a day lost to inclement weather, at straight time.
- Four 10-hour days may be worked, at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, General Election Day, Veterans Day, Thanksgiving Day, Christmas Day

County - ATLANTIC

Craft: Pipefitter **PREVAILING WAGE RATE**

See "Plumber" Rates

Craft: Pipefitter **COMMENTS/NOTES**

*** See PLUMBER Rates***

Craft: Plasterer **PREVAILING WAGE RATE**

See "Cement Mason" Rates

Craft: Plasterer **COMMENTS/NOTES**

See CEMENT MASON Rates

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Plumber **PREVAILING WAGE RATE**

	05/01/26
Foreman	W65.20 B52.11 T117.31
Journeyman	W59.50 B52.11 T111.61

Craft: Plumber **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 Months	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%
Benefits	34.60	35.94	37.30	38.64	39.98	41.32	42.68	44.02	45.38	46.72

Ratio of Apprentices to Journeymen - 1:4

Craft: Plumber **COMMENTS/NOTES**

FOREMAN REQUIREMENTS:
- On any job having 2 or more Journeyman Plumbers, 1 must be designated a Foreman.
- There must be 1 additional Foreman for every 10 Plumbers on the job.

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- When 2 shifts are worked, the second shift shall receive 8 hours pay for 8 hours of work.
- When 3 shifts are worked, the second shift shall receive 8 hours pay for 7.5 hours of work, and the third shift shall receive 8 hours pay for 7 hours of work.
- The rate of pay for all shift work shall be an additional 15% of the hourly rate, per hour.

OVERTIME:
The first 4 hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and the first 12 hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. Hours in excess of 12 per day, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Roofer **PREVAILING WAGE RATE**

	05/27/26
Foreman (5 workers or less)	W49.53 B35.22 T84.75
Foreman (6 workers or more)	W50.03 B35.22 T85.25
Journeyman	W47.53 B35.22 T82.75

Craft: Roofer **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
Yearly	55%	60%	65%	75%						
Benefits	23.74	28.49	35.22	35.22						

Ratio of Apprentices to Journeymen - *

* 1:2, 2:4, 3:6, 4:8, 5:10, 6:12, 7:14

Craft: Roofer **COMMENTS/NOTES**

NOTE: Mopper, Operator of Felt Laying Machine or Slag Dispenser shall receive an additional $.50 per hour.

FOREMAN REQUIREMENTS:
- There must be a Foreman on all jobs.
- Foreman rate depends on the number of Roofers on the job, as indicated.

The regular workday is 8 hours between 5:00 AM and 4:30 PM.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, and all hours on Saturdays , Sundays, and holidays shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Roofer - Shingle, Slate & Tile **PREVAILING WAGE RATE**

	05/27/26
Foreman (3 workers or less)	W37.70 B22.68 T60.38
Foreman (4 workers or more)	W38.20 B22.68 T60.88
Helper	W18.60 B22.68 T41.28
Journeyman (shingle work)	W37.20 B22.68 T59.88

Craft: Roofer - Shingle, Slate & Tile **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
Yearly	60%	70%	80%							
Benefits	22.68	22.68	22.68							

Ratio of Apprentices to Journeymen - *

* 1:2, 2:4, 3:6, 4:8, 5:10, 6:12, 7:14

Craft: Roofer - Shingle, Slate & Tile **COMMENTS/NOTES**

NOTE: Above rates are for Shingle work only. Slate and Tile work rates are an additional $3.00 per hour.

HELPER RATIO: 1 Helper to 1 Journeyman

FOREMAN REQUIREMENTS:
- There must be a Foreman on all jobs.
- Foreman rate depends on the number of Roofers on the job, as indicated.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays, Sundays, and holidays shall be paid at time and one-half the wage rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Sheet Metal Sign Installation **PREVAILING WAGE RATE**

	07/15/26
Foreman	W38.38 B25.01 T63.39
Journeyman	W36.38 B25.01 T61.39

Craft: Sheet Metal Sign Installation **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
1000 Hours	50%	55%	60%	65%	70%	75%	80%	90%		
Benefits	23.80	23.88	23.96	24.05	25.15	25.23	25.32	25.49		

Ratio of Apprentices to Journeymen - 1:2

Craft: Sheet Metal Sign Installation **COMMENTS/NOTES**

HAZARDOUS DUTY:
Sign Installers working from a bosun's chair or outside swinging scaffold at a height of 60 feet or more: + $5.00 per hour.

FOREMAN REQUIREMENTS:
When there are 3 or more Sign Installers on a job, one must be designated a Foreman.

The regular workday shall be 8 hours, between 8:00 AM and 5:00 PM.

OVERTIME:
Hours in excess of 8 per day, or outside the regular workday, Monday through Friday, and all hours on Saturdays and Sundays shall be paid at time and one-half the regular rate. All hours on holidays shall be paid at time and one-half the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day, day after Thanksgiving, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Sheet Metal Worker **PREVAILING WAGE RATE**

	06/01/26
Foreman	W68.43 B49.10 T117.53
Journeyman	W64.25 B49.10 T113.35

Craft: Sheet Metal Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	PERIOD AND RATES									
6 months	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%
Benefits	15.45	17.25	19.07	20.86	22.66	32.27	34.68	37.08	39.48	41.89

Ratio of Apprentices to Journeymen- 1:3, except for the following types of work where the ratio shall be 1:1 (architectural metal work, testing and balancing, lockers, shelving and toilet partitions).*
* For work performed in a fabrication shop, the ratio will be applied on a "company-wide" basis (i.e. the total number of apprentices and journeymen employed by the company).

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Craft: Sheet Metal Worker **COMMENTS/NOTES**

JOB SITE FOREMAN REQUIREMENTS:
- When there are 2 to 9 Sheet Metal Workers on a jobsite, 1 must be designated a Foreman.
- When there are 10 to 16 Sheet Metal Workers on a job site, 2 must be designated Foremen.
- When there are 17 to 23 Sheet Metal Workers on a job site, 3 must be designated Foremen.
- For every 7 addtional Sheet Metal Workers on a job site, there shall be 1 additional Foreman.

SHOP FOREMAN REQUIREMNTS (For custom fabrication):
- When there are 1 to 10 Sheet Metal Workers in the shop, 1 must be designated a Foreman.
- For every 10 additional Sheet Metal Workers in the shop, 1 must be designated a Foreman.

The regular workday consists of 8 hours, between 6:00 AM and 4:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- There must be a day shift worked in order to have a 2nd and/or 3rd Shift.
- Shop work does not satisfy shift requirements.
- 2nd Shift (4:30 PM-12:30 AM) shall be paid an additional 15% of the regular rate per hour inclusive of benefits, and receive 8 hours pay for 7.5 hours of work.
- 3rd Shift (12:30 AM-8:00 AM) shall be paid an additional 25% of the regular rate per hour inclusive of benefits, and receive 8 hours pay for 7 hours of work.

OVERTIME:

County - ATLANTIC

Hours in excess of 8 per day, or before or after the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday, shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.
- Benefits on overtime hours are as follows:
Time and one-half = 57.79
Double-time = 65.24

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Good Friday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Sprinkler Fitter **PREVAILING WAGE RATE**

	01/01/26	01/01/27
Foreman	W66.64 B37.81 T104.45	W70.86 B38.81 T109.67
General Foreman	W68.89 B37.81 T106.70	W73.11 B38.81 T111.92
Journeyman	W63.14 B37.81 T100.95	W67.11 B38.81 T105.92
Master Foreman	W71.14 B37.81 T108.95	W75.36 B38.81 T114.17

Craft: Sprinkler Fitter **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
1000 Hours	43%	48%	52%	56%	59%	64%	68%	72%	76%	80%
Benefits	10.23	10.23	22.79	22.79	23.04	23.04	23.04	23.04	23.04	23.04

Ratio of Apprentices to Journeymen - 1:1

Craft: Sprinkler Fitter **COMMENTS/NOTES**

APPRENTICE RATE SCHEDULE AS OF 1-1-27:

INTERVAL PERIOD AND RATES
1000 Hours 43% 48% 52% 56% 59% 64% 68% 72% 76% 80%
Benefits 11.23 11.23 23.79 23.79 24.04 24.04 24.04 24.04 24.04 24.04

FOREMAN REQUIREMENTS:
- There must be a Foreman on all projects. If there is only 1 Sprinkler Fitter on the project, he shall be designated a Foreman.
- On any job with 15 to 25 Sprinkler Fitters 1 shall be designated a General Foreman.
- On any job with over 25 Sprinkler Fitters 1 shall be designated a Master Foreman.

The regular workday consists of 8 hours, between 6:00 AM and 6:00 PM.

SHIFT DIFFERENTIALS:
- Shift work must run for a minimum of 5 consecutive workdays.
- 2nd and/or 3rd shift shall receive an additional 15% of the hourly rate, per hour.

OVERTIME:
- Hours in excess of 8 per day, or before or after the regular workday that are not shift work, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid

at double the hourly rate.
- Four 10-hour days may be worked at straight time, Monday through Friday.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, Christmas Day. Saturday holidays will be observed the preceding Friday, Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Tile Worker **PREVAILING WAGE RATE**

	06/01/26
Finisher	W44.17 B32.83 T77.00
Setter	W51.99 B39.83 T91.82

Craft: Tile Worker **APPRENTICE RATE SCHEDULE**

INTERVAL	**PERIOD AND RATES**									
750 Hours	40%	45%	50%	55%	60%	65%	70%	75%	80%	90%

Ratio of Apprentices to Journeymen - 1:4

Craft: Tile Worker **COMMENTS/NOTES**

NOTE: These rates also apply to Terrazzo and Marble work.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and the first 10 hours on Saturdays shall be paid at time and one half the regular rate, inclusive of benefits. Hours in excess of 10 on Saturdays, and all hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS:
New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day. Sunday holidays shall be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Truck Driver **PREVAILING WAGE RATE**

	05/01/26
Bucket, Seeding/Fertilizing/ Mulching trucks	W47.91 B27.55 T75.46
Concrete mobile unit; Tack Spreader, Transit Mix trucks	W47.91 B27.55 T75.46
Dump, Tank, Pick-up, Vacuum or Vac-All trucks	W47.91 B27.55 T75.46
Helper on Straight 3-axle truck, Mechanic's helper	W47.71 B27.55 T75.26
Mechanic	W48.41 B27.55 T75.96
Shop Steward, Large Off-Road Dump Truck, Winch Truck	W48.36 B27.55 T75.91
Straight 3-axle truck	W47.91 B27.55 T75.46
Tow Truck	W48.06 B27.55 T75.61
Tractor Trailer, Fuel, and Asphalt Oil Distributor Trucks	W48.26 B27.55 T75.81
Water Truck	W47.91 B27.55 T75.46

Craft: Truck Driver **COMMENTS/NOTES**

HAZARDOUS WASTE WORK:
- On hazardous waste removal work on a State-designated hazardous waste site where the driver is in direct contact with hazardous materials and when personal protective equipment is required for respiratory, skin, and eye protection: + $3.00 per hour.
- All other designated hazardous waste sites: + $1.00 per hour.

SHIFT DIFFERENTIAL:
- Second shift shall receive an additional $1.00 per hour.

OVERTIME:

- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days at straight time, Monday through Thursday, with Friday used as a make-up day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. When all trades agree, the day after Thanksgiving may be substituted for Veterans' Day. Sunday holidays will be observed the following Monday.

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

County - ATLANTIC

Craft: Truck Driver-Material Delivery Driver **PREVAILING WAGE RATE**

	05/01/26
Driver	W47.91 B27.55 T75.46

Craft: Truck Driver-Material Delivery Driver **COMMENTS/NOTES**

HAZARDOUS WASTE WORK:
- All designated hazardous waste sites: + $1.00 per hour.

SHIFT DIFFERENTIAL:
- Second shift shall receive an additional $1.00 per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, and all hours on Saturdays shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Employees may work four 10-hour days at straight time, Monday through Thursday, with Friday used as a make-up day. If Friday is not a make-up day, then all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, President's Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. When all trades agree, the day after Thanksgiving may be substituted for Veterans' Day. Sunday holidays will be observed the following Monday.

Craft: Welder **PREVAILING WAGE RATE**

Welder

Craft: Welder **COMMENTS/NOTES**

Welders rate is the same as the craft to which the welding is incidental.

STATEWIDE RATES

TERRITORY

ENTIRE STATE

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT

PREVAILING WAGE RATE DETERMINATION

OPERATING ENGINEERS **Rates Expiration Date :**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must be established for 5 consecutive workdays.
- Any work started outside of the allowed start time, 6:00 AM to 9:00 AM, except for * tidal work, shall be considered an irregular shift and paid at straight time, plus 15% for the first eight hours, inclusive of benefits.
- * FOR TIDAL WORK- a contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work), providing the eight hour shift is completed between the hours of 5:00 AM and 6:30 PM.
- All time worked in excess of an established shift (an established shift is a shift that is determined at the time of the bid) shall be paid at the applicable overtime rate. When a portion of an established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.
- When working with other trades who receive a higher irregular shift differential, these employees shall also receive the higher differential rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veterans Day.

For projects bid after April 1, 2020, on hazardous waste removal work of any kind, including a state or federally designated site, where the operating engineer is required to wear level A, B, or C personal protection, the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour.
- An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $1.00 per hour.

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
61.63	42.45	104.08

CLASSIFICATIONS:

A-Frame

Backhoe (combination)

Boom Attachment on loaders (Except pipehook)

Boring & Drilling Machine

Brush Chopper, Brush Shredder, Tree Shredder, Tree Shearer

Bulldozer, finish grade

Cableway

Carryall

Concrete Pump

Concrete Pumping System (Pumpcrete & similar types)

Conveyor, 125 feet or longer

Drill Doctor (Duties include dust collector and maintenance)

Front End Loader (2 cu. yds. but less than 5 cu. yds.)

Grader, finish

Groove Cutting Machine (ride-on type)

Heater Planer

Hoist: Outside Material Tower Hoist (all types including steam, gas, diesel, electric, air hydraulic, single and double drum, concrete, brick shaft caisson, snorkle roof, and other similar types, Except Chicago-boom type) * receives an addtional $1.00 per hour on 100 ft. up to 199 ft. total height, and an additional $2.00 per hour on 200 ft. and over total height.

Hydraulic Crane (10 tons & under)

Hydraulic Dredge

Hydro-Axe

Hydro-Blaster

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
61.63	42.45	104.08

CLASSIFICATIONS:

Jack (screw, air hydraulic, power-operated unit, or console type, Except hand jack or pile load test type)

Log Skidder

Pan

Paver, concrete

Plate & Frame Filter Press

Pumpcrete (unit type)

Pumpcrete, Squeezecrete, or Concrete Pumping machine (regardless of size)

Scraper

Side Boom

Straddle Carrier (Ross and similar types)

Whiphammer

Winch Truck (hoisting)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
59.72	42.45	102.17

CLASSIFICATIONS:

Asphalt Curbing Machine

Asphalt Plant Engineer

Asphalt Spreader

Autograde Curb Trimmer & Sidewalk Shoulder Slipform (CMI & similar types)

Autograde Curecrete Machine (CMI & similar types)

Autograde Tube Finisher & Texturing Machine (CMI & similar types)

Bar Bending Machines (Power)

Batcher, Batching Plant, & Crusher [On Site]

Belt Conveyor System

Boom-Type Skimmer Machine

Bridge Deck Finisher

Bulldozer (all sizes)

Captain (Power Boats)

Car Dumper (railroad)

Compressor & Blower unit for loading/unloading of concrete, cement, fly ash, or similar type materials (used independently or truck-mounted)

Compressor (2 or 3 battery)

Concrete Breaking Machine

Concrete Cleaning/Decontamination Machine

Concrete Finishing Machine

Concrete Saw or Cutter (ride-on type)

Concrete Spreader (Hetzel, Rexomatic & similar types)

Concrete Vibrator

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
59.72	42.45	102.17

CLASSIFICATIONS:

Conveyors - under 125 feet

Crane Signalman

Crushing Machine

Directional Boring Machine

Ditching Machine - Small (Ditchwitch, Vermeer or similar types)

Dope Pot - Mechanical (with or without pump)

Dumpster

Elevator

Fireman

Fork Lift (Economobile, Lull & similar types)

Front End Loader (1 cu. yd. and over but less than 2 cu. yds.)

Generator (2 or 3 battery)

Giraffe Grinder

Goldhofer/Hydraulic Jacking Trailer

Grader & Motor Patrols

Grout Pump

Gunnite Machine (Excluding nozzle)

Hammer - Vibratory (in conjunction with generator)

Heavy Equipment Robotics - Operator/Technician

Hoist (roof, tugger, aerial platform hoist, house car)

Hopper

Hopper Doors (power operated)

Ladder (motorized)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
59.72	42.45	102.17

CLASSIFICATIONS:

Laddervator

Locomotive (Dinky-type)

Maintenance Utility Man

Master Environmental Maintenance Technician

Mechanic

Mixer (Except paving mixers)

Pavement Breaker (truck-mounted or small self-propelled ride-on type)

Pavement Breaker - maintenance of compressor or hydraulic unit

Pipe Bending Machine (power)

Pitch Pump

Plaster Pump (regardless of size)

Post Hole Digger (post pounder, auger)

Rod Bending Machines

Roller (black top)

Scale (power)

Seamen Pulverizing Mixer

Shoulder Widener

Silo

Skimmmer Machine (boom type)

Steel Cutting Machine (service & maintenance)

Tamrock Drill

Tractor

Transfer Machines

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
59.72	42.45	102.17

CLASSIFICATIONS:

Tug Captains

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System - Operator/Maintenance Technician

Vacuum Blasting Machine - Operator/Maintenance Technician

Vibrating Plant (used with unloading)

Welder & Repair Mechanic

Effective Dates:

07/01/2026

Rate	Fringe	Total
54.38	42.45	96.83

CLASSIFICATIONS:

Assistant Engineer/Oiler

Driller's Helper

Field Engineer - Transit man or Instrument man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Mechanic's Helper

Off Road Back Dump

Tire Repair & Maintenance

Effective Dates:

07/01/2026

Rate	Fringe	Total
51.80	42.45	94.25

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
61.96	42.45	104.41

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (minimum)

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
63.22	42.45	105.67

CLASSIFICATIONS:

Autograde Pavement Profiler (CMI & similar types)

Autograde Pavement Profiler - Recycle Type (CMI & similar types)

Autograde Placer/Trimmer/Spreader Combination (CMI & similar types)

Autograde Slipform Paver (CMI & similar types)

Backhoe (Excavator)

Central Power Plant

Concrete Paving Machine

Cranes, Derricks, Pile Drivers (all types), under 100 tons with a boom (including jib and/or leads) under 100 ft.

Draglines

Drill, Bauer, AMI and similar types

Drillmaster, Quarrymaster

Drillmaster/Quarrymaster (down-the-hole drill), rotary drill, self-propelled hydraulic drill, self-powered drill

Elevator Grader

Field Engineer-Chief of Party

Front End Loader (5 cu. yards or larger)

Gradall

Grader, Rago

Helicoptor Co-Pilot

Helicoptor Communications Engineer

Juntann Pile Driver

Locomotive (large)

Mucking Machine

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
63.22	42.45	105.67

CLASSIFICATIONS:

Pavement & Concrete Breaker (Superhammer & Hoe Ram)

Pile Driver

Prentice Truck

Roadway Surface Grinder

Scooper (loader & shovel)

Shovel (Excavator)

Trackhoe (Excavator)

Tree Chopper with boom

Trenching Machine (cable plow)

Tunnel Boring Machine

Vacuum Truck

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
58.09	42.45	100.54

CLASSIFICATIONS:

Chipper

Compressor (single)

Concrete Spreader (small type)

Conveyor Loader (Except elevator graders)

Engines, Large Diesel (1620 HP) & Staging Pump

Farm Tractor

Fertilizing Equipment (operation & maintenance)

Fine Grade Machine (small type)

Form Line Grader (small type)

Front End Loader (under 1 cubic yard)

Generator (single)

Grease, Gas, Fuel, & Oil Supply Trucks

Heaters (Nelson or other type)

Lights - portable generating light plant

Mixer, Concrete (small)

Mulching Equipment (operation & maintenance)

Power Broom or Sweeper

Pump (diesel engine & hydraulic - regardless of power)

Pump (larger than 2 inch suction, including submersible pumps)

Road Finishing Machine (small type)

Roller - grade, fill, or stone base

Seeding Equipment (operation & maintenance)

Sprinkler & Water Pump Trucks

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
58.09	42.45	100.54

CLASSIFICATIONS:

Steam Generator or Boiler

Stone Spreader

Tamping Machine (vibrating ride-on type)

Temporary Heating Plant (Nelson or other type, including proprane, natural gas, and flow-type units)

Water or Sprinkler Truck

Welding Machine (gas, diesel, or electric convertor, of any type)

Welding System - Multiple (rectifier transformer type)

Wellpoint Systems (including installation by bull gang and maintenance)

Effective Dates:

07/01/2026

Rate	Fringe	Total
65.04	42.45	107.49

CLASSIFICATIONS:

Helicoptor Pilot/Engineer

Effective Dates:

07/01/2026

Rate	Fringe	Total
69.72	42.45	112.17

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) 140 ft. and over

Effective Dates:

07/01/2026

Rate	Fringe	Total
68.72	42.45	111.17

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with boom (including jib and/or leads) from 100 ft. to 139 ft.

OPERATING ENGINEERS **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
65.22	42.45	107.67

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types) , under 100 tons with a boom (including jib and/or leads) 140 ft. and over

Effective Dates:

07/01/2026

Rate	Fringe	Total
67.72	42.45	110.17

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), 100 tons and over and TOWER CRANE with a boom (including jib and/or leads) under 100 ft.

Effective Dates:

07/01/2026

Rate	Fringe	Total
64.22	42.45	106.67

CLASSIFICATIONS:

Cranes, Derricks, Pile Driver (all types), under 100 tons with a boom (including jib and/or leads) from 100 ft. to 139 ft.

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

{For apprentice rates refer to "Operating Engineers" apprentice rates in any county rate package}

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must be established for 5 consecutive workdays.
- Any work started outside of the allowed start time, 6:00 AM to 9:00 AM, except for * tidal work, shall be considered an irregular shift and paid at straight time, plus 15% for the first eight hours, inclusive of benefits.
- * FOR TIDAL WORK- a contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work), providing the eight hour shift is completed between the hours of 5:00 AM and 6:30 PM.
- All time worked in excess of an established shift (an established shift is a shift that is determined at the time of the bid) shall be paid at the applicable overtime rate. When a portion of an established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.
- When working with other trades who receive a higher irregular shift differential , these employees shall also receive the higher differential rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veterans Day.

For projects bid after April 1, 2020, on hazardous waste removal work of any kind, including a state or federally designated site, where the operating engineer is required to wear level A, B, or C personal protection, the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour.
- An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $1.00 per hour.

Effective Dates:

07/01/2026

Rate	Fringe	Total
66.85	42.45	109.30

CLASSIFICATIONS:

Helicopter Co-Pilot & Communications Engineer

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
62.79	42.45	105.24

CLASSIFICATIONS:

A-Frame

Cherry Picker -10 tons or less (Over 10 tons use crane rate)

Hoist (all types Except Chicago-boom)

Jack (screw, air hydraulic, power-operated unit or console type, Except hand jack or pile load test type)

Side Boom

Straddle Carrier

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
60.13	42.45	102.58

CLASSIFICATIONS:

Aerial Platform Used On Hoists

Apprentice Engineer/Oiler with Compressor or Welding Machine

Captain (Power Boats)

Compressor (2 or 3 in battery)

Concrete Cleaning/Decontamination Machine Operator

Conveyor or Tugger Hoist

Directional Boring Machine

Elevator or House Car

Fireman

Forklift

Generator (2 or 3)

Heavy Equipment Robotics, Operator/Technician

Maintenance Utility Man

Master Environmental Maintenance Technician

Tug Master (Power Boats)

Ultra High Pressure Waterjet Cutting Tool System Operator/Maintenance Technician

Vacuum Blasting Machine Operator/Maintenance Technician

Welding Machines, Gas or Electric Converters on any type-2 or 3 in battery including diesels

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
58.60	42.45	101.05

CLASSIFICATIONS:

Compressor (Single)

Generators

Welding Machines, Gas, Diesel, Or Electric Converters of any type-single

Welding System, Multiple (Rectifier Transformer Type)

Effective Dates:

07/01/2026

Rate	Fringe	Total
54.84	42.45	97.29

CLASSIFICATIONS:

Assistant Engineer/Oiler

Drillers Helper

Field Engineer - Transit/Instrument Man

Maintenance Apprentice (Deckhand)

Maintenance Apprentice (Oiler)

Off Road Back Dump

Effective Dates:

07/01/2026

Rate	Fringe	Total
62.41	42.45	104.86

CLASSIFICATIONS:

Lead Engineer, Foreman Engineer, Safety Engineer (Minimum)

Effective Dates:

07/01/2026

Rate	Fringe	Total
51.80	42.45	94.25

CLASSIFICATIONS:

Field Engineer - Rodman or Chainman

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
63.55	42.45	106.00

CLASSIFICATIONS:

Field Engineer-Chief of Party

Vacuum Truck

Effective Dates:

07/01/2026

Rate	Fringe	Total
71.74	42.45	114.19

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms, including jib, 140 ft. and over, above ground). Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), and Pile Drivers (all types) 100 tons and over and Tower Cranes.

Effective Dates:

07/01/2026

Rate	Fringe	Total
70.08	42.45	112.53

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. abovr ground), Derricks (all derricks. land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), 100 tons and over and Tower Crane.

Effective Dates:

07/01/2026

Rate	Fringe	Total
67.24	42.45	109.69

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, 140 ft. and over, above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, 140 ft. and over, above ground), Pile Drivers (all types), under 100 tons.

Effective Dates:

07/01/2026

Rate	Fringe	Total
65.58	42.45	108.03

CLASSIFICATIONS:

Cranes (all cranes, land or floating with booms including jib, less than 140 ft. above ground), Derricks (all derricks, land, floating or Chicago Boom type with booms including jib, less than 140 ft. above ground), Pile Drivers (all types), under 100 tons.

STRUCTURAL STEEL ERECTION **Rates Expiration Date :**

Effective Dates:

07/01/2026

Rate	Fringe	Total
67.24	42.45	109.69

CLASSIFICATIONS:

Helicopter Pilot & Engineer

TEST BORING PRELIMINARY TO CONSTRUCTION-SOUTH/WEST **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Hunterdon, Mercer, Monmouth, Ocean, Salem, Sussex, Warren

The regular workday consists of 8 hours, Monday to Friday, between 6:00 AM and 5:30 PM.

SHIFT DIFFERENTIALS:
- Shift work must be established for 5 consecutive workdays.
- Any work started outside of the allowed start time, 6:00 AM to 9:00 AM, except for * tidal work, shall be considered an irregular shift and paid at straight time, plus 15% for the first eight hours, inclusive of benefits.
- * FOR TIDAL WORK- a contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work), providing the eight hour shift is completed between the hours of 5:00 AM and 6:30 PM.
- All time worked in excess of an established shift (an established shift is a shift that is determined at the time of the bid) shall be paid at the applicable overtime rate. When a portion of an established shift works into Saturday, Sunday or a holiday, that time worked shall be paid at the established shift rate.
- When working with other trades who receive a higher irregular shift differential , these employees shall also receive the higher differential rate.

OVERTIME:
- Hours in excess of 8 per day, or outside of the regular workday, Monday through Friday, that are not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sunday and holidays shall be paid at double the regular rate, inclusive of benefits.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with all hours on Friday paid at time and one-half the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. When all trades on a particular job site agree, the day after Thanksgiving may be substituted for Veterans Day.

For projects bid after April 1, 2020, on hazardous waste removal work of any kind, including a state or federally designated site, where the operating engineer is required to wear level A, B, or C personal protection, the operating engineer shall receive an hourly wage rate of his regular hourly wage plus $5.00 per hour.
- An operating engineer working at a hazardous waste removal project or site at a task requiring hazardous waste related certification, but who is not working in a zone requiring level A, B, or C personal protection, shall receive an hourly wage rate of his regular rate plus $1.00 per hour.

Effective Dates:

07/01/2026

Rate	Fringe	Total
63.22	42.45	105.67

CLASSIFICATIONS:

Driller

Effective Dates:

07/01/2026

Rate	Fringe	Total
56.38	42.45	98.83

CLASSIFICATIONS:

Driller's Helper

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

{For apprentice rates refer to "Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Traffic Control Coordinator: When either of the work classifications found below are working as a Traffic Control Coordinator they are to receive $.75 above their current rate of pay.

Effective Dates:

03/01/2026

Rate	Fringe	Total
69.31	40.63	109.94

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2026

Rate	Fringe	Total
68.94	40.63	109.57

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrician Foreman, Rigging Foreman

FREE AIR TUNNEL JOBS **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
68.31	40.63	108.94

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Cleanup Foreman, Grout Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
71.44	40.63	112.07

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2026

Rate	Fringe	Total
67.63	40.63	108.26

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
67.19	40.63	107.82

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)

Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Manitenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Tod Man)

Effective Dates:

03/01/2026

Rate	Fringe	Total
67.00	40.63	107.63

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man Top or Bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)

Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man, Gravel Man, Form Man)

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
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FREE AIR TUNNEL JOBS **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
66.50	40.63	107.13

CLASSIFICATIONS:

All Others (including Powder Watchman, Change House Attendant, Top Laborer)

DRILL FOR GROUND WATER SUPPLY **Rates Expiration Date :**

The well driller and/or helper may perform all work relative to the construction, finishing, and servicing of wells, pumps and borings for ground water supply. The present methods of well drilling entailing as they do, many diverse job operations calling for drilling, pump discharge, piping, and the operation of various types of related power equipment, shall all be within the job duties and functions of the well driller and/or helper. In the event that an extension of work should occur beyond water well drilling functions, into the field of general construction work, such extension of work would come under the appropriate rates listed elsewhere in this wage determination.

- For Work Hours, Shift Differentials, Overtime Rates, and Recognized Holidays see the "Operating Engineers" section of this wage determination.

Effective Dates:

07/01/2026

Rate	Fringe	Total
61.97	42.45	104.42

CLASSIFICATIONS:

Driller

Effective Dates:

07/01/2026

Rate	Fringe	Total
55.13	42.45	97.58

CLASSIFICATIONS:

Driller's Helper

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date :**

NOTE: These wage rates only apply to dredging and other marine construction activities occurring in navigable waters and their tributaries.
Boat crews carrying explosive material (dynamite, pourfex, and other similar materials) shall be paid at 120% of the hourly wage rate for hours engaged in handling of said materials. Employees required to possess a Hazardous Material Certification as a condition of employment shall be compensated at 120% of the hourly wage rate.
OVERTIME:
Hours in excess of 40 per week, and all hours on Saturdays and Sundays, shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.
RECOGNIZED HOLIDAYS: New Year's Day, Martin Luther King Day, Good Friday, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

	10/01/2025		**10/01/2026**
Rate	Fringe	Total	Total
48.48	15.44	63.92	65.74

CLASSIFICATIONS:

Lead Dredgerman, Operator, Leverman

Licensed Tug Operator with MOTV, Deck Captain

Effective Dates:

	10/01/2025		**10/01/2026**
Rate	Fringe	Total	Total
41.93	14.99	56.92	58.47

CLASSIFICATIONS:

Derrick Operator, Spider/Spill Barge Operator

Engineer, Electrician, Chief Welder, Chief Mate

Fill Placer, Operator II

Licensed Boat Operator

Maintenance Engineer

Effective Dates:

	10/01/2025		**10/01/2026**
Rate	Fringe	Total	Total
39.46	14.81	54.27	55.75

CLASSIFICATIONS:

Certified Welder

OPERATING ENGINEERS MARINE-DREDGING **Rates Expiration Date :**

Effective Dates:

10/01/2025			10/01/2026
Rate	Fringe	Total	Total
38.38	14.74	53.12	54.54

CLASSIFICATIONS:

Mate, Drag Barge Operator, Steward, Assistant Fill Placer

Welder

Effective Dates:

10/01/2025			10/01/2026
Rate	Fringe	Total	Total
37.15	14.65	51.80	53.18

CLASSIFICATIONS:

Boat Operator

Effective Dates:

10/01/2025			10/01/2026
Rate	Fringe	Total	Total
30.86	14.21	45.07	46.22

CLASSIFICATIONS:

Shoreman, Deckhand, Rodman, Scowman

Effective Dates:

10/01/2025			10/01/2026
Rate	Fringe	Total	Total
43.20	15.07	58.27	59.89

CLASSIFICATIONS:

Crane Operator

MICROSURFACING/SLURRY SEAL **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem
IN ALL OTHER COUNTIES use the Heavy and General Laborers - North "Slurry Seal Laborer" rates.

SHIFT DIFFERENTIALS:
Any shift starting at 3:30 PM or later shall receive an additional $0.35/hr

OVERTIME:
Hours in excess of 8 per day or 40 per week shall be paid at time and one-half the hourly rate. All hours on holidays shall be paid at double the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Washington's Birthday, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day.

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.80	29.95	83.75

CLASSIFICATIONS:

Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
51.85	29.95	81.80

CLASSIFICATIONS:

Box man, Hopper, CM Controller

Effective Dates:

03/01/2026

Rate	Fringe	Total
50.15	29.95	80.10

CLASSIFICATIONS:

Microsurface/Slurry Preparation

Effective Dates:

03/01/2026

Rate	Fringe	Total
50.80	29.95	80.75

CLASSIFICATIONS:

Squeegee man

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
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MICROSURFACING/SLURRY SEAL **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
48.70	29.95	78.65

CLASSIFICATIONS:

Cleaner, Taper

ASPHALT LABORERS - SOUTH **Rates Expiration Date :**

"THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY: Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem
{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}
The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.
SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.
OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.
RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.
Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr
FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

Effective Dates:

03/01/2026

Rate	Fringe	Total
56.95	40.63	97.58

CLASSIFICATIONS:

Paving Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.50	40.63	94.13

CLASSIFICATIONS:

Head Raker

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.65	40.63	94.28

CLASSIFICATIONS:

Screedman

ASPHALT LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.10	40.63	93.73

CLASSIFICATIONS:

Tampers, Smoothers, Kettlemen, Painters, Shovelers, Roller Boys

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.20	40.63	93.83

CLASSIFICATIONS:

Milling Controller

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.40	40.63	94.03

CLASSIFICATIONS:

Traffic Control Coordinator

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.35	40.63	93.98

CLASSIFICATIONS:

Raker, Luteman

Effective Dates:

Rate	Fringe	Total

CLASSIFICATIONS:

Certified Paving Foreman

TEST BORING PRELIMINARY TO CONSTRUCTION-NORTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, Union

SHIFT DIFFERENTIAL:
Employees on a shift other than between the hours of 8:00 AM and 5:00 PM shall receive an additional $2.00 per hour.

OVERTIME:
Hours in excess of 8 per day, Monday through Friday, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and holidays shall be paid at double the regular rate.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Hazardous Waste Pay (for Levels A, B, and C): an additional 15% of the hourly rate, per hour.

A newly hired Helper with no experience in the industry shall be paid as follows:
1st year on the job - 70% of Helper wage rate
2nd year on the job - 80% of Helper wage rate
3rd year on the job - 90% of Helper wage rate
All helpers receive full fringe benefit rate.

Effective Dates:

10/21/2025

Rate	Fringe	Total
38.15	36.22	74.37

CLASSIFICATIONS:

Helper (4th year helper)

Effective Dates:

10/21/2025

Rate	Fringe	Total
48.78	36.22	85.00

CLASSIFICATIONS:

Driller

Effective Dates:

10/21/2025

Rate	Fringe	Total
55.61	36.22	91.83

CLASSIFICATIONS:

Foreman

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.
FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Effective Dates:

03/01/2026

Rate	Fringe	Total
52.70	40.63	93.33

CLASSIFICATIONS:

"D" Rate:
basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.40	40.63	94.03

CLASSIFICATIONS:

"C" Rate:
pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; asphalt raker or lute man

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.65	40.63	94.28

CLASSIFICATIONS:

"B" Rate:
concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

Effective Dates:

03/01/2026

Rate	Fringe	Total
57.20	40.63	97.83

CLASSIFICATIONS:

"A" Rate:
blaster

Effective Dates:

03/01/2026

Rate	Fringe	Total
56.95	40.63	97.58

CLASSIFICATIONS:

"FOREMAN" Rate:
labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
57.95	40.63	98.58

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

Effective Dates:

03/01/2026

Rate	Fringe	Total
54.15	40.63	94.78

CLASSIFICATIONS:

TRAFFIC CONTROL COORDINATOR Rate

HEAVY & GENERAL LABORERS - NORTH **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
59.45	40.63	100.08

CLASSIFICATIONS:

" CERTIFIED FOREMAN Rate" :

Effective Dates:

03/01/2026

Rate	Fringe	Total
60.45	40.63	101.08

CLASSIFICATIONS:

" CERTIFIED GENERAL FOREMAN Rate" :

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, Salem

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.

FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Effective Dates:

03/01/2026

Rate	Fringe	Total
52.70	40.63	93.33

CLASSIFICATIONS:

"D" Rate:
basic, landscape, asphalt, slurry seal, or railroad track laborer; utility meter installer; flagman; salamander tender; pitman; dumpman; rakers or tampers on cold patch work; wrappers or coaters of pipe; waterproofer; timberman; wagon drill or drill master helper; powder carrier; magazine tender; signal man; power buggy operator; tree cutter; operator of basic power tools

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.40	40.63	94.03

CLASSIFICATIONS:

"C" Rate:
pipe layer; laser man; conduit or duct line layer; operator of jack hammer, chipping hammer, pavement breaker, concrete cutter, asphalt cutter, sheet hammer, or walk-behind saw cutter; sandblaster; acetylene cutting or burning; wagon drill, directional drill, or hydraulic drill operator; drill master; core driller; asphalt raker or lute man

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
57.20	40.63	97.83

CLASSIFICATIONS:

"A" Rate:
blaster

Effective Dates:

03/01/2026

Rate	Fringe	Total
56.95	40.63	97.58

CLASSIFICATIONS:

"FOREMAN" Rate:
labor foreman, asphalt foreman, drill foreman, pipe foreman, grade foreman, finisher foreman, concrete foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
57.95	40.63	98.58

CLASSIFICATIONS:

"GENERAL FOREMAN" Rate

Effective Dates:

03/01/2026

Rate	Fringe	Total
54.15	40.63	94.78

CLASSIFICATIONS:

TRAFFIC CONTROL COORDINATOR Rate

Effective Dates:

03/01/2026

Rate	Fringe	Total
60.45	40.63	101.08

CLASSIFICATIONS:

" CERTIFIED GENERAL FOREMAN Rate" :

HEAVY & GENERAL LABORERS - SOUTH **Rates Expiration Date :**

Effective Dates:

03/03/2026

Rate	Fringe	Total
59.45	40.63	100.08

CLASSIFICATIONS:

" CERTIFIED FOREMAN Rate" :

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.65	40.63	94.28

CLASSIFICATIONS:

"B" Rate:
concrete finisher; setter of brick or stone pavers; stone cutter; form setter; manhole, catch basin, or inlet builder; asphalt screedman; rammer; hardscaping; gunite nozzle man

PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date :**

These rates apply to the following: welding on Transportation Mainline pipe lines (cross-country pipe lines, or any segments thereof, transporting coal, gas, oil, water or other transportable materials, vapors or liquids, including portions of such pipe lines within private property boundaries up to the final metering station or connection - the point where a valve, consumer connection, or town border station divides mainline transmission lines or higher pressure lateral and branch lines from lower pressure distribution systems).

PER DIEM PAYMENT:
In addition to the total wage rate paid for each craft, the following per diem (per day) amounts must also be paid - Pipeline Journeyman: $80.50; Pipeline Journeyman Welder: $140.50; and Pipeline Helper: $64.50. Note: in order to receive the per diem payment an employee must work a minimum of 8 hours in a 24 hour period.

NOTES:
- Journeymen employed as "stringer bead" welders and journeymen who are regularly employed as "hot-pass" welders shall receive $1.00 per hour more than other journeymen.
- Welders running "stringer bead" or "hot-pass" on "cutouts" or "tie-ins" on a production basis shall be paid $1.00 per hour above the journeymen rate.
- Whenever a welder helper is employed using a power buffer or power grinder immediately behind the stringer bead and /or hot-pass welders, and the pipe gang is set on a production basis, the helper shall be paid $2.00 per hour above the helper rate.
- If back welding is performed inside a pipe under either or both of the following conditions, the welder engaged in the welding will receive $3.00 per hour above the regular rate for the job only for the days on which such back welding is performed:
  - The employer elects, as a regular procedure, to back weld each line-up. This condition is not intended to apply to occasional back welding performed by the pipe gang to repair a bead, to rectify a "high-lo" condition or wall thickness, etc.
  - A welder is required to back weld a completed weld behind the firing line.
- If the welder helper is required to go inside the pipe for the purpose of brushing, buffing and grinding the weld, they shall receive a wage rate $1.00 per hour above the regular helper rate for the days involved.
- Welders working on "hot work" shall be paid $2.00 per hour above the regular rate for each day engaged in such work. "Hot work' is defined as work on lines in service where there is the danger of fire or explosion.

The regular workday shall be 8 hours, between 8:00 AM and 4:30 PM.

OVERTIME:
Hours in excess of 8 per day, and all hours on Sundays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

06/04/2026

Rate	Fringe	Total
60.89	39.95	100.84

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

06/04/2026

Rate	Fringe	Total
60.89	39.95	100.84

CLASSIFICATIONS:

Pipeline Journeyman

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PIPELINE - MAINLINE TRANSMISSION **Rates Expiration Date :**

Effective Dates:

06/04/2026

Rate	Fringe	Total
37.59	28.07	65.66

CLASSIFICATIONS:

Pipeline Helper

PIPELINE - GAS DISTRIBUTION **Rates Expiration Date :**

These rates apply to the following: welding on gas line distribution systems (that portion of the gas distribution system placed in streets, roads, subways, tunnels, viaducts, highways and easements which serves the users of gas).

SHIFT DIFFERENTIALS:
An "irregular" shift may start any time from 5:00 PM to 12:00 AM, Monday through Friday, and shall receive an additional 15% of the regular rate per hour, inclusive of benefits.

OVERTIME:
Hours in excess of forty per week, and all hours on Saturdays shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the regular rate, inclusive of benefits.

RECOGNIZED HOLIDAYS: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day, and Christmas Day. Sunday holidays observed the following Monday.

Effective Dates:

11/05/2025

Rate	Fringe	Total
66.32	36.10	102.42

CLASSIFICATIONS:

Pipeline Journeyman Welder

Effective Dates:

11/05/2025

Rate	Fringe	Total
66.32	36.10	102.42

CLASSIFICATIONS:

Pipeline Journeyman

Effective Dates:

11/05/2025

Rate	Fringe	Total
43.28	25.22	68.50

CLASSIFICATIONS:

Pipeline Helper

ASPHALT LABORERS- NORTH **Rates Expiration Date :**

THESE RATES APPLY IN THE FOLLOWING COUNTIES ONLY:
Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, Warren
{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}
The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.
SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.
OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.
RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.
Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr
FOR TIDE WORK (pertains to tidal water): A contractor can start their job according to tide schedules (tide schedules are the various high and low tides related to this work) providing the eight (8) hour shift is completed between the hours of 5:00 AM and 6:30 PM.

Effective Dates:

03/01/2026

Rate	Fringe	Total
56.95	40.63	97.58

CLASSIFICATIONS:

Asphalt Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.65	40.63	94.28

CLASSIFICATIONS:

Asphalt Screedman

Effective Dates:

03/01/2026

Rate	Fringe	Total
53.40	40.63	94.03

CLASSIFICATIONS:

Asphalt Raker or Lute Man

ASPHALT LABORERS- NORTH **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
52.70	40.63	93.33

CLASSIFICATIONS:

Asphalt Laborer

Effective Dates:

03/01/2026

Rate	Fringe	Total
59.45	40.63	100.08

CLASSIFICATIONS:

Certified Asphalt Foreman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Electrician-Utility Work (North)
(For apprentice rates refer to Electrician-Utility Work (North) in any county rate package).
These rates apply to work contracted for by the following utility companies:
Public Service Electric & Gas Co. of NJ, First Energy, Borough of Madison Electric Department, Sussex Rural Electric Cooperative, Rockland Utilities, and Butler Municipal Electric Co.
These rates do not apply to work on substations or switching stations.
For Utility work contracted for by a utility company other than those listed above or those listed under "Electrician-Utility Work (South), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 6:00 AM and 6:00 PM.
FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)-all hours of work shall be paid at double the hourly rate.
SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
2nd shift (between the hours of 4:30 PM and 1:00 AM): 8 hours of work + 17.3% of the regular rate, inclusive of benefits.
3rd shift (between the hours of 12:30 AM and 9:00 AM): 8 hours of work + 31.4% of the regular rate per hour, inclusive of benefits.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular wokday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate, inclusive of benefits. All hours on Sundays and holidays shall be paid at double the hourly rate, inclusive of benefits.
Four 10-hour days may worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday.

RECOGNIZED HOLIDAYS:
New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day and Christmas Day, or day on which they are legally observed.

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
69.55	48.68	118.23	122.97	127.89	132.99

CLASSIFICATIONS:

Chief Lineman

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
63.23	44.26	107.49	111.79	116.26	120.90

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
63.23	44.26	107.49	111.79	116.26	120.90

CLASSIFICATIONS:

Special License Operator

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
66.39	46.47	112.86	117.38	122.07	126.95

CLASSIFICATIONS:

Journeyman Lineman when welding, splicing, hot stick, barehand and helicopter work

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
60.70	42.49	103.19	107.32	111.60	116.07

CLASSIFICATIONS:

Line Equipment Operator

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
47.42	33.19	80.61	83.84	87.19	90.67

CLASSIFICATIONS:

Groundman

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
80.93	56.65	137.58	143.08	148.81	154.75

CLASSIFICATIONS:

General Foreman

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
74.61	52.22	126.83	131.92	137.19	142.66

CLASSIFICATIONS:

Assistant General Foreman

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
72.71	50.89	123.60	128.55	133.70	139.04

CLASSIFICATIONS:

Line Foreman

ELECTRICIAN- UTILITY WORK (NORTH) **Rates Expiration Date :**

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
50.58	35.40	85.98	89.43	93.00	96.73

CLASSIFICATIONS:

GTO (Groundman Truck Operator) with CDL A

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
47.42	33.19	80.61	83.84	87.19	90.67

CLASSIFICATIONS:

First Responder

Effective Dates:

12/04/2025			11/29/2026	11/28/2027	12/03/2028
Rate	Fringe	Total	Total	Total	Total
50.58	35.40	85.98	89.43	93.00	96.73

CLASSIFICATIONS:

Line Equipment Mechanic

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Electrician-Utility Work (South)
(For apprentice rates refer to Electrician-Utility Work (South) in any county rate package).
These rates apply to work contracted for by the following utility company:
Atlantic City Electric.
These rates do not apply to work on substations or switching stations.
For utility work contracted for by a utility company other than the one listed above or those listed under "Electrician-Utility Work (North), see the "Outside Commercial Rates" for the county in which the jobsite is located.

* FOR OUTSIDE COMMERCIAL RATES PLEASE SEE COUNTY RATES

The regular workday is 8 hours, between 7:00 AM and 4:30 PM.
FOR EMERGENCY WORK ONLY: (emergency work is defined as work caused by storm, catastrophe, act of god, and circumstances beyond the control of the employer)- all hours of work shall be paid at double the hourly rate.
SHIFT DIFFERENTIALS:
Shift work must run for a minimum of 5 consecutive workdays.
When two (2) or three (3) shifts are worked the following shall apply:
1st shift (between the hours of 8:00 AM and 4:30 PM)
2nd shift (between the hours of 4:30 PM and 12:30 AM): 8 hours of work + 10% of the regular rate of pay for 7.5 hours worked.

3rd shift (between the hours of 12:30 AM and 8:00 AM): 8 hours of work + 15% of the regular rate of pay for 7 hours worked.

OVERTIME:
Hours in excess of 8 per day, or before or after the regular wokday Monday through Friday, that is not shift work, and all hours on Saturday shall be paid at time and one-half the regular rate. All hours on Sundays and Holidays shall be paid double the hourly rate.

Four 10-hour days may be worked, at straight time, between 6:00 AM and 6:00 PM, Monday through Thursday with Friday used as a make-up day.

RECOGNIZED HOLIDAYS:
New Year's Day, Memorial Day, July 4th, Labor Day, Veterans' Day, Thanksgiving Day and Christmas Day or on days celebrated.

WORKING RULES:
There shall be a Foreman in charge of each work crew. No crews are to exceed twelve (12) men, including Foremen.

There shall be a General Foreman designated for transmission work when three (3) or more crews are on the same job and for distribution work where there are are more than twenty (20) employees on site.

A small job crew shall consist of five (5) or less employees, one (1) of the Journeyman Linemen in the crew shall be designated as a Small Job Foreman.
Work performed from ladders and/or mechanical lift equipment shall be the work of Linemen and/or Apprentices.
On new construction, fitting and framing poles, towers or structures may be done by Journeymen and/or Apprentices.
Groundmen may assist, but may not perform any work which would be performed by Linemen if assembled in the air.

There shall be a Journeyman Lineman in each pole setting, erection, grounding, wire and cable-pulling crew of more than three (3) men.

Effective Dates:

12/02/2025

Rate	Fringe	Total
73.79	62.52	136.31

CLASSIFICATIONS:

General Foreman

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/02/2025

Rate	Fringe	Total
65.72	57.24	122.96

CLASSIFICATIONS:

Foreman

Effective Dates:

12/02/2025

Rate	Fringe	Total
62.26	55.01	117.27

CLASSIFICATIONS:

Small Job Foreman

Effective Dates:

12/02/2025

Rate	Fringe	Total
57.65	51.98	109.63

CLASSIFICATIONS:

Heavy Equipment Operator

Effective Dates:

12/02/2025

Rate	Fringe	Total
60.53	53.85	114.38

CLASSIFICATIONS:

Cable Splicer

Effective Dates:

12/02/2025

Rate	Fringe	Total
57.65	51.98	109.63

CLASSIFICATIONS:

Journeyman Lineman

Effective Dates:

12/02/2025

Rate	Fringe	Total
60.53	53.85	114.38

CLASSIFICATIONS:

Journeyman Welder

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/02/2025

Rate	Fringe	Total
57.65	51.98	109.63

CLASSIFICATIONS:

Journeyman Painter

Effective Dates:

12/02/2025

Rate	Fringe	Total
46.12	44.49	90.61

CLASSIFICATIONS:

Light Equipment Operator

Effective Dates:

12/02/2025

Rate	Fringe	Total
40.36	40.72	81.08

CLASSIFICATIONS:

Groundman Truck Driver

Effective Dates:

12/02/2025

Rate	Fringe	Total
37.47	38.85	76.32

CLASSIFICATIONS:

Groundman 3rd Year

Effective Dates:

12/02/2025

Rate	Fringe	Total
34.59	36.96	71.55

CLASSIFICATIONS:

Groundman 2nd Year

Effective Dates:

12/02/2025

Rate	Fringe	Total
31.71	35.09	66.80

CLASSIFICATIONS:

Groundman 1st Year

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

ELECTRICIAN- UTILITY WORK (SOUTH) **Rates Expiration Date :**

Effective Dates:

12/02/2025

Rate	Fringe	Total
25.37	30.96	56.33

CLASSIFICATIONS:

Flagman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

THESE RATES APPLY TO CONSTRUCTION ON NEW TRANS HUDSON TUNNELS ONLY

{For apprentice rates refer to "Laborer - Heavy & General" apprentice rates in any county rate package}

The regular workday consists of 8 hours, starting at 7:00 AM or 8:00 AM.

SHIFT DIFFERENTIALS:
- Shifts must start at 3:00 PM, 4:00 PM, 12:00 AM, or 1:00 AM, to be considered shift work, except when the project owner mandates special hours of work in the job specifications, in which case those hours may be considered shift work.
- When such hours are mandated by the project owner, a shift that begins before midnight on Friday and ends on Saturday morning, or that begins at or after 8:00 PM on Sunday and ends on Monday morning may be paid at the shift differential rate.
- Shifts shall receive an additional $3.00 per hour.

OVERTIME:
- Hours in excess of 8 per day, Monday through Friday, or outside of the regular workday that are not shift work, and all hours on Saturdays, shall be paid at time and one-half the hourly rate. All hours on Sundays and holidays shall be paid at double the hourly rate.
- Four 10-hour days may be worked, Monday through Thursday, at straight time, with Friday used as a make-up day for a day lost to inclement weather. If Friday is not a make-up day, all hours on Friday shall be paid at time and one-half the hourly rate.

RECOGNIZED HOLIDAYS: New Year's Day, Presidents' Day, Memorial Day, July 4th, Labor Day, Presidential Election Day, Veterans' Day, Thanksgiving Day, Christmas Day. Sunday holidays observed the following Monday. Veterans Day may be substituted for the day after Thanksgiving. However, in the trading of Veterans Day for the day after Thanksgiving, if overtime is worked on Veterans Day, it shall be paid at double the hourly rate.

Hazardous Waste Work:
-where Level A, B, or C protection is required: + $5.00/hr
-other Hazardous Waste site: + $1.00/hr

Traffic Control Coordinator: When either of the work classifications found below are working as a Traffic Control Coordinator they are to receive $.75 above their current rate of pay.

Effective Dates:

03/01/2026

Rate	Fringe	Total
83.18	40.63	123.81

CLASSIFICATIONS:

Walking Boss & Superintendent

Effective Dates:

03/01/2026

Rate	Fringe	Total
82.73	40.63	123.36

CLASSIFICATIONS:

Heading Foreman, Shaft Foreman, Rod Foreman, Electrical Foreman, Rigging Foreman

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
81.98	40.63	122.61

CLASSIFICATIONS:

Iron Foreman, Caulking Foreman, Form Foreman, Cement Finishing Foreman, Concrete Foreman, Track Foreman, Clean-up Foreman, Grout Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
85.73	40.63	126.36

CLASSIFICATIONS:

Blaster

Effective Dates:

03/01/2026

Rate	Fringe	Total
81.15	40.63	121.78

CLASSIFICATIONS:

Top Labor Foreman

Effective Dates:

03/01/2026

Rate	Fringe	Total
80.63	40.63	121.26

CLASSIFICATIONS:

Skilled Men (including Caulker, Powder Carrier, all other skilled men)
Skilled Men (including Miner, Drill Runner, Iron Man, Conveyor Man, Maintenance Man, Safety Miner, Rigger, Block Layer, Cement Finisher, Rod Man)

Effective Dates:

03/01/2026

Rate	Fringe	Total
80.40	40.63	121.03

CLASSIFICATIONS:

Semi-Skilled Men (including Bell or Signal Man top or bottom, Form Worker & Mover, Concrete Worker, Shaft Man, Tunnel Laborer, Caulker's Helper, all other semi-skilled)
Semi-Skilled Men (including Miner's Helper, Chuck Tender, Track Man, Nipper, Brake Man, Derail Man, Cable Man, Hose Man,
Gravel Man, Form Man)

NEW JERSEY DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
PREVAILING WAGE RATE DETERMINATION

HEAVY & GENERAL LABORERS- NEW TRANS HUDSON TUNNELS **Rates Expiration Date :**

Effective Dates:

03/01/2026

Rate	Fringe	Total
79.80	40.63	120.43

CLASSIFICATIONS:

All others (including Powder Watchman, Change House Attendant, Top Laborer, Job Steward)

SECTION 011000 - SUMMARY

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Phased construction.
   4. Access to site
   5. Owner-furnished/Contractor-installed (OFCI) products.
   6. Contractor's use of site and premises.
   7. Coordination with occupants.
   8. Work restrictions.
   9. Specification and Drawing conventions.

B. Related Requirements:
   1. Section 015000 - Temporary Facilities and Controls for limitations and procedures governing temporary use of Owner's facilities.
   2. Section 017300 - Execution for coordination of Owner-installed products.

1.03 PROJECT INFORMATION

A. Project Identification: RENOVATIONSBuilding E Renovations
   1. Project Location: 5100 Black Horse Pike,Project Location Address 2Mays LandingNew Jersey, 08330

B. Owner: Atlantic Cape Community College
   1. Owner's Representative: Owners Rep's Name

C. Architect: Spiezle Architectural Group, Inc.
   1. Architect's Representative:

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:
   1. MEP Engineer: Spiezle Architectural Group
      a. Representative: Jeff Jennings

1.04 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
   1. Building E Renovations and other Work indicated in the Contract Documents.

B. Type of Contract:
   1. Project will be constructed under a single prime contract.

1.05 PHASED CONSTRUCTION

A. The Work shall be conducted in multiple phases, with each phase commencing and substantially complete on the dates as indicated on the Phasing Drawing(s).
   1. The remaining Work shall be substantially complete with a Certificate of Occupancy at time of Substantial Completion.

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

C. Project Substantial Completion: Work will commence within ten (10) calendar days after receipt of written "Notice to Proceed" and be substantially completed in accordance with the Contract Documents and Contractor’s Construction Schedule for substantial completion of the entire project including a Certificate of Occupancy for the entire building by mm-dd-yyyy.
   1. All time limits stated in the Contract are of the essence.

1.06 ACCESS TO SITE

A. Use of Site: Limit use of Project site to work in areas indicated and coordinated with Owner during summer use. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Limits: Confine construction operations to area(s) as indicated on the drawings or established by approval from the Owner so as not to interfere with facility hours of operations.
   2. Owner Occupancy: Allow for Owner occupancy of the Project site and use by the public.
   3. Driveways, Walkways and Entrances: Keep driveways, parking garages, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
      c. Contractor is not permitted to use any parking spaces designated for Owner’s staff or visitors. Contractor shall review available on-site parking locations prior to submitting his bid.

B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Maintain heating, ventilation and air conditioning levels in Owner occupied areas of the building throughout the construction period. Repair damage caused by construction operations.

C. The Contractor shall comply with the Owner’s Site Security Programs as administered by the Owner including Contractor badging. Each employee of the Contractor will be supplied a badge by the Owner, which will be distributed to them by the Owner. Each employee must have a State issued picture ID in order to be assigned a badge. This badge must be worn at all times while on the construction site. No Contractor will be allowed access to the existing building without a badge and prior approval from the Owner. The Contractor may be fined $250.00 per occurrence for any worker who does not have a proper badge and identification.

1.07 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI) PRODUCTS

A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
   1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
   2. Provide for delivery of Owner-furnished products to Project site.
   3. Upon delivery, inspect, with Contractor present, delivered items.
      a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
   4. Obtain manufacturer's inspections, service, and warranties.
   5. Inform Contractor of earliest available delivery date for Owner-furnished products.

B. Contractor's Responsibilities: The Work includes the following, as applicable:
   1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
   2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
   3. Receive, unload, handle, store, protect, and install Owner-furnished products.
   4. Make building services connections for Owner-furnished products.
   5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
   6. Repair or replace Owner-furnished products damaged following receipt.

C. Owner-Furnished/Contractor-Installed (OFCI) Products:
   1. As indicated on the drawings.

1.08 CONTRACTOR'S USE OF SITE AND PREMISES

A. Restricted Use of Site: Each Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
   1. Prior to commencing work on site, the Contractor shall meet with the Architect or Owner's Designee to review work to be completed, determine its impact on occupied areas and adjacent properties, etc. to distribute necessary guidelines.
   2. Designated areas will be established, as necessary, for parking, toilet facilities, special trailers and deliveries, etc.
   3. The Contractor and its Employees and its subcontractors are authorized to be on grounds only during the performance of work related to the project.

4. Obey speed limits as posted, or if not posted, not to exceed 10 mph on grounds. Yield to all pedestrian traffic. Do not blow horn unless necessary. Not all persons on site can be expected to possess good pedestrian skills.
5. Vehicles and operating equipment shall be turned off, locked and secure whenever not in use. All tools and equipment, not removed from the site on a daily basis, shall be secured and kept in the work staging area at the end of the workday. The Owner will not assume responsibility for any missing articles.
6. Do not fraternize with Owner's employees or building occupants while working on site.
7. Facility occupants and employees are not allowed in work areas. Active work areas shall always be secured and/or enclosed to prevent occupants and employees from wandering inside.
8. Safety shall always be maintained by the Contractor at the job site .
9. Possession and/or consumption of alcoholic beverages or drugs are always strictly prohibited on site .
10. Contractor and its personnel are required to report in and out on a daily basis at a location designated by the Owner and may be required to sign in and out in a visitor's log book in the presence of the Owner's staff person of responsible charge. The Owner will notify its respective building supervisors and any affected departments when the Contractor and its personnel will be working in any occupied area of the building.

B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Limits on Use of Site: Confine construction operations to work in areas indicated or established by approval from the Owner so as not to interfere with facility hours of operations.
   2. Owner Occupancy: Allow for Owner occupancy of the Project site and use by the public.
   3. Driveways, Walkways and Entrances: Keep driveways, parking garage, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
      c. Contractor is not permitted to use any parking spaces designated for Owner's staff or visitors. Contractor shall review available on-site parking locations prior to submitting his bid.
      d. Schedule deliveries to minimize use of driveways and entrances and to avoid morning and afternoon busing periods.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Unless otherwise noted, maintain heating, ventilation and air conditioning levels in Owner occupied areas of the building throughout the construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.09 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy Project site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
   2. Notify Owner not less than three (3) calendar days in advance of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
   1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
   2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
   3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
   4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.
   5. The occupancy of any portion of the Project does not constitute an acceptance of any work as the Project will be accepted as a whole and not in units. Prior to such occupancy, however, the Architect, Owner’s Representative, and the Contractor shall fully inspect the portions of the Project to be occupied, preparing a complete list of omissions of materials, faulty workmanship, or any items to be repaired or replaced. The Owner will assume responsibility for damage to premises so occupied of any items not on this list when such damage is due to greater than normal wear and tear but does not assume responsibility for improper or defective workmanship or materials.

1.10 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
   1. Notify Owner not less than three (3) calendar days in advance of proposed utility interruptions.
   2. Obtain Owner's written permission before proceeding with utility interruptions.

C. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
   1. Notify Owner not less than three (3) calendar days in advance of proposed disruptive operations.
   2. Obtain Owner's written permission before proceeding with disruptive operations.

D. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances within the existing building and on Project site is not permitted.

E. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

F. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
   1. Maintain list of approved screened personnel with Owner's representative.

G. Changing of clothing in public spaces, including but not limited to the project area, corridors, parking lots, and other spaces where students might be present, is not permitted.

1.11 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
   1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
   2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
   3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. **Unless otherwise indicated, linked information is not part of the Contract Documents**.
   4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
   1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
   2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.

3. Keynoting: Materials and products in the drawings may be identified by reference keynotes.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012100 - ALLOWANCES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.
   1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:
   1. Lump Sum allowances.
   2. Unit-cost allowances.
   3. Quantity allowances.

C. Related Requirements:
   1. Section 012600 - Contract Modification Procedures for procedures for submitting and handling Change Orders.
   2. Section 014000 - Quality Requirements for procedures governing the use of allowances for field testing by an independent testing agency.

1.03 DEFINITIONS

A. Allowance: A quantity of work or dollar amount included in the Base Bid of the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.04 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier or approved equal.

1.05 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.06 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.07 LUMP SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials according to Owner's/Architect’s written instructions and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.08 UNIT-COST ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.09 QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
   1. Coordinate quantity allowance adjustment with corresponding unit-price requirements in Section 012200 "Unit Prices."

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
   1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.10 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

C. Costs of testing and inspection services not specifically required by the Contract Documents are Contractor responsibilities and are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.11 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
   1. Include installation costs in purchase amount only where indicated as part of the allowance.
   2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
   3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
   4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
   1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has

changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 SCHEDULE OF ALLOWANCES

A. **Lump Sum Allowance No. AL-01**: Lump Sum Allowance: Include a Lump Sum allowance of $100,000.00 for use according to Owner's/Architect’s written instructions.

END OF SECTION 012100

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
   1. Section 012100 - Allowances for products selected under an allowance.
   2. Section 016000 - Product Requirements for requirements for submitting comparable product submittals for products by listed manufacturers.

1.03 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
   1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1.04 ACTION SUBMITTALS

A. Equivalent or Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Equivalent or Substitution Request Form: Use form provided in Project Manual.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product, fabrication, or installation method cannot be provided, if applicable.
      b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
      c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
   a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.05 QUALITY ASSURANCE

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

1.06 PROCEDURES

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

1.07 SUBSTITUTIONS

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

B. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
    1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
        a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
        b. Requested substitution does not require extensive revisions to the Contract Documents.
        c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
        d. Substitution request is fully documented and properly submitted.
        e. Requested substitution will not adversely affect Contractor's construction schedule.
        f. Requested substitution has received necessary approvals of authorities having jurisdiction.
        g. Requested substitution is compatible with other portions of the Work.
        h. Requested substitution has been coordinated with other portions of the Work.
        i. Requested substitution provides specified warranty.
        j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:
   1. Section 012500 - Substitution Procedures for administrative procedures for handling requests for substitutions made after the Contract award.
   2. Section 013100 - Project Management and Coordination for requirements for forms for contract modifications provided as part of web-based Project management software.

1.03 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.04 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
   2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change.
      d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration,

start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
   2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
   3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   4. Include costs of labor and supervision directly attributable to the change.
   5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
   6. Comply with requirements in Section 012100 - Allowances if the proposed change requires substitution of one product or system for product or system specified.
   7. Proposal Request Form: Use form acceptable to Architect.

1.05 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Section 012100 - Allowances for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.06 CHANGE ORDER PROCEDURES

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

1.07 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
   1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:
   1. Section 012100 - Allowances for procedural requirements governing the handling and processing of allowances.
   2. Section 012600 - Contract Modification Procedures for administrative procedures for handling changes to the Contract.
   3. Section 013200 - Construction Progress Documentation for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.03 DEFINITIONS

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

1.04 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
   1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
   2. Submit the schedule of values to Architect at earliest possible date, but no later than (15) fifteen days of the written Notice to Proceed and no later than (7) seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one-line item for each Specification Section.
   1. Identification: Include the following Project identification on the schedule of values:
      a. Project name and location.
      b. Owner's name.

c. Name of Architect.
d. Architect's Project number.
e. Contractor's name and address.
f. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document AIA G703: Continuation Sheets.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five (5) percent of the Contract Sum.
4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site.
5. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
6. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
7. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling two (2) percent of the Contract Sum and subcontract amount.
8. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.05 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.

B. Payment Application Times: The date for each progress payment is indicated in the Supplementary Conditions. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Submit Application for Payment to Architect by the first day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month .
   1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

D. Application for Payment Forms: Use AIA Document AIA G702 and AIA Document AIA G703 as form for Applications for Payment.

E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.

2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:
   a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
   b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
   c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

G. Transmittal: After approval of pencil copy of Application for Payment, submit (3) three signed and notarized original copies of each Application for Payment to the Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien form AIA G706 and AIA G706A and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
5. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

I. Certified payroll records for the applicable period submitted directly to Owner.

J. Form AA-201: Initial Project Workforce Reports.

K. Form AA-202: Monthly Project Workforce Reports.

L. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Schedule of unit prices.
6. Submittal schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.

M. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
      a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 017700 - Closeout Procedures.
   2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

N. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Certification of completion of final punch list items.
   3. Insurance certificates for products and completed operations where required and proof that taxes (unless tax exempt), fees, and similar obligations were paid.
   4. Updated final statement, accounting for final changes to the Contract Sum.
   5. AIA Document AIA G706: ‘Contractor's Affidavit of Payment of Debts and Claims’.
   6. AIA Document AIA G706A: ‘Contractor's Affidavit of Release of Liens.
   7. AIA Document AIA G707: ‘Consent of Surety to Final Payment’.
   8. Evidence that claims have been settled.
   9. Maintenance Bond.
   10. Contractor’s ‘As-Built’ documents in PDF file format, unless otherwise agreed upon in writing by Architect.
   11. Operations and Maintenance Manuals.
   12. Proof of ‘attic stock’ or ‘extra materials’ received by the Owner.
   13. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
   14. Final liquidated damages settlement statement.
   15. Proof that taxes (unless tax exempt), fees, and similar obligations are paid.
   16. Waivers and releases.

17. Written Guarantee of 2-years.
18. Completed Punchlist signed and notarized by the Contractor's authorized representative.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
   1. General coordination procedures.
   2. Coordination drawings.
   3. RFIs.
   4. Digital project management procedures.
   5. Web-based Project management software package.
   6. Project meetings.

B. The contractor and its subcontractors shall participate in coordination requirements as described herein.

C. Related Requirements:
   1. Section 013200 - Construction Progress Documentation for preparing and submitting Contractor's construction schedule.
   2. Section 017300 - Execution for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. Section 017700 - Closeout Procedures for coordinating closeout of the Contract.

1.03 DEFINITIONS

A. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.04 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
   1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
   3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within (15) days of issuance of the Notice to Proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
    1. Post copies of list in Project meeting room. Keep list current at all times.

1.05 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation. The Contractor shall be responsible for being the supervisor, manager, overseer, coordinator and expediter of its Subcontractors. The Contractor shall have included in its bid a sufficient cost amount to furnish such administrative and supervisory duties.
    1. The Lump Sum Single Prime Contractor “The Contractor” is the sole responsible party for the coordination of the entire project.
    2. The Contractor shall be responsible to coordinate and expedite the total construction process and all of its parts. The Owner relies upon the organization, management, skill, cooperation and efficiency of the Contractor to supervise, direct, control and manage the work and to coordinate and expedite the efforts of the other prime contractors and subcontractors so as to deliver the work conforming to the contract within the scheduled time. The Contractor is responsible for proper sequence and coordination. It shall determine the location of work and resolve conflicts amongst Contractors.
    3. The Contractor shall provide a qualified full-time staff member or members to manage the project on site. This CONSTRUCTION SUPERINTENDENT shall coordinate, organize, and manage the project from the contractor’s on site field office and oversee their own work and the work of their sub-contractors. Should the prime contractor be responsible for multiple projects at different sites, or multiple locations on one large site, then the contractor shall provide a separate qualified superintendent for each of the projects or locations. This determination shall be made by and subject to the approval of the Owner, Construction Manager, and Architect who at all times may require additional manpower. The superintendent shall be responsible for onsite safety, quality assurance, conformance with the Contract Documents and perform coordination with all on site construction personnel and/or subcontractors. The Construction superintendent shall be subject to the approval of the Owner, Construction Manager, and Architect who at all times have the right to require the contractor to replace this Construction superintendent if they fail to perform.
    4. The Contractor’s Project Manager shall coordinate, organize, and manage the project from the contractor’s main office and oversee the shop drawing process signing off for quality assurance and conformance with the Contract Documents on each shop drawing. The project manager shall be subject to the approval of the Owner, Construction Manager, and Architect who at all times have the right to require the contractor to replace this project manager if they fail to perform.
    5. The other subcontractor’s shall also have a designated superintendent and/or foreman who will at all times be subject to the approval of the Owner,

Construction Manager, and Architect. The Owner, Construction Manager, and Architect reserves the right to require the Contractor to replace the superintendent and/or foreman if, in the opinion of the Owner, Construction Manager, and Architect, the superintendent and/or foreman is not performing satisfactorily.

6. Each subcontractor shall coordinate his activities with the activities of other contractors.
7. The Contractor is required to submit a site logistics plan coordinating all Owner functions with the access and safety of the job site.
8. The Contractor is required to coordinate all the inspection and material testing to meet the contract documents specifications.
9. The Contractor has full and sole responsibility for construction methods and implementation of a "quality control system" to insure coordination.
10. The Contractor is responsible for field verification of all dimensions/measurements for the coordination of materials and trades. Check field dimensions, clearances, relationships to available space, and anchors.
11. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
12. The Contractor shall make all necessary arrangements to conduct work so that all parts shall be carried on harmoniously and simultaneously or sequentially, so as components or increments of the same shall not interfere or retard the progress of others.
13. The Contractor shall coordinate the delivery, unloading, movement, relocation, storage and protection of all materials.
14. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
15. Minor changes in locations of equipment, parts, etc. due to field conditions shall be made, if so directed, at no additional cost.
16. The Contractor shall examine the drawings and dimensions and is responsible for satisfactory joining and fitting of all parts of the work.
17. Make adequate provisions to accommodate items scheduled for later installation.
18. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
19. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities, scheduled activities of other contractors, and direction of Project Coordinator to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.

2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.06 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
      b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
      c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
      e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
      f. Indicate required installation sequences.
      g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
      h. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Coordination drawings shall be prepared in a joint effort by the Contractor and its Subcontractors to avoid material and equipment installation interference as well as project delays. The coordination drawings will clearly indicate locations, dimensions,

and elevations including, but not limited to, duct work, insulation, mechanical equipment, hot water supply and return piping, fire sprinkler work, electrical fixtures, electrical conduit, structural steel, beams, columns, joist, plumbing piping, plumbing equipment, ceiling grid, penetrations, lintels, etc. Additionally, any trade Contractor requiring a penetration to be made in wall, floor and or roof shall identify the required opening size and location. The size and type of lintel required for the penetration shall be required. Each Prime Contractor is responsible for laying out their necessary wall, floor or roof penetration.

C. The Contractor will coordinate a meeting between its subcontractors to finalize the coordination review. Upon the final review as to the accuracy of the coordination drawings, Contractor's representative who has written authorization from the President of the Contractor to approve and sign-off on the coordination drawings will sign and date the coordination drawings. The Contractor will then submit copies of the signed and dated coordination drawing to the Architect Architect for review. The signed coordination drawings shall be submitted to the Architect within (30) thirty calendar days from the date of Notice to Proceed. The Contractor that fails to furnish completed coordination drawings within the time specified shall be financially responsible for removals, repairs, patching, etc. caused by failure to provide coordination drawings at the time needed in coordination with the Contractor's Construction Schedule.

D. As the work progresses, the Contractor shall familiarize itself with the work to be done by others in so far as it affects its work and shall promptly give such information to others as affects their mutual interests. The Contractor shall notify the Architect of any condition that might prevent the satisfactory completion of their work.

E. The Contractor shall carefully check job space requirements with all other subcontractors to make sure that the combined work can be installed in the allotted spaces, chases, etc., with all piping, conduits, ductwork, etc. concealed from view. The Contractor shall coordinate its shop drawings with those of all other subcontractors. Coordination drawings shall be the mutual responsibility of all Contractors and Subcontractors involved. Any Contractor or its Subcontractor not coordinating its work with others will be responsible for any additional costs arising from lack of coordination. In the case of conflict between Contractors and its subcontractors, the Architect will have the final decision in accordance with the General Conditions of the Contract for Construction. If the Contractor fails to supply the proper sizes and locations, it shall be financially responsible for consequential corrective work.

F. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
   2. Plenum Space: Indicate subframing for support of ceiling, raised access floor, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
   3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.

4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts, and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
    a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
    d. Location of pull boxes and junction boxes dimensioned from column center lines.
8. Fire-Protection System: Show the following:
    a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
    a. If the Architect determines that coordination drawings are not being prepared in a manner consistent with the design intent, such as conduit runs, piping and the like exposed without regard to aesthetic effect of the design intent of the contract documents, or are otherwise deficient, Architect will inform the Contractor, who shall make changes as directed at no additional cost to the Contract amount.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 - Submittal Procedures.

G. Coordination Drawing Process: Prepare coordination drawings in the following manner:
1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.

5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.
6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.
7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

H. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
   1. File Preparation Format:
      a. CAD drawing files (.DWG) or BIM model files (.RVT) or other format as mutually agreed upon by all parties responsible for preparation of coordination drawings.
   2. File Submittal Format: Submit or post coordination drawing files using PDF format.
   3. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
      a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
      b. Digital Data Software Program: Drawings files are available in BIM and/or CAD format in the latest software versions.
      c. Contractor(s) shall execute an indemnification/hold-harmless document as provided by the Architect prior to the distribution of digital data files.

1.07 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
   1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
   2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
   3. If the Architect must prepare “responses to Contractor’s Requests for Information” (RFI’s) where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or Project correspondence or documentation the Owner will back-charge the Contractor for all costs associated with the additional Contract Administration Services provided by the Architect.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
   1. Project name.
   2. Name of Architect.
   3. Architect's Project number.
   4. Date.

5. Name of Contractor.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Form bound in Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
    1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow (7) seven calendar days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
    1. The following Contractor-generated RFIs will be returned without action:
        a. Requests for approval of submittals.
        b. Requests for approval of substitutions.
        c. Requests for approval of Contractor's means and methods.
        d. Requests for coordination information already indicated in the Contract Documents.
        e. Requests for adjustments in the Contract Time or the Contract Sum.
        f. Requests for interpretation of Architect's actions on submittals.
        g. Incomplete RFIs or inaccurately prepared RFIs.
    2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
    3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
        a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within (5) five days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly and at each job meeting. Use software log that is part of Project management software which includes not less than the following:
    1. Project name.
    2. Name and address of Contractor.
    3. Name and address of Architect.
    4. RFI number, including RFIs that were returned without action or withdrawn.
    5. RFI description.
    6. Date the RFI was submitted.

7. Date Architect response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's[and Construction Manager's] action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within (3) three days if Contractor disagrees with response.

1.08 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model will be provided by Architect for Contractor's use during construction.
   1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
   2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
   3. Digital Drawing Software Program: Contract Drawings are available in Revit.
   4. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to Owner and Architect].
      a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement acceptable to Owner and Architect.

B. Web-Based Project Management Software Package: Use Architect's web-based Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.
   1. Web-based Project management software includes, at a minimum, the following features:
      a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
      b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
      c. Document workflow planning, allowing customization of workflow between project entities.
      d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
      e. Track status of each Project communication in real time, and log time and date when responses are provided.
      f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
      g. Processing and tracking of payment applications.
      h. Processing and tracking of contract modifications.
      i. Creating and distributing meeting minutes.
      j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
      k. Management of construction progress photographs.
      l. Mobile device compatibility, including smartphones and tablets.

2. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
   1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
   2. Name file with submittal number or other unique identifier, including revision identifier.
   3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.09 FIELD SUPERVISION

A. The Contractor shall have a full-time superintendent present on site to supervise its work and that of its Subcontractors. At no time shall the Contractor or its Subcontractors be working on the Project without the Contractor's superintendent present. The Contractor shall submit the name of its Superintendent to the Architect prior to commencement of work.

B. Each Prime Contractor shall have a full-time superintendent present on site to supervise its work and that of its subcontractors and to coordinate its own work with that of other Prime Contractors. At no time shall any Prime Contractor or its Subcontractors be working on the Project without the Prime Contractor's superintendent present. Each Prime Contractor shall submit the name of its Superintendent to the Architect prior to commencement of work.

C. Field Supervisor shall be fluent in the English language to ensure full communications can be achieved during daily operations between Contractor, Architect, and Owner.

1.10 PROJECT MEETINGS

A. Job Meetings shall be held at the Site, or elsewhere as designated by the Architect or Construction Manager, for each project at least once every two (2) weeks on a prescribed date and time of each month, or more often, as directed and required by the Architect or Construction Manager.

B. It will be mandatory for the President of the Contractor to be present or have its representative present who has written authorization from the President of the Contractor to approve and sign-off on updated Contractors' Construction Schedule, etc. at every Meeting for project, unless previously excused by the Architect. A Contractor more than fifteen (15) minutes late to any meeting shall be viewed as not in attendance.

C. General: Architect shall schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Architect will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notification to all parties of scheduled meeting dates and times shall be provided a minimum of (7) seven days prior to meeting. Contractor(s) will inform its subcontractors,

suppliers, participants and others involved whose presence is required at scheduled meetings and times.

2. Agenda: Architect may prepare a meeting agenda to distribute to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved and distribute the meeting minutes to everyone concerned, including Architect and Owner, within (7) seven calendar days of the meeting.

D. Preconstruction Conference: Contractor Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to all interested parties, but no later than (15) fifteen days after execution of the Agreement.
   1. Attendees: Authorized representatives of Architect and Owner, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Responsibilities and personnel assignments.
      b. Tentative construction schedule prepared by the Contractor.
      c. Phasing.
      d. Critical work sequencing and long lead items.
      e. Designation of key personnel and their duties.
      f. Lines of communications.
      g. Procedures for processing field decisions and Change Orders.
      h. Procedures for RFIs.
      i. Procedures for testing and inspecting.
      j. Procedures for processing Applications for Payment.
      k. Distribution of the Contract Documents.
      l. Submittal procedures.
      m. Preparation of Record Documents.
      n. Use of the premises and any existing building.
      o. Work restrictions.
      p. Working hours.
      q. Owner's occupancy requirements.
      r. Responsibility for temporary facilities and controls.
      s. Procedures for moisture and mold control.
      t. Procedures for disruptions and shutdowns.
      u. Construction waste management and recycling.
      v. Parking availability.
      w. Office, work, and storage areas.
      x. Equipment deliveries and priorities.
      y. First aid.
      z. Security.
      aa. Progress cleaning.
   3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

E. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
    1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
    2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
        a. Contract Documents.
        b. Options.
        c. Related RFIs.
        d. Related Change Orders.
        e. Purchases.
        f. Deliveries.
        g. Submittals.
        h. Sustainable design requirements.
        i. Review of mockups.
        j. Possible conflicts.
        k. Compatibility requirements.
        l. Time schedules.
        m. Weather limitations.
        n. Manufacturer's written instructions.
        o. Warranty requirements.
        p. Compatibility of materials.
        q. Acceptability of substrates.
        r. Temporary facilities and controls.
        s. Space and access limitations.
        t. Regulations of authorities having jurisdiction.
        u. Testing and inspecting requirements.
        v. Installation procedures.
        w. Coordination with other work.
        x. Required performance results.
        y. Protection of adjacent work.
        z. Protection of construction and personnel.
    3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
    4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
    5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

F. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
    1. Conduct the conference to review requirements and responsibilities related to Project closeout.
    2. Attendees: Authorized representatives of Owner, Architect and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other

concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    a. Preparation of Record Documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Procedures for completing and archiving web-based Project software site data files.
    d. Submittal of written warranties.
    e. Requirements for completing sustainable design documentation.
    f. Requirements for preparing operations and maintenance data.
    g. Requirements for delivery of material samples, attic stock, and spare parts.
    h. Requirements for demonstration and training.
    i. Preparation of Contractor's punch list.
    j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    k. Submittal procedures.
    l. Coordination of separate contracts.
    m. Owner's partial occupancy requirements.
    n. Installation of Owner's furniture, fixtures, and equipment.
    o. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

G. Progress Meetings: Architect will conduct progress meetings at a minimum, biweekly intervals on a prescribed date and time, or more often as directed or required by the Architect.
    1. Coordinate dates of meetings with preparation of payment requests.
    2. Attendees: In addition to representatives of Owner, Architect and their consultants, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
    3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
        a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
            1) Review schedule for next period.
        b. Review present and future needs of each entity present, including the following:
            1) Interface requirements.
            2) Sequence of operations.
            3) Resolution of BIM component conflicts.

4) Status of submittals.
5) Status of sustainable design documentation.
6) Deliveries.
7) Off-site fabrication.
8) Access.
9) Site use.
10) Temporary facilities and controls.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) Status of RFIs.
16) Status of Proposal Requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
   a. Schedule Updating: Contractor(s) shall revise the construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule within (4) four days of the concurrent progress meeting.

H. Coordination Meetings: Contractor shall conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
   1. Attendees: In addition to representatives of Owner, Architect and their consultants, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
      a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
      c. Review present and future needs of each contractor present, including the following:
         1) Interface requirements.

2) Sequence of operations.
3) Resolution of BIM component conflicts.
4) Status of submittals.
5) Deliveries.
6) Off-site fabrication.
7) Access.
8) Site use.
9) Temporary facilities and controls.
10) Work hours.
11) Hazards and risks.
12) Progress cleaning.
13) Quality and work standards.
14) Status of RFIs.
15) Proposal Requests.
16) Change Orders.
17) Pending changes.

3. Reporting: The contractor shall record meeting results and distribute copies to everyone in attendance including Owner, Architect and to others affected by decisions or actions resulting from each meeting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract Documents, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Contractor's Construction Schedule.
   2. Submittals Schedule.
   3. Daily construction reports.
   4. Field condition reports.

1.03 SUBMITTALS

A. Submittals Schedule: Submit (2) two copies of schedule. Arrange the following information in a tabular format:
   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (action or informational).
   4. Name of subcontractor.
   5. Description of the Work covered.
   6. Scheduled date for Architect's final release or approval.

B. Contractor's Construction Schedule: Submit (2) two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

C. Daily Construction Reports: Submit (2) two copies with each monthly application for payment.

D. Material Location Reports: Submit (2) two copies with each monthly application for payment.

E. Field Condition Reports: Submit (2) two copies at time of discovery of differing conditions.

F. Special Reports: Submit (2) two copies weekly intervals.

1.04 QUALITY ASSURANCE

A. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review

methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
2. Review schedule for work of Owner's separate contracts.
3. Review requirements for tests and inspections by independent testing and inspecting agencies.
4. Review time required for completion and startup procedures.
5. Review and finalize list of construction activities to be included in schedule.
6. Review submittal requirements and procedures.
7. Review procedures for updating schedule.

1.05 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from parties involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 PRODUCTS

2.01 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, delivery, and installation when establishing dates.
   1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
   2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for Notice to Proceed to date of Substantial and Final Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat separate areas as a separate numbered activity for each principal element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than (10) ten calendar days, unless specifically allowed by Architect.
   2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than (60) sixty days, as separate

activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than (10) ten calendar days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion and for Township inspections and issuance of a TCO or CO.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work Restrictions: Show the effect of the following types of items on the schedule including, but not limited to:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.
      i. Local ordinances.
   3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
      a. Subcontract awards.
      b. Submittals.
      c. Purchases.
      d. Mockups.
      e. Fabrication.
      f. Sample testing.
      g. Deliveries.
      h. Installation.
      i. Tests and inspections.
      j. Adjusting.
      k. Curing.
      l. Startup and placement into final use and operation.
   4. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for, but not limited to, the following:
      a. Structural completion.
      b. Permanent space enclosure.
      c. Completion of mechanical installation.
      d. Completion of electrical installation.
      e. Substantial Completion.

D. Milestones: Include any milestones indicated in the Contract Documents, in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

F. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.
   1. Microsoft Projects, latest version, for Windows XP operating system for Gantt Charts

2.03 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor shall, within (15) fifteen calendar days after issuance of a Notice to Proceed, submit a draft Contractor’s Construction Schedule detailing logic, tasks and durations along with a detailed submittal schedule to the Architect.

B. Schedule: The General Contractor shall submit a comprehensive, fully developed, Contractor's Construction Schedule detailing logic, tasks and durations related to all work of the entire Project. The schedule shall not exceed time limits current under the Contract Documents for substantial completion of (each) phase and that of the Project.

C. Preparation: Indicate each significant construction activity separately. Identify first workday of each week through to completion.

2.04 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Each Prime Contractor shall, within (15) fifteen calendar days after issuance of a Notice to Proceed, submit a draft Contractor’s Construction Schedule detailing logic, tasks and durations along with a detailed submittal schedule to the Project Coordinator.

B. Gantt-Chart Schedule: The Project Coordinator shall submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within (30) thirty calendar days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project. The schedule shall include the joint coordination, input and collective agreement of each Prime Contractor. Schedule shall be a comprehensive, fully developed, Contractor‘s Construction Schedule detailing logic, tasks and durations related to all work of the entire Project. The schedule shall not exceed time limits current under the Contract Documents for substantial completion of (each) phase and that of the Project.

C. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
   1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in (10) ten percent increments within time bar.

2.05 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Preliminary Bar-Chart-Schedule: Submit schedule within (15) fifteen days of date established for the Notice to Proceed. Outline significant construction activities for the first (60) sixty days of construction. Include skeleton diagram for the remainder of the Work based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, time-scaled CPM network analysis diagram for the Work.
   1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than (30) thirty days after date established for the Notice to Proceed.
   2. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
   3. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
   4. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
   5. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
   1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
      a. Preparation and processing of submittals.
      b. Mobilization and demobilization.
      c. Purchase of materials.
      d. Delivery.
      e. Fabrication.
      f. Utility interruptions.
      g. Installation.
      h. Work by Owner that may affect or be affected by Contractor's activities.
      i. Testing .
   2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
   3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
   4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
      a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

2.06 REPORTS

A. Daily Construction Reports: Contractor shall prepare a daily construction report recording the following information concerning events at Project site: Failure to comply is cause for docking payment.
1. List of subcontractors at Project site.
2. Approximate count of personnel at Project site.
3. Equipment at Project site.
4. Material deliveries.
5. High and low temperatures and general weather conditions.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events (refer to special reports).
9. Stoppages, delays, shortages, and losses.
10. Emergency procedures.
11. Orders and requests of authorities having jurisdiction.
12. Change Orders received and implemented.
13. Construction Change Directives received and implemented.
14. Substantial Completions authorized.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for information in Section 006000 - Project Forms, Form 006010 - Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.07 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within weekly of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Meeting to Review and approve Contractor's Construction Schedule: (14) fourteen calendar days after receipt of the Contractor's Construction Schedule, the Owner, President of the Company or Corporation, of the Contractor, shall meet to review, agree and sign off on the Contractor's Construction in the presence of the Owner. Failure of the Contractor to sign off on the Contractor's Construction Schedule shall result in the assessment of liquidated damages as outlined in Section 006212 - Supplementary Conditions - AIA A201-2017 , article 8.4.

B. Contractor's Construction Schedule Updating: At, at least, every 30 calendar days or as often as deemed necessary by the Architect, update schedule to reflect actual construction progress and activities and to recommend changes in the sequencing and scheduling. Issue schedule (1) one week before each regularly scheduled progress meeting. Upon (7) seven working days of the Architect's request, submit an updated schedule to the Architect.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate Actual Completion percentage for each activity.

C. The updated Contractors' Construction Schedule will be reviewed at each Job Meeting. Contractor is required to have a representative present at the Job Meeting with written authorization from the President of the Company or Corporation to review, agree upon and sign-off on any approved and agreed upon changes to the updated Contractors' Construction Schedule. Failure by Contractor to provide timely input in the time required to update the schedule shall result in the liability of the Contractor for liquidated damages. In addition, payment to the Contractor may result in the withholding of payments to the Contractor, and in the liability of the Contractor for liquidated damages, for failure of the Project to be completed within the designated time due to the Contractor's failure to cooperate. Contractor shall be responsible for meeting the overall Project's phased completion date(s) and overall substantial completion date.

D. Any acceleration of the Contractor's Construction Schedule shall be agreed upon by the Contractor and approved by the Architect in writing.

E. In the absence of a signed change order approving an extension of time, all Contractor Construction Schedule updates must show substantial completion date(s) consistent with the date(s) required in Section 011000 – Summary, paragraph 1.5.D. Changes in logistics or duration shall not be made, except for good cause, and shall not result in

an extension of the time for substantial completion. In the event certain aspects of the work fall behind the Contractor's Construction Schedule, the Contractor(s) responsible shall, in coordination, and consultation with all other Contractors, will develop a recovery plan to revise logistics, add manpower resources to reduce durations, expedite procurement or advance start of activities, to get the project back on a schedule that will assure completion in accordance with the substantial completion date.

F. Distribution: Distribute copies of approved schedule to Architect, Owner, testing agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms or temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.
   2. Periodic construction photographs.
   3. Final completion construction photographs.

B. Related Requirements:
   1. Section 013300 - Submittal Procedures for submitting photographic documentation.
   2. Section 017700 - Closeout Procedures for submitting photographic documentation as project record documents at Project closeout.
   3. Section 017900 - Demonstration and Training for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.03 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building for Architect’s notation of vantage points marked for location and direction of each photograph recording. Indicate elevation or story of construction. Include same information as corresponding photographic documentation. Architect shall select a minimum of (6) six views to be photographed and included with each Application for Payment.

B. Digital Photographs:
   1. Digital Camera: Minimum sensor resolution of 8 megapixels.
   2. Format: Minimum resolution of 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
   3. Identification: Provide the following information with each image description in file metadata tag:
      a. Date photograph was taken.
      b. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
      c. Unique sequential numerical identifier.

1.04 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner and Architect for unlimited reproduction of photographic documentation.

PART 2 PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

B. Digital Video Recordings: Provide high-resolution, digital video in format acceptable to Architect/Owner.

PART 3 EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in file name for each image.
   2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.

C. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
   1. Flag construction limits before taking construction photographs.
   2. Take a sufficient number of photographs to show existing conditions adjacent to property before starting the Work.
   3. Take a sufficient number of photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
   4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

D. Periodic Construction Photographs: Take photographs at regular intervals throughout construction to document regular progress and major milestone, including but not limited to:
   1. Commencement of the Work, through completion of subgrade construction.
   2. Above-grade structural framing.
   3. Exterior building enclosure.
   4. Interior Work, through date of Substantial Completion.

E. Submit periodic construction photographs with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

F. Architect-Directed Construction Photographs: From time to time, the Architect may instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.

G. Final Completion Construction Photographs: Take 20 color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.
   1. Do not include date stamp.

H. Additional Photographs: Architect may request photographs in addition to periodic photographs specified.
   1. In emergency situations, take additional photographs within 24 hours of request.
   2. Circumstances that could require additional photographs include, but are not limited to, the following:
      a. Special events planned at Project site.
      b. Immediate follow-up when on-site events result in construction damage or losses.
      c. Photographs to be taken at fabrication locations away from Project site..
      d. Substantial Completion of a major phase or component of the Work.
      e. Extra record photographs at time of final acceptance.
      f. Owner's request for special publicity photographs.

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Submittal schedule requirements.
   2. Administrative and procedural requirements for submittals.

B. Related Requirements:
   1. Section 012900 - Payment Procedures for submitting Applications for Payment and the schedule of values.
   2. Section 013100 - Project Management and Coordination for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
   3. Section 013200 - Construction Progress Documentation for submitting schedules and reports, including Contractor's construction schedule.
   4. Section 013233 - Photographic Documentation for submitting preconstruction photographs, periodic construction photographs, and Final Completion construction photographs.
   5. Section 014000 - Quality Requirements for submitting test and inspection reports, and schedule of tests and inspections.
   6. Section 017700 - Closeout Procedures for submitting closeout submittals and maintenance material submittals.
   7. Section 017823 - Operation and Maintenance Data for submitting operation and maintenance manuals.
   8. Section 017839 - Project Record Documents 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   9. Section 017900 - Demonstration and Training for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.03 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying

with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.04 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
   1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
   2. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
      a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
   3. Format: Arrange the following information in a tabular format:
      a. Scheduled date for first submittal.
      b. Specification Section number and title.
      c. Submittal Category: Action; informational.
      d. Name of subcontractor.
      e. Description of the Work covered.
      f. Scheduled date for Architect's final release or approval.

B. No extension of contract time will be considered or authorized because of failure to transmit submittals far enough in advance of the work to permit processing.

1.05 SUBMITTAL FORMATS

A. Submittal Information: All submittals shall include the Architects “Submittal Cover Sheet” as provided in the Project Manual, or approved document equivalent; and shall contain the following information in each submittal:
   1. Project name.
   2. Date.
   3. Name of Architect.
   4. Name of Contractor.
   5. Name of firm or entity that prepared submittal.
   6. Names of subcontractor, manufacturer, and supplier.
   7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
   8. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
   9. Drawing number and detail references, as appropriate.
   10. Indication of full or partial submittal.
   11. Location(s) where product is to be installed, as appropriate.
   12. Other necessary identification.
   13. Remarks.

14. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Paper Submittals:
   1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
   2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
   3. Action Submittals: Submit (3) three paper copies of each submittal unless otherwise indicated. Architect will return (2) two copies.
   4. Informational Submittals: Submit (2) two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
   5. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

E. Electronic Submittals: Prepare submittals as a PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number and a brief description.
   1. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using the Architect’s “Submittal Cover Sheet” as included in Project Manual and Contractor’s transmittal form. The Architect will return submittals, without review, received from sources other than the Contractor and those submittals received without the Architect’s “Submittal Cover Sheet” and/or Contractor’s transmittal form.

1.06 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
   1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF of Contractor’s transmittal form and Architects “Submittal Cover Sheet”. Include information in email subject line as requested by Architect.
      a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of a fully prepared and complete submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
    1. Initial Review: Allow fifteen (15) business days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
    2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
    3. Resubmittal Review: Allow fifteen (15) business days for review of each resubmittal.
    4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow twenty (20) business days for initial review of each submittal. Sequential reviews may include, but are not limited to the following:
        a. Structural foundations and base plates.
        b. Structural steel framing and decking.
        c. HVAC systems and components.
        d. Plumbing systems and components.
        e. Electrical systems and components.
    5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow fifteen (15) business days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
        a. Submit one copy of submittal to concurrent reviewer(s) in addition to copies to Architect.

D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
    1. Note date and content of previous submittal.
    2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
    3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.07 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable.
   3. Include the following information, as applicable:
      a. Manufacturer's catalog cuts.
      b. Manufacturer's product specifications.
      c. Standard color charts.
      d. Statement of compliance with specified referenced standards.
      e. Testing by recognized testing agency.
      f. Application of testing agency labels and seals.
      g. Notation of coordination requirements.
      h. Availability and delivery time information.
   4. For equipment, include the following in addition to the above, as applicable:
      a. Wiring diagrams that show factory-installed wiring.
      b. Printed performance curves.
      c. Operational range diagrams.
      d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
   5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Dimensions
      b. Identification of products.
      c. Fabrication and installation drawings.
      d. Rough-in and setting diagrams.
      e. Shop work manufacturing instruction.
      f. Templates and patterns.
      g. Design calculations.
      h. Schedules.
      i. Compliance with specified standards.
      j. Notation of coordination requirements.
      k. Notation of dimensions established by field measurement.
      l. Relationship and attachment to adjoining construction clearly indicated.
      m. Seal and signature of professional engineer if specified, within the state Project is located.
      n. Wiring diagrams showing field-installed wiring, including power, signal and control wiring.

o. Wiring diagrams differentiating between manufacturer-installed and field-installed wiring and responsibilities for who makes the final connections.

2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
   a. Submit Shop Drawings to Architect via email or other electronic media transfer.
   b. For larger projects were shop drawing quantities and file sizes may limit the amount of media allowed to be electronically transferred, Shop Drawing packages may be broken down into smaller groups. In this case, file names should be clearly identified with a description (i.e. Part 1, Part 2, etc.) to alert recipients to the receipt of multiple files.

C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
   1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
   2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
      a. Project name and submittal number.
      b. Generic description of Sample.
      c. Product name and name of manufacturer.
      d. Sample source.
      e. Number and title of applicable Specification Section.
      f. Specification paragraph number and generic name of each item.
   3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
   4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
      a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
      b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
   5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
      a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Submit one directly to Owner and one to Architect. Architect will return submittal with options selected.
   6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of

repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit (2) two sets of Samples. Architect will retain one Sample set; remainder will be provided to the Owner to be retained on site for future verification.
    1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least (3) three sets of paired units that show approximate limits of variations.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
    1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
    2. Manufacturer and product name, and model number if applicable.
    3. Number and name of room or space.
    4. Location within room or space.

E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

G. Certificates:
    1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
    2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
    3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
    4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
    5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
    6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1 on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
    a. Name of evaluation organization.
    b. Date of evaluation.
    c. Time period when report is in effect.
    d. Product and manufacturers' names.
    e. Description of product.
    f. Test procedures and results.
    g. Limitations of use.

1.08 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
    1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF files and (2) two paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
    1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.
    2. Responsible design professional shall be licensed in the state which the Project is located.

1.09 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp or indication in web-based Project management software. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
   1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval, and will return the same without action.

1.10 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return.
   1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action, as follows:
      a. Approved: Submittal contents have been reviewed without comment. Resubmission is not required.
      b. Approved as Noted: Submittal contents have been reviewed with comments included. Resubmission is not required, unless specifically directed by Architect for purposes of ‘record’ or other indicated purpose.
      c. Revise and Resubmit: Submittal contents have been reviewed and require resubmission based on the quantity or content of the comments included. Contractor shall not release material until resubmission is made with an ‘Approved’ or Approved as Noted’ result.
      d. Rejected: Submittal contents have been reviewed and found to be in non-conformance with the requirements of the contract drawings and/or specifications, lack sufficient information for a complete review or as otherwise noted in the Architect comments. Contractor shall not release material until resubmission is made with an ‘Approved’ or Approved as Noted’ result.
      e. Information/Record Only: Submittal contents is not required or is of a non-reviewable nature. At the Architect’s discretion, the submittal may be returned without action or retains for record purposes only.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

G. Whether specifically indicated or not on the returned submittal, the Architect's review does not include review of Material Safety Data Sheets (MSDS) where submitted with other received submittal information.
   1. MSDS information shall always be maintained by the Contractor's field personnel and kept up to date. Include and catalog new MSDS sheets as materials are brought onto each Project and/or site.
   2. Record copies of MSDS information shall be required to be organized into a Project binder for each individual Project and/or site. Duplicate copies shall be provided to the Owner's designated representative.

1.11 CONTRACTOR'S USE OF ARCHITECT'S ELECTRONIC DIGITAL DATA FILES

A. General: At Contractor's written request, copies of Architect's digital data files may be conditionally provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
   1. Contractor will be required to sign an Indemnification and Hold Harmless Agreement in form provided by the Architect for the use of original electronic digital data created by the Architect.
   2. Electronic digital data files will be provided only for the specific purpose of providing a reference document to the Contractor to be used for backgrounds for the completion by the Contractor of shop drawings only.
   3. The Contractor shall agree the electronic digital data information is for reference purposes only and that the Architect provides no warranty of any kind, written or implied, as to the completeness or accuracy of the electronic digital data files.
   4. The Contractor shall agree to hold all information contained in the electronic digital data files confidential and protect it against use by others.
   5. The Contractor shall be required to indemnify and hold harmless the Architect, its principals, employees and consultants in accordance with all terms and conditions listed in the Architect's Indemnification and Hold Harmless Agreement.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 013300

SECTION 013516 - ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes special procedures for alteration work.

1.03 DEFINITIONS

A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

B. Consolidate: To strengthen loose or deteriorated materials in place.

C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.

D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish as approved by Architect.

F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

K. Retain: To keep existing items that are not to be removed or dismantled.

L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.04 COORDINATION

A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
    1. Schedule construction operations in sequence required to obtain best Work results.
    2. Coordinate sequence of alteration work activities to accommodate the following:
        a. Owner's continuing occupancy of portions of existing building.
        b. Owner's partial occupancy of completed Work.
        c. Other known work in progress.
        d. Tests and inspections.
    3. Detail sequence of alteration work, with start and end dates.
    4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
    5. Use of elevator and stairs.
    6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

1.05 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.
    1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to Owner where directed by Architect.

1.06 INFORMATIONAL SUBMITTALS

A. Alteration Work Subschedule:
    1. Submit alteration work subschedule within (7) seven days of date established for commencement of alteration work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

C. Alteration Work Program: Submit 15 days before work begins.

D. Fire-Prevention Plan: Submit 15 days before work begins.

1.07 QUALITY ASSURANCE

A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has completed a minimum of (5) five recent projects with a record of

successful in-service performance that demonstrates the firm's qualifications to perform this work.

1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
    a. Construct new mockups of required work whenever a supervisor is replaced.

B. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.

C. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.

D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

E. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

1.08 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials:

1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

B. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be

dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
   1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
   2. Secure stored materials to protect from theft.
   3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.

1.09 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of measured drawings, preconstruction photographs and/or preconstruction videotapes.
   1. Comply with requirements specified in Section 013233 - Photographic Documentation.

B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

C. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION

3.01 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
   1. Use only proven protection methods, appropriate to each area and surface being protected.
   2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
   3. Erect temporary barriers to form and maintain fire-egress routes.
   4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
   5. Contain dust and debris generated by alteration work and prevent it from reaching the public or adjacent surfaces.
   6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
   7. Protect floors, stairs, and other surfaces along hauling routes from damage, wear, and staining with "Ram Board" products or approved equal.

8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

B. Temporary Protection of Materials to Remain:
   1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
   2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:
   1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
   2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
   3. Maintain existing services unless otherwise indicated; keep in service and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
   1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
   2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

3.02 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:
   1. Comply with NFPA 241 requirements unless otherwise indicated.
   2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
      a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
   1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
   2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.

3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
    a. Train each fire watch in the proper operation of fire-control equipment and alarms.
    b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
    c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
    d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
    e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
    1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.03 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.04 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs and/or video recordings.

D. Comply with requirements in Section 013233 - Photographic Documentation.

E. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

F. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
   1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 013516

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Contractor to provide quality-assurance and quality-control services required by Owner, Architect, or authority having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:
   1. Section 012100 - Allowances for testing and inspection allowances.

1.03 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of (5) five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
   1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

H. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

I. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.04 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.05 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.06 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within (10) ten days of Notice to Proceed, and not less than (5) five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.

B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.

2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
3. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.07 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
    1. Name, address, telephone number, and email address of factory-authorized service representative making report.
    2. Statement that equipment complies with requirements.
    3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
    4. Statement of whether conditions, products, and installation will affect warranty.
    5. Other required items indicated in individual Specification Sections.

1.08 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.
    1. Requirements of authorities having jurisdiction supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.09 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
   2. Payment for these services will be made from testing and inspection allowances specified in Section 012100 "Allowances," as authorized by Change Orders.
   3. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
   1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
   2. Engage a qualified testing agency to perform quality-control services.
      a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
   3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspection will be performed.
   4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Architect's, Construction Manager's, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
   1. Notify Architect's and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspection equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
2. Distribution: Distribute schedule to Owner, Architect, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having

jurisdiction as the responsibility of Owner, as indicated in the Statement of Special Inspections attached to this Section, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, , with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect.
   4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and authorities' having jurisdiction reference during normal working hours.
   1. Submit log at Project closeout as part of Project Record Documents.

3.02 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.03 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.04 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.
   1. AABC - Associated Air Balance Council; www.aabc.com.
   2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
   3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
   4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
   5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
   6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
   7. ABMA - American Boiler Manufacturers Association; www.abma.com.
   8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
   9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
   10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
   11. AF&PA - American Forest & Paper Association; www.afandpa.org.
   12. AGA - American Gas Association; www.aga.org.
   13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
   14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
   15. AI - Asphalt Institute; www.asphaltinstitute.org.
   16. AIA - American Institute of Architects (The); www.aia.org.
   17. AISC - American Institute of Steel Construction; www.aisc.org.
   18. AISI - American Iron and Steel Institute; www.steel.org.
   19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
   20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
   21. ANSI - American National Standards Institute; www.ansi.org.
   22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
   23. APA - APA - The Engineered Wood Association; www.apawood.org.
   24. APA - Architectural Precast Association; www.archprecast.org.
   25. API - American Petroleum Institute; www.api.org.
   26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
   27. ARI - American Refrigeration Institute; (See AHRI).
   28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
   29. ASCE - American Society of Civil Engineers; www.asce.org.
   30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
   31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.

32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASSP - American Society of Safety Professionals (The); www.assp.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AVIXA - Audiovisual and Integrated Experience Association; (Formerly: Infocomm International); www.soundandcommunications.com.
38. AWEA - American Wind Energy Association; www.awea.org.
39. AWI - Architectural Woodwork Institute; www.awinet.org.
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
41. AWPA - American Wood Protection Association; www.awpa.com.
42. AWS - American Welding Society; www.aws.org.
43. AWWA - American Water Works Association; www.awwa.org.
44. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
45. BIA - Brick Industry Association (The); www.gobrick.com.
46. BICSI - BICSI, Inc.; www.bicsi.org.
47. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
48. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
49. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
50. CDA - Copper Development Association; www.copper.org.
51. CE - Conformite Europeenne; www.ec.europa.eu/growth/single-market/ce-marking.
52. CEA - Canadian Electricity Association; www.electricity.ca.
53. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
54. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
55. CGA - Compressed Gas Association; www.cganet.com.
56. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
57. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
58. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
59. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
60. CPA - Composite Panel Association; www.compositepanel.org.
61. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
62. CRRC - Cool Roof Rating Council; www.coolroofs.org.
63. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
64. CSA - CSA Group; www.csa-group.org.
65. CSI - Construction Specifications Institute (The); www.csiresources.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTA - Consumer Technology Association; www.cta.tech.
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.coolingtechnology.org.
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.

71. DHA - Decorative Hardwoods Association; (Formerly: Hardwood Plywood & Veneer Association); www.decorativehardwoods.org.
72. DHI - Door and Hardware Institute; www.dhi.org.
73. ECA - Electronic Components Association; (See ECIA).
74. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
75. ECIA - Electronic Components Industry Association; www.ecianow.org.
76. EIA - Electronic Industries Alliance; (See TIA).
77. EIMA - EIFS Industry Members Association; www.eima.com.
78. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
79. EOS/ESD Association; (Electrostatic Discharge Association); www.esda.org.
80. ESTA - Entertainment Services and Technology Association; (See PLASA).
81. ETL - Intertek (See Intertek); www.intertek.com.
82. EVO - Efficiency Valuation Organization; www.evo-world.org.
83. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
84. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
85. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
86. FM Approvals - FM Approvals LLC; www.fmglobal.com.
87. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
88. FRSA - Florida Roofing, Sheet Metal Contractors Association, Inc.; www.floridaroof.com.
89. FSA - Fluid Sealing Association; www.fluidsealing.com.
90. FSC - Forest Stewardship Council U.S.; www.fscus.org.
91. GA - Gypsum Association; www.gypsum.org.
92. GANA - Glass Association of North America; (See NGA).
93. GS - Green Seal; www.greenseal.org.
94. HI - Hydraulic Institute; www.pumps.org.
95. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
96. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
97. HPVA - Hardwood Plywood & Veneer Association; (See DHA).
98. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
99. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
100. IAS - International Accreditation Service; www.iasonline.org.
101. ICBO - International Conference of Building Officials; (See ICC).
102. ICC - International Code Council; www.iccsafe.org.
103. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
104. ICPA - International Cast Polymer Association; www.theicpa.com.
105. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
106. IEC - International Electrotechnical Commission; www.iec.ch.
107. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
108. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
109. IESNA - Illuminating Engineering Society of North America; (See IES).
110. IEST - Institute of Environmental Sciences and Technology; www.iest.org.

111. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
112. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.org.
113. II - Infocomm International; (See AVIXA).
114. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
115. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
116. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
117. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
118. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
119. ISO - International Organization for Standardization; www.iso.org.
120. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
121. ITU - International Telecommunication Union; www.itu.int.
122. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
123. LMA - Laminating Materials Association; (See CPA).
124. LPI - Lightning Protection Institute; www.lightning.org.
125. MBMA - Metal Building Manufacturers Association; www.mbma.com.
126. MCA - Metal Construction Association; www.metalconstruction.org.
127. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
128. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
129. MHIA - Material Handling Industry of America; www.mhia.org.
130. MIA - Marble Institute of America; (See NSI).
131. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
132. MPI - Master Painters Institute; www.paintinfo.com.
133. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
134. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
135. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
136. NADCA - National Air Duct Cleaners Association; www.nadca.com.
137. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
138. NALP - National Association of Landscape Professionals; www.landscapeprofessionals.org.
139. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
140. NBI - New Buildings Institute; www.newbuildings.org.
141. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
142. NCMA - National Concrete Masonry Association; www.ncma.org.
143. NEBB - National Environmental Balancing Bureau; www.nebb.org.
144. NECA - National Electrical Contractors Association; www.necanet.org.
145. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
146. NEMA - National Electrical Manufacturers Association; www.nema.org.
147. NETA - InterNational Electrical Testing Association; www.netaworld.org.
148. NFHS - National Federation of State High School Associations; www.nfhs.org.
149. NFPA - National Fire Protection Association; www.nfpa.org.
150. NFPA - NFPA International; (See NFPA).

151. NFRC - National Fenestration Rating Council; www.nfrc.org.
152. NGA - National Glass Association (The); (Formerly: Glass Association of North America); www.glass.org.
153. NHLA - National Hardwood Lumber Association; www.nhla.com.
154. NLGA - National Lumber Grades Authority; www.nlga.org.
155. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
156. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
157. NRCA - National Roofing Contractors Association; www.nrca.net.
158. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
159. NSF - NSF International; www.nsf.org.
160. NSI - National Stone Institute; (Formerly: Marble Institute of America); www.naturalstoneinstitute.org.
161. NSPE - National Society of Professional Engineers; www.nspe.org.
162. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
163. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
164. NWFA - National Wood Flooring Association; www.nwfa.org.
165. NWRA - National Waste & Recycling Association; www.wasterecycling.org
166. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
167. PDI - Plumbing & Drainage Institute; www.pdionline.org.
168. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
169. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
170. RFCI - Resilient Floor Covering Institute; www.rfci.com.
171. RIS - Redwood Inspection Service; www.redwoodinspection.com.
172. SAE - SAE International; www.sae.org.
173. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
174. SDI - Steel Deck Institute; www.sdi.org.
175. SDI - Steel Door Institute; www.steeldoor.org.
176. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
177. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
178. SIA - Security Industry Association; www.siaonline.org.
179. SJI - Steel Joist Institute; www.steeljoist.org.
180. SMA - Screen Manufacturers Association; www.smainfo.org.
181. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
182. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
183. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
184. SPIB - Southern Pine Inspection Bureau; www.spib.org.
185. SPRI - Single Ply Roofing Industry; www.spri.org.
186. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
187. SSINA - Specialty Steel Industry of North America; www.ssina.com.
188. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
189. STI - Steel Tank Institute; www.steeltank.com.
190. SWI - Steel Window Institute; www.steelwindows.com.
191. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
192. TCA - Tilt-Up Concrete Association; www.tilt-up.org.

193. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
194. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
195. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
196. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
197. TMS - The Masonry Society; www.masonrysociety.org.
198. TPI - Truss Plate Institute; www.tpinst.org.
199. TPI - Turfgrass Producers International; www.turfgrasssod.org.
200. TRI - Tile Roofing Institute; www.tileroofing.org.
201. UL - Underwriters Laboratories Inc.; www.ul.com.
202. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
203. USAV - USA Volleyball; www.usavolleyball.org.
204. USGBC - U.S. Green Building Council; www.usgbc.org.
205. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
206. WA - Wallcoverings Association; www.wallcoverings.org.
207. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
208. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
209. WDMA - Window & Door Manufacturers Association; www.wdma.com.
210. WI - Woodwork Institute; www.wicnet.org.
211. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
   1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
   2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
   3. ICC - International Code Council; www.iccsafe.org.
   4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
   1. COE - Army Corps of Engineers; www.usace.army.mil.
   2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
   3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
   4. DOD - Department of Defense; www.quicksearch.dla.mil.
   5. DOE - Department of Energy; www.energy.gov.
   6. EPA - Environmental Protection Agency; www.epa.gov.
   7. FAA - Federal Aviation Administration; www.faa.gov.
   8. FG - Federal Government Publications; www.gpo.gov/fdsys.
   9. GSA - General Services Administration; www.gsa.gov.
   10. HUD - Department of Housing and Urban Development; www.hud.gov.
   11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.

12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
   1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.govinfo.gov.
   2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
   3. DSCC - Defense Supply Center Columbus; (See FS).
   4. FED-STD - Federal Standard; (See FS).
   5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
      a. Available from Defense Standardization Program; www.dsp.dla.mil.
      b. Available from General Services Administration; www.gsa.gov.
      c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.
   6. MILSPEC - Military Specification and Standards; (See DOD).
   7. USAB - United States Access Board; www.access-board.gov.
   8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
   1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
   2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
   3. CDHS; California Department of Health Services; (See CDPH).
   4. CDPH; California Department of Public Health; Indoor Air Quality Program;www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/Main-Page.aspx.
   5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
   6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
   7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestservice.tamu.edu.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 014200

SECTION 014533 - CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

1.02 DEFINITIONS

A. Code or Building Code: ICC (IBC), International Building Code, most recent edition adopted by authority having jurisdiction, including all applicable amendments and supplements without limitation, and specifically Chapter 17 - Special Inspections and Tests.

B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

C. NIST: National Institute of Standards and Technology.

D. Special Inspections and Tests: Inspections and testing of materials, installation, fabrication, erection, or placement of components and connections mandated by Building Code to safeguard public welfare.

1. Special inspections and tests are separate from and independent of tests and inspections conducted by Owner or Contractor for purposes of quality assurance and contract administration.

1.03 REFERENCE STANDARDS

A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025a.

B. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

C. IAS AC291 - Accreditation Criteria for Special Inspection Agencies AC291; 2025, with Editorial Revision.

D. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Special Inspection Agency Qualifications: Prior to start of work, Special Inspection Agency is required to:
   1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Special Inspection Agency is acceptable to AHJ.
   4. Submit documentation that Special Inspection Agency is accredited by IAS according to IAS AC291.

C. Testing Agency Qualifications: Prior to start of work, Testing Agency is required to:
   1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Testing Agency is acceptable to AHJ.
   4. Submit documentation that Testing Agency is accredited by IAS according to IAS AC89.

D. Special Inspection Reports: After each special inspection, Special Inspector is required to submit at least two copies of report; one to Architect and one to AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of Special Inspector.
      d. Date and time of special inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of special inspection.
      h. Date of special inspection.
      i. Results of special inspection.
      j. Compliance with contract documents.
   2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.

E. Test Reports: After each test or inspection, Testing Agency is required to submit report to Architect and to AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test or inspection.
      h. Date of test or inspection.
      i. Results of test or inspection.
      j. Compliance with contract documents.

1.05 SPECIAL INSPECTION AND TESTING AGENCY

A. Owner will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. Special Inspection Agency may delegate to independent testing agency to perform testing and sampling associated with special inspections and required by building code.

C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.06 TESTING AND INSPECTION AGENCIES

A. Owner may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.07 QUALITY ASSURANCE

A. Special Inspection Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.
   2. Accredited by IAS according to IAS AC291.

B. Testing Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.
   2. Accredited by IAS according to IAS AC89.

C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SPECIAL INSPECTIONS AND TESTING

A. The Code requires special inspections and testing of certain materials, components, assemblies, and connections used in constructing the project. Special inspections and testing will be performed in accordance with the Code.

3.02 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:

1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified reference standards.
3. Ascertain compliance of materials and products with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests or inspections specified.

B. Limits on Special Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.03 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:
1. Test samples submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
3. Perform specified sampling and testing of products in accordance with specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
6. Perform additional tests and inspections required by Architect.
7. Submit reports of all tests or inspections specified.

B. Limits on Testing or Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.04 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Contractor Responsibilities, General:
   1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
   2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to work to be tested or inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
      c. To facilitate tests or inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
   5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Retain special inspection records.

B. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

END OF SECTION 014533

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract Documents, including General and Supplementary Conditions and other Division 01 and Technical Specifications, apply to this Section.

1.02 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Specific administrative and procedural minimum actions are specified in this Section, as extensions of provisions in General Conditions and other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this Section is intended to limit types and amounts of temporary work required, and no omission from this Section will be recognized as an indication by Architect or its Engineers that such temporary activity is not required for successful completion of the Work and compliance with requirements of Contract Documents. Provisions of this Section are applicable to, but not by way of limitation, utility services, construction facilities, security/protection provisions, and support facilities, etc.

C. The types of temporary support facilities required and to be provided includes, but not by way of limitation include:
   1. Security.
   2. Field offices, storage sheds, fabrication sheds.
   3. Sanitary facilities, drinking water, water distribution, drainage, dewatering equipment.
   4. Temporary heating, cooling, ventilation.
   5. Electrical power distribution, lighting.
   6. Enclosure of work, hoisting facilities, ladders, scaffolds, stairs ramps, access ways and roads.
   7. First aid facilities, bulletin board, private and public telephones, clocks, thermometer.
   8. Project identification signs, cleanup facilities, dumpsters and waste disposal services, rodent/pest control and similar miscellaneous general services.
   9. All as may be reasonably required for proficient performance of the work and accommodation of personnel at the site including Architect's and Engineer's personnel.
   10. Include moving, relocation, and reinstallation as may be required to accommodate construction progress.

D. Discontinue and remove temporary support facilities and make incidental similar use of permanent work of the project, only when and in manner authorized by the Architect; and, if not otherwise indicated, immediately before time of Substantial Completion.

Locate temporary support facilities for convenience of users, and for minimum interference with construction activities.

1.03 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weather tight; exterior walls are insulated and weather tight; and all openings are closed with permanent construction or substantial temporary closures.

1.04 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, occupants of the Project, and authorities having jurisdiction.

B. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

C. Water Service: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

D. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.05 QUALITY ASSURANCE

A. General: In addition to compliance with governing regulations and rules/recommendations of franchised utility companies, comply with specific requirements indicated and with applicable local industry standards for construction work (published recommendations by local consensus "building councils").

B. ANSI Standards: Comply with applicable provisions of ANSI A10-Series standards on construction safety.

C. NFPA Code: Comply with NFPA 241 "Safeguarding Construction, Alteration and Demolition Operations".

D. Environmental Impact Statement: Comply with provisions of Owner's committed EIS, for development and operation of temporary facilities and construction activities.

E. Conservation: In compliance with Owner's policy on energy/materials conservation, install and operate temporary facilities and perform construction activities in manner which reasonably will be conservative and avoid waste of energy and materials including water.

F. ADA and ICC/ANSI Compliance: Construction for this Project must comply with the Americans with Disability Act (ADA) of 2009 and ICC/ANSI A117.1.

G. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

H. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.06 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Establish and initiate the use of each temporary facility at time first reasonably required for proper performance of the Work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.

C. Install, operate, maintain, and protect temporary facilities in a manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property, and free of deleterious effects.

D. Installers shall verify clearances of all paths at job site leading to final installation locations, and break down the final product components into component assemblies sized accordingly to negotiate all corners, turns, etc., in the path to its final installation location.

E. Contractors will provide their own extension cords, hoses, etc. as required for their work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pavement: Comply with requirements in Pavement Sections.

B. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) (9 gage) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails. Include gates for both personnel and trucks with locks held under strict security control.

C. Materials for Temporary Work: Lumber, plywood, gypsum board, insulation, paints, etc. required for temporary work shall comply with corresponding specification sections and applicable codes and regulations of in effect at the Project location by authorities having jurisdiction.

D. Temporary Floor Protections: Provide Heavy-Duty temporary floor protection (Ram Board or Equal) under all work areas.

2.02 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile unit(s) with adequate space, suitably furnished, with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Contractors Field Office: General Contractor will provide adequate office space for field office personnel, suitably finished, furnished, equipped, and conditioned.

C. Storage and Fabrication Sheds: The Contractor shall provide suitable storage facilities at the site for the proper protection and safe storage of his materials. Such storage facilities must be approved in advance in writing by the Architect.
   1. Store combustible materials apart from building.

D. Other Contractors requiring storage facilities will supply their own and located where approved by the Architect.

E. All materials delivered to the premises which are to form a part of the work are to be considered the property of the Owner and must not be removed without the Owner's consent; but the Contractor shall remove all surplus materials upon completion of each phase of the work and as directed by the Architect.

2.03 FIRE PROTECTION PROVISIONS

A. Fire Extinguishers: Provide Fire protection equipment during the entire construction period as required by the authority having jurisdiction of types, sizes, numbers, and locations as would be reasonably effective in extinguishing fires during early stages, by personnel at Project site. Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures. Post warning and quick instructions at each extinguisher location, and instruct personnel at Project site, at time of their first arrival, on proper use of extinguishers and other available facilities at Project site. Post local fire department call number on each telephone instrument at Project site.

2.04 TEMPORARY UTILITY SERVICES

A. The types of services required include, but not by way of limitation, sewers and drainage, water, sanitary, heat (and cooling), ventilation (and humidity control), electrical power, lighting, or telephones and electronic communication service. Where possible and reasonable, connect to existing franchised utilities for required services; and comply with service companies' recommendations on materials and methods, or engage service companies to install services. Locate and relocate services (as necessary) to minimize interference with construction operations.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sanitary Facilities: Provide temporary self-contained toilet units with provisions to remove effluent lawfully, wash facilities, and drinking water with cups for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

C. TEMPORARY WATER SERVICE:
   1. Water Service: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
      a. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

D. TEMPORARY HEATING SERVICE:
   1. Provide heat for working areas as soon as the building is generally enclosed by roof and walls.
   2. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   3. Provide adequate heat by the use and maintenance of vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control. and maintain a minimum temperature of 40 degrees F. and once plaster, spackling and/or painting work begins, a minimum temperature of 55 degrees F. within the enclosed area of the building at all times, and removal of same when no longer required. The Contractor shall be responsible for prevention of freeze-ups following enclosure of the building. Remove soot, smudges, residue, and other deposits from ceilings, walls and all other exposed surfaces resulting from the use of heating equipment. Finish work shall not commence until work areas are properly cleaned. Provide supervision of heaters, at no additional cost, at all times prior to start up of permanent heating system. Provide and pay for all fuel and related equipment maintenance.
   4. Ventilation and Humidity Control: Provide temporary ventilation (heating and cooling) required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

E. TEMPORARY ELECTRIC SERVICE:
   1. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.
   2. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

a. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

F. Telephone Service: Contractor shall provide temporary telephone service in common-use facilities for use by all construction personnel. Install (4) four telephone line(s) for each field office except as otherwise indicated.
   1. Provide additional telephone lines for the following:
      a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
      b. Provide telephone lines as previously indicated at the Field Office for Owner Personnel.
   2. At each telephone, post a list of important telephone numbers.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Architect's office.
      e. Engineers' offices.
      f. Owner's office.
      g. Principal subcontractors' field and home offices.
   3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

G. Electronic Communication Service: Contractor shall provide temporary electronic communication service, including electronic mail, in common-use facilities.
   1. Provide DSL in primary field office.

3.03 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for emergency and fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

D. Project Identification and Temporary Signs: Contractor shall provide Project identification and other signs as indicated on drawings. Install signs where indicated or directed to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted. Engage an experienced sign painter to paint graphics on sign as indicated. Construct sign of treated wood framing and posts, and 3/4” plywood panels of exterior type Grade B-C sanded 2 sides. No other signs will be permitted at the Site. Remove the project identification and temporary signs at the completion of the project.
   1. Provide project identification sign showing name of the Project, Owner, Architect, Engineers, and Contractor(s).
   2. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
   1. The Contractor shall provide waste-collection containers for use by all construction personnel to deposit all rubbish, debris, boxes, crates, etc. The Contractor shall remove and properly dispose of the contents of the waste-collection containers as necessary to keep the progress of the job moving.
   2. The Contractor shall maintain the construction areas as clean as the progress of the work will permit.
      a. The Contractor will clean up all its waste materials, rubbish and debris on a daily basis.
      b. The Contractor will place its waste materials, rubbish and debris outside of building in the waste-collection containers on a daily basis.
      c. The Contractor will broom clean the building a minimum of once a week.
      d. The Contractor will be responsible to keep the public streets, roadway access, construction area, etc. clean and free of debris, mud, snow, ice, materials, etc. at all times during the entire period of construction. If the Contractor does not adhere to this requirement, the Owner will engage a water power sweeping contractor to thoroughly clean the area and will back charge the Contractor for all costs involved.
   3. Upon Substantial Completion, the Contractor shall completely clean the entire Project. The cleaning shall include, but is not limited to, cleaning of all surfaces, finishes, equipment, fixtures, sidewalks, driveway, parking lots, etc. The building and grounds and surrounding areas shall be left in a condition acceptable to the Owner.

3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Contractor shall provide facilities, establish procedures, and conduct construction activities in a manner which will ensure compliance with Owner's environmental impact statement and other regulations controlling construction activities at Project site. Contractor shall designate one person, the Construction Superintendent or other, to enforce strict discipline on activities related to generation of wastes, pollution of air/water/soil, generation of noise, and similar harmful or deleterious effects which might violate regulations or reasonably irritate persons at or in vicinity of Project site and will be responsible to maintain acceptable environmental conditions at all times during the construction period.
   2. Contractor shall provide filtering systems, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Maintain a minimum of 0.1 inches of water, negative pressure from point of enclosure. General Contractor shall provide exhaust from a location as remote as possible from unaltered areas. The point of exhaust shall be a minimum of 25 feet from any air intake or building opening in compliance with regulations as established by the environmental protection agency and applicable governmental and local requirements.

3. Contractor shall apply and pay for all necessary environmental permits as required.

B. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Covered Walkway: Contractor shall erect structurally adequate, protective, covered walkway for passage of individuals along adjacent public street(s), sidewalks. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and any requirements indicated on Drawings. Provide protective measures as required to provide free and safe passage of occupants and general public to and from occupied portions of the building. Maintain exits in a manner that is acceptable to the Local Building Official.
   1. Construct covered walkways using scaffold or shoring framing.
   2. Provide wood-plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
   3. Extend back wall beyond the structure to complete enclosure fence.
   4. Paint and maintain in a manner approved by Owner and Architect.

E. Temporary Enclosures: Contractor shall provide temporary enclosures for protection of all new and existing construction, interior and exterior effected by scope of work, in progress and completed, from exposure, foul weather and unsatisfactory ambient conditions, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior at all times during construction. Damage and/or leaks effecting existing materials and/or equipment within an existing building resulting from inadequate temporary enclosure materials and methods are the responsibility of the Contractor to remedy and replace to the satisfaction of the Architect.
   1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
   2. Use fire-retardant treated lumber and plywood. Provide tarpaulins and UL label and flame spread of 15 or less; provide translucent type (nylon reinforced polyethylene) where daylighting of enclosed space would be beneficial for workmanship, and reduce use of temporary lighting.

F. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
   1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
   2. Construct dustproof partitions with 2 layers of 3-mil (0.07-mm) polyethylene sheet on each side. Cover floor with 2 layers of 3-mil (0.07-mm) polyethylene sheet, extending sheets 18 inches (460 mm) up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.
      a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.
   3. Insulate partitions to provide noise protection to occupied areas.

4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
5. Protect air-handling equipment.
6. Construct temporary dustproof closures to open ends of ductwork and equipment until such time as systems are ready for use or till substantial completion.
7. Weather strip openings.
8. Provide walk-off mats at each entrance through temporary partition.

G. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in hazardous fire-exposure and construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Fire Extinguishers: Provide portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

3.05 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of the Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Closeout Procedures.

END OF SECTION 015000

SECTION 015639 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the protection and trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent construction.

B. Related Requirements:
   1. Section 015000 - Temporary Facilities and Controls for temporary controls, utilities, support facilities, temporary site fencing, and, if applicable, temporary erosion and sedimentation controls if not specified in Section 311000 - Site Clearing.

1.03 DEFINITIONS

A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

C. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

C. Qualification Data: For tree service firm and arborist.

D. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

1.05 QUALITY ASSURANCE

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of tree protection and trimming.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.

C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
   1. Before tree protection and trimming operations begin, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, and other concerned entities to review tree protection and trimming procedures and responsibilities.

PART 2 PRODUCTS

2.01 MATERIALS

A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.

B. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and toxic and other nonsoil materials.
   1. Obtain topsoil only from well-drained sites where topsoil is 4 inches deep or more; do not obtain from bogs or marshes.

C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

D. Chain-Link Fence: Metallic-coated steel chain-link fence fabric of 0.120-inch- diameter wire; a minimum of 48 inches high; with 1.9-inch- diameter line posts; 2-3/8-inch-diameter terminal and corner posts; 1-5/8-inch- diameter top rail; and 0.177-inch-diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

E. Organic Mulch: Wood and bark chips, free of deleterious materials.

PART 3 EXECUTION

3.01 PREPARATION

A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.

1. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Mulch areas within drip line of trees to remain and other areas indicated.
   1. Apply 3-inch average thickness of organic mulch. Do not place mulch within 6 inches of tree trunks.

D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.

E. Maintain tree protection zones free of weeds and trash.

F. Do not allow fires within tree protection zones.

G. Trees with a diameter of 6 inches or greater cannot be removed or disturbed between the dates of April 1 and September 30.

3.02 EXCAVATION

A. Install shoring or other protective support systems to minimize sloping or benching of excavations.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.
   1. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction.
   2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

D. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.
   1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.03 REGRADING

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond tree protection zones. Maintain existing grades within tree protection zones.

B. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist, unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

C. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

D. Moderate Fill: Where existing grade is more than 6 inches but less than 12 inches below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
   1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
   2. Place filter fabric with edges overlapping 6 inches minimum.
   3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.04 TREE PRUNING

A. Prune trees to remain that are affected by temporary and permanent construction.

B. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.

C. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
   1. Type of Pruning: Cleaning.
   2. Specialty Pruning: Restoration.

D. Cut branches with sharp pruning instruments; do not break or chop.

E. Chip removed tree branches and dispose of off-site.

3.05 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.

B. Remove and replace trees indicated to remain that die or are damaged during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.
   1. Provide new trees of same size and species as those being replaced; plant and maintain as specified in Division 32 Section "Plants."
   2. Provide new trees of 6-inch caliper size and of a species selected by Architect when damaged trees more than 6 inches in caliper size, measured 12 inches above grade, are required to be replaced. Plant and maintain new trees as specified in Division 22 Section "Plants."

C. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch- diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.06 DISPOSAL OF WASTE MATERIALS

A. Burning is not permitted.

B. Disposal: Remove excess excavated material and displaced trees from Owner's property.

END OF SECTION 015639

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and equivalent products.

B. Related Requirements:
   1. Section 011000 - Summary for Contractor requirements related to Owner-furnished products.
   2. Section 012100 - Allowances for products selected under an allowance.
   3. Section 012500 - Substitution Procedures for requests for substitutions.
   4. Section 014200 - References for applicable industry standards for products specified.
   5. Section 017700 - Closeout Procedures for submitting warranties.

1.03 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
   3. Equivalent Product: Product by named manufacturer that is demonstrated and approved through the equivalent product submittal process described in Part 2 "Equivalent Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," or ‘approved equal” including make or model number or other designation. Published

attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Equivalent Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating equivalent products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating equivalent products.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a equivalent product request or substitution request, if applicable.

D. Equivalent Product Request Submittal: An action submittal requesting consideration of a equivalent product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in Part 2 "Equivalent Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 - Submittal Procedures.

F. Substitution: Refer to Section 012500 - Substitution Procedures for definition and limitations on substitutions.

1.04 QUALITY ASSURANCE

A. Equivalency of Options: If Contractor is given option of selecting between two or more products for use on Project, select product equivalent with products previously selected, even if previously selected products were also options.

B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
    a. Name of product and manufacturer.
    b. Model and serial number.
    c. Capacity.

d. Speed.
e. Ratings.

1.05 COORDINATION

A. Modify or adjust affected work as necessary to integrate work of approved equivalent products and approved substitutions.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:
   1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
   2. Store products to allow for inspection and measurement of quantity or counting of units.
   3. Store materials in a manner that will not endanger Project structure.
   4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
   5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
   6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
   7. Protect stored products from damage and liquids from freezing.

1.07 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
   1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
   1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
   2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
   3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 PRODUCTS

2.01 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
   1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
   2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
   3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
   4. Where products are accompanied by the term "as selected," Architect will make selection.
   5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
   6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Equivalent Products" Article to obtain approval for use of an unnamed product.
      a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.

B. Product Selection Procedures:
   1. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
      a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
      b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.

2. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
    a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
    b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a equivalent product. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Equivalent Products" Article for consideration of an unnamed product by one of the other named manufacturers.
    a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 - Substitution Procedures for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
    1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 - Substitution Procedures for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
    1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.02 EQUIVALENT PRODUCTS

A. Conditions for Consideration of Equivalent Products: Architect will consider Contractor's request for equivalent product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
    1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

B. Architect's Action on Equivalent Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 013300 - Submittal Procedures.
1. Form of Approval of Submittal: As specified in Section 013300 - Submittal Procedures.
2. Use product specified if Architect does not issue a decision on use of a equivalent product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by the Architect of Contractor's request for use of equivalent product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 EXECUTION (NOT USED)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
   1. Construction layout.
   2. Installation of the Work.
   3. Alterations.
   4. Cutting and patching.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.

B. Related Requirements:
   1. Section 011000 - Summary for coordination of Owner-furnished products, Owner-performed work, Owner's separate contracts, and limits on use of Project site.
   2. Section 013300 - Submittal Procedures for submitting surveys.
   3. Section Professional Surveyor 017700 - Closeout Procedures for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.03 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.04 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor or professional engineer licensed in the state the Project is located.

B. Certified Surveys: Submit two copies signed by land surveyor or professional engineer licensed in the state the Project is located.

C. Certificates: Submit certificate signed by land surveyor or professional engineer licensed in the state the Project is located, certifying that location and elevation of improvements comply with requirements.

D. Cutting and Patching Plan: Submit plan describing procedures at least (10) ten days prior to the time cutting and patching will be performed. Include the following information:
   1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
   2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
   3. Products: List products to be used for patching and firms or entities that will perform patching work.
   4. Dates: Indicate when cutting and patching will be performed.
   5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
      a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
   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.

E. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.05 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Professional Engineer Qualifications: Refer to Section 014000 - Quality Requirements.

C. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
   1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
   2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include, but are not limited to the following:
      a. Primary operational systems and equipment.
      b. Fire separation assemblies.
      c. Air or smoke barriers.
      d. Fire-suppression systems.

e. Plumbing piping systems.
f. Mechanical systems piping and ducts.
g. Control systems.
h. Communication systems.
i. Fire-detection and -alarm systems.
j. Conveying systems.
k. Electrical wiring systems.
l. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
   a. Water, moisture, or vapor barriers.
   b. Membranes and flashings.
   c. Exterior curtain-wall construction.
   d. Sprayed fire-resistive material.
   e. Equipment supports.
   f. Piping, ductwork, vessels, and equipment.
   g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
5. Provide comprehensive GPRS ground penetrating radar scanning and detection services prior to drilling and cutting to locate electrical and plumbing utilities below the concrete slabs before cutting or coring.

D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

E. 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 or compromise existing warranties.

PART 2 PRODUCTS

2.01 MATERIALS

A. Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

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 Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
   1. Where existing services and/or systems are required to be removed, relocated, or abandoned, whether shown on drawings or not, bypass such services and/or systems before cutting to prevent interruption to the fullest extent possible to occupied areas.

2. Prior to cutting and patching work, survey and locate utilities, structural elements and hazards using location/detection equipment. Submit a written report to the Architect describing the nature and extent of any conflicts with the intended function or design of the work. Do not proceed until conflicts are resolved.

E. Remove debris and abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring from concealed and exposed spaces. Prepare surfaces and remove surface finishes to provide for proper installation of new work and new finishes.

F. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

G. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

H. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 - Project Management and Coordination.

3.03 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.

B. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

C. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.04 FIELD ENGINEERING

A. Identification: Owner will identify existing benchmarks, control points, and property corners if not specifically identified in the Site/Civil documents.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

3.05 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb, and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
   4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.
   1. Comply with Section 017700 - Closeout Procedures for repairing or removing and replacing defective Work.

3.06 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 indicated.
    2. Report discrepancies to Architect before disturbing existing installation.
    3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
    1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 - Temporary Facilities and Controls in locations indicated on drawings.
    2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
    1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
    2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.

D. Remove existing work as indicated and as required to accomplish new work.
    1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
    2. Remove items indicated on drawings.
    3. Relocate items indicated on drawings.
    4. 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.
    5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunication): 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. See Section 011000 - Summary for other limitations on outages and required notifications.
        c. 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.

F. 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.

G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
   4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

H. 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.

I. 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.

J. Clean existing systems and equipment.

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

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

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

3.07 CUTTING AND PATCHING

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. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. 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.

D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 - Summary.

E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will 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, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
   4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

G. Cleaning: Clean areas and spaces where cutting and patching are performed, immediately after work is performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.08 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
   2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Use containers intended for holding waste materials of type to be stored.
   4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 - Temporary Facilities and Controls and/or Section 017419 - Construction Waste Management and Disposal.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.09 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 - Quality Requirements.

3.10 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Salvaging nonhazardous demolition and construction waste.
   2. Recycling nonhazardous demolition and construction waste.
   3. Disposing of nonhazardous demolition and construction waste.

1.03 DEFINITIONS

A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.

C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition and construction waste become property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
   1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 30 days after notice to proceed.

1.06 INFORMATIONAL SUBMITTALS

A. Qualification Data: For waste management coordinator and/or refrigerant recovery technician.

1.07 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.

B. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.

1.08 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
    1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work in compliance with Section 024119 "Selective Demolition."
    2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
    3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
    4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
    5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
    6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there were 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 transportation and tipping fees and cost of collection containers and handling for each type of waste.
   3. Total cost of disposal (with no waste management).
   4. Revenue from salvaged materials.
   5. Revenue from recycled materials.
   6. Savings in transportation and tipping fees by donating materials.
   7. Savings in transportation and tipping fees that are avoided.
   8. Handling and transportation costs. Include cost of collection containers for each type of waste.
   9. Net additional cost or net savings from waste management plan.

PART 2 PRODUCTS

2.01 RECYCLING RECEIVERS AND PROCESSORS

A. Provide information on local, available recycling receivers and processors:

2.02 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including but not limited to the following:
   1. Demolition Waste:
      a. Asphalt paving.
      b. Concrete.
      c. Concrete reinforcing steel.
      d. Brick.
      e. Concrete masonry units.
      f. Wood studs.
      g. Wood joists.
      h. Plywood and oriented strand board.
      i. Wood paneling.
      j. Wood trim.
      k. Structural and miscellaneous steel.
      l. Rough hardware.
      m. Roofing.
      n. Insulation.
      o. Doors and frames.
      p. Door hardware.
      q. Windows.
      r. Glazing.
      s. Metal studs.

t. Gypsum board.
u. Acoustical tile and panels.
v. Carpet.
w. Carpet pad.
x. Demountable partitions.
y. Equipment.
z. Cabinets.
aa. Plumbing fixtures.
bb. Piping.
cc. Supports and hangers.
dd. Valves.
ee. Sprinklers.
ff. Mechanical equipment.
gg. Refrigerants.
hh. Electrical conduit.
ii. Copper wiring.
jj. Lighting fixtures.
kk. Lamps.
ll. Ballasts.
mm. Electrical devices.
nn. Switchgear and panelboards.
oo. Transformers.

2. Construction Waste:
   a. Masonry and CMU.
   b. Lumber.
   c. Wood sheet materials.
   d. Wood trim.
   e. Metals.
   f. Roofing.
   g. Insulation.
   h. Carpet and pad.
   i. Gypsum board.
   j. Piping.
   k. Electrical conduit.
   l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
      1) Paper.
      2) Cardboard.
      3) Boxes.
      4) Plastic sheet and film.
      5) Polystyrene packaging.
      6) Wood crates.
      7) Wood pallets.
      8) Plastic pails.
   m. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:

1) Paper.
2) Aluminum cans.
3) Glass containers.

PART 3 EXECUTION

3.01 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
   1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
   1. Distribute waste management plan to everyone concerned within (3) three days of submittal return.
   2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
   2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

D. Waste Management in Historic Zones or Areas: Transportation equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, by 12 inches or more.

3.02 SALVAGING DEMOLITION WASTE

A. Comply with requirements in Section 024119 "Selective Demolition" for salvaging demolition waste.

B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
   3. Store items in a secure area until installation.
   4. Protect items from damage during transport and storage.
   5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

C. Salvaged Items for Sale and Donation: Not permitted on Project site.

D. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.03 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall acrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
   1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
      a. Inspect containers and bins for contamination and remove contaminated materials if found.
   2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
   4. Store components off the ground and protect from the weather.
   5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.04 RECYCLING DEMOLITION WASTE

A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch size.

B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
   1. Pulverize concrete to maximum 1-1/2-inch size.

D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
   1. Pulverize masonry to maximum 1-inch size.
   2. Clean and stack undamaged, whole masonry units on wood pallets.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

J. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.

K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
   1. Store clean, dry carpet and pad in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

L. Carpet Tile: Remove debris, trash, and adhesive.
   1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

M. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.

N. Conduit: Reduce conduit to straight lengths and store by material and size.

O. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

3.05 RECYCLING CONSTRUCTION WASTE

A. Packaging:
   1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
   2. Polystyrene Packaging: Separate and bag materials.
   3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
   4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:
   1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
   2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
   1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

D. Paint: Seal containers and store by type.

3.06 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
    1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
    2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.

B. Related Requirements:
   1. Section 012900 - Payment Procedures for requirements for Applications for Payment for Substantial Completion and Final Completion.
   2. Section 013233 - Photographic Documentation for submitting Final Completion construction photographic documentation.
   3. Section 015000 - Temporary Facilities and Controls
   4. Section 017300 - Execution
   5. Section 017419 - Construction Waste Management and Disposal
   6. Section 017823 - Operation and Maintenance Data for additional operation and maintenance manual requirements.
   7. Section 017839 - Project Record Documents for submitting Record Drawings, Record Specifications, and Record Product Data.
   8. Section 017900 - Demonstration and Training for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.03 DEFINITIONS

A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of cleaning agent.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.05 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest-control inspection.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.07 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of (10) ten days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
   3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect's. Label with manufacturer's name and model number.
      a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.
   5. Submit testing, adjusting, and balancing records.
   6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of (10) ten days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
   1. Advise Owner of pending insurance changeover requirements.
   2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   3. Complete startup and testing of systems and equipment.
   4. Perform preventive maintenance on equipment used prior to Substantial Completion.

5. Advise Owner of changeover in utility services.
6. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
8. Complete final cleaning requirements.
9. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of (10) ten days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
   1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

1.08 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
   1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
   2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit Consent of Surety for Final Payment.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

C. Complete and submit to Architect “Ready for Closeout” form included as part of the Project Manual.

1.09 LIST OF INCOMPLETE ITEMS

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction

including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.
4. Submit list of incomplete items in the following format:
    a. PDF Electronic File: Architect will return annotated file.

1.10 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
    1. Submit on digital media acceptable to Architect, by email to Architect, or by uploading to web-based project software site.
    2. Original Warranties and Bond documents with raised seals shall be forwarded to the Architect for delivery to the Owner.

D. Warranties in Paper Form:
    1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
    2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
    3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.01 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Remove snow and ice to provide safe access to building.
    f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
    i. Vacuum and mop concrete.
    j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    l. Remove labels that are not permanent.
    m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
r. Clean strainers.
s. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 015000 - Temporary Facilities and Controls Prepare written report.

D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 - Temporary Facilities and Controls and/or Section 017419 - Construction Waste Management and Disposal.

3.02 REPAIR OF THE WORK

A. Complete repair and restoration operations required by Section 017300 - Execution before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory manuals.
   2. Emergency manuals.
   3. Systems and equipment operation manuals.
   4. Systems and equipment maintenance manuals.
   5. Product maintenance manuals.

B. Related Requirements:
   1. Section 013300 - Submittal Procedures for submitting copies of submittals for operation and maintenance manuals.
   2. Section 019113 - General Commissioning Requirements for verification and compilation of data into operation and maintenance manuals.

1.03 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.04 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
   1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
   2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operation and maintenance manuals in the following format:
   1. Submit on digital media acceptable to Architect, or by email to Architect, or by uploading to web-based project software site. Enable reviewer comments on draft submittals.

C. Initial Manual Submittal: Submit draft copy of each manual at least (30) thirty days before commencing demonstration and training. Architect[and Commissioning Authority] will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least (15) fifteen days before commencing demonstration and training. Architect will return copy with comments.
   1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within (15) fifteen days of receipt of Architect's comments and prior to commencing demonstration and training.

E. Comply with Section 017700 - Closeout Procedures for schedule for submitting operation and maintenance documentation.

1.05 FORMAT OF OPERATION AND MAINTENANCE MANUALS

A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
   1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
   2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

1.06 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.
   3. Manual contents.

B. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for Architect.
   7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
   8. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
    1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.07 EMERGENCY MANUALS

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. Content: Organize manual into a separate section for each of the following:
    1. Type of emergency.
    2. Emergency instructions.
    3. Emergency procedures.

C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
    1. Fire.
    2. Flood.
    3. Gas leak.
    4. Water leak.
    5. Power failure.
    6. Water outage.
    7. System, subsystem, or equipment failure.
    8. Chemical release or spill.

D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

E. Emergency Procedures: Include the following, as applicable:
    1. Instructions on stopping.
    2. Shutdown instructions for each type of emergency.
    3. Operating instructions for conditions outside normal operating limits.
    4. Required sequences for electric or electronic systems.
    5. Special operating instructions and procedures.

1.08 SYSTEMS AND EQUIPMENT OPERATION MANUALS

A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
   1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
   2. Performance and design criteria if Contractor has delegated design responsibility.
   3. Operating standards.
   4. Operating procedures.
   5. Operating logs.
   6. Wiring diagrams.
   7. Control diagrams.
   8. Piped system diagrams.
   9. Precautions against improper use.
   10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:
   1. Product name and model number. Use designations for products indicated on Contract Documents.
   2. Manufacturer's name.
   3. Equipment identification with serial number of each component.
   4. Equipment function.
   5. Operating characteristics.
   6. Limiting conditions.
   7. Performance curves.
   8. Engineering data and tests.
   9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:
   1. Startup procedures.
   2. Equipment or system break-in procedures.
   3. Routine and normal operating instructions.
   4. Regulation and control procedures.
   5. Instructions on stopping.
   6. Normal shutdown instructions.
   7. Seasonal and weekend operating instructions.
   8. Required sequences for electric or electronic systems.
   9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.09 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
   1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
   2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
   1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
      a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
   2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
   3. Identification and nomenclature of parts and components.
   4. List of items recommended to be stocked as spare parts.

E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
   1. Test and inspection instructions.
   2. Troubleshooting guide.
   3. Precautions against improper maintenance.
   4. Disassembly; component removal, repair, and replacement; and reassembly instructions.

5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   1. Include procedures to follow and required notifications for warranty claims.

J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
   1. Do not use original project record documents as part of maintenance manuals.

1.10 PRODUCT MAINTENANCE MANUALS

A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

D. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   4. Material and chemical composition.
   5. Reordering information for specially manufactured products.

E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.

4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
   1. Record Drawings.
   2. Record specifications.
   3. Record Product Data.
   4. Miscellaneous record submittals.

B. Related Requirements:
   1. Section 017300 - Execution for final property survey.
   2. Section 017700 - Closeout Procedures for general closeout procedures.
   3. Section 017823 - Operation and Maintenance Data for operation and maintenance manual requirements.

1.03 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:
   1. Number of Copies: Submit copies of Record Drawings as follows:
      a. Initial Submittal:
         1) Submit PDF electronic files of scanned record prints and one set of file prints.
         2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
      b. Final Submittal:
         1) Submit PDF electronic files of scanned Record Prints and one set of file prints.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.

1.04 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.
    e. Cross-reference record prints to corresponding photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made by Change Order or Construction Change Directive.
    k. Changes made following Architect's written orders.
    l. Details not on the original Contract Drawings.
    m. Field records for variable and concealed conditions.
    n. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect . When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file with comment function enabled.
2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
3. Refer instances of uncertainty to Architect for resolution.
4. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
    a. See Section013100 - Project Management and Coordination for requirements related to use of Architect's digital data files.

C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Identification: As follows:
    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

1.05 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
    1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
    2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
    3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
    4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
    5. Note related Change Orders and Record Drawings where applicable.

B. Format: Submit record specifications as annotated PDF electronic files.

1.06 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
    1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
    2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
    3. Note related Change Orders and Record Drawings where applicable.

C. Format: Submit Record Product Data as annotated PDF electronic files.
    1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.07 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of

the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic files.
   1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.08 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.
   3. Demonstration and training video.

1.03 SUBMITTALS

A. Instruction Program: Submit (2) two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module, no less than 10 days prior to the anticipated date of the Demonstration and Training. Include learning objective and outline for each training module.
   1. At completion of training, submit (2) two complete training manual(s) for Owner's use.

B. Qualification Data: For Instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Demonstration and Training Video on DVD: Submit (2) two copies within (7) seven days of end of each training module.
   1. Identification: On each copy, provide an applied label with the following information:
      a. Name of Project.
      b. Name of Architect.
      c. Name of Contractor.
      d. Date videotape was recorded.
      e. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures and training.

1.05 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 PRODUCTS

2.01 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment, including, but not limited to, the following types of systems as provided:
   1. Motorized doors, including overhead coiling doors, overhead coiling grilles, and automatic entrance doors.
   2. Equipment, including stage equipment, projection screens, loading dock equipment, waste compactors, food-service equipment, residential appliances, and laboratory fume hoods.
   3. Electrically operated solar shades equipment and controls.
   4. Fire-protection systems, including fire alarm, fire pumps, and fire-extinguishing systems.
   5. Intrusion detection systems.
   6. Conveying systems, including elevators, wheelchair lifts, escalators, and cranes.
   7. Laboratory equipment, including laboratory air and vacuum equipment and piping.
   8. Heat generation, including boilers, feedwater equipment, pumps, and steam distribution piping.
   9. Plumbing systems, including fixtures, pumps, and water distribution piping.
   10. Refrigeration systems, including chillers, cooling towers, condensers, pumps, and distribution piping.
   11. HVAC systems, including air-handling equipment, air distribution systems, and terminal equipment and devices.
   12. HVAC instrumentation and controls.
   13. Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies, and motor controls.
   14. Packaged engine generators, including transfer switches.
   15. Lighting equipment and controls.
   16. Communication systems, including intercommunication, surveillance, clocks and programming, voice and data, and television equipment.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
   1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
      a. System, subsystem, and equipment descriptions.

b. Performance and design criteria if Contractor is delegated design responsibility.
c. Operating standards.
d. Regulatory requirements.
e. Equipment function.
f. Operating characteristics.
g. Limiting conditions.
h. Performance curves.

2. Documentation: Review the following items in detail:
   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project Record Documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
   l. Required sequences for electric or electronic systems.
   m. Special operating instructions and procedures.
5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.

c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.
h. Instructions on methods and material agents known to be detrimental and to be avoided.

8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 EXECUTION

3.01 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

B. Set up instructional equipment at instruction location.

3.02 SCHEDULING

A. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
   1. Schedule training with Owner, through Architect in accordance with requirements outlined in Section 1 above.

B. The Owner shall not be liable for any additional costs related to rescheduling of training, provided that they gave a minimum of 48 hours notice to the Contractor of the need to reschedule a Demonstration and Training Event.

3.03 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Owner will furnish Contractor with names and positions of participants, no less than 3 days prior to the training event.

3.04 DEMONSTRATION AND TRAINING VIDEO ON DVD

A. General: Engage a qualified photographer to record demonstration and training videos. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
   1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video Format: Provide high-quality DVD color.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

END OF SECTION 017900

SECTION 019113 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with Contract Documents and the manufacturer’s recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Provider are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Owner’s operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion.

C. The Commissioning Provider directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Provider's responsibilities.

D. The Commissioning Provider is employed by Owner.

1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:

B. HVAC System, including:
   1. Major and minor equipment items.
   2. Piping systems and equipment.
   3. Terminal units.
   4. Control system.
   5. Variable frequency drives.

C. Integrated Automation.

D. Electronic Safety and Security:
   1. Security system, including doors and hardware.
   2. Fire and smoke alarms.

E. Communications:
   1. Voice and data systems.
   2. Public address/paging.

F. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

A. Section 017800 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Provider, unless they require review by Architect; in that case, submit to Architect first.
   2. Submit one copy to the Commissioning Provider, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Provider.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Provider in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable .rtf or .docx electronic format.
   5. As soon as possible after submittals made to Architect are approved, submit copies of approved submittals to Commissioning Provider.

B. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
   1. Manufacturer's product data, cut sheets, and shop drawings.
   2. Manufacturer's installation instructions.
   3. Startup, operating, and troubleshooting procedures.
   4. Fan and pump curves.
   5. Factory test reports.
   6. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.

C. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.

D. Startup Plans and Reports.

E. Completed Prefunctional Checklists.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:

1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F and resolution of plus/minus 0.1 degree F.
2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.
3. Calibration: According to the manufacturer's recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
1. Dataloggers required for Functional Tests will be provided by the Commissioning Provider and will not become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

A. Commissioning Provider has prepared the Commissioning Plan.
1. Attend meetings called by the Commissioning Provider for purposes of completing the commissioning plan.
2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Provider within 60 days after award of contract.
2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
4. Provide sufficient notice to Commissioning Provider for delivery of relevant Checklists and Functional Test procedures to avoid delay.

3.02 STARTUP PLANS AND REPORTS

A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.

B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

C. Submit directly to the Commissioning Provider.

3.03 PREFUNCTIONAL CHECKLISTS

A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer’s start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.

B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Provider is not required unless otherwise specified.
   1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
   2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
   3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
   4. If any Checklist line item is not relevant, record reasons on the form.
   5. Contractor may independently perform startup inspections and/or tests, at Contractor's option.
   6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
   7. Submit completed Checklists to Commissioning Provider within 2 days of completion.

C. Commissioning Provider is responsible for furnishing the Prefunctional Checklists to Contractor.
   1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in Contract Documents.

2. Provide all additional information requested by Commissioning Provider to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
3. Commissioning Provider may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in Contract Documents or not.
4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Provider Witnessing: Required for:
1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
1. If difficulty in correction would delay progress, report deficiency to the Commissioning Provider immediately.

3.04 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Provider is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Provider will document the deficiency and the Contractor's stated intentions regarding correction.
1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with Contract Documents or does not perform properly.
2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Provider; the Commissioning Provider will reschedule the test, and the Contractor shall re-test.
3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
4. Contractor shall bear the cost of Owner and Commissioning Provider personnel time witnessing re-testing.
5. Contractor shall bear the cost of Owner and Commissioning Provider personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:

1. Some test procedures are included in Contract Documents; where Functional Test procedures are not included in Contract Documents, test procedures will be determined by the Commissioning Provider with input by and coordination with Contractor.
2. Examples of Functional Testing:
    a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
    b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.
    c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.
    d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Provider is Functional Testing.

F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

3.05 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gauges, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Architect beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate, and final results.

C. All Sensors:
1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
2. Verify that sensors with shielded cable are grounded only at one end.
3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:
1. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
2. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.

3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.
   1. Disconnect sensor.
   2. Connect a signal generator in place of sensor.
   3. Connect ammeter in series between transmitter and building automation system control panel.
   4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
   5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
   6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
   7. Record all values and recalibrate controller as necessary to comply with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
   8. Reconnect sensor.
   9. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
   10. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
   11. If not, replace sensor and repeat.
   12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
   1. Watthour, Voltage, Amperage: 1 percent of design.
   2. Pressure, Air, Water, Gas: 3 percent of design.
   3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F.
   4. Relative Humidity: 4 percent of design.
   5. Barometric Pressure: 0.1 inch of Hg.
   6. Flow Rate, Air: 10 percent of design.
   7. Flow Rate, Water: 4 percent of design.
   8. AHU Wet Bulb and Dew Point: 2.0 degrees F.

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:
   1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
   2. Set pump/fan to normal operating mode.
   3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
   4. Command valve/damper to open; verify position is full open and adjust output signal as required.
   5. Command valve/damper to a few intermediate positions.
   6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
   1. With full pressure in the system, command valve closed.
   2. Use an ultra-sonic flow meter to detect flow or leakage.

3.06 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
   1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
   2. Sampling is not allowed for:
      a. Major equipment.
      b. Life-safety-critical equipment.
      c. Prefunctional Checklist execution.
   3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
   4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
   5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
   6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
   7. If YY percent of the units in the second sample fail, test all remaining identical units.
   8. If frequent failures occur, the Commissioning Provider may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:
   1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Provider's request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
   2. Other points will be monitored by the Commissioning Provider using dataloggers.
   3. At the option of the Commissioning Provider, some control system monitoring may be replaced with datalogger monitoring.
   4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
   5. Graphical output is desirable and is required for all output if the system can produce it.
   6. Monitoring may be used to augment manual testing.

3.07 OPERATION AND MAINTENANCE MANUALS

A. See Section 017800 - Closeout Submittals for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Provider for review; make changes recommended by Commissioning Provider.

D. Commissioning Provider will add commissioning records to manuals after submission to Owner.

END OF SECTION 019113

RT Environmental Services, Inc.

February 14, 2025

Mr. Dominic Sambucci
Atlantic Cape Community College
5100 Black Horse Pike
Mays Landing, New Jersey 08330
Phone: (609) 230-9642
Email: dsambucc@atlantic.edu

RE: ASBESTOS CONTAINING MATERIALS SURVEY REPORT
ATLANTIC CAPE COMMUNITY COLLEGE - MAYS LANDING CAMPUS
5100 BLACK HORSE PIKE, BUILDING E
MAYS LANDING, ATLANTIC COUNTY, NEW JERSEY
RT PROJECT # 81125-20

Dear Mr. Sambucci:

RT Environmental Services, Inc. (RT) is pleased to present the results of the Asbestos Containing Materials (ACM) Survey conducted for the above-referenced property. RT was retained by Atlantic Cape Community College to complete these services in accordance with RT's proposal #25-0033, dated January 17, 2025.

RT understands the ACM survey was requested in connection with the proposed renovation of the above-referenced building. Given the future renovation plans for the building, RT made all reasonable efforts to identify and sample all suspect ACMs in the building in accordance with the U.S. Environmental Protection Agency's (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations. NESHAP requires a thorough inspection of institutional, commercial, and industrial buildings in those instances where demolition or renovation activities will occur.

FINDINGS

The following materials were identified to contain asbestos:

- **Gray Floor Tile (12"x12") and Associated Black Mastic** - Approximately 480 square feet of asbestos containing floor tile and associated mastic were observed in Rooms 104, 110, and 112 of the subject building.
- **Plaster Ceilings** - Approximately 430 square feet of asbestos containing plaster ceilings were observed in Rooms 102, 103, 105, 111, and 113 of the subject building.
- **Gray Window Caulk** - Approximately 120 linear feet of asbestos containing gray window caulk was observed in Rooms 104, 105, 106, 110, 111, and 112 of the subject building.

- **Pipe Insulation Elbows and Joints** - Approximately 5 pipe insulation elbows and joints were observed above the drop ceiling in Room E101 of the subject building. There is the potential for additional pipe insulation elbows and joints to be present above the drop ceiling throughout the subject building.

Additionally, 5 fire doors observed throughout the subject building were assumed to be asbestos containing. All identified ACMs appeared to be in good condition. No other ACMs were identified as part of this ACM survey.

RECOMMENDATIONS

RT recommends that the identified ACMs be properly abated prior to any renovation or demolition activities. If no renovation activities are planned, ACMs should be managed under an appropriate Operations and Maintenance (O & M) Plan. All removal activities should be completed by a licensed asbestos abatement contractor and should occur in coordination with proper project oversight, technical supervision, and air monitoring, in accordance with EPA and NJAC 5:23-8 regulations.

During renovation activities, there is the potential for additional quantities of suspect ACMs to become evident which may not have been previously visible or accessible. Should this occur, RT recommends that a licensed building inspector be contacted immediately to evaluate the suspect materials and collect representative samples, if warranted. RT recommends that this evaluation occur prior to continuation of any renovation activities which have the potential to impact the newly encountered material.

RT appreciates the opportunity to be of service to Atlantic Cape Community College on this project. Please contact us if you have any questions.

Respectfully,

RT Environmental Services, Inc.



Justin Lauterbach, QEP, LSRP
President

RT Environmental Services, Inc.

ASBESTOS CONTAINING MATERIALS SURVEY REPORT

ATLANTIC CAPE COMMUNITY COLLEGE - MAYS LANDING CAMPUS
5100 BLACK HORSE PIKE, BUILDING E
MAYS LANDING, ATLANTIC COUNTY, NEW JERSEY 08330

RT PROJECT # 81125-20

PREPARED FOR:

MR. DOMINIC SAMBUCCI
ATLANTIC CAPE COMMUNITY COLLEGE
5100 BLACK HORSE PIKE
MAYS LANDING, NEW JERSEY 08330

SUBMITTED BY:

RT ENVIRONMENTAL SERVICES, INC.
215 W. CHURCH ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406

FEBRUARY 14, 2025

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1.0 EXECUTIVE SUMMARY

RT was retained by Atlantic Cape Community College to perform an Asbestos Containing Materials (ACM) Survey of the subject building located at 5100 Black Horse Pike, Building E, Mays Landing, Atlantic County, New Jersey, 08330.

The subject building is approximately 18,145-sq. ft., one-story, and slab on grade with a block construction. The subject building was unoccupied during the inspection. RT was informed that the subject building is planned to be renovated. A Subject Building Location Map is included as Figure 1 and an existing floor plan for the subject building is provided as Figure 2.

The purpose of the investigation and sampling was to determine the presence and estimated quantity of all visible and accessible ACMs in the subject building. Given the future renovation plans for the building, RT made all reasonable efforts to identify and sample all suspect ACMs in the subject building in accordance with the U.S. Environmental Protection Agency's (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations. NESHAP requires a thorough inspection of institutional, commercial, and industrial buildings in those instances where demolition or renovation activities will occur.

The ACM survey was conducted by a licensed building inspector on February 10, 2025 and a total of 65 suspect ACMs were collected in accordance with EPA sampling guidelines. Building material samples were collected from 29 homogeneous areas, as determined by the building inspector. The samples were analyzed by polarized light microscopy (PLM). The U.S. Environmental Protection Agency (EPA) and the U.S. Occupational Safety and Health Administration (OSHA) define an ACM as any material containing greater than one percent of asbestos.

The following ACMs (>1% asbestos) were identified during the survey:

- **Gray Floor Tile (12"x12") and Associated Black Mastic** - Approximately 480 square feet of asbestos containing floor tile and associated mastic were observed in Rooms 104, 110, and 112 of the subject building.
- **Plaster Ceilings** - Approximately 430 square feet of asbestos containing plaster ceilings were observed in Rooms 102, 103, 105, 111, and 113 of the subject building.
- **Gray Window Caulk** - Approximately 120 linear feet of asbestos containing gray window caulk was observed in Rooms 104, 105, 106, 110, 111, and 112 of the subject building.
- **Pipe Insulation Elbows and Joints** - Approximately 5 pipe insulation elbows and joints were observed above the drop ceiling in Room E101 of the subject building. There is the potential for additional pipe insulation elbows and joints to be present above the drop ceiling throughout the subject building.

Additionally, 5 fire doors observed throughout the subject building were assumed to be asbestos containing. All identified ACMs appeared to be in good condition. No other ACMs were identified as part of this ACM survey.

RT recommends that the identified ACMs be properly abated prior to any renovation or demolition activities. If no renovation activities are planned, ACMs should be managed under an appropriate Operations and Maintenance (O & M) Plan. All removal activities should be completed by a licensed asbestos abatement contractor and should occur in coordination with proper project oversight, technical supervision, and air monitoring, in accordance with EPA and NJAC 5:23-8 regulations.

During renovation activities, there is the potential for additional quantities of suspect ACMs to become evident which may not have been previously visible or accessible. Should this occur, RT recommends that a licensed building inspector be contacted immediately to evaluate the suspect materials and collect representative samples, if warranted. RT recommends that this evaluation occur prior to continuation of any renovation activities which have the potential to impact the newly encountered material.

2.0 REGULATORY GUIDELINES

2.1 DEFINITIONS AND GUIDELINES

ACM Definition

The EPA and OSHA consider a material to be asbestos-containing if at least one sample from the homogeneous area shows asbestos in an amount greater than 1%.

Point Count Quantification

If a material is found to contain 10% or less asbestos via visual estimation, it can be treated as non-asbestos-containing per EPA Regulations, if verified to contain 1% or less asbestos by the Point Count Quantification Procedure. If not point counted, a sample in which asbestos was visually detected and estimated (including trace to ≤1%) must be assumed to be greater than 1% and treated as ACM.

EPA National Emission Standards for Hazardous Air Pollutants (NESHAP)

EPA classifies ACM into several categories.

- A regulated asbestos-containing material (RACM) as defined by the Asbestos National Emissions Standard for Hazardous Air Pollutants (NESHAP) is:
    - Friable asbestos material,
    - Category I non-friable ACM that has becomes friable,
    - Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or
    - Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.
- A Category I Non-friable ACM includes packings, gaskets, resilient floor covering, and asphalt roofing products which contain more than one percent asbestos.
- A Category II Non-friable ACM includes any material, except for a Category I non-friable ACM, which contains more than one-percent asbestos and cannot be reduced to a powder by hand pressure when dry.

OSHA

The Occupational Safety and Health Administration (OSHA) requires all suspect materials to be

analyzed by layer, even materials such as drywall/joint compound, which may sometimes be composited per the EPA. If any layer contains asbestos in a concentration >1%, the material is considered an ACM.

OSHA has a classification system (Class I through Class IV) for ACM depending on the type of material and the disturbance. The classification system is summarized below:

- Class I work is defined as activities involving the removal of ACM or presumed ACM (PACM) that is thermal system insulation (TSI) and surfacing materials.
- Class II activities involve removal of ACM/PACM other than TSI or surfacing material.
- Class III work includes repair and maintenance operations which are likely to disturb ACM/PACM, and
- Class IV work includes maintenance and custodial activities during which employees contact but do not disturb ACM/PACM.

Materials where asbestos is detected, but where point counting is conducted and determined that the concentration is ≤1% asbestos, are not considered to be ACM by OSHA. However, these materials are considered unclassified asbestos work per OSHA. Some OSHA work control practices and prohibitions will still apply, with the extent depending on whether the worker's exposure to airborne asbestos exceeds the OSHA permissible exposure limit (PEL). Additional details of the OSHA asbestos regulations related to the construction industry can be found in 29 CFR part 1926.1101.

Quantification

Quantification of suspect asbestos-containing materials was conducted using visual estimation by a licensed asbestos inspector. This visual estimation was performed in accordance with generally accepted practices in the asbestos industry based on materials that were accessible and exposed. These values are sufficiently accurate for the purpose of documenting the presence of asbestos within its space for the purpose of identifying abatement control conditions or for general policy considerations. Actual quantities may differ between visually estimated values and physical measurements. If a licensed asbestos abatement contractor is engaged to remove asbestos containing materials, the abatement contractor is responsible for verifying reported quantities of ACM.

3.0 INTRODUCTION

3.1 SCOPE OF SERVICES

The scope of services for this project consisted of conducting an ACM survey which included an inspection, sampling, and PLM analysis of accessible suspect ACMs at the subject building. The ACM survey included the interior and exterior of the subject building, including the roof. The purpose of this survey was to identify and sample suspect ACMs which could potentially be damaged or disturbed during planned renovation activities. Authorization to perform this work was given on January 28, 2025 by Mr. Dominic Sambucci for Atlantic Cape Community College. This survey was conducted in accordance with the terms and conditions of RT's proposal number 25-0033.

3.2 RELIANCE

RT has prepared this ACM Survey report solely for the benefit of Atlantic Cape Community College. RT has issued the ACM Survey report to this entity and grants the right to rely on the contents of this Report.

No third party, other than Atlantic Cape Community College and its creditor, financial or insurance underwriter, shall have the right to rely on the RT opinions rendered in connection with these services without obtaining the written consent of RT. Any reliance is conditioned upon Atlantic Cape Community College, and any third party's, agreement to be bound to RT's General Terms and Conditions along with the limitations identified in this Report. It should be also be noted that RT's consent to provide additional reliance on this ACM Survey report will be further subject to Atlantic Cape Community College's approval.

3.3 LIMITATIONS

The purpose of this ACM survey was to identify and sample suspect ACMs to determine whether or not they meet the EPA definition of ACM. EPA defines an ACM as any material containing greater than 1% asbestos. Survey work has been completed in general accordance with federal, state, and local regulations and accepted professional practices as applied by professionals in the community.

Sampling of suspect ACMs is destructive by its very nature in that a portion of the building must be cut/cored and removed for laboratory analysis. RT makes all reasonable efforts to restore and/or patch the identified material to the extent possible; however, RT is not responsible for restoring the sampled materials to their pre-sampling condition.

Depending on the scope of work detailed in RT's proposal, the client may have requested that the building roof system be evaluated and sampled for asbestos. As part of roof sampling procedures, it becomes necessary to cut/core into the roofing materials and penetrate down to

the roof decking or underlying substrate. In these instances, RT will repair the roof by applying temporary patching at the sample locations, as indicated in RT's proposal. In the event that RT is authorized to conduct roof sampling, it is assumed that RT's client has obtained permission from the building owner to conduct such sampling, and the client and owner understand that the bulk sampling of the roofing materials by cutting/coring into the roof may void the warranty of the roofing currently in effect. RT recommends that the sampled locations be permanently patched/ repaired by a qualified professional roofing contractor and/or a roofing contractor approved by the current warranty holder. RT is not responsible for leaks or damage to the roof as a result of the sample locations not being permanently patched/sealed. If the roof is not sampled due to client request, roofing will be assumed to contain asbestos until at which time roof sampling is able to be conducted. Due to the destructive nature of roof sampling, RT does not warrant a watertight condition following sample extraction.

The Building Inspector completed a survey of interior and exterior building components and identified those suspect ACMs which were visible and readily accessible. No demolition of building materials, or disassembly of building components, was performed as part of this inspection unless otherwise noted. Potential ACMs that may be concealed within structural components, and would only be accessible through extensive mechanical or structural demolition, were not included in the scope of this ACM survey unless otherwise noted. Destructive sampling and sampling behind finished surfaces, such as plaster or wallboard, hard ceilings, mechanical chases, inside chimneys or stacks, etc. is generally not conducted as part of an initial ACM survey.

During renovation and demolition activities, there is the potential for additional quantities of suspect ACMS to become evident which may not have been previously visible or accessible. Should this occur, RT recommends that a licensed building inspector be contacted immediately to evaluate the suspect materials and collect representative samples, if warranted. RT recommends that this evaluation occur prior to continuation of any renovation/demolition activities which have the potential impact the newly encountered material.

This report describes existing conditions at the time of the inspection. Conditions of ACM may change as a result of damage, deterioration, or other disturbance and may increase the potential for a release of asbestos fibers.

This ACM Survey report is not an asbestos abatement specification, and quantities of materials listed in this report are estimates only. Should the owner, or client, wish to perform asbestos abatement activities, RT recommends that an additional site inspection be conducted with a licensed abatement contractor to identify appropriate methods for abatement and confirm the quantities of the identified ACMs.

4.0 BUILDING & INSPECTION INFORMATION

4.1 BUILDING INFORMATION

Subject Building Address	5100 Black Horse Pike, Building E, Mays Landing, New Jersey 08330
Building Type & Construction	Slab on grade, block construction
Number of Floors	One story with no basement
Total Square Feet of Space (approximate)	18,145
Approximate Construction Date (year)	Late 1960s
Current Tenant(s)	Atlantic Cape Community College
Current Use(s)	The subject building is currently utilized as a gymnasium and by office personnel

4.2 INSPECTION INFORMATION

RT Building Inspector(s)	Nick Lippincott, P.G.
License/Certification #	064086
Date of Inspection	February 10, 2025

Inspector qualifications are provided in Appendix 1.

5.0 METHODOLOGY

Inspection and sampling procedures were performed in general accordance with the guidelines published by EPA in 40 Code of Federal Regulations (CFR) Part 763. Survey and inspection activities were completed by an EPA certified and Pennsylvania licensed building inspector.

5.1 ASBESTOS VISUAL INSPECTION PROCEDURES

A walkthrough of the subject building was initially conducted to identify those suspect ACMs which were visible and accessible.

Materials which were similar in color, texture, general appearance, and which appear to have been installed at the same time, were grouped into homogeneous sampling areas. Such materials are termed "homogeneous materials" by the EPA. During the walkthrough, the approximate locations of these homogeneous materials were noted.

Sampling locations were chosen to be representative of each homogeneous sampling area. While an effort was made to collect samples randomly, samples were taken from areas already damaged, or those areas which were least visible to minimize disturbance of the material. The inspector determined whether the materials were friable or non-friable by touching the material, where practical. A friable material is defined as any material able to be crushed, crumbled, pulverized, or reduced to a powder by hand pressure when dry.

Samples were then collected by coring through the material from the surface down to the base of the substrate. All layers of the material were placed into a sample container for transportation to a certified laboratory. Sample containers were sealed and labeled with a unique sample identification number.

In some cases, suspect materials may be identified by the building inspector which are known to meet the definition of ACM. Additionally, there may be materials which are unable to be sampled, such as interior boiler components, gaskets, electrical wire insulation, etc. In these cases, EPA recommends that the building inspector not attempt to sample these materials and identify them as materials assumed to be ACM. Any "assumed" materials identified during RT's inspection are listed in Section 6.1.

A total of 65 samples of suspect ACMs were collected from 29 homogeneous materials in the subject building. The samples were analyzed by PLM. A list of the identified homogenous areas and specific samples collected as part of this survey is provided in Table 1. Categories of suspect ACMs identified and sampled as part of this survey include the following:

- Cove base and associated mastics
- Floor tile and associated mastics

- Ceiling tile
- Plaster ceiling
- Pipe insulation/wrapping
- Window caulk
- Drywall and associated joint compound
- Roof layers
- Roof Tar

Roofing materials were sampled from the subject building by coring through the roof system to the base deck material. RT applied a temporary patch to the roof core location following sample extraction. Due to the destructive nature of roof sampling, RT does not warrant a watertight condition following sample extraction.

5.2 ASBESTOS ANALYSIS PROCEDURES

All samples were submitted to EMSL Analytical, Inc. (EMSL), an National Voluntary Laboratory Accreditation Program (NVLAP) Certified laboratory located in Plymouth Meeting, Pennsylvania (NVLAP #200699-0). EMSL is certified to perform asbestos analysis in both Pennsylvania and New Jersey, and throughout the United States. A copy of the Laboratory's Accreditation Certificate is included in Appendix 2.

Building material samples were submitted to the laboratory for analysis of total asbestos content by polarized light microscopy (PLM) method in accordance with the "EPA Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93/116 July 1993). Analysis is performed by visually assessing the bulk building material samples with a stereoscope followed by slide preparation for microscopic examination and identification of individual asbestos fibers. Samples of individual homogenous areas submitted for PLM analysis were analyzed on a "positive-stop" basis (i.e. if the first sample analyzed in a set shows a positive ACM result, the additional samples are not analyzed and the material is deemed ACM).

The asbestos detection limit for the PLM procedure is approximately 1% by area. PLM is the primary methodology used to determine asbestos fiber concentration in bulk building materials. The EPA method allows samples which are visually determined to have less than 10% asbestos to be quantified using a point count procedure approved by EPA. Point counting provides a more accurate quantification of the percent asbestos by area in a particular material/sample. Point count results supersede the results of the initial PLM visual estimation. Homogeneous materials that have point count results of 1% or less asbestos are considered non-ACM.

6.0 FINDINGS

6.1 ASBESTOS LABORATORY RESULTS

A total of 65 samples of suspect ACMs were collected from 29 homogeneous materials in the subject building. The samples were analyzed by PLM. The EPA and OSHA define an ACM as any material containing greater than 1% asbestos.

The following ACMs (>1% asbestos) were identified during the survey:

- Gray floor tile (12"x12") located in Rooms 104, 110, and 112 of the subject building, approximately 480 square feet, homogenous area #3
- Black mastic (associated with gray floor tile above) located in Rooms 104, 110 and 112 of the subject building, approximately 480 square feet, homogenous area #4
- Plaster ceilings located in Rooms 102, 103, 105, 111, and 113 of the subject building, approximately 430 square feet, homogenous area #6
- Gray window caulk located in Rooms 104, 105, 106, 110, 111, and 112 of the subject building, approximately 120 linear feet, homogenous area #8
- Pipe insulation elbows and joints located above drop ceiling in Room E101 of the subject building, quantities could not be confirmed during the inspection, homogenous area #10

Room numbers referenced above correspond with the subject building floor plan that is provided as Figure 2. All other samples collected as part of this survey were non-detect for asbestos. Additionally, approximately 5 fire doors were observed throughout the subject building and were assumed to be asbestos containing. A summary of the laboratory analytical results is presented in Table 1. The table also provides the description of the materials sampled, their general location, and estimated quantities.

The laboratory analytical report and chain of custody are included in Appendix 3, and site photographs are included in Appendix 4.

7.0 CONCLUSIONS & RECOMMENDATIONS

7.1 CONCLUSIONS

Results of the ACM survey indicate the following:

- Approximately 480 square feet of asbestos containing gray floor tile and associated black mastic were observed in Rooms 104, 110, and 112 of the subject building.
- Approximately 430 square feet of asbestos containing plaster ceilings were observed in Rooms 102, 103, 105, 111, and 113 of the subject building.
- Approximately 120 linear feet of asbestos containing gray window caulk was observed in Rooms 104, 105, 106, 110, 111, and 112 of the subject building.
- Approximately 5 pipe insulation elbows and joints were observed above drop ceiling in Room E101 of the subject building. There is the potential for additional pipe insulation elbows and joints to be present above the drop ceiling throughout the subject building.

Additionally, 5 fire doors observed throughout the subject building were assumed to be asbestos containing. All identified ACMs appeared to be in good condition. No other ACMs were identified as part of this ACM survey.

7.2 RECOMMENDATIONS

RT recommends that the identified ACMs be properly abated prior to any renovation or demolition activities. If no renovation activities are planned, ACMs should be managed under an appropriate O & M Plan. All removal activities should be completed by a licensed asbestos abatement contractor and should occur in coordination with proper project oversight, technical supervision, and air monitoring, in accordance with EPA and NJAC 5:23-8 regulations.

During renovation activities, there is the potential for additional quantities of suspect ACMs to become evident which may not have been previously visible or accessible. Should this occur, RT recommends that a licensed building inspector be contacted immediately to evaluate the suspect materials and collect representative samples, if warranted. RT recommends that this evaluation occur prior to continuation of any renovation activities which have the potential to impact the newly encountered material.

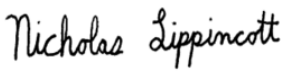
8.0 REPORT INFORMATION

8.1 CERTIFICATION

To the best of my knowledge, I believe that all contracted environmental work described in this report were completed in full compliance with applicable laws and regulations governing the work.

RT appreciates the opportunity to be of service to Atlantic Cape Community College on this project. Please contact us if you have any questions.

Report Prepared by:



Nick Lippincott, P.G., Building Inspector #064086
Project Manager

Report Reviewed by:



Justin Lauterbach, QEP, LSRP, Building Inspector #053041
President

FIGURE 1 SUBJECT BUILDING LOCATION MAP

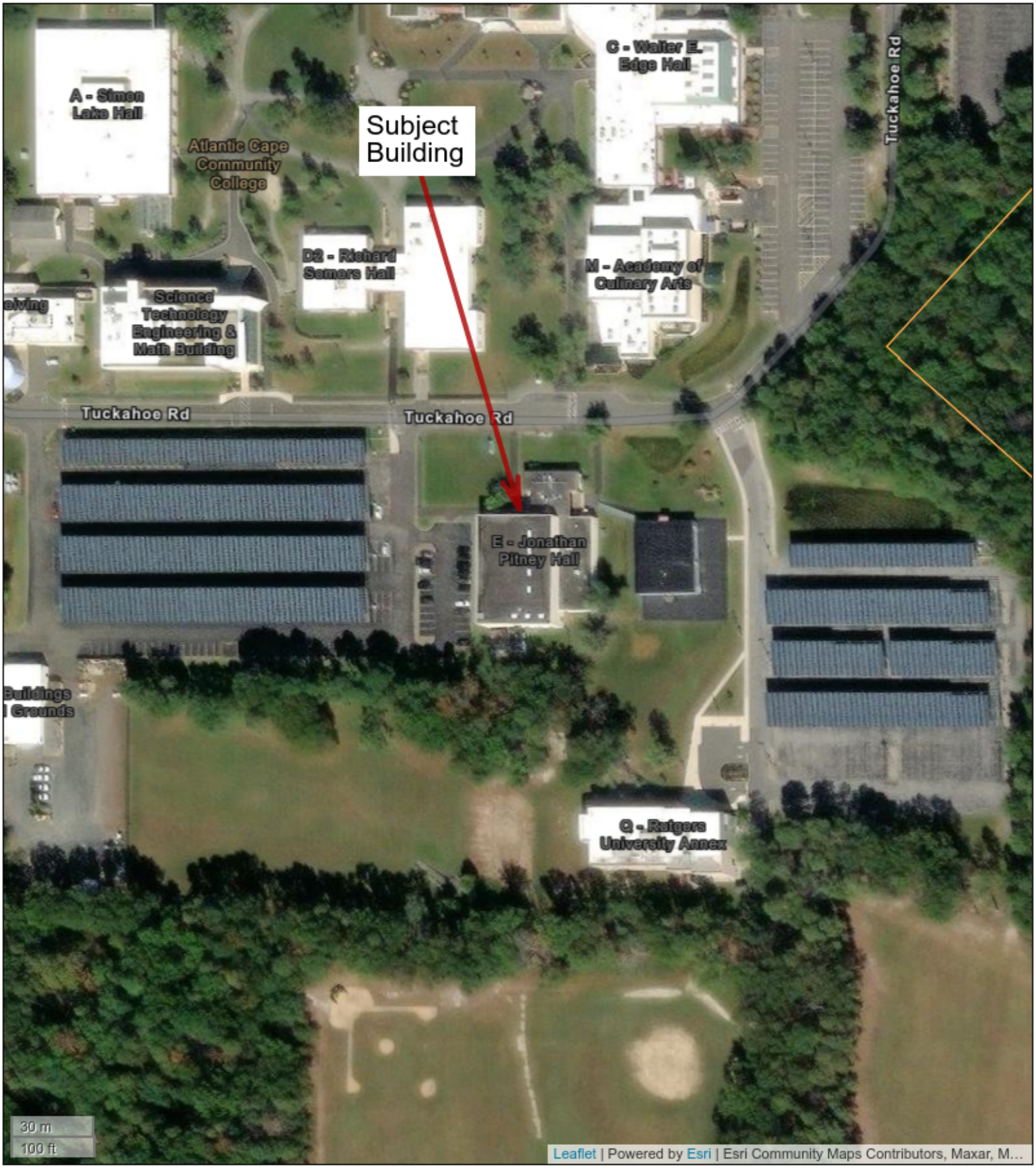


Figure 1: Subject Building Location Map

5100 Black Horse Pike, Building E
Mays Landing, New Jersey 08330
RT Project No. 81125-20

FIGURE 2 SUBJECT BUILDING FLOOR PLAN

5. Assemble outside with your department

6. Follow Fire Department instructions

"E" Building

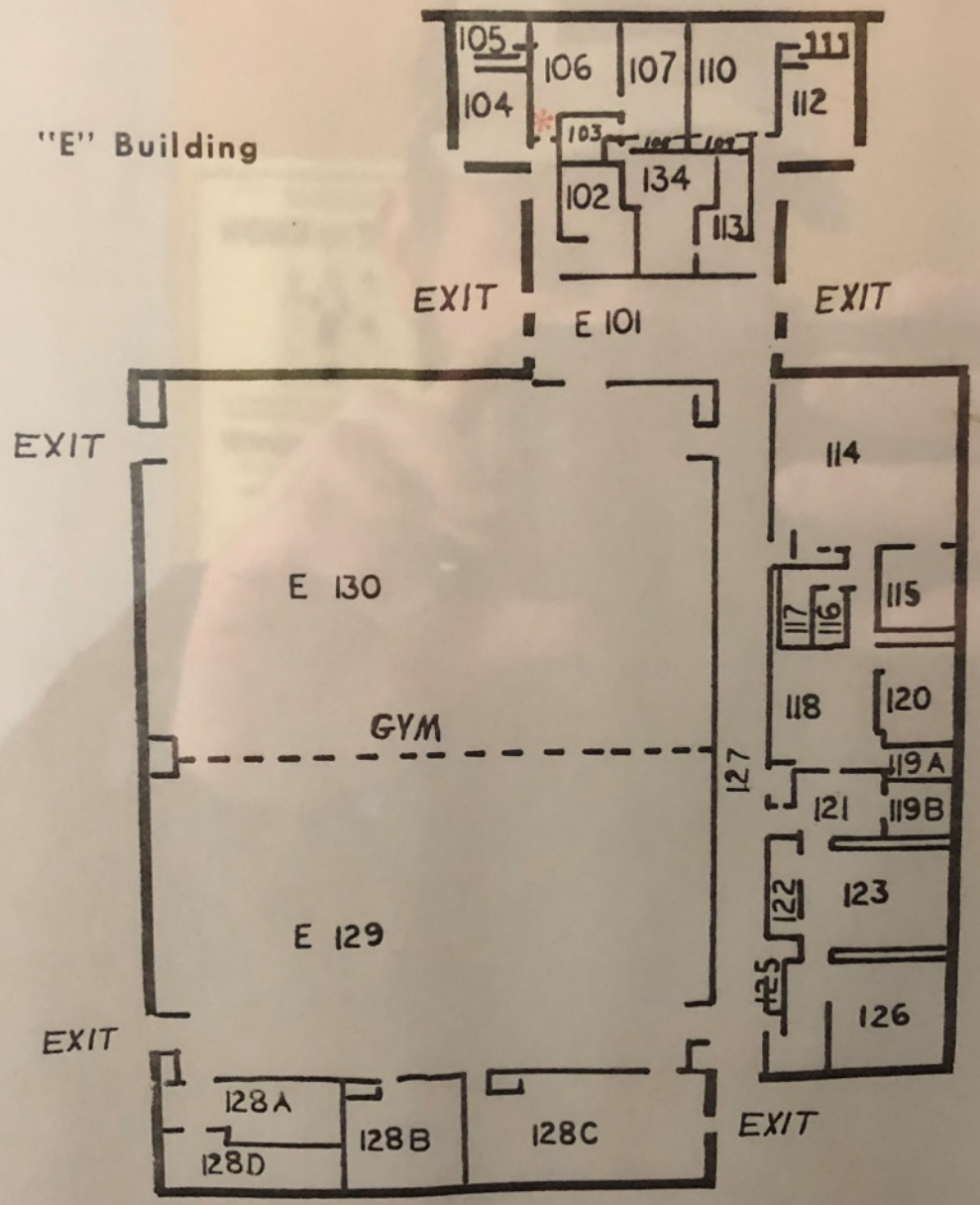


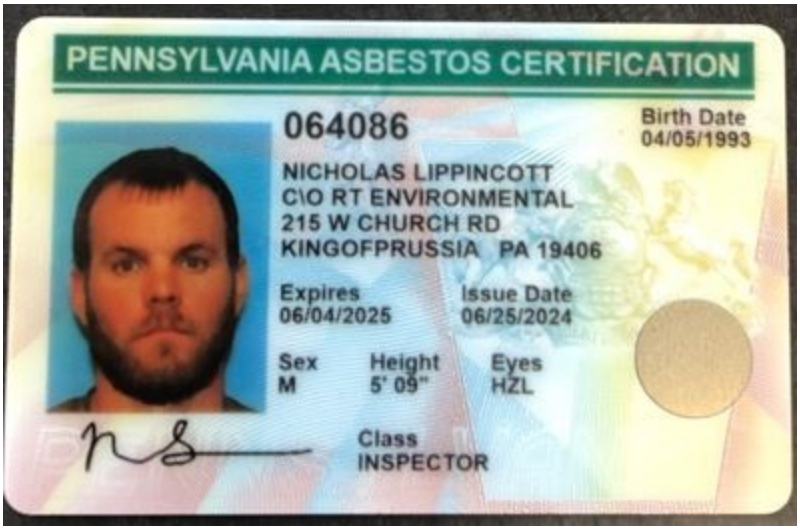
TABLE 1 ACM ANALYTICAL RESULTS

TABLE 1
ACM ANALYTICAL RESULTS
ACCC MAYS LANDING
5100 BLACK HORSE PIKE, BUILDING E
MAYS LANDING, NEW JERSEY 08330
RT PROJECT #81125-20

Sample #	Homogenous Group #	Sample Location	Sample Description	Asbestos (% and Type)	Quantity
001	1	Room 104	Tan Cove Base	ND	-
002				ND	-
003	2		Brown Mastic	ND	-
004				ND	-
005	3		Gray Floor Tile (12"x12")	**2% Chrysotile**	**480 SF**
006				*	
007	4		Black Mastic	**15% Chrysotile**	
008				*	
009	5		Ceiling Tile (2'x4')	ND	-
010				ND	-
011	6	Room 105	Plaster (Ceiling)	**3% Chrysotile**	**65 SF**
012	7	Room 106	Pipe Wrapping	ND	-
013				ND	-
014				ND	-
015	8		Gray Window Caulk	**2% Chrysotile**	**120 LF**
016				*	
017	9	Room 107	White Sink Undercoat	ND	-
018				ND	-
019	6	Room 103	Plaster (Ceiling)	*	**54 SF**
020		Room 102		*	**150 SF**
021	10	Room 101	Pipe Insulation Elbows	**3% Chrysotile**	**Note 1**
022				*	**-**
023				*	**-**
024	6	Room 113	Plaster (Ceiling)	*	**98 SF**
025	11	Room 109	Ceiling Tile (2'x2')	ND	-
026				ND	-
027	12	Room 110	White Floor Tile (12"x12")	ND	-
028				ND	-
029	13		Yellow Mastic	ND	-
030				ND	-
031	14		Blue Floor Tile (12"x12")	ND	-
032				ND	-
033	15		Brown Cove Base	ND	-
034				ND	-
035	16		Gray Mastic	ND	-
036				ND	-
037	6	Room 111	Plaster (Ceiling)	*	**60 SF**
038	17	Room 114	White Cove Base	ND	-
039				ND	-
040	18		White Mastic	ND	-
041				ND	-
042	19		White Speckled Floor Tile (12"x12")	ND	-
043				ND	-
044	20		Yellow Mastic	ND	-
045				ND	-
046	21	Rooms 115 - 117	Pink Cove Base	ND	-
047				ND	-
048	22	Room 127	Ceiling Tile (Squares)	ND	-
049				ND	-
050	23	Gym	Black Cove Base	ND	-
051				ND	-
052	24		Tan Mastic	ND	-
053				ND	-
054	25	Room 131	Drywall	ND	-
055				ND	-
056				ND	-
057	26		Joint Compound	ND	-
058				ND	-
059				ND	-
060	27	Room 130	White Cove Base	ND	-
061				ND	-
062	28	Exterior	Roof Layers	ND	-
063				ND	-
064	29		Roof Tar	ND	-
065				ND	-

Notes:
Note 1: Pipe insulation elbows could not be quantified at the time of the inspection
Sample results in bold contain asbestos
* = Positive Stop
ND = Not Detected
SF = Square Feet
LF =Linear Feet

APPENDIX 1 INSPECTOR LICENSE


PENNSYLVANIA ASBESTOS CERTIFICATION
064086
Birth Date
04/05/1993
NICHOLAS LIPPINCOTT
C\O RT ENVIRONMENTAL
215 W CHURCH RD
KINGOFPRUSSIA PA 19406
Expires
06/04/2025
Issue Date
06/25/2024
Sex
M
Height
5' 09"
Eyes
HZL
Class
INSPECTOR

APPENDIX 2 LABORATORY ACCREDITATION CERTIFICATE

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200699-0

EMSL Analytical, Inc.

Plymouth Meeting, PA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).

2025-01-01 through 2025-12-31

Effective Dates

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

EMSL Analytical, Inc.
5221 Militia Hill Road
Plymouth Meeting, PA 19462
Mr. Kevin Ream
Phone: 610-828-3102
Email: kream@emsl.com
http://www.emsl.com

ASBESTOS FIBER ANALYSIS **NVLAP LAB CODE 200699-0**

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

APPENDIX 3 LABORATORY ANALYTICAL REPORT AND CHAIN OF CUSTODY

EMSL Analytical, Inc.

5221 Militia Hill Road Plymouth Meeting, PA 19462

Tel/Fax: (610) 828-3102 / (610) 828-3122

http://www.EMSL.com / plymouthmeetinglab@emsl.com

EMSL Order:	182500661
Customer ID:	RTES49
Customer PO:	81125-20-01
Project ID:	

Attention:	Nicholas Lippincott	**Phone:**	(610) 265-1510
	RT Environmental Services, Inc.	**Fax:**	(610) 265-0687
	215 W Church Road	**Received Date:**	02/10/2025 2:25 PM
	Suite 301	**Analysis Date:**	02/11/2025 - 02/13/2025
	King Of Prussia, PA 19406	**Collected Date:**	02/10/2025
Project:	ACCC-MAYS LANDING-BLDG E ACM SURVEY		

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
001 *182500661-0001*	ROOM 104 - TAN COVE BASE	Tan Non-Fibrous Homogeneous	HA: 1	100% Non-fibrous (Other)	None Detected
002 *182500661-0002*	ROOM 104 - TAN COVE BASE	Tan Non-Fibrous Homogeneous	HA: 1	100% Non-fibrous (Other)	None Detected
003 *182500661-0003*	ROOM 104 - BROWN MASTIC	Brown Non-Fibrous Homogeneous	HA: 2	100% Non-fibrous (Other)	None Detected
004 *182500661-0004*	ROOM 104 - BROWN MASTIC	Brown Non-Fibrous Homogeneous	HA: 2	100% Non-fibrous (Other)	None Detected
005 *182500661-0005*	ROOM 104 - GREY FLOOR TILE	Gray Non-Fibrous Homogeneous	HA: 3	98% Non-fibrous (Other)	**2% Chrysotile**
006 *182500661-0006*	ROOM 104 - GREY FLOOR TILE		HA: 3		**Positive Stop (Not Analyzed)**
007 *182500661-0007*	ROOM 104 - BLACK MASTIC	Black Non-Fibrous Homogeneous	HA: 4	85% Non-fibrous (Other)	**15% Chrysotile**
008 *182500661-0008*	ROOM 104 - BLACK MASTIC		HA: 4		**Positive Stop (Not Analyzed)**
009 *182500661-0009*	ROOM 104 - CEILING TILE (9'X1')	Brown Fibrous Homogeneous	40% Cellulose 30% Glass HA: 5	30% Non-fibrous (Other)	None Detected
010 *182500661-0010*	ROOM 104 - CEILING TILE (9'X1')	Gray Non-Fibrous Homogeneous	45% Cellulose 26% Glass HA: 5	29% Non-fibrous (Other)	None Detected
011 *182500661-0011*	ROOM 105 - PLASTER	White Non-Fibrous Homogeneous	HA: 6	97% Non-fibrous (Other)	**3% Chrysotile**
012 *182500661-0012*	ROOM 106 - PIPE WRAPPING	Tan/Black Non-Fibrous Homogeneous	70% Cellulose HA: 7	30% Non-fibrous (Other)	None Detected

Initial report from: 02/13/2025 17:24:13

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Tel/Fax: (610) 828-3102 / (610) 828-3122
http://www.EMSL.com / plymouthmeetinglab@emsl.com

EMSL Order:	182500661
Customer ID:	RTES49
Customer PO:	81125-20-01
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
013 *182500661-0013*	ROOM 106 - PIPE WRAPPING	Tan Non-Fibrous Homogeneous	50% Cellulose 20% Glass HA: 7	30% Non-fibrous (Other)	None Detected
014 *182500661-0014*	ROOM 106 - PIPE WRAPPING	Tan Non-Fibrous Homogeneous	50% Cellulose HA: 7	50% Non-fibrous (Other)	None Detected
015 *182500661-0015*	ROOM 106 - GRAY WINDOW CAULK	Gray Non-Fibrous Homogeneous	HA: 8	98% Non-fibrous (Other)	**2% Chrysotile**
016 *182500661-0016*	ROOM 106 - GRAY WINDOW CAULK		HA: 8		**Positive Stop (Not Analyzed)**
017 *182500661-0017*	ROOM 107 - WHITE SINK UNDERCOAT	White Non-Fibrous Homogeneous	20% Cellulose HA: 9	80% Non-fibrous (Other)	None Detected
018 *182500661-0018*	ROOM 107 - WHITE SINK UNDERCOAT	White Non-Fibrous Homogeneous	30% Cellulose HA: 9	70% Non-fibrous (Other)	None Detected
019 *182500661-0019*	ROOM 103 - PLASTER		HA: 6		**Positive Stop (Not Analyzed)**
020 *182500661-0020*	ROOM 102 - PLASTER		HA: 6		**Positive Stop (Not Analyzed)**
021 *182500661-0021*	ROOM 101 - PIPE INSULATION ELBOW	Gray Non-Fibrous Homogeneous	50% Glass HA: 10	47% Non-fibrous (Other)	**3% Chrysotile**
022 *182500661-0022*	ROOM 101 - PIPE INSULATION ELBOW		HA: 10		**Positive Stop (Not Analyzed)**
023 *182500661-0023*	ROOM 101 - PIPE INSULATION ELBOW		HA: 10		**Positive Stop (Not Analyzed)**
024 *182500661-0024*	ROOM 113 - PLASTER		HA: 6		**Positive Stop (Not Analyzed)**
025 *182500661-0025*	ROOM 109 - CEILING TILE (2'X2')	Gray Fibrous Homogeneous	60% Glass HA: 11	40% Non-fibrous (Other)	None Detected
026 *182500661-0026*	ROOM 109 - CEILING TILE (2'X2')	Gray Non-Fibrous Homogeneous	49% Glass HA: 11	51% Non-fibrous (Other)	None Detected
027 *182500661-0027*	ROOM 110 - WHITE FLOOR ILE	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos % Fibrous	Non-Asbestos % Non-Fibrous	Asbestos % Type
			HA: 12		
028 *182500661-0028*	ROOM 110 - WHITE FLOOR ILE	White Non-Fibrous Homogeneous	HA: 12	100% Non-fibrous (Other)	None Detected
029 *182500661-0029*	ROOM 110 - YELLOW MASTIC	Yellow Non-Fibrous Homogeneous	HA: 13	100% Non-fibrous (Other)	None Detected
030 *182500661-0030*	ROOM 110 - YELLOW MASTIC	Yellow Non-Fibrous Homogeneous	HA: 13	100% Non-fibrous (Other)	None Detected
031 *182500661-0031*	ROOM 110 - BLUE FLOOR TILE	Blue Non-Fibrous Homogeneous	HA: 14	100% Non-fibrous (Other)	None Detected
032 *182500661-0032*	ROOM 110 - BLUE FLOOR TILE	Blue Non-Fibrous Homogeneous	HA: 14	100% Non-fibrous (Other)	None Detected
033 *182500661-0033*	ROOM 110 - BROWN COVE BASE	Brown Non-Fibrous Homogeneous	HA: 15	100% Non-fibrous (Other)	None Detected
034 *182500661-0034*	ROOM 110 - BROWN COVE BASE	Brown Non-Fibrous Homogeneous	HA: 15	100% Non-fibrous (Other)	None Detected
035 *182500661-0035*	ROOM 110 - GRAY MASTIC	Gray Non-Fibrous Homogeneous	HA: 16	100% Non-fibrous (Other)	None Detected
036 *182500661-0036*	ROOM 110 - GRAY MASTIC	Gray Non-Fibrous Homogeneous	HA: 16	100% Non-fibrous (Other)	None Detected
037 *182500661-0037*	ROOM 111 - PLASTER		HA: 6		**Positive Stop (Not Analyzed)**
038 *182500661-0038*	ROOM 114 - WHITE COVE BASE	White Non-Fibrous Homogeneous	HA: 17	100% Non-fibrous (Other)	None Detected
039 *182500661-0039*	ROOM 114 - WHITE COVE BASE	White Non-Fibrous Homogeneous	HA: 17	100% Non-fibrous (Other)	None Detected
040 *182500661-0040*	ROOM 114 - WHITE MASTIC	Yellow Non-Fibrous Homogeneous	HA: 18	100% Non-fibrous (Other)	None Detected
041 *182500661-0041*	ROOM 114 - WHITE MASTIC	Yellow Non-Fibrous Homogeneous	HA: 18	100% Non-fibrous (Other)	None Detected

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Customer PO:	81125-20-01
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
042 *182500661-0042*	ROOM 114 - WHITE SPECKLED FLOOR TILE	Gray Non-Fibrous Homogeneous	HA: 19	100% Non-fibrous (Other)	None Detected
043 *182500661-0043*	ROOM 114 - WHITE SPECKLED FLOOR TILE	Gray Non-Fibrous Homogeneous	HA: 19	100% Non-fibrous (Other)	None Detected
044 *182500661-0044*	ROOM 114 - YELLOW MASTIC	Yellow Non-Fibrous Homogeneous	HA: 20	100% Non-fibrous (Other)	None Detected
045 *182500661-0045*	ROOM 114 - YELLOW MASTIC	Yellow Non-Fibrous Homogeneous	HA: 20	100% Non-fibrous (Other)	None Detected
046 *182500661-0046*	ROOMS 115-117 - PINK COVE BASE	Red Non-Fibrous Homogeneous	HA: 21	100% Non-fibrous (Other)	None Detected
047 *182500661-0047*	ROOMS 115-117 - PINK COVE BASE	Red Non-Fibrous Homogeneous	HA: 21	100% Non-fibrous (Other)	None Detected
048 *182500661-0048*	ROOM 127 - CEILING TILE (SQUARES)	Tan Fibrous Homogeneous	60% Cellulose 10% Glass HA: 22	30% Non-fibrous (Other)	None Detected
049 *182500661-0049*	ROOM 127 - CEILING TILE (SQUARES)	Gray Fibrous Homogeneous	60% Cellulose 10% Glass HA: 22	30% Non-fibrous (Other)	None Detected
050 *182500661-0050*	GYM - BLACK COVE BASE	Black Non-Fibrous Homogeneous	HA: 23	100% Non-fibrous (Other)	None Detected
051 *182500661-0051*	GYM - BLACK COVE BASE	Black Non-Fibrous Homogeneous	HA: 23	100% Non-fibrous (Other)	None Detected
052 *182500661-0052*	GYM - TAN MASTIC	Tan Non-Fibrous Homogeneous	HA: 24	100% Non-fibrous (Other)	None Detected
053 *182500661-0053*	GYM - TAN MASTIC	Tan Non-Fibrous Homogeneous	HA: 24	100% Non-fibrous (Other)	None Detected
054 *182500661-0054*	ROOM 131 - DRYWALL	Gray Non-Fibrous Homogeneous	HA: 25	100% Non-fibrous (Other)	None Detected
055 *182500661-0055*	ROOM 131 - DRYWALL	Gray Non-Fibrous Homogeneous	HA: 25	100% Non-fibrous (Other)	None Detected
056 *182500661-0056*	ROOM 131 - DRYWALL	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Project ID:

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
			HA: 25		
057 *182500661-0057*	ROOM 131 - JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 26		
058 *182500661-0058*	ROOM 131 - JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 26		
059 *182500661-0059*	ROOM 131 - JOINT COMPOUND	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 26		
060 *182500661-0060*	ROOM 130 - WHITE COVE BASE	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 27		
061 *182500661-0061*	ROOM 130 - WHITE COVE BASE	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 27		
062 *182500661-0062*	EXTERIOR - ROOF LAYERS	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 28		
063 *182500661-0063*	EXTERIOR - ROOF LAYERS	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
			HA: 28		
064 *182500661-0064*	EXTERIOR - ROOF TAR	Black Fibrous Homogeneous	10% Cellulose 20% Fibrous (Other)	70% Non-fibrous (Other)	None Detected
			HA: 29		
065 *182500661-0065*	EXTERIOR - ROOF TAR	Black Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
			HA: 29		

Analyst(s)
Allen Kuestner (16)
Kevin Small (22)
Tahirrah Steele (18)

Kevin Ream, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 “Interim Method”) but augmented with procedures outlined in the 1993 (”final”) version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Plymouth Meeting, PA NVLAP Lab Code 200699-0, Philadelphia ALL-292, VA 3333000315, AIHA LAP, LLC-IHLAP Accredited #178659

Initial report from: 02/13/2025 17:24:13

OrderID: 182500661

EMSL ANALYTICAL, INC.
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Asbestos Bulk Building Materials - Chain of Custody

EMSL Order Number / Lab Use Only

182500661

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077
PHONE: (800) 220-3675
EMAIL: CinnAsblab@EMSL.com

Customer Information		Billing Information	
Customer ID		Billing ID:	
Company Name:	RT Environmental Services, Inc.	Company Name:	
Contact Name	N. Lippincott	Billing Contact:	
Street Address:	215 W Church Road	Street Address:	
City, State, Zip	King of Prussia, PA 19406	Country: USA	City, State, Zip: Country:
Phone:	(724) 674-9089		Phone:
Email(s) for Report:	nlippincott@rtenv.com		Email(s) for Invoice:

Project Information

Project Name/No: ACCC - Mays Landing - Bldg E ACM Survey
Purchase Order: 81125-20-01
EMSL LIMS Project ID. (If applicable, EMSL will provide)
US State where samples collected: NJ
State of Connecticut (CT) must select project location: ☐ Commercial (Taxable) ☐ Residential (Non-Taxable)
Sampled By Name: Nicholas Lippincott
Sampled By Signature: N L
Date Sampled: 02/10/25
No. of Samples in Shipment: 65

Turn-Around-Time (TAT)

☐ 3 Hour ☐ 6 Hour ☐ 24 Hour ☐ 32 Hour ☐ 48 Hour ☑ 72 Hour ☐ 96 Hour ☐ 1 Week ☐ 2 Week

Please call ahead for large projects and/or turnaround times 6 Hours or Less. *32 Hour TAT available for select tests only; samples must be submitted by 11:30am.

Test Selection

PLM - Bulk (reporting limit)

☑ PLM EPA 600/R-93/116 (<1%)
☐ PLM EPA NOB (<1%)
☐ POINT COUNT
☐ 400 (<0.25%) ☐ 1,000 (<0.1%)
☐ POINT COUNT w/ GRAVIMETRIC
☐ 400 (<0.25%) ☐ 1,000 (<0.1%)
☐ NIOSH 9002 (<1%)
☐ NYS 198.1 (Friable - NY)
☐ NYS 198.6 NOB (Non-Friable - NY)
☐ NYS 198.8 (Vermiculite SM-V)

TEM - Bulk

☐ TEM EPA NOB
☐ NYS NOB 198.4 (Non-Friable - NY)
☐ TEM EPA 600/R-93/116 w Milling Prep (0.1%)

Other Tests (please specify)

☑ Positive Stop - Clearly Identified Homogeneous Areas (HA)

Sample Number	HA Number	Sample Location	Material Description
001	1	Room 104	Tan Cove Base
002	1	↓	↓
003	2		Brown Mastic
004	2		↓
005	3		Gray floor tile
006	3		↓
007	4		Black mastic
008	4		↓
009	5		Ceiling tile (4'x2')
010	5	↓	↓

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Method of Shipment: Drop-off		Sample Condition Upon Receipt:	
Relinquished by: N L	Date/Time 02/10/25 14:25	Received by	Date/Time 2/10/25
Relinquished by	Date/Time	Received by	Date/Time 225PM

Controlled Document - Asbestos Bulk R7 9/14/2021

☐ AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.

OrderID: 182500661

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Asbestos Bulk Building Materials - Chain of Custody

EMSL Order Number / Lab Use Only

182500661

EMSL Analytical, Inc.
200 Route 130 North
Cinnaminson, NJ 08077

PHONE: (800) 220-3675
EMAIL: CinnAstlab@EMSL.com

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Sample Number	HA Number	Sample Location	Material Description
011	6	Room 105	Plaster
012	7	Room 106	Pipe wrapping
013	7	↓	↓
014	7	↓	↓
015	8	↓	Gray Window Caulk
016	8	↓	↓
017	9	Room 107	White Sink Undercoat
018	9	↓	↓
019	6	Room 103	Plaster
020	6	Room 102	↓
021	10	Room 101	Pipe Insulation Elbow
022	10	↓	↓
023	10	↓	↓
024	6	Room 113	Plaster
025	11	Room 109	Ceiling tile (2'x2')
026	11	↓	↓
027	12	Room 110	White floor tile
028	12	↓	↓
029	13	↓	Yellow mastic
030	13	↓	↓
031	14	↓	Blue floor tile
032	14	↓	↓
033	15	↓	Brown Cove Base
034	15	↓	↓
035	16	↓	Gray Mastic

Method of Shipment: Drop off		Sample Condition Upon Receipt:	
Relinquished by:	Date/Time: 02/10/25 14:25	Received by	Date/Time
Relinquished by:	Date/Time:	Received by	Date/Time

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Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Sample Number	HA Number	Sample Location	Material Description
036	16	Room 110	Gray mastic
037	6	Room 111	Plaster
038	17	Room 114	White cove base
039	17	↓	↓
040	18		White mastic
041	18		↓
042	19		White speckled floor tile
043	19		↓
044	20		Yellow mastic
045	20	↓	↓
046	21	Rooms 115-117	Pink cove Base
047	21	↓	↓
048	22	Room 127	Ceiling tile (Squares)
049	22	↓	↓
050	23	Gym	Black cove Base
051	23		↓
052	24		Tan mastic
053	24		↓
054	25	Room 131	Drywall
055	25		↓
056	25		
057	26		Joint Compound
058	26		↓
059	26	↓	↓
060	27	Room 130	White cove base

Method of Shipment:	Drop off		Sample Condition Upon Receipt:		
Relinquished by		Date/Time: 02/10/25 14:25	Received by:		Date/Time
Relinquished by.		Date/Time:	Received by.		Date/Time

Controlled Document - Asbestos Bulk R7 09/14/2021

☐ AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

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Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Sample Number	HA Number	Sample Location	Material Description
061	27	Room 130	White Cove Base
062	28	Exterior	Roof Layers
063	28	↓	↓
064	29	↓	Roof tar
065	29	↓	↓

Method of Shipment: Drop-off		Sample Condition Upon Receipt:	
Relinquished by:	Date/Time: 02/10/25 14:25	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Controlled Document - Asbestos Bulk R7 09/14/2021

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APPENDIX 4 SITE PHOTOGRAPHS



Photo 1: View of the subject building (facing southeast).



Photo 2: View of the subject building (facing southwest).

Client: Atlantic Cape Community College
Site Name: Atlantic Cape Community College - Mays Landing Campus

Site Location: 5100 Black Horse Pike, Building E, Mays Landing, New Jersey 08330
Project Number: 81125-20



Photo 3: View of the lobby in the subject building (Room E101).



Photo 4: View of the lobby in the subject building (Room E101).



Photo 5: View of asbestos containing pipe insulation elbows and joints located above drop ceiling in the subject building lobby (Room E101).



Photo 6: View of the women's restroom in the subject building (Room 102).



Photo 7: View of Room 103 in the subject building.



Photo 8: View of Room 104 in the subject building.



Photo 9: View of asbestos containing gray floor tile located in Room 104 of the subject building.



Photo 10: View of Room 105 in the subject building.



Photo 11: View of asbestos containing plaster ceiling located in Room 105 of the subject building.



Photo 12: View of Room 106 in the subject building.



Photo 13: View of windows (bottom windows) in Room 106 of the subject building that have asbestos containing gray window caulk.



Photo 14: Close up view of asbestos containing gray window caulk in Room 106 of the subject building.



Photo 15: View of Room 107 in the subject building.



Photo 16: View of the gender neutral restroom in the subject building (Room 109).



Photo 17: View of Room 110 in the subject building.



Photo 18: View of Room 111 in the subject building.



Photo 19: View of Room 112 in the subject building.



Photo 20: View of the men's restroom in the subject building (Room 113).



Photo 21: View of the physical trainer's office (Room 114).



Photo 22: View of the physical trainer's office (Room 114).



Photo 23: View of the boys locker room (Room 115).



Photo 24: View of the visiting team's locker room (Room 118).



Photo 25: View of the archery equipment storage room (Room 121).



Photo 26: View of the women's locker room (Room 123).



Photo 27: View of the women's locker room (Room 126).



Photo 28: View of the hallway to the locker rooms (Room 127).



Photo 29: View of the equipment storage room (Room 128A/128D).



Photo 30: View of the HVAC room located above Room 128A/128D.



Photo 31: View of the weight room (Room 128B/128C).



Photo 32: View of the gymnasium (Rooms 129 & 130).



Photo 33: View of the gymnasium (Rooms 129 & 130).



Photo 34: View of a mechanical room in the subject building (Room 134).



Photo 35: View of a standard fire door placard observed on 5 doors within the subject building.



Photo 36: View of the upper roof (facing north).



Photo 37: View of the northern lower roof from the upper roof.

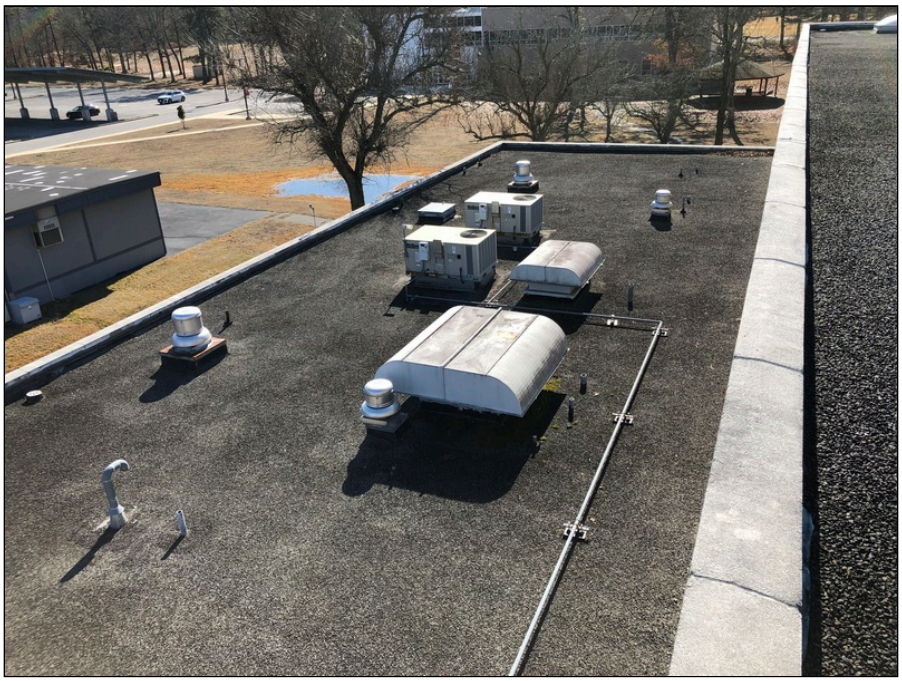


Photo 38: View of the eastern lower roof from the upper roof.

SECTION 024100 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of building elements for alteration purposes.

C. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 011000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 016000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 017000 - 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.

F. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

G. Section 026500 - Underground Storage Tank Removal.

H. Section 312200 - Grading: Rough and fine grading.

I. Section 312323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 DEFINITIONS

A. Demolish: Dismantle, raze, destroy, or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner, that may be uncovered during demolition, remain the property of Owner.
   1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

C. Owner reserves first right of refusal for removal and salvaged items. Items indicated for removal and salvage remain the Owner's property. Remove, clean, and pack items to protect against damage and deliver to Owner's designated storage area with labels to identify contents of containers. Demolished materials shall become the Contractor's property and removed from the site with further disposition at the Contractor's option.

1.05 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Site Plan: Indicate:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

C. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
   1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.
   2. Summary of safety procedures.
   3. Demolition firm qualifications.

D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

E. Pre-demolition Photographs or Video: Submit before Work begins.

F. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

G. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.07 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.

1.08 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.09 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
   1. Coordinate with the Owner’s continuing occupation and use of portions of the building to maintain safe emergency access to and from the facilities at all times.
   2. Provide minimum of three (3) working days advance notice to Owner of demolition activities that will impact Owner’s normal operations.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work.
   2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

E. Partial Demolition and Removal: Items indicated to be removed, and not intended to be salvaged or retained by the Owner, but of salvageable value to Contractor, may be removed from the project as work progresses. Transport salvaged items from the project as they are removed.
   1. Storage or sale of removed items on site will not be permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
   1. Roofing system

B. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: See Section 312323.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. Inventory and record the condition of items to be removed and re-installed and items to be removed and salvaged.

E. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect and Owner's Representative in accurate detail. Pending receipt of directive from Architect and/or Owner's Representative, rearrange demolition schedule as necessary to continue overall job progress without delay.

F. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
   1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

G. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs, preconstruction videotapes and/or templates.
   1. Comply with requirements specified in Section 013233 - Photographic Documentation.
   2. Inventory and record the condition of items to be removed and salvaged. Provide photographs and/or video of conditions that might be misconstrued as damage caused by salvage operations.

H. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.02 DEMOLITION

A. Remove the entire building as indicated on drawings.

B. Remove paving and curbs required to accomplish new work.

C. Remove all other paving and curbs within site boundaries.

D. Within area of new construction, remove foundation walls and footings to minimum 4 feet below finished grade.

E. Outside area of new construction, remove foundation walls and footings to minimum 2 feet below finished grade.

F. Remove concrete slabs on grade within site boundaries.

G. Remove underground tanks.

H. Remove manholes and manhole covers, curb inlets and catch basins.

I. Remove fences and gates.

J. Remove creosote-treated wood utility poles.

K. Remove other items indicated, for salvage, relocation, and recycling.

L. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 312200.

3.03 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with requirements in Section 017000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. 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.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   6. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
   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.
   8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

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. Do not begin removal until vegetation to be relocated has been removed and vegetation to remain has been protected from damage.

F. Protect existing structures and other elements to remain in place and not 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.

G. 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.

H. Hazardous Materials:
   1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

I. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Comply with requirements of Section 017419 - Construction Waste Management and Disposal.

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.

J. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

K. Underground Storage Tanks: Remove and dispose of as specified in Section 026500.

3.04 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.05 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Use utility and material locator equipment to locate utilities, structural elements etc. concealed within the building's construction.

B. Existing building fire protection system shall not be diminished. Removal of existing devices shall not occur until the new equipment is in place and ready for the switchover.

C. Existing Services/Systems to Remain: Locate and maintain services/systems indicated to remain and protect them against damage.
1. Comply with requirements for existing services/systems interruptions specified in Section 011000 - Summary.

D. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building. Provide minimum of three (3) working days advance notice to Owner if shutdown of service is necessary during change-over.

3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed. Protect store and re install existing equipment effected by the new work that is not noted to be demolished.
    a. Piping to Be Removed: Remove piping indicated to be removed back to the main and cap or plug remaining piping with same or compatible piping material.
    b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
    e. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    f. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remove remaining portion of pipe or conduit after bypassing.
    g. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.
    h. Contractor's scope of work includes, and the Contractor is required and expected to, patch any hole(s) resulting in the removal and/or capping of plumbing fixture(s) and/or piping in a wall, ceiling or floor to remain to match existing conditions, unless otherwise noted.

3.06 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
    1. Verify construction and utility arrangements are as indicated.
    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 areas that remain occupied.
    1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.
    2. Provide sound retardant partitions of construction and in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.

D. Remove existing work as indicated and required to accomplish new work.
    1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
    2. Remove items indicated on drawings.

E. 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 to remain in operation, and 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. See Section 011000 - Summary for limitations on outages and required notifications.
4. Verify that abandoned services serve only abandoned facilities before removal.
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.

F. Protect existing work to remain.
1. Prevent movement of structure. Provide shoring and bracing as required.
2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch to match new work.

3.07 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 024100

HEALTH & SAFETY SERVICES, Inc.

PO Box 365 • Berlin, NJ 08009 • (856) 452-1311 • info@hssenv.com

Indoor Air Quality • Asbestos & Lead Management • Site Assessments

TECHNICAL SPECIFICATIONS

for

ASBESTOS ABATEMENT

at the

ATLANTIC CAPE COMMUNITY COLLEGE BUILDING E

Prepared By:

Health & Safety Services, Inc.
PO Box 365
Berlin, New Jersey 08009
Phone - (856) 452-1311
info@hssenv.com
NJ ASCM # 117

AHERA Project Designer
James J. Proctor

JUNE, 26

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MAP & EMERGENCY NUMBERS ..... ERROR! BOOKMARK NOT DEFINED.

SITE DRAWING ..... ERROR! BOOKMARK NOT DEFINED.

Scope of Work

No Demolition of wall chases can proceed until containment area has been setup and negative pressure established; all demolition activities are to be completed by asbestos licensed workers in controlled conditions.

FULL CONTAINMENT WET REMOVAL of asbestos containing pipefittings (60), floor tiles & mastic (480 SF), and plaster ceilings (450 SF). Work area to be placed under negative pressure full containment with construction of (3) three stage Decontamination Chamber. NJ Sub-Chapter 8 Regulations apply. This abatement will take place in an OCCUPIED BUILDING due to ongoing school gym activities.

This project will be completed in 3 Phases:

1. Non-friable abatement in room E-110 due to power requirements of the building. This area will have the flooring removed in a non-friable manner, then isolated from the remaining Occupied Subchapter 8 abatement phases.
2. Half of lobby down to room E-107 Full containment occupied building - plaster ceiling demolition, floor tiles& mastic, pipefittings. Pipe chase wall exploratory demolition is to take place once negative pressure has been achieved. Pipe chases in rooms E-104 & the adjoining hallway are to be opened enough to verify the presence/absence of asbestos pipefittings.
3. Remaining half of lobby down to room E-112 Full containment occupied building - plaster ceiling demolition, floor tiles& mastic, pipefittings.

SPECIAL CONDITIONS Asbestos abatement projects involving ceiling tile and T-grid components, elevators, carpet, contaminated soil and projects in tunnels, crawl spaces, plumbing access panels, and/or involving live electrical panels or live steam lines are likely to present unique conditions that will require special precautions in addition to the procedures described in this section. In instances where special precautions need to be instituted, they shall be described in plans and specifications approved by the asbestos safety control monitor firm.

the following special conditions exist:

- No floor poly required in areas where floor tiles and mastics are to be removed
- No ceiling poly in areas where asbestos containing plaster ceilings are to be removed
- Live electric may exist in the building, caution is to be used around electrical lines

SEPARATION BARRIERS Isolation conditions include a requirement that the work area be separated from occupied areas by separation barriers of rigid construction consisting of nominal two inch by four inch studs spaced 16 inches on center and covered with a minimum of one plywood or comparable metal framing and 1/2 inch gypsum board covering. All seams shall be caulked to render the barrier air tight before two layers of polyethylene sheeting are applied on both sides. The polyethylene sheeting shall overlap at the seams. All penetrations around conduits, pipes, ducts or other openings between the work area and adjacent spaces shall be sealed, using materials determined to be suitable in accordance with the applicable subcode. In buildings

required by the Uniform Construction Code to be of non-combustible construction, all materials used to construct separation barriers shall meet the Uniform Construction Code, building subcode requirements for that building and all plastics used shall be flame resistant. A separate means of egress for abatement personnel, materials and equipment shall be maintained. Adequate fire evacuation routes shall always exist for all building occupants. Barriers are located at the gym entrance and east hall entrance.

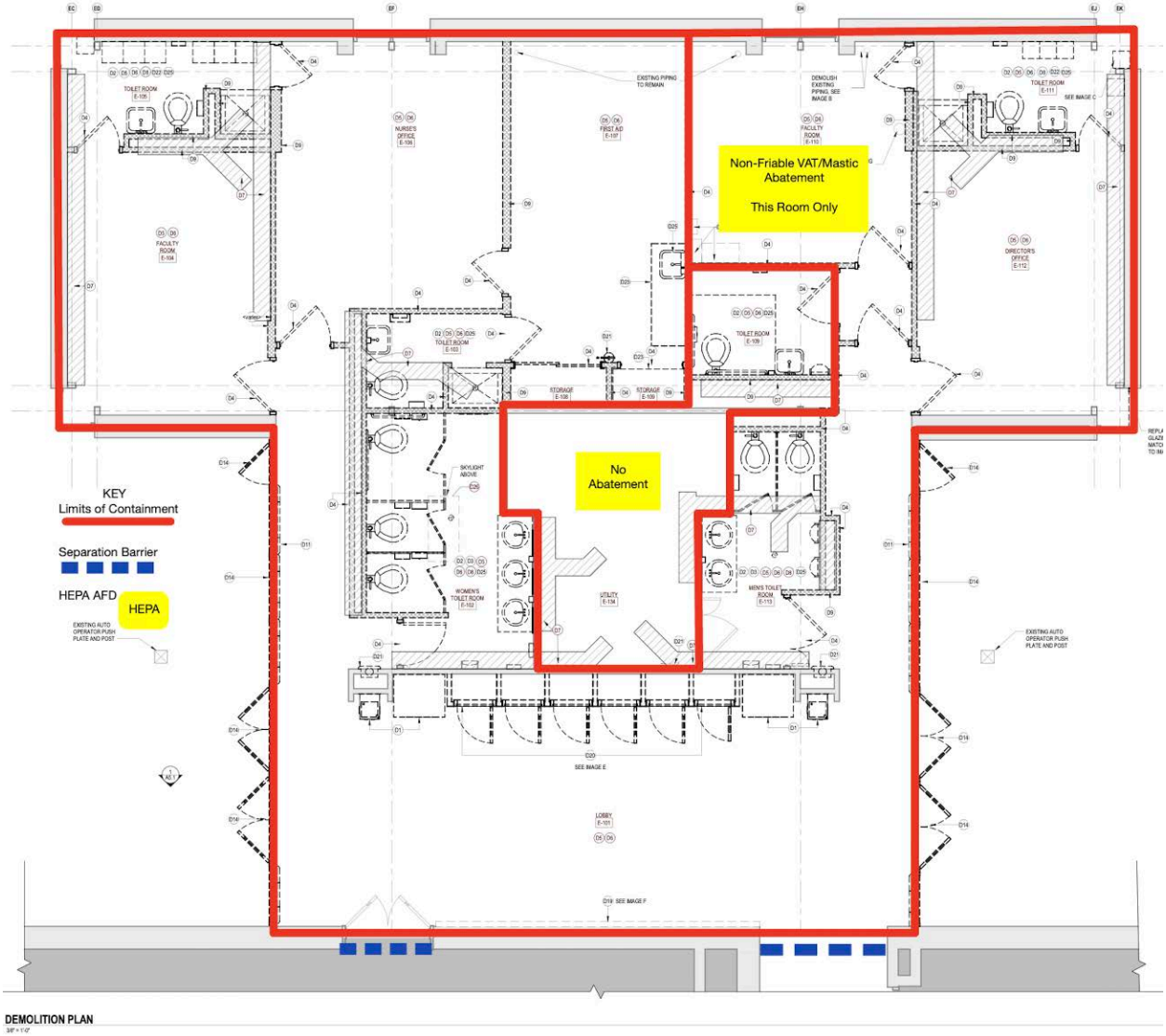
CRITICAL BARRIERS to be sealed with double layer of 6 Mil Fire Rated Poly. The contractor is to use a separate entrance to access the boiler room. Critical Barriers shall completely seal off the work area to prevent the distribution of fibers to the surrounding area. Such openings include, but are not limited to: between the top of non-removable lights, HVAC systems, windows, doorways, entrance ways, ducts, grilles, grates, diffusers, wall clocks, speaker grilles, floor drains, sink drains, electrical outlets, etc

AIR FILTRATION DEVICES are to be HEPA filtered and exhaust outside of building.

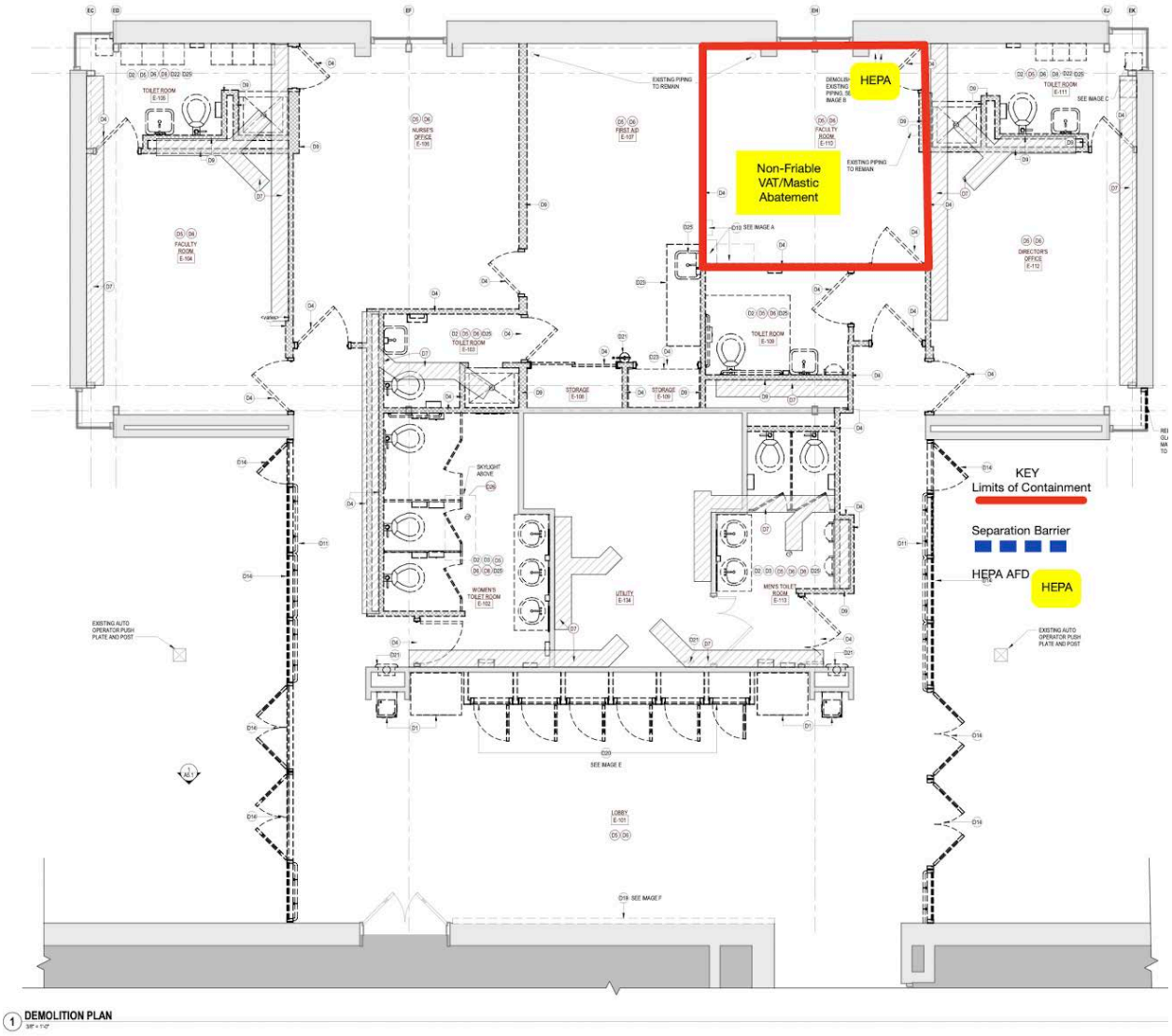
WASTE LOADOUT is to be completed at times of least occupancy of the building.

CONTRACTOR TO SUPPLY HEPA Filtered negative air units to maintain 4 air exchanges every hour, also a negative pressure differential of at least 0.05" w.c. must be maintained during occupancy of the building, a digital print-out manometer in clean room of decontamination chamber and a separate digital printout manometer in the waste decon. Negative pressure differential to be maintained and monitored from start of removal to acceptable final air clearance, that will be analyzed by (T.E.M.) Transmission Electron Microscopy, 24 HR TAT.

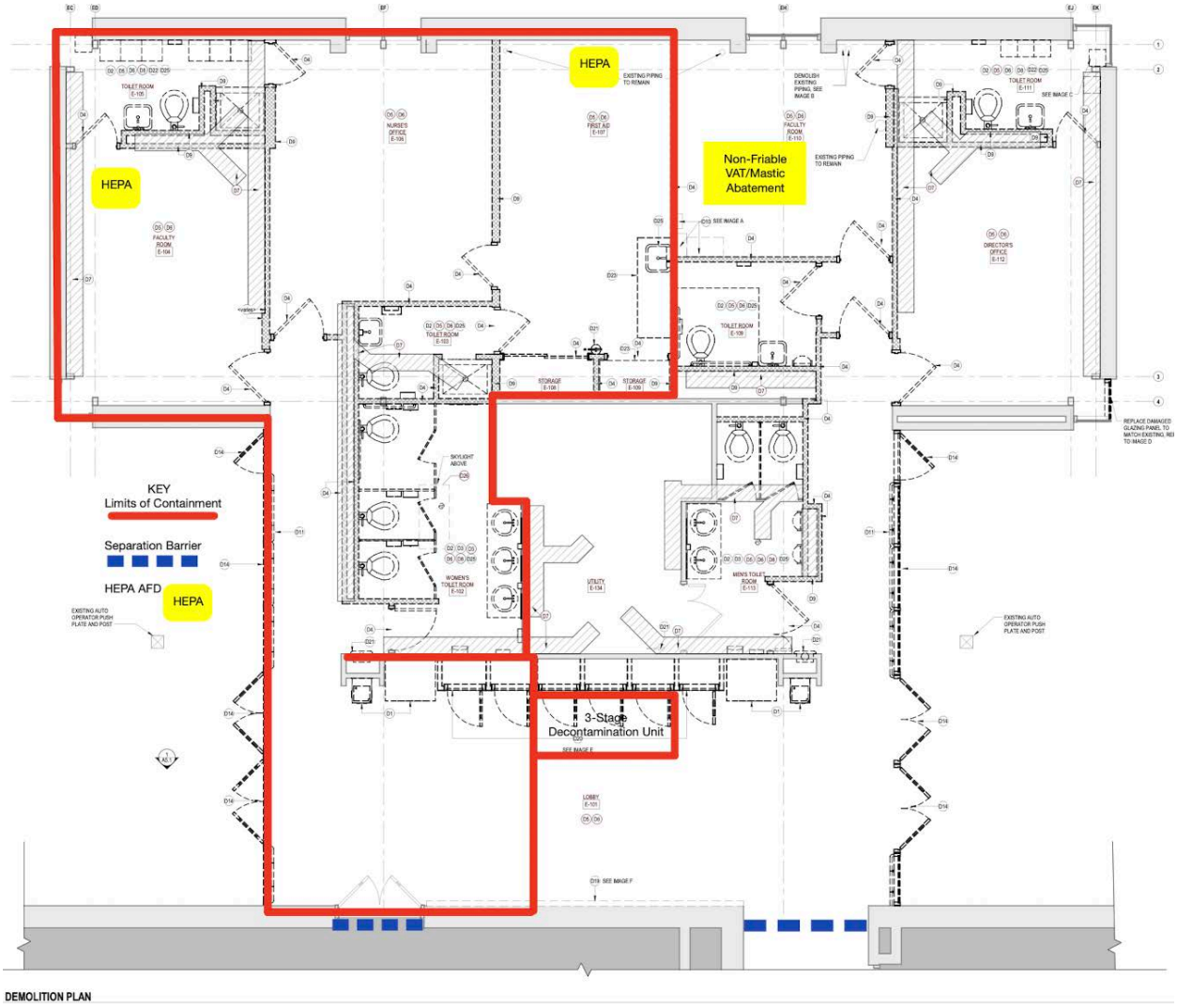
Overall Project



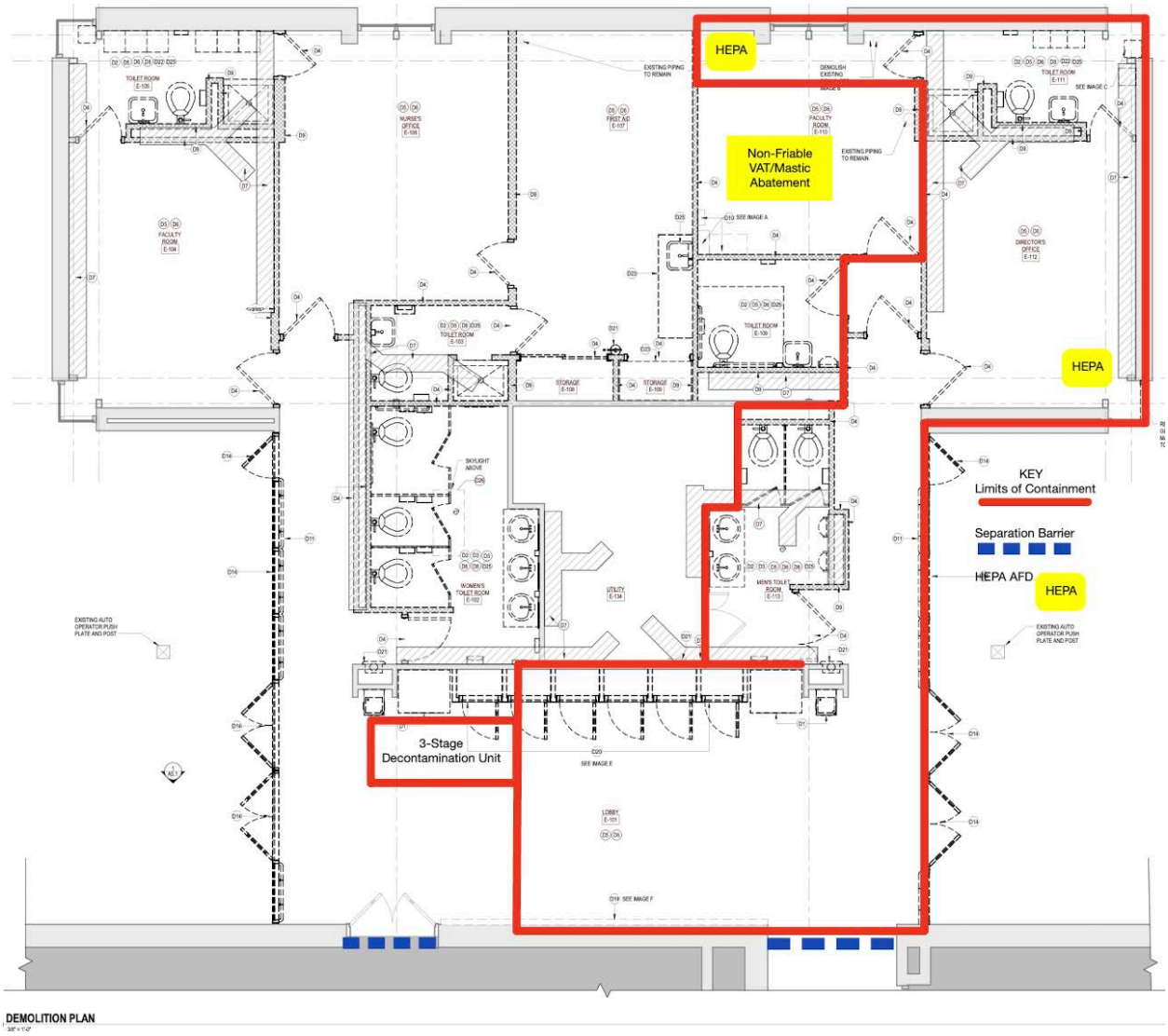
Phase 1 – Non-Friable Flooring



Phase 2 – Full Containment



Phase 3 – Full Containment



Part I GENERAL

1.00 Instructions to Bidders

A. By submitting a bid, the bidder acknowledges that he has investigated and satisfied himself as to:
   1. The conditions affecting the work, including but not limited to physical conditions of the site which may bear upon site access, handling and storage of tools and materials, access to water, electric, or other utilities or otherwise affect the performance of required activities;
   2. The character and quantity of all surface and subsurface materials or obstacles to be encountered in so far as this information is reasonably ascertainable from an inspection of the site, including exploratory work done by the building owner or a designated consultant, as well as information presented in drawings and specifications included with this contract.

B. Any failure by the bidder to acquaint himself with available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The building owner is not responsible for any conclusions or interpretations made by the bidder on the basis of the information made available by the building owner.

C. No bid will be accepted from any bidder who has not inspected the job site either in person or through a qualified representative.

D. Should the bidder find any discrepancies in the plans and/or specifications or should he doubt the meaning or intent of any part thereof, he must, no later than five (5) days prior to the bid opening, request clarification from Health & Safety Services, Inc. Conflicts between contract documents and applicable Federal, State, or Local regulations or requirements shall be included in a clarifications statement. Failure to request such clarification is a waiver to any claim by the bidder for expense made necessary by reason of later interpretation of the contract documents by the building owner and/or Health & Safety Services, Inc.

1.01 Access to Work Site and Hours of Work

A. All arrangements for access to the work site shall be made through the Owner's Representative.

B. The contractor must start work on the agreed upon start date and continue uninterrupted with a full work force until project is complete.

1.02 Notifications

A. The contractor shall notify the following agencies in writing ten (10) days prior to the each start of the asbestos removal project. The Contractor must submit a copy of notice to Health & Safety Services, Inc., prior to the application for the asbestos abatement permit from the State of New Jersey Department of Community Affairs, Trenton; the contractor is responsible for permit application.

1. US Environmental Protection Agency
   Asbestos NESHAPS Contracts
   Air & Hazardous Material Division
   26 Federal Plaza
   New York, New York 10007
   P/ (212) 637- 4052
   F/ (212) 637-3398 or 4035

2. New Jersey Department of Community Affairs
   Bureau of Construction Code Enforcement
   CN 816
   Trenton, New Jersey 08625
   P/ (609) 530-8812
   F/ (609) 530-8858

3. New Jersey Department of Health
   Asbestos Control Project
   CN 360
   Trenton, New Jersey 08625
   P/ (609) 984-2193
   F/ (609) 984-2192

4. State of New Jersey
   Department of Environmental Protection
   Division of Solid Waste Management
   CN 414
   Trenton, New Jersey 08625-0414
   P/ (609) 292-7081
   F/ (609) 777-0769

5. New Jersey Department of Labor
   225 East State Street
   PO Box 392
   Trenton, NJ 08625-0392
   (609) 292-2516

Notification to the agencies in Section A above shall be on the required forms (where applicable) and include the following information:

1. Name and address of owner of building.
2. Name and address of the operator of the building.
3. Name and address of contractor.
4. Address and description of the building, including size, age and prior use of the building or area, and amount of friable asbestos material present in square feet and/or linear feet, as applies. Designate room numbers and other locations information unless entire building is involved.
5. Scheduled starting and completion dates for removal.

6. Procedures and equipment (including ventilating system) that will be employed to comply with 40 CFR Part 61, National Emission Standards for Hazardous Air Pollutants.
7. The name and address of the Department of Environmental Protection registered waste hauler and of the Department of Environmental Protection registered landfill where the asbestos waste will be deposited. Such landfill should also comply with 40 CFR Part 61.
8. The name and address of the Monitoring Firm to perform air monitoring on behalf of the contractor's employees.
9. Contractor shall obtain all permits and certificate of Occupancy.

B. The contractor shall notify the Owner's Asbestos Safety Monitoring Firm in writing at least 48 hours prior to commencement of any preparation of work.

1.03 Documentation of Worker's Qualifications

A. The contractor shall post the names, signatures, and photocopies of state issued licenses for all workers to be doing asbestos removal work on the job site. In addition, contractor must display a sign in letters larger than 4 inches tall indicating, "Licensed by the State of New Jersey for Asbestos Work". N.J.S.A 34:5A-32 et seq.

B. The contractor shall comply with all applicable requirements of 40 CFR Part 61, "Accepted Engineering Practices", and N.J.A.C. 5:23-8.

1.04 Air Monitoring & Inspections

A. The contractor is responsible for all OSHA required air monitoring for his employees.

B. Air monitoring and visual inspection in the adjacent to the work area will be conducted throughout the abatement project by the Owner's air monitoring technician and/or the Owner's representative in accordance with these specifications.

C. The Contractor shall provide the required respirators and protective clothing to all workers, and to all official representatives of the State, Federal government of other designated party who may inspect the job site.

D. The Contractor shall cooperate fully with all aspects of the air monitoring programs which are conducted by the independent air monitoring consultant.

1.05 Definitions

A. The following words, terms and abbreviations when used in this document shall have the following meanings unless the context clearly indicates otherwise.

1. **Abatement** - procedures to decrease or eliminate fiber release from precast, spray or trowel applied asbestos-containing building materials. Includes encapsulation, enclosure and removal.
2. **Airlock** - system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways at least three feet (one-meter) apart.
3. **Air Monitoring** - the process of measuring the fiber content (fibers of a specified size range) of a specific volume of air in a stated period of time.
4. **Amended Water** - water to which a wetting agent is added. The wetting agent is a combination of chemicals which aids in the penetration of the material and increases the probability of individual fiber wetting.
5. **Asbestos** - a general term used to describe a group of naturally occurring hydrated mineral silicates. Including but not limited to the asbestos form varieties chrysotile (serpentine), crocidolite (riebeckite), amosite (cummingtonite-grunerite), anthophyllite, tremolite and actinolite.
6. **Asbestos Containing Material (ACM)** - any material which contains more than 1 percent asbestos by weight.
7. **Asbestos Safety Technician (AST)** - a person certified by the New Jersey Department of Community Affairs, hired by an Asbestos Safety Control Monitor who continuously monitors and inspects the asbestos abatement work pursuant to N.J.A.C. 5:23-8 and these specifications.
8. **Authorized Personnel** - The owner, the owner's representative, asbestos abatement contract personnel, asbestos safety control monitor personnel, emergency personnel, or a representative of any Federal, State, or Local regulatory agency, or other personnel under contract for, or having jurisdiction over the project.
9. **Barrier** - polyethylene sheeting that completely seals off the work area to prevent contamination of the surrounding area.
10. **Breathing Zone** - A hemisphere forward of the shoulders with a radius of approximately six to nine inches.
11. **Building Owner** - The Owner, or his authorized representative.
12. **Category 1 Non-Friable Asbestos Containing Material (ACM)** - Asbestos containing packing, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos, as determined using the method specified in Appendix A, Subpart F of 40 CFR Part 763, Section 1; Polarized Light Microscopy.
13. **Category 2 Non-Friable Asbestos Containing Material (ACM)** - Any material , excluding Category 1 Non-Friable Asbestos Containing Material as determined using the method specified in Appendix A, Subpart F of 40 CFR Part 763, Section 1; Polarized Light Microscopy. This material, when dry, can not be crumbled, pulverized, or reduced to powder by hand pressure.
14. **Certificate of Completion** - The certificate issued by the Asbestos Safety Control Monitor signifying that the asbestos hazard abatement work has been completed in conformance with NJAC 5:23-8 and/or these specifications.
15. **Clean Room** - an uncontaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment. Also referred to as Change Room.
16. **Competent Person** - in addition to the definition in 29 CFR 1926.32 {f}, one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure and who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32 {f}.
17. **Construction Permit for Asbestos Abatement** - requires official approval to commence any asbestos hazard abatement job.
18. **Contractor** - the Asbestos Removal Contractor licensed by the New Jersey Department of Labor.
19. **Critical Barrier** - two layers of 6 mil polyethylene sheeting that completely seals off the work area to prevent the distribution of fibers to the surrounding area, such as the opening between the top of non-removable lights, HVAC systems, windows, doorways, entrance ways, ducts, grilles, grates, diffusers, wall clocks, speaker grilles, floor drains, sink drains, etc..

20. **Curtained Doorway** - a device to allow ingress or egress from one room to another while minimizing air movement between the rooms. Typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway and securing each along the top of the doorway, with the vertical edge of one along one vertical side of the doorway and the vertical edge of the other along the opposite vertical sides. Two curtained doorways spaced a minimum of three feet (one meter) apart form an airlock.
21. **Decontamination Enclosure System** - a series of connected rooms, with curtained doorway between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A decontamination enclosure system always contains an airlock.
22. **Demolition** - The actual destruction and removal of a building, or part of a building, without the intent to renovate, repair, or replace. If it is later decided to retain the building, or part of the building, for future use, the project shall not be considered demolition and the criteria for reoccupancy shall be 0.010 fibers per cubic centimeter of air (f/cc).
23. **Disposal Bag** - Six-Mil thick leak tight plastic bags used for transporting asbestos waste from work site to disposal site. Each disposal bag will be labeled as follows:
24.

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS
AND
ASBESTOS NA 2212, RQ

Each bag shall contain the U.S. DOT Class 9 (miscellaneous) hazardous material label. Contractor shall also label all disposal bags and/or containers with the name of the waste generator (Owner) and the location from which the waste was generated; all in accordance with the EPA NESHAPS regulation, 40 CFR Part 61, Subpart M.

25. **Employee** - an asbestos abatement worker having proper training, instruction and licensing.
26. **Encapsulation** - treatment of asbestos containing materials, generally ceilings, using a liquid to bond or seal the surface to minimize the potential for fiber release.
27. **Enclosure** - the construction of an airtight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
28. **Equipment Decontamination Enclosure System** - a decontamination enclosure system for materials and equipment, typically consisting of a designated area of the work area, a washroom and an uncontaminated area.
29. **Equipment Room** - a contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
30. **Flame-Resistant Polyethylene Sheeting**- a single polyethylene film in the largest sheet size possible to minimize seams, normal six mils thick, conforming to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films.
31. **Friable** - any material which when dry may be crumbled, pulverized, or reduced to a powder by hand pressure or mechanical means.
32. **Fixed Object** - a unit of equipment or furniture which cannot be removed from the work area(s).
33. **Limited Containment (Glove Bag) Technique** - a method with limited applications for removing small amounts for friable asbestos containing material from HVAC Ducts, pipe runs, pipe joints, and other non-planar surfaces in a non-contained (plasticized) work area. The glovebag is constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process. All workers are permitted to use the glovebag technique, provided that they are highly trained, experienced, and skillful in the method.
34. **HEPA Filter** - a High Efficiency Particulate Air filter capable of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns in length.
35. **HEPA Vacuum**- a High Efficiency Particulate Air filter vacuum cleaner, capable of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns in length.

36. **Holding Area** - a chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area is comprised of an airlock.
37. **HVAC** - Heating, Ventilation and Air Conditioning system.
38. **Moveable Object** - a unit of equipment or furniture in the work area(s) which can be removed from the work area(s).
39. **Negative Pressure** - air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).
40. **NIOSH** - National Institute for Occupational Safety and Health.
41. **Occupied Building** - A building or structure where occupancy is permitted in certain areas outside of the required containment during an asbestos hazard abatement project.
42. **Plastic Sheeting** - polyethylene sheet material, of the thickness indicated.
43. **Protection Factor** - the ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection Factor is a measure of the degree of protection provided by a respirator to the wearer.
44. **Removal** - the act of properly eliminating and disposing asbestos containing or contaminated materials from a building.
45. **Repair** - corrective action using recommended work practices to minimize the likelihood of fiber release from small damaged areas of ACM.
46. **Respirator** - a device designed to protect the wearer from inhaling harmful atmospheres.
47. **Sealant** - a liquid or solution to be used as a binding agent, such as a diluted encapsulant or a water based paint, on dried exposed surfaces from which asbestos-containing material has been removed. The color of the coat shall be separate and distinct from the underlying substrate.
48. **Separation Barrier** - a constructed wall with no door that separates the clean area from the work area having a fire rating, if applicable and does not interfere with the means of egress. Polyethylene sheeting (minimum 2 layers of 6 mil) shall be placed on the work site of the barrier so that it completely seals off the work area to prevent the distribution of fibers to the surrounding area.
49. **Shower Room** - a room constituting an airlock, between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water suitable arranged for complete showering during decontamination. The shower room always comprises on airlock.
50. **Surfactant** - a chemical wetting agent added to water to improve penetration of the ACM. Surfactants are used to ensure that all Asbestos Containing Materials are thoroughly wet before removal.
51. **Wet Cleaning** - the process of reducing asbestos contamination in a building by using cloths, mops, or other cleaning tools which have been dampened with amended water to decontaminate the area and by disposing these cleaning tools as asbestos contaminated waste.
52. **Washroom** - a room between work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an airlock.
53. **Work Area** - the place in a building which asbestos abatement occurs.
54. **Worker Decontamination Enclosure System** - a decontamination enclosure system for workers, typically consisting of a clean room, a shower room and an equipment room.

1.06 Personnel Requirements and Training

A. All of the Contractor's workers must have valid training, a minimum of one years experience in asbestos abatement and a current asbestos workers permit as issued by the State of New Jersey, and shall comply with all applicable requirements of N.J.S.A. 34:5A-32 et seq. and 29 CFR 1926.58(k)(3), as well as other non-training requirements of 29 CFR 1926.

B. The Contractor shall furnish proof that all of the Contractor's personnel on the job (supervisors and workers) have been given medical examinations as required by OSHA regulations, 29 CFR 1910 and 29 CFR 1926. As a minimum, the examination should include a chest roentgenogram, a medical history with specific reference to respiratory disease and pulmonary function tests. This information should be provided to the Owner during the pre-construction meeting.

C. The Contractor shall provide a Certified, License Asbestos Supervisor to the project with a minimum of two years of successful experience in Asbestos Abatement operations similar in scope and magnitude to this project. The Contractor shall submit copy of qualifications to owner.

1.07 Asbestos Consultant/Asbestos Safety Technician

A. Health & Safety Services, Inc. shall perform all air sampling specified. They shall have access to all areas of the asbestos removal project at all times and shall continuously inspect and monitor the performance of the contractor and his employees to verify that their performance complies with this specification. An Asbestos Safety Technician (AST) shall be on site at all times that work is in progress, from the initial preparation of the work area to the completion of the abatement operation. The AST is present to protect the Owner's interest and to ensure compliance of N.J.A.C. 5:23-8. The air sampling, monitoring and inspections made by the AST shall not relieve the Contractor of his monitoring obligations.

B. The ASCM will send 20 day notification to building owner for distribution to occupants, and post notifications of asbestos abatement project 7 days prior to abatement on entrances adjacent to the work area

C. The Asbestos Safety Technician shall have the authority to require that all workers present a valid work card before entering the work site. He shall also have the authority to direct verbally and in writing the actions of the contractor to assure compliance. The Technician shall have the authority to test the seal of the respirators of all who enter the work site to ensure proper fit. In matters of gross negligence or flagrant disregard for the safety of others, including the possibility of contaminating the building environment and the appearance of an emergent unsafe condition at the work site, the Technician shall direct such corrective action as may be necessary.

C. The Asbestos Safety Technician upon receipt of testing results indicating that concentrations above 0.010 fibers per cc have occurred outside the containment barriers or above 0.020 fibers/cc within the clean room of the decontamination chamber during the abatement action shall report

these results immediately to the contractor and to the owner's representative so that prompt corrective action may be taken.

D. The Asbestos Safety Technician shall keep a daily log of on-site observations concerning contractor's compliance with activities required under this specification listing all deficiencies encountered. In addition, this log shall list the names of all persons entering the work area. This log shall be made available upon request at all times to the Owner's Representative.

E. During the removal phase of the duties of the Asbestos Safety Technician shall be as follows:

1. Monitoring outside the work area shall be provided throughout removal operations, to ensure that no outside contamination is occurring.
2. Filters, cassettes and sampling train shall be assembled as specified in NIOSH 7400 method and 40 CFR 763. The flow rate shall be between 0.5 and 16 liters per minute. The total volume shall be a volume sufficient to achieve a detection limit of 0.010 f/cc. Pumps shall be calibrated before and after sampling and a record kept of this calibration.
3. The Asbestos Safety Technician shall take a minimum of three (3) samples per day, 1 sample every 4 hours in occupied areas during removal activities for every 10,000 SF of occupied space will be analyzed on-site, results will be available 4 hours after initial start and every 4 hours thereafter till the end of the shift. One stationary sample at decontamination unit entrance/exit and the remaining samples adjacent to work area but remote from the decontamination unit entrance. In the selection of adjacent areas to be monitored, preference shall be given to rooms adjacent to ACM worker's/Waste routes, critical barriers and/or occupied areas.
4. If the Contractor's barriers or other control methods are observed to malfunction and if the Contractor does not correct the problems immediately upon notification, the Asbestos Safety Technician shall have the authority to halt removal of asbestos in the affected work area. In such a situation additional sampling of at least 5 samples per day per area shall be performed by the Asbestos Safety Technician at the Contractor's expense.
5. The analysis of air samples (excluding final air tests) shall be done using NIOSH #7400 Method (A rules), by an AIHA AAR Certified microscopist via on-site analysis.
6. The evaluation criteria shall be 0.010 fibers per cubic centimeters.
7. A series of smoke tests shall be performed at the decontamination unit entrance/exit, by the asbestos safety technician to ensure continuous negative air pressure. This test shall be performed before each work shift and every four hours thereafter until the end of the work shift.
8. The Asbestos Safety Technician shall calculate the required number of negative air filtration units for each work area. This calculation shall be made whenever the volume of the work area changes. The Asbestos Safety Technician shall inform the Owner's Representative and the Contractor of any discrepancies between the number of units required and those in operation within the work area.
9. A record shall be kept in a daily log of all on-site observations, inspections and required activities.
10. The Asbestos Safety Technician shall ensure that all asbestos waste shall be removed from the work site daily unless it is placed in a locked, secure container outside of the work area until removal by a registered waste hauler.

F. Final Certification tests shall be conducted as follows:

1. Within 48 hours after final clean-up and before the removal of critical barriers, a visual inspection and a final air test shall be performed by the Asbestos Safety Technician for the Owner. This test is required to establish safe conditions for removal of critical barriers and to permit occupancy and/or demolition activity to begin. Sufficient time following clean-up activities shall be allowed so that all surfaces are dry during monitoring. At least 24 hours shall be allowed to pass after any wet cleaning has been done before the post-removal tests are begun.
2. Normal occupancy use conditions shall be simulated using aggressive sampling techniques.
3. EVALUATION CRITERIA:
    a. **Transmission Electron Microscopy:** (for abated materials in the amounts above 160 Linear Feet of 260 Square Feet) A minimum of 7 samples is required: five samples collected inside the abatement area, one field blank, and one sealed blank. Sampling and analysis must be completed according to the protocol outlined in 40 CFR 763. The work area will be considered clean if either: the arithmetic mean of the asbestos structure concentrations of the five samples collected inside the work area is equal to or less than 70 structures per square millimeter; or the two blank samples have an arithmetic mean of the asbestos structure concentration on the blank filters that is less than or equal to 70 s/mm^2.

If test results exceed these parameters, the Asbestos Safety Technician shall so inform the Contractor and the Owner's representative. If these criteria have not been met the Contractor shall be required to re-clean all surfaces using wet cleaning methods and provide negative HEPA-filtered exhaust air during the re-cleaning process. This process of re-cleaning, allowing surfaces to dry and re-testing shall be repeated until compliance is achieved.

b. **Phase Contrast Microscopy:** (for abated materials in the amounts below 160 linear feet or 260 square feet) A set of five samples will be collected in each area of PCM clearance If any of the samples in any set of air test results exceeds 0.010 fiber/cc, the Asbestos Safety Technician shall so inform the Contractor and the Owners' representative. If these criteria have not been met the Contractor shall be required to re-clean all surfaces using wet cleaning methods and provide negative HEPA-filtered exhaust air during the re-cleaning process. This process of re-cleaning, allowing surfaces to dry and re-testing shall be repeated until compliance is achieved.

Note: All costs incurred by the owner as a result of the work area failing to meet final clearance will be the Contractor's responsibility. The work schedule for all projects requiring Transmission Electron Microscopy includes 24 hour turnaround time. The Contractor will compensate the Owner for the difference in costs if less than 24 hour turnaround time is required on TEM samples in order to satisfy contractual agreements.

G. Final inspection shall be conducted by the Asbestos Safety Technician as follows:

1. Upon notice by the Owner's representative or by the Contractor and at least 48 hours after the removal of the critical barriers, a final inspection shall be made to ensure the absence of any visible signs of asbestos or asbestos containing materials and that all removed asbestos and asbestos contaminated materials have been properly disposed of off-site.
2. Acceptable airborne fiber levels have been attained.
3. The Asbestos Safety Technician shall ensure that all asbestos waste has been removed from the work site by a registered waste hauler.

H. The Asbestos Safety Technician shall prepare a comprehensive final report, including daily logs, required inspection reports, observations and air monitoring results. The Asbestos Consultant shall maintain the report as a permanent record and present a copy to the Owner.

PART II CONTRACTOR RESPONSIBILITIES & DESCRIPTION OF WORK

2.00 Scope of Work

A. This section covers the furnishing of all labor, materials, facilities, equipment, services, employee training and testing, permits and agreements necessary to perform the work required for asbestos abatement in accordance with these specifications, EPA, OSHA Regulations, NIOSH recommendations, State of New Jersey Regulations, and any other applicable federal, state, and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions shall apply. It shall be the contractor's responsibility to verify exact quantities and locations of all asbestos containing materials. The quantities shown are for informational purposes only. Prospective bidder should bid this project according to what is observed during the Pre-bid walk through.

B. Description of Work: Perform the work and provide the services as follows:

1. Contractor must provide a foreman/supervisor that can speak and write English.

2. Worker training, respiratory protection and fit-testing, and OSHA required medical examinations.

3. Work area preparation including protection of all surrounding fixtures as described herein.

4. Asbestos Abatement to include the following:

   a. Isolate the work areas from remaining areas through the use of separation barriers.

   b. Asbestos removal in the following locations:
      ACCC Building E
      5100 Black Horse Pike
      Mays Landing, NJ 08330

   c. Contingency Plan refer to New Jersey Sub-Chapter 8 Asbestos Hazard Abatement Sub-Code 5:23 - 8.19 .5 or section 2.13 of this specification.

C. Sequence of Work shall be as follows:

1. The Contractor will insure that prior to abatement preparation, that all movable objects have been removed from the abatement area.
2. The Contractor will restrict access to areas where abatement is to take place from remainder of the building. The Owner will ensure that no school personnel occupy the building from the time that the Contractor mobilizes until the Certificate of Occupancy has been applied for by the AST.
3. The Contractor shall pre-clean the abatement area by HEPA vacuuming all surfaces.
4. The Contractor will construct to operational all final barriers, seals, and decontamination chambers as directed by the Asbestos Safety Technician.
5. The Contractor shall give the AST in writing 24 hours notice requesting a pre-commencement inspection.
6. Once the abatement has begun the AST shall make progress inspections and perform a Pre-Sealant inspection before the encapsulation process begins. The inspector shall insure that no visible debris is left on the substrate before any encapsulation begins.
7. The Owners Testing Laboratory shall perform final air testing after a 24-hour writing period from any wet wiping or cleaning. The final air tests will be performed by Transmission Electron Microscopy (TEM). The testing and analysis shall be done in compliance with the 40 CFR 763 and NJAC 5:23-8. If the results are higher than the allowable threshold the contractor will re-clean the abatement area and the testing firm must re-test. This sequence will continue until the test results are acceptable.
8. Once the appropriate air testing results are met, the Contractor will remove all critical barriers and separation barriers inside the abatement area. No tape, polyethylene sheet plastic or other construction debris can remain in the abatement area after this cleaning.
9. The AST will perform a final visual inspection of the abatement area. The Contractor must notify state inspectors 24 hours prior to the AST's final visual.

2.01 Standard Operating Procedures

A. The Contractor shall develop and implement a written standard procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, visitors, general public, and the environment.

The standard operating procedure shall ensure:

1. Tight security on a 24 hour basis from unauthorized entry into the work space.
2. Remove asbestos in ways that minimize release of fibers.
3. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or in any way breaking respiratory protection.
4. Proper protective clothing and respiratory protection prior to entering the work space from the outside.
5. Packing, labeling, loading, transporting, and disposing of contaminated material in a way that minimize exposure and contamination.

6. Proper exit practices from the work space to be the outside through the showering and decontamination facilities.
7. Emergency evacuation for medical or safety (fire and smoke) so that exposure will be minimized.
8. Safety from accidents in the work space, especially from electrical shocks, slippery surfaces, and entanglements in loose hoses and equipment.
9. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work.
10. Engineering systems that minimize exposure to fibers in the work space.
11. The contractor shall submit these plans and procedures at least ten (10) days prior to abatement.

2.02 Notifications, Permits, Warning Signs, Labels, and Posters

A. Erect English warning signs around the work space and at every point of potential entry from the outside, with the words "Danger" Asbestos Hazard, Do Not Enter". The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than OSHA requirements. Warning signs shall be posted at the entrance to the work area and around its perimeter at intervals of no more than twenty-five (25) feet.

B. Provide the OSHA required labels for all plastic bags and all drums utilized to transport contaminated material to the landfill.

C. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, EPA, and NIOSH.

2.03 Emergency Precautions

A. Establish emergency and fire exits from the work area. Post these in the administrative area on the work site.

B. The Contractor shall be prepared to administer first aid to the injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination. When an injury occurs, precautions shall be taken to reduce airborne fiber concentrations (i.e. misting of the air with water) until the injured person has been removed from the work area.

C. Before the Contractor starts the removal of asbestos materials, the local police and fire departments shall be notified by the Contractor as to the danger of entering the work area. The Contractor shall make every effort to help these departments form plans of action should their personnel need to enter the contaminated area.

2.04 Submittals

A. Submit copies of the following items to the Asbestos Safety Control Monitor:

1. Security and safety logs showing names of persons entering work space, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.
2. Disposal Certificates.
3. Required Permits, Clearances, and Licenses.
4. All Contractor's Air Monitoring and inspection Results.

B. At the completion of the project the asbestos abatement Contractor will submit the following documentation to the Construction Manager with their invoice. This information will also be submitted to Health & Safety Services, Inc.

1. The Certificate of Acceptance/Occupancy from the local construction official.
2. A copy of all waste disposal manifests.
3. A copy of Certified Payroll for the project.

2.05 Owner/Contractor Responsibilities

A. The **Contractor** or persons employed by the CM shall clean with wet cloths and/or with HEPA vacuums as appropriate all movable items that can be removed from the work area without disrupting the asbestos material. This shall include furniture, equipment, drapes, curtains. The cloths used for cleaning shall be disposed of as asbestos contaminated waste.

B. During this period, the **Contractor** shall be responsible in all areas affected by his operation for:

1. Building Security - Fire and smoke detection systems
2. Maintaining the existing building and utility systems such as plumbing or electrical installations.
3. The **Contractor** shall provide security to prevent unauthorized entry into the work area, and maintenance of decontamination chambers, isolation barriers and negative air systems.

C. Should the failure of any utility occur, the Owner will not be responsible to the **Contractor** for loss of time or any other expense incurred.

D. The **Contractor** shall provide all digital manometers required for this project in accordance with N.J.A.C. 5:23-8, to include one (1) spare unit.

E. The **Contractor** is required to protect workers who must enter confined spaces, in accordance with 29 CFR 1910.120 (b) (1) (iv) and all applicable regulations.

F. The Owner will provide the Contractor with a list of items that cannot be removed, or are damaged prior to abatement activities.

G. The Owner will stop all deliveries that may be scheduled to the work area while work is in progress.

H. The **Owner** will have authorized personnel on site at all times or supply contractor with means of contacting such personnel without unreasonable delay. Such personnel shall have access to all areas and have knowledge of electrical and air handling equipment. Such personnel shall assist Contractor in case of any power failure or breakdown to shut down air supply systems, to reset and control all protective systems such as alarms, sprinklers, locks, etc.. The **Owner** shall insure no active air handling systems are operating within the work area.

I. The **Owner** will not occupy the building in which work is being performed during the entire asbestos abatement operation, including completion of clean up, but excluding re-insulation.

2.06 Use of Building Facilities

A. The Owner shall make available to the Contractor all required amounts of water and electric power located at the site at no charge.

B. The Owner shall provide telephone service and a telephone at the job site for use by the Contractor and the Consultant.

C. The Contractor shall provide all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc.

D. The Contractor shall provide a separate temporary GFCI electric panel board to power all equipment associated with the asbestos abatement project. The Owner shall designate an existing power box in close proximity to the work area. Contractor's licensed electrician shall provide temporary tie-in via cable, outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. All temporary electric shall be in accordance with OSHA Regulations, specifically but not limited to, 1926 Subpart K.

E. Contractor shall provide fire protection in accordance with all State and Local fire codes.

F. When temporary services lines are no longer required, they shall be removed by the Contractor. Any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary service lines, shall be restored to their original condition by the Contractor, in a manner satisfactory to the Owner.

G. Contractor shall provide hot shower water necessary for use in the decontamination unit.

2.07 Use of the Premises

A. The Contractor shall confine his apparatus, the storage of materials, and supplies, and the operation of his workmen to limits established by law, ordinances, and the directions of the Owner. All flammable or combustible materials shall be properly stored to obviate fire and in areas approved by the Owner.

B. The Contractor shall assure that no exits from the building are obstructed, that appropriate safety barriers are established to prevent access, and that work areas are kept neat, clean, and safe.

C. All surrounding work, fixtures, soil lines, drains, water lines, pipes, electrical conduit, wires, utilities, railings, shrubbery, landscaping, etc. which is to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the Owner, at no additional cost.

D. Any or all routes through the building to be used by the Contractor shall first be approved by the Owner and the Consultant.

E. Toilet facilities are available on site for the Contractors use.

2.08 Electrical Fixtures and HVAC Registers Dust Control

A. Prior to the commencement of any removal and cleaning activities, any existing lighting fixtures and ceiling suspension system shall be decontaminated using a HEPA vacuum equipped with a soft brush attachment.

B. All HVAC registers diffusers, induction units, etc. shall receive no replacements or changes. Existing fixtures shall be shut down by the Owner's personnel prior to any work in the area.

2.09 Protection and Damage

A. Replace or repair any items damaged, due to work performed under this contract, equal to their original construction and finish. Repaired or replaced items will be subject to the Owner's approval.

B. Use rubber-tired vehicles which use non-volatile fuels for conveying material inside building and provide temporary covering, as necessary, to protect floors.

C. No materials shall be thrown from windows or doors of buildings. Building waste system shall NOT be used to remove refuse.

D. Debris shall be removed from the site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption.

E. Protect floors along removal routes from damage, wear and staining.

F. Liquidated damages of $350.00 will be assessed for each day or part thereof that the Asbestos Removal permit remains open past the scheduled abatement dates.

2.10 Respiratory Systems

A. Provide all workers, foremen, superintendents, authorized visitors and inspectors personally issued and marked respiratory equipment approved by NIOSH and OSHA. When respirators with disposable filters are employed, provide sufficient filters for replacement as necessary by the worker.

B. The Contractor shall require that each person entering the Work Area wear an approved respirator and protective clothing. There shall be no exceptions to this rule.

C. Respiratory protection shall be in accordance with OSHA Regulation 1910.1001 (d), OSHA Regulation 1910.134 and ANSI z88.2-1980. Respirators chosen shall also be approved by NIOSH under the provisions of 30 CFR Part. 11.

D. Respiratory protection shall be determined by airborne fiber concentration (fibers per cubic centimeter of air).

At a minimum, respiratory protection shall be:

- 0.01 - 1.0 f/cc - Dual Cartridge, Air Purifying respirator with HEPA cartridge.
- 1.0 - 10.0 f/cc - Powered Air Purifying respirator with HEPA cartridge.
- 10.0 and above - Type C supplied air pressure demand respirator.

E. **NO ONE** is to be permitted into the work area without proper protection. No disposable dust masks shall be used at any time.

F. All personnel engaged in asbestos abatement procedures requiring an air purifying respirator shall have an unobstructed face/mask seal (i.e., no facial hair).

2.11 Protective Clothing

A. Provide to all workers, foremen, superintendents and authorized visitors and inspectors protective disposable clothing (TYVEK) consisting of full-body coveralls, head covers, gloves and 18 inch high boot type covers or reusable footwear.

B. Provide eye protection and hard hats as required by job conditions and safety regulations.

C. Reusable footwear, hard hats and eye protection devices shall be left in the "Contaminated Equipment Room" until the end of the asbestos abatement work.

D. Disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the work space to the outside through the decontamination facility.

E. The Contractor shall also maintain sufficient supply of all other related items such as towels, soap, etc.

2.12 Air Monitoring - Contractors

A. The Contractor shall employ a certified laboratory and NIOSH certified air test technician to conduct air sampling and analysis in accordance with OSHA Regulations, 29 CFR, 1910.1001 (Asbestos Standard for General Industry), 1926.58 (Asbestos Standards for Construction), and 1910.134 (Respirator Standard).

B. The Testing Laboratory shall be a current proficient participant in the NIOSH PAT Program. The laboratory identification number shall be submitted and approved by the Consultant.

C. The Contractor shall require a competent person from his testing laboratory to perform the following functions:

1. Monitor the set up of the work area enclosure and ensure its integrity.
2. Insure that employees are adequately trained in the use of proper work practices, proper personal protective equipment and in decontamination procedures.
3. Insure that employees USE proper work practices, proper personal protective equipment and proper decontamination procedures.
4. Supervise all employee exposure monitoring. Such monitoring shall comply in all respects with OSHA Regulation 1926.58 Appendix "A".
5. Conduct air sampling as per OSHA 1926.58 and as described herein.

D. Air monitoring and inspection of the Contractor's employees shall be conducted under the supervision of the Contractor's competent person.

E. Continuous air monitoring and inspections will include work area samples, personal samples from the breathing zone of a laborer to establish 8-hour TWA's.

F. Sampling and analyses shall be performed in accordance with the NIOSH #7400 method.

G. Air sample results shall be relayed verbally to the consultant within 24 hours followed by written results posted on the job site within 48 hours after the samples have been taken. Results shall be inscribed on official letterhead.

H. All costs for required air monitoring by the contractor's competent person shall be borne by the contractor.

2.13 Contingency Plan

A. If pressure drops below 0.05"w.c.
   a) The AST and abatement supervisor shall investigate and evaluate the engineering controls to determine the source of the pressure loss
   b) The contractor shall institute corrective actions to reestablish an acceptable pressure differential

B. If pressure drops below 0.01" w.c.
   a) The contractor shall cease all abatement activities
   b) The AST shall notify the building owner to evacuate all spaces outside the work area which is pressurized to isolate it from the work area.
   c) The AST and abatement supervisor shall investigate and evaluate the engineering controls to determine the source of the pressure loss
   d) The contractor shall institute corrective actions to reestablish an acceptable pressure differential
   e) Reoccupancy will not be permitted until at least 0.05" w.c. is achieved
   f) If a the pressure differential is not established to 0.05" w.c. from 24 hours from the first reading of 0.01"w.c. the entire building shall be evacuated

C. If air levels exceed 0.01f/cc, the following procedures shall be implemented
   a) The AST and abatement supervisor shall investigate and evaluate the engineering controls to determine the source of the high air levels
   b) An additional/second air sample shall be collected at the place of elevated levels and analyzed by an outside AIHA approved laboratory. If the result is below 0.01 f/cc the contingency plan is terminated. If the result is above 0.01 f/cc the sample is to be analyzed via Transmission Electron Microscopy (TEM), if the result is above 0.01 f/cc the adjacent areas to the elevated levels shall be misted with amended water, wet wiped and HEPA vacuumed.
   c) The decision of cleaning shall be made by the ASCM and building owner
   d) Phase Contrast Microscopy (PCM) air sampling will continue until levels of 0.01 f/cc or less are achieved.
   e) If airborne levels do not achieve 0.01 f/cc or less within 24 hours of first elevated level, the entire building shall be evacuated
   f) Reoccupancy shall not be permitted until levels of 0.01 f/cc or less are achieved by either Phase Contrast Microscopy (PCM) or Transmission Electron Microscopy (TEM) analysis.

D. If a power outage occurs during abatement activities, the building occupants shall be evacuated until the air samples determine that the occupied spaces are safe, and power has been restored. If a power outage occurs while the building is unoccupied, occupancy will not be permitted until air samples determine that the spaces to be occupied are safe and the power has been restored

PART III DISPOSAL OF ASBESTOS WASTE

3.00 Disposal of Asbestos Waste

This subsection shall apply to the removal of asbestos from the job site and the disposal of asbestos waste.

All Asbestos waste is to be disposed of at a approved landfill, and a copy of the manifest is to be given to the building owner.

A. The contractor is required to give a notice 10 days prior to the disposal to the New Jersey Department of Environmental Protection, Division of Waste Management, Bureau of Field Operations. In addition, all disposal procedures must comply with CAA 112, 42 U.S.C 7412, and 40 CFR 61.156, NJAC 7:26

B. Disposal of asbestos waste shall be conducted as follows:

1. All asbestos waste materials destined for disposal shall be wetted and packaged in permanently sealed, leak tight containers (such as 6 mil plastic bags, double bagged with visible labels) before it can be transported and disposed. No hauling of loose asbestos or asbestos contaminated debris is permitted.

2. A locked, secure container shall be provided if asbestos waste is to be stored outside unattended.

C. Notify the Owner's Asbestos Consultant in writing not less than 48 hours prior to the proposed time of removing and delivery of contaminated waste to the landfill. The Owner's Asbestos Consultant may elect to observe this operation.

D. The waste hauler must possess a valid solid waste transporter registration. A licensed solid waste transporter shall be a commercial collector/hauler or shall be the removal company if they are so registered.

E. Asbestos waste can be hauled in trucks or in dumpster containers provided the load is comprised only of asbestos in bags and does not contain any other wastes which could compromise the integrity of the permanent containers.

F. If rough surfaces or other materials are present in the load which could potentially puncture the permanent containers, then those containers shall be enclosed in temporary fiber or steel drums during loading, transport and unloading operations. In addition, asbestos waste shall not be loaded into or hauled with vehicles containing collection devices.

G. Use only enclosed or covered trucks to haul impermeable containers to prevent loss or damage to containers in route to sanitary landfill.

H. Allow only sealed plastic bags or impermeable containers to be deposited in landfill. Leave damaged, broken or leaking plastic bags in the impermeable container and deposit entire container in landfill. Obtain prior approval from appropriate regulatory officials before disposing contaminated materials from high pressure vacuum collection system in the approved landfill.

I. Ensure that there are no visible emissions to the outside air from site where materials and waste are deposited.

J. Contractor may recycle uncontaminated impermeable containers.

PART IV PRODUCTS

4.00 Quality

A. Brand Names and Approved Equals

1. The contractor shall use Brand Named materials specified or an approved equal. (NEW JERSEY STATUTE 40A: 11-13 SPECIFICATIONS)

2. The contractor shall provide to the Owner and the Consultant, materials he/she plans to use during abatement activities. Changes in the submission of these materials shall be provided prior to abatement commencing. The Owner shall approve/disapprove these submissions.

3. No abatement activities shall occur prior to the Owner's consent and the Consultant's recommendation of the use of these products.

4. BRAND NAMES AND/OR DESCRIPTIONS USED IN THIS SPECIFICATION FOR BID PROPOSAL ARE TO ACQUAINT PROSPECTIVE BIDDERS WITH THE TYPE OF EQUIPMENT DESCRIBED (OR COMMODITY) AND WILL BE USED AS A STANDARD BY WHICH ALTERNATE OR COMPETITIVE MATERIALS OFFERED WILL BE JUDGED. COMPETITIVE ITEMS MUST BE EQUAL TO THE STANDARD DESCRIBED AND BE OF THE SAME REPUTATION FOR QUALITY AND WORKMANSHIP. VARIATIONS BETWEEN EQUIPMENT DESCRIBED AND MATERIAL OFFERED ARE TO BE FULLY EXPLAINED IN AN ACCOMPANYING LETTER. IN THE ABSENCE OF ANY CHANGES BY THE BIDDER, IT WILL BE PRESUMED AND REQUIRED THAT MATERIALS AS DESCRIBED IN THESE SPECIFICATIONS BE DELIVERED.

4.01 Materials

A. The wetting agent shall be BWE 5000 as manufactured by Better Working Environments Inc., of San Diego OR an equal.

B. Encapsulating material shall be bridging and/or penetrating in nature and must be applied in two coats.

C. Cement to be used to seal ends, tears and penetrations shall be fire-rated and asbestos-free.

D. Framing materials shall consist of 2 x 4 studs and sections of 5/8" plywood from first quality lumber, Fire Retardant.

E. The contractor shall use only polyethylene sheeting with a minimum thickness of 6 mil.

F. The use of drums is permissible as long as said drums contain lining that is leak-proof. The exterior of drums must have clear and permanent labeling and labeling specified by OSHA and EPA regulations.

G. All waste shall be discarded in properly labeled and 6 mil thick polyethylene double bags.

H. Asbestos warning signs shall be in English script and placed in areas as required by OSHA and the EPA.

I. All tape shall be of high quality polyethylene film tape.

J. Spray adhesive may be used.

K. Disposable clothing to be used shall be of the same composition as Dupont's Tyvek or equivalent.

L. All materials utilized on the site shall be non-combustible per NJAC 5:23-8.15e4.

4.02 Tools and Equipment

A. Asbestos filtration devices shall be equipped with HIGH EFFICIENCY PARTICULATE ABSOLUTE (HEPA) filter systems certified by the manufacturer to have an efficiency of not less than 99.97%.

B. Scaffolding is to be used when and where needed as long as its use is monitored and is safety tested and approved for such work conditions by OSHA and any other safety regulatory agency.

C. Transportation and storage equipment shall be used so that no accumulations of ACM shall occur on a daily basis. This equipment shall be constructed and registered as such to store and/or transport waste material without any threat to persons or the environment of possible contamination.

D. All vacuum equipment to be used shall use HEPA filtering systems.

PART V EXECUTION

5.00 Permits, Notifications, Licenses

A. The contractor shall present a duplicate copy of his asbestos contractors license issued by the New Jersey Department of Labor with his bid. Only licensed contractors may perform work described and required by this specification. As required by law, the contractor shall maintain on the project site a valid Contractors license.

B. The Contractor shall apply for the necessary construction permits required for the asbestos abatement project.

C. The Contractor shall maintain the required number of qualified personnel on site to complete project on schedule.

NOTE: ALL CONTRACTOR EMPLOYEES MUST POSSESS A VALID NJ ASBESTOS REMOVER/LABORER'S PERMIT AND MAKE AVAILABLE TO THE OWNER, CONSULTANT, NJ DCA, NJ DOL, NJ DOH AND AST THESE PERMITS UPON REQUEST AT THE PROJECT SITE. ALL EMPLOYEES MUST HAVE A MINIMUM OF AT LEAST SIX (6) MONTHS EXPERIENCE IN ASBESTOS ABATEMENT IN THE STATE OF NEW JERSEY.

D. The contractor shall also present to the AST, Owner, and Consultant prior to the commencement of abatement, proof that a NJ DEP Registered Waste Hauler Permit exists. NO PRECOMMENCEMENT INSPECTION SHALL TAKE PLACE UNTIL SUCH PROOF EXISTS AND IS SATISFACTORY TO THE NJ DCA, THE ASCM/AST, THE OWNER AND THE CONSULTANT.

E. At the completion of the project the asbestos abatement Contractor will submit the following documentation to the owner with their invoice. This information will also be submitted to the owners representative, Health & Safety Services, Inc..

1. The Certificate of Acceptance/Occupancy from the local construction official.

2. A copy of all waste disposal manifests.

5.01 Inspections

A. The AST will perform inspections throughout the entire asbestos abatement project. The AST inspections are as follows:

1. Precommencement inspections by the AST will occur prior to each phase of abatement. The AST will observe and will check compliance of the following:

   a. critical/separation barriers in place
   b. AFD units in place and operating
   c. notifications, variances, permits and licenses in place
   d. waste container on site and labeled
   e. OSHA signs posted
   f. emergency plans and numbers posted
   g. decontamination chamber in place and operating
   h. poly on walls and floor and ceiling.
   i. proper supplies of bags, suits, filters, towels, masks and other equipment
   j. proper discontinued use of HVAC systems
   k. ground fault interrupters are in place outside of the work area and operable

2. Progress Inspections by the A.S.T. will occur a minimum of twice per work shift at random times - per NJ sub chapter 8 rules and regulations.
3. Cleanup inspections will occur as work progresses to ensure that the work area is clean and that no asbestos containing materials are left exposed. Equipment must also be placed in an orderly fashion to promote means of ingress and egress.
4. Pre-sealant inspections shall take place after all exposed surfaces have been wet-wiped and are found cleaned. The contractor shall notify the AST that an inspection is requested 48 hours prior to the actual inspection time. The AST shall, in writing, notify the contractor and Owner of the results of the inspection.
5. The AST shall perform a final visual inspection after being notified that such an inspection is requested at least 24 hours in advance. NO FINAL VISUAL INSPECTION SHALL TAKE PLACE IMMEDIATELY AFTER ANY WET CLEANING.

B. During any inspection by State or Federal agencies, the Contractor must have a supervisor present.

C. The New Jersey Department of Community Affairs and the New Jersey Department of Labor are authorized to make unannounced and periodic inspections during the entire abatement process to observe AST and Contractor compliance with applicable statutes.

D. The Consultant, Health & Safety Services, Inc., will also make random and periodic inspections to observe contractor compliance with specifications and statutes. Directives from the consultant shall be given to the AST to be forwarded to the contractor.

5.02 Decontamination Facilities and Procedures

A. DECONTAMINATION CHAMBER

1. The decontamination facility shall be constructed of 2"x 4"x 8' wooden framing covered with two layers of 6-mil poly sheeting on all sides.
2. Airlocks shall be installed between contaminated area, equipment room, shower room, and clean room. Air locks shall consist of three layers of 6 mil. poly each and shall be alternately secured. Each airlock shall be weighted down.
3. All individual chambers shall be at least 4 feet square to allow access with a stretcher in the event of emergencies.
4. The shower shall have both hot and cold water receptacles, liquid shampoo and liquid soap, both in plastic containers, so that workers and visitors can decontaminate prior to entering the clean room.
5. The contractor shall provide all connections for water and electrical hook-ups necessary to perform the work described in this specification.
6. The clean room shall contain an area where street clothes, towels, and cleaned respirators can be stored. The Contractor shall maintain an adequate supply of towels and soap for visitors and inspectors at all times.
7. The equipment room shall be provided by the contractor where work materials, footwear, and contaminated work clothing can be stored.
8. The decontamination chamber shall be located in the area as defined in the diagrams.
9. During abatement operations, the Contractor shall be allowed to use the decontamination chamber for waste egress.

B. DECONTAMINATION SEQUENCE - PERSONAL

1. ALL workers and visitors who will enter the work area shall remove all street clothes, put on clean overalls, and respirators while in the clean room. The person will then proceed through the showers and dirty (equipment) room and enter the work area.
2. Before leaving, the worker will remove all gross contamination with the use of HEPA vacuums. With the help of another worker, the person shall remove disposable TYVEK clothing. Contaminated clothing shall be placed in labeled poly bags and left in the work area until completion of the project.
3. The worker then proceeds to the shower room. Respiratory protection shall still be worn while showering. Such protection shall be removed after the person has completely showered to prevent inhalation of asbestos fibers.
4. After showering the person moves to the clean room and dresses in either new coveralls for re-entry, or street clothes if leaving.
5. NO EATING, DRINKING, SMOKING OR CHEWING SHALL OCCUR IN THE WORK AREA OR DECONTAMINATION CHAMBER.
6. No footwear that is not readily cleanable, shall remain in the equipment room and, at the end of the project, will be discarded as contaminated waste.
7. NO EXCEPTIONS TO THESE DECONTAMINATION PROCEDURES WILL BE ALLOWED!!!

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.
B. Floors and slabs on grade.
C. Concrete reinforcement.
D. Joint devices associated with concrete work.
E. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary; 2025.
B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
E. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
F. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
G. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
H. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
I. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
J. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2026.
L. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2024.
M. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2022.
N. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2025.

O. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.

P. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.

Q. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.

R. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2026.

S. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

T. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2026.

U. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

V. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2026.

W. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.

X. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2025.

Y. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2023.

Z. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.

AA. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.

BB. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2023.

CC. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2024.

DD. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.

EE. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.

FF. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.

GG. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

HH. ASTM C1708/C1708M - Standard Test Methods for Self-Leveling Mortars Containing Hydraulic Cements; 2025.

II. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2025).

JJ. ASTM E1155/E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2023.

KK. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.

LL. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

MM. ASTM E1993/E1993M - Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs; 1998 (Reapproved 2020).

NN. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with fiber reinforcing manufacturer's written recommendations.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Test Reports: Submit report for each test or series of tests specified.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.

B. Follow recommendations of ACI PRC-305 when concreting during hot weather.

C. Follow recommendations of ACI PRC-306 when concreting during cold weather.

D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Slabs with Porosity Inhibiting Admixture (PIA) or Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover cost of flooring failures due to moisture migration from slabs for life of the concrete.
   1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.

C. Termite-Resistant Vapor Barrier Sheet: Provide ten year manufacturer's limited warranty.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
   3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Type: Deformed billet-steel bars.
   2. Finish: Galvanized in accordance with ASTM A767/A767M, Class I, unless otherwise indicated.

B. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
   1. Form: Coiled Rolls.
   2. WWR Style: 4 x 8-W6 x W10.

C. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.
   2. Color: Gray.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

C. Lightweight Aggregate: ASTM C330/C330M.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

E. Structural Fiber Reinforcement: ASTM C1116/C1116M.
   1. Fiber Length: 0.5 inch, nominal.
   2. Fiber Type: Alkali-resistant synthetic.

2.04 ADMIXTURES

A. Chemical Admixture: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
   1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
   2. Retarding Admixture: ASTM C494/C494M, Type B.
   3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
   4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
   5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
   6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
   7. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.

B. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

C. Air Entrainment Admixture: ASTM C260/C260M.
   1. Manufacturers:
      a. Master Builders Solutions; MasterAir Series: www.master-builders-solutions.com/en-us/#sle.
      b. Or approved equal..

D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
   1. Products:
      a. Euclid Chemical Company; PLASTOL 6420: www.euclidchemical.com/#sle.
      b. Master Builders Solutions, MasterGlenium Series: www.master-builders-solutions.com/en-us/#sle.
      c. Or approved equal..

E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
   1. Products:
      a. Euclid Chemical Company; ACCELGUARD 80: www.euclidchemical.com/#sle.
      b. Master Builders Solutions; MasterSet AC FP 20: www.master-builders-solutions.com/en-us/#sle.
      c. Or approved equal..

F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
   1. Products:
      a. Master Builders Solutions; MasterSet DELVO: www.master-builders-solutions.com/en-us/#sle.
      b. Or approved equal..

G. Moisture Vapor Reducing Admixture (MVRA): Liquid, inorganic admixture free of volatile organic compounds (VOCs). Closes capillary systems formed during concrete curing to reduce moisture vapor emission and transmission. Reduces concrete shrinkage with no adverse effect on concrete properties or applied flooring.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:
   1. Sheet Material: ASTM E1745, Class A; 15 mill minimum, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited. Permeance of less than 0.01 perms as tested in accordance with mandatory conditiong tests per ASTM E1745 Section 7.1.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations. Overlap sheet products 6 inches minimum.
   3. Products:
      a. Stego Industries, LLC; Stego Wrap Vapor Barrier 15-mil.: www.stegoindustries.com/#sle.
      b. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm): www.wrmeadows.com/#sle.
      c. Or approved equal..

B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.
   1. Grout: Comply with ASTM C1107/C1107M.
   2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.
   3. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
   4. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch.
   5. Flowable Products:
      a. Five Star Products, Inc; Five Star Fluid Grout 100: www.fivestarproducts.com/#sle.
      b. Or approved equal..

C. Sealant
   1. Manufacturer: Subject to compliance with requirements, provide products of one of the following, or approved equal:
      a. Dow Chemical Company: Midland, Mi.
      b. VC Industries/V.5 Gypsum: Chicago, IL.

D. Self-Leveling Cementitious Concrete Floor Topping:
   1. Minimum Compressive Strength at 28 Days, ASTM C1708/C1708M: 7,000 pounds per square inch.
   2. Products:
      a. LATICRETE International, Inc; NXT Level DL: www.laticrete.com/#sle.
      b. Or approved equal..

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

1. Products:
    a. Euclid Chemical Company; AKKRO-7T: www.euclidchemical.com/#sle.
    b. W. R. Meadows, Inc; ACRY-LOK: www.wrmeadows.com/#sle.
    c. Or approved equal..

B. Slab Isolation Joint Filler: 1/2-inch thick, height equal to slab thickness, with removable top section forming 1/2-inch deep sealant pocket after removal.
    1. Material: Closed-cell, non-absorbent, compressible polymer foam in sheet form.

C. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.

D. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.

2.07 CURING MATERIALS

A. Curing Compound, Non-Dissipating: Liquid, membrane-forming, clear, nonyellowing acrylic; complying with ASTM C309.
    1. Vehicle: Water-based.
    2. Gloss: Low.
    3. Solids by Mass: 15 percent, minimum.
    4. VOC Content: OTC compliant.

2.08 CONCRETE MIX DESIGN

A. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
    1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

B. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

C. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

D. Normal Weight Concrete:
    1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 3,000 pounds per square inch.
    2. Water-Cement Ratio: Maximum 40 percent by weight.
    3. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
    4. Maximum Slump: 3 inches.
    5. Maximum Aggregate Size: 5/8 inch.

2.09 MIXING

A. Transit Mixers: Comply with ASTM C94/C94M.

B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

C. Do not use shrinkage-reducing admixture (SRA) in same concrete batch with MVRA or PIA.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R, _____.

E. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
   1. Use latex bonding agent only for non-load-bearing applications.

F. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.

G. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

H. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
   1. Granular Fill Over Vapor Retarder: Cover vapor retarder with compactible granular fill as indicated on drawings. Do not use sand.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.

C. Concrete reinforcement steel shll be grounded and bonded in accordance with the National Eectric COde (NEC) Section 250-50. A conductive reinforcement bar

measuring at least 1/2" in diameter and a minimum of 20 feet in length that is incased in a minimum of 2" concrete cover shall suffice for use as an electrode.

D. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

A. Place concrete in accordance with ACI PRC-304.

B. Place concrete for floor slabs in accordance with ACI PRC-302.1.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Contraction Joint Devices: Use preformed joint device, with top set flush with top of slab.

E. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.06 SEPARATE FLOOR TOPPINGS

A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.

B. Place required dividers, edge strips, reinforcing, and other items to be cast in.

C. Apply bonding agent to substrate in accordance with manufacturer's instructions.

D. Place concrete floor toppings to required lines and levels.

E. Screed toppings level, maintaining surface flatness of maximum 1:1000.

3.07 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 014000, will inspect finished slabs for compliance with specified tolerances.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
   1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
   2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
   3. Under Carpeting: F(F) of 35; F(L) of 25, on-grade only.
   4. Under Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.

C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155/E1155M, within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.08 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

D. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   3. Other Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

3.09 CURING AND PROTECTION

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:

1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   a. Spraying: Spray water over floor slab areas and maintain wet.
3. Final Curing: Begin after initial curing but before surface is dry.

3.10 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

H. Slab Testing: Cooperate with manufacturer of specified moisture vapor reducing admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

3.11 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.12 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

3.13 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Foundation Walls: 3,000 pounds per square inch 28 day concrete, form finish with honeycomb filled surface.

B. Underside of Supported Floors and Structure Exposed to View: 4,000 pounds per square inch 28 day concrete, form finish with honeycomb filled surface.

C. Exposed Portico Structure: 4,000 pounds per square inch 28 day concrete, air entrained, smooth rubbed finish.

END OF SECTION 033000

SECTION 035400 - CAST UNDERLAYMENT

<<<< UPDATE NOTES

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.

2.02 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

B. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2021.

C. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

D. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

F. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

G. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.

H. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine; 2025.

I. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

2.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's data documenting physical characteristics and product limitations.

C. Shop Drawings: Include plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.

D. Manufacturer's Instructions: Indicate information on surface preparation, mixing instructions, environmental limitations, and installation instructions.

2.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

B. Product Compatibility: Manufacturers of underlayment and floor-covering systems certify in writing that products are compatible.

C. Fire-Resistance Ratings: Where indicated, provide hydraulic-cement underlayment systems identical to those of assemblies tested for fire resistance per ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

D. Sound Transmission Characteristics: Where indicated, provide hydraulic-cement underlayment systems identical to those of assemblies tested for STC and IIC ratings per ASTM E90 and ASTM E492 by a qualified testing agency.

E. Pre-installation Conference: Conduct conference at Project site.
   1. Provide minutes of pre-installation conference.

2.05 FIELD CONDITIONS

A. Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.

B. Do not install underlayment until floor penetrations and peripheral work are complete.

C. Maintain minimum ambient temperatures of between 50 degrees F and 80 degrees F 24 hours before, during and 72 hours after installation of underlayment.

D. During curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Cementitious Underlayment:
   1. ARDEX Engineered Cements; K-15 Self-Leveling Underlayment Concrete: www.ardexamericas.com/#sle.
   2. Custom Building Products; CL-150 Self-Leveling Underlayment: www.custombuildingproducts.com/#sle.
   3. Mapei Corporation; Ultraplan 1 Plus: www.mapei.com/#sle.
   4. Maxxon Corporation; Commercial Gyp-Fix EZ: www.maxxon.com/#sle.
   5. Or Approved Equal
   6. Substitutions: See Section 016000 - Product Requirements.

3.02 MATERIALS

A. Cementitious Underlayment: Blended cement mix, producing self-leveling underlayment with the following properties when mixed with water in accordance with manufacturer's directions:
   1. Compressive Strength: Minimum 4000 pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1,000 psi after 28 days, tested in accordance with ASTM C348.
   3. Density: 125 pcf, nominal.
   4. Final Set Time: 1-1/2 to 2 hours, maximum.
   5. Thickness: Capable of thicknesses from minimum uniform thickness of 1/4 inch capable of feathered edge to match adjacent floor elevation, to maximum 3-1/2 inch.
   6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.
   7. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.

B. Aggregate: Dry, well-graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.

C. Reinforcement: Galvanized metal lath complying with recommendations of underlayment manufacturer for specific project circumstances.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.

E. Joint and Crack Filler: Latex-based filler, as recommended by manufacturer.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate. Proceed with application only after unsatisfactory conditions have been corrected.

4.02 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.

B. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.

C. Concrete: : Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
   1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb. of water/1000 sq. ft. in 24 hours, or as required to meet the manufacturer's recommendations of floor finishes to be applied.

D. Wood: Mechanically fasten loose boards and panels to eliminate substrate movement and squeaks. Sand to remove coatings that might impair underlayment bond and remove sanding dust.
   1. Install metal lath for reinforcement of underlayment.

E. Metal Substrates: Mechanically remove, according to manufacturer's written instructions, rust, foreign matter, and other contaminants that might impair underlayment bond. Apply corrosion-resistant coating compatible with underlayment if recommended in writing by underlayment manufacturer.

F. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.

G. Remove substrate surface irregularities. Fill voids and deck joints with filler to prevent underlayment from leaking. Finish smooth.

H. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

I. Sound Control: Install sound control materials according to manufacturer's written instructions.
   1. Do not install mechanical fasteners that penetrate through the sound control materials.

J. Vacuum clean surfaces.

K. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

4.03 APPLICATION

A. Apply underlayment in accordance with manufacturer's instructions.
   1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
   2. Coordinate application of components to provide optimum underlayment-to-substrate and intercoat adhesion.
   3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Pump or pour material onto substrate. Do not retemper or add water.
   1. Pump, move, and screed while material is still highly flowable.
   2. Be careful not to create cold joints.
   3. Wear spiked shoes while working in wet material to avoid leaving marks.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

4.04 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set is reached.

B. Air cure in accordance with manufacturer's instructions.

4.05 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION 035400

SECTION 053100 - STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof deck.

B. Bearing plates and angles.

1.02 RELATED REQUIREMENTS

A. Section 051200 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2025.

E. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2025, with Errata (2026).

H. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; 2016, with Editorial Revision (2022).

I. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).

J. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; 2022.

K. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

D. Certificates: Certify that products furnished meet or exceed specified requirements.

E. Submit manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Deck:
   1. Canam Steel Corporation: www.canam-steeljoists.ws.
   2. Cordeck, Inc: www.cordeck.com/#sle.
   3. New Millennium Building Systems: www.newmill.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.02 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
   1. Calculate to structural working stress design and structural properties specified.

B. Roof Deck: Non-composite type, fluted steel sheet:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS), with G90/Z275 galvanized coating.
      a. Grade as required to meet performance criteria.

2.03 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.

B. Welding Materials: AWS D1.1/D1.1M.

C. Fasteners: Galvanized hardened steel, self tapping.

2.04 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips and cover plates, 22 gauge, 0.0299 inch thick sheet steel; of profile and size as indicated; finished same as deck.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On steel supports provide minimum 1-1/2 inch bearing.

C. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.
   1. Welding: Use fusion welds through weld washers.

D. Weld deck in accordance with AWS D1.3/D1.3M.

E. At deck openings greater than 18 inches in size, provide steel angle reinforcement. as specified in Section 051200.

F. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud load bearing interior wall framing.

B. Ceiling joist framing.

C. Soffit framing.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Wood blocking and miscellaneous framing.

B. Section 092116 - Gypsum Board Assemblies: Cold-formed steel nonstructural framing.

C. Section 095100 - Acoustical Ceilings: Ceiling suspension system.

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2020.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2025.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2025.

H. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).

I. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025a.

J. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

K. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2025, with Errata (2026).

L. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to metal framing systems, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.

C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
   2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
   3. Shop drawings shall be signed and sealed by a qualified professional engineer licensed in the State where the Project is located who is responsible for the preparation of shop drawings.

D. Design Data:
   1. Shop drawings signed and sealed by a professional structural engineer.
   2. Design calculations sufficient to demonstrate compliance with design criteria; signed and sealed by a professional structural engineer.
   3. Details and calculations for factory-made connectors, signed and sealed by a professional structural engineer.

E. Mill certificates signed by manufacturers of cold-formed metal framing certifying that their products comply with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, and galvanized-coating thickness.
   1. In lieu of mill certificates, submit test reports from a qualified independent testing agency evidencing compliance with requirements.

F. Testing Agency Qualification Statement.

G. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
   1. Steel sheet.
   2. Expansion anchors.
   3. Power-actuated anchors.
   4. Mechanical fasteners.
   5. Vertical deflection clips.
   6. Horizontal drift deflection clips
   7. Miscellaneous structural clips and accessories.

H. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before the start of scheduled welding work.

I. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

J. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a professional structural engineer experienced in designing this work and licensed in the State in which the Project is located.

B. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.

C. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.

E. Codes and Standards: Comply with provisions of the latest adopted version of International Building Code 2021, New Jersey Edition, unless more stringent requirements are indicated elsewhere.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Structural Framing:
   1. ClarkDietrich; _____: www.clarkdietrich.com/#sle.
   2. MarinoWARE; ____: www.marinoware.com/#sle.
   3. Steel Construction Systems; _____: www.steelconsystems.com/#sle.
   4. Nuconsteel; a Nucor Company.
   5. United Steel Manufacturing.
   6. Substitutions: Or approved equal.

2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design cold-formed steel framing.

B. Design Requirements: Design cold-formed framing systems, components and connectors to withstand specified design loads in compliance with ICC (IBC), ASCE 7, AISI S100, and AISI S240.
   1. Design Loads: As indicated on drawings, and as required by the code in effect for the location of the Project Site.
   2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:

C. Design Criteria: In accordance with applicable codes.
   1. Live load deflection meeting the following, unless otherwise indicated:
      a. Floors: Maximum vertical deflection under live load of 1/480 of span.
      b. Roofs: Maximum vertical deflection under live load of 1/240 of span.
      c. Exterior Walls: Maximum horizontal deflection under wind load of 1/240 of span.
      d. Design nonaxial loadbearing framing to accommodate not less than 1/2 in vertical deflection.
      e. Ceiling Joist Framing: Vertical deflection of 1/240 of the span for live loads and 1/240 for total loads of the span.
   2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
   3. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   4. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
   5. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F
   6. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure.

2.03 MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

2.04 STRUCTURAL FRAMING COMPONENTS

A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.
   3. Thickness and Depth: Depth as indicated on the drawings; thickness and structural grade as required to meet design criteria.

4. Provide components fabricated in accordance with ASTM A1008/A1008M Designation SS.

B. Jamb Studs: AISI S240; manufactured, engineered, c-shaped with wide flanges, designed to replace conventional double-stud framing at openings.
   1. Structural Grade: As required to meet design criteria.
   2. Thickness and Depth: Depth as indicated on drawings; thickness and structural grade as required to meet specified design criteria.

C. Headers: AISI S240; manufactured, engineered one-member or two-member assemblies, with wide flanges, designed to replace conventional box or nested header framing at openings.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.
   3. Thickness and Depth: Depth as indicated on drawings; thickness and structural grade as required to meet specified design criteria.
   4. Jamb Mounting Clips: Manufacturer's standard.

2.05 LATERAL FORCE-RESISTING SYSTEMS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

2.06 CONNECTIONS

A. Performance Requirements: Provide connections in compliance with requirements of AISI S240.

B. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
   1. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
   2. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
   3. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 10 feet.

2.07 MISCELLANEOUS CONNECTIONS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

C. Welding: Comply with AWS D1.1/D1.1M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION - GENERAL

A. Install structural members and connections in compliance with ASTM C1007.

3.03 INSTALLATION OF STUDS

A. Install wall studs plumb and level.

B. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

C. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

D. Install intermediate studs above and below openings to align with wall stud spacing.

E. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.

F. Attach cross studs to studs for attachment of fixtures anchored to walls.

G. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

H. Touch-up field welds and damaged corrosion-protected surfaces zinc-rich paint in compliance with ASTM A780/A780M.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Coordination of Other Tests and Inspections: Owner will employ independent testing agency to test and/or inspect _____; provide access and _____ as required to accommodate timely performance.

3.05 TOLERANCES

A. Studs - Vertical Alignment (Plumbness): 1/960 of span or 1/8 inch in 10 ft, in accordance with ASTM C1007.

B. Studs - Maximum Variation from True Position: 1/8 inch in accordance with ASTM C1007.

C. Stud Spacing: 1/8 inch from the designated spacing, provided that the cumulative error does not exceed the requirements of the finishing materials in accordance with ASTM C1007.

END OF SECTION 054000

SECTION 061000 - ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonstructural dimension lumber framing.
B. Roofing nailers.
C. Preservative treated wood materials.
D. Fire retardant treated wood materials.
E. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
B. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2024).
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
D. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2024, with Errata.
E. AWPA M4 - Standard for the Handling, Storage, Field Fabrication and Field Treatment of Preservative-Treated Wood Products; 2023.
F. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.
G. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. PS 20 - American Softwood Lumber Standard; 2025.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide technical data on insulated sheathing and application instructions.
C. Product Data: Submit technical data on wood treatment.

1.05 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, and installation.

1.06 WARRANTY

A. See Section 017839 - Project Record Documents for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Stud Framing (2 by 2 through 2 by 6):
   1. Grade: No. 2.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 PRESSURE-PRESERVATIVE TREATMENT (PPT)

A. Manufacturers:
   1. Arxada; Wolman E: www.arxada.com/#sle.
   2. Koppers Performance Chemicals, Inc: www.koppersperformancechemicals.com/#sle.
   3. Substitutions: See Section 016000 - Product Requirements.

B. Factory-treat wood members in accordance with AWPA U1 and use category indicated.

C. Applications Indicated on Drawings: Use Category UC3A, above ground, exterior, protected.

D. Kiln-dry wood after treatment with waterborne preservative to maximum moisture content of 19 percent for lumber and 15 percent for plywood.

E. Fabricate to maximum extent possible before treatment.

F. Label preservative-treated wood with marking as required by AWPA U1 and ICC (IBC). Unless otherwise permitted by standard U1 and building code, include the following markings: AWPA U1, accredited inspection agency mark, treating plant identification, type of preservative, preservative retention, and permitted end use.

G. Field Treatment for Cuts and Holes in Preservative-Treated Wood: Comply with AWPA M4.

2.04 ACCESSORIES

A. Metal and Finish of Fasteners:
   1. Preservative-Treated Wood:
      a. Nails, timber rivets, wood screws, and lag screws - general use: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
   2. Untreated Wood: Unfinished steel.

PART 3 EXECUTION

3.01 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 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.

3.03 FRAMING INSTALLATION

A. 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.

B. 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.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes, AWC (WFCM) Wood Frame Construction Manual, and _____.

E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 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. Provide nonstructural framing and blocking to support the following:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.
   10. Other wall- or ceiling-mounted items indicated on drawings.

3.05 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.06 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

3.07 CLEANING

A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
   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 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 061000

SECTION 064100 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood casework with transparent finish.

B. Shop finishing.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry.

B. Section

C. Section 123600 - Countertops.

1.03 REFERENCE STANDARDS

A. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

C. ANSI/AWI 0400 - Factory Finishing; 2022.

D. ANSI/AWI 0620 - Finish Carpentry/Installation; 2024.

E. ANSI/AWI 0641 - Architectural Wood Casework; 2019.

F. ASTM C1036 - Standard Specification for Flat Glass; 2025.

G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2024, with Editorial Revision (2025).

I. AWI 100 - Submittals; 2018.

J. AWI 200 - Care and Storage; 2018.

K. AWI 300 - Materials; 2018.

L. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

M. BHMA A156.9 - Cabinet Hardware; 2020.

N. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

O. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

P. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

Q. PS 1 - Structural Plywood; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene preinstallation meeting not less than one week prior to completion of framing behind casework; require attendance of contractor, framing contractor, and casework fabricator.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. AWI QCP Program Submittal Requirements: Comply with AWI 100.

C. Product Data for Wood Casework for Transparent Finish: Submit manufacturer's published, product descriptive data.
   1. Panel Cores for Wood Veneer Panels: For each type, include thickness.
   2. Veneer Tape Edgebanding: For each type, indicate material and thickness.

D. Shop Drawings:
   1. AWI QCP Program Shop Drawing Requirements:
      a. Plans and Elevations: Plan and elevation views of each assembly type.
         1) Include casework assembly dimensions.
      b. Detailed Sections: Dimensioned section views of each casework configuration.
         1) Include appropriate locations for casework wall anchorage.
      c. Details of Wood Veneer Leaves: Include dimensions and grain direction for each leaf.

E. Samples:
   1. AWI QCP Program Requirements for Samples: Comply with AWI 100.
   2. Samples, Wood Veneer Panels: For each wood veneer species and cut, submit twofinished samples, indicating specified species, cut, and finish; size: 8 by 8 inches, minimum; thickness: 3/4 inch.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: AWI QCP-licensed woodworking firm.

B. Installer Qualifications: AWI QC-accredited installer.

C. Fabricator/Installer Qualifications: Firm specializing in fabricating and installing products specified in this section with minimum five years of documented experience; with qualifications indicating ability to comply with requirements of this section.

D. Architectural Woodwork Institute (AWI) Quality Certification Program (QCP):

1.07 MOCK-UPS

A. Locate where directed.

B. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver products in original packaging materials bearing product identification.

C. Store products prior to installation on flat, level, clean surfaces; elevate products above floors and protect from sunlight.

D. Store products in interior rooms with completed wet work and overhead work.

E. For products other than wood and wood-based products, store and handle in accordance with fabricator's documented instructions.

F. Handle materials and products to prevent damage to edges, ends, or surfaces.

1.09 FIELD CONDITIONS

A. Ambient Conditions for Acclimation, Installation, and Post-Installation of Wood-Based Products:
   1. Acclimation Period Prior to Installation: 72 hours minimum, inside installation environment.
   2. Temperature Conditions During Installation and Post-Installation: Maintain temperature between 60 degrees F and 90 degrees F.

PART 2 PRODUCTS

2.01 ARCHITECTURAL WOOD CASEWORK

A. Casework Finish: Wood casework with laminate cladding.

B. Provide casework and casework components in sizes and profiles as indicated on drawings.

C. Adjustable glass Shelves, As shown on drawings. Reference glazing specification.

2.02 PERFORMANCE REQUIREMENTS

A. Architectural Woodwork Institute (AWI) Performance Requirements:
   1. Comply with AWI 300, ANSI/AWI 0641, ANSI/AWI 0400, and ANSI/AWI 0620 as applicable for specified casework finish, aesthetic grade, and performance duty level.
      a. Product Performance Duty Level: Duty Level 3.
   2. Panel and Material Thicknesses: Provide panels and materials as required to meet specified performance duty level, subject to minimum thickness requirements of AWI 300 and ANSI/AWI 0641 and flatness requirements indicated below.
   3. Panel Flatness: Provide panels with maximum variation from flat in 12 inches as measured diagonally across panel.

2.03 WOOD CASEWORK WITH TRANSPARENT FINISH

A. Finishing Method:
   1. Shop-applied transparent finish of wood veneer.
B. Casework Construction:
   1. Frameless Cabinet and Door Interface: As indicated on drawings.
C. Wood Species for Exposed Exterior and Interior Surfaces:
   1. Hardwood Species and Cut: Maple; plain-sliced.
D. Custom Grade - Wood Casework with Transparent Finish:
   1. Exposed Exterior Surfaces, Panels to Receive Transparent Finish:
   2. Exposed Interior Surfaces, Panels to Receive Transparent Finish:
E. Exposed Exterior Surfaces, Matching of Veneer Leaves:
   1. Matching of Veneer Leaves: Book match.
F. Grain Direction of Exposed Surfaces:
   1. Fascia and Filler Panels: Vertical.
   2. Face Frame Members: Lengthwise along members.
G. Edgebanding Applications for Wood Casework with Transparent Finish:
   1. Edgebanding: Provide edgebanding on exposed edges.
H. Edgebanding Materials for Wood Casework with Transparent Finish:
   1. Species: Same species as exposed surfaces.
   2. Wood Veneer: 0.018 inch minimum thickness.

2.04 WOOD VENEER PANELS

A. Description: Panels consisting of wood face veneers applied to cores; panel layup with face ply, back ply, and core of either single layer or odd number of inner plies, to produce balanced construction panel; comply with HPVA HP-1.
   1. Panels subject to size limitations, minimum thickness requirements, and fabrication tolerances of specified aesthetic grade and performance duty level in accordance with AWI 300 and ANSI/AWI 0641.
B. Hardwood Face Veneers Intended to Receive Transparent Finish:
   1. Species and Cut: As specified in this section with wood casework for transparent finish.
   2. Face Veneer Grade: As specified in this section with wood casework intended for transparent finish; associated with applicable surface exposures and specified performance requirements.
C. Hardwood Veneer Plywood Panels:
   1. Products:
      a. Roseburg Forest Products; SkyPly Hardwood Plywood: www.roseburg.com/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

2.05 CONCEALED CABINET BASE COMPONENTS

A. Cabinet Base Toe-Kick Subfronts:
   1. Finished Face of Toe Kick Subfronts: As indicated on drawings.
B. Cabinet Base Blocking and Stretchers:

1. Materials and Size: Fabricator's choice subject to requirements of ANSI/AWI 0641.

C. Cabinet Base Sleepers:
   1. Materials and Size: Fabricator's choice subject to requirements of ANSI/AWI 0641.

2.06 WOOD AND WOOD-BASED MATERIALS

A. AWI 200 Wood Moisture Content Requirements:

B. Plywood: Comply with PS 1.

C. Wood Anchoring Strips:
   1. Materials and Size: Fabricator's choice subject to requirements of ANSI/AWI 0641.

2.07 CABINET AND DRAWER HARDWARE

A. Adjustable Shelf Support Systems, Standards and Shelf Rests:
   1. Description: Slotted vertical standards with shelf rests for supporting shelves; standards mounted in evenly spaced, cleanly bored holes.
   2. Adjustment Increment: 1-1/4 inches.
   3. Standard Length: As indicated on drawings.
   4. Open Shelf Rests: Comply with BHMA A156.9, KV Steel #180EB10.
   5. Material and Finish: Selected from full range of finishes.
   6. Products:
      a. CR Laurence: www.crlaurence.com.
      b. Substitutions: See Section 016000 - Product Requirements.

2.08 CASEWORK ACCESSORY COMPONENTS

A. Glass and Glazing Applications:
   1. Frameless sliding glass doors, where indicated on drawings.
      a. Exposed Edges and Corners: Ground and polished.
   2. Glass shelves, where indicated on drawings.
      a. Exposed Edges and Corners: Ground and polished.
   3. Glass: Clear, tempered, safety glass.
      a. ASTM C1036, Type I transparent flat; Class I clear.
      b. ASTM C1048, Kind FT fully tempered; Condition A uncoated; Quality Q3.
      c. Safety glass complying with ANSI Z97.1 Class A.
      d. Thickness: 1/4 inch nominal, minimum.
   4. Laminated Safety Glass:
      a. Description: Two lites of flat glass of equal thickness bonded with one interlayer.
      b. ASTM C1036, Type I transparent flat; Class I clear.
      c. ANSI Z97.1, Type II; with interlayer complying with ASTM C1172 - Class A.
      d. Interlayer: Polyvinyl butyral (PVB): 0.030 inch, minimum.
      e. Glass Ply Thickness: 1/4 inch nominal, minimum, each ply.

2.09 FABRICATION

A. Shop-fabricate casework to dimensions, profiles, and details indicated on drawings.

B. Fabricate to maximum extents plausible, including doors, drawers, and hardware; fabricate units in sizes transportable through building openings.

C. When necessary to cut and fit on site, provide materials with sufficient allowance for cutting.

D. Wood Casework with Laminate Cladding: Apply laminates in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline.

E. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:

F. WI Certified Compliance Labels: Indicate compliance with WI Certified Compliance Program by applying WI Certified Compliance Labels on each casework elevation.

G. Fabrication Tolerances: Comply with specified performance requirements.

2.10 SHOP FINISHING

A. Surface Preparation: Comply with:
   1. ANSI/AWI 0400 for specified aesthetic grade.

B. Shop Finishing: Shop finish architectural wood casework.
   1. Comply with ANSI/AWI 0400 for specified aesthetic grade.

C. Transparent Finish System:
   1. MPI (APSM) Gloss Level Measured at 60-Degree Angle:
      a. Gloss Level 5.
   2. ANSI/AWI 0400 Finish System: TR-1 - Lacquer, Nitrocellulose.
   3. Stain: As selected by Architect from stain manufacturer's full range of colors.

2.11 SOURCE QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Inspection Services: Provide AWI QCP fabrication inspection services.
   1. Inspect for compliance with contract documents; on subjects that contract documents are silent, inspect for compliance with specified AWI grade.
   2. Provide report of inspection results first to architectural woodwork fabricator. After ten days, provide updated report to Architect, Owner, and Contractor.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify casework and materials required for installation have been delivered, handled and stored as specified.

B. Verify wood blocking that provides casework backing is installed as indicated on drawings.

C. Verify location and sizes of rough-in plumbing and rough-in electrical associated with work of this section.

3.02 INSTALLATION

A. Install and secure work of this section in accordance with specified performance requirements.

B. Install work of this section rigid, plumb, and level and in accordance with fabricator's documented instructions; secure casework as indicated on drawings.

C. See Section 088000 for site-glazing of glass applications installed in casework components.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. AWI QCP Inspection Services: Provide AWI QCP installation inspection services.
   1. Inspect for compliance with contract documents; on subjects contract documents are silent, inspect for compliance with specified AWI aesthetic grade.

3.04 ADJUSTING

A. Adjust hardware for smooth operation in accordance with hardware manufacturer's documented instructions.

3.05 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean exposed surfaces of casework, shelving, and hardware.

3.06 PROTECTION

A. Protect installed casework from subsequent construction operations.

END OF SECTION 064100

SECTION 079200 - JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).

B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.

G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.

H. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

I. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

J. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:

1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
2. List of backing materials approved for use with the specific product.

3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

E. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

F. Executed warranty.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
1. Adhesion Testing: In accordance with ASTM C794.
2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver sufficient samples to manufacturer for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nonsag Sealants:
1. Pecora Corporation: www.pecora.com/#sle.
2. Sika Corporation: www.usa.sika.com/#sle.
3. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
4. Or Approved Equal.

5. Substitutions: See Section 016000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints:
      a. Seal the following joints:
         1) Wall expansion and control joints.
         2) Joints between doors, windows, and other frames or adjacent construction.
         3) Joints between different exposed materials.
   2. Interior Joints:
      a. Seal the following joints:
         1) Joints between door frames and window frames and adjacent construction.
         2) In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, and piping penetrations.
         3) In sound-rated wall and ceiling assemblies, seal joints between wall assemblies and ceiling assemblies; between wall assemblies and other construction; between ceiling assemblies and other construction.
   3. Do Not Seal:
      a. Intentional weep holes in masonry.
      b. Joints indicated to be covered with expansion joint cover assemblies.
      c. Joints where sealant is specified to be furnished and installed by manufacturer of product to be sealed.
      d. Joints where sealant installation is specified in other sections.

B. Interior Wet Areas: restrooms; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 NONSAG JOINT SEALANTS

A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   5. Color: Match adjacent finished surfaces.
   6. Service Temperature Range: Minus 20 to 180 degrees F.
   7. Products:
      a. Adfast USA Inc; Adseal LM 4600 Series: www.adfastcorp.com/#sle.

b. Dow; DOWSIL 756 SMS Building Sealant: www.dow.com/#sle.
c. Momentive Performance Materials, Inc/GE Silicones; SCS9000 SilPruf NB - Non-Staining Silicone Weatherproofing Sealant: www.siliconeforbuilding.com/#sle.
d. Pecora Corporation; Pecora 890 NST (Non-Staining Technology): www.pecora.com/#sle.
e. Sika Corporation; Sikasil WS-290: usa.sika.com/#sle.
f. Tremco Commercial Sealants & Waterproofing; Spectrem 1: www.tremcosealants.com/#sle.
g. Or Approved Equal.
h. Substitutions: See Section 016000 - Product Requirements.

B. Silicone Sealant: ASTM C920, Grade NS, Use T; single component, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
1. Movement Capability: Plus 100 percent and minus 50 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Products:
a. Dow; DOWSIL 888 Silicone Joint Sealant: www.dow.com/#sle.
b. Pecora Corporation; Pecora PCS: www.pecora.com/#sle.
c. Pecora Corporation; Pecora 301 NS (Non-Sag): www.pecora.com/#sle.
d. Tremco Commercial Sealants & Waterproofing; Spectrem 800: www.tremcosealants.com/#sle.
e. Or Approved Equal.
f. Substitutions: See Section 016000 - Product Requirements.
4. Color: White.
5. Products:
a. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
b. Sika Corporation; Sikasil GP: usa.sika.com/#sle.
c. Or Approved Equal.
d. Substitutions: See Section 016000 - Product Requirements.

C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: Match adjacent finished surfaces.
4. Service Temperature Range: Minus 40 to 180 degrees F.
5. Products:
a. Pecora Corporation; DynaTrol II: www.pecora.com/#sle.
b. Sika Corporation; Sikaflex-1A: usa.sika.com/#sle.
c. Tremco Commercial Sealants & Waterproofing; Dymonic 100: www.tremcosealants.com/#sle.
d. Or Approved Equal.
e. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORIES

A. Sealant Backing Rod, Closed-Cell Type:
    1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.
    2. Size: 25 to 50 percent larger in diameter than joint width.
    3. Products:
        a. Nomaco, Inc; HBR: www.nomaco.com/#sle.
        b. Or Approved Equal.
        c. Substitutions: See Section 016000 - Product Requirements.

B. Preformed Extruded Silicone Joint Seal: Pre-cured low-modulus silicone extrusion, in sizes to fit applications indicated on drawings, combined with a neutral-curing liquid silicone sealant for bonding joint seal to substrates.
    1. Size: 1 inch wide, in rolls 100 feet long.
    2. Thickness: 0.78 inch, with ridges along outside bottom edges for bonding area.
    3. Color: As selected by Architect..
    4. Durometer Hardness, Type A: 26 to 32, minimum, when tested in accordance with ASTM D2240.
    5. Tensile Strength: 218 psi, in accordance with ASTM D412.
    6. Products:
        a. Tremco Commercial Sealants & Waterproofing; Spectrem Simple Seal: www.tremcosealants.com/#sle.
        b. Or Approved Equal.
        c. Substitutions: See Section 016000 - Product Requirements.

C. Preformed Extruded Polyurethane Joint Seal: Medium-modulus, preformed polyurethane extrusion used to bridge joints under elastomeric wall coatings, in sizes to fit applications indicated on drawings, combined with polyurethane sealant for bonding joint seal to substrates.
    1. Size: 1-1/2 inch wide, in rolls 100 feet long.
    2. Thickness: 0.051 inch, with ridges along outside bottom edges for bonding area.
    3. Durometer Hardness, Type A: 55, minimum, when tested in accordance with ASTM D2240.
    4. Tensile Strength: 532 psi, in accordance with ASTM D412.
    5. Elongation at Break: 690 percent, in accordance with ASTM D412.
    6. Products:
        a. Or Approved Equal
        b. Substitutions: See Section 016000 - Product Requirements.

D. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

E. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

F. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. 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.

D. Install bond breaker backing tape where backer rod cannot be used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

D. Repair destructive test location damage immediately after evaluation and recording of results.

3.05 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Hollow metal frames for wood doors.

1.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware.

B. Section 088000 - Glazing: Glass for doors and borrowed lites.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. ASCE: American Society of Civil Engineers.

C. HMMA: Hollow Metal Manufacturers Association.

D. NAAMM: National Association of Architectural Metal Manufacturers.

E. NFPA: National Fire Protection Association.

F. SCIF: Sensitive Compartmented Information Facility.

G. SDI: Steel Door Institute.

H. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2025.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.
H. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2026.
I. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
J. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
L. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
M. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.
N. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
O. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
P. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: https://steeldoor.org/sdi-certified/#sle.
B. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
   4. Substitutions: Approved equal.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Hinged edge square, and lock edge beveled.
   5. Typical Door Face Sheets: Flush.
   6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Interior Doors, Non-Fire-Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
   2. Door Thickness: 1-3/4 inches, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Rabbet: Equal rabbet standard Size.
   2. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.

D. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Glazing: As specified in Section 088000, factory installed.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

C. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

D. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

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 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 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. Coordinate frame anchor placement with wall construction.

C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

D. Install door hardware as specified in Section 087100.

E. Comply with glazing installation requirements of Section 088000.

F. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, acoustical, and special function.

1.02 RELATED REQUIREMENTS

A. Section 081113 - Hollow Metal Doors and Frames.
B. Section 087100 - Door Hardware.
C. Section 088000 - Glazing .

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
C. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).
D. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
C. Samples: Submit two samples of door construction, 2 by 4 inches in size cut from top corner of door.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Haley Brothers: www.haleybros.com/#sle.
   2. Simpson Door Company: https://www.simpsondoor.com/#/sle.
   3. VT Industries, Inc: www.vtindustries.com/#sle.

2.02 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.
   1. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Wood veneer facing with factory transparent finish.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: White birch, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Any option allowed by quality standard for grade.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge for hardware reinforcement.

C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Opaque:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Color: As selected by Architect.
      c. Sheen: Flat.

2.07 ACCESSORIES

A. Hollow Metal Door Frames: See Section 081113.

B. Door Window Frames: Door window frames with glazing securely fastened within door opening.
   1. Frame Material: 18 gauge, 0.0478 inch, galvanized steel.
   2. Metal Finish: Beige polyester powder coating.

C. Glazing: See Section 088000.

D. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

E. Astragals and Edges for Double Doors: Pairs of doors astragals, and door edge sealing and protection devices.
   1. UL listed products in compliance with requirements of authorities having jurisdiction.
   2. Edge Type: Beveled edge

F. Door Hardware: See Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
C. Use machine tools to cut or drill for hardware.
D. Coordinate installation of doors with installation of frames and hardware.
E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.
B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.
B. Adjust closers for full closure.

END OF SECTION 081416

SECTION 084313 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.
B. Infill panels of glass.
C. Weatherstripping.
D. Door hardware.

1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.
B. Section 087100 - Door Hardware: Hardware items other than specified in this section.
C. Section 088000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2025.
B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2026.
B. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
E. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
F. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
   1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

D. Samples: Submit two samples 12x12 inches in size illustrating finished aluminum surface, glass, infill panels, glazing materials.

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.

H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

I. Manufacturer's qualification statement.

J. Installer's qualification statement.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of professional structural engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.
   1. Provide certified glass products through ANSI-accredited certifications that include plant audits and independent laboratory performance testing.
      a. Insulating Glass Certification Council (IGCC).
      b. Safety Glazing Certification Council (SGCC).

1.07 MOCK-UPS

A. See Section 014000 - Quality Requirements for additional requirements.

B. Locate where directed.

C. Mock-up may remain as part of work.

1.08 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.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum-Framed Storefronts:
   1. Kawneer North America: www.kawneer.com/#sle.
   2. Oldcastle BuildingEnvelope: www.oldcastlebe.com/#sle.
   3. YKK AP America, Inc: www.ykkap.com/commercial/#sle.
   4. EFCO Corporation: www.efcocorp.com.

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

A. Front-Set Style, Thermally-Broken:
   1. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

B. Substitutions: See Section 016000 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 BASIS OF DESIGN -- SWINGING DOORS

A. Entrance Doors, Various Stile Widths:
   1. Thickness: 1-3/4 inches.

B. Medium Stile, Insulating Glazing, Thermally-Broken:
   1. Thickness: 1-3/4 inches.

2.04 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Glazing Rabbet: For 1 inch insulating glazing.
   2. Finish Color: As selected by Architect from manufacturer's standard line.
   3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.

4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Performance Requirements
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
      a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

2.05 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Glazing Stops: Flush.

B. Infill Panels: Insulated, aluminum, with edges formed to fit glazing channel and sealed.
   1. Total Nominal Thickness: 1 inch.

2.06 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Fasteners: Stainless steel.

D. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.07 FINISHES

A. High Performance Organic Coating: Primer and topcoat coatings system based on super durable polyester resin powder containing high level of isophthalic acid; with minimum dry film thickness (DFT) of 2 to 3.5 mil, 0.0020 to 0.0035 inch over aluminum extrusions and panels; meeting requirements of AAMA 2604.

2.08 HARDWARE

A. For each door, include weatherstripping, sill sweep strip, and threshold.

B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Install hardware using templates provided.

K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for general testing and inspection requirements.

B. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

C. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 084313

SECTION 080671 – DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section references specification sections relating to commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors.
3. Other doors to the extent indicated.

B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical and access control door hardware.
3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
4. Automatic operators.
5. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Hardware”.
2. Division 08 Section “Automatic Door Operators”.

D. Codes and References: Comply with the version adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service

representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.6 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Refer to “PART 3 – EXECUTION” for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a

hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.

1. Section 08 71 00 – Door Hardware.

C. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. SU - Securitron
4. RO - Rockwood
5. SA - SARGENT
6. SC - Schlage
7. MC - Medeco
8. NO - Norton Rixson
9. OT - Other

Hardware Sets

Set: 1.0

Doors: 121, 123

2	Continuous Hinge	CFM_SLF-HD1 x Length Required x PT		PE	087100	
2	Electric Power Transfer	EL-CEPT	630	SU	087100	⚡
1	Concealed Vert Rod Exit, Nightlatch	16 55 56 72 ADPE8410 P106 x 862	US32D	SA	087100	⚡
1	Concealed Vert Rod Exit, Exit Only	16 55 56 72 ADPE8410 EO	US32D	SA	087100	⚡
3	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100	
2	Door Pull	RM5277-24 Mtg-Type 12HD	US32D	RO	087100	
2	Conc Overhead Stop	6-X36	630	NO	087100	
2	Surface Closer	PR7500	600x689	NO	087100	
2	Drop Plate	7788	689	NO	087100	
2	Blade Stop	6891	689	NO	087100	
1	Gasketing	Provided by Aluminum Frame Supplier		OT		
2	Door Sweep	3452CNB x Length Required		PE	087100	
1	Threshold	278x292AFGT x Length Required x MSES25SS		PE	087100	
1	Credential Reader	Provided by Security Supplier		OT		
2	ElectroLynx Harness (door)	QC-C**** x Length Required		MK	087100	⚡
2	ElectroLynx Harness (frame)	QC-C1500P		MK	087100	⚡
2	Door Position Switch	DPS-M-BK		SU	087100	⚡
1	Power Supply	AQL_ x Amps & Relays Required (Consolidate as Applicable)		SU	087100	⚡
1	Wiring Diagram	Elevation and Point to Point as Specified		OT		

Notes: Operational Narrative:
1. Doors normally closed and secure.
2. Authorized access by card reader retracting exit device latches for predetermined time limit. Exit device latches can be electrically held retracted for open access.
3. Egress free for immediate exit.
4. REX switch in push rail allows authorized exit without alarm condition.
5. Door position switches monitor open/closed status.
6. Exit device latches release (fail secure) in event of power loss. Keyed cylinder override for emergency access.

Set: 2.0

Doors: 122, 124

2	Continuous Hinge	CFM_SLF-HD1 x Length Required x PT		PE	087100	
2	Electric Power Transfer	EL-CEPT	630	SU	087100	
1	Concealed Vert Rod Exit, Nightlatch	16 55 56 72 ADPE8410 P106 x 862	US32D	SA	087100	
1	Concealed Vert Rod Exit, Exit Only	16 55 56 72 ADPE8410 EO	US32D	SA	087100	
3	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100	
2	Door Pull	RM5277-24 Mtg-Type 12HD	US32D	RO	087100	
2	Conc Overhead Stop	6-X36	630	NO	087100	
1	Surface Closer	PR7500	600x689	NO	087100	
1	Drop Plate	7788	689	NO	087100	
1	Blade Stop	6891	689	NO	087100	
1	Automatic Opener	6300 Series	600x689	NO	087100	
1	Gasketing	Provided by Aluminum Frame Supplier		OT		
2	Door Sweep	3452CNB x Length Required		PE	087100	
1	Threshold	278x292AFGT x Length Required x MSES25SS		PE	087100	
1	Credential Reader	Provided by Security Supplier		OT		
2	ElectroLynx Harness (door)	QC-C**** x Length Required		MK	087100	
2	ElectroLynx Harness (frame)	QC-C1500P		MK	087100	
2	Door Position Switch	DPS-M-BK		SU	087100	
1	Post & Actuator	Re-Use Existing			087100	
1	Operator Actuator	Re-Use Existing			087100	
1	Power Supply	AQL_ x Amps & Relays Required (Consolidate as Applicable)		SU	087100	
1	Wiring Diagram	Elevation and Point to Point as Specified		OT		

Notes: Operational Narrative:
1. Doors normally closed and secure.
2. Authorized access by card reader retracting exit device latches for predetermined time limit. Exit device latches can be electrically held retracted for open access.
3. ADA access by actuator switch. In locked condition, actuator energized only upon valid card reader presentation.
4. Egress free for immediate exit. ADA egress by actuator switch.
5. REX switch in push rail allows authorized exit without alarm condition.
6. Door position switches monitor open/closed status.
7. Exit device latches release (fail secure) in event of power loss. Keyed cylinder override for emergency

access.

Set: 3.0

Doors: 112, 117

3	Hinge, Full Mortise	T4A3386 [NRP]	US32D	MK	087100
1	Pull Plate	BF 110x70C	US32D	RO	087100
1	Push Plate	70F	US32D	RO	087100
1	Surface Closer	7500	689	NO	087100
1	Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1	Mop Plate	K1050 6" high CSK BEV	US32D	RO	087100
1	Door Stop	403 (or) 441CU (As Condition Requires)	US26D	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 4.0

Doors: 113, 116

3	Hinge, Full Mortise	TA2714-MCK [NRP]	US26D	MK	087100
1	Keypad Lock	CO-100 Series x Rhodes x SFIC	US26D	SC	
1	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100
1	Door Stop	403 (or) 441CU (As Condition Requires)	US26D	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 5.0

Doors: 114

3	Hinge, Full Mortise	TA2714-MCK [NRP]	US26D	MK	087100
1	Keypad Lock	CO-100 Series x Rhodes x SFIC	US26D	SC	
1	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100
1	Door Stop	403 (or) 441CU (As Condition Requires)	US26D	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 6.0

Doors: 118, 120

3	Hinge, Full Mortise	TA2714-MCK [NRP]	US26D	MK	087100
1	Keypad Lock	CO-100 Series x Rhodes x SFIC	US26D	SC	
1	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100
1	Surface Closer w/Hold Open	7500H	689	NO	087100
1	Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1	Door Stop	403 (or) 441CU (As Condition Requires)	US26D	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 7.0

Doors: 115

3	Hinge, Full Mortise	TA2714-MCK [NRP]	US26D	MK	087100
1	Storeroom/Closet Lock	72 10XG04 LL	US26D	SA	087100
1	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100
1	Surface Closer w/Hold Open	7500H	689	NO	087100
1	Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
1	Door Stop	403 (or) 441CU (As Condition Requires)	US26D	RO	087100
3	Silencer	608-RKW		RO	087100

Set: 8.0

Doors: 125

6	Hinge, Full Mortise	TA2714-MCK [NRP]	US26D	MK	087100
2	Manual Flush Bolt	555 / 557 (As Required x Extended Top Rod as Required	US26D	RO	087100
1	Dust Proof Strike	570	US26D	RO	087100
1	Classroom Lock	72 10XG37 LL	US26D	SA	087100
1	Small Format Inter Core	Medeco X4 (Coordinate with owner)	26	MC	087100
1	Surface Closer w/Hold Open	P7500H	600x689	NO	087100
2	Kick Plate	K1050 10" high CSK BEV	US32D	RO	087100
2	Door Stop	403 (or) 441CU (As Condition Requires)	US26D	RO	087100
2	Silencer	608-RKW		RO	087100

END OF SECTION 080671

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 01 Section "General Conditions”.
2. Division 04 Section "Masonry".
3. Division 06 Section “Rough Carpentry”.
4. Division 06 Section “Finish Carpentry”.
5. Division 08 Section “Operations and Maintenance”.
6. Division 08 Section “Flush Wood Doors”.
7. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
8. Division 08 Section "Glazing".
9. Division 08 Section "Door Hardware”.
10. Division 08 Section “Automatic Door Operators”.
11. Division 09 Sections "Painting".
12. Division 26 Section "Electrical”

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. SDI-113 Standard Practice for Determining the Steady-State Thermal Transmittance of Steel Door & Frame Assemblies.
10. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
11. ASTM C1199 - Standard Test Method for Measuring the Steady-State Thermal Transmittance of Fenestration Systems Using Hot Box Methods
12. ASTM E1423 - Practice for Determining Steady State Thermal Transmittance of Fenestration Systems.
13. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
14. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
15. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
16. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
17. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
18. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
19. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Smoke Control Door Assemblies: Comply with NFPA 105.

    a. Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:

a. Curries Company (CU) - CM Series.
b. Curries Company (CU) - M Series.

C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.5 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld joints continuously through full throat width of frames, including rabbets, soffits, and stops; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
5. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
6. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
7. Jamb Anchors: Provide number and spacing of anchors as follows:

    a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches on-center and as follows:

        1) Two anchors per jamb up to 60 inches high.
        2) Three anchors per jamb from 60 to 90 inches high.
        3) Four anchors per jamb from 90 to 120 inches high.
        4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

    b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

        1) Three anchors per jamb up to 60 inches high.
        2) Four anchors per jamb from 60 to 90 inches high.
        3) Five anchors per jamb from 90 to 96 inches high.
        4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
        5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
8. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

D. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

    1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.

2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.7 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

E. Verify tolerances against manufacturers installations instructions for tornado and hurricane storm shelter openings.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.5 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 081113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.

C. Related Sections:

1. Division 01 Section "General Conditions".
2. Division 06 Section “Rough Carpentry”.
3. Division 06 Section “Finish Carpentry”.
4. Division 08 Section “Operations and Maintenance”.
5. Division 08 Section “Hollow Metal Doors and Frames”.
6. Division 08 Section “Flush Wood Doors”.
7. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
8. Division 08 Section “Automatic Door Operators”.
9. Division 26 Section "Electrical”

D. Codes and References: Comply with the version adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access

control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.6 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.7 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.8 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Hardware shall not have any visible manufacturer names on exposed materials, except cylinders, when the door is in a closed position.

2.2 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

5. Manufacturers:

a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.3 CONTINUOUS HINGES

A. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

    a. Pemko (PE).

2.4 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. Securitron (SU) - EL-CEPT Series.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

    a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. McKinney (MK) - QC-C Series.

2.5 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:

a. Rockwood (RO).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
3. Pulls shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.
5. Manufacturers:

a. Rockwood (RO).

2.6 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

1. Manufacturers:

a. Medeco (MC).
b. Match Existing, Field Verify.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Manufacturer’s Standard.

C. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.7 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.8 CYLINDRICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed cylindrical locksets. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

a. Sargent Manufacturing (SA) - 10X Line.

2.9 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.10 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide exit devices with functions and features as follows:

a. Where required by code, provide knurling or abrasive coating on all levers leading to hazardous areas.
b. Meets UL and CUL Standard 10C Positive Pressure, Fire Test of Door Assemblies with levers that meet A117.1 Accessibility Code.
c. No catch points: addition of applied deflectors or other added components are not allowed.
d. No visible plastic.
e. Heavy duty end caps with flush and overlapping options made of stainless steel, brass, or bronze with architectural finishes.
f. Constructed of all stainless steel.
g. Stainless steel pullman type latch with deadlock feature.
h. Narrow or wide style exterior trim as specified in the hardware sets.
i. Center case adjustability on concealed vertical rod exit devices; single operation with hex key individually adjusts top or bottom latches. No retainer screws or clips required to maintain adjustment.
j. Ten-year limited warranty for mechanical features.

2. Manufacturers:

a. Sargent Manufacturing (SA) - PE80 Series.

2.11 SURFACE DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Heavy duty surface mounted door closers shall have a 30-year warranty.

2. Manufacturers:

a. Norton Rixson (NO) - 7500 Series.

2.12 ELECTROMECHANICAL DOOR OPERATORS

A. Electromechanical Door Operators (High Traffic): Provide ANSI/BHMA A156.19 Certified Products Directory (CPD) listed low energy operators that are UL325/991 and UL10C certified and comply with requirements for the Americans with Disabilities Act (ADA). Operators shall accommodate openings up to 250 pounds and 48” wide. Provide accessories such as custom templates, special mounting brackets, spacers and drop plates as needed for proper installation. Operators shall accommodate openings up to 200 pounds and 48” wide. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide operators with features as follows:

a. Non-handed with push and pull side mounting.
b. Activation by push button, hands-free or radio frequency devices.
c. Adjustable opening force and closing power.
d. Two-year limited warranty.
e. Wi-Fi interface where the operator is a secure, password protected WiFi hot spot with no connection to building’s IT required.
    1) Simple setup with no app required.
    2) View status and make adjustments without removing the cover.
    3) Built-in logic to support single use restroom applications with no external relay boards, logic modules, position switches required.
f. Mounting backplate to simplify and speed up installation.
g. Integration with access control systems.

2. Operators shall have the following functionality:

a. Adjustable Hold Open: Amount of time a door will stay in the full open position after an activation.
b. Blow Open for Smoke Ventilation: Door opens when signal is received from alarm system allowing air or smoke to flow through opening. Door will stay open until signal from alarm system is stopped.

c. Emergency Interface Relay: Door closes and ignores any activation input until signal is discontinued.
d. Infinite Hold Open: Door will hold open at set position until power is turned off.
e. Latch Assist: At closed position, after an activation, the door is pulled in. After the door has closed, the door is pulled in to assist with latch release/engagement.
f. Obstruction Detection: Door closes if it hits an obstruction while opening; door will reverse to open position if it hits an obstruction while closing. Door will stop once it hits an obstruction and will rest against the obstruction until removed.
g. Open Delay: Delays operator opening for locking hardware.
h. Outside Wall Switch Disable: When contact is closed, outside wall switch is disabled.
i. Power Assist: Senses the door is being opened manually and applies small amount of power to assist the user in opening the door with force less than 5 lbs. The door opens only as far as it is moved manually, then closes once released.
j. Power Close: Additional force to assist door closing between 7° and 2°.
k. Presence Detector Input: Input for external sensor to detect presence at door open or close position only.
l. Push & Go: As the door is manually opened, the operator "senses" movement and opens door to the full-open position.
m. Selector Mode Switch: Off disables the signal inputs unless Blow Open is activated, on activates the signal inputs, hold open activates the unit (unless Blow Closed is activated) to the hold open position.
n. Vestibule Delay: When the wall switch is pressed, first door in vestibule will open. Second door will open once vestibule door delay has expired. Delay is adjustable.
o. Executive Mode Feature: When the door receives an activation signal it opens and remains open until either a second signal is received, or the door is manually moved in closing direction.

3. Manufacturers:

a. Norton Rixson (NO) - 6300 Series.

2.13 ARCHITECTURAL TRIM AND ACCESSORIES

A. Door, Frame and Wall Protective Trim: ANSI/BHMA A156.6, protective products as specified in the hardware sets. Door protection plates shall be not more than 2" less than door width on stop side and 1” less door width on the pull side or on stop side of pairs of doors. Listed manufacturers shall meet all functions and features as specified herein.

1. Provide protective trim with functions and features as follows:

a. Meets ADA requirements for smooth bottom door surfaces.
b. UL Classified options for use on fire-rated doors up to 3 hours.
c. Fabricated from stainless steel, brass, bronze, aluminum, or high-impact plastic.
d. Available in a variety of sizes, finishes, and profiles to suit aesthetic and functional requirements.
e. Designed to protect doors, frames, and adjacent walls from damage due to impact, abrasion, or traffic.
f. Fasteners included; adhesive-backed options available for select models.

g. Ten-year limited warranty.

2. Manufacturers:

a. Rockwood (RO).

2.14 DOOR STOPS AND HOLDERS

A. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Rockwood (RO).

B. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

a. Norton Rixson (NO).

2.15 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.16 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Securitron (SU) - DPS Series.

B. Intelligent Switching Power Supplies: Provide the least number of power supplies at the appropriate amperage level sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Power supplies shall meet all functions and features as specified herein.

a. UL listed dual voltage 12 or 24 VDC field selectable continuous output.
b. Dedicated fast charger to prolong battery life with low battery cutoff to protect batteries from deep discharge.
c. Enhanced surge immunity for input/output protection
d. Separate, dedicated battery charging circuit to keep locks cooler.
e. Dual-color LED visual notification to prevent applying incorrect voltages to the power supply.
f. Instant auto-switch to battery on AC loss.
g. Expandable up to 16 outputs in the standard enclosure
h. Integrated fire alarm interface to allow main output shutdown or disconnect on a per output basis when using an R8 output module.
i. Network ready and remotely manage locks and connected devices when using an M8 managed output module on network models.
j. Lifetime replacement, no-fault, no questions asked warranty.

2. Manufacturers:

a. Securitron (SU) - AQL Series.

2.17 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.18 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Refer to Section 080671, Door Hardware Sets, for hardware sets.

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.
B. Glazing units.
C. Laminated glass interlayers.
D. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 064100 - Architectural Wood Casework: Cabinets with requirements for glass shelves and _____.
B. Section 072600 - Vapor Retarders.
C. Section 079200 - Joint Sealants: Sealants for other than glazing purposes.
D. Section 081113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
E. Section 084313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
F. Section 084413 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.
G. Section 085113 - Aluminum Windows: Glazing provided by window manufacturer.
H. Section 088723 - Safety and Security Films.
I. Section 088813 - Fire-Rated Glazing.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
F. ASTM C1036 - Standard Specification for Flat Glass; 2025.

G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2024, with Editorial Revision (2025).

I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2024.

L. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials; 2019.

M. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2023.

N. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

O. BS EN 14179-1 - Glass in Building - Heat Soaked Thermally Toughened Soda Lime Silicate Safety Glass - Part 1: Definition and Description; 2016.

P. GANA (GM) - GANA Glazing Manual; 2022.

Q. GANA (SM) - GANA Sealant Manual; 2008.

R. ICC (IgCC) - International Green Construction Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

S. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (Reaffirmed 2016).

T. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.

U. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.

V. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2026.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

D. Samples: Submit one samples 12 inch by ___ inch in size of glass units.

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Insulating Glass Units: One of each glass size and each glass type.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
      a. Insulating Glass Certification Council (IGCC).
      b. Safety Glazing Certification Council (SGCC).

C. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.
   1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
      a. North American Contractor Certification (NACC) for glazing contractors.
      b. Equivalent independent third-party ANSI accredited certification.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

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 017800 - Closeout Submittals for additional warranty requirements.

B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

C. Laminated Glass: Provide a ten (10) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
   1. GGI - General Glass International; _____: www.generalglass.com/#sle.
   2. Standard Bent Glass Corp: www.standardbent.com/#sle.
   3. Viracon, Inc: www.viracon.com/#sle.
   4. Or Approved Equal.
   5. Substitutions: See Section 016000 - Product Requirements.

B. Laminated Glass Manufacturers:
   1. Cardinal Glass Industries: www.cardinalcorp.com/#sle.
   2. Thompson I.G., LLC; Laminated Glass: www.thompsonig.com/#sle.
   3. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com/#sle.
   4. Or Approved Equal.
   5. Substitutions: See Section 016000 - Product Requirements.

C. Plastic Films Manufacturers:
   1. 3M Window Film: solutions.3m.com/wps/portal/3M/en_US/Window_Film/Solutions/#sle.
   2. Or Approved Equal.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer; licensed in the State the Project is located in, and as defined in Section 014000 "Quality Requirements," to design glazing.

C. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure: Calculated in accordance with ASCE 7.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7
   4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   5. Glass thicknesses listed are minimum.

D. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
   1. In conjunction with weather barrier related materials described in other sections, as follows:
      a. Vapor Retarders: See Section 072600.
   2. To utilize inner pane of multiple pane insulating glass units for continuity of vapor retarder and/or air barrier seal.

3. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.

E. Windborne-Debris-Impact Resistance: Exterior glazing shall comply with enhanced-protection testing requirements in ASTM E1996 for Wind Zone 1 when tested according to ASTM E1886. Test specimens shall be no smaller in width and length than glazing indicated for use on Project and shall be installed in same manner as glazing indicated for use on Project.
   1. Large-Missile Test: For glazing located within 30 feet of grade.
   2. Small-Missile Test: For glazing located more than 30 feet above grade.

F. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

G. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the glazing manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

H. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of ICC (IgCC).

I. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 7 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
   5. Heat-Soak Testing (HST): Provide HST of fully tempered glass used on canopy, point-supported, spider wall, high-risk, sloping overhead, horizontal overhead, free-standing glass protective barrier, or other demanding applications of project, to reduce risks of spontaneous breakage due to nickel sulfide (NiS) induced fractures in accordance with BS EN 14179-1.
   6. Impact Resistant Safety Glass: Complies with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I criteria.
   7. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.
   8. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.
   2. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

C. Windborne-Debris-Impact-Resistant Laminated Glass: Comply with requirements specified above for laminated glass except laminate glass with one of the following to comply with interlayer manufacturer's written instructions:
   1. Polyvinyl butyral interlayer.
   2. Polyvinyl butyral interlayers reinforced with polyethylene terephthalate film.
   3. Ionomeric polymer interlayer.
   4. Cast-in-place and cured-transparent-resin interlayer.
   5. Cast-in-place and cured-transparent-resin interlayer reinforced with polyethylene terephthalate film.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
   1. Glass: Any of the manufacturers specified for float glass.
   2. Alpen High Performance Products; Thinglass IGUs - Triple: www.thinkalpen.com/#sle.
   3. Guardian Glass, LLC; _____: www.guardianglass.com/#sle.
   4. Vitro Architectural Glass (formerly PPG Glass); _____: www.vitroglazings.com/#sle.
   5. Substitutions: See Section 016000 - Product Requirements.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   3. Warm-Edge Spacers: Low-conductivity thermoplastic with desiccant warm-edge technology design.
      a. Spacer Width: As required for specified insulating glass unit.
      b. Spacer Height: Manufacturer's standard.
   4. Spacer Color: White.
   5. Edge Seal:
      a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
      b. Color: Black.
   6. Purge interpane space with dry air, hermetically sealed.

D. Type IG-1 - Insulating Glass Units: Low-E Coated, Insulating Laminate Vision Glass.
   1. Applications: Exterior glazing unless otherwise indicated.
   2. Space between lites filled with Argon filled, 12 mm (1/2 inch) wide, hermetically sealed.

3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    a. Tint: Clear.
    b. Coating: Low-E (passive type), on #2 surface.
4. Inboard Lite: Laminated float glass, 1/4 inch thick, minimum.
    a. Tint: Clear.
    b. Interlayer: Ionoplast interlayer, 0.060 inch thick.
5. Total Thickness: 1-1/8 inch.
6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.21, nominal.
7. Visible Light Transmittance (VLT): 49 percent, nominal.
8. Solar Heat Gain Coefficient (SHGC): 0.22, nominal.
9. Glazing Method: Dry glazing method, gasket glazing.

2.05 GLAZING UNITS

A. Type G-1 - Monolithic Safety Glazing: Non-fire-rated.
    1. Applications:
        a. Glazed lites in doors, except fire doors.
        b. Glazed sidelights to doors, except in fire-rated walls and partitions.
        c. Other locations required by applicable federal, state, and local codes and regulations.
        d. Other locations indicated on drawings.
    2. Glass Type: Laminated safety safety glass as specified.
    3. Tint: Clear.
    4. Thickness: 1/4 inch, nominal.

B. Type G-2 - Glass Shelves:
    1. Applications: Locations as indicated on drawings.
    2. Tint: Clear.
    3. Glass Type: Fully tempered float glass with ground edges and corners; ASTM C1048.
    4. Thickness: 1/4 inch, nominal.

2.06 GLAZING COMPOUNDS

A. Type GC-1 - Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; gray color.

B. Type GC-2 - Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

C. Type GC-3 - Polysulfide Sealant: Two component; chemical curing, nonsagging type; ASTM C920 Type M, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

D. Type GC-4 - Polyurethane Sealant: Single component, chemical curing, nonstaining, nonbleeding; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 20 to 35; color as selected.

E. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

F. Manufacturers:
   1. Dow Corning Corporation; _____: www.dowcorning.com/construction/#sle.Dow Corning Corporation; _____: www.dowcorning.com/construction/#sle.
   2. Pecora Corporation; _____: www.pecora.com/#sle.
   3. Tremco Commercial Sealants & Waterproofing; Proglaze: www.tremcosealants.com/#sle.
   4. Or Approved Equal.
   5. Substitutions: See Section 016000 - Product Requirements.

2.07 ACCESSORIES

A. Concealed nonprogressive structural glass mounting system.

B. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

C. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

D. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
   1. Width: As required for application.
   2. Thickness: As required for application.
   3. Spacer Rod Diameter: As required for application.

E. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

F. Glazing Clips: Manufacturer's standard type.

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 the minimum required face and edge clearances are being provided.

C. 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.

D. Verify that sealing between joints of glass framing members has been completed effectively.

E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

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, and paint.

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 - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

F. Carefully trim protruding tape with knife.

3.06 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

C. Monitor and report installation procedures and unacceptable conditions.

3.07 CLEANING

A. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

C. Remove nonpermanent labels immediately after glazing installation is complete.

D. Clean glass and adjacent surfaces after sealants are fully cured.

E. 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 088000

SECTION 088700 - ARCHITECTURAL GLASS FILM

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes:
   1. Decorative Window Film

1.03 SUBMITTALS

A. Manufacturer's Product Date for specified products

B. Submit shop drawings showing layout, profiles and product components including dimensions, anchorage and accessories.

C. Samples: 4" x 4" sample of manufacturer's texture, color and pattern.

1.04 QUALITY ASSURANCE

A. Obtain all products in this section from a single Manufacturer with a minimum of 10 years' experience.

B. Installer Qualifications: A trained and qualified installer, specialized and experienced in work required for this project.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification intact.

B. Store products protected from weather, temperature and other harmful conditions as recommended by supplier.

C. Product must remain in original plastic bag and boxes and have storage conditions as follows:
   1. 40 °F – 90 °F (4 °C – 32 °C)
   2. Out of direct sunlight
   3. Clean dry area
   4. Original container
   5. Do not stack boxes over six (6) units high. Excessive weight can damage the film
   6. Products are not recommended for interior applications where condensation consistently occurs.

7. Handle products in accordance with manufacturer's instructions.
8. Shelf life: 1 year

1.06 PROJECT CONDITIONS

A. Confirm appropriate substrate is suitable for mounting of glass finish components prior to start of installation.

B. Apply materials when environmental conditions are within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer’s absolute limits. Application temperature range is 60 °F – 100 °F (16 °C – 38 °C).

C. Environmental Limitations: Do not install until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.07 WARRANTY

A. Manufacturer’s Warranty: submit manufacturer’s standard warranty documented by authorized manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Architectural Window Film: For application to interior glass: 3M Company, Fassara Glass Finishes (Basis of Design) or approved equal. Basis of Design color/pattern selection as indicated on the Finish Schedule.

2.02 MATERIAL PROPERTIES

1. General: Glass and plastic finishes field-applied application to glass or plastic material as visual opaque or decorative film.
2. Film: Polyester
3. Decorative Pattern: Printed
4. Adhesive: Acrylic, Pressure Sensitive, Permanent
5. Liner: Silicone-coated Polyester
6. Thickness (Average) (Film and Adhesive without Liner): 3.2 mils (80 microns)

2.03 PERFORMANCE REQUIREMENTS

A. Fire Performance: Surface burning characteristics when tested in accordance with ASTM E84: Class A
   1. Flame Spread: 25 maximum.
   2. Smoke Developed: 450 maximum.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrate(s) for compliance. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

A. Comply with all manufacturers' instructions for surface preparation.
B. Thoroughly clean substrate of substances that could impair the overlay's bond, including mold, mildew, oil, grease.
C. Re-clean surfaces with appropriate surface prep solvent and remove any haze or surface contamination.

3.03 APPLICATION

A. Do not proceed with installation until all finishing work has been completed in and around the work area.
B. Verify pattern prior to material acquisition.
C. Comply with manufacturer's installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
D. Form smooth, wrinkle-free, bubble-free surface for finished installation.
E. Remove air bubbles, wrinkles, blisters and other defects. Use approved procedures to prevent the formation of air bubbles, wrinkles, blisters and other defects.

3.04 CLEANING AND PROTECTION

A. Use cleaning methods recommended by architectural surfacing manufacturer for applicable environment.
B. Protect completed glass finish during remainder of construction period.

END OF SECTION 088700

SECTION 090561 - COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Carpet tile.
   3. Thin-set ceramic tile and stone tile.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

F. Patching compound.

G. Remedial floor coatings.

H. Remedial floor treatment.

1.02 RELATED REQUIREMENTS

A. Section 017419 - Construction Waste Management and Disposal: Handling of existing floor coverings removed.

B. Section 033000 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.

C. Section 033000 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

D. Section 035400 - Cast Underlayment: Self-leveling underlayment applied as remediation treatment.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.

D. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Submit report to Architect.
   7. Submit report not more than two business days after conclusion of testing.

E. Adhesive Bond and Compatibility Test Report.

F. Copy of RFCI (RWP).

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
   1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

D. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.

2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

C. Keep materials from freezing.

1.08 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
3. Products:
   a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
   b. Floor Seal Technology, Inc: www.floorseal.com/#sle.
   c. LATICRETE International, Inc; SKIM LITE: www.laticrete.com/#sle.
   d. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating, Two-Component: Single-layer coating resistant to water vapor transmission meeting flooring manufacturer's emission limits, resistant to alkalinity (pH) level found, and suitable for flooring adhesion without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Products:
      a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
      b. Bona US; R540: www.bona.com/#sle.
      c. Floor Seal Technology, Inc; MES 100: www.floorseal.com/#sle.
      d. LATICRETE International, Inc; LATICRETE VAPOR BAN E: www.laticrete.com/#sle.
      e. Mapei Corporation; Planiseal VS: www.mapei.com/#sle.
      f. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer: usa.sika.com/#sle.

D. Remedial Floor Treatment: Penetrating, spray-applied, silicate-based product resistant to water vapor transmission meeting flooring manufacturer's emission limits, resistant to alkalinity (pH) level found, and suitable for flooring adhesion without further treatment.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
      a. Do not attempt to remove coating or penetrating material.
      b. Do not abrade surface.
      c. Remove existing coatings and curing agents from surface according to recommendations of remedial coating manufacturer.
   3. Preliminary cleaning.
   4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.

6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
7. Specified remediation, if required.
8. Patching, smoothing, and leveling, as required.
9. Other preparation specified.
10. Adhesive bond and compatibility test.
11. Protection.

C. Remediations:
1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI (RWP), as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
   1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
   2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
   3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.

C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 APPLICATION OF REMEDIAL FLOOR TREATMENT

A. Comply with requirements and recommendations of treatment manufacturer.

3.11 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 090561

SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Metal stud wall framing.
C. Metal channel ceiling framing.
D. Resilient sound isolation clips.
E. Acoustic insulation.
F. Cementitious backing board.
G. Gypsum wallboard.
H. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 054000 - Cold-Formed Metal Framing: Structural steel stud framing.
B. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.
C. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
D. Section 078400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
E. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2020.
D. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
H. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2025.

I. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

J. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2026).

K. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2024.

L. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

M. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

N. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2025.

O. 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; 2022.

P. 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; 2022.

Q. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

R. ASTM C1288 - Standard Specification for Fiber-Cement Interior Substrate Sheets; 2023.

S. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2025.

T. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

U. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2024.

V. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

W. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

X. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

Y. ASTM E413 - Classification for Rating Sound Insulation; 2022.

Z. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

AA. ASTM E1414/E1414M - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum; 2021a.

BB. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2024.

CC. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

DD. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

EE. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

FF. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

B. Sequencing: Install service utilities in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

D. Steel Framing Industry Association (SFIA) Certification:
   1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.

E. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Member of Steel Framing Industry Association (SFIA).

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.

B. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

C. Store metal products to prevent corrosion.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 50-54 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Grid Suspension Systems: Provide grid suspension systems in accordance with ASTM C840 and GA-216 complying with the following:
   1. ICC-ES Evaluation Report No. ESR-1338.

2.02 METAL FRAMING MATERIALS

A. Material and Product Requirements: AISI S201 and AISI S220.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
   1. Corrosion Protection Coating Designation: G40, G60 at showers, toilet rooms, and other interior locations subject to high humidity, steam and water in accordance with AISI S220.

C. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. Jaimes Industries: www.jaimesind.com/#sle.
   3. Or Approved Equal.
   4. Substitutions: See Section 016000 - Product Requirements.

D. Nonstructural Framing System Components: AISI S220; 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/120 at 5 psf.
   1. Studs: ASTM C645 C-shaped with knurled or embossed faces, 0.0329 (20 gauge) min. thickness of base metal unless otherwise indicated.
      a. Depth of Section: 3-5/8”, or as otherwise indicated.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C-shaped.
   4. Flexible Track: Flexible framing consisting of adjustable leg straps and pivoting, hinged track brackets designed to provide curved framing assemblies of varying radii.
      a. Dimensions: 3-5/8 inches deep by 1-3/16 inches high in lengths and configurations indicated on drawings.
   5. Furring Members: ASTM C645; 0.0179 (25 gauge) Hat-shaped sections, minimum depth of 7/8 inch.
   6. Furring Members: U-shaped sections, minimum depth of 3/4 inch.
   7. Furring Members: Zee-shaped sections, minimum depth of 1 inch.
   8. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.
   9. Resilient Sound Isolation Clips: Steel resilient clips with molded rubber isolators, attaches to framing; improves noise isolation performance of wall and floor-ceiling assemblies.
   10. Sill Plate Isolation Pads: Acoustical separation between sole plate and subfloor.

E. Area Separation Wall Studs and Accessories: Galvanized sheet steel.

F. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short.

G. Nonstructural Framing Accessories:
   1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
   2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
   3. Framing Connectors: ASTM A653/A653M, G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.
   4. Drywall Corner Clips: Drywall clips help support drywall to reduce wood blocking on top plates, end walls, and corners.
   5. Steel Column and Beam Drywall Clip: UL-listed slip-on clips to connect gypsum board to steel beams and columns for fireproofing.

H. Grid Suspension Systems: Aluminum grid system of main tees and support bars connected to structure using hanging wire.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
   4. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
   5. USG Corporation: www.usg.com/#sle.
   6. Or Approved Equal.
   7. Substitutions: See Section 016000 - Product Requirements.

B. Interior Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; Provide panels in maximum lengths and widths available that will minimize joints in each area and correspond with the support system indicated.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
   3. Thickness:
      a. Vertical Surfaces: 5/8 inch thick, unless otherwise indicated, with long ends tapered.
      b. Interior Gypsum Ceiling Board: 1/2 inch thick, unless otherwise indicated, manufactured with a special gypsum core containing additives to offer greater support and sag resistance for water based spray texture paints and insulation than 5/8” standard regular-type panels.
      c. Flexible Gypsum Wallboard: 1/4 inch, unless otherwise indicated, manufactured to bend to fit tight radii and to be more flexible than standard regular-type panels of the same thickness, with long ends tapered. Apply in double layer at curved assemblies unless additional layers are indicated.
      d. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   4. Mold-Resistant, Paper-Faced Products:
      a. American Gypsum Company; M-Bloc: www.americangypsum.com/#sle.
      b. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
      c. Approved Equal.

C. Abuse Resistant Wallboard:
   1. Application: High-traffic areas indicated, including:
      a. Stage Proscenium.
      b. Folding Partition Soffits
   2. Surface Abrasion: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   4. Soft Body Impact: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
   5. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   6. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.
   7. Type: Fire-resistance-rated Type X, UL or WH listed.
   8. Thickness: 5/8 inch.
   9. Edges: Tapered.

D. Backing Board For Wet Areas: One of the following products:
   1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
      a. Thickness: 5/8 inch.
   4. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
      a. Thickness: 5/16 inch thick, 48” x 48” unless otherwise indicated. Cement board underlayment is for use in the installation of ceramic tile over wood floor systems.
      b. Products:
         1) James Hardie Building Products, Inc: www.jameshardie.com/#sle.
         2) Durock by United States Gypsum.
         3) Or Approved Equal.
         4) Substitutions: See Section 016000 - Product Requirements.

E. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas.
   2. Type: Regular and Type X, in locations indicated.
   3. Type X Thickness: 5/8 inch.
   4. Regular Board Thickness: 5/8 inch.
   5. Edges: Tapered.

F. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 1/2 inch.
   3. Edges: Tapered.

2.04 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness of stud.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

C. Mullion Extension: Extruded aluminum transition assembly with expandable foam infill to fill void between glass wall mullion and remote partition.
   1. Finish: Match glazing assembly framing finish.

D. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
   1. Corner Beads: Low profile, for 90 degree outside corners.
   2. Expansion Joints:
      a. Fire-Resistance Rated: 1 hour when joint system tested in accordance with UL 2079.
      b. Type: V-shaped metal with factory-installed protective tape.

E. Decorative Metal Trim:
   1. Material: Extruded aluminum alloy 6063-T5 temper.
   2. Finish: Anodized, clear.
   3. Type: Profile as selected from manufacturer's standard range.

F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners on glass mat gypsum sheathing, except as otherwise indicated.
   2. Paper Tape: 2 inch wide, creased paper tape for joints and corners on interior and exterior gypsum, except as otherwise indicated.
   3. Joint Compound: Setting type, field-mixed. Comply with ASTM C 475 and recommendations of the manufacturer.
      a. For interior gypsum wallboard and exterior gypsum soffit board use setting-type taping compound followed by coats of setting-type sandable topping compound or as otherwise recommended by manufacturer.
      b. For Glass-Mat Gypsum Sheathing Board use type(s) recommended by the manufacturer for the application required at this project.
      c. For tile backing panels use the type recommended by the manufacturer for the application required at this project.
      d. For veneer plaster panels use the type recommended by the manufacturer, (veneer plaster base coat or setting type joint compound), for the application required at this project.

G. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

H. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

J. Adhesive for Attachment to Wood, ASTM C557 and Metal:

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 1/1200.
   2. Laterally brace entire suspension system.
   3. Install bracing as required at exterior locations to resist wind uplift.

C. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
   1. Orientation: Horizontal.
   2. Spacing: At 24 inches on center.

F. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.

G. Resilient Sound Isolation Clips: Install resilient sound isolation clips, and where applicable, associated furring sections and channels, in accordance with clip manufacturer's written instructions.

H. Blocking: Install mechanically fastened steel channel blocking for support of:
   1. Framed openings.
   2. Wall-mounted cabinets.
   3. Plumbing fixtures.
   4. Toilet partitions.
   5. Toilet accessories.
   6. Wall-mounted door hardware.

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. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.

C. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: 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. Double-Layer, Nonrated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated 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 indicated on drawings.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   2. At exterior soffits, not more than 30 feet apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

D. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations indicated on drawings. Provide vent area specified.

3.06 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   5. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
   6. Level 0: Temporary partitions.
   7. Level 0: Surfaces indicated to be finished in later stage of project.

C. 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 are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.08 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean areas of work.

3.09 PROTECTION

A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION 092116

SECTION 093000 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.
B. Tile for wall applications.
C. Cementitious backer board as tile substrate.
D. Stone thresholds.
E. Ceramic accessories.
F. Ceramic trim.
G. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 035400 - Cast Underlayment: Hydraulic and cementitious underlayments where required by TCNA (HB) or TCNA (HB-GP) method specified.
B. Section 079200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
C. Section 090561 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
D. Section 224017 - Bathtubs and Showers: Shower receptors.

1.03 REFERENCE STANDARDS

A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
B. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.
C. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.
A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
B. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
C. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.

D. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.

E. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

F. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.

G. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).

H. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.

I. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

J. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

K. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

L. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2025-2026.

M. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2025.

1.04 SUBMITTALS

A. See Section 013000 - 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. Installer's qualification statement.

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 016000 - Product Requirements, for additional provisions.
   2. Extra Tile: 10 sq ft of each size, color, and surface finish combination.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications: Natural Stone Institute (NSI) Accredited Commercial B Contractor, light commercial: www.naturalstoneinstitute.org/#sle.

C. Installer Qualifications:
   1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 MOCK-UPS

A. See Section 014000 - Quality Requirements for additional requirements.

B. Construct tile mock-up incorporating components specified for location.
   1. Minimum size of mock-up is indicated on drawings.
   2. Mock-up may remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.

B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile:
   1. Basis of Design: Dal-Tile Corporation: www.daltile.com/#sle.
   2. Basis of Design: Tilebar: www.tilebar.com.
   3. Approved equal

B. Setting Materials:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. Basis of Design: Mapei Corporation: www.mapei.com/#sle.
   3. Schluter-Systems: www.schluter.com/#sle.
   4. Approved equal.

C. Grout:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. Basis of Design: Mapei Corporation: www.mapei.com/#sle.
   3. Approved equal.

2.02 TILE

A. Ceramic Glazed Wall Tile: ANSI A137.1 standard grade.

1. Semi-gloss, non-vitreous tile. Multiple colors and layout patterns as indicated or another approved manufacturer having matching colors to blend with the color schemes selected for adjacent materials in the project.
    a. Style: As indicated on drawings
    b. Color: As indicated on drawings
    c. Pattern: As indicated on drawings
2. Size: As indicated on drawings
3. Trim Units: Coordinated sizes and coursing of adjoining flat tile.
4. Base: Coved; style and color as indicated on the drawings.

B. Porcelain Floor Tile: ANSI A137.1 standard grade.
1. A large format, fine grained tile, smooth and impervious with a water absorption of 0.5% or less measured by the ASTM C373 test method with a sharply formed face with color through body. Multiple colors and layout patterns as indicated or another approved manufacturer having matching colors to blend with the color schemes selected for adjacent materials in the project.
2. Style: As indicated on drawings
3. Color: As indicated on drawings
4. Pattern: As indicated on the drawings
5. Finish: As indicated on drawings
6. Size: As indicated on drawing

2.03 TRIM AND ACCESSORIES

A. Accessory and Trim Tiles
1. Provide accessory and trim tiles to match colors of floor, base, and wall tile as indicated. Field butt inside corners, bullnose out corners. Trims for thinset and mudset installations as indicated and transitions from mud set to thinset and other floor finishes or transition strips or saddles.

B. Metal Thresholds
1. Metal extruded sloped transition-shaped profile trim for transitions between new floor tiles and lower height installed floors as manufactured by Schluter Systems, or Approved Equal.
2. Profile: Schluter – RENO-U, or approved equal.
3. Material: Brushed stainless steel 304
4. Height: As required to accommodate tile thickness and adjacent lower floor thickness.
5. ADA Compliant.

C. Satin anodized aluminum, extruded square shaped profile trim for outside corners as manufactured by Schluter Systems, or Approved Equal.
1. Profile: Schluter – QUADEC, or approved equal.
2. Material: Satin Aluminum, matte finish
3. Height: As required to accommodate tile thickness
4. Provide matching connectors where lengths exceed those provided by manufacturer.

D. Satin anodized aluminum, extruded edge-protection profile trim for outside corners as manufactured by Schluter Systems, or Approved Equal.
1. Profile: Schluter – JOLLY, or approved equal.
2. Material: Satin Aluminum, matte finish

3. Height: As required to accommodate tile thickness
4. Provide matching connectors where lengths exceed those provided by manufacturer.

E. Shower Receptor: See Section 224017.

F. Ceramic Trim: Matching bullnose, double bullnose, cove base, and cove ceramic shapes in sizes coordinated with field tile.
   1. Manufacturers: Same as for tile.

G. Thresholds: 2 inches wide by full width of wall or frame opening; beveled edge on both long edges; without holes, cracks, or open seams.

2.04 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
   1. Applications: Use this type of bond coat on walls, where indicated, and where no other type of bond coat is indicated.
   2. Products:
      a. Bostick; Hydroment PM.
      b. Mapei Corporation; Adesilex P10 Mosaic & Glass Tile: www.mapei.com/#sle.
      c. Substitutions: See Section 016000 - Product Requirements.

C. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
   1. Applications: Kitchen Areas.
   2. Products:
      a. Mapei; Kerapozy CQ
      b. Or Approved Equal.
      c. Substitutions: See Section 016000 - Product Requirements.

2.05 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Latex Modified Grout: ANSI A118.6 standard cement grout.
   1. Applications: Use where indicated on drawings 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: As indicated on drawings.

2.06 MAINTENANCE MATERIALS

A. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
   1. Composition: Water-based colorless silicone.

2.07 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.

1. Crack Resistance: No failure at 1/8 inch gap, minimum.
2. Peel-and-Stick Sheet Type:
    a. Material: Rubberized membrane laminated to reinforcing fabric.
    b. Thickness: 20 mils, maximum.
    c. Products:
        1) Proflex Products, Inc; Maxxim Sim-40: www.proflex.us/#sle.
        2) Protecto Wrap: www.protectowrap.com/#sle.
        3) Sika Corp; SikaTile 225 PNS: www.sika.com/#sle.
        4) Or Approved Equal.
        5) Substitutions: See Section 016000 - Product Requirements.

B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
    1. Crack Resistance: No failure at 1/16-inch gap, minimum; comply with ANSI A118.12.

C. Waterproofing Membrane at Showers and Tiled Tubs: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
    1. Peel-and-Stick Sheet Type:
        a. Material: Rubberized membrane laminated to reinforcing fabric, 40 mils, thick, minimum.

D. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch thick; 2-inch wide coated glass fiber tape for joints and corners.
    1. Products:
        a. Custom Building Products; WonderBoard Lite Backerboard: www.custombuildingproducts.com/#sle.
        b. Or Approved Equal.
        c. Substitutions: See Section 016000 - Product Requirements.

E. Tile Cleaner
    1. Product specifically acceptable to manufacturer of tile and grout manufacturer for application indicated and as recommended by National Tile Promotion Federation, 112 North Alfred St., Alexandria, VA 22134 or Ceramic Tile Institute, 700 N. Virgil Ave., Los Angeles, CA 90029, or Approved Equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.

B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).

1. Test as Follows:
    a. Alkalinity (pH): ASTM F710.
    b. Internal Relative Humidity: ASTM F2170.
    c. Moisture Vapor Emission: ASTM F1869.
2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
3. Follow moisture and alkalinity remediation procedures in Section 090561.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Vacuum clean surfaces and damp clean.

B. Seal substrate surface cracks with filler.

C. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to feather edge.

D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108/A118/A136, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.

B. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. 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.

E. Form internal angles square and external angles bullnosed.

F. Install ceramic accessories rigidly in prepared openings.

G. Install non-ceramic trim in accordance with manufacturer's instructions.

H. Install thresholds where indicated on drawings.

I. Sound tile after setting. Replace hollow sounding units.

J. Keep control and expansion joints free of mortar, grout, and adhesive.

K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

L. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.

M. 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 - FLOORS - THIN-SET METHODS

A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F102, with standard grout.

B. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, on ground, with standard grout, unless otherwise indicated on drawings.
   1. Where waterproofing membrane is indicated on drawings, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout, on ground.

C. Over wood substrates with backer board underlayment, install in accordance with TCNA (HB) Method F144, for cementitious backer boards, with standard grout.

D. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At tiled showers and bathtubs, install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.

B. Grout with standard grout.

3.06 INSTALLATION - WALL TILE

A. On exterior walls, install in accordance with TCNA (HB) Method W244E, thin-set over cementitious backer units, with waterproofing membrane.

B. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244C, using membrane at toilet rooms, kitchens, locker rooms, and _____.

C. 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.

D. Over interior concrete and masonry, install in accordance with TCNA (HB) Method W202I, thin-set with dry-set or latex-Portland cement bond coat.

3.07 CLEANING

A. Clean tile and grout surfaces.

END OF SECTION 093000

SECTION 095100 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.
B. Acoustical panels.
C. Metal edge moldings and trim
D. Acoustical sealant.
E. Miscellaneous accessories including Beam End Retaining Clips, Hold-Down Clips, Stiffening Braces and Hanger Wire, etc.

1.02 RELATED REQUIREMENTS

A. 092116 - Gypsum Board Assemblies
B. Division 21 – Fire Suppression related work.
C. Division 22 – Plumbing related work.
D. Division 23 – Mechanical related work.
E. Division 26 – Electrical related work.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
D. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019 (Reapproved 2025).
F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
G. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.
H. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2024a.

I. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

J. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

K. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

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. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements 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. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

E. Manufacturer's qualification statement.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to two percent of total installed.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

C. Contractor should be aware that the reflected ceiling plans and layouts may vary due to job conditions.

PART 2 PRODUCTS

2.01

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
   2. Smoke-Developed Index: 50 or less.

C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.02 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Basis of Design: Armstrong World Industries, INC; Basis of Design for performance, design, and quality: www.armstrongceilings.com/#sle.
   2. CertainTeed Corporation; www.certainteed.com/ceilings-and-walls/#sle.
   3. USG Corporation; www.usg.com/ceilings/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Suspension Systems:
   1. Same as for acoustical units.

2.03 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions determined according to ASCE 7 for Seismic Design Category D, E, or F and complying with the following:
   1. Local authorities having jurisdiction.

B. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Comply with ASTM E1264 for Class A materials.
   2. Smoke-Developed Index: 50 or less.

2.04 ACOUSTICAL PANELS, GENERAL

A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.

B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

C. Acoustical Units - General: ASTM E1264, Class A.
   1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E795.

2.05 ACOUSTICAL PANEL TYPES

A. Acoustical panel designations below are interior applications for high humidity and unconditioned spaces. Provide antimicrobial paint to inhibit mold and mildew growth and provide 30 year performance guarantee against sag or warp.

B. TYPE ACP-1:
   1. Panel Style / Model: #1775 HRC or approved Equal, with the following characteristics:
   2. Classification: ASTM E1264 Type III.
   3. Fire Rating: Class A
   4. Size: 24 by 24 inches.
   5. Thickness: 5/8 inch.
   6. Light Reflectance 0.85 percent, determined in accordance with ASTM E1264.
   7. NRC .85, determined in accordance with ASTM E1264.
   8. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
   9. Panel Edge: Square.
   10. Color: White.
   11. Suspension System: 15/16” Exposed Tee System Prelude XL, white, or approved equal.
   12. Anti-mold & Mildew BioBlock+
   13. Sag Resistant Humid-guard+
   14. Products:
      a. Armstrong World Industries, Inc; Dune: www.armstrongceilings.com/#sle.
      b. Approved equal.

2.06 METAL SUSPENSION SYSTEM

A. Available Manufacturers: Subject to compliance with requirements, manufacturers of products that may be include in the work include, but are not limited to the following, or approved equal:
   1. Armstrong (Basis of Design for performance, design and quality).
   2. Certain Teed.
   3. USG Corporation.

B. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold-down clips, stabilizer bars, clips, and splices as required.
   1. Materials:
      a. Aluminum Grid: Aluminum sheet, ASTM B209/B209M.
   2. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as

determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
    a. Type: Post installed expansion anchors.
    b. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 for Class SC 1 service condition.
  2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

D. Components: Main runner and cross tees shall be double-web hot dipped galvanized steel construction per ASTM A635 with 15/16” type exposed flange design, unless otherwise indicated. Members shall be fire/flame rated and seismic zone rated. Each exposed bottom flange shall be continuous with unbroken roll formed cap the length of the member. Cap shall be steel, finished as specified below.
  1. Structural Classification: Intermediate duty.
  2. Main Beam: Routed 6” center to center, continuously along the length of its web to locate intersecting cross tees. Web Height shall be 1-1/2”.
  3. 4’ Cross Tees: Web height shall be 1-1/2”.
  4. 2’ Cross Tees: Web height shall be 1-3/8”.
  5. End condition of Cross Tees: Staked-on (stab) end detail with override flange.

E. Cross Tee shall be double web bulb section of steel conforming to ASTM A 366, web height 1-1/2” and have a 15/16” bottom flange. Exposed bottom flange shall be continuous with unbroken roll formed cap the length of the member.

F. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
  1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641, Class 1 zinc coating, soft temper.
  2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 12 gauge diameter wire.

G. Hanger Rods or Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

H. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch thick, galvanized-steel sheet complying with ASTM A 653, G90 coating designation; with bolted connections and 5/16-inch diameter bolts.

I. Hanger Channels shall be 1 1/2”; 0.475 lb. per 1,000 ft.; cold rolled steel or 1.12 lb. per 1,000 ft. hot rolled steel for integrating with metal stud framing for supporting suspended ceiling system.

J. Bulb Tee Hanger shall be used for suspending bulb tees from 1 1/2” hanger channels - hanger will slide onto and hang from channel and bulb tee will slide and be clipped to bulb tee hanger. Hanger is also known as “New York City Clip”.

K. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

L. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

M. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.

N. Stiffening Brace shall be provided to the entire grid system of vestibule areas leading to the exterior and within 10 feet of exterior doors in areas exposed to wind uplift of up to 90 lbs./sq. ft. Brace shall be attached between the upper and lower ties on each vertical hanger wire. Combine with hold-down clips.

O. Beam End Retaining Clips shall be provided for attachment of beam ends to wall moldings for seismic stabilization, and or stabilizer bars when required by current Seismic Code.

P. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

Q. Impact Clips: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

R. Clean-Room Gasket System: Where indicated, provide manufacturer's standard system, including manufacturer's standard gasket and related adhesives, tapes, seals, and retention clips, designed to seal out foreign material from and maintain positive pressure in clean room.

S. Lighting fixtures to have lighting fixture support clips in addition to being supported from above independent of ceiling grid.

2.07 METAL EDGE MOLDINGS AND TRIM

A. Available Manufacturers: Subject to compliance with requirements, manufacturers of products that may be include in the work include, but are not limited to the following, or approved equal:
   1. Armstrong (Basis of Design for performance, design and quality).
   2. Certain Teed.
   3. USG.

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.
   1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
   2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
   3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

C. Wall moldings shall be “L” shape molding and have at least 7/8” exposed flanges, not less than .019 nominal steel with finish specified below. Use shadow molding with square edge lay-in and 15/16” flanges where indicated. Include inside and outside corner moldings with rounded inside corners for bullnose block walls.

D. Bullnose Corner Cover: For use with 15/16” grids. Armstrong No. 7866 or approved equal. Cover snaps over molding to trim outside corners. Fits 1” radius block.

E. Special Profiled Perimeter Trim as indicated and shall be of extruded aluminum channel trim compatible with the exposed suspension system. Profile height as indicated and finished to match ceiling grid.

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.

C. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

D. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

D. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Unless otherwise indicated on the drawings, avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions, as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Suspension System, Non-Seismic: 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.

F. Seismic Suspension System, Seismic Design Categories D, E, F: Hang suspension system with grid ends attached to the perimeter molding on two adjacent walls; on opposite walls, maintain a 3/4 inch clearance between grid ends and wall.

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. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.04 INSTALLATION - ACOUSTICAL PANELS

A. Install acoustical panels in accordance with manufacturer's instructions.

B. Fit acoustical panels in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical panels level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Panels:
   1. Make field cut edges of same profile as factory edges.

F. Where round obstructions occur, provide preformed closures to match perimeter molding.

G. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.

H. Install hold-down clips on panels within 20 ft of an exterior door.

3.05 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.

3.06 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean surfaces.

C. Replace damaged or abraded components.

END OF SECTION 095100

SECTION 096500 - RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient sheet flooring.

B. Resilient tile flooring.
   1. Luxury vinyl plank flooring.
   2. Luxury vinyl tile flooring.

C. Resilient base.
   1. Resilient rubber wall base.

D. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

B. Section 090561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

A. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine; 2025.

B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2025a.

C. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2021a, with Editorial Revision.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

E. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).

F. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

H. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

A. See Section 013000 - 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: Show layout of special tile, sheet, special patterns, logos, details and color coding for verification of correct color and pattern locations coordinated with layout on Architectural drawings. Show locations of seams, expansion joints, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

E. Verification Samples: Submit two samples, 6 by 9 inch in size illustrating color and pattern for each resilient flooring product specified.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

J. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

K. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 1 box for each 50 boxes of each type and color.
   3. Extra Wall Base: 10 linear feet for each 500 linear feet of each type and color.
   4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

C. Source Limitations: Obtain each type, color, and pattern of each type of resilient flooring product specified from one source for each resilient floor covering product with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

D. Fire Test Performance: Provide resilient flooring products and accessories that comply with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
   1. Critical Radiant Flux: Class I, Not less than 0.45 watts per sq. cm when tested in conformance with ASTM E648 or NFPA 253.
   2. Smoke Density: Less than 450 in conformance with ASTM E662.
   3. Static Coefficient of Friction: Greater than 0.6 for level surfaces and greater than 0.8 for ramped surfaces in accordance with ASTM D2047.

E. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

D. Protect roll materials from damage by storing on end.

E. Do not double stack pallets.

1.07 FIELD CONDITIONS

A. Maintain temperature of not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C) in spaces to receive resilient flooring products for at least 72 hours prior to installation, during installation, and for not less than 72 hours after installation. Subsequently, maintain a temperature of not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C) in areas where work is completed.

B. Do not install resilient flooring materials and accessories until they are at the same temperature as the space where they are to be installed.

C. Maintain relative humidity in spaces to receive resilient flooring products and accessories before, during, and after installation within the range recommended in writing by manufacturer.

D. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by manufacturer.

E. Install resilient flooring and accessories after other finishing operations, including painting and ceiling operations, have been completed. Moisture content of concrete slabs and environmental conditions must be within limits recommended by manufacturer of products being installed for sufficient bonding with adhesives as determined by moisture tests.

PART 2 PRODUCTS

2.01 MATERIALS

A. Designs, Logos, Features, Colors and Patterns: Multiple colors for patterns, logos, features, borders, fields, and designs shall be selected by Architect from manufacturer's full range of colors.

2.02 SHEET FLOORING

2.03 TILE FLOORING

A. Luxury Vinyl Plank - Flooring: Commercial Plank flooring with. ExoGuard+ Finish or approved equal. Commercial grade backing class.
   1. Manufacturers:
      a. Shaw, Inc.; Basis of Design.
      b. Mannington Commercial: www.manningtoncommercial.com#sle.
      c. Patcraft;
      d. Interface Flooring.
      e. Or Approved Equal
      f. Substitutions: See Section 016000 - Product Requirements.
   2. Style: As indicated on drawings
   3. Color: As indicated on drawings
   4. Pattern: As indicated on drawings
   5. Dimensions: As indicated on drawings
   6. Wear Layer: As indicated on drawings
   7. Color: To be selected by Architect from manufacturer's full range.

B. Luxury Vinyl Tile - Flooring: Commercial Polyurethane Plank. Quantum-Guard Elite Finish or Approved Equal. Commercial grade backing class.
   1. Manufacturers:
      a. Mannington Commercial; Basis of Design.
      b. Shaw, Inc..
      c. Patcraft.
      d. Armstrong.
      e. Or Approved Equal
      f. Substitutions: See Section 016000 - Product Requirements.
   2. Style: As indicated on drawings
   3. Color: As indicated on drawings
   4. Pattern: As indicated on drawings
   5. Dimensions: As indicated on drawings
   6. Wear Layer: As indicated on drawings
   7. Color: To be selected by Architect from manufacturer's full range.

2.04 RESILIENT BASE

A. Resilient Base - FS SS-W-40a, Type I (rubber), Style B (with a cove toe, for use with hard surface flooring); ASTM F1861.
   1. Manufacturers:
      a. Roppe Corporation: www.roppe.com/#sle.
      b. Tarkett Flooring; Basis of Design: www.tarkett.com/#sle.
      c. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
      d. Or Approved Equal.
      e. Substitutions: See Section 016000 - Product Requirements.
   2. Height: 4 inches.
   3. Thickness: 0.125 inch.
   4. Finish: Satin.
   5. Length: Roll.
   6. Color: As indicated on drawings.
   7. Accessories: Premolded external corners and internal corners.

2.05 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

C. Resilient Edge Strips: Homogenous vinyl or rubber composition; 1/8" thick; not less than 1" wide; tapered or bullnose edge as selected by the Architect.

D. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edge of tiles, and in maximum available lengths to minimize running joints.

E. Epoxy Caulking Compound: Water-resistant type two-component epoxy caulking compound by the tread manufacturer to suite resilient flooring products and substrate conditions.

F. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

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. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
   3. Follow moisture and alkalinity remediation procedures in Section 090561.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 090561.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Scribe, cut, and fit flooring to but neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.

D. Extend flooring into toe spaces, door reveals, closets, and similar openings.

E. Maintain reference markers, holes and openings that are in place or marked for future cutting by repeating of finish flooring as marled on the subfloor.

F. Install flooring on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with flooring cut, scribed and installed on covers. Tightly adhere edges to perimeter of substrate around covers and to covers.

G. Adhere floor coverings to substrates using a full spread of adhesives applied to substrate to comply with adhesive and floor covering manufacturer’s written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times.

H. Provide complete installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

I. Roll floor coverings according to floor covering manufacturer’s written instructions.

J. Heat-Welded Seams: Rout joints and heat with welding bead, permanently fusing sections into a seamless floor covering. Prepare, weld, and finish seams according to manufacturer’s written instructions to produce surfaces flush with adjoining floor covering surfaces.

3.04 INSTALLATION - SHEET FLOORING

A. Lay out sheet floor covering to maintain uniformity of floor covering direction and to minimize the number of seams and placing them in inconspicuous and low-traffic areas and not less than 6 inches away from parallel joints in flooring substrates.

B. Seams are prohibited in bathrooms, kitchens, toilet rooms, and custodial closets.

C. Cut sheet at seams in accordance with manufacturer's instructions.

D. Seal seams by heat welding where indicated.

E. Match edges of sheet floor covering for color shading and pattern at seams according to manufacturer’s written recommendations. Avoid cross and but seams.

F. Eliminate deformations that result from hanging method used during the drying process (stove bar marks) according to manufacturer’s written recommendations.

3.05 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring from center marks established with principal walls or center aisles, discounting minor offsets, so that tile at opposite edges of areas are of equal width. Adjust as necessary to avoid use of cut width less than 1/2 tile at room perimeters. Lay flooring square to room axis, unless otherwise shown.

C. Match floor tiles for color and pattern by using tile from cartons of the same batch and mixing tiles as recommended in writing by the manufacturer. Cut tile neatly around all fixtures. Broken, cracked, chipped or deformed tiles are not acceptable.

D. Lay flooring with grain running in one direction unless directed otherwise.

E. Lay flooring in pattern layout design with respect to location of colors, patterns, borders, fields and design layout, and sizes as provided by time of submittal review by Architect.

F. Place flooring with adhesive cement in strict conformance with manufacturer's recommendations. Place epoxy caulking compound in the nose of all treads in accordance with tread manufacturer’s recommendations. Scribe, cut and fit flooring materials as required. Butt tightly to vertical surfaces, thresholds, nosing and edgings. Extend flooring into toe spaces, door reveals and into closets and similar openings. Make joints even, straight and as inconspicuous as possible and laid tight. The entire surface shall be smooth, straight, and free from buckles, waves and projecting edges.

G. Tightly cement resilient flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient flooring at perimeter of each covered area to assure adhesion.

H. Maintain reference markers, holes or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.

I. Install flooring on covers for telephone and electrical ducts, and other such items as occur within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.

J. Use full spread of adhesive applied to substrate in accordance with tile manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.

3.06 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external 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.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION 096500

SECTION 096813 - TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide all labor, materials, accessories, equipment, and incidentals to complete tile carpeting work, as shown and specified, including but not necessarily limited to the following:
   1. Modular, tufted carpet tile.
   2. Modular, flocked carpet tile.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

B. Section 090561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Showing the Following:
   1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
   2. Carpet tile type, color, and dye lot.
   3. Type of subfloor.
   4. Type of installation.
   5. Pattern of installation.
   6. Pattern type, location, and direction.
   7. Pile direction.
   8. Type, color, and location of edge, transition, and other accessory strips.

9. Transition details to other flooring materials.
10. Type, color, and location of edge, transition, and other accessory strips.
11. Transition details to other flooring materials.

D. Samples: For each type of the following products and for each pattern, color, texture, and construction required. Label each Sample with manufacturer's name, material description, color, pattern, construction, and designation indicated on Drawings and in schedules.
   1. Carpet Tile:
      a. Samples for Initial Selection: Carpet Manufacturer’s Pattern Book.
      b. Verification Samples: Full-size Sample, not less than 12-inch x 12-inch (300-mm-).
   2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch long Samples.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Manufacturer's Qualification Statement.

H. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI 104, Section 5, "Storage and Handling."

1.08 PROJECT CONDITIONS

A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."

B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

1.09 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within a period of not less than 15 years from the date of substantial completion of the Project:
   1. Wear - Surface fiber wear shall not be more than 10% by weight in 15 years. (Note: Wear warranty shall not require use of chair pads)
   2. Static - Static generation at less than 3.0 kV at 70º F, and 20% R.H.
   3. No delamination
   4. No edge ravel
   5. No dimensional instability (i.e., shrinkage, curling and doming) which adversely affect the ability of the tile to lay flat
   6. Mergeability: Carpet that is of the same style/color, but from different dyelots and/or manufacturing dates, may be merged and used interchangeably, both at initial installation and at later selective replacement, to create a continuous carpeted surface with no tile appearing out of place

B. Submit manufacturer’s certified test results by (NVLAP) National Voluntary Laboratory Accreditation Program, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction to show that carpet meets or exceeds product performance specification criteria for carpet testing requirements.

C. Installation provider shall warrant for (1) year following the date of substantial completion that all installation services have been performed in a workmanlike manner and shall promptly re-perform all services not meeting this warranty.

PART 2 PRODUCTS

2.01 MODULAR CARPET TILE PERFORMANCE STANDARDS

2.02 MODULAR CARPET TILE SHALL MEET THE FOLLOWING PERFORMANCE STANDARDS:

1. Carpet Flammability
2. NFPA 253 “Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source”: Class II, 0.22 watts/cm2 or better.
3. DOC FF-1 “Pill Test” (CPSC 16 CFR, Part 1630): Passes
4. Smoke Density (ASTM E648): Less than or equal to 450 Flaming Mode
5. Dry Breaking Strength: Not less than 100 lbf (445 N) per ASTM D 2646.
6. Tuft Bind: Not less than 10 lbf (45 N) for loop pile per ASTM D 1335.

7. Delamination: Not less than 3.5 lbf/in. (15 N/mm) per ASTM D 3936.
8. Dimensional Tolerance: Within 1/32 inch (0.8 mm) of specified size dimensions, as determined by physical measurement.
9. Dimensional Stability: 0.1 percent or less change per (Aachen Test Method Din 54318).
10. Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC 165.
11. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) per AATCC 16, Option E.
12. Gas Fade (AATCC 23): 4
13. Ozone Fade (AATCC 109) 4
14. Antimicrobial Activity: AATCC 174, Part II) Not less than 95.0% reduction.
15. Fungicidal (AATCC 174, Part III) No growth.
16. Soil Protection (AATCC 175) Not less than 8.0 on the Red 40 Stain Scale.
17. Electrostatic Propensity: Static Generation at 70 deg. F, 20% R.H., less than 2.5 kV per AATCC 134 w/ neolite.

2.03 MANUFACTURERS

A. Tile Carpeting:
   1. Interface, Inc: www.interface.com/#sle.
   2. Mannington Commercial; Basis of Design: www.manningtoncommercial.com#sle.
   3. J&J Flooring.
   4. Shaw Contract.
   5. Tarkett.
   6. Or Approved Equal.
   7. Substitutions: See Section 016000 - Product Requirements.

2.04 MATERIALS

A. Provide colors and patterns as indicated from the manufacturer's full color range of colors for the products listed below, as manufactured by Forbo Flooring Systems, J+J Flooring, Patcraft, Mannington Commercial, Tarkett, or Approved Equal.

B. Carpet Tile (CPT-1)
   1. Basis of Design: Mannington Commercial:
      a. Collection/Style: As indicated on the drawings
      b. Color: As indicated on the drawings.
      c. Size: As indicated on the drawings.
      d. Thickness: As indicated on the drawings.
      e. Installation method: As indicated on the drawings.
      f. Pile Characteristic: Tip Sheared Patterned Loop
      g. Density: 6,900 oz. Sq/Yd
      h. Tufted Weight: 18 oz.
      i. Finished Pile Thickness: 3.05 mm
      j. Construction: Tufted
      k. Fiber Content: 100% solution dyed nylon
      l. Fiber Type: Type 6 or 6,6
      m. Gauge/Stitch: 1/12

n. Primary Backing/Backcoating: Manufacturer's standard, non-woven, composite materials.
o. Secondary Backing: Nexus
p. Applied Soil-Resistance Treatment: Manufacturer's standard material.

C. Carpet Tile (CPT-2)
1. Basis of Design: Mannington Commercial:
a. Collection/Style: As indicated on the drawings
b. Color: As indicated on the drawings.
c. Size: As indicated on the drawings.
d. Thickness: As indicated on the drawings.
e. Installation method: As indicated on the drawings.
f. Pile Characteristic: Multi-level Pattern Loop
g. Density: 6,900 oz. Sq/Yd
h. Tufted Weight: 18 oz.
i. Finished Pile Thickness:305 mm
j. Construction: Tufted
k. Fiber Content: 100% solution dyed nylon
l. Fiber Type: Type 6 or 6,6
m. Gauge/Stitch: 1/10
n. Primary Backing/Backcoating: Manufacturer's standard, non-woven, composite materials.
o. Secondary Backing: Ecoworx
p. Applied Soil-Resistance Treatment: Manufacturer's standard material.

D. Carpet Tile (CPT-3)
1. Basis of Design: Mannington Commercialt:
a. Collection/Style: As indicated on the drawings
b. Color: As indicated on the drawings.
c. Size: As indicated on the drawings.
d. Thickness: As indicated on the drawings.
e. Installation method: As indicated on the drawings.
f. Pile Characteristic: Multi-Level Pattern Loop
g. Density: 6,900 oz. Sq/Yd
h. Tufted Weight: 18 oz.
i. Finished Pile Thickness:305 mm
j. Construction: Tufted
k. Fiber Content: 100% solution dyed nylon
l. Fiber Type: Type 6 or 6,6
m. Gauge/Stitch: 1/12 inches
n. Primary Backing/Backcoating: Manufacturer's standard, non-woven, composite materials.
o. Secondary Backing: Ecoworx
p. Applied Soil-Resistance Treatment: Manufacturer's standard material.

2.05 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Edge Strips: Embossed aluminum, _____ color.

C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

D. Adhesive Connectors: Pressure sensitive adhesive squares to suit products indicated, that complies with flammability requirements for installed carpet tile. Adhesive Connectors shall contain antimicrobial preservative and have “zero” calculated VOC’s and acceptable to and recommended by carpet tile manufacturer for stable, firm and slip-resistant installation.

E. Carpet Tape: Double sided adhesive strip for carpet installation to suit products indicated, that complies with flammability requirements for installed carpet tile. Adhesive carpet tape for permanent bond for substrate indicated acceptable to and recommended by carpet tile manufacturer for stable, firm and slip-resistant installation.

F. Carpet edge guard, non-metallic - Extruded or molded heavy duty vinyl or rubber carpet edge guard of size and profile indicated, and with minimum two inch wide anchorage flange; colors selected by architect/designer from among standard colors available within the industry.

G. Miscellaneous materials - As recommended by manufacturer of carpet. Other carpeting products to be selected by installation provider to meet project requirements.

H. Electrostatic (Dissipation low-generation)
   1. Surface Resistivity - Across face of carpet (< 2.0 x 109 and >1.5 x 105) or (0.15 to 2000 megaohms).
   2. Transverse or Volume Resistivity - Through face of carpet (Less than 2.0 x 1010 and greater than 1.5 X 105 ohms) or (0.15 to 2000 megaohms).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
   1. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 090561.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.

F. Provide cut outs where required. Conceal cut edges with protective edge guards or overlapping flanges. Bind or seal cut edges as recommended by carpet tile manufacturer.

G. Provide cut outs at illuminated floor lighting strip junction boxes. Take custody of junction box cover and cut and adhere carpet piece to the recessed top of the junction box cover. Match grain of adjacent carpet installation. Return cover to the electrical contractor for final installation.

H. Run carpet under open bottom items such as heating convectors and install tight against walls, columns, and cabinets so that the entire floor area is covered with carpet. Cover over all floor type door closures.

I. Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise.

J. Maintain dye lot integrity. Do not mix dye lots in same area.

K. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

L. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines unless patterns are random or non-directional.

M. Expansion joints - Do not bridge building expansion joints with continuous carpeting.

N. Locate change of color or pattern between rooms under door centerline.

O. Fully adhere carpet tile to substrate.

P. Trim carpet tile neatly at walls and around interruptions.

Q. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Remove excess adhesive without damage, from floor, base, and wall surfaces.

C. Remove yarns that protrude from carpet tile surface.

D. Clean and vacuum carpet surfaces using commercial machine with face-beater element.

E. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

F. Remove spots and replace carpet where spots cannot be removed. Remove rejected carpeting and replace with new carpeting. Remove any protruding yarns with shears or sharp scissors.

3.05 INSPECTION

A. Upon completion of the installation, verify that work is complete, properly installed and acceptable.

B. Preliminary Acceptance - Upon completion of the carpet installation of each floor, it shall be inspected by Owner, Architect, and Installer.

END OF SECTION 096813

SECTION 097200 - WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vinyl Wall coverings.

1.02 RELATED REQUIREMENTS

A. Section 099123 - Interior Painting: Substrate preparation.

1.03 REFERENCE STANDARDS

A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems; 2020 (Reapproved 2025).
B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
C. ASTM F793/F793M - Standard Classification of Wall Coverings and Ceiling Coverings by Use Characteristics; 2025.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Manufacturer's data sheets for wall covering and adhesive. Indicate compliance with specified flame spread and smoke developed ratings.
C. Shop Drawings: Indicate wall elevations with seaming layout.
D. Manufacturer's qualification statement.
E. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.
B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials for damage upon arrival.
B. Protect packaged adhesive from temperature cycling and cold temperatures.
C. Do not store roll goods on end.

1.07 FIELD CONDITIONS

A. Maintain adhesive and wall covering manufacturer's recommended temperature ranges 24 hours before, during, and after installation.

PART 2 PRODUCTS

2.01 WALL COVERINGS

A. Wall Covering - Vinyl: Fabric-backed vinyl roll stock.
   1. Comply with ASTM F793/F793M, Category V, Type II.
   2. Total Weight: 20 oz/sq yd.
   3. Backing: Woven, osnaburg fabric.
   4. Color: As indicated on drawings.
   5. Pattern: Logo file provided by Owner.
   6. Size As indicated o drawings
   7. Surface Texture: Smooth.
   8. Manufacturers:
      a. Fluid Prints; Mediatex Covertex UPcycling FR: www.fluidprints.com/#sle.
      b. Wolf-Gordon; RAMPART: www.wolfgordon.com/#sle.
      c. Substitutions: See Section 016000 - Product Requirements.

2.02 ACCESSORIES

A. Adhesive: Type recommended by wall covering manufacturer.

B. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify substrate surfaces are primed and meet manufacturer's requirements to receive work.

B. Measure moisture content of substrates with electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.

C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet or at rate greater than 1/16 inch/ft.

D. Notify Architect of detrimental conditions affecting wall covering installation.

E. Correct detrimental conditions before starting installation.

3.02 PREPARATION

A. Remove wall plates and accessories impeding wall covering installation.

B. Wash impervious surfaces with tetra-sodium phosphate; rinse and neutralize; wipe dry.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings before preparing surfaces or finishing.

D. Correct surface defects affecting work of this section and clean surfaces. Remove existing coatings exhibiting loose surface defects.

E. Vacuum surfaces to remove loose particles.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply adhesive to wall immediately before applying wall covering.

C. Use wall covering in roll number sequence.

D. Razor trim edges of wall covering. Do not razor trim on gypsum board surfaces.

E. Smoothly apply wall covering without wrinkles, gaps, or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

F. Horizontal seams are not permitted.

G. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

H. Cover spaces above and below windows and above doors in pattern sequence from roll.

I. Where wall covering tucks into reveals, metal wallboard, or plaster stops, use contact adhesive within 6 inches of wall covering termination. Ensure complete contact bond.

J. Remove excess adhesive from seams while wet and before proceeding to next wall covering sheet.

K. Reinstall wall plates and accessories removed to accommodate work of this section.

3.04 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean wall coverings of dust, dirt, excess adhesive, and other contaminants.

END OF SECTION 097200

SECTION 098000 - ACOUSTICAL POLYESTER DECORATIVE WALL TREATMENT

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 DESCRIPTION OF WORK

A. Provide all labor, materials, hardware, accessories, equipment, incidentals and supervision necessary to complete acoustical wall panel work, as shown and as required, including but not limited to, the following:
   1. Acoustical Polyester Decorative Wall Treatment
   2. Extruded Aluminum Framing
   3. Mounting Hardware and Accessories

1.04 QUALITY ASSURANCE

A. Fire Performance Characteristics: Provide acoustical Polyester Decorative Wall Treatment, with surface-burning characteristics as indicated below, which have been determined by testing assemblies of identical materials and construction according to ASTM E84 by a testing organization acceptable to authorities having jurisdiction.
   1. Flame Spread: 25 or less, Class 1.
   2. Smoke Developed: 450 or less.

B. Single-Source Responsibility for Acoustical Polyester Decorative Wall Treatment: Obtain each type of acoustical wall panel from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying the work.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer’s technical data for type of wall panel required.

B. Shop Drawings: show fabrication and installation of panels including plans, elevations, sections, details of components, and attachments to other construction.

C. Samples for Color Selection Purposes: Submit manufacturer's standard size swatches of material indicated as facing for panels and wall treatment showing full range of colors, textures, and patterns available for each type of panel and facing material required.

D. Samples for Verification Purposes: Submit 12" square samples of each type of acoustical polyester decorative wall treatment required and in each color, texture an pattern indicated or selected for facing materials. Include representative samples of installation devices and accessories.

1.06 DELIVERY STORAGE ND HANDLING

A. Protect Acoustical Polyester Decorative Wall Treatment from excessive moisture in shipment, storage, and handling. Deliver in unopened bundles and store in a dry place with adequate air circulation. Do not deliver material to building until wet-work, such as concrete and plaster, has been completed and cured to a condition of equilibrium.

1.07 PROJECT CONDITIONS

A. Environmental Conditions: Do not begin installations until spaces for acoustical Polyester Decorative Wall Treatment have been enclosed and maintained at approximately the same humidity and temperature conditions as planned for occupancy. Maintain temperature and humidity as recommended by panel manufacturer.

B. Field Measurements: Check actual wall surfaces by accurate field measurements before fabrication and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.

PART 2 PRODUCTS

2.01 (AWP) ACOUSTICAL POLYESTER DECORATIVE WALL TREATMENT

A. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to the following or approved equal:
   1. Zintra (Basis of Design)
   2. EzoBord
   3. or approved equal.

B. Fabricate panels to sizes and configurations indicated.
   1. Material: Thermally bonded (heat pressed), high density, recycled polyester (100%) acoustic
   2. panel containing not less than 60 percent post-consumer recycled material.
   3. Composition: Unfaced monolithic panel.
   4. Thickness: 1/2"
   5. Weight: 7.5 lbs/sf
   6. Finish: Unfaced panel color options: Premium Color Options

C. Frame Acoustic Polyester wall panel with coordinating extruded aluminum channel J-molding.

D. Fabricate back-mounted, framed panels in factory to exact sizes required based on field measurements. Follow manufacturer's recommendations.

E. Sound Absorption Performance: Provide Acoustical Polyester Decorative Wall Treatment with minimum noise reduction coefficients (NRC) indicated as determined by testing per ASTM C423 for mounting type specified under individual product requirements.

F. Colors and Patterns: Where manufacturer's material is indicated, Provide multiple colors, sizes, shapes and patterns as selected from manufacturer's full range of premium color materials, of type(s) indicated.

G. Custom Sizes: As indicated on the Architectural drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of acoustical Polyester Decorative Wall Treatment. Do not proceed with installation until unsatisfactory conditions have been corrected. Starting of installation work will indicate Installer's acceptance of conditions.

3.02 INSTALLATION

A. Install acoustical Polyester Decorative Wall Treatment in locations indicated with vertical surfaces and edges plumb, top edges level, and in alignment with other panels, scribed to fit adjoining work accurately at borders and at penetrations. Comply with panel manufacturer's printed instructions for installation of panels using type of mounting accessories indicated, or, if none indicated, as recommended by manufacturer.

B. Variation from Plumb and Level: Plus or minus 1/16 inch.

3.03 CLEANING AND PROTECTION

A. Clean Panels: Upon completion of installation, remove dust and foreign materials in accordance with manufacturer's written instructions. Remove surplus materials and debris upon completion of work and leave the installation neat and clean.

B. Protect Panels and maintain conditions in accordance with manufacturer's recommendations and in a manner acceptable to the Installer to avoid damage or deterioration.

C. Remove and replace panels that are damaged and are unacceptable to the Architect.

END OF SECTION 098000

SECTION 099000 - PAINTING AND COATING - COMMERCIAL FACILITY GUIDE

SPECIFICATION - SHERWIN-WILLIAMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Scope:
   1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
      a. Interior:
         1) Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.
         2) Concrete Ceilings: Poured concrete, precast concrete, cement board, cast-in-place concrete, and plaster.
         3) Masonry CMU: Concrete, split face, scored, smooth, high density, low density, and fluted.
         4) Metal, Galvanized: Ceilings and ductwork.
         5) Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
         6) Drywall: Walls, ceilings, gypsum board, and similar items.

1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.

B. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2020.

C. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).

D. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Product characteristics.
   2. Surface preparation instructions and recommendations.
   3. Primer requirements and finish specification.
   4. Storage and handling requirements and recommendations.
   5. Application methods.

6. Clean-up information.

C. Samples: Submit two paper draw down samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, safety data sheets (SDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
   3. Label each container with color in addition to manufacturer's label.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.05 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, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.

B. Follow manufacturer's recommended procedures for producing the best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.

2.02 PAINTINGS AND COATINGS

A. General:
   1. Provide factory-mixed coatings unless otherwise indicated.
   2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. SCAQMD 1113 Rule.
      c. CARB (SCM).
      d. Architectural coatings VOC limits of State in which the project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site, or other method acceptable to authorities having jurisdiction.

C. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 PAINT SYSTEMS - INTERIOR

A. Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.
   1. Latex Systems:
      a. Semi-Gloss Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.5 mils dry per coat.
      b. Eg-Shel Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.7 mils dry per coat.
      c. Flat Finish:
         1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
            (a) 8 mils wet, 3.2 mils dry per coat.
         2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.
            (a) 4 mils wet, 1.6 mils dry per coat.

B. Masonry CMU: Concrete, split face, scored, smooth, high density, low density, and fluted.
    1. Latex Systems:
        a. Semi-Gloss Finish Scuff Resistant Waterbase Enamel:
            1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
                (a) 75 to 125 sq ft/gal.
            2) 2nd and 3rd Coat: Sherwin-Williams Scuff Tuff Interior Waterbased Enamel, Semi-Gloss, S26-50 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.2 mils dry per coat.
        b. Flat Finish:
            1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
                (a) 75 to 125 sq ft/gal.
            2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Flat, B30-2600 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.6 mils dry per coat.

C. Metal, Galvanized: Ceilings and ductwork.
    1. Dryfall Waterborne Topcoats:
        a. Flat Finish:
            1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-181 Series: www.sherwin-williams.com/#sle.
                (a) 6 mils wet, 1.7 mils dry per coat.

D. Drywall: Walls, ceilings, gypsum board, and similar items.
    1. Latex Systems:
        a. Semi-Gloss Finish:
            1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.5 mils dry per coat.
            2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.5 mils dry per coat.
        b. Eg-Shel Finish:
            1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.5 mils dry per coat.
            2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Eg-Shel, B20-2600 Series: www.sherwin-williams.com/#sle.
                (a) 4 mils wet, 1.7 mils dry per coat.

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 effect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to 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 mildew from impervious surfaces by scrubbing with solution of water and bleach. Rinse with clean water and allow surface to dry.

D. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk.
   2. Fill bug holes, air pockets, and other voids with cement patching compound.
   3. Prepare concrete in accordance with SSPC-SP 13/NACE No.6.

E. Masonry: Remove efflorescence and chalk.

F. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

A. Protect finished coatings from damage until completion of project.
B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 099000

SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dimensional letter signage.

1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.

C. Shop Drawings:
   1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.

D. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

E. Manufacturer's qualification statement.

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 dimensional letter signs as required to prevent damage before installation.

B. Store under cover and elevated above grade.

1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 DIMENSIONAL LETTERS

A. Metal Letters:
   1. Material: Stainless steel sheet, fabricated reverse channel.
   2. Thickness: Manufacturer's standard for letter size.
   3. Letter Height: As indicated on drawings.
   4. Text and Typeface:
      a. Character Font Exterior: Helvetica, Arial, or other sans serif font.
      b. Character Font Interior: Frutiger or Palatino
      c. Character Case: Upper case only.
   5. Finish: Brushed, satin.
   6. Color: As selected.
   7. Mounting: Projected mount with collars.

2.02 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate dimensional letter signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until mm-dd-yyyy; repair or replace damaged items.

END OF SECTION 101419

SECTION 101423 - PANEL SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide all labor, materials, accessories, equipment, and incidentals to provide signs and plaques as indicated including, but not limited to, the following:
   1. Panel signage.
   2. Exterior Truss Construction Identification Emblem

B. Provide identification plaque at each new and existing interior door opening to each interior space and as indicated on the drawings.

1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.

C. Shop Drawings:
   1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
   2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
      a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
      b. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
      c. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples of each type of sign, of size similar to that required for project, indicating sign style, font, and method of attachment.

E. Selection Samples: Where colors, materials, and finishes are not specified, submit two sets of color selection charts or chips.

F. Verification Samples: Submit samples showing colors, materials, and finishes specified.

G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

H. Manufacturer's qualification statement.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements for additional provisions.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Provide Identifying Emblems in compliance with N.J.A.C. 5:23-3.5(e) to identify the building as having floor, roof, or both roof and floor trusses.

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 under cover and elevated above grade.

1.06 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Panel Signage:
   1. Best Sign Systems, Inc: www.bestsigns.com/#sle.
   2. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
   3. Inpro Corporation: www.inprocorp.com/#sle.
   4. Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
   5. Or Approved Equal
   6. Substitutions: See Section 016000 - Product Requirements.

2.02 REGULATORY REQUIREMENTS

A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.03 PANEL SIGNAGE

A. Panel Signage:

1. Application: Room and door signs.
2. Description: Flat signs with engraved panel media, tactile characters.
3. Sign Size: 8 inches by 6 inches.
4. Total Thickness: 1/4 inch.
5. Sign Edges: Bevelled.
6. Letter Edges: Squared.
7. Corners: Radiused.
8. Color and Font, unless otherwise indicated:
    a. Character Font: Helvetica, Arial, or other sans serif font.
    b. Character Case: Upper and lower case (title case).
    c. Background Color: As scheduled.
    d. Character Color: Contrasting color.
9. Material: Laminated colored plastic engraved through face to expose core as background color.
10. Profile: Flat panel without frame.
11. Tactile Letters: Raised 1/32 inch minimum.
12. Braille: Grade II, ADA-compliant.
13. One-Sided Wall Mounting: Concealed or exposed screws.

2.04 SIGNAGE APPLICATIONS

A. Room and Door Signs:
1. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section for replaceable occupant name.
2. Classrooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
3. Conference and Meeting Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section with sliding "In Use/Vacant" indicator.
4. Assembly Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings,
    a. Capacity Plaques: Post Occupant Load in every assembly room (Multipurpose, Auditorium, Gymnasium, Courtyards) or as indicated on the drawings. Plaques shall be 10” x 3” containing the words “MAXIMUM CAPACITY” along with the number of occupants approved for the room or space and shall be located in a conspicuous place near the main entrance to the room or space. Plaques shall be 10” x 6” for rooms or spaces having multiple-use capabilities and shall be posted for all such occupancies.
5. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
6. Rest Rooms: Identify with pictograms, the name(s)"MEN" and "WOMEN", room numbers to be determined later, and braille.

2.05 EXTERIOR TRUSS CONSTRUCTION IDENTIFICATION EMBLEM

A. Identifying Emblem shall be made of 18 gauge bonderized steel. Emblem shall be of a bright and reflective color. Shape of the emblem shall be an isosceles triangle and the

size shall be 12 inches horizontally by 6 inches vertically. The following letters, of a size and color to make them conspicuous, shall be printed on the emblem:

1. “F” to signify a floor with truss construction;
2. “R” to signify a roof with truss construction; or
3. “F/R” to signify both a floor and roof with truss construction.

2.06 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

B. Exposed Screws: Chrome plated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Location of room and capacity plaques to be mounted with characters 48 inches minimum and 60 inches maximum above the adjacent finished floor or ground surface measured from the baseline of the characters on wall next to door on the latch side when door is closed. When a tactile sign is provided at double doors, the sign shall be to the right of the right hand door. Where there is no space on the latch side of a single door, or the right side of double doors, signs shall be on the nearest adjacent wall. Signs containing tactile characters shall have an 18 inch minimum by 18 inch minimum space on the floor or ground centered on the sign, beyond the arc of any door swing between the closed position and 45 degree open position.

   1. Exception: Door mounted signs shall be permitted on the push side of the doors without closers and without hold-open devices.

E. Location of Truss Identifying Emblem shall be permanently affixed to the left of the main entrance door at a height of between four and six feet above the ground.

F. Protect from damage until mm-dd-yyyy; repair or replace damaged items.

END OF SECTION 101423

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES - SEACHROME CORPORATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grab bars.
B. Shower and tub seats.
C. Shower shelves.
D. Dispensers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Seachrome Corporation: www.seachrome.com/#sle.

END OF SECTION 102800

SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

B. Solid plastic urinal screens.

1.02 ABBREVIATIONS AND ACRONYMS

A. HDPE: High-density polyethylene.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2025a.

C. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

D. ASTM A743/A743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application; 2021.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

H. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on panel construction, hardware, accessories, and finishes.

C. Shop Drawings:
   1. Indicate plans, elevations, and dimensions. Include door swings, toilet fixture centerlines, and floor drains on plans.

D. Samples:

1. For Initial Selection: Submit color charts and samples for each type of toilet compartment material.

E. Manufacturer's qualification statement.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver, store, and handle materials and products in accordance with manufacturer's instructions and recommendations and industry standards.

1.08 FIELD CONDITIONS

A. Ambient Conditions: Maintain environmental conditions such as temperature, humidity, and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Existing Conditions: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 25-year manufacturer warranty for HDPE material against breakage, corrosion, and delamination.

PART 2 PRODUCTS

2.01 PLASTIC TOILET COMPARTMENTS

A. Toilet Compartments: Solid plastic (HDPE), standard privacy, floor anchored, overhead braced.

B. Urinal Screens: Solid plastic (HDPE), wall hung.

C. Design Criteria:
   1. Accessibility: Design compartments indicated on drawings to comply with ICC A117.1 and ADA Standards.
   2. Fire Performance: Provide assemblies that pass when tested in accordance with NFPA 286.

D. Fabrication:
   1. Fabricate toilet compartment components to sizes indicated.

2. Coordinate requirements and provide cutouts for through-partition toilet accessories.
3. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.
4. Floor-Anchored, Overhead-Braced Units: Provide supports, leveling mechanisms, Easy-Stall shoes, and anchors at pilasters to suit floor conditions.

2.02 COMPONENTS

A. Doors and Panels: Single sheets of solid molded homogenous high-density polyethylene (HDPE).
   1. Finish:
      a. Color: As selected from manufacturer's color card.
      b. Texture: Manufacturer's standard for selected color.
   2. Edges: 1/4-inch radius machined edges.
   3. Heat Sink: Extruded aluminum attached to bottom of doors and panels.

B. Door and Panel Dimensions:
   1. Thickness: 1 inch.
   2. Door Panel Height: 55 inches.
   3. Door Height Above Floor: 14 inches.
   4. Urinal/Entrance Screen Panel Height: 55 inches.
   5. Urinal/Screen Screen Panel Height Above Floor: 14 inches.

2.03 MATERIALS

A. Aluminum Extrusions: ASTM B221 (ASTM B221M).

B. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666/A666M, Type 304, stretcher-leveled standard of flatness.

C. Stainless Steel Castings: ASTM A743/A743M.

2.04 HARDWARE AND ACCESSORIES

A. Brackets:

B. Door Hardware: Clear anodized aluminum:
   1. Hinges: 8 inch wrap-around pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Latch and Keeper: 6 inch slide latch with wrap-around keeper.
   3. Coat Hook: Chrome-plated zamac. Manufacturer's standard coat hook with rubber bumper; one per compartment, mounted on door.

C. Attachments, Screws, and Bolts: Stainless steel , tamper-resistant type..

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Attach Easy Stall shoe system to floor with 1/4 by 2 inch screws. Insert pilaster into Easy Stall shoe and secure after height adjustment.

C. Maintain maximum 1/2-inch space between pilasters and panels.

D. Maintain maximum 1-inch space between wall and panels.

E. Attach panel brackets securely to walls using anchor devices.

F. Attach panels and pilasters to brackets. Locate head rail joints at pilaster centerlines.

G. Do not permit field touch-up of scratches or damaged finish. Replace damaged or scratched materials with new materials.

3.03 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

3.04 CLEANING

A. Clean partition and screen surfaces with materials and cleansers in accordance with manufacturer's recommendations.

END OF SECTION 102113.19

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.
B. Commercial shower and bath accessories.
C. Under-lavatory pipe supply covers.
D. Electric hand/hair dryers.
E. Utility room accessories.

1.02 RELATED REQUIREMENTS

A. Section 093000 - Tiling: Ceramic washroom accessories.
B. Section 102113.19 - Plastic Toilet Compartments.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
C. ASTM C1036 - Standard Specification for Flat Glass; 2025.
D. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.
E. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2021.
F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
H. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 013300 - Submittal Procedures , for submittal procedures.
B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
C. Samples: Submit two samples of each accessory, illustrating color and finish.
D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. Bradley Corporation: www.bradleycorp.com/#sle.
   2. Georgia-Pacific Professional: www.gppro.com/#sle.
   3. Bobrick
   4. Substitutions: Section 016000 - Product Requirements.

B. Electric Hand/Hair Dryers:
   1. Dyson Inc; Dyson Airblade 9kJ: www.dyson.com/#sle.

C. Provide products of each category type by single manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

B. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Double roll, surface mounted, for coreless type rolls.
   1. Products:
      a. Renown
      b. Approve equal.

B. Paper Towel Dispenser: Folded paper type, stainless steel, fully-recessed, with viewing slots on sides as refill indicator and tumbler lock.
   1. Capacity: 300 C-fold minimum.
   2. Products:
      a. Bradley Corporation, Inc:: https://www.bradleycorp.com/

C. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock.
   1. Products:
      a. Hillyard.
      b. Approved equal.

D. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
   1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
   2. Frame: 0.05 inchangle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.

3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
4. Shelf: Stainless steel; gauge and finish to match mirror frame, turned down edges, welded to frame; 5 inches deep, full width of mirror.
5. Products:
    a. ASI
    b. Approved equal.

E. Seat Cover Dispenser: Stainless steel, surface-mounted, reloading by concealed opening at base, tumbler lock.
1. Products:
    a. Alpine.
    b. Approved equal.

F. Grab Bars: Stainless steel, peened surface.
1. Heavy Duty Grab Bars: Floor supports are acceptable if necessary to achieve load rating.
    a. Push/Pull Point Load: Minimum 1000 pound-force, minimum.
    b. Dimensions: 1-1/2 inch outside diameter, minimum 0.125 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
    c. Length and Configuration: As indicated on drawings.
    d. Products:
        1) Bobrick

G. Combination Sanitary Napkin/Tampon Dispenser with Disposal: Stainless steel, recessed.
1. Products:
    a. ASI.
    b. Approved equal.

H. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
1. Products:
    a. Alpine

2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
3. Construction: 1/8 inch flexible PVC.
    a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
    b. Comply with ASTM C1822, type indicated.
    c. Comply with ASME A112.18.9.
    d. Comply with ICC A117.1.
    e. Microbial and Fungal Resistance: Comply with ASTM G21.
4. Color: White.

5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.
6. Products:
    a. Plumberex Specialty Products, Inc; Plumberex Handy-Shield Maxx: www.plumberex.com/#sle.

2.06 ELECTRIC HAND/HAIR DRYERS

A. Electric Hand Dryers: Traditional fan-in-case type, with downward fixed nozzle.
    1. Operation: Automatic, sensor-operated on and off.
    2. Mounting: Wall-mounted - surface.
    3. Cover: Stainless steel with brushed finish.
        a. Tamper-resistant screw attachment of cover to mounting plate.
    4. Electric Hand Dryer Products:
        a. Dyson.

2.07 UTILITY ROOM ACCESSORIES

A. Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, hat-shaped channel.
    1. Holders: Three spring-loaded rubber cam holders.
    2. Length: 36 inches.
    3. Products:
        a. American Specialties, Inc: www.americanspecialties.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

D. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 102800

SECTION 122400 - WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 REFERENCE STANDARDS

A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

B. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequencing:
   1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
   2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
   1. Motorized Shades: Include power requirements and standard wiring diagrams for specified products.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
   1. Motorized Shades: Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.

D. Certificates: Manufacturer's documentation that line voltage components are UL listed or UL recognized.

E. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.

F. Selection Samples: Include fabric samples in full range of available colors and patterns.
   1. Motorized Shades: Include finish selections for controls.
G. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.
H. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
I. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.
J. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
K. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

1.07 MOCK-UP

A. Mock-Up: Provide full size mock-up of window shade system complete with selected shade fabric including example of seams and batten pockets when applicable.
   1. Obtain Architect's approval of light and privacy characteristics of fabric prior to fabrication.
   2. Full-sized mock-up may become part of the final installation.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
B. Handle and store shades in accordance with manufacturer's recommendations.

1.09 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.
B. Field Measurements: Take accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:

1. Shade Hardware: 25 years.
2. Electric Motors: 2 years.
3. Electronic Control Equipment: 2 years.
4. Fabric: 25 years.
5. Aluminum and Steel Coatings: 25 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Manually Operated Roller Shades:
   1. Draper, Inc (Basis of Design); Clutch Operated FlexShade: www.draperinc.com/#sle.
   2. Mecho Shade Systems LLC Mecho/5x System: www.mechoshade.com/#sle.
   3. Rollease Acmeda Contract; Contract Series Easy Spring Air: www.rolleaseacmedacontract.com/#sle.
   4. Or Approved Equal.
   5. Substitutions: See Section 016000 - Product Requirements.

B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.02 SHADE BAND

A. Shade Bands: Construction of Railroaded 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.

B. 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.

C. Shade Band and Shade Roller Attachment:

D. 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 in diameter for manual shades, and less than 2.55 inches for motorize shades are not acceptable.

E. Provide for positive mechanical engagement with drive/brake mechanism.

F. 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.

G. Mounting spline shall not require use of adhesives, adhesive tapes, staples, and/or rivets.

H. Any method of attaching shade band to roller tube that requires the use of: adhesive, adhesive tapes, staples, and/or rivets are not acceptable.

2.03 SHADE FABRICATION

A. Fabricate units to completely fill existing openings from head to sill and jamb-to-jamb, unless specifically indicated otherwise.

B. Fabricate shade cloth to hang flat without buckling or distortion. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling. Fabricate unguided shadecloth to roll true and straight without shifting sideways more than 1/8 inch in either direction per 8 feet of shade height due to warp distortion or weave design.

C. Provide battens in standard shades as required assuring proper tracking and uniform rolling of the shade bands. Contractor shall be responsible for assuring the width-to-height (W:H) ratios shall not exceed manufacturer's standards or, in absence of such standards, shall be responsible for establishing appropriate standards to assure proper tracking and rolling of the shade cloth within specified standards. Battens shall be roll-formed stainless steel or tempered steel, as required.

D. For railroaded shade bands, provide seamless railroaded shade bands as required to meet size requirements and in accordance with seam alignment as acceptable to Architect. Manufacturer to assure the proper tracking of the railroaded shade bands.

2.04 ROLLER SHADES

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Interior Roller Shades - Basis of Design: Draper, Inc; Clutch Operated FlexShade NEXD: www.draperinc.com/#sle.
   1. Description: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and other components necessary for complete installation.
      a. Mounting: Ceiling mounted.
      b. Size: As indicated on drawings.
   2. Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
   3. Roller Tubes: As required for type of shade operation; designed for removal without removing mounting hardware.
      a. Material: Extruded aluminum or steel, with wall thickness and material selected by manufacturer.
      b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
   4. Hembars: Designed to maintain bottom of shade straight and flat, selected from manufacturer's standard options.
   5. Manual Operation:
      a. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
      b. Drive Chain: Continuous loop, stainless steel, beaded ball chain, 95 lb minimum breaking strength; comply with WCMA A100.1. Provide upper and lower limit stops.

2.05 SHADE FABRIC

A. Fabric for Light-Filtering Shades: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
   1. Manufacturers:
      a. Mecho/5 Shade System.
      b. Substitutions: See Section 016000 - Product Requirements.
   2. Material: Vinyl coated polyester.
   3. Performance Requirements:
      a. Flammability: Pass NFPA 701 large and small tests.
   4. Openness Factor: 3%.
   5. Color: As selected by Architect from manufacturer's full range of colors.

2.06 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: As recommended in writing by manufacturer.

C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.

C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

C. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

3.05 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals, for closeout submittals.

B. See Section 017900 - Demonstration and Training, for additional requirements.

C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

D. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.06 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

3.07 MAINTENANCE

A. See Section 017000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

END OF SECTION 122400

SECTION 123200 - MANUFACTURED WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured standard and custom casework, with cabinet hardware.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Blocking and nailers for anchoring casework.

B. Section 079200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.

C. Section 092116 - Gypsum Board Assemblies: Reinforcements in metal-framed partitions for anchoring casework.

D. Section 123600 - Countertops: Additional requirements for countertops.

1.03 DEFINITIONS

A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.

B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.

C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

1.04 REFERENCE STANDARDS

A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

B. ASTM C1036 - Standard Specification for Flat Glass; 2025.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

D. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2024, with Editorial Revision (2025).

E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

G. BHMA A156.9 - Cabinet Hardware; 2020.

H. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

I. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Component dimensions, configurations, construction details, joint details, attachments.

C. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors and reinforcements, placement dimensions and tolerances, clearances required, and keying information.

D. Samples for Finish Selection: Fully finished, for color selection. Minimum sample size: 2 inches by 3 inches.
   1. Wood samples for color and species selection.
   2. Plastic laminate samples, for color, texture, and finish selection.

E. Casework Samples: Representative of types in the project.
   1. Base Cabinet: Cabinet with drawer and door and specified hardware.

F. Manufacturer's Installation Instructions.

G. Maintenance Data: Manufacturer's recommendations for care and cleaning.

H. Finish touch-up kit for each type and color of materials provided.

1.07 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Quality Standard: Unless otherwise indicated, engineer casework and installation to comply with AWI's "Architectural Woodwork Quality Standards" Sections 1600 and 1700.

C. Accessible casework shall be in conformance with: IBC International Building Code, ICC/ANSI A117.1, and the Americans with Disabilities Act.

D. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by manufacturer.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.

B. Acceptance at Site:
   1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.

C. Storage:
   1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" Article of this section.

1.09 MOCK-UPS

A. Provide full size base cabinet complete with drawers, door, adjustable shelf and countertop.

B. See Section 014000 - Quality Requirements for additional requirements.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion, at no additional cost to Owner. Defects include, but are not limited to:
   1. Ruptured, cracked, or stained finish coating.
   2. Discoloration or lack of finish integrity.
   3. Cracking or peeling of finish.
   4. Failure of hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Casework:
   1. TMI Systems Corporation; Basis of design: www.tmisystems.com/#sle.
   2. Institutional Casework Inc: www.iciscientific.com/#sle.
   3. Labscape LLC: www.labscape.com/#sle.
   4. Wood-Metal Industries: www.wood-metal.com/#sle.
   5. Stevens Industries: www.stevensadvantage.com/#sle.
   6. Or Approved Equal.
   7. Substitutions: See Section 016000 - Product Requirements.

B. Plastic Laminate Casework:

1. TMI Systems Corporation; Basis of design: www.tmisystems.com/#sle.
2. Institutional Casework Inc: www.iciscientific.com/#sle.
3. Case Systems: www.casesystems.com/#sle.
4. Diversified Fixture: www.diversifiedfixture.com/#sle.
5. Labscape LLC: www.labscape.com/#sle.
6. Stevens Industries: www.stevensadvantage.com/#sle.
7. Or Approved Equal.
8. Substitutions: See Section 016000 - Product Requirements.

C. Obtain casework from single source and manufacturer, unless otherwise indicated.

2.02 CASEWORK, GENERAL

A. Quality Standard: AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Types: More than one type is required. See drawings for location of each type of casework.

C. Wood Veneer Faced Cabinets: Custom Grade.

D. Plastic Laminate Faced Cabinets: Custom Grade.

2.03 FABRICATION

A. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.

B. Construction: As required for selected grade.

C. Glazing for Doors: Clear laminated tempered glass.

D. Fittings and Fixture Locations: Cut and drill components for fittings and fixtures.

E. Hardware Application: Factory-machine casework members for hardware that is not surface applied.

F. Access Panels: Where indicated, for maintenance of utility service and mechanical and electrical components.

G. Removable back panels on all base cabinets. Provide partial height back panels at sink cabinets.

H. Removable panels at backs of open spaces between base cabinets.
1. Provide cutouts for power receptacles where indicated on drawings.

I. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

J. Scribes and Fillers: Panels of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.

K. Matching Wood Grain: Comply with requirements of quality standard for specified grade and as follows:
1. Provide center matched panels at each elevation.

L. Apron Frames: Construction similar to other cabinets, with modifications.

M. Countertop Panel-Type Supports: Materials similar to adjacent casework, 1-1/2 inch in width, with front-to-back and toe space dimensions matching base cabinet. Designed

to be secured in a concealed fashion to countertop material. Include two leveling devices per support panel.

2.04 WOOD-VENEER-FACED CASEWORK

A. Wood-Veneer-Faced Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base cabinets.
   1. Style: Reveal overlay. Ease doors and drawer fronts slightly at edges.
   2. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
      a. Base Cabinets: 24 inches.
      b. Tall Cabinets: 22 inches.
      c. Wall Cabinets: 16 inches.
   3. Finishes:
      a. Exposed Exterior Surfaces: HPVA HP-1 Grade A, Maple, plain sliced, book-matched.
      b. Exposed Interior Surfaces: HPVA HP-1 Grade B, Maple, plain sliced, random-matched.
      c. Semi-Exposed Surfaces: HPVA HP-1 Grade B, Maple, plain sliced, random-matched.
      d. Concealed Surfaces: Manufacturer's option.
      e. Matching Wood Grain Pattern: Comply with requirements of quality standard for specified grade and as follows:
         1) Provide center matched panels at each elevation.
      f. Factory-finish all exposed and semi-exposed surfaces with the same finish.
         1) Preparation: Wood sanded smooth, free from dust and mill marks.
         2) Stain: Single application of clean, manufacturer-recommended stain of selected color; tinted coating not acceptable.
         3) Coating: Clear, superior-quality, chemical-resistant acyclic urethane; applied in accordance with manufacturer instructions, force-dried, sanded and wiped clean.
         4) Coats: Multiple coats as required to achieve minimum 1.5 mil dry film thickness.
         5) Appearance: Clear satin gloss; not cloudy or muddy.

2.05 PLASTIC-LAMINATE-CLAD CASEWORK

A. Plastic-Laminate-Clad Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base cabinets.
   1. Style: Reveal overlay. Ease doors and drawer fronts slightly at edges.
   2. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
      a. Base Cabinets: 24 inches.

b. Tall Cabinets: 22 inches.
c. Wall Cabinets: 16 inches.

3. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline.
   a. Finish: Matte or suede, gloss rating of 5 to 20.
   b. Surface Color and Pattern: As selected by Architect from manufacturer's full line.
   c. Exposed Interior Surfaces: Thermally fused laminate.
   d. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
      1) Matching Wood Grain Pattern: Comply with requirements of quality standard for specified grade and as follows:
         (a) Provide center matched panels at each elevation.

2.06 COUNTERTOPS

A. Countertops: See Section 123600.

2.07 CABINET HARDWARE

A. Comply with BHMA A156.9 requirements.
   1. Acceptable base materials for plated finishes include brass, bronze, and steel.

B. Resilient Base: Provide resilient base at unfinished toe kicks.

C. Locks: Provide locks on casework drawers and doors. Lock with 5 pin cylinder and 2 keys per lock.
   1. Hinged Doors: Cam type lock, satin chromium plated over nickel on base material.
   2. Framed Sliding Doors: Plunger-type sliding showcase lock, satin chromium plated over nickel on base material.
   3. Frameless Sliding Glass Doors: Ratchet-type sliding showcase lock, satin chromium plated over nickel on base material.
   4. Tall Hinged Doors: Three-point latching system.
   5. Keying: Key locks alike within a space; key each room separately.
   6. Master Key System: All locks operable by master key.

D. Shelves in Cabinets:
   1. Adjustable Shelf Supports: Shall be injection molded polycarbonate, clear color to blend with selected interior finish, friction fit into cabinet end panels and vertical dividers, readily adjustable on 32 mm (approximately 1-1/4”) centers. Each shelf support shall have two (2) integral support pins, 5 mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The supports shall be automatically adaptable to 3/4” or 1” thick shelving and shall provide non-tip feature for shelving. Supports are designed to readily permit field fixing of shelf if desired. Structural load testing shall show loading to 1,500 pounds (375 pounds per support) without failure.

E. Swinging Doors: Hinges, pulls, and catches.
   1. Hinges: Heavy duty, five knuckle 2-3/4" institutional type hinge. Mill ground, hospital tip, tight pin feature with all edges eased. Hinge to be full wrap around type of tempered steel .095" thick. Hinges shall conform to ANSI - BHMA

standard A156.9, Grade 1. Each pair of hinges shall hold a minimum of 310 lbs. to assure positive door attachment.

2. Hinges: One pair hinges per door to 48" height. One and one-half pair hinges over 48" in height. Hinge to accommodate 13/16" thick laminated door, and allow 270° swing. Finish shall be epoxy finish, color to match basic cabinet body color or in contrasting color or brushed chrome as selected by Architect
3. Pulls: Chrome wire pulls, 4 inches wide.
4. Catches: Magnetic. 5 lb. Magnetic catch for base and wall cabinets. Provide two 5 lb. catches at each tall cabinet door.

F. Drawers: Pulls and slides.
1. Pulls: Chrome wire pulls, 4 inches wide.
2. Slides: Steel, full extension arms, ball bearings; self-closing; Slides will have a 100 pound load rating at full extension and a built-in, positive stop both directions, with self closing feature. Slides shall have a lifetime warranty as offered by the slide manufacturer. Large drawer slides shall have a 150 pound load rating with a lifetime warranty as offered by the slide manufacturer..

2.08 MATERIALS

A. Wood-Based Materials:
1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.

B. Solid Wood: Clear, dry, sound, plain sawn, selected for compatible species, grain and color, no defects.

C. Semi-Exposed Solid Wood: Dry, sound, plain sawn, no appearance defects, any species similar in color and grain to exposed portions.

D. Hardwood Plywood: Veneer core; HPVA HP-1 Grade as indicated; same species as exposed solid wood, clear, compatible grain and color, no defects. Band exposed edges with solid wood of same species as veneer.

E. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.

F. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

G. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications. complying with Grade requirements, and standard with the manufacturer.

H. Thermally Fused Laminate (TFL): Melamine resin, NEMA LD 3, Type VGL laminate panels.

I. Glass: Fully tempered float; ASTM C1036, Type 1, Quality Q3; ASTM C1048, tempered using horizontal tempering and complying with ANSI Z97.1; 3/16 inch thick minimum; exposed edges ground, and cut or drilled to receive hardware; clear.

J. Laminated Glass: Fully tempered float glass, laminated in accordance with ASTM C1172, Type II; clear.

2.09 ACCESSORIES

A. Plastic Edge Banding: Extruded PVC, flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
   1. Color: As selected by Architect from manufacturer's full range.
   2. Use at exposed edges.

B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

C. Concealed Joint Fasteners: Corrosion-resistant, standard with manufacturer.

D. Cable Grommets: Provide 2", 2.5", and 3" diameter cable drop grommets of ABS plastic with rotating top. Provide 3” diameter exit grommets of ABS plastic in all vertical dividers between adjoining units at all cable tray locations for cable passage.

E. Sealant for Use in Casework Installation:

PART 3 EXECUTION

3.01 PREPARATION

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

3.02 EXAMINATION

A. Site Verification of Environmental Conditions:
   1. Do not deliver casework until the following conditions have been met:
      a. Building has been enclosed (windows and doors sealed and weather-tight).
      b. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
      c. Ceiling, overhead ductwork, piping, and lighting have been installed.
      d. Installation areas do not require further “wet work” construction.

B. For Base Cabinets Installation: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 1/2 inch leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.

C. For Wall Cabinets Installation: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
   1. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 ft and 1/2 inch in 20 ft or more, and/or maximum variation from plumb exceeds 1/4 inchper story.

D. Verify adequacy of support framing and anchors.

E. Verify that service connections are correctly located and of proper characteristics.

3.03 INSTALLATION

A. Perform installation in accordance with manufacturer's instructions.

B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.

C. Set casework items plumb and square, securely anchored to building structure.

D. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.

E. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
   1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
   2. Variation of Bottoms of Wall Cabinets from Level: 1/8 inch in 10 feet.
   3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
   4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
   5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.

F. Secure wall and floor cabinets to concealed reinforcement at gypsum board assemblies.

G. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
   1. Where base cabinets are installed away from walls or service space framing, anchor to floor at toe space at not more than 24 inches on center, and at sides of cabinets with not less than two fasteners per side.

H. Wall Cabinets: Fasten to hanging strips, and/or wall substrates. Fasten each cabinet through back, near top, at not less than 16 inches on center.

I. Install hardware uniformly and precisely.

J. Countertops: Install countertops intended and furnished for field installation in one true plane, with ends abutting at hairline joints, and no raised edges.

K. Replace units that are damaged, including those that have damaged finishes.

3.04 ADJUSTING

A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.05 CLEANING

A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

B. Clean casework and other installed surfaces thoroughly.

3.06 PROTECTION

A. Do not permit finished casework to be exposed to continued construction activity.

B. Protect casework and countertops from ongoing construction activities. Prevent workmen from standing on, or storing tools and materials on casework or countertops.

C. Repair damage, including to finishes, that occurs prior to Date of Substantial Completion, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION 123200

SECTION 123600 - COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for manufactured casework.

B. Wall-hung counters and vanity tops.

1.02 RELATED REQUIREMENTS

A. Section 123200 - Manufactured Wood Casework .

1.03 REFERENCE STANDARDS

A. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. NSF 51 - Food Equipment Materials; 2023.

H. PS 1 - Structural Plywood; 2023.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

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. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

H. Installation Instructions: Manufacturer's installation instructions and recommendations.

I. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

A. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD 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.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
   1. Exposed Edge Treatment: Square, substrate built up to minimum 1-1/4 inch thick; covered with matching laminate.
   2. Back and End Splashes: Same material, same construction.
   3. Fabricate in accordance with manufacturer's standard requirements.

C. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.

1. Flat Sheet Thickness: 1/2 inch, minimum.
2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    a. Manufacturers:
        1) American Bath Group: www.americanbathgroup.com/#sle.
        2) Avonite Surfaces: www.avonitesurfaces.com/#sle.
        3) Dupont: www.corian.com/#sle.
        4) Formica Corporation: www.formica.com/#sle.
        5) LG Hausys America, Inc: www.lghausysusa.com/#sle.
        6) Meganite, Inc: www.meganite.com/#sle.
        7) Relang International, LLC: www.duraseinusa.com/#sle.
        8) Wilsonart; Basis of design: www.wilsonart.com/#sle.
        9) Or Approved Equal.
        10) Substitutions: See Section 016000 - Product Requirements.
    b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
    d. Color and Pattern: As selected by Architect from manufacturer's full line.
3. Other Components Thickness: 1/2 inch, minimum.
4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge; use marine edge at sinks.
5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
6. Skirts: As indicated on drawings.
7. Fabricate in accordance with manufacturer's standard requirements.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B211/B211M, 6463 alloy, T5 temper.

B. Wood-Based Components:
    1. Wood fabricated from old growth timber is not permitted.

C. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

D. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

E. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch by 1/2 inch.
    1. Color: As selected by Architect from manufacturer's full line.

F. Joint Sealant: Mildew-resistant silicone sealant, clear.

G. Sealer: Stain and acid protection for natural stone counters.
    1. NSF approved for food contact per NSF 51.
    2. Products:
        a. Custom Building Products: www.custombuildingproducts.com/#sle.

b. Rockstar Sealing, a division of TuffSkin Surface Protection LLC: www.rockstarsealing.com/#sle.
c. STONETECH, a division of LATICRETE International, Inc: www.laticrete.com/#sle.
d. Or Approved Equal.
e. Substitutions: See Section 016000 - Product Requirements.

2.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
      a. Rout a 1/8 inch drip groove at underside of exposed overlapping edges, set back 1/2 inch from face of edge.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

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. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.

C. Seal joint between back/end splashes and vertical surfaces.
    1. Where indicated use rubber cove molding.
    2. Where applied cove molding is not indicated use specified sealant.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 123600

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Above ground piping.
B. Buried piping.
C. Escutcheons.
D. Expansions - hose and braid.
E. Mechanical couplings.
F. Mechanical pressed fittings.
G. Pipe hangers and supports.
H. Pipe sleeves.
I. Pipe sleeve-seal systems.
J. Piping specialties.
K. Pressure gauges.
L. Pressure relief valves.

1.02 REFERENCE STANDARDS

A. ANSI Z21.22 - American National Standard for Relief Valves for Hot Water Supply Systems; 2015 (Reaffirmed 2025).
B. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
C. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2026.
D. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
E. ASME B16.4 - Gray Iron Threaded Fittings: Classes 125 and 250; 2021.
F. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
G. ASME B16.9 - Factory-Made Wrought Buttwelding Fittings; 2024.
H. ASME B16.11 - Forged Fittings, Socket-Welding and Threaded; 2021.
I. ASME B16.25 - Buttwelding Ends; 2022.
J. ASME B36.10M - Welded and Seamless Wrought Steel Pipe; 2022.
K. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2022.
L. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators; 2025, with Errata.

M. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).

N. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

O. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe; 2021.

P. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2026.

Q. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.

R. ASTM A795/A795M - Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use; 2021.

S. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2026.

T. ASTM F3226/F3226M - Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems; 2019 (Reapproved 2024).

U. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

V. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2018.

W. AWWA C606 - Grooved and Shouldered Joints; 2022.

X. FM 1920 - Approval Standard for Pipe Couplings and Fittings for Aboveground Fire Protection Systems; 2007.

Y. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Z. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems; 2024.

AA. UL (DIR) - Online Certifications Directory; Current Edition.

BB. UL 213 - Rubber Gasketed Fittings for Fire-Protection Service; Current Edition, Including All Revisions.

CC. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

DD. UL 405 - Standard for Safety Fire Department Connection Devices; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's catalog information. Indicate valve data and ratings.

C. Shop Drawings: Indicate pipe materials used, jointing methods, supports, and floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

1.04 WARRANTY

A. See Section 017800 - 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 GENERAL REQUIREMENTS

A. Sprinkler-based System:
   1. Comply with NFPA 13.
   2. See Section 211300.

B. Standpipe and Hose System:
   1. Comply with NFPA 14.
   2. See Section 211200.

C. Combined Sprinkler, Standpipe, and Hose System:
   1. Comply with NFPA 13 and NFPA 14.
   2. See Sections 211300 and 211200.

D. Welding Materials and Procedures: Comply with ASME BPVC-IX.

E. Provide system pipes, fittings, sleeves, escutcheons, seals, and other related accessories.

2.02 BURIED PIPING

A. Steel Pipe: ASTM A53/A53M Schedule 40, ASTM A135/A135M Schedule 10, ASTM A795/A795M Standard Weight, or ASME B36.10M Schedule 40, black, with AWWA C105/A21.5 polyethylene jacket, or double layer, half-lapped polyethylene tape.
   1. Steel Fittings: ASME B16.9, wrought steel, buttwelded, ASME B16.25, buttweld ends, ASTM A234/A234M, wrought carbon steel or alloy steel, ASME B16.5, steel flanges and fittings, or ASME B16.11, forged steel socket welded and threaded; with double layer, half-lapped polyethylene tape.
   2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings.
   3. Joints: Welded in accordance with AWS D1.1/D1.1M.

2.03 ABOVE GROUND PIPING

A. Steel Pipe: ASTM A795 Schedule 40, black.
   1. Steel Fittings: ASME B16.5 steel flanges and fittings.
   2. Cast Iron Fittings: ASME B16.1, flanges and flanged fittings and ASME B16.4, threaded fittings.
   3. Malleable Iron Fittings: ASME B16.3, threaded fittings and ASTM A47/A47M.
   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 Press Sealed Fittings: ASTM F3226/F3226M; listed as complying with UL 213 or FM 1920, with EPDM seals.

2.04 PIPE SLEEVES

A. Vertical Piping:

1. Sleeve Length: 1 inch above finished floor.
2. Provide sealant for watertight joint.
3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.

B. Pipe Passing Through Below Grade Exterior Walls:
1. Zinc-coated or cast-iron pipe.
2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

C. Pipe Passing Through Quarry Tile, Terrazzo, or Ceramic Tile Floors:
1. Brass pipe.
2. Connect sleeve with floor plate.

D. Not required for wall hydrants for fire department connections or in drywall construction.

E. Clearances:
1. Provide allowance for insulated piping.
2. Wall, Floor, Floor, Partitions, and Beam Flanges: 1 inch greater than external; pipe diameter.
3. Rated Openings: Caulked tight with firestopping material complying with ASTM E814 in accordance with Section 078400 to prevent the spread of fire, smoke, and gases.

2.05 PIPE SLEEVE-SEAL SYSTEMS

A. Manufacturers:
1. Advance Products & Systems, Inc; _____: www.apsonline.com/#sle.
2. GPT, a company of Enpro Industries, Inc; _____: www.gptindustries.com/#sle.
3. Or Approved Equal.

B. Modular Mechanical Seals:
1. Elastomer-based interlocking links to continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
3. Size and select seal component materials in accordance with service requirements.
4. Service Requirements:
   a. Corrosion resistant.
   b. Underground, buried, and wet conditions.
   c. Fire Resistance: 1 hour, UL (DIR) approved.
   d. High temperature, up to 400 deg F.
   e. Low temperature, down to minus 67 deg F.
5. Glass-reinforced plastic pressure end plates.

C. Wall Sleeve: PVC material with waterstop collar, and nailer end caps.

D. Sleeve-Forming Disk: Nonconductive plastic-based material, 3 inch thick.

E. Pipeline-Casing Seals:
1. End Seals: 1/8 inch, pull-on type, rubber or synthetic rubber based.

2.06 ESCUTCHEONS

A. Manufacturers:
   1. Fire Protection Products, Inc; _____: www.fppi.com/#sle.com/#sle.
   2. Tyco Fire Protection Products; _____: www.tyco-fire.com/#sle.
   3. Viking Group Inc; _____: www.vikinggroupinc.com/#sle.
   4. Or Approved Equal.

B. Material:
   1. Fabricate from nonferrous metal.
   2. Metals and Finish: Comply with ASME A112.18.1.

C. Construction:
   1. One-piece for mounting on chrome-plated tubing or pipe and one-piece or split-pattern type elsewhere.
   2. Internal spring tension devices or setscrews to maintain a fixed position against a surface.

2.07 PIPE HANGERS AND SUPPORTS

A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
   1. Manufacturers:
      a. AFCON, a brand of Anvil International; _____: www.anvilintl.com/#sle.
      b. FNW; _____: www.fnw.com/#sle.
      c. Or Approved Equal.

B. Hangers for Pipe Sizes 2 inches and Over: Carbon steel, adjustable, clevis.
   1. Manufacturers:
      a. AFCON, a brand of Anvil International; _____: www.anvilintl.com/#sle.
      b. FNW; _____: www.fnw.com/#sle.
      c. Or Approved Equal.

2.08 EXPANSION JOINTS AND LOOPS - HOSE AND BRAID

A. Manufacturers:
   1. The Metraflex Company; FireLoop: www.metrafire.com/#sle.
   2. Flex-Hose Co. Inc; _____: www.flexhose.com/#sle.
   3. Flex-Weld, Inc; _____: www.kelcoind.com/#sle.
   4. Or Approved Equal.

B. Provide flexible loops with two flexible sections of hose and braid, two 90-degree elbows, and 180-degree return with support bracket and air release or drain plug.

C. Provide flexible loops capable of movement in the x, y, and z planes. Flexible loops to impart no thrust loads to the building structure.

D. Flexible Connectors: Flanged, braided type with wetted components of stainless steel, sized to match piping.
   1. Maximum Allowable Working Pressure: 150 psig at 120 degrees F.
   2. Accommodate the Following:
      a. Axial Deflection in Compression and Expansion: _____ inch.
      b. Lateral Movement: _____ inch.
      c. Angular Rotation: 15 degrees.
      d. Force developed by 1.5 times specified maximum allowable operating pressure.

3. Provide necessary accessories including, but not limited to, swivel joints.

2.09 MECHANICAL COUPLINGS

A. Manufacturers:
   1. Anvil International; _____: www.anvilintl.com/#sle.
   2. Tyco Fire Protection Products; ____: www.tyco-fire.com/#sle.
   3. Victaulic Company; FireLock Style 009H: www.victaulic.com/#sle.
   4. Or Approved Equal.

B. Rigid Mechanical Couplings for Grooved Joints:
   1. Dimensions and Testing: Comply with AWWA C606.
   2. Minimum Working Pressure: 300 psig.
   3. Housing Material: Fabricate of ductile iron complying with ASTM A536.
   4. Housing Coating: Factory applied orange enamel.
   5. Gasket Material: EPDM suitable for operating temperature range from minus 30 degrees F to 230 degrees F.
   6. Bolts and Nuts: Hot-dipped-galvanized or zinc-electroplated steel.

2.10 MECHANICAL PRESSED FITTINGS

A. Manufacturers:
   1. Apollo Valves; _____: www.apollovalves.com/#sle.
   2. Viega ProPress: www.viega.us.

B. Provide double-pressed type, utilizing EPDM, nontoxic, synthetic rubber sealing elements for use with Schedule 40 carbon steel piping.

2.11 PIPING SPECIALTIES

A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber-faced clapper to automatically actuate water motor alarm, pressure retard chamber and variable pressure trim with the following additional capabilities and features:
   1. Activate electric alarm.
   2. Test and drain valve.
   3. Replaceable internal components without removing valve from installed position.

B. Dry Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber-faced clapper to automatically actuate water motor alarm, accelerator, and with the following additional capabilities and features:
   1. Activate electric alarm.
   2. Test and drain valve.
   3. Externally resettable.
   4. Replaceable internal components without removing valve from installed position.

C. Auxiliary Drains: Condensate collection drain for each section of trapped pipe in preaction or dry fire protection system.

D. Air Venting Valves:

E. Backflow Preventer: Reduced-pressure principle valve assembly backflow preventer with drain and OS & Y gate valve on each end.

F. Test Connections:
    1. Inspector's Test Connection for Preaction and Dry Pipe Systems:
        a. Provide test connections approximately 6 feet above floor for each or portion of each sprinkler system equipped with an alarm device, located at most remote part of each system.
        b. Route test connection to an open-site drain location, excluding janitor sinks, accepting full flow without negative consequences.
        c. Supply discharge orifice with same size as corresponding sprinkler orifice.
        d. Limit vertical height of exterior wall penetration to 2 feet above finished grade.
    2. Combination Inspector's Test Connection and Drain Valve:
        a. Provide test connections approximately 6 feet above floor for each or portion of each sprinkler system equipped with an alarm device, located at most remote part of each system.
        b. Route combination test connection and drain valve to an open-site drain location, excluding janitor sinks, accepting full flow without negative consequences.
        c. Supply discharge orifice with same size as corresponding sprinkler orifice.
        d. Limit vertical height of exterior wall penetration to 2 feet above finished grade.
    3. Backflow Preventer Test Connection:
        a. Provide downstream of the backflow prevention assembly, listed hose valves with 2.5-inch National Standard male hose threads with cap and chain.
        b. Provide one valve for each 250 gpm of system demand or fraction thereof.
        c. Provide permanent sign reading "Test Valve." See Section 210553.

G. Water Motor Alarm: Hydraulically operated impeller type alarm with aluminum alloy chrome-plated gong and motor housing, nylon bearings, and inlet strainer.

H. Electric Alarm: Electrically operated chrome-plated gong with pressure alarm switch.

I. Water Flow Switch: Vane-type switch for mounting horizontally or vertically, with two contacts; rated 10 A at 125 VAC and 2.5 A at 24 VDC.

J. Fire Department Connections:
    1. Type: Exposed, projected wall mount made of corrosion-resistant metal complying with UL 405.
        a. Configuration: Horizontal.
        b. Outlet: Bottom with pipe threads, 4 NPS.
        c. Rated Working Pressure: 175 psi.
        d. Finish: Chrome.
        e. Sleeve: Brass, 18-inch height.
        f. Signage: Raised or engraved lettering 1 inch, minimum, indicating system type.
        g. Manufacturers:
            1) Elkhart Brass Manufacturing Company, Inc; _____: www.elkhartbrass.com/#sle.
            2) Fire End & Croker Corporation; _____: www.croker.com/#sle.
            3) Or Approved Equal.

2.12 PRESSURE GAUGES

A. Manufacturers:
    1. AGF Manufacturing; _____: www.agfmfg.com/#sle.

2. Dwyer Instruments, Inc; _____: www.dwyer-inst.com/#sle.
3. Winters Instruments; _____: www.winters.com/#sle.
4. Or Approved Equal.

B. Pressure Gauges: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background.
1. Case: Steel with brass bourdon tube.
2. Diameter: 4-1/2 inch.
3. Mid-Scale Accuracy: One percent.
4. Scale: Display in psi and kPa.

2.13 PRESSURE RELIEF VALVES

A. Manufacturers:
1. AGF Manufacturing; _____: www.agfmfg.com/#sle.
2. Cla-Val Co; _____: www.cla-val.com/#sle.
3. Watts; _____: www.watts.com/#sle.
4. Or Approved Equal.

B. ANSI Z21.22, AGA certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

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. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. 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.
4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.

I. 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.

J. Structural Considerations:
1. Do not penetrate building structural members unless indicated.
2. Locate flexible expansion loops at or near the building seismic joint.

K. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

L. Manufactured Sleeve-Seal Systems:
1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
3. Locate piping in center of sleeve or penetration.
4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
5. Tighten bolting for a watertight seal.
6. Install in accordance with manufacturer's recommendations.

M. 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.

N. 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, unions, and couplings for servicing are consistently provided.

END OF SECTION 210500

SECTION 210513 - COMMON MOTOR REQUIREMENTS FOR FIRE SUPPRESSION EQUIPMENT

<<<< UPDATE NOTES

PART 1 GENERAL

2.01 SECTION INCLUDES

A. General construction and requirements.
B. Applications.
C. Single phase electric motors.

2.02 RELATED REQUIREMENTS

A. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

2.03 REFERENCE STANDARDS

A. NEMA MG 00001 - Motors and Generators; 2024.
B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.

2.05 QUALITY ASSURANCE

A. Comply with NFPA 70.
B. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of high efficiency motors.

2.06 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Provide five year manufacturer warranty for motors larger than 20 horsepower.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Baldor Electric Company/ABB Group; _____: www.baldor.com/#sle.

B. Leeson Electric Corporation; _____: www.leeson.com/#sle.

C. Regal-Beloit Corporation (Century); _____: www.centuryelectricmotor.com/#sle.

D. Or Approved Equal.

3.02 GENERAL CONSTRUCTION AND REQUIREMENTS

A. Electrical Service: Refer to Section 260583 for required electrical characteristics.

B. Electrical Service:
   1. Motors 1/2 HP and Smaller: 115 volts, single phase, 60 Hz.
   2. Motors Larger than 1/2 Horsepower: 230 volts, three phase, 60 Hz.

C. Construction:
   1. Open drip-proof type except where specifically noted otherwise.
   2. Design for continuous operation in 104 degrees F environment.
   3. Design for temperature rise in accordance with NEMA MG 00001 limits for insulation class, service factor, and motor enclosure type.

D. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.

E. Wiring Terminations:
   1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
   2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

3.03 APPLICATIONS

A. Single phase motors for fans, pumps, blowers, and air compressors: Capacitor start type.

3.04 SINGLE PHASE POWER - CAPACITOR START MOTORS

A. Starting Torque: Three times full load torque.

B. Starting Current: Less than five times full load current.

C. Pull-up Torque: Up to 350 percent of full load torque.

D. Breakdown Torque: Approximately 250 percent of full load torque.

E. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.

PART 3 EXECUTION

4.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.

C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION 210513

SECTION 210523 - GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Two-piece ball valves with indicators.
B. Iron butterfly valves with indicators.
C. Check valves.
D. Iron OS&Y gate valves.
E. Trim and drain valves.

1.02 RELATED REQUIREMENTS

A. Section 210553 - Identification for Fire Suppression Piping and Equipment.

1.03 ABBREVIATIONS AND ACRONYMS

A. EPDM: Ethylene-propylene diene monomer.
B. NRS: Non-rising stem.
C. OS&Y: Outside screw and yoke.
D. PTFE: Polytetrafluoroethylene.

1.04 REFERENCE STANDARDS

A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; 2013 (Reaffirmed 2018).
B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2026.
C. ASME B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings: Classes 150 and 300; 2021.
D. AWWA C606 - Grooved and Shouldered Joints; 2022.
E. FM 1112 - Examination Standard for Indicating Valves (Butterfly or Ball Type); 2020.
F. FM 1120/1130 - Examination Standard for Fire Service Water Control Valves (OS&Y and NRS Type Gate Valves); 2025.
G. FM 1140 - Examination Standard for Quick Opening Valves 1/4 Inch Through 2 Inch Nominal Size; 2024.
H. FM 1210 - Examination Standard for Swing Check Valves; 2025.
I. UL 258 - Shutoff Valves for Trim and Drain Purposes for Fire Protection Service; Current Edition, Including All Revisions.

J. UL 262 - Gate Valves for Fire-Protection Service; Current Edition, Including All Revisions.

K. UL 312 - Check Valves for Fire-Protection Service; Current Edition, Including All Revisions.

L. UL 1091 - Standard for Butterfly Valves for Fire-Protection Service; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Source Limitations: Furnish valves of same kind by same manufacturer.

B. Valve-End Connections:
   1. Flanges on Iron Valves: ASME B16.1 or ASME B16.42.
   2. Threaded Ends: ASME B1.20.1.
   3. Grooved Ends: AWWA C606.

C. Valve Pressure Ratings: Not less than minimum pressure rating indicated or higher as required.

D. Valve Sizes: Same as upstream piping unless otherwise indicated.

E. Valve Actuator Types:
   1. Worm-gear actuator with handwheel for quarter-turn valves, except trim and drain valves.
   2. Handwheel: For other than quarter-turn trim and drain valves.
   3. Hand-lever: For quarter-turn trim and drain valves 2 NPS and smaller.

2.02 TWO PIECE BALL VALVES WITH INDICATORS

A. UL 1091 and FM 1112 listed.

B. Description:
   1. Minimum Pressure Rating: 175 psig.
   2. Body Design: Two piece.
   3. Body Material: Forged brass or bronze.
   4. Port Size: Full or standard.
   5. Seat: PTFE.
   6. Stem: Bronze or stainless steel.
   7. Ball: Chrome-plated brass.
   8. Actuator: Worm gear or traveling nut.
   9. End Connections: Threaded or grooved.

2.03 IRON BUTTERFLY VALVES WITH INDICATORS

A. Manufacturers:
   1. FNW: www.fnw.com/#sle.
   2. Kennedy Valve: www.kennedyvalve.com/#sle.
   3. Arita Valve, a Unimech brand; BF-28/29: www.unimechflow.com/#sle.
   4. Or Approved Equal.

B. UL 1091 and FM 1112 listed.

C. Minimum Pressure Rating: 175 psig.

D. Body Material: Cast or ductile iron.

E. Seat: EPDM.

F. Stem: Stainless steel.

G. Disc: Ductile iron with EPDM coating.

H. Actuator: Worm gear or traveling nut.

I. Body Design: Grooved-end or wafer style.

2.04 SWING CHECK VALVES

A. Manufacturers:
   1. FNW: www.fnw.com/#sle.
   2. Kennedy Valve; AWWA Compliant: www.kennedyvalve.com/#sle.
   3. Arita Valve, a Unimech brand; SW-55: www.unimechflow.com/#sle.
   4. Or Approved Equal.

B. UL 312 and FM 1210 listed.

C. Minimum Pressure Rating: 175 psig.

D. Body Material: Cast or ductile iron.

E. Clapper: Bronze, EPDM-coated ductile iron, or stainless steel.

F. Seat: Bronze or EPDM-coated bronze.

G. End Connections: Flanged.

2.05 IRON OS&Y GATE VALVES

A. Manufacturers:
   1. FNW; 751 Series: www.fnw.com/#sle.
   2. Kennedy Valve; Ken-Seal Series, AWWA Compliant: www.kennedyvalve.com/#sle.
   3. Arita Valve, a Unimech brand; RGA-33: www.unimechflow.com/#sle.
   4. Or Approved Equal.

B. UL 262 and FM 1120/1130 listed.

C. Minimum Pressure Rating: 175 psig.

D. Body and Bonnet Material: Cast or ductile iron.

E. Wedge: Cast or ductile iron, or bronze with elastomeric coating.

F. Stem: Brass, bronze, or stainless steel.

G. Packing: Non-asbestos PTFE.

H. Supervisory Switch: External.

2.06 TRIM AND DRAIN VALVES

A. Ball Valves:
   1. Description:
      a. UL 258 or FM 1140 listed.
      b. Pressure Rating: 175 psig.
      c. Body Design: Two piece.
      d. Body Material: Forged brass or bronze.
      e. Port Size: Full or standard.
      f. Seat: PTFE.
      g. Stem: Bronze or stainless steel.
      h. Ball: Chrome-plated brass.
      i. Actuator: Hand-lever.
      j. End Connections: Threaded or grooved.

B. Angle Valves:
   1. Description:
      a. UL 258 or FM 1140 listed.
      b. Pressure Rating: 175 psig.
      c. Body Material: Brass or bronze.
      d. Ends: Threaded.
      e. Stem: Bronze.
      f. Disc: Bronze.
      g. Packing: Asbestos free.
      h. Handwheel: Malleable iron, bronze, or aluminum.

C. Globe Valves:
   1. Description:
      a. UL 258 or FM 1140 listed.
      b. Pressure Rating: 175 psig.
      c. Body Material: Bronze with integral seat and screw-in bonnet.
      d. Ends: Threaded.
      e. Stem: Bronze.
      f. Disc Holder and Nut: Bronze.
      g. Disc Seat: Nitrile.
      h. Packing: Asbestos free.
      i. Handwheel: Malleable iron, bronze, or aluminum.

PART 3 EXECUTION

3.01 EXAMINATION

A. Confirm valve interior to be free of foreign matter and corrosion.

B. Remove packing materials.

C. Examine guides and seats by operating valves from the fully open position to the fully closed position.

D. Examine valve threads and mating pipe for form and cleanliness.

E. Examine mating flange faces for conditions that might cause leakage.
   1. Check bolting for proper size, length, and material.
   2. Verify gasket for size, defects, damage, and suitable material composition for service.

F. Replace defective valves with new valves.

3.02 INSTALLATION

A. Install valves in accessible locations to allow for operation, inspections, tests, and maintenance.

B. Install listed valves in accordance with their listing.

C. Install valves in accordance with manufacturer's instructions.

D. Support valves independently of adjacent piping.

E. Install valves in horizontal piping with stem at or above pipe center.

F. Position valves to allow full actuator movement.

G. Install OS&Y valves with full clearance for rising stem. Install surrounding components so they do not interfere with nor are they impacted by full extension of rising stem.

H. Install supervised shutoff valves in supervised-open position.

I. Install permanent identification signs indicating portion of system controlled by each shutoff valve.

J. Install threaded-end valves with unions upstream and downstream.

K. Install valve tags. See Section 210553. Label valves in accordance with NFPA standard applying to the piping system in which valves are installed.

END OF SECTION 210523

SECTION 210553 - IDENTIFICATION FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Tags.
C. Pipe markers.
D. Ceiling tacks.

1.02 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.
B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2025.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturers catalog literature for each product required.
C. Manufacturer's Installation Instructions: Indicate special procedures, and installation instructions.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Automatic Controls: Tags.
B. Control Panels: Nameplates.
C. Instrumentation: Tags.
D. Major Control Components: Nameplates.
E. Piping: Tags.
F. Relays: Tags.
G. Small-sized Equipment: Tags.
H. Valves: Nameplates and ceiling tacks where above lay-in ceilings.

2.02 NAMEPLATES

A. Manufacturers:
   1. Brimar Industries, Inc; _____: www.pipemarker.com/#sle.
   2. Kolbi Pipe Marker Co; _____: www.kolbipipemarkers.com/#sle.

3. Seton Identification Products, a Tricor Direct Company; _____: www.seton.com/#sle.
4. Or Approved Equal.

B. Description: Laminated three-layer plastic with engraved letters.
1. Letter Color: White.
2. Letter Height: 1/4 inch.
3. Background Color: Black.
4. Thickness: 1/8 inch.
5. Plastic: Comply with ASTM D709.

2.03 TAGS

A. Manufacturers:
1. Brady Corporation; _____: www.bradycorp.com/#sle.
2. Brimar Industries, Inc; _____: www.pipemarker.com/#sle.
3. Seton Identification Products, a Tricor Direct Company; _____: www.seton.com/#sle.
4. Or Approved Equal.

B. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.

C. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

D. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

2.04 PIPE MARKERS

A. Manufacturers:
1. Brady Corporation; _____: www.bradycorp.com/#sle.
2. Brimar Industries, Inc; _____: www.pipemarker.com/#sle.
3. Seton Identification Products, a Tricor Company; _____: www.seton.com/#sle.
4. Or Approved Equal.

B. Color: Comply with ASME A13.1.

C. 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.

D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

E. Underground Plastic Pipe Markers: Bright-colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.

F. Color code as follows:
1. Fire Quenching Fluids: Red with white letters.

2.05 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.

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. Install plastic pipe markers in accordance with manufacturer's instructions.

D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

E. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

F. Use tags on piping 3/4 inch diameter and smaller.
   1. Identify service, flow direction, and pressure.
   2. Install in clear view and align with axis of piping.
   3. 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.

END OF SECTION 210553

SECTION 211300 - FIRE-SUPPRESSION SPRINKLER SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wet-pipe sprinkler system.
B. Dry-pipe sprinkler system.
C. System design, installation, and certification.
D. Fire department connections.

1.02 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; Current Edition.
B. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).
C. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.
D. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. 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.
C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 016000 - Product Requirements for additional provisions.
    2. Extra Sprinklers: Type and size matching those installed in quantity required by referenced NFPA design and installation standard.
    3. Sprinkler Wrenches: For each sprinkler type.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sprinklers, Valves, and Equipment:
    1. Anvil International; _____: www.anvilintl.com/#sle.
    2. Tyco Fire Protection Products; _____: www.tyco-fire.com/#sle.
    3. Viking Corporation; _____: www.vikinggroupinc.com/#sle.

4. Or Approved Equal.

2.02 SPRINKLER SYSTEM

A. Sprinkler System: Provide coverage for Building Addition Area.

B. Occupancy: Light hazard; comply with NFPA 13.

C. Water Supply: Determine volume and pressure from water flow test data.

D. Provide fire department connections where indicated.

E. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

F. Pipe Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
   1. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
   2. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
   3. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
   4. Other Types: As required.

2.03 SPRINKLERS

A. Suspended Ceiling Type: Concealed pendant type with matching screw on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Enamel, color as selected.
   4. Escutcheon Plate Finish: Enamel, color as selected.
   5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

B. Exposed Area Type: Pendant type with guard.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Brass.
   4. Fusible Link: Glass bulb type temperature rated for specific area hazard.

C. Sidewall Type: Semi-recessed horizontal sidewall type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Enamel, color as selected.
   4. Escutcheon Plate Finish: Enamel, color as selected.
   5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

D. Dry Sprinklers: Concealed pendant type with matching push on escutcheon plate.
   1. Response Type: Quick.
   2. Coverage Type: Standard.
   3. Finish: Enamel, color as selected.
   4. Cover Plate Finish: Enamel, color as selected.
   5. Fusible Link: Glass bulb type temperature rated for specific area hazard.

2.04 NITROGEN GENERATOR

A. Nitrogen Generator:
   1. Provide FM (AG) approved system and accessories.
B. Minimum Nitrogen Purity: 98 percent.
C. Provide piping and accessories to connect to dry and preaction fire suppression systems.
D. Accessories:
   1. Provide control panel or remote annunciator panel.
   2. Provide air maintenance device.
   3. Provide nitrogen storage tank sized to comply with NFPA 13.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.
B. Install equipment in accordance with manufacturer's instructions.
C. Place pipe runs to minimize obstruction to other work.
D. Place piping in concealed spaces above finished ceilings.
E. 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.
F. Flush entire piping system of foreign matter.
G. Hydrostatically test entire system.
H. Require test be witnessed by Fire Marshal.

END OF SECTION 211300

SECTION 220516 - EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flexible pipe connectors.
B. Expansion joints and compensators.
C. Pipe loops, offsets, and swing joints.

1.02 RELATED REQUIREMENTS

A. Section 221005 - Plumbing Piping.

1.03 REFERENCE STANDARDS

A. EJMA (STDS) - EJMA Standards; Eleventh Edition.
B. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data:
    1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
    2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Comply with UL (DIR) requirements.

2.02 FLEXIBLE PIPE CONNECTORS - STEEL PIPING

A. Manufacturers:
    1. Flex-Weld, Inc
    2. Mercer Rubber Company
    3. The Metraflex Company
    4. Unisource Manufacturing, Inc

5. Or Approved Equal.

B. Inner Hose: Stainless steel.

C. Exterior Sleeve: Single braided, stainless steel.

D. Pressure Rating: 125 psi up to 12 inch.

E. Maximum Service Temperature: 450 degrees F.

F. End Connections: Threaded.

G. Size: Use pipe sized units.

2.03 FLEXIBLE PIPE CONNECTORS - COPPER PIPING

A. Manufacturers:
   1. Flex-Weld, Inc
   2. Mercer Rubber Company
   3. The Metraflex Company
   4. Unisource Manufacturing, Inc
   5. Or Approved Equal.

B. Inner Hose: Bronze.

C. Exterior Sleeve: Braided bronze.

D. Pressure Rating: 125 psi up to 2 inch.

E. Maximum Service Temperature: 450 degrees F.

F. End Connections: Welded or sweat.

G. Size: Use pipe sized units.

H. Maximum offset: 3/4 inch on each side of installed center line.

I. Application: Copper piping.

2.04 EXPANSION JOINTS - TWO-PLY BRONZE BELLOWS TYPE

A. Manufacturers:
   1. Mercer Rubber Company
   2. Or Approved Equal.

B. Construction: Bronze with anti-torque device, limit stops, internal guides.

C. Pressure Rating: 125 psi and 400 degrees F.

D. Maximum Compression: 1-3/4 inches.

E. Maximum Extension: 1/4 inch.

F. Joint: Soldered.

G. Size: Use pipe sized units.

H. Application: Copper piping.

2.05 EXPANSION JOINTS - COMPENSATORS

A. Manufacturers:
   1. Flex-Hose Co. Inc

2. Mercer Rubber Company
3. Unisource Manufacturing, Inc
4. Or Approved Equal.

B. Type: Two-ply 304 stainless steel bellows with carbon steel shroud.

C. Maximum Working Pressure: 200 psi.

D. Maximum Working Temperature: 400 degrees F.

E. End Connections: Female copper sweat.

F. Application: Copper piping up to 3 inches in size or steel piping up to 4 inches in size.

2.06 EXPANSION JOINTS AND LOOPS - HOSE AND BRAID

A. Manufacturers:
1. Flex-Hose Co. Inc
2. Flex-Weld, Inc
3. The Metraflex Company
4. Unisource Manufacturing, Inc
5. Or Approved Equal.

B. Provide flexible loops with two flexible sections of hose and braid, two 90 degree elbows, and 180 degree return with support brackets and plugged drain port for steam service.

C. Maximum Allowable Motion: 2 inch in the x, y, and z planes with no thrust loads to the building structure.

D. Maximum Working Pressure: 150 psi at 800 degrees F.

E. Construction: Class 150, schedule 40, stainless steel hose and braid assembly with carbon steel fittings, including elbows and flanged end connections sized to match pipe segment.
1. Selected Product to Accommodate:
a. Angular Rotation: 15 degrees.
b. Force developed by 1.5 times specified maximum allowable operating pressure.
2. Provide necessary accessories including, but not limited to, swivel joints.

2.07 EXPANSION JOINTS - EXTERNALLY PRESSURIZED

A. Manufacturers:
1. Flex-Hose Co. Inc
2. Flex-Weld, Inc
3. The Metraflex Company
4. Unisource Manufacturing, Inc
5. Or Approved Equal.

B. Bellows Type: Two-ply, single bellows constructed of 304 stainless steel.

C. Internal Liner: Carbon steel with internal and external guides.

D. End Connections: Class 150, carbon steel, welded flange.

E. Maximum Axial Compression: 4 inches.

F. Maximum Working Pressure: 150 psi at 700 degrees F.

G. Application: Steel piping 2 inches and over.

2.08 ACCESSORIES

A. ----------

B. Note to Specifier: The stainless steel material option above is an accessory not relating to the material of the other products below.

C. ----------

D. Pipe Alignment Guides:
   1. Manufacturers:
      a. Flex-Weld, Inc
      b. The Metraflex Company
      c. Or Approved Equal.
      d. Substitutions: See Section 016000 - Product Requirements.
   2. Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inches travel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with EJMA (Expansion Joint Manufacturers Association) Standards.

C. Install flexible pipe connectors on pipes connected to vibration isolated equipment. Provide line size flexible connectors.

D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.

E. Anchor pipe to building structure where indicated. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.

F. Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.

G. Substitute grooved piping for vibration isolated equipment instead of flexible connectors. Grooved piping need not be anchored.

END OF SECTION 220516

SECTION 220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe sleeves.

B. Pipe sleeve-seals.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

B. Section 220523 - General-Duty Valves for Plumbing Piping.

C. Section 220553 - Identification for Plumbing Piping and Equipment: Piping identification.

D. Section 220719 - Plumbing Piping Insulation.

1.03 REFERENCE STANDARDS

A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2024.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2026.

C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

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.

1.05 WARRANTY

A. See Section 017800 - 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 PIPE SLEEVES

A. Manufacturers:

1. Flexicraft Industries
2. Or Approved Equal.

B. Vertical Piping:
   1. Sleeve Length: 1 inch above finished floor.
   2. Provide sealant for watertight joint.
   3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.
   4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.

C. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.

D. Pipe Passing Through Below Grade Exterior Walls:
   1. Zinc coated or cast iron pipe.
   2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

E. Pipe Passing Through Concrete Beam Flanges, except where Brass Pipe Sleeves are Specified:
   1. Galvanized steel pipe or black iron pipe with asphalt coating.
   2. Connect sleeve with floor plate except in mechanical rooms.

F. Pipe Passing Through Mechanical, Laundry, and Animal Room Floors above Basement:
   1. Galvanized steel pipe or black iron pipe with asphalt coating.
   2. Connect sleeve with floor plate except in mechanical rooms.

G. Penetrations in concrete beam flanges are permitted but are prohibited through ribs or beams without prior approval from the Architect.

H. Clearances:
   1. Provide allowance for insulated piping.
   2. Wall, Floor, Partitions, and Beam Flanges: 1 inch greater than external pipe diameter.
   3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 078400 to prevent the spread of fire, smoke, and gases.

2.02 PIPE-SLEEVE SEALS

A. Manufacturers:
   1. Advance Products & Systems, LLC
   2. American Polywater Corporation
   3. Flexicraft Industries
   4. Or Approved Equal.

B. Modular Mechanical Sleeve-Seal:
   1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
   2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
   3. Size and select seal component materials in accordance with service requirements.

4. Service Requirements:
    a. Corrosion resistant.
    b. Oil, fuel, gas, and solvent resistant.
    c. Underground, buried, and wet conditions.
    d. Fire Resistant: 1 hour, UL (DIR) approved.
5. Glass-reinforced plastic pressure end plates.

C. Sealing Compounds:
1. Provide packing and sealing compound to fill pipe to sleeve thickness.
2. Combined packing and sealing compounding to match partition fire-resistance hourly rating.

D. Pipe Sleeve Material:
1. Bearing Walls: Steel, cast iron, or terra-cotta pipe.
2. Masonry Structures: Sheet metal or fiber.

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.

3.02 INSTALLATION

A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

B. Install piping to conserve building space, to not interfere with use of space and other work.

C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

D. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
1. Underground Piping: Caulk pipe sleeve watertight with lead and oakum or mechanically expandable chloroprene inserts with bitumen sealed metal components.
2. Aboveground Piping:
    a. Pack solid using mineral fiber complying with ASTM C592.
    b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
3. All Rated Openings: Caulk tight with fire stopping material complying with ASTM E814 in accordance with Section 078400 to prevent the spread of fire, smoke, and gases.
4. Caulk exterior wall sleeves watertight with lead and oakum or mechanically expandable chloroprene inserts with mastic-sealed components.

E. Manufactured Sleeve-Seal Systems:

1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
3. Locate piping in center of sleeve or penetration.
4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
5. Tighten bolting for a water-tight seal.
6. Install in accordance with manufacturer's recommendations.

F. 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.

3.03 CLEANING

A. Upon completion of work, clean all parts of the installation.

B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

C. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

END OF SECTION 220517

SECTION 220519 - METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flow meters.

B. Pressure gauges.

C. Thermometers.

D. Pressure-temperature test plugs.

1.02 RELATED REQUIREMENTS

A. Section 232113 - Hydronic Piping.

1.03 REFERENCE STANDARDS

A. AGA/ANSI B109 Set - INCLUDES ANSI B109.1, ANSI B109.2, ANSI B109.3, ANSI B109.4; 2000.

B. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2022.

C. ASME MFC-3M - Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi; 2004 (Reaffirmed 2025).

D. ASTM E1 - Standard Specification for ASTM Liquid-in-Glass Thermometers; 2014 (Reapproved 2025).

E. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers; 2014 (Reapproved 2021).

F. AWWA M6 - Water Meters -- Selection, Installation, Testing, and Maintenance; 2026.

G. NSF 61 - Drinking Water System Components - Health Effects; 2025, with Addendum

H. NSF 372 - Drinking Water System Components - Lead Content; 2024.

I. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

J. UL 404 - Gauges, Indicating Pressure, for Compressed Gas Service; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide red-marked product data sheets for each furnished item with associated components and accessories.

C. Project Record Documents: Record actual locations of components and instrumentation.

PART 2 PRODUCTS

2.01 FLOWMETERS

A. Manufacturers:
   1. Dwyer Instruments, Inc
   2. McCrometer, Inc
   3. Omega Engineering a subsidiary of Spectris, Plc
   4. VWR International, LLC
   5. Or Approved Equal.

B. In-Line Monitor:
   1. Material: Borosilicate glass.
   2. Accuracy: Plus or minus five percent full scale.
   3. Provide 10-point NIST Calibration Certificate.
   4. Flow: Water, flow-range as indicated on drawings.
   5. Connection Size: 1 inch NPT female.
   6. Maximum Service Pressure: 200 psi.
   7. Maximum Service Temperature: 100 degrees F.
   8. Range marks to bear metric and English (dual) scale with gpm units.

C. Flow Sensing Element.
   1. In-Line Averaging Measuring Station: Type 316 stainless steel pitot type flow element inserted through welded threaded couplet, with safety shut-off valves and quick coupling connections, and permanent metal tag indicating design flow rate, reading for design flow rate, metered fluid, line size, station or location number.
      a. Pressure rating: 275 psi.
      b. Maximum temperature: 400 degrees F.
      c. Accuracy: Plus 0.55 percent to minus 2.30 percent.
   2. Venturi Fitting with Built-in Orifice Plate: Calibrated ASME MFC-3M venturi orifice plate and flanges with valved taps, chart for conversion of differential pressure readings to flow rate, with pressure gauge in case.
   3. Portable Meter: Dry single diaphragm type pressure gauge with 6 inch dial pointer, stainless steel wetted metal parts, variable pulsation damper, equalizing valve, two bleed valves, and master chart for direct conversion of meter readings to flow rate, mounted in rust-proof carrying case with two ten foot long rubber test hoses with brass valves or quick connections for measuring stations.

2.02 PRESSURE GAUGES

A. Manufacturers:
   1. Ashcroft, Inc
   2. Dwyer Instruments, Inc
   3. Moeller Instrument Company, Inc
   4. Omega Engineering a subsidiary of Spectris, Plc
   5. Weksler Glass Thermometer Corp
   6. Winters Instruments; _____: www.winters.com/#sle.
   7. Or Approved Equal.

B. Bourdon Tube for Liquids and Gases:

1. Dial Text and Markings: Black color on white background with scaled kPa and psi units.
2. Accuracy: ASME B40.100, adjustable commercial grade (D) with 5 percent of span.
3. Process Connection: Lower-back, 1/4 inch NPT male except where noted.
4. Gauge Wetted Materials: Painted steel case and brass socket rated to match process pressure and temperature range.
5. Comply with UL 393 when used for fire protection service or UL 404 when used for compressed gas service.

C. Diaphragm Actuated for Gases:
1. Dial Size and Cover: 3-1/2 inch diameter scale with polycarbonate window.
2. Dial Text and Markings: Black color on white background with scaled cm (cm wg) and inch (in wg) units.
3. Accuracy: ASME B40.100, adjustable commercial grade (B) with 2 percent at mid-range of span.
4. Process Connection: Lower-back, 1/4 inch NPT male except where noted.
5. Gauge Wetted Materials: Painted steel case and phosphor bronze socket rated to match process pressure and temperature range.
6. Comply with UL 404 when used for compressed gas service.

2.03 THERMOMETERS

A. Manufacturers:
1. Dwyer Instruments, Inc
2. Moeller Instrument Company, Inc
3. Watts Water Technologies, Inc
4. Weiss Instruments, LLC
5. Weksler Glass Thermometer Corp
6. Winters Instruments
7. Or Approved Equal

B. General:
1. Product Compliance: ASTM E1.
2. Lens: Clear glass, except where stated.
3. Accuracy: One percent, when tested in accordance with ASTM E77, except where stated.
4. Scale: Black markings depicting single scale in degrees F where expected process value falls half-span of standard temperature range.

C. Thermometers - Straight: 5 inch v-shape lead-free brass case with clear glass window scale, 2 inch NPT stem, 3-1/4 inch NPT thermowell, and red or blue non-toxic organic liquid filled glass tube.

D. Thermometers - Adjustable Angle: 7 inch v-shape aluminum case with clear glass window scale, 6 inch NPT stem, red or blue organic non-toxic liquid filled glass tube, and adjustable joint with positive locking device allowing 360 degrees in horizontal plane or 180 degrees in vertical plane adjustments.

E. Thermometers - Dial Type:
1. Fixed: 5 inch diameter dial with black pointer, stainless steel case, silicone damping bimetal element, hermetically sealed lens, recalibrating screw, and 2-1/2 inch NPT stem.

a. Remote-Local Reading: Include built-in platinum RTD probe for remote reading.

2. Adjustable Angle: 5 inch diameter dial with black pointer, stainless steel case, silicone damping bimetal element, hermetically sealed lens, recalibrating screw, and 2-1/2 inch NPT stem.
3. Vapor (Gas) Actuated: 4-1/2 inch glass-reinforced phenolic case, aluminum dial with black pointer, recalibrating screw, 2 inch brass thermowell, adjustable joint with positive locking device allowing 180 degrees in vertical plane adjustment and capillary.

2.04 PRESSURE-TEMPERATURE TEST PLUGS:

A. Manufacturers:
   1. Dwyer Instruments, Inc
   2. Watts Water Technologies, Inc
   3. Weiss Instruments, LLC
   4. Weksler Glass Thermometer Corp
   5. Winters Instruments
   6. Or Approved Equal

B. Size: 500 psi capacity; 1/2 inch MPT brass fitting with gasket, cap, and retaining strap for 1/8 inch pressure gauge or temperature probe.

C. Wetted Materials per Temperature Range:
   1. Up to 200 degrees F: Brass probe with neoprene core.
   2. 200 to 350 degrees F: Brass probe with EPDM core.
   3. 350 to 400 degrees F: Brass probe with synthetic rubber core.

D. Accessories: Brass, lever-handle cock and snubber-filter.

E. Test Kit: Internally padded carrying case fitted with two 2-1/2 inch diameter pressure gauges, adapters, two 1/8 inch probes, and 1 inch dual-scale dial thermometers.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify Utility Service Provider piping readiness to receive meter.

B. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports, and test plugs.

3.02 INSTALLATION

A. Install metering products in accordance with manufacturer's instructions for intended fluid type and service.

B. Install rotameters (flowmeters) between 4 to 6 ft above finished floor unless instructed otherwise to allow easy readability.

C. Install pressure gauges as follows:
   1. At Pumps: Place single gauge before strainer, suction side and discharge side.

2. Include gauge cock to isolate each gauge and extend nipples for insulation clearance.
3. Include siphons on high temperature systems and select type according to service rating.
4. Adjust gauges to selected viewing angle, clean thoroughly, and calibrate to zero.

D. Install thermometers as follows:
1. Hot Water Heaters: Place upstream and downstream of heater. Add one on the inlet end when using steam as the water heating medium.
2. Piping: Install thermometers in branch butt weld connection fitting or socket-weld thermowell. Enlarge pipes smaller than 2-1/2 inch to accommodate sockets. Ensure sockets are above insulation clearance.

E. Locate PT (pressure-temperature) test plugs adjacent to control device sockets.

END OF SECTION 220519

SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Angle valves.
B. Ball valves.
C. Butterfly valves.
D. Check valves.
E. Flow limiting valves.
F. Gate valves.
G. Globe valves.
H. Lubricated plug valves.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 083100 - Access Doors and Panels.
C. Section 220548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
D. Section 220553 - Identification for Plumbing Piping and Equipment.
E. Section 220716 - Plumbing Equipment Insulation.
F. Section 220719 - Plumbing Piping Insulation.
G. Section 221005 - Plumbing Piping.

1.03 ABBREVIATIONS AND ACRONYMS

A. CWP: Cold working pressure.
B. EPDM: Ethylene propylene copolymer rubber.
C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
D. NRS: Non-rising stem.
E. OS&Y: Outside screw and yoke.
F. PTFE: Polytetrafluoroethylene.
G. RS: Rising stem.
H. TFE: Tetrafluoroethylene.
I. WOG: Water, oil, and gas.
J. WSP: Working steam pressure.

1.04 REFERENCE STANDARDS

A. API STD 594 - Check Valves: Flanged, Lug, Wafer, and Butt-Welding; 2022.

B. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; 2013 (Reaffirmed 2018).

C. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2026.

D. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.

E. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves; 2022, with Errata (2023).

F. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.

G. ASME B16.34 - Valves — Flanged, Threaded, and Welding End; 2025.

H. ASME B31.9 - Building Services Piping; 2025.

I. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

J. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings; 2004 (Reapproved 2023).

K. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.

L. ASTM B61 - Standard Specification for Steam or Valve Bronze Castings; 2015 (Reapproved 2021).

M. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings; 2017 (Reapproved 2025).

N. AWWA C606 - Grooved and Shouldered Joints; 2022.

O. MSS SP-45 - Drain and Bypass Connections; 2026.

P. MSS SP-70 - Gray Iron Gate Valves, Flanged and Threaded Ends; 2011.

Q. MSS SP-71 - Gray Iron Swing Check Valves, Flanged and Threaded Ends; 2018.

R. MSS SP-72 - Ball Valves with Flanged or Butt-Welding Ends for General Service; 2010a.

S. MSS SP-78 - Gray Iron Plug Valves, Flanged and Threaded Ends; 2026.

T. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves; 2019.

U. MSS SP-85 - Gray Iron Globe and Angle Valves, Flanged and Threaded Ends; 2011.

V. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .

W. NSF 61 - Drinking Water System Components - Health Effects; 2025, with Addendum

X. NSF 372 - Drinking Water System Components - Lead Content; 2024.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

E. Maintenance Materials: Furnish Owner with one wrench for every five plug valves, in each size of square plug valve head.
   1. See Section 016000 - Product Requirements for additional provisions.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. See drawings for specific valve locations.

B. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).

C. Provide the following valves for the applications if not indicated on drawings:
   1. Shutoff: Ball, butterfly, gate or plug.
   2. Dead-End: Single-flange butterfly (lug) type.
   3. Throttling: Provide globe, angle, ball, or butterfly.
   4. Swing Check (Pump Outlet):
      a. 2 inch and Smaller: Bronze swing check valves with bronze or nonmetallic disc.

D. Substitutions of valves with higher CWP classes or WSP ratings for same valve types are permitted when specified CWP ratings or WSP classes are not available.

E. Required Valve End Connections for Non-Wafer Types:
   1. Steel Pipe:
      a. 2 inch and Smaller: Threaded ends.
      b. 2-1/2 inch to 4 inch: Grooved or flanged ends except where threaded valve-end option is indicated in valve schedules below.
      c. Grooved-End Copper Tubing and Steel Piping: Grooved.
   2. Copper Tube:
      a. 2 inch and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
      b. 2-1/2 inch to 4 inch: Grooved or flanged ends except where threaded valve-end option is indicated in valve schedules below.

F. Low Pressure, Compressed Air Valves 150 psi or Less:
   1. 2 inch and Smaller:
      a. Bronze: Provide with solder-joint ends.
      b. Ball: One piece, full port, brass with brass trim.
      c. Bronze Lift Check: Class 125, bronze disc.
      d. Bronze Swing Check: Class 125, bronze disc.
      e. Bronze Gate: Class 125, NRS.

G. Domestic, Hot and Cold Water Valves:
   1. 2 inch and Smaller:
      a. Bronze and Brass: Provide with solder-joint ends.
      b. Bronze Angle: Class 125, bronze disc.
      c. Ball: One piece, full port, brass with brass trim.

d. Bronze Swing Check: Class 125, bronze disc.
e. Bronze Gate: Class 125, NRS.
f. Bronze Globe: Class 125, bronze disc.

H. Sanitary Waste Water Valves:
1. 2 inch and Smaller:
a. Bronze and Brass: Provide with solder-joint.
b. Bronze Angle: Class 125, bronze disc.
c. Ball: One piece, full port, brass with brass trim.
d. Bronze Swing Check: Class 125, bronze disc.
e. Bronze Gate: Class 125, NRS.
f. Bronze Globe: Class 125, bronze disc.
2. 2-1/2 inch and Larger:
a. Iron, 2-1/2 inch to 4 inch: Provide with threaded ends.
b. Iron Ball: Class 150.
c. Iron Swing Check: Class 125, metal seats.
d. Iron Swing Check with Closure Control: Class 125, lever and spring.
e. Iron Grooved-End Swing Check: 300 CWP.
f. Iron Gate: Class 125, NRS.
g. Iron Globe: Class 125.
h. Lubricated Plug: Class 125, regular gland.

2.02 GENERAL REQUIREMENTS

A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.

B. Valve Sizes: Match upstream piping unless otherwise indicated.

C. Valve Actuator Types:
1. Handwheel: Valves other than quarter-turn types.
2. Hand Lever: Quarter-turn valves 6 inch and smaller except plug valves.
3. Wrench: Plug valves with square heads.

D. Insulated Piping Valves: With 2 inch stem extensions and the following features:
1. Gate Valves: Rising stem.
2. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
3. Butterfly Valves: Extended neck.
4. Memory Stops: Fully adjustable after insulation is installed.

E. Valve-End Connections:
1. Threaded End Valves: ASME B1.20.1.
2. Flanges on Iron Valves: ASME B16.1 for flanges on iron valves.
3. Pipe Flanges and Flanged Fittings 1/2 inch through 24 inch: ASME B16.5.
4. Solder Joint Connections: ASME B16.18.
5. Grooved End Connections: AWWA C606.

F. General ASME Compliance:
1. Ferrous Valve Dimensions and Design Criteria: ASME B16.10 and ASME B16.34.
2. Solder-joint Connections: ASME B16.18.

3. Building Services Piping Valves: ASME B31.9.

G. Potable Water Use:
   1. Certified: Approved for use in compliance with NSF 61 and NSF 372.
   2. Lead-Free Certified: Wetted surface material includes less than 0.25 percent lead content.

H. Valve Bypass and Drain Connections: MSS SP-45.

I. Source Limitations: Obtain each valve type from a single manufacturer.

2.03 BRONZE, ANGLE VALVES

A. Class 125; CWP Rating: 200 psi:
   1. Comply with MSS SP-80, Type 1.
   2. Body: Bronze; ASTM B62, with integral seat and screw in bonnet.
   3. End Connections: Pipe thread.
   4. Stem: Bronze.
   5. Disc: Bronze.
   6. Packing: Asbestos free.
   7. Handwheel: Bronze or aluminum.

2.04 BRASS, BALL VALVES

A. One Piece, Full Port with Brass Trim and Push-to-fit or Threaded Connections:
   1. Comply with MSS SP-110.
   2. CWP Rating: 200 psi.
   3. Body: Forged brass.
   4. Seats: PTFE.
   5. Stem: Brass.
   6. Ball: Chrome-plated brass.
   7. Operator: Handle.

B. Two Piece, Full Port with Brass Trim and Female Thread, Male thread, or Solder Connections:
   1. Comply with MSS SP-110.
   2. WSP Rating: 150 psi.
   3. WOG Rating: 600 psi.
   4. Vacuum Rating: 28.9 in-Hg.
   5. Body: Forged brass.
   6. Seats: PTFE.
   7. Stem: Brass.
   8. Ball: Chrome-plated brass.
   9. Cap: Include cap-gasket and chain for 3/4 inch hose connection.
   10. Operator: Lockable handle and memory stop.

C. Two Piece, Full Port with Press Connections:
   1. WOG Rating: 250 psi.
   2. Body: Forged brass.
   3. Seats:
   4. Ball:
   5. Blow-out Proof Stem: Forged brass.

6. Operator: Provide lockable handle.
7. Maximum Service Temperature: 250 degrees F.

D. Three Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
2. WSP Rating: 150 psi.
3. CWP Rating: 600 psi.
4. Body: Forged brass.
5. End Connections: Pipe thread.
6. Seats: PTFE.
7. Stem: Stainless steel.
8. Ball: Stainless steel, vented.
9. Operator: Provide lockable handle.

2.05 BRONZE, BALL VALVES

A. General:
1. Fabricate from dezincification resistant material.
2. Copper alloys containing more than 15 percent zinc are not permitted.

B. One Piece, Reduced Port with Bronze Trim:
1. Comply with MSS SP-110.
2. WSP Rating: 400 psi.
3. CWP Rating: 600 psi.
4. Body: Bronze.
5. End Connections: Pipe press.
6. Seats: PTFE.
7. Stem: Bronze.
8. Ball: Chrome plated brass.
9. Operator: Provide lockable handle.

C. Two Piece, Full Port with Bronze Trim:
1. Comply with MSS SP-110.
2. WSP Rating: 150 psi.
3. WOG Rating: 600 psi.
4. Body: Forged bronze or dezincified-brass alloy.
5. Ends Connections: Pipe thread or solder.
6. Seats: PTFE.
7. Stem: Bronze, blowout proof.
8. Ball: Chrome plated brass.
9. Operator: Provide lockable handle and stem extension.

D. Three Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
2. WSP Rating: 150 psi.
3. CWP Rating: 600 psi.
4. Body: Bronze.
5. End Connections: Pipe thread or press.
6. Seats: PTFE.
7. Stem: Stainless steel.
8. Ball: Stainless steel, vented.

9. Operator: Provide lockable handle.

2.06 IRON, BALL VALVES

A. Class 125, Full Port, Stainless Steel Trim:
   1. Comply with MSS SP-72.
   2. CWP Rating: 200 psi.
   3. Body: ASTM A536 Grade 65-45-12, ductile iron.
   4. End Connections: Flanged.
   5. Seats: PTFE.
   6. Operator: Lever with locking handle.

2.07 BRONZE, LIFT CHECK VALVES

A. General:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.

B. Class 125:
   1. Comply with MSS SP-80, Type 1, Metal Disc to Metal Seat and Type 2, Nonmetallic Disc to Metal Seat.
   2. CWP Rating: 200 psi.
   3. Design: Vertical flow.
   4. Body: Comply with ASTM B61 or ASTM B62, bronze.
   5. End Connections: Threaded.
   6. Disc (Type 1): Bronze.

2.08 BRASS, INLINE CHECK VALVES

A. Class 150:
   1. WOG Rating: 200 psi.
   2. Maximum Service Temperature: 250 degrees F.
   3. Body: Forged brass.
   4. Disc: Forged brass.
   5. Seal: PTFE, bubble-tight.
   6. End Connections: Press.

2.09 BRASS, HORIZONTAL SWING CHECK VALVES

A. Class 125, Threaded End Connections:
   1. WOG Rating: 200 psi.
   2. Body: Forged brass.
   3. Disc: Forged brass.
   4. Hinge-Pin, Screw, and Cap: Forged brass.

B. Class 125, Press End Connections:
   1. WOG Rating: 200 psi.
   2. Body: Forged brass.
   3. Disc: Forged brass.

4. Hinge-Pin, Screw, and Cap: Forged brass.

2.10 BRONZE, SWING CHECK VALVES

A. General:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.

B. Class 125:
   1. Pressure and Temperature Rating: MSS SP-80, Type 3.
   2. Design: Y-pattern, horizontal or vertical flow.
   3. WOG Rating: 200 psi.
   4. Body: Bronze, ASTM B62.
   5. End Connections: Threaded.
   6. Disc: Bronze.

C. Class 150:
   1. Pressure and Temperature Rating: MSS SP-80, Type 3.
   2. Design: Y-pattern, horizontal or vertical flow.
   3. WSP Rating: 150 psi.
   4. WOG Rating: 300 psi.
   5. Body: Bronze, ASTM B62.
   6. End Connections: Threaded or soldered.
   7. Disc: Bronze.

2.11 IRON, HORIZONTAL SWING CHECK VALVES

2.12 IRON, SWING CHECK VALVES WITH CLOSURE CONTROL

A. Class 125 with Lever and Spring-Closure Control.
   1. Comply with MSS SP-71, Type I.
   2. Description:
      a. CWP Rating: 200 psi.
      b. Design: Clear or full waterway.
      c. Body: ASTM A126, gray iron with bolted bonnet.
      d. Ends: Flanged as indicated.
      e. Trim: Bronze.
      f. Gasket: Asbestos free.
      g. Closer Control: Factory installed, exterior lever, and weight.

2.13 IRON, GROOVED-END SWING CHECK VALVES

A. Class 300:
   1. CWP Rating: 300 psi.
   2. Body: ASTM A536, Grade 65-45-12 ductile iron.
   3. Seal: EPDM.
   4. Disc: Ductile iron.
   5. Coating: Black, non-lead paint.

2.14 FLOW LIMITING VALVES

A. Size: As indicated on drawings, female threaded.
B. Flow Setting: As indicated on drawings.
C. Flow Accuracy: Plus or minus 5 percent.
D. Differential Pressure Range: 2 to 45 psi
E. Body and Cap: Lead-free brass.
F. Cap and Plug: Lead-free brass.
G. Cartridge: Stainless steel with replaceable EPDM seal.
H. Maximum Service Pressure: 600 psi, WOG.
I. Maximum Service Temperature: 250 degrees F.
J. Accessories: Provide hanging tag and test-plug outlet extensions.

2.15 BRONZE, GATE VALVES

A. General:
    1. Fabricate from dezincification resistant material.
    2. Copper alloys containing more than 15 percent zinc are not permitted.
B. Rising Stem or OS&Y:
    1. Pressure-Temperature Range: MSS SP-80, Type I.
    2. Class 125:
        a. WSP Rating: 125 psi, saturated.
        b. CWP Rating: 200 psi.
    3. Class 150: CWP Rating; 300 psi.
    4. Body: ASTM B62, bronze with integral seat and screw-in bonnet.
    5. End Connections: Threaded or solder.
    6. Stem: Bronze.
    7. Disc: Solid wedge; bronze.
    8. Packing: Asbestos free.
    9. Handwheel Operator: Malleable iron.

2.16 IRON, GATE VALVES

A. Bolted Bonnet: OS&Y; Rising Stem:
    1. Pressure and Temperature Rating: MSS SP-70, Type I.
    2. Class 125: WOG Rating; 200 psi.
    3. Body: ASTM A126, gray iron with bolted bonnet.
    4. End Connections: Flanged.
    5. Trim: Bronze.
    6. Disc: Solid wedge.
    7. Packing and Gasket: Asbestos free.

2.17 BRONZE, GLOBE VALVES

A. General:

1. Fabricate from dezincification resistant material.
2. Copper alloys containing more than 15 percent zinc are not permitted.

2.18 IRON, GLOBE VALVES

A. Class 125 and Class 250:
   1. Class 125, WOG Rating: 200 psi.
   2. Class 250, WOG Rating: 500 psi.
   3. Comply with MSS SP-85, Type I.
   4. Body: Gray iron; ASTM A126, with bolted bonnet.
   5. Connection Ends: Flanged.
   6. Trim: Bronze.
   7. Packing and Gasket: Asbestos free, adjustable.
   8. Operator: Handwheel or chainwheel.
   9. Pressure and Temperature Rating: ASME B16.1.

2.19 LUBRICATED PLUG VALVES

A. Regular Gland with Flanged Ends:
   1. Comply with MSS SP-78, Type II.
   2. Class 125: CWP Rating: 200 psi.
   3. Class 250: CWP Rating: 400 psi.
   4. Body: ASTM A48/A48M or ASTM A126, cast iron with lubrication sealing system.
   5. Pattern: Regular or short.
   6. Plug: Cast iron or bronze with sealant groove.

PART 3 EXECUTION

3.01 EXAMINATION

A. Discard all packing materials and verify that valve interior, including threads and flanges are completely clean without signs of damage or degradation that could result in leakage.

B. Verify valve parts to be fully operational in all positions from closed to fully open.

C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.

D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.

B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

C. Where valve support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.

D. Install check valves where necessary to maintain direction of flow as follows:
   1. Lift Check: Install with stem plumb and vertical.
   2. Swing Check: Install horizontal maintaining hinge pin level.
   3. Orient plate-type into horizontal or vertical position, between flanges.

E. Provide chainwheels on operators for valves 4 inch and larger where located 96 inches or more above finished floor, terminating 60 inches above finished floor.

END OF SECTION 220523

SECTION 220529 - HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prefabricated trapeze-framed systems.
B. Strut systems for pipe or equipment support.
C. Beam clamps.
D. Pipe hangers.
E. Pipe rollers and roller supports.
F. Pipe supports, guides, shields, and saddles.
G. Seismic bracing hardware.
H. Anchors and fasteners.

1.02 RELATED REQUIREMENTS

A. Section 055000 - Metal Fabrications.
B. Section 220548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
B. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
E. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping; 2025.
F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.
G. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures; 1999 (Reapproved 2022).
H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

J. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

M. FM (AG) - FM Approval Guide; Current Edition.

N. MFMA-4 - Metal Framing Standards Publication; 2004.

O. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

P. UL (DIR) - Online Certifications Directory; Current Edition.

Q. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Provide required hardware to hang or support piping, equipment, or fixtures with related accessories as necessary to complete installation of plumbing work.

B. Provide hardware products listed, classified, and labeled as suitable for intended purpose.

C. 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 with a minimum safety factor of _____. Include consideration for vibration, equipment operation, and shock loads where applicable.

D. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.

E. Fire Resistance: Provide hardware rated for 60 minutes resistance unless specifically indicated by the authority having jurisdiction.

F. Vibration Isolation and Seismic Restraint Requirements: See Section 220548.

G. Materials for Metal Fabricated Supports: Comply with Section 055000.
   1. Zinc-Plated Steel: Electroplated in accordance with ASTM B633 unless stated otherwise.
   2. Galvanized Steel: Hot-dip galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M unless stated otherwise.

H. Corrosion Resistance: Use corrosion-resistant metal-based materials fully compatible with exposed piping materials and suitable for the environment where installed.
   1. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
   2. Outdoor, Damp, or Wet-Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.

2.02 PREFABRICATED TRAPEZE-FRAMED SYSTEMS

A. Prefabricated Trapeze-Framed Metal Strut Systems:
   1. Manufacturers:
      a. Anvil International, LLC
      b. Custom Strut and Roll Forming, LLC
      c. Gripple, Inc
      d. Unistrut, a brand of Atkore International, Inc
      e. Or Approved Equal.
   2. MFMA-4 compliant, pre-fabricated, MSS SP-58 Type 59 continuous-slot metal strut channel with associated tracks, fittings, and related accessories.
   3. MFMA-4 compliant, prefabricated, side-loading continuous-slot metal strut channel bracket with associated tracks, fittings, and related accessories.
   4. Strut Channel or Bracket Material:
      a. Indoor Dry Locations: Use zinc-plated steel or galvanized steel.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
   5. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
   6. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
   7. Accessories: Provide bracket covers, cable basket clips, cable tray clips, clamps, conduit clamps, fire-retarding brackets, j-hooks, protectors, and vibration dampeners.

2.03 STRUT SYSTEMS FOR PIPE OR EQUIPMENT SUPPORT

A. Strut Channels:
   1. Manufacturers:
      a. ABB Installation Products
      b. Gripple, Inc
      c. Unistrut, a brand of Atkore International Inc
      d. Or Approved Equal.
   2. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.
   3. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.

B. Hanger Rods:
   1. Threaded zinc-plated steel unless otherwise indicated.
   2. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch diameter.
      b. Piping up to 1 inch: 1/4 inch diameter.
      c. Piping larger than 1 inch: 3/8 inch diameter.

d. Trapeze Support for Multiple Pipes: 3/8 inch in length.

C. Channel Nuts:
   1. Manufacturers:
      a. B-Line, a brand of Eaton Corporation
      b. FNW
      c. Unistrut, a brand of Atkore International, Inc
      d. Or Approved Equal.
   2. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring as indicated on drawings.

D. Cable Hanging System Kits:
   1. Manufacturers:
      a. B-Line, a brand of Eaton Corporation
      b. Ductmate Industries, Inc
      c. Gripple, Inc
      d. Or Approved Equal.
   2. Provide cable-wire in bulk or pre-cut lengths with respective cable hangers as required to hold minimum weight of 120 lb.
   3. Accessories: Provide brackets, clip or c-clip hangers, covers, and y-hook hangers.

2.04 BEAM CLAMPS

A. Manufacturers:
   1. B-Line, a brand of Eaton Corporation
   2. FNW
   3. Unistrut, a brand of Atkore International, Inc
   4. Or Approved Equal.

B. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.

C. C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.

D. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).

E. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.

F. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.

G. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish.

H. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.

I. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.

2.05 PIPE HANGERS

A. Band Hangers, Adjustable:
   1. Manufacturers:

a. B-Line, a brand of Eaton Corporation
b. Gripple, Inc
c. Or Approved Equal.

2. MSS SP-58 type 7 or 9, zinc-plated ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.

B. Clevis Hangers, Adjustable:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. FNW
c. nVent Caddy, a brand of nVent
d. Or Approved Equal.
2. Copper Tube: MSS SP-58 type 1, epoxy-plated copper.
3. Light-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.
4. Standard-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.

C. Nonmetallic Pipe Hangers:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. DecoShield Systems, Inc
c. Gregory Industries, Inc
d. Or Approved Equal.
2. CPVC fabricated, snap-action hanger for pendant or sidewall applications.

2.06 PIPE CLAMPS

A. Riser Clamps:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. FNW
c. nVent Caddy, a brand of nVent; _____
d. Or Approved Equal.
2. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
3. MSS SP-58 type 1 or 8, carbon steel or steel with epoxy plated, plain, stainless steel, or zinc plated finish.
4. Medium Split Horizontal Pipe Clamp: MSS SP-58 type 4, carbon steel or stainless steel with epoxy plated, plain, stainless steel, or zinc plated finish.
5. Copper Tube Pipe Clamp: MSS SP-58 type 8, epoxy plated copper.
6. UL (DIR) listed: Pipe sizes 1/2 to 8 inch.

B. Extension Split Pipe Clamp:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. FNW
c. nVent Caddy, a brand of nVent
d. Or Approved Equal.
2. MSS SP-58 type 12, hinged split ring and yoke roller hanger with epoxy copper or plain finish.
3. Material: ASTM A47/A47M malleable iron or ASTM A36/A36M carbon steel.

4. Provide hanger rod and nuts of the same type and material for a given pipe run.
5. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.

C. Offset Pipe Clamps: Double-leg design two-piece pipe clamp.

D. Strut Clamps:
1. Manufacturers:
   a. FNW
   b. Unistrut, a brand of Atkore International, Inc
   c. Or Approved Equal.
2. Pipe Clamp: Two-piece rigid, universal, or outer diameter type, carbon steel with epoxy copper or zinc finish.
3. Cushioned Pipe or Tubing Strut Clamp: Provide strut clamp with thermoplastic elastomer cushion having dielectric strength of 670 V/mil.

E. Insulation Coupling:
1. Manufacturers:
   a. FNW
   b. nVent Caddy, a brand of nVent
   c. Unistrut, a brand of Atkore International, Inc
   d. Or Approved Equal.
2. Two bolt-type clamps designed for installation under insulation.
3. Material: Carbon steel with epoxy copper or zinc finish.

2.07 PIPE ROLLERS AND ROLLER SUPPORTS

A. Manufacturers:
1. ASC Engineered Solutions
2. FNW
3. nVent Caddy, a brand of nVent
4. Or Approved Equal.

B. MSS SP-58 type 43 based on required load, nonconductive and corrosion resistant.

C. Steel Yoke Type: MSS SP-58 type 44, vertically adjustable, nonconductive, and corrosion resistant.

D. Material: Zinc plated ASTM A36/A36M carbon steel or ASTM A47/A47M malleable iron.

2.08 PIPE SUPPORTS, GUIDES, SHIELDS, AND SADDLES

A. Dielectric Barriers: Provide between metallic supports and metallic piping and associated items of dissimilar type; acceptable dielectric barriers include rubber or plastic sheets or coatings attached securely to pipe or item.

B. Stanchions:
1. Manufacturers:
   a. Anvil International
   b. B-Line, a brand of Eaton Corporation
   c. nVent Caddy, a brand of nVent
   d. Or Approved Equal.

2. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
3. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.
4. For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.

C. U-Bolts:
1. Manufacturers:
   a. B-Line, a brand of Eaton Corporation
   b. FNW; 7610
   c. nVent Caddy, a brand of nVent
   d. Or Approved Equal.
2. MSS SP-58 type 24, carbon steel u-bolt for pipe support or anchoring.

D. Intermediate Anchors and Pipe Alignment Guides:
1. Manufacturers:
   a. Anvil International, LLC
   b. B-Line, a brand of Eaton Corporation
   c. Gregory Industries, Inc
   d. Or Approved Equal.
2. Pipe Sizes 6 inch and Smaller: Minimum clearance of 0.16 inch.
3. Pipe Size 8 inch: 0.625 inch U-bolt with double nuts providing minimum clearance of 0.28 inch.
4. Pipe Size 10 inch: 0.75 inch U-bolt.
5. Pipe Sizes 12 to 16 inch: 0.875 inch U-bolt.
6. Pipe Sizes 18 to 30 inches: 1 inch U-bolt.
7. Use pipe clamps with oversize pipe sleeve that provides clearance around pipe.

E. Pipe Alignment Guides:
1. Manufacturers:
   a. Anvil International
   b. B-Line, a brand of Eaton Corporation
   c. Gregory Industries, Inc
   d. The Metraflex Company
   e. Or Approved Equal.
2. Pipe Sizes 8 inch and Smaller: Spider or sleeve type.
3. Pipe Sizes 10 inch and Larger: Roller type.

F. Pipe Shields for Insulated Piping:
1. Manufacturers:
   a. Anvil International
   b. FNW
   c. Gregory Industries, Inc
   d. Or Approved Equal.
2. MSS SP-58 type 40, ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
3. General Construction and Requirements:
   a. Surface Burning Characteristics: Comply with ASTM E84 or UL 723.
   b. Shields Material: UV-resistant polypropylene with glass fill.
   c. Maximum Insulated Pipe Outer Diameter: 12-5/8 inch.
   d. Service Temperature: Minus 40 to 178 degrees F.

e. Pipe shields to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.

G. Pipe Supports:
1. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
2. Liquid Temperatures Up to 122 degrees F:
a. Overhead Support: MSS SP-58 types 1, 3 through 12 clamps.
b. Support From Below: MSS SP-58 types 35 through 38.

H. Nonpenetrating Pipe Supports:
1. Manufacturers:
a. Green Link, Inc
b. Or Approved Equal.

I. Pipe Supports, Thermal Insulated:
1. Manufacturers:
a. Buckaroos, Inc
b. Or Approved Equal.
2. General Requirements:
a. Insulated pipe supports to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
b. Surface Burning Characteristics: Flame spread index/smoke developed index of 5/30, maximum, when tested in accordance with ASTM E84 or UL 723.
c. Provide pipe supports for 1/2 to 30 inch iron pipes.
d. Insulation inserts to consist of rigid phenolic foam insulation surrounded by 360 degree, PVC jacketing.
3. PVC Jacket:
a. Pipe insulation protection shields to be provided with ball bearing hinge and locking seam.
b. Moisture Vapor Transmission: 0.0071 perm inch, when tested in accordance with ASTM E96/E96M.
c. Minimum Thickness: 60 mil, 0.06 inch.
d. Connections: Brush-on welding adhesive.
4. Products:
a. Buckaroos, Inc
b. Or Approved Equal.

J. Copper Pipe Supports:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. HoldRite, a brand of Reliance Worldwide Corporation
c. Or Approved Equal.

K. PEX Pipe Supports:
1. Manufacturers:
a. HoldRite, a brand of Reliance Worldwide Corporation
b. Or Approved Equal.

L. CPVC Pipe Supports:
1. Manufacturers:
a. HoldRite, a brand of Reliance Worldwide Corporation

b. Or Approved Equal.

M. Thermal Insulated, Surface-Mounted Pipe Supports:
1. Manufacturers:
a. FNW; 7701: www.fnw.com/#sle.
b. HoldRite, a brand of Reliance Worldwide Corporation
c. Or Approved Equal.
2. Material: Carbon steel with epoxy copper or zinc finish.
3. Weather and UV light resistant foam, plastic, or rubber material with built-in strut. Maximum Load: 50 lb for single pipe or multiple landed on top strut.

N. Overhead Pipe Supports:
1. Manufacturers:
a. HoldRite, a brand of Reliance Worldwide Corporation
b. nVent Caddy, a brand of nVent
c. Or Approved Equal.

2.09 SEISMIC BRACING HARDWARE

A. Cable Suspension Systems:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. nVent Caddy, a brand of nVent
c. Gripple, Inc
d. Or Approved Equal.
2. Strut channel or bracket-fitted fitting with locking mechanism for pipe or equipment suspension using cable wires extended to surface-mounted end-fixing fittings.
3. Provide cable wire and end-fixing as required to hold minimum weight of 120 lb.

B. Cable Sway Bracing Systems:
1. Manufacturers:
a. B-Line, a brand of Eaton Corporation
b. nVent Caddy, a brand of nVent
c. Gripple, Inc
d. Or Approved Equal.
2. Cable wire hanger with fix and release spring mechanism enclosed using zinc housing with 302 stainless steel components for pipe or equipment suspension to surface-mounted end-fixing fittings.
3. Provide cable wire and end-fixing as required to hold minimum weight of 25 lb.

2.10 ANCHORS AND FASTENERS

A. Manufacturers - Mechanical Anchors:
1. FNW
2. Hilti, Inc
3. ITW Red Head, a division of Illinois Tool Works, Inc
4. Powers Fasteners, Inc
5. Simpson Strong-Tie Company Inc
6. Or Approved Equal.

B. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

C. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.

D. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.

E. Hollow Masonry: Use toggle bolts.

F. Hollow Stud Walls: Use toggle bolts.

G. Steel: Use beam ceiling clamps, beam clamps, machine bolts, or welded threaded studs.

H. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.

I. Sheet Metal: Use sheet metal screws.

J. Wood: Use wood screws.

K. Plastic and lead anchors are not permitted.

L. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.

M. Preset Concrete Inserts: Continuous metal strut channel and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
   1. Channel Material: Use galvanized steel.
   2. Manufacturer: Same as manufacturer of metal strut channel framing system.

N. Concrete Inserts:
   1. Manufacturers:
      a. B-Line, a brand of Eaton Corporation
      b. HoldRite, a brand of Reliance Worldwide Corporation
      c. nVent Caddy, a brand of nVent
      d. Or Approved Equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

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. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.

C. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.

D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.

E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

G. Provide thermal insulated pipe supports complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.

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. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.

J. Secure fasteners according to manufacturer's recommended torque settings.

K. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - 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 220529

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Tags.
C. Pipe markers.

1.02 RELATED REQUIREMENTS

A. Section 099123 - Interior Painting: Identification painting.

1.03 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.
B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2025.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Schedules:
   1. Submit plumbing component identification schedule listing equipment, piping, and valves.
   2. Detail proposed component identification data in terms of of wording, symbols, letter size, and color coding to be applied to corresponding product.
   3. Valve Data Format: Include id-number, location, function, and model number.
C. Manufacturer's Installation Instructions: Indicate special procedures, and installation.
D. Project Record Documents: Record actual locations of tagged valves.

PART 2 PRODUCTS

2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE

A. Nameplates:
   1. Heat exchangers, water heaters, and other heat transfer products.
   2. Control panels, transducers, and other related control equipment products.
   3. Pumps, tanks, filters, water treatment devices, and other plumbing equipment products.
B. Tags:
   1. Piping: 3/4 inch diameter and smaller.
   2. Manual operated and automated control valves.

3. Instrumentation, relays, gauges, and other related control equipment products.
4. Ceiling tacks placed on lay-in ceiling surface to reference plumbing components.

C. Pipe Markers: 3/4 inch diameter and higher.

2.02 NAMEPLATES

A. Manufacturers:
1. Brimar Industries, Inc
2. Kolbi Pipe Marker Co
3. Seton Identification Products
4. Or Approved Equal.

B. Description: Laminated piece with up to three lines of text.
1. Letter Color: White.
2. Letter Height: 1/4 inch.
3. Background Color: Black.
4. Nameplate Height: 3/4 inch.
5. Nameplate Material:
a. Flexible: Vinyl with adhesive backing per ASTM D709.
b. Metal: Brass with center-side holes for screw fastening.

2.03 TAGS

A. Manufacturers:
1. Advanced Graphic Engraving
2. Brady Corporation
3. Brimar Industries, Inc
4. Craftmark Pipe Markers
5. Kolbi Pipe Marker Co
6. Seton Identification Products; _____: www.seton.com/#sle.
7. Or Approved Equal.

B. Metal: Brass, 19 gauge 1-1/2 inch in diameter with smooth edges, blank, smooth edges, and corrosion-resistant ball chain. Up to three lines of text.

C. Valve Tag Chart: Typewritten 12-point letter size list in anodized aluminum frame.

D. Piping: 3/4 inch diameter and smaller. Include corrosion resistant chain. Identify service, flow direction, and pressure.

2.04 PIPE MARKERS

A. Manufacturers:
1. Brady Corporation
2. Brimar Industries, Inc
3. Craftmark Pipe Markers
4. Kolbi Pipe Marker Co
5. Seton Identification Products
6. Or Approved Equal.

B. Comply with ASME A13.1.

C. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.

D. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

E. Underground Flexible Marker: Bright-colored continuously printed ribbon tape, minimum 6 inches wide by 4 mil, 0.004 inch thick, manufactured for direct burial service.

F. Identification Scheme, ASME A13.1:
   1. Primary: External Pipe Diameter, Uninsulated or Insulated.
      a. 3/4 to 1-1/4 inches: Use 8 inch field-length with 1/2 inch text height.
      b. 1-1/2 to 2 inches: Use 8 inch field-length with 3/4 inch text height.
      c. 2-1/2 to 6 inches: Use 12 inch field-length with 1-1/4 inch text height.
   2. Secondary: Color scheme per fluid service.
      a. Combustible Fluids: White text on brown background.
      b. Compressed Air: White text on blue background.
      c. Fire Quenching Fluids: White text on red background.
      d. Flammable and Oxidizing Fluids: Black text on yellow background.
      e. Toxic and Corrosive Fluids: Black text on orange background.
      f. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.
   3. Tertiary: Other Details.
      a. Directional flow arrow.

PART 3 EXECUTION

3.01 PREPARATION

A. Degrease and clean surfaces to receive identification products.

B. Prepare surfaces for stencil painting, see Section 099123.

3.02 INSTALLATION

A. Install flexible nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install tags in clear view and align with axis of piping

C. Install plastic pipe markers in accordance with manufacturer's instructions.

D. Apply ASME A13.1 Pipe Marking Rules:
   1. Place pipe marker adjacent to changes in direction.
   2. Place pipe marker adjacent each valve port and flange end.
   3. Place pipe marker at both sides of floor and wall penetrations.
   4. Place pipe marker every 25 to 50 feet interval of straight run.

END OF SECTION 220553

SECTION 220719 - PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cellular glass insulation.
B. Glass fiber insulation.
C. Polyethylene insulation.
D. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 221005 - Plumbing Piping: Placement of hangers and hanger inserts.

1.03 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
B. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007 (Reapproved 2024).
C. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 2007 (Reapproved 2024).
D. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2025.
E. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.
F. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing; 2022.
G. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2023).
H. ASTM C1423 - Standard Guide for Selecting Jacketing Materials for Thermal Insulation; 2021.
I. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.
J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
L. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.05 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 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER INSULATION

A. Manufacturers:
   1. CertainTeed Corporation
   2. Johns Manville Corporation
   3. Knauf Insulation
   4. Owens Corning Corporation
   5. Owens Corning Corporation.
   6. Or Approved Equal.

B. Insulation: ASTM C547 and ASTM C795; 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.

C. 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.

D. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

E. Vapor Barrier Lap Adhesive: Compatible with insulation.

F. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

G. Fibrous Glass Fabric:
   1. Cloth: Untreated; 9 oz/sq yd weight.
   2. Blanket: 1.0 pcf density.
   3. Weave: 5 by 5.

H. Indoor Vapor Barrier Finish:

1. Cloth: Untreated; 9 oz/sq yd weight.
2. Vinyl emulsion type acrylic, compatible with insulation, black color.

I. Outdoor Vapor Barrier Mastic: Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

J. Outdoor Breather Mastic: Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

K. Insulating Cement: ASTM C449.

2.03 CELLULAR GLASS INSULATION

A. Manufacturers:
1. Owens Corning Corporation
2. Or Approved Equal.

B. Insulation: ASTM C552, Type II, Grade 6.
1. K Value: 0.35 at 100 degrees F.
2. Service Temperature Range: From 250 degrees F to 800 degrees F.
3. Water Vapor Permeability: 0.005 perm inch maximum per inch.
4. Water Absorption: 0.5 percent by volume, maximum.

2.04 POLYETHYLENE INSULATION

A. Manufacturers:
1. Armacell LLC
2. Or Approved Equal.

B. Insulation: Flexible closed-cell polyethylene tubing, slit lengthwise for installation, complying with applicable requirements of ASTM D1056.
1. K Value: ASTM C177; 0.25 at 75 degrees F.
2. Maximum Service Temperature: 200 degrees F.
3. Density: 2 pcf.
4. Maximum Moisture Absorption: 1.0 percent by volume.
5. Moisture Vapor Permeability: 0.05 perm inch, when tested in accordance with ASTM E96/E96M.
6. Connection: Contact adhesive.

2.05 JACKETING AND ACCESSORIES

A. PVC Plastic Jacket:
1. Manufacturers:
a. Johns Manville Corporation
b. Or Approved Equal.
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: 10 mil, 0.010 inch.
e. Connections: Brush on welding adhesive.

B. ABS Plastic Jacket:
   1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
      a. Minimum Service Temperature: Minus 40 degrees F.
      b. Maximum Service Temperature: 180 degrees F.
      c. Moisture Vapor Permeability: 0.012 perm inch, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 30 mil, 0.03 inch.
      e. Connections: Brush on welding adhesive.

C. Aluminum-Foil Laminate Jacket:
   1. Manufacturers:
      a. H.B. Fuller Construction Products, Inc
      b. Ideal Tape Co., Inc
      c. Or Approved Equal.
   2. Factory-applied, pressure sensitive adhesive jacketing on paper release liner.
   3. Finish: Aluminum smooth.
   4. Comply with ASTM C1775.

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 North American Insulation Manufacturers Association (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 over 140 degrees F, insulate flanges and unions at equipment.

G. 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.

H. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 078400.

I. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

END OF SECTION 220719

SECTION 221005 - PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sanitary waste piping, buried within 5 feet of building.
B. Sanitary waste piping, above grade.
C. Domestic water piping, buried within 5 feet of building.
D. Domestic water piping, above grade.
E. Storm drainage piping, buried within 5 feet of building.
F. Storm drainage piping, above grade.
G. Natural gas piping, buried within 5 feet of building.
H. Natural gas piping, above grade.
I. Pipe flanges, unions, and couplings.
J. Pipe hangers and supports.
K. Ball valves.
L. Butterfly valves.
M. Balancing valves.
N. Flow-balancing valves.
O. Pressure reducing valves.
P. Pressure relief valves.
Q. Pressure-temperature valves.
R. Strainers.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 083100 - Access Doors and Panels.
C. Section 099113 - Exterior Painting.
D. Section 220516 - Expansion Fittings and Loops for Plumbing Piping.
E. Section 220529 - Hangers and Supports for Plumbing Piping and Equipment.
F. Section 220548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.
G. Section 220553 - Identification for Plumbing Piping and Equipment.
H. Section 220719 - Plumbing Piping Insulation.
I. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.
J. Section 312316 - Excavation.

K. Section 312316.13 - Trenching.

L. Section 312323 - Fill.

M. Section 330110.58 - Disinfection of Water Utility Piping Systems.

1.03 REFERENCE STANDARDS

A. ANSI LC 1/CSA 6.26 - Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing; 2023.

B. ANSI Z21.22 - American National Standard for Relief Valves for Hot Water Supply Systems; 2015 (Reaffirmed 2025).

C. ANSI Z223.1 - National Fuel Gas Code; 2024.

D. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.

E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.

F. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.

G. ASME B31.1 - Power Piping; 2024.

H. ASME B31.9 - Building Services Piping; 2025.

I. ASME BPVC-IV - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers; 2025, with Errata.

J. ASSE 1003 - Water Pressure Reducing Valves for Potable Water Distribution Systems; 2023.

K. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

L. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2026.

M. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2026.

N. ASTM B32 - Standard Specification for Solder Metal; 2020.

O. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2025.

P. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.

Q. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.

R. ASTM B302 - Standard Specification for Threadless Copper Pipe, Standard Sizes; 2017 (Reapproved 2026).

S. ASTM B813 - Standard Specification for Water Flushable Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2024.

T. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2023.

U. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2026.

V. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.

W. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

X. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2025a.

Y. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2024.

Z. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).

AA. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2025.

BB. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).

CC. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).

DD. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

EE. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2026.

FF. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; 2018.

GG. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2023.

HH. AWWA C606 - Grooved and Shouldered Joints; 2022.

II. AWWA C651 - Disinfecting Water Mains; 2023.

JJ. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2021.

KK. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2020.

LL. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).

MM. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry; 2018, with Editorial Revision (2020).

NN. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).

OO. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.

PP. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

QQ. MSS SP-67 - Butterfly Valves; 2022.

RR. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves; 2019.

SS. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .

TT. NSF 61 - Drinking Water System Components - Health Effects; 2025, with Addendum

UU. NSF 372 - Drinking Water System Components - Lead Content; 2024.

VV. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

C. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.

1.05 FIELD CONDITIONS

A. Do not install underground piping when bedding is wet or frozen.

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.

B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

2.02 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74 extra heavy 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.

C. PVC Pipe: ASTM D2665 or ASTM D3034.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY WASTE 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.

2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.

C. PVC Pipe: ASTM D1785 Schedule 40, or ASTM D2241 SDR 26 with not less than 150 psi pressure rating.
   1. Fittings: ASTM D2466, PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.04 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Copper Pipe: ASTM B42, hard drawn.
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
   2. Joints: ASTM B32, alloy Sn95 solder.
   3. Joints: AWS A5.8M/A5.8, BCuP copper and silver braze.

2.05 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Pipe: ASTM B88 (ASTM B88M), Type K (A), Drawn (H).
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: ASTM B32, alloy Sn95 solder.
   3. Mechanical Press Sealed Fittings: Double-pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic, synthetic rubber sealing elements.

2.06 STORM DRAINAGE PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.

B. PVC Pipe: ASTM D2665 or ASTM D3034.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.07 STORM DRAINAGE PIPING, ABOVE GRADE

A. Cast Iron Pipe: CISPI 301, hubless, service weight.
   1. Fittings: Cast iron.
   2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.

B. PVC Pipe: ASTM D2665.
   1. Fittings: PVC.
   2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.08 NATURAL GAS PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Steel Pipe: ASTM A53/A53M, Grade B, Type F, Schedule 40 black.
   1. Fittings: ASTM A234/A234M, wrought steel welding type.
   2. Joints: ASME B31.1, welded.

3. Jacket: AWWA C105/A21.5 polyethylene jacket or double layer, half-lapped 10 mil polyethylene tape.

2.09 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
   1. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
   2. Joints: Threaded or welded to ASME B31.1.

B. Flexible Gas Piping:
   1. Corrugated Stainless Steel Tubing: Comply with ANSI LC 1/CSA 6.26.
   2. Comply with ASTM E84.
   3. Fittings: Provided by piping system manufacturer.
   4. Provide piping with integral lightning protection.

2.10 PIPE FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 inch and Under:
   1. Ferrous Pipe: Class 150 malleable iron threaded unions.
   2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.

B. No-Hub Couplings:
   1. Testing: In accordance with ASTM C1277 and CISPI 310.
   2. Gasket Material: Neoprene complying with ASTM C564.
   3. Band Material: Stainless steel.
   4. Eyelet Material: Stainless steel.

2.11 PIPE HANGERS AND SUPPORTS

A. See Section 220529 for additional requirements.

B. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
   3. Trapeze Hangers: Welded steel channel frames attached to structure.
   4. Vertical Pipe Support: Steel riser clamp.

C. Plumbing Piping - Drain, Waste, and Vent:
   1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
   2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
   3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
   4. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.

D. Plumbing Piping - Water:
   1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
   2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.

3. Hangers for Hot Pipe Sizes 2 to 4 inch: Carbon steel, adjustable, clevis.
4. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

E. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, as follows:
1. Concrete Wedge Expansion Anchors: Comply with ICC-ES AC193.
2. Masonry Wedge Expansion Anchors: Comply with ICC-ES AC01.
3. Concrete Screw Type Anchors: Comply with ICC-ES AC193.
4. Masonry Screw Type Anchors: Comply with ICC-ES AC106.
5. Concrete Adhesive Type Anchors: Comply with ICC-ES AC308.
6. Other Types: As required.

2.12 BALL VALVES

A. Manufacturers:
1. Anvil International
2. Apollo Valves
3. Grinnell Products
4. Nibco, Inc; _____: www.nibco.com/#sle.
5. Uponor, Inc
6. Or Approved Equal.

B. Construction, 4 inch and Smaller: MSS SP-110, Class 150, 400 psi CWP, bronze or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops, threaded or grooved ends with union.

2.13 BUTTERFLY VALVES

A. Manufacturers:
1. Anvil International
2. Apollo Valves
3. Crane Company
4. Flomatic Valves
5. Grinnell Products
6. Or Approved Equal.

B. Construction 1-1/2 inch and Larger: MSS SP-67, 200 psi CWP, cast or ductile iron body, nickel-plated ductile iron disc, resilient replaceable EPDM seat, wafer ends, extended neck, 10 position lever handle.

C. Provide gear operators for valves 8 inches and larger, and chain-wheel operators for valves mounted over 8 feet above floor.

2.14 BALANCING VALVES

A. Manufacturers:
1. Anvil International
2. ITT Bell & Gossett
3. Griswold Controls
4. Taco, Inc
5. Or Approved Equal.

B. Construction: Class 125, brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.

C. Manual Operated Y-Pattern Globe, Size 1/2 to 2 inch:
   1. Class 125, brass or bronze body, multi-turn handwheel, memory stop, variable orifice, soldered connections, dual PT (hot and cold pressure-temperature) test ports for 300 psi, minus 4 to 250 deg F WOG service.

D. Automatic Flow Limiting Cartridge, Size 3/4 inch:
   1. Class 125, brass or bronze body, stainless steel cartridge, threaded connections with built-in union, dual PT (hot and cold pressure-temperature) test ports for 400 psi, 0.5 gpm WOG service.

E. Automatic Flow Limiting Cartridge with Ball Valve, Size 1/2 to 1 inch:
   1. Class 125, brass or bronze body, stainless steel cartridge, leak-proof stem, threaded or soldered connections with built-in union, dual PT (hot and cold pressure-temperature) test ports for 400 psi, 0.25 to 1.5 gpm WOG service.

F. Calibration: Control flow within five percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, maximum minimum pressure 3.5 psi.

2.15 FLOW-BALANCING VALVES

A. Manufacturers:
   1. Anvil International
   2. Griswold Controls
   3. ITT Bell & Gossett
   4. Taco, Inc
   5. Or Approved Equal.

B. Construction: Class 125, Brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.

C. Calibration: Control flow within 5 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, maximum minimum pressure 3.5 psi.

2.16 PRESSURE REDUCING VALVES

A. Manufacturers:
   1. Amtrol Inc
   2. Apollo Valves
   3. Cash Acme, a brand of Reliance Worldwide Corporation
   4. Cla-Val Company
   5. Flomatic Valves
   6. Watts Regulator Company
   7. Zurn Industries, LLC
   8. Or Approved Equal.

B. 2 inch and Smaller:
   1. ASSE 1003, bronze body, stainless steel, and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded single union ends.
   2. Pressure Reducing Pilot-Operator:

a. Operating Range: 5 to 50 psi.
b. Connected into brass or bronze pilot piping and fittings.
c. Fixed flow restrictor, pressure gauges, and isolation valves.

2.17 PRESSURE RELIEF VALVES

A. Manufacturers:
   1. Cla-Val Co
   2. Watts Regulator Company
   3. Or Approved Equal.
B. ANSI Z21.22, AGA certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

2.18 PRESSURE-TEMPERATURE VALVES

A. Manufacturers:
   1. Cla-Val Co
   2. Watts Regulator Company
   3. Or Approved Equal.
B. ANSI Z21.22, AGA certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F, capacity ASME BPVC-IV certified and labelled.

2.19 STRAINERS

A. Manufacturers:
   1. Armstrong International, Inc
   2. Green Country Filter Manufacturing
   3. WEAMCO
   4. Or Apparently Equal.
B. Size 1/2 inch to 3 inch:
   1. Class 150, threaded forged bronze Y-pattern body, stainless steel perforated mesh screen with cap, and rated for 150 psi, 250 deg F WOG service.

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. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 220516.

G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
   1. See Section 220719.

H. Provide access where valves and fittings are not exposed.
   1. Coordinate size and location of access doors with Section 083100.

I. Establish elevations of buried piping outside the building to ensure not less than 3 ft of cover.

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. Prepare exposed, unfinished pipe, fittings, supports, and accessories for finish painting.
   1. See Section 099113 for painting of exterior plumbing systems and components.

L. Excavate in accordance with Section 312316.

M. Excavate in accordance with Section 312316.13.

N. Backfill in accordance with Section 312323.

O. Backfill in accordance with Section 312316.13.

P. Install bell and spigot pipe with bell end upstream.

Q. Install valves with stems upright or horizontal, not inverted. See Section 220523.

R. Install water piping to ASME B31.9.

S. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

T. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

U. Sleeve pipes passing through partitions, walls, and floors.

V. 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 above slab.

W. Pipe Hangers and Supports:
1. Install in accordance with ASME B31.9.
2. Support horizontal piping as indicated.
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.
6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
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. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
10. Provide hangers adjacent to motor-driven equipment with vibration isolation; see Section 220548.
11. Support cast iron drainage piping at every joint.

3.04 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Install gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install globe valves for throttling, bypass, or manual flow control services.

E. Provide lug end butterfly valves adjacent to equipment when provided to isolate equipment.

F. Provide spring-loaded check valves on discharge of water pumps.

G. Provide flow controls in water recirculating systems where indicated.

3.05 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.06 FIELD TESTS AND INSPECTIONS

A. Verify and inspect systems according to requirements by the Authority Having Jurisdiction. In the absence of specific test and inspection procedures proceed as indicated below.

B. Domestic Water Systems:
   1. Perform hydrostatic testing for leakage prior to system disinfection.
   2. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
   3. General:
      a. Fill the system with water and raise static head to 10 psi above service pressure. Minimum static head of 50 to 150 psi. As an exception, certain codes allow a maximum static pressure of 80 psi.
   4. Metal Piping Systems Subject to Freezing Conditions:
      a. Inject 40 psi of compressed air into piping to spot check for leaks with liquid soap. Document and repair leaks as necessary.
      b. Raise injected compressed air pressure to 1.5 times rated service pressure or minimum pressure of 100 psi for a duration of 2 hours and verify with a gauge that no perceptible pressure drop is measured.

C. Gas Distribution Systems:
   1. Test Preparation: Close each appliance valve or disconnect and cap each connected appliance.
   2. General Systems:
      a. Inject a minimum of 10 psi of compressed air into the piping system for a duration of 15 minutes and verify with a gauge that no perceptible pressure drop is measured.
      b. Ensure test pressure gauge has a range of twice the specific pressure rate selected with an accuracy of 1/10 of 1 pound.
   3. Welded Pipes or Systems with Service Pressures Above 14 in-wc:
      a. Inject a minimum of 60 psi of compressed air into the piping system for a duration of 30 minutes and verify with a gauge that no perceptible pressure drop is measured.
      b. Ensure test pressure gauge has a range of twice the specific pressure rate selected with an accuracy of 1/10 of 1 pound with 1 psi increments.

D. Test Results: Document and certify successful results, otherwise repair, document, and retest.

3.07 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Disinfect water distribution system in accordance with Section 330110.58.

B. Prior to starting work, verify system is complete, flushed, and clean.

C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

D. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.

E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

F. Maintain disinfectant in system for 24 hours.

G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

I. 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.

3.08 SERVICE CONNECTIONS

A. Provide new sanitary sewer services. Before commencing work, check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves, pressure reducing valve, and sand strainer.
   1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Calk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
   2. Provide 18 gauge, 0.0478-inch galvanized sheet metal sleeve around service main to 6 inch above floor and 6 feet minimum below grade. Size for minimum of 2 inches of loose batt insulation stuffing.

END OF SECTION 221005

SECTION 221006 - PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drains.
B. Cleanouts.
C. Hose bibbs.
D. Hydrants.
E. Washing machine boxes and valves.
F. Refrigerator valve and recessed box.
G. Backwater valves.
H. Backflow preventers.
I. Double check valve assemblies.
J. Water hammer arrestors.
K. Sumps.
L. Sanitary waste interceptors.
M. Mixing valves.
N. Relief valves.
O. Air vents.
P. Floor drain trap seals.
Q. Exterior penetration accessories.

1.02 RELATED REQUIREMENTS

A. Section 221005 - Plumbing Piping.
B. Section 223000 - Plumbing Equipment.
C. Section 224000 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

A. ASME A112.6.3 - Floor Drains; 2022.
B. ASME A112.6.4 - Roof, Deck, and Balcony Drains; 2022.
C. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers; 2023.
D. ASSE 1012 - Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent; 2021.

E. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Prevention Assemblies; 2021.

F. ASSE 1015 - Performance Requirements for Double Check Backflow Prevention Assemblies; 2021.

G. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2023.

H. NSF 61 - Drinking Water System Components - Health Effects; 2025, with Addendum

I. NSF 372 - Drinking Water System Components - Lead Content; 2024.

J. PDI-WH 201 - Water Hammer Arresters; 2017.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

C. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company
   2. Noble Company
   3. Whitehall Manufacturing
   4. Zurn Industries, LLC
   5. Or Approved Equal.

B. Roof Drains:
   1. Assembly: ASME A112.6.4.
   2. Body: Lacquered cast iron with sump.
   3. Strainer: Removable polyethylene dome with vandal proof screws.

C. Roof Overflow Drains:
   1. Lacquered cast iron body and clamp collar and bottom clamp ring; pipe extended to _____ inches above flood elevation.

D. Downspout Nozzles:
   1. Bronze round with straight bottom section.

E. Area Drains:
   1. Body: Lacquered cast iron with sump.
   2. Strainer: Round nickel-bronze.

F. Floor Drains:
   1. Manufacturers:
      a. ACO, Inc
      b. Infinity Drain Ltd
      c. Jay R. Smith Manufacturing Company
      d. Zurn Industries, LLC
      e. Or Approved Equal.

G. Institutional Ligature-Resistant Floor Drains:
   1. ASME A112.6.3; ligature-resistant 304 stainless steel, vandal resistant screws, cast iron no hub drain body, reversible clamping collar, and round, adjustable round nickel bronze strainer with removable perforated sediment bucket.
   2. Manufacturers:
      a. MIFAB, Inc
      b. Whitehall Manufacturing
      c. Or Approved Equal.

H. Prefabricated Trench Drain (TD-1): Trench drain system assembled from factory fabricated, polymer concrete castings in standard lengths and variable depths, with integral joint flanges and integral grating support rails; includes joint gaskets and grating.
   1. Load Class: DIN 19580, Class A.
   2. ADA Standards compliant.
   3. Chemical Resistant.
   4. Grating Material and Style: Slotted ductile iron.
   5. Trench Width: 12 inches.
   6. Trench Section Length: 39 inches and 19-1/2 inches.
   7. Grating Support Rail: Stainless steel.

2.03 CLEANOUTS

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company
   2. Josam Company
   3. MIFAB, Inc
   4. Zurn Industries, LLC

B. Cleanouts at Exterior Surfaced Areas (CO-1):
   1. Round cast nickel bronze access frame and non-skid cover.

C. Cleanouts at Exterior Unsurfaced Areas (CO-2):
   1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.

D. Cleanouts at Interior Finished Floor Areas (CO-3):
   1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.

E. Cleanouts at Interior Finished Wall Areas (CO-4):
   1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

F. Cleanouts at Interior Unfinished Accessible Areas (CO-5): Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.04 HOSE BIBBS

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company
   2. Murdock Manufacturing, Inc; _____: www.murdockmfg.com/#sle.
   3. Watts Regulator Company
   4. Zurn Industries, LLC
   5. Or Approved Equal.

B. Interior Hose Bibbs:
   1. Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome-plated where exposed with handwheel, integral vacuum breaker in compliance with ASSE 1011.

2.05 HYDRANTS

A. Manufacturers:
   1. Arrowhead Brass & Plumbing, LLC
   2. Jay R. Smith Manufacturing Company; _____
   3. Murdock Manufacturing, Inc
   4. Zurn Industries, LLC
   5. Or Approved Equal.

B. Wall Hydrants:
   1. ASSE 1019; freeze resistant, self-draining type with chrome-plated wall plate hose thread spout, handwheel, and integral vacuum breaker.

2.06 WASHING MACHINE BOXES AND VALVES

A. Box Manufacturers:
   1. IPS Corporation/Water-Tite
   2. Oatey Supply Chain Services, Inc
   3. Viega LLC
   4. Or Approved Equal.

B. Valve Manufacturers:
   1. Cash Acme, a brand of Reliance Worldwide Corporation
   2. IPS Corporation/Water-Tite
   3. Viega LLC
   4. Zurn Industries, LLC
   5. Or Approved Equal.

2.07 REFRIGERATOR VALVE AND RECESSED BOX

A. Box Manufacturers:
   1. IPS Corporation/Water-Tite
   2. Oatey Supply Chain Services, Inc
   3. Viega LLC
   4. Or Approved Equal.

B. Valve Manufacturers:

1. IPS Corporation/Water-Tite
2. Zurn Industries, LLC; _____: www.zurn.com/#sle.
3. Or Approved Equal.

C. Description: Plastic preformed rough-in box with brass valves with wheel handle, slip in finishing cover.

2.08 BACKWATER VALVES

A. Manufacturers:
1. Jay R. Smith Manufacturing Company
2. Savko Plastic Pipe & Fittings, Inc
3. Zurn Industries, LLC
4. Or Approved Equal.

B. Cast Iron Backwater Valves: ASME A112.6.4; lacquered cast iron body and cover, brass valve, extension sleeve, and access cover.

2.09 BACKFLOW PREVENTERS

A. Manufacturers:
1. Apollo Valves
2. Cash Acme, a brand of Reliance Worldwide Corporation
3. MIFAB, Inc
4. Watts Regulator Company, a part of Watts Water Technologies
5. Zurn Industries, LLC
6. Or Approved Equal.

B. Reduced Pressure Backflow Preventer Assembly:
1. ASSE 1013; cast bronze body and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure, and non-threaded vent outlet.
2. Size: _____ inch assembly with threaded gate valves.

C. Reduced Pressure Backflow Preventer Assembly:
1. ASSE 1013 and NSF 61 compliant reinforced-nylon body and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure, integral male test fittings, and non-threaded vent outlet.
2. Size: 3/4 to 2 inch assembly with threaded gate valves.
3. Maximum Working Parameters: 175 psi at 180 degrees F.
4. Accessories: Provide air gap fitting, lead-free Y-strainer, and test cocks.

2.10 DOUBLE CHECK-VALVE ASSEMBLIES

A. Manufacturers:
1. Apollo Valves
2. Cash Acme, a brand of Reliance Worldwide Corporation
3. MIFAB, Inc

4. Watts Regulator Company, a part of Watts Water Technologies
5. Zurn Industries, LLC
6. Or Approved Equal.

B. Double Check Valve Assembly:
1. ASSE 1012; cast bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.
2. Size: 3/4 to 2 inch, NPS assembly with threaded full port ball valves.

C. Double Check Valve Assembly:
1. ASSE 1015 and NSF 61 compliant cast bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.
2. Size: 3/4 to 2 inch, NPS assembly with threaded full port ball valves.
3. Maximum Working Parameters: 175 psi at 180 degrees F.
4. Accessories: Provide lead-free Y-strainer and pit-mounted protective enclosure.

2.11 WATER HAMMER ARRESTORS

A. Manufacturers:
1. Cash Acme, a brand of Reliance Worldwide Corporation; _____: www.cashacme.com/#sle.
2. Jay R. Smith Manufacturing Company
3. Watts Regulator Company, a part of Watts Water Technologies
4. Zurn Industries, LLC
5. Or Approved Equal.

B. Water Hammer Arrestors:
1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.

2.12 SUMPS

A. Manufacturers:
1. Jay R. Smith Manufacturing Company
2. Zurn Industries, LLC
3. Or Approved Equal.

B. Precast concrete with required openings and drainage fittings.

C. Cover: 3/8 inch thick checkered steel plate with gasket seal frames and anchor bolts.

2.13 SANITARY WASTE INTERCEPTORS

A. Manufacturers:
1. Jay R. Smith Manufacturing Company
2. MIFAB, Inc
3. Zurn Industries, LLC
4. Or Approved Equal.

B. Oil Interceptors:

1. Construction:
    a. Material: Epoxy coated fabricated steel.
    b. Rough-in: On floor.
    c. Accessories: Integral deep seal trap, removable integral flow control, adjustable draw-off assembly, sediment bucket.
    d. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.
2. Manufacturers:
    a. MIFAB, Inc; Super Max Oil Interceptor: www.mifab.com/#sle.
    b. MIFAB, Inc; Big Max Oil Interceptor: www.mifab.com/#sle.
    c. MIFAB, Inc; Lil Max Oil Interceptor: www.mifab.com/#sle.
    d. Or Equal.

2.14 MIXING VALVES

A. Thermostatic Mixing Valves:
    1. Manufacturers:
        a. Cash Acme, a brand of Reliance Worldwide Corporation
        b. ESBE
        c. Honeywell International Inc
        d. Leonard Valve Company
        e. Or Approved Equal.
    2. Valve: Chrome-plated cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment.
    3. Accessories:
        a. Volume control shut-off valve on outlet.
        b. Stem thermometer on outlet.
        c. Strainer stop checks on inlets.

2.15 RELIEF VALVES

A. Manufacturers:
    1. Cash Acme, a brand of Reliance Worldwide Corporation
    2. ITT Bell & Gossett; _____: www.bellgossett.com/#sle.
    3. Or Approved Equal.
    4. Or Equal.

B. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

2.16 AIR VENTS

A. Manufacturers:
    1. Cash Acme, a brand of Reliance Worldwide Corporation
    2. ITT Bell & Gossett
    3. Taco, Inc
    4. Or Approved Equal.

B. Manual Type: Short vertical sections of 2 inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.

C. Float Type:
   1. Brass or semi-steel body, copper, polypropylene, or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.
   2. Cast iron body and cover, float, bronze pilot valve mechanism suitable for system operating temperature and pressure; with isolating valve.

D. Washer Type:
   1. Brass with hygroscopic fiber discs, vent ports, adjustable cap for manual shut-off, and integral spring loaded ball check valve.

2.17 FLOOR DRAIN TRAP SEALS

A. Manufacturers:
   1. Green Drains
   2. MIFAB, Inc
   3. Or Approved Equal.

B. Description: Push-fit EPDM or silicone fitting with a one-way membrane.

2.18 EXTERIOR PENETRATION ACCESSORIES

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.
   1. Manufacturers:
      a. Quickflash Weatherproofing Products, Inc
      b. Or Approved Equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

C. Encase exterior cleanouts in concrete flush with grade.

D. Install floor cleanouts at elevation to accommodate finished floor.

E. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.

F. Pipe relief from backflow preventer to nearest drain.

G. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatory sinks, washing machine outlets, or _____.

H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom). Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18 inches long.

END OF SECTION 221006

SECTION 221123 - DOMESTIC WATER PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Circulators.

1.02 REFERENCE STANDARDS

A. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. NSF 61 - Drinking Water System Components - Health Effects; 2025, with Addendum

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide certified pump curve with duty point marked over pump and system operating conditions and NPSH curve and power requirement by pump tag.
   2. Manufacturer's catalog sheets for fixtures, fittings, accessories, and supplies.

1.04 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for circulators. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 CIRCULATORS

A. Manufacturers:
   1. Armstrong Fluid Technology; _____: www.armstrongfluidtechnology.com/#sle.
   2. Bell & Gossett, a Brand of Xylem, Inc
   3. Grundfos Pumps Corporation
   4. Taco, Inc
   5. Or Approved Equal.

B. Casing: Bronze with bronze cast impeller, and stainless steel rotor assembly.

C. Shaft: Alloy steel with integral thrust collar and two oil-lubricated bronze sleeve bearings.

D. Mechanical Seal: Carbon rotating against a stationary ceramic seat.

E. Pipe-End Connection: Union connection.

F. Maximum Discharge Pressure: 145 psi.

G. Motor: 1,750 rpm, ECM duty with flexible coupling.

H. Service Temperature Range: Minus 30 to 250 degrees F.

I. Controls: Provide aquastat set for high-temp cutoff, electric plug, and illuminated hand switch.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products with related fittings, and accessories according to manufacturer instructions.

B. Potable and Drinking Water Service: Provide NSF 61 certified; comply with ICC (IPC).

C. Ensure that small pressure gauges are installed on both upstream and downstream ends.

D. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are nonoverloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

3.02 CLEANING

A. Thoroughly clean plumbing fixtures and equipment.

END OF SECTION 221123

SECTION 223000 - PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial indirect-fired water heaters.

B. Domestic-water heat exchangers.

C. In-line circulator pumps.

1.02 REFERENCE STANDARDS

A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittals procedures.

B. Product Data:

1. Product Data: Provide manufacturer's literature and data sheets for each product. Include information on materials of fabrication, assembly of components, dimensions, weights, capabilities, performance, electrical characteristics, location and sizes of connections, service and access locations, and manufacturer-provided and field-installed accessories.

PART 2 PRODUCTS

2.01 WATER HEATERS

A. Commercial Indirect-Fired Water Heaters:

1. Manufacturers:
   a. Bradford White Corporation
   b. Lochinvar.
   c. Weil-McLain.
2. Type: Automatic, indirect-fired, vertical storage.
3. Minimum Efficiency Required: ASHRAE Std 90.1 I-P.
4. Tank: Glass lined welded steel ASME labeled; multiple flue passages, 4 inch diameter inspection port, thermally insulated with minimum 2 inches glass fiber, encased in corrosion-resistant steel jacket; baked-on enamel finish; floor shield and legs.
5. Accessories:
   a. Water Connections: Brass.
   b. Dip Tube: Brass.

c. Drain valve.
d. Anode: Magnesium.

6. Applications:

2.02 IN-LINE CIRCULATOR PUMPS

A. Manufacturers:
   1. Armstrong Fluid Technology; _____: www.armstrongfluidtechnology.com/#sle.
   2. Bell & Gossett, a brand of Xylem, Inc; _____: www.bellgossett.com/#sle.
   3. Sterling SIHI GmbH; _____: www.sterlingsihi.com/#sle.

B. Casing: Bronze, rated for 125 psig working pressure, with stainless steel rotor assembly.

C. Impeller: Bronze.

D. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.

E. Seal: Carbon rotating against a stationary ceramic seat.

F. Drive: Flexible coupling.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions required for applicable certifications.

B. Electrical Work: Provide automatic control and protective devices with associated wiring to interconnect related interfaced devices required for specified operation.

C. Coordinate system, equipment, and piping work with applicable electrical, fuel, gas, vent, drain, and waste support interconnections as included or provided by other trades.

D. Pumps:
   1. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

END OF SECTION 223000

SECTION 224000 - PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush valve water closets.
B. Wall hung urinals.
C. Lavatories.
D. Sinks.
E. Under-lavatory pipe supply covers.
F. Showers.
G. Bottle filling drinking fountains.
H. Electric water coolers.
I. Mop sinks.

1.02 RELATED REQUIREMENTS

A. Section 221005 - Plumbing Piping.
B. Section 221006 - Plumbing Piping Specialties.
C. Section 223000 - Plumbing Equipment.
D. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
B. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).
C. ASME A112.6.1M - Floor-Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).
D. ASME A112.18.1 - Plumbing Supply Fittings; 2024.
E. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures; 2011 (Reaffirmed 2022).
F. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2024.
G. ASME A112.19.3 - Stainless Steel Plumbing Fixtures; 2022.
H. ASME A112.19.5 - Flush Valves and Spuds for Water Closets, Urinals, and Tanks; 2022.
I. ASSE 1014 - Performance Requirements for Backflow Prevention Devices for Hand-Held Showers; 2020.

J. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.

K. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping; 2021.

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

M. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

N. NSF 61 - Drinking Water System Components - Health Effects; 2025, with Addendum

O. NSF 372 - Drinking Water System Components - Lead Content; 2024.

P. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

C. Manufacturer's Instructions: Indicate installation methods and procedures.

D. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Provide five year manufacturer warranty for electric water cooler.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

B. Water Efficiency: EPA WaterSense label is required for all water closets, urinals, lavatory faucets, and showerheads.

C. Maximum Fixture or Faucet Supply Pressure: 60 psi unless stated otherwise.

2.02 REGULATORY REQUIREMENTS

A. Comply with applicable codes for installation of plumbing systems.

B. Comply with UL (DIR) requirements.

C. Perform work in accordance with local health department regulations.

D. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation.

2.03 FLUSH VALVE WATER CLOSETS

A. Water Closets:
   1. Vitreous china, ASME A112.19.2, floor mounted, siphon jet flush action, china bolt caps.
   2. Bowl: ASME A112.19.2; 16.5 inches high with elongated rim.
   3. Flush Valve: Exposed (top spud).
   4. Flush Operation: Sensor operated.
   5. Handle Height: 44 inches or less.
   6. Inlet Size: 1-1/2 inches.
   7. Trapway Outlet: 4 inch.
   8. Color: White.
   9. Manufacturers:
      a. Advanced Modern Technologies Corporation
      b. American Standard, Inc
      c. Gerber Plumbing Fixtures LLC
      d. Kohler Company
      e. PROFLO
      f. Zurn Industries, LLC
      g. Or Approved Equal.

B. Flush Valves:
   1. Valve Supply Size: 1 inch.
   2. Valve Outlet Size: 1-1/2 inches.
   3. Manufacturers:
      a. Advanced Modern Technologies Corporation
      b. American Standard, Inc
      c. Delany Products
      d. Sloan Valve Company
      e. Stern Engineering
      f. Zurn Industries, LLC
      g. Or Approved Equal.
   4. Sensor-Operated:
      a. Type: ASME A112.19.5; chloramine-resistant clog-resistant dual-seat diaphragm valve complete with vacuum breaker, stops and accessories.
      b. Mechanism: Solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
      c. Supplied Volume Capacity: 1.2 gal per flush.
      d. Metering: Provide wireless communications into monitoring and logging application.
   5. Concealed Type: Rough brass, exposed parts chrome-plated, wall escutcheon, wheel handle stop.

C. Toilet Seats:
   1. Manufacturers:
      a. American Standard, Inc; _____: www.americanstandard-us.com/#sle.
      b. Bemis Manufacturing Company
      c. Church Seat Company
      d. DXV by American Standard, Inc

e. Olsonite
f. PROFLO
g. Zurn Industries, LLC
h. Or Approved Equal.

2. Plastic: Solid, white finish, enlongated shape, closed front, slow-closing hinged seat cover, and brass bolts with covers.
3. Plastic: Black finish, open front, extended back, self-sustaining hinge, brass bolts, with cover.

D. Water Closet Carriers:
1. Manufacturers:
a. Jay R. Smith Manufacturing Company
b. JOSAM Company
c. Zurn Industries, LLC
d. Or Approved Equal.
2. ASME A112.6.1M; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

2.04 WALL HUNG URINALS

A. Manufacturers:
1. Advanced Modern Technologies Corporation.
2. American Standard, Inc
3. Gerber Plumbing Fixtures LLC
4. Kohler Company
5. PROFLO
6. Zurn Industries, LLC
7. Or Approved Equal.

B. Vitreous china, ASME A112.19.2, wall hung with side shields and concealed carrier.
1. Consumption Volume: 1.0 gal per flush, maximum.
2. Flush Valve: Exposed (top spud).
3. Flush Operation: Sensor operated.
4. Trapway Outlet: Integral.
5. Removable stainless steel strainer.
6. Supply Size: 3/4 inch.
7. Outlet Size and Location: 2 inches, bottom side.

C. Flush Valves:
1. Manufacturers:
a. Advanced Modern Technologies Corporation
b. American Standard, Inc
c. Delany Products
d. Sloan Valve Company
e. Stern Engineering
f. Zurn Industries, LLC
g. Or Approved Equal.
2. Sensor-Operated:

a. Type: ASME A112.19.5; chloramine-resistant, clog-resistant dual-seat diaphragm valve with vacuum breaker, stops and accessories.
b. Mechanism: Solenoid-operated piston or electronic motor-actuated operator with low-voltage powered infrared sensor, and mechanical override or override push button.
c. Supplied Volume Capacity: 1.2 gal per flush.
d. Metering: Provide wireless communications into monitoring and logging application.

3. Concealed Type: Rough brass, exposed parts chrome-plated, wall escutcheon, wheel handle stop.

D. Urinal Carriers:
1. Manufacturers:
a. Jay R. Smith Manufacturing Company
b. JOSAM Company
c. Zurn Industries, LLC
d. Or Approved Equal.
2. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

2.05 LAVATORIES

A. Manufacturers:
1. American Standard, Inc
2. DXV by American Standard, Inc
3. Gerber Plumbing Fixtures LLC
4. Kohler Company
5. Zurn Industries, LLC
6. Or Approved Equal.

B. Wall-Hung Basin:
1. Vitreous China, Grade A: ASME A112.19.2; white, rectangular commercial-grade sink with predrilled holes, rear-center drain, front overflow, and hanger. Size as indicated on drawings with 4-inch centerset spacing.
2. Carrier:
a. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded studs for fixture hanger, bearing plate and studs.
b. Manufacturers:
1) Jay R. Smith MFG. Co
2) JOSAM Company
3) Zurn Industries, LLC
4) Or Approved Equal.

C. Supply Faucet:
1. Deck Mounted Faucet Manufacturers:
a. Advanced Modern Technologies Corporation
b. American Standard, Inc
c. DXV by American Standard, Inc
d. Grohe America, Inc
e. Kohler Company

f. Zurn Industries, LLC
g. Or Approved Equal.

2. ASME A112.18.1; chrome plated combination supply fitting with pop-up waste, water economy aerator with maximum flow of 2.2 gpm, indexed handles.
3. Two-Handle, Supply Faucet: ASME A112.18.1; deck-mount, ceramic cartridge disc valve, and maximum flow of 1.2 gpm. Brushed nickel finish.

D. Sensor Operated Faucet:
1. Cast brass, chrome plated, deck mounted with sensor located on neck of spout.
2. Spout Style: Standard.
3. Power Supply:
a. Wired: 6 VDC, field-wired into dedicated or common power supply.
4. Mixing Valve: None, single line for tempered water.
5. Water Supply: 3/8 inch compression connections.
6. Aerator: Vandal resistant, 0.5 gpm, laminar flow device.
7. Finish: Polished chrome.
8. Lead Content: Extra low; maximum 0.25 percent by weighed average.
9. Manufacturers:
a. Advanced Modern Technologies Corporation
b. American Standard, Inc; _____: www.americanstandard-us.com/#sle.
c. Chicago Faucet Company
d. Gerber Plumbing Fixtures LLC
e. Moen Incorporated
f. Sloan Valve Company
g. Watts
h. Zurn Industries, LLC
i. Or Approved Equal.

E. Thermostatic Mixing Valve:
1. ASSE 1070 listed with combination stop, strainer, and check valves, and flexible stainless steel connectors.
2. Manufacturers:
a. Acorn Controls
b. Cash Acme, a brand of Reliance Worldwide Corporation
c. Or Approved Equal.
3. Braided hot and cold water supply lines.
4. Chrome plated 17 gauge, 0.0538 inch brass P-trap with clean-out plug and arm with escutcheon.

F. Lavatory Carrier:
1. Manufacturers:
a. Jay R. Smith Manufacturing Company
b. JOSAM Company
c. Zurn Industries, LLC
d. Or Approved Equal.
2. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded studs for fixture hanger, bearing plate and studs.

2.06 SINKS

A. Manufacturers:
   1. American Bath Group
   2. American Standard, Inc
   3. Jay R. Smith Manufacturing Company
   4. Kohler Company
   5. Trueform Concrete
   6. Or Approved Equal.

B. Single Compartment Bowl
   1. ASME A112.19.3; 22" by 19" by 8 inch outside dimensions 20 gauge, 0.0359 inch thick, Type 302 stainless steel, self rimming and undercoated, with ledge back drilled for trim.
   2. Drain: 1-1/2 inch chromed brass.

C. Kitchen Faucets:
   1. Manufacturers:
      a. American Standard, Inc
      b. Grohe America, Inc
      c. PROFLO
      d. Or Approved Equal.
   2. Two-Handle Faucet:
      a. Type: Deck-mount, lever operated faucet with mounting plate.
      b. Type: Deck-mount lever operated faucet with mounting plate and side spray.
      c. Spray Type: Full stream spray at 1.75 gpm, maximum.
      d. ASME A112.18.1, ADA Standards, and NSF 61 compliant assembly.
      e. Materials: Stainless steel disc valve on brass body with polished chrome finish.

2.07 UNDER-LAVATORY PIPE SUPPLY COVERS

A. Manufacturers:
   1. Plumberex Specialty Products, Inc
   2. Or Approved Equal.

B. General:
   1. Insulate exposed drainage piping including hot, cold and tempered water supplies under lavatories or sinks per ADA Standards.
   2. Construction: 1/8 inch PVC with antimicrobial, antifungal and UV resistant properties.
      a. Comply with ASTM E84 for flame and smoke development.
      b. Comply with ASTM C1822 Type III for covers on accessible lavatory piping.
      c. Comply with ASME A112.18.9 for covers on accessible lavatory piping.
      d. Comply with ICC A117.1.

2.08 ELECTRIC WATER COOLERS

A. Manufacturers:
   1. Elkay Manufacturing Company
   2. Haws Corporation
   3. Murdock Manufacturing, Inc

4. Oasis International
5. Or Approved Equal.

B. Water Cooler: Electric, mechanically refrigerated; surface mounted, ADA compliant; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
   1. Capacity: 8 gph of 50 degrees F water with inlet at 80 degrees F and room temperature of 90 degrees F, when tested in accordance with ASHRAE Std 18.
   2. Electrical: 115 VAC, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.

C. Bottle Filler: Materials to match fountain.

2.09 MOP SINKS

A. Terrazzo Mop Sink Manufacturers:
   1. Acorn Engineering Company
   2. American Bath Group
   3. Just Manufacturing Company
   4. Zurn Industries, LLC
   5. Or Approved Equal.

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.

2.10 SERVICE SINKS

A. Manufacturers:
   1. Acorn Engineering Company
   2. American Standard, Inc
   3. Elkay Manufacturing Company
   4. Zurn Industries, LLC
   5. Or Approved Equal.

B. Bowl: ASME A112.19.1; 22 by 18 by 12 inches deep, porcelain enameled interior cast iron roll-rim sink, with 12-inch high back, concealed hanger, chrome-plated strainer, stainless steel rim guard, cast iron P-trap with adjustable floor flange.

C. Two-Lever Handle Service Faucet:
   1. Type: Wall-mount spout faucet with union inlets and mounting plate.

2.11 HOSE BIB BOXES

A. Manufacturers:
   1. Metcraft Industries, Inc
   2. Outdoor Shower Company
   3. Or Approved Equal..

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

B. Verify that electric power is available and of the correct characteristics.

C. 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. Install and secure fixtures in place with wall supports and bolts.

E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.

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.

B. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

3.07 PROTECTION

A. Protect installed products from damage due to subsequent construction operations.

B. Do not permit use of fixtures by construction personnel.

C. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 224000

SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General construction and requirements.
B. Applications.
C. Single phase electric motors.
D. Three phase electric motors.
E. Electronically Commutated Motors (ECM).

1.02 RELATED REQUIREMENTS

A. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. NEMA MG 00001 - Motors and Generators; 2024.
B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.
C. Manufacturer's Installation Instructions: Indicate setting, mechanical connections, lubrication, and wiring instructions.
D. Operation Data: Include instructions for safe operating procedures.
E. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

1.05 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Provide five year manufacturer warranty for motors larger than 20 horsepower.

PART 2 PRODUCTS

2.01 GENERAL CONSTRUCTION AND REQUIREMENTS

A. Electrical Service: Refer to Section 260583 for required electrical characteristics.

B. Electrical Service:
   1. Motors 1/2 HP and Smaller: 115 volts, single phase, 60 Hz.
   2. Motors Larger than 1/2 Horsepower: 208 volts, three phase, 60 Hz.

C. Construction:
   1. Open drip-proof type except where specifically noted otherwise.
   2. Design for continuous operation in 104 degrees F environment.
   3. Design for temperature rise in accordance with NEMA MG 00001 limits for insulation class, service factor, and motor enclosure type.

D. Explosion-Proof Motors: UL approved and labelled for hazard classification, with over temperature protection.

E. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.

F. Wiring Terminations:
   1. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
   2. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

2.02 APPLICATIONS

A. Exception: Motors less than 250 watts, for intermittent service may be the equipment manufacturer's standard and need not comply with these specifications.

B. Single phase motors for shaft mounted fans, oil burners, and centrifugal pumps: Split phase type.

C. Single phase motors for fans, pumps, blowers, and air compressors: Capacitor start type.

2.03 SINGLE PHASE POWER - SPLIT PHASE MOTORS

A. Starting Torque: Less than 150 percent of full load torque.

B. Starting Current: Up to seven times full load current.

C. Breakdown Torque: Approximately 200 percent of full load torque.

D. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.

2.04 SINGLE PHASE POWER - CAPACITOR START MOTORS

A. Starting Torque: Three times full load torque.

B. Starting Current: Less than five times full load current.

C. Pull-up Torque: Up to 350 percent of full load torque.

D. Breakdown Torque: Approximately 250 percent of full load torque.

E. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.

F. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve bearings.

2.05 ELECTRONICALLY COMMUTATED MOTORS (ECM)

A. Applications:
   1. Commercial:
      a. Roof Top Unit:
         1) Operating Mode: Constant speed.
         2) Input: Motor manufacturer to coordinate control requirements with the control board of the roof top unit and/or specified sequence of operation.
         3) Shaft Extension: Single.
         4) RPM: 300 through 1200.
      b. DX Fan Coil Unit:
         1) Operating Mode: Constant cfm.
         2) Input: Motor manufacturer to coordinate control requirements with the control board of the DX fan coil unit and/or specified sequence of operation.
         3) Shaft Extension: Single.
         4) Options: Remote mount control/User-Interface.
         5) RPM: 300 through 1250.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.

C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION 230513

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe sleeves.

B. Pipe-sleeve seals.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

1.03 REFERENCE STANDARDS

A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2024.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2026.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

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.

PART 2 PRODUCTS

2.01 PIPE SLEEVES

A. Manufacturers:
   1. Flexicraft Industries
   2. Or Approved Equal.

B. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.

C. Pipe Passing Through Below Grade Exterior Walls:
   1. Zinc coated or cast iron pipe.
   2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

D. Clearances:
   1. Provide allowance for insulated piping.

2. Wall, Floor, Partitions, and Beam Flanges: 1 inch greater than external pipe diameter.
3. All Rated Openings: Caulked tight with fire stopping material in compliance with ASTM E814 in accordance with Section 078400 to prevent the spread of fire, smoke, and gases.

2.02 PIPE-SLEEVE SEALS

A. Manufacturers:
   1. Advance Products & Systems, LLC
   2. American Polywater Corporation
   3. Flexicraft Industries
   4. Or Approved Equal.

B. Modular Mechanical Sleeve-Seal:
   1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
   2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
   3. Size and select seal component materials in accordance with service requirements.
   4. Glass-reinforced plastic pressure end plates.

PART 3 EXECUTION

3.01 INSTALLATION

A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

B. Install piping to conserve building space, to not interfere with use of space and other work.

C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

D. Provide sleeves when penetrating footings, floors, walls, partitions, and _____. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

E. Manufactured Sleeve-Seal Systems:
   1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
   2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
   3. Locate piping in center of sleeve or penetration.
   4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
   5. Tighten bolting for a water-tight seal.
   6. Install in accordance with manufacturer's recommendations.

F. 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.

END OF SECTION 230517

SECTION 230519 - METERS AND GAUGES FOR HVAC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pressure gauges and pressure gauge taps.

B. Thermometers and thermometer wells.

1.02 REFERENCE STANDARDS

A. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2022.

B. ASTM E1 - Standard Specification for ASTM Liquid-in-Glass Thermometers; 2014 (Reapproved 2025).

C. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers; 2014 (Reapproved 2021).

D. AWWA M6 - Water Meters -- Selection, Installation, Testing, and Maintenance; 2026.

E. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide list that indicates use, operating range, total range and location for manufactured components.

PART 2 PRODUCTS

2.01 PRESSURE GAUGES

A. Manufacturers:
   1. Dwyer Instruments, Inc
   2. Moeller Instrument Company, Inc
   3. Omega Engineering, Inc
   4. Winters Instruments
   5. Or Approved Equal.

B. Pressure Gauges: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background.
   1. Case: Steel with brass bourdon tube.
   2. Size: 4-1/2 inch diameter.
   3. Mid-Scale Accuracy: One percent.

2.02 PRESSURE GAUGE TAPPINGS

A. Gauge Cock: Tee or lever handle, brass for maximum 150 psi.

B. Needle Valve: Brass, 1/4 inch NPT for minimum 150 psi.

C. Syphon: Steel, Schedule 40, 1/4 inch angle or straight pattern.

2.03 STEM TYPE THERMOMETERS

A. Manufacturers:
   1. Dwyer Instruments, Inc
   2. Omega Engineering, Inc
   3. Weksler Glass Thermometer Corp
   4. Winters Instruments
   5. Or Approved Equal.

B. Thermometers - Fixed Mounting: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish.
   1. Size: 9 inch scale.
   2. Window: Clear Lexan.
   3. Accuracy: 2 percent, per ASTM E77.
   4. Calibration: Degrees F.

C. Thermometers - Adjustable Angle: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device; adjustable 360 degrees in horizontal plane, 180 degrees in vertical plane.
   1. Size: 9 inch scale.
   2. Window: Clear Lexan.
   3. Stem: 3/4 inch NPT brass.
   4. Accuracy: 2 percent, per ASTM E77.
   5. Calibration: Degrees F.

2.04 THERMOMETER SUPPORTS

A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain.

2.05 TEST PLUGS

A. Manufacturers:
   1. Dwyer Instruments, Inc
   2. Watts Water Technologies, Inc
   3. Weiss Instruments, LLC
   4. Weksler Glass Thermometer Corp
   5. Winters Instruments
   6. Or Approved Equal.

B. Test Plug: 1/4 inch or 1/2 inch brass fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with neoprene core for temperatures up to 200 degrees F.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install positive displacement meters with isolating valves on inlet and outlet to AWWA M6. Provide full line size valved bypass with globe valve for liquid service meters.

C. Provide one pressure gauge per pump, installing taps before strainers and on suction and discharge of pump. Pipe to gauge.

D. Install thermometer sockets adjacent to controls system thermostat, transmitter, or sensor sockets. Refer to Section 230943. Where thermometers are provided on local panels, duct or pipe mounted thermometers are not required.

E. Locate duct mounted thermometers minimum 10 feet downstream of mixing dampers, coils, or other devices causing air turbulence.

F. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

G. Adjust gauges and thermometers to final angle, clean windows and lenses, and calibrate to zero.

H. Locate test plugs adjacent thermometers and thermometer sockets.

END OF SECTION 230519

SECTION 230523 - GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ball valves.

B. Check valves.

C. Plug valves.

1.02 REFERENCE STANDARDS

A. API STD 594 - Check Valves: Flanged, Lug, Wafer, and Butt-Welding; 2022.

B. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; 2013 (Reaffirmed 2018).

C. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.

D. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves; 2022, with Errata (2023).

E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.

F. ASME B16.34 - Valves — Flanged, Threaded, and Welding End; 2025.

G. ASME B31.9 - Building Services Piping; 2025.

H. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2022.

I. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings; 2004 (Reapproved 2023).

J. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings; 2017 (Reapproved 2025).

K. MSS SP-45 - Drain and Bypass Connections; 2026.

L. MSS SP-78 - Gray Iron Plug Valves, Flanged and Threaded Ends; 2026.

M. MSS SP-80 - Bronze Gate, Globe, Angle, and Check Valves; 2019.

N. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

E. Maintenance Materials: Furnish Owner with one wrench for every five plug valves, in each size of square plug valve head.
   1. See Section 016000 - Product Requirements for additional provisions.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).

B. Provide the following valves for the applications if not indicated on drawings:
   1. Isolation (Shutoff): Butterfly, Gate, Ball, and Plug.

C. Substitutions of valves with higher CWP classes or WSP ratings for same valve types are permitted when specified CWP ratings or WSP classes are not available.

2.02 GENERAL REQUIREMENTS

A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.

B. Valve Sizes: Match upstream piping unless otherwise indicated.

C. Valve Actuator Types:
   1. Hand Lever: Quarter-turn valves 6 inch and smaller.
   2. Wrench: Plug valves with square heads.

D. Valves in Insulated Piping: Provide 2 inch stem extensions and the following features:
   1. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

E. Valve-End Connections:
   1. Threaded End Valves: ASME B1.20.1.
   2. Pipe Flanges and Flanged Fittings 1/2 inch through 24 inch: ASME B16.5.
   3. Solder Joint Connections: ASME B16.18.

F. General ASME Compliance:
   1. Ferrous Valve Dimensions and Design Criteria: ASME B16.10 and ASME B16.34.
   2. Building Services Piping Valves: ASME B31.9.

G. Bronze Valves:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.

H. Valve Bypass and Drain Connections: MSS SP-45.

2.03 BRASS, BALL VALVES

A. One Piece, Full Port with Brass Trim and Push-to-fit or Threaded Connections:
   1. Comply with MSS SP-110.

2. CWP Rating: 200 psi.
3. Body: Forged brass.
4. Ends: Threaded.
5. Seats: PTFE or TFE.
6. Stem: Brass.
7. Ball: Chrome-plated brass.

2.04 BRONZE, BALL VALVES

A. General:
   1. Fabricate from dezincification resistant material.
   2. Copper alloys containing more than 15 percent zinc are not permitted.
B. One Piece, Reduced Port with Bronze Trim:
   1. Comply with MSS SP-110.
   2. CWP Rating: 400 psi.
   3. Ends: Threaded.
   4. Seats: PTFE.

2.05 BRASS, INLINE CHECK VALVES

A. Class 150: CWP Rating: 200 psi .
B. Maximum Service Temperature: 250 degreess F.
C. Body: Forged brass.
D. Disc: Forged brass.
E. Seal: PTFE, bubble tight.
F. End-Connections: Press.

2.06 BRASS, HORIZONTAL SWING CHECK VALVES

A. Threaded End-Connections:
   1. Class 125: CWP Rating: 200 psi.
   2. Body: Forged brass.
   3. Disc: Forged brass.
   4. Hinge-Pin, Screw, and Cap: Forged brass.
B. Press End-Connections:
   1. Class 125: WOG Rating: 200 psi.
   2. Body: Forged brass.
   3. Disc: Forged brass.
   4. Hinge-Pin, Screw, and Cap: Forged brass.

2.07 BRONZE, SWING CHECK VALVES

A. Class 125:
   1. Pressure and Temperature Rating: MSS SP-80, Type 3.
   2. Design: Y-pattern, horizontal or vertical flow.
   3. WSP Rating: 200 psi.

4. Body: Bronze, ASTM B62.
5. End Connections: Threaded or soldered.
6. Disc: Bronze.

2.08 LUBRICATED PLUG VALVES

A. Regular Gland and Cylindrical with Threaded Ends:
   1. Comply with MSS SP-78, Type II.
   2. Class 150:
      a. Sizes 2-1/2 to 12 inch , CWP Rating; 200 psi.
      b. Sizes 14 to 24 inch, CWP Rating; 150 psi.
   3. Body Material: Cast iron with lubrication sealing system.
   4. Pattern: Regular or short.
   5. Plug: Cast iron or bronze with sealant groove.

PART 3 EXECUTION

3.01 EXAMINATION

A. Discard all packing materials and verify that valve interior, including threads and flanges, are completely clean without signs of damage or degradation that could result in leakage.

B. Verify valve parts to be fully operational in all positions from closed to fully open.

C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.

D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.

B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

END OF SECTION 230523

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Support and attachment components.

1.02 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping; 2025.

F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.

G. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures; 1999 (Reapproved 2022).

H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2025.

J. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

L. FM (AG) - FM Approval Guide; Current Edition.

M. MFMA-4 - Metal Framing Standards Publication; 2004.

N. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

O. UL (DIR) - Online Certifications Directory; Current Edition.

P. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 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 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 033000.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, nonpenetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.

1.05 QUALITY ASSURANCE

A. Comply with applicable building code.

1.06 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 plumbing 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 with a minimum safety factor of _____. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.

5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
    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.

B. Prefabricated Trapeze-Framed Metal Strut Systems:
1. Manufacturers:
    a. ABB Installation Products
    b. B-Line, a brand of Eaton Corporation
    c. Unistrut, a brand of Atkore International Inc
    d. Or Approved Equal.
2. MFMA-4 compliant, pre-fabricated, MSS SP-58 type 59 continuous-slot metal strut channel with associated tracks, fittings, and related accessories.
3. Strut Channel or Bracket Material:
    a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
4. Accessories: Provide bracket covers, cable basket clips, cable tray clips, clamps, conduit clamps, fire-retarding brackets, j-hooks, protectors, and vibration dampeners.

C. Strut Channels:
1. Manufacturers:
    a. B-Line, a brand of Eaton Corporation
    b. Gripple, Inc
    c. Unistrut, a brand of Atkore International Inc
    d. Or Approved Equal
2. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.
3. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.

D. Hanger Rods:
1. Threaded zinc-plated steel unless otherwise indicated.
2. Minimum Size, Unless Otherwise Indicated or Required:
    a. Equipment Supports: 1/2 inch diameter.
    b. Piping up to 1 inch: 1/4 inch diameter.
    c. Piping larger than 1 inch: 3/8 inch diameter.
    d. Trapeze Support for Multiple Pipes: 3/8 inch diameter.

E. Pipe Supports:
1. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
2. Liquid Temperatures Up To 122 degrees F:
    a. Overhead Support: MSS SP-58 Types 1, 3 through 12.
    b. Support From Below: MSS SP-58 Types 35 through 38.

F. Pipe Stanchions:
1. Manufacturers:
    a. Anvil International

b. Or Approved Equal.
2. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
3. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.
4. For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.

G. Beam Clamps:
1. Manufacturers:
a. FNW
b. Or Approved Equal.
2. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.
3. Beam C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
4. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
5. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
6. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
7. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish,
8. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
9. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.

H. Riser Clamps:
1. Manufacturers:
a. FNW
b. Or Approved Equal.
2. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
3. MSS SP-58 type 1 or 8, carbon steel or steel with epoxy plated, plain, stainless steel, or zinc plated finish.
4. Medium Split Horizontal Pipe Clamp: MSS SP-58 type 4, carbon steel or stainless steel with epoxy plated, plain, stainless steel, or zinc plated finish.
5. Copper Tube Pipe Clamp: MSS SP-58 type 8, epoxy plated copper.
6. UL (DIR) listed: Pipe sizes 1/2 to 8 inch.

I. Pipe Hangers:
1. Split Ring Hangers:
a. Provide hinged split ring and yoke roller hanger with epoxy copper or plain finish.
b. Material: ASTM A47/A47M malleable iron or ASTM A36/A36M carbon steel.
c. Provide hanger rod and nuts of the same type and material for a given pipe run.
d. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.
2. Clevis Hangers, Adjustable:
a. Manufacturers:
1) FNW

2) Eaton.
3) Or Approved Equal.

b. Copper Tube: MSS SP-58 Type 1, epoxy-plated copper.
c. Light-Duty: MSS SP-58 Type 1, zinc-colored, epoxy plated.
d. Standard-Duty: MSS SP-58 Type 1, zinc-colored, epoxy plated.

J. Pipe Shields for Insulated Piping:
1. Manufacturers:
a. Anvil International
b. FNW
c. Or Approved Equal.
2. MSS SP-58 Type 40, ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel
3. General Construction and Requirements:
a. Surface Burning Characteristics: Comply with ASTM E84 or UL 723.
b. Shields Material: UV-resistant polypropylene with glass fill.
c. Maximum Insulated Pipe Outer Diameter: 12-5/8 inch.
d. Minimum Service Temperature: Minus 40 degrees F.
e. Maximum Service Temperature: 178 degrees F.
f. Pipe shields to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.

K. Anchors and Fasteners:
1. Manufacturers - Mechanical Anchors:
a. FNW
b. Hilti, Inc
c. ITW Red Head, a division of Illinois Tool Works, Inc
d. Or Approved Equal.
2. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
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. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
C. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.

D. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

F. 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.

G. Secure fasteners according to manufacturer's recommended torque settings.

H. Remove temporary supports.

END OF SECTION 230529

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.
B. Tags.
C. Adhesive-backed duct markers.
D. Pipe markers.
E. Ceiling tacks.

1.02 RELATED REQUIREMENTS

A. Section 099123 - Interior Painting: Identification painting.

1.03 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.
C. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Air Handling Units: Nameplates.
B. Air Terminal Units: Tags.
C. Control Panels: Nameplates.
D. Piping: Tags.
E. Thermostats: Nameplates.
F. Valves: Tags and ceiling tacks where located above lay-in ceiling.

2.02 NAMEPLATES

A. Manufacturers:
   1. Advanced Graphic Engraving, LLC
   2. Brimar Industries, Inc
   3. Craftmark Pipe Markers
   4. Seton Identification Products, a Tricor Direct Company
   5. Or Approved Equal.

B. Letter Color: White.

C. Letter Height: 1/4 inch.

D. Background Color: Black.

2.03 TAGS

A. Manufacturers:
   1. Advanced Graphic Engraving
   2. Brady Corporation
   3. Brimar Industries, Inc
   4. Craftmark Pipe Markers
   5. Seton Identification Products, a Tricor Company
   6. Or Approved Equal.

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 PIPE MARKERS

A. Manufacturers:
   1. Brady Corporation
   2. Brimar Industries, Inc
   3. Craftmark Pipe Markers
   4. Seton Identification Products, a Tricor Company
   5. Or Approved Equal.

B. Color: Comply with ASME A13.1.

C. 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.

D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.

E. Color code as follows:
   1. Heating, Cooling, and Boiler Feedwater: Green with white letters.
   2. Toxic and Corrosive Fluids: Orange with black letters.
   3. Compressed Air: Blue with white letters.

2.05 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 099123 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. Install plastic pipe markers in accordance with manufacturer's instructions.

D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

E. Use tags on piping 3/4 inch diameter and smaller.
   1. Identify service, flow direction, and pressure.
   2. Install in clear view and align with axis of piping.
   3. 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.

END OF SECTION 230553

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Testing, adjustment, and balancing of air systems.

B. Testing, adjustment, and balancing of hydronic, steam, and refrigerating systems.

1.02 RELATED REQUIREMENTS

A. Section 012100 - Allowances: Inspection and testing allowances.

B. Section 014000 - Quality Requirements: Employment of testing agency and payment for services.

C. Section 019113 - General Commissioning Requirements: Commissioning requirements that apply to all types of work.

D. Section 230800 - Commissioning of HVAC.

E. Section 250500 - Common Work Results for Integrated Automation.

1.03 REFERENCE STANDARDS

A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.

B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2024, with Errata (2025).

C. NEBB (TAB) - Procedural Standard for Testing, Adjusting and Balancing of Environmental Systems; 2026.

D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2023.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

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. Include at least the following in the plan:
    a. 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.
    b. 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.
    c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.

d. Final test report forms to be used.
e. Procedures for formal deficiency reports, including scope, frequency and distribution.

C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
1. Revise TAB plan to reflect actual procedures and submit as part of final report.
2. 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.
3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:
1. SMACNA (TAB).

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. TAB Agency Qualifications:
1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
2. Certified by one of the following:
a. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.

D. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 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. Access doors are closed and duct end caps are in place.

8. Air outlets are installed and connected.
9. Duct system leakage is minimized.

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.

3.03 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.

B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.

C. Measure air quantities at air inlets and outlets.

D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.

E. Use volume control devices to regulate air quantities only to 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 changes required. Vary branch air quantities by damper regulation.

G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

H. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.

I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.

J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.

K. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

L. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.05 inches positive static pressure near the building entries.

3.04 WATER SYSTEM PROCEDURE

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Duct insulation.

B. Duct liner.

C. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

A. Section 230553 - Identification for HVAC Piping and Equipment.

B. Section 233100 - HVAC Ducts and Casings: Glass fiber ducts.

1.03 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2025.

C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.

D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2025.

E. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2020.

F. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2025.

G. ASTM C1126 - Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation; 2024.

H. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts; 2016 (Reapproved 2021).

I. ASTM C1423 - Standard Guide for Selecting Jacketing Materials for Thermal Insulation; 2021.

J. ASTM C1775 - Standard Specification for Laminate Protective Jacket and Tape for Use Over Thermal Insulation for Outdoor Applications; 2022.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

M. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

N. SAE AMS3779 - Tape, Adhesive, Pressure-Sensitive Thermal Radiation Resistant, Aluminum Coated Glass Cloth; 2016b.

O. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

P. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer's Instructions: Indicate installation procedures necessary to ensure acceptable workmanship and that installation standards will be achieved.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER, FLEXIBLE

A. Manufacturer:
   1. CertainTeed Corporation
   2. Johns Manville
   3. JP Lamborn Co
   4. Knauf Insulation
   5. Owens Corning Corporation
   6. Or Approved Equal.

B. Insulation: ASTM C553; flexible, noncombustible blanket.
   1. K value: 0.36 at 75 degrees F, when tested in accordance with ASTM C518.
   2. Maximum Service Temperature: 1,200 degrees F.
   3. Maximum Water Vapor Absorption: 5.0 percent by weight.

C. Vapor Barrier Jacket:
   1. Kraft paper with glass fiber yarn and bonded to aluminized film.
   2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
   3. 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 Mastic:
   1. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

2.03 GLASS FIBER, RIGID

A. Manufacturer:
   1. CertainTeed Corporation
   2. Johns Manville
   3. Knauf Insulation
   4. Owens Corning Corporation
   5. Or Approved Equal.

B. Insulation: ASTM C612; rigid, noncombustible blanket.
   1. K Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
   2. Maximum Service Temperature: 450 degrees F.
   3. Maximum Water Vapor Absorption: 5.0 percent.
   4. Maximum Density: 8.0 pcf.

C. Vapor Barrier Jacket:
   1. Kraft paper with glass fiber yarn and bonded to aluminized film.
   2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
   3. 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.

2.04 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturers:
   1. Aeroflex USA, Inc
   2. Armacell LLC
   3. K-Flex USA LLC
   4. Or Approved Equal.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
   1. Minimum Service Temperature: Minus 40 degrees F.
   2. Maximum Service Temperature: 180 degrees F.
   3. Connection: Waterproof vapor barrier adhesive.

2.05 JACKETING AND ACCESSORIES

A. Aluminum-Foil Laminate Jacket:
   1. Manufacturers:
      a. Ideal Tape Co., Inc
      b. Or Approved Equal.
   2. Factory-applied, pressure sensitive adhesive jacketing on paper release liner.
   3. Finish: Aluminum smooth.
   4. Comply with ASTM C1775.

B. Reinforced Tape:
   1. FSK tape suitable for sealing seams between insulation, insulated elbows, and fittings resulting in a tight, smooth surface without wrinkles.

2. Comply with UL 723 or ASTM E84.
3. Moisture Vapor Permeability: 0.00 perm inch, when tested in accordance with ASTM E96/E96M.

2.06 DUCT LINER

A. Manufacturers:
   1. Aeroflex USA, Inc
   2. Armacell LLC
   3. CertainTeed Corporation
   4. Ductmate Industries, Inc, a DMI Company
   5. Johns Manville
   6. Owens Corning Corporation
   7. Or Approved Equal.

B. Note: Choose the liner type - Elastomeric Foam, Glass Fiber, or Phenolic Foam.

C. Elastomeric Foam Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
   1. Minimum Service Temperature: Minus 40 degrees F.
   2. Maximum Service Temperature: 180 degrees F.
   3. Fungal Resistance: No growth when tested according to ASTM G21.
   4. Apparent Thermal Conductivity: Maximum of 0.28 at 75 degrees F.
   5. Erosion Resistance: Does not show evidence of breaking away, flaking off, or delamination at velocities of 10,000 fpm when tested in accordance with ASTM C1071.
   6. Connection: Waterproof vapor barrier adhesive.

D. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation. Comply with ASTM C916.

E. Adhesive: Waterproof, fire-retardant type, ASTM C916.

F. Liner Fasteners: Galvanized steel, self-adhesive pad with integral head.

PART 3 EXECUTION

3.01 EXAMINATION

A. Test ductwork for design pressure prior to 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. 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.

C. 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.

D. 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.

E. Duct and Plenum Liner Application:
   1. Adhere insulation with adhesive for 90 percent coverage.
   2. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
   3. Seal and smooth joints. Seal and coat transverse joints.
   4. Seal liner surface penetrations with adhesive.
   5. Duct dimensions indicated are net inside dimensions required for airflow. Increase duct size to allow for insulation thickness.

END OF SECTION 230713

SECTION 230719 - HVAC PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping insulation.
B. Flexible removable and reusable blanket insulation.
C. Weather barrier coatings.
D. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 078400 - Firestopping.
C. Section 099123 - Interior Painting: Painting insulation jacket.
D. Section 232300 - Refrigerant Piping: Placement of inserts.

1.03 REFERENCE STANDARDS

A. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2025.
B. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing; 2022.
C. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation; 2022.
D. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation; 2023.
E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturers:
   1. Aeroflex USA, Inc.
   2. Armacell LLC
   3. K-Flex USA LLC
   4. Or Approved Equal.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
   1. Minimum Service Temperature: Minus 40 degrees F.
   2. Maximum Service Temperature: 180 degrees F.
   3. Connection: Waterproof vapor barrier adhesive.

C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

D. Weather Barrier Coating: Air dried, contact adhesive, compatible with insulation and ASTM E84 compliant.

2.03 WEATHER BARRIER COATINGS

A. Weather-Resistive Barrier Coating: Fire-resistive, UV resistant, water-based mastic for use over closed cell polyethylene and polyurethane foam insulation; applied with glass fiber or synthetic reinforcing mesh.
   1. Manufacturers:
      a. H.B. Fuller Construction Products, Inc
      b. Or Approved Equal.
   2. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A, when tested in accordance with ASTM E84.
   3. Water Vapor Permeance: Greater than 1.0 perm in accordance with ASTM E96/E96M.

2.04 JACKETING AND ACCESSORIES

A. PVC Plastic.
   1. Manufacturers:
      a. Johns Manville Corporation
      b. Or Approved Equal.
   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: 10 mil, 0.010 inch.
e. Connections: Brush on welding adhesive.

3. Covering Adhesive Mastic: Compatible with insulation.

B. Vapor Barrier Membranes: ASTM C1136, Type IX.

1. Multilayer Laminate Vapor Barrier:
   a. Provide multilayer laminate with 1.0 mil, 0.001 inch foil, reversible.
   b. Thickness: 2.4 mil, 0.002 inch.
   c. Moisture Vapor Permeability: 0.00 perm inch, when tested in accordance with ASTM E96/E96M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Test piping for design pressure, liquid tightness, and continuity prior to 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:

1. Insulate entire system, including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

E. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 078400.

F. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

G. 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. Provide two coats of UV resistant finish for flexible elastomeric cellular insulation without jacketing.

END OF SECTION 230719

SECTION 231123 - FACILITY NATURAL-GAS PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, valves, and connections for natural gas piping systems.

1.02 RELATED REQUIREMENTS

A. Section 099113 - Exterior Painting.
B. Section 230516 - Expansion Fittings and Loops for HVAC Piping.
C. Section 230553 - Identification for HVAC Piping and Equipment.

1.03 REFERENCE STANDARDS

A. ANSI Z21.18/CSA 6.3 - Gas Appliance Pressure Regulators; 2019 (Reaffirmed 2024).
B. ANSI Z21.80/CSA 6.22 - Line Pressure Regulators; 2019 (Reaffirmed 2024).
C. ANSI Z223.1 - National Fuel Gas Code; 2024.
D. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
E. ASME B31.1 - Power Piping; 2024.
F. ASME B31.9 - Building Services Piping; 2025.
G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
H. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2026.
I. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

PART 2 PRODUCTS

2.01 NATURAL GAS PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53/A53M, Grade B, Type F, Schedule 40 black.
   1. Manufacturers:

a. Wheatland Tube Company
b. Or Approved Equal.

2. Fittings: ASME B16.3, malleable iron, or ASTM A234/A234M, wrought steel welding type.
3. Joints: Threaded or welded to ASME B31.1.

2.02 FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 Inches and Under:
   1. Ferrous Pipe: Class 150 malleable iron threaded unions.

B. Flanges for Pipe Size Over 1 Inch:
   1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.

2.03 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
   3. Trapeze Hangers: Welded steel channel frames attached to structure.
   4. Vertical Pipe Support: Steel riser clamp.

2.04 BALL VALVES

A. Manufacturers:
   1. Apollo Valves
   2. Grinnell Products
   3. Nibco, Inc
   4. Or Approve Equal.

B. Construction, 4 Inches and Smaller: MSS SP-110, Class 150, 400 psi CWP, brass, bronze, or ductile iron body, 304 stainless steel or chrome plated brass ball, regular port, Teflon seats and stuffing box ring, blowout proof stem, lever handle with balancing stops, solder, threaded, or grooved ends with union.

2.05 STRAINERS

A. Manufacturers:
   1. Armstrong International, Inc
   2. Green Country Filter Manufacturing
   3. WEAMCO
   4. Or Approved Equal.

B. Size 2 inch and Under:
   1. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
   2. Class 150, threaded bronze body 300 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.

2.06 LINE PRESSURE REGULATORS AND APPLIANCE REGULATORS INDICATORS

A. Manufacturers:
   1. Actaris Metering Systems (A brand of ITT Controls).
   2. Dungs Combustion Controls
   3. Maxitrol Company
   4. Or Approved Equal.

B. Compliance Requirements:
   1. Appliance Regulator: ANSI Z21.18/CSA 6.3.
   2. Line Pressure Regulator: ANSI Z21.80/CSA 6.22.

C. Materials in Contact With Gas:
   1. Housing: Aluminum, steel (free of non-ferrous metals).
   2. Seals and Diaphragms: NBR-based rubber.

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. Install in accordance with manufacturer's instructions.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 230516.

F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed.

H. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

I. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting.
   1. Painting of exterior piping systems and components is specified in Section 099113.

J. Install valves with stems upright or horizontal, not inverted.

K. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Support horizontal piping as indicated.
   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. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

3.04 APPLICATION

A. Install unions downstream of valves and at equipment or apparatus connections.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.

D. Install ball valves for throttling, bypass, or manual flow control services.

E. Provide plug valves in natural gas systems for shut-off service.

END OF SECTION 231123

SECTION 232113 - HYDRONIC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hydronic system requirements.
B. Heating water piping, above grade.
C. Heating water and glycol piping, above grade.
D. Equipment drains and overflows.
E. Pipe hangers and supports.
F. Unions, flanges, mechanical couplings, and dielectric connections.
G. Valves:
    1. Ball valves.
    2. Check valves.
    3. Pressure independent temperature control valves and balancing valves.
H. Flow controls.

1.02 RELATED REQUIREMENTS

A. Section 232500 - HVAC Water Treatment: Pipe cleaning.

1.03 REFERENCE STANDARDS

A. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300; 2021.
B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
D. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings; 2021.
E. ASME B31.9 - Building Services Piping; 2025.
F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
G. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2026.
H. ASTM B32 - Standard Specification for Solder Metal; 2020.
I. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
J. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
K. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2021a.

L. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2025a.

M. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2024.

N. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80; 2024.

O. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).

P. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications; 2007 (Reapproved 2024).

Q. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2026.

R. AWS D10.12M/D10.12 - Guide for Welding Mild Steel Pipe; 2000.

S. AWWA C606 - Grooved and Shouldered Joints; 2022.

T. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Include data on pipe materials, pipe fittings, valves, and accessories.
   2. Provide manufacturers catalog information.
   3. Indicate valve data and ratings.

PART 2 PRODUCTS

2.01 HYDRONIC SYSTEM REQUIREMENTS

A. Comply with ASME B31.9 and applicable federal, state, and local regulations.

B. Piping: Provide piping, fittings, hangers, and supports as required, as indicated, and as follows:
   1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.
   2. Use non-conducting dielectric connections whenever jointing dissimilar metals.
   3. Grooved mechanical joints may be used in accessible locations only.
      a. Accessible locations include those exposed on interior of building, in pipe chases, and in mechanical rooms, aboveground outdoors, and as approved by Architect.
      b. Use rigid joints unless otherwise indicated.
   4. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.

C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges, unions, or grooved couplings to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.

D. Valves: Provide valves where indicated:
   1. Provide drain valves where indicated, and if not indicated, provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch gate valves with cap; pipe to nearest floor drain.
   2. For throttling, bypass, or manual flow control services, use globe, ball, or butterfly valves.

2.02 HEATING WATER AND GLYCOL PIPING, ABOVE GRADE

A. Steel Pipe: ASTM A53/A53M, Schedule 40, black, using one of the following joint types:
   1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D10.12M/D10.12 welded.
   2. Threaded Joints: ASME B16.3, malleable iron fittings.
   3. Grooved Joints: AWWA C606 grooved pipe, fittings of same material, and mechanical couplings.

B. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn, using one of the following joint types:
   1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings.
      a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
      b. Braze: AWS A5.8M/A5.8 BCuP copper/silver alloy.
   2. Mechanical Press Sealed Fittings: Double pressed type complying with ASME B16.51, utilizing EPDM, nontoxic synthetic rubber sealing elements.
      a. Manufacturers:
         1) Apollo Valves
         2) FNW
         3) Grinnell Products
         4) Or Approved Equal.

2.03 EQUIPMENT DRAINS AND OVERFLOWS

A. PVC Pipe: ASTM D1785, Schedule 40, or ASTM D2241, SDR 21 or 26.
   1. Fittings: ASTM D2466 or D2467, PVC.
   2. Joints: Solvent welded in accordance with ASTM D2855.

2.04 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
   3. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.

B. In grooved installations, use rigid couplings with offsetting angle-pattern bolt pads or with wedge-shaped grooves in header piping to permit support and hanging in accordance with ASME B31.9.

2.05 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS

A. Unions for Pipe of 2 Inches and Less:
   1. Ferrous Piping: 150 psi brass or malleable iron, threaded.
   2. Copper Pipe: Bronze, soldered joints.

B. Flanges for Pipe 2 Inches and Greater:
   1. Ferrous Piping: 150 psig forged steel, slip-on.
   2. Copper Piping: Bronze.
   3. Gaskets: 1/16 inch thick, preformed neoprene.

C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
   1. Dimensions and Testing: In accordance with AWWA C606.
   2. Mechanical Couplings: Comply with ASTM F1476.
   3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
   4. When pipe is field grooved, provide coupling manufacturer's grooving tools.

2.06 BALL VALVES

A. Manufacturers:
   1. Anvil International
   2. Apollo Valves
   3. Grinnell Products; _____: www.grinnell.com/#sle.
   4. Or Approved Equal.

B. Up To and Including 2 Inches:
   1. Bronze one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.

C. Over 2 Inches:
   1. Ductile iron body, chrome plated stainless steel ball, teflon, Virgin TFE, or _____ seat and stuffing box seals, lever handle, gear operated, or _____, flanged ends, rated to 800 psi.

2.07 SWING CHECK VALVES

A. Manufacturers:
   1. Anvil International
   2. Apollo Valves
   3. Grinnell Products
   4. Or Approved Equal.

2.08 PRESSURE INDEPENDENT TEMPERATURE CONTROL VALVES AND BALANCING VALVES

A. Manufacturers:
   1. Danfoss
   2. Schneider Electric
   3. Or Approved Equal.

B. Control Valves: Factory-fabricated pressure independent with internal differential pressure regulator (DPRV), which automatically adjusts to normal changes in system pressure and provides 100 percent control valve authority at all positions of the valve.

2.09 FLOW CONTROLS

A. Manufacturers:
   1. Anvil International
   2. Bell & Gossett, a brand of Xylem, Inc
   3. Griswold Controls
   4. ITT Bell & Gossett
   5. Taco, Inc
   6. Or Approved Equal.

B. Construction: Class 125, Brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.

C. Calibration: Control flow within 10 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, minimum pressure 2 psi.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Prepare pipe for grooved mechanical joints as required by coupling manufacturer.

C. Remove scale and dirt on inside and outside before assembly.

D. Prepare piping connections to equipment using jointing system specified.

E. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

F. After completion, fill, clean, and treat systems. See Section 232500 for additional requirements.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

C. Route piping in orderly manner, parallel to building structure, and maintain gradient.

D. Install piping to conserve building space and to avoid interference with use of space.

E. Group piping whenever practical at common elevations.

F. Slope piping and arrange to drain at low points.

END OF SECTION 232113

SECTION 232114 - HYDRONIC SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Expansion tanks.
B. Air vents.
C. Air separators.
D. Strainers.
E. Magnetic filters.
F. Pump connectors.

1.02 REFERENCE STANDARDS

A. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
B. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels; 2025, with Errata .

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description and model.

PART 2 PRODUCTS

2.01 EXPANSION TANKS

A. Manufacturers:
   1. American Wheatley, a company of Global Flow Products, LLC; _____: www.wheatleyhvac.com/#sle.
   2. Amtrol Inc; _____: www.amtrol.com/#sle.
   3. Bell & Gossett, a brand of Xylem, Inc; _____: www.bellgossett.com/#sle.
   4. Taco, Inc; _____: www.taco-hvac.com/#sle.
   5. Or Equal.
B. Construction: Welded steel, tested and stamped in accordance with ASME BPVC-VIII-1; supplied with National Board Form U-1, adjustable flexible EPDM diaphragm or bladder seal factory precharged to 12 psi, and steel support stand.

C. Automatic Cold Water Fill Assembly: Pressure reducing valve, reduced pressure double check backflow preventer, test cocks, strainer, vacuum breaker, and valved by-pass.

2.02 AIR VENTS

A. Manufacturers:
   1. Armstrong International, Inc; _____: www.armstronginternational.com/#sle.
   2. Bell & Gossett, a brand of Xylem, Inc; _____: www.bellgossett.com/#sle.
   3. Flamco: www.flamcogroup.us/#sle.
   4. Taco, Inc; _____: www.taco-hvac.com/#sle.
   5. Or Equal.
   6. Substitutions: See Section 016000 - Product Requirements.

B. Manual Air Vent: Short vertical sections of 2-inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.

C. Hygroscopic Air Vent:
   1. Brass with hygroscopic fiber discs, vent ports, adjustable cap for manual shut-off, and integral spring-loaded ball check valve.

D. Maximum Fluid Pressure: 150 psi.

E. Maximum Fluid Temperature: 250 degrees F.

2.03 AIR SEPARATORS

A. Dip Tube Fitting (Where Not Provided By Boiler Manufacturer):
   1. Manufacturers:
      a. Bell & Gossett, a brand of Xylem, Inc; _____: www.bellgossett.com/#sle.
      b. Or Equal.
      c. Substitutions: See Section 016000 - Product Requirements.
   2. For 125 psi operating pressure; to prevent free air collected in boiler from rising into system.

B. Centrifugal Air Separators/Strainers:
   1. Manufacturers:
      a. American Wheatley, a company of Global Flow Products, LLC; _____: www.wheatleyhvac.com/#sle.
      b. Armstrong International, Inc; _____: www.armstronginternational.com/#sle.
      c. Bell & Gossett, a brand of Xylem, Inc; _____: www.bellgossett.com/#sle.
      d. Taco, Inc; _____: www.taco-hvac.com/#sle.
      e. Or Equal.
      f. Substitutions: See Section 016000 - Product Requirements.
   2. Primed steel body, tested and stamped in accordance with ASME BPVC-VIII-1 with integral bronze strainer, tangential flanged inlet and outlet connections, and internal stainless steel air collector tube.
   3. Maximum Service Flow and Pressure: 16 gpm at 125 psi.

2.04 STRAINERS

A. Manufacturers:

1. American Wheatley, a company of Global Flow Products, LLC; _____: www.wheatleyhvac.com/#sle.
2. Armstrong International, Inc; _____: www.armstronginternational.com/#sle.
3. Flexicraft Industries; _____: www.flexicraft.com/#sle.
4. Grinnell Products; _____: www.grinnell.com/#sle.
5. Nexus Valve, Inc; _____: www.nexusvalve.com/#sle.
6. The Metraflex Company; LPD Y Strainer: www.metraflex.com/#sle.
7. Or Equal.
8. Substitutions: See Section 016000 - Product Requirements.

B. Size 2 inch and Under:
1. Provide threaded, grooved, or sweat brass or iron body for up to 175 psi working pressure, Y-pattern strainer with 1/32 inch stainless steel perforated screen.
2. Body Material by Fluid Service:
a. Cast Iron or Brass:
1) Steam: Up to 250 psi at 450 degrees F.
2) Liquids: Up to 400 psi at 150 degrees F.

C. Size 2-1/2 inch to 4 inch:
1. Provide flanged or grooved iron body for up to 175 psi working pressure, up to 250 degrees F working temperature, Y-pattern strainer with 1/16 inch or 3/64 inch stainless steel perforated screen.
2. Body Material by Fluid Service:
a. Cast Iron:
1) Steam: Up to 125 psi at 350 degrees F.
2) Liquids: Up to 200 psi at 150 degrees F.

2.05 MAGNETIC FILTERS

A. Description: ASME BPVC-VIII-1 compliant, packaged oxide filtration assembly configured to remove dissolved ferrous metals from hydronic systems.

B. In-line Filter Assembly:
1. Magnetic belt surrounded by stainless steel vessel and nonferrous casing.
2. Provide filter assembly with automatic air vent and EPDM flange gaskets.
3. Flange Connections: 2 inches, ASME B16.5 Class 150.
4. Maximum Fluid Service Pressure: 145 psi.
5. Maximum Temperature: 212 degrees F.

2.06 PUMP CONNECTORS

A. Manufacturers:
1. Anvil International; AnviFlex: www.anvilintl.com/#sle.
2. FNW; _____: www.fnw.com/#sle.
3. The Metraflex Company; Vane Flex: www.metraflex.com/#sle.
4. _____.
5. Substitutions: See Section 016000 - Product Requirements.

B. Flexible Connectors: Flanged, braided type with wetted components of stainless steel, sized to match piping.
1. Maximum Operating Service: 150 psi at 120 degrees F.

2. Accommodate the Following:
    a. Axial Deflection in Compression and Expansion: _____ inch.
    b. Lateral Movement: _____ inch.
    c. Angular Rotation: 15 degrees.
    d. Force developed by 1.5 times specified maximum allowable operating pressure.
3. End Connections: Same as specified for pipe jointing.
4. Provide pump connector with integral vanes to reduce turbulent flow.
5. Provide necessary accessories including, but not limited to, swivel joints.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install specialties in accordance with manufacturer's instructions.

B. Where large air quantities can accumulate, provide enlarged air collection standpipes.

C. Provide manual air vents at system high points and as indicated.

D. For automatic air vents in ceiling spaces or other concealed locations, provide vent tubing to nearest drain.

E. Provide air separator on suction side of system circulation pump and connect to expansion tank.

F. Provide valved drain and hose connection on strainer blowdown connection.

G. Provide relief valves on pressure tanks, low-pressure side of reducing valves, heat exchangers, and expansion tanks.

H. Select system relief valve capacity so that it is greater than make-up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment.

I. Pipe relief valve outlet to nearest floor drain.

END OF SECTION 232114

SECTION 232123 - HYDRONIC PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Circulators.

1.02 RELATED REQUIREMENTS

A. Section 230513 - Common Motor Requirements for HVAC Equipment.

B. Section 230934 - Variable-Frequency Motor Controllers.

C. Section 253500 - Integrated Automation Instrumentation and Terminal Devices for HVAC.

1.03 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. UL 778 - Standard for Motor-Operated Water Pumps; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Armstrong Fluid Technology, Inc

B. Bell & Gossett, a Xylem Inc. brand

C. Grundfos Pumps Corporation

D. Or Approved Equal.

2.02 GENERAL

A. Provide pumps that operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

B. Electrical Requirements:
   1. Listed and classified by UL or testing agency acceptable to authority having jurisdiction as suitable for the purpose specified and indicated.
   2. Variable Frequency Drives (VFDs): Provide in accordance with Section 230934, except for integral-VFDs.
   3. Enclosures: Provide unspecified product(s) required to fit motor:

2.03 CIRCULATORS

A. Horizontal shaft, single-stage pump with direct connected, resilient-mount, oil lubricated motor for discharge pressures of up to 125 psi.

B. Casing: Cast iron, with flanged pump connections.

C. Impeller: Non-ferrous keyed to shaft.

D. Bearings: Oil-lubricated bronze sleeve.

E. Shaft: Alloy steel with bronze sleeve, integral thrust collar.

F. Drive: Flexible coupling.

G. Electrical:
   1. Motor: 1,750 rpm unless indicated otherwise; see Section 230513.
   2. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide access space around pumps for service. Provide no less than minimum space recommended by manufacturer.

C. Provide line sized shut-off valve and strainer on pump suction, and line sized soft seat check valve and balancing valve on pump discharge.

D. Controls Human-Machine Interface (HMI): HVAC operator terminal; see Section 253500.

END OF SECTION 232123

SECTION 232300 - REFRIGERANT PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping.
B. Refrigerant.
C. Moisture and liquid indicators.
D. Valves.
E. Strainers.
F. Check valves.
G. Pressure regulators.
H. Pressure relief valves.
I. Filter-driers.
J. Solenoid valves.
K. Expansion valves.
L. Receivers.
M. Flexible connections.
N. Engineered wall seals and insulation protection.
O. Exterior penetration accessories.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 083100 - Access Doors and Panels.
C. Section 230716 - HVAC Equipment Insulation.
D. Section 230719 - HVAC Piping Insulation.
E. Section 230993 - Sequence of Operations for HVAC Controls.
F. Section 236213 - Packaged Air-Cooled Refrigerant Compressor and Condenser Units.
G. Section 236313 - Air Cooled Refrigerant Condensers.
H. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. AHRI 495 - Performance Rating of Refrigerant Liquid Receivers; 2005.
B. AHRI 710 (I-P) - Performance Rating of Liquid-Line Driers; 2009.
C. AHRI 711 (SI) - Performance Rating of Liquid-Line Driers; 2009.

D. AHRI 750 - Thermostatic Refrigerant Expansion Valves; 2007.

E. ASHRAE Std 15 - Safety Standard for Refrigeration Systems; 2024, with Addendum (2025).

F. ASHRAE Std 34 - Designation and Safety Classification of Refrigerants; 2024, with Addendum (2025).

G. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.

H. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes; 2024.

I. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2022.

J. ASME B31.9 - Building Services Piping; 2025.

K. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Qualification Standard for Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing, and Fusing Operators; 2025, with Errata.

L. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2023.

M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

N. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

O. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

P. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013 (Reapproved 2021).

Q. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2026.

R. ICC (IMC)-2018 - International Mechanical Code; 2018.

S. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2025.

T. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

U. UL 429 - Electrically Operated Valves; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide general assembly of specialties, including manufacturer's catalogue information. Provide manufacturer's catalog data including load capacity.

C. Design Data: Submit design data indicating pipe sizing. Indicate load-carrying capacity of trapeze, multiple pipe, and riser support hangers.

D. Test Reports: Indicate results of leak test, acid test.

E. Manufacturer's Installation Instructions: Indicate support, connection requirements, and isolation for servicing.

F. Submit welders certification of compliance with ASME BPVC-IX.

G. Designer's qualification statement.

H. Installer's qualification statement.

PART 2 PRODUCTS

2.01 SYSTEM DESCRIPTION

A. Where more than one piping system material is specified ensure system components are compatible and joined to ensure integrity of system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

B. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.

C. Liquid Indicators:
   1. Use line size liquid indicators in main liquid line leaving condenser.
   2. If receiver is provided, install in liquid line leaving receiver.
   3. Use line size on leaving side of liquid solenoid valves.

D. Valves:
   1. Use service valves on suction and discharge of compressors.
   2. Use gauge taps at compressor inlet and outlet.
   3. Use gauge taps at hot gas bypass regulators, inlet and outlet.
   4. Use check valves on compressor discharge.
   5. Use check valves on condenser liquid lines on multiple condenser systems.

E. Refrigerant Charging (Packed Angle) Valve: Use in liquid line between receiver shut-off valve and expansion valve.

F. Strainers:
   1. Use line size strainer upstream of each automatic valve.
   2. Where multiple expansion valves with integral strainers are used, use single main liquid line strainer.
   3. Use shut-off valve on each side of strainer.

G. Pressure Relief Valves: Use on ASME receivers and pipe to outdoors.

H. Filter-Driers:
   1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.

I. Solenoid Valves:
   1. Use in liquid line of systems operating with single pump-out or pump-down compressor control.

2.02 REGULATORY REQUIREMENTS

A. Comply with ASME B31.9 for installation of piping system.

B. Welding Materials and Procedures: Comply with ASME BPVC-IX and applicable state labor regulations.

C. Products Requiring Electrical Connection: Listed and classified by UL, as suitable for the purpose indicated.

2.03 PIPING

A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
   1. Fittings: ASME B16.22 wrought copper.
   2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.
   3. Mechanical Press Sealed Fittings: Double pressed type complying with UL 207 and ICC (IMC)-2018.

B. Pipe Supports and Anchors:
   1. Provide hangers and supports that comply with MSS SP-58.
      a. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron adjustable swivel, split ring.
   3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
   4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
   5. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
   6. Vertical Support: Steel riser clamp.
   7. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
   8. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
   9. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 REFRIGERANT

A. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.

B. Refrigerant: R-134a, tetrafluoroethane as defined in ASHRAE Std 34.

2.05 MOISTURE AND LIQUID INDICATORS

A. Manufacturers:
   1. Parker Hannifin/Refrigeration and Air Conditioning
   2. Sporlan, a Division of Parker Hannifin
   3. Or Approved Equal.

B. Indicators: Single port type, UL listed, with copper or brass body, flared or soldered ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum temperature of 200 degrees F and maximum working pressure of 500 psi.

2.06 VALVES

A. Manufacturers:
   1. Hansen Technologies Corporation
   2. Henry Technologies
   3. Flomatic Valves

4. Or Approved Equal.

B. Diaphragm Packless Valves:
   1. UL listed, globe or angle pattern, forged brass body and bonnet, phosphor bronze and stainless steel diaphragms, rising stem and handwheel, stainless steel spring, nylon seat disc, soldered or flared ends, with positive backseating; for maximum working pressure of 500 psi and maximum temperature of 275 degrees F.

C. Packed Angle Valves:
   1. Forged brass or nickel plated forged steel, forged brass seal caps with copper gasket, rising stem and seat with backseating, molded stem packing, soldered or flared ends; for maximum working pressure of 500 psi and maximum temperature of 275 degrees F.

D. Ball Valves:
   1. Two piece bolted forged brass body with teflon ball seals and copper tube extensions, brass bonnet and seal cap, chrome plated ball, stem with neoprene ring stem seals; for maximum working pressure of 500 psi and maximum temperature of 300 degrees F.

E. Service Valves:
   1. Forged brass body with copper stubs, brass caps, removable valve core, integral ball check valve, flared or soldered ends, for maximum pressure of 500 psi.

2.07 STRAINERS

A. Manufacturers:
   1. Hansen Technologies Corporation
   2. Parker Hannifin/Refrigeration and Air Conditioning
   3. Sporlan, a Division of Parker Hannifin; _____: www.parker.com/#sle.
   4. Or Approved Equal.

B. Straight Line or Angle Line Type:
   1. Brass or steel shell, steel cap and flange, and replaceable cartridge, with screen of stainless steel wire or monel reinforced with brass; for maximum working pressure of 430 psi.

2.08 CHECK VALVES

A. Manufacturers:
   1. Hansen Technologies Corporation
   2. Parker Hannifin/Refrigeration and Air Conditioning
   3. Sporlan, a Division of Parker Hannifin
   4. Or Approved Equal.
   5. Substitutions: See Section 016000 - Product Requirements.

B. Globe Type:
   1. Cast bronze or forged brass body, forged brass cap with neoprene seal, brass guide and disc holder, phosphor-bronze or stainless steel spring, teflon seat disc; for maximum temperature of 300 degrees F and maximum working pressure of 425 psi.

C. Straight Through Type:

1. Brass body and disc, phosphor-bronze or stainless steel spring, neoprene seat; for maximum working pressure of 500 psi and maximum temperature of 200 degrees F.

2.09 PRESSURE REGULATORS

A. Manufacturers:
   1. Hansen Technologies Corporation
   2. Parker Hannifin/Refrigeration and Air Conditioning
   3. Sporlan, a Division of Parker Hannifin
   4. Or Approved Equal.

B. Brass body, stainless steel diaphragm, direct acting, adjustable over 0 to 80 psi range, for maximum working pressure of 450 psi.

2.10 PRESSURE RELIEF VALVES

A. Manufacturers:
   1. Hansen Technologies Corporation
   2. Henry Technologies
   3. Sherwood Valve/Harsco Corporation
   4. Or Approved Equal.

B. Straight Through or Angle Type: Brass body and disc, neoprene seat, factory sealed and stamped with ASME UV and National Board Certification NB, selected to ASHRAE Std 15, with standard setting of 235 psi.

2.11 FILTER-DRIERS

A. Manufacturers:
   1. Flow Controls Division of Emerson Electric
   2. Parker Hannifin/Refrigeration and Air Conditioning
   3. Sporlan, a Division of Parker Hannifin
   4. Or Approved Equal.

B. Performance:
   1. Flow Capacity - Liquid Line: ____ ton, minimum, rated in accordance with AHRI 710 (I-P) (AHRI 711 (SI)).
   2. Pressure Drop: 2 psi, maximum, when operating at full connected evaporator capacity.
   3. Design Working Pressure: 350 psi, minimum.

C. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, activated charcoal, and filtration to 40 microns, with secondary filtration to 20 microns; of construction that will not pass into refrigerant lines.

D. Construction: UL listed.
   1. Connections: As specified for applicable pipe type.

2.12 SOLENOID VALVES

A. Manufacturers:

1. Flow Controls Division of Emerson Electric
2. Parker Hannifin/Refrigeration and Air Conditioning
3. Sporlan, a Division of Parker Hannifin
4. Or Approved Equal.

B. Valve: AHRI 760 I-P, pilot operated, copper, brass or steel body and internal parts, synthetic seat, stainless steel stem and plunger assembly (permitting manual operation in case of coil failure), integral strainer, with flared, soldered, or threaded ends; for maximum working pressure of 500 psi.

C. Coil Assembly: UL 429 UL listed, replaceable with molded electromagnetic coil, moisture and fungus proof, with surge protector and color coded lead wires, integral junction box with pilot light.

2.13 EXPANSION VALVES

A. Manufacturers:
1. Flow Controls Division of Emerson Electric
2. Parker Hannifin/Refrigeration and Air Conditioning
3. Sporlan, a Division of Parker Hannifin
4. Or Approved Equal.

B. Angle or Straight Through Type: AHRI 750; design suitable for refrigerant, brass body, internal or external equalizer, bleed hole, adjustable superheat setting, replaceable inlet strainer, with nonreplaceable capillary tube and remote sensing bulb and remote bulb well.

C. Selection: Evaluate refrigerant pressure drop through system to determine available pressure drop across valve. Select valve for maximum load at design operating pressure and minimum 10 degrees F superheat. Select to avoid being undersized at full load and excessively oversized at part load.

2.14 ELECTRONIC EXPANSION VALVES

A. Manufacturers:
1. Flomatic Valves.
2. Parker Hannifin/Refrigeration and Air Conditioning
3. Sporlan, a Division of Parker Hannifin
4. Or Approved Equal.

B. Valve:
1. Brass body with flared or soldered connection, needle valve with floating needle and machined seat, stepper motor drive.

C. Evaporation Control System:
1. Electronic microprocessor based unit in enclosed case, proportional integral control with adaptive superheat, maximum operating pressure function, preselection allowance for electrical defrost and hot gas bypass.

D. Refrigeration System Control: Electronic microprocessor based unit in enclosed case, with proportional integral control of valve, on/off thermostat, air temperature alarm (high and low), solenoid valve control, liquid injection adaptive superheat control, maximum operating pressure function, night setback thermostat, timer for defrost control.

2.15 RECEIVERS

A. Manufacturers:
   1. Henry Technologies
   2. Parker Hannifin/Refrigeration and Air Conditioning
   3. Sherwood Valve/Harsco Corporation
   4. Or Approved Equal.

B. Internal Diameter 6 inch and Smaller:
   1. AHRI 495, UL listed, steel, brazed; 400 psi maximum pressure rating, with tappings for inlet, outlet, and pressure relief valve.

2.16 FLEXIBLE CONNECTORS

A. Manufacturers:
   1. Circuit Hydraulics, Ltd
   2. Flexicraft Industries
   3. Penflex
   4. Or Approved Equal.

B. Corrugated stainless steel hose with single layer of stainless steel exterior braiding, minimum 9 inches long with copper tube ends; for maximum working pressure of 500 psi.

2.17 ENGINEERED WALL SEALS AND INSULATION PROTECTION

A. Manufacturers:
   1. Airex Manufacturing, Inc
   2. Or Approved Equal.

B. Basis of Design: Airex Manufacturing, Inc; www.airexmfg.com/#sle.
   1. Pipe Penetration Wall Seal: Airex Titan Outlet.
   2. Refrigeration Pipe Insulation Protection System: Airex E-Flex Guard.
   3. Pipe Penetration Wall Seal and Insulation Protection System: Airex Pro-System Kit.

C. Pipe Penetration Wall Seal: Seals HVAC piping wall penetrations with compression gasket wall mounted rigid plastic outlet cover.
   1. Outlet Cover Color: Gray.

D. Insulation Protection System: Mechanical line insulation and PVC cover.
   1. PVC Insulation Cover Color: Black with full-length velcro fastener.
   2. Weatherization and Ultraviolet Exposure Protection: Comply with ASTM G153.
   3. Water/Vapor Permeability: Comply with ASTM E96/E96M.
   4. Anti-Fungal and Anti-Microbial Resistance: Comply with ASTM G21.
   5. Flame Spread and Smoke Development Rating of 25/450: Comply with ASTM E84.

2.18 EXTERIOR PENETRATION ACCESSORIES

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

B. Sealing Systems for Roof Penetrations: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.

PART 3 EXECUTION

3.01 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.

3.02 INSTALLATION

A. Install refrigeration specialties in accordance with manufacturer's instructions.

B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.

C. Install piping to conserve building space and avoid interference with use of space.

D. Group piping whenever practical at common elevations and locations. Slope piping one percent in direction of oil return.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.5.
   2. Support horizontal piping as indicated.
   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.

G. Arrange piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.

H. Provide clearance for installation of insulation and access to valves and fittings.

I. Provide access to concealed valves and fittings. Coordinate size and location of access doors with Section 083100.

J. Flood piping system with nitrogen when brazing.

K. Insulate piping and equipment.

L. Follow ASHRAE Std 15 procedures for charging and purging of systems and for disposal of refrigerant.

M. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.

N. Install flexible connectors at right angles to axial movement of compressor, parallel to crankshaft.

O. Fully charge completed system with refrigerant after testing.

P. Provide electrical connection to solenoid valves. See Section 260583.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Test refrigeration system in accordance with ASME B31.5.

C. Pressure test system with dry nitrogen to 200 psi. Perform final tests at 27 inches vacuum and 200 psi using halide torch. Test and repair piping until no leakage.

END OF SECTION 232300

SECTION 233100 - HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal ducts.
B. Flexible ducts.
C. Air plenums and casings.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 099113 - Exterior Painting: Weld priming, weather resistant, paint or coating.
C. Section 099123 - Interior Painting: Weld priming, paint or coating.
D. Section 230130.51 - HVAC Air-Distribution System Cleaning: Post install duct cleaning.
E. Section 230548 - Vibration and Seismic Controls for HVAC.
F. Section 230713 - Duct Insulation: External insulation and duct liner.
G. Section 233300 - Air Duct Accessories.
H. Section 233319 - Duct Silencers.
I. Section 233600 - Air Terminal Units.
J. Section 233700 - Air Outlets and Inlets: Fabric air distribution devices.

1.03 REFERENCE STANDARDS

A. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; Most Recent Edition Cited by Referring Code or Reference Standard.
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.
D. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.
F. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2026.
G. ICC (IMC) - International Mechanical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. ICC-ES AC01 - Acceptance Criteria for Expansion Anchors in Masonry Elements; 2018, with Editorial Revision (2020).

I. ICC-ES AC106 - Acceptance Criteria for Predrilled Fasteners (Screw Anchors) in Masonry; 2018, with Editorial Revision (2020).

J. ICC-ES AC193 - Acceptance Criteria for Mechanical Anchors in Concrete Elements; 2017, with Editorial Revision (2020).

K. ICC-ES AC308 - Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements; 2023.

L. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

M. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2027.

N. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

O. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; 2012.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for duct materials.

C. Shop Drawings: Indicate duct fitting types, gauges, sizes, welds, and configuration.

D. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate per appropriate seal class, following SMACNA (LEAK).

1.05 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.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.

B. Provide metal duct unless otherwise indicated. Fibrous glass duct can be substituted at the Contractor's option.

C. Acoustical Treatment: Provide sound-absorbing liners and sectional silencers for metal-based ducts in compliance with Section 233319.

D. Seismic Restraint: Fabricate in compliance with ICC (IMC) requirements; see Section 230548.

E. Duct Shape and Material in accordance with Allowed Static Pressure Range:
   1. Round: Plus or minus 2 in-wc of galvanized steel.
   2. Rectangular: Plus or minus 1/2 in-wc of galvanized steel.

F. Duct Sealing and Leakage in accordance with Static Pressure Class:
   1. Duct Pressure Class and Material for Common Mechanical Ventilation Applications:
      a. Supply Air: 1/2 in-wc pressure class, galvanized steel.
      b. Outside Air Intake: 1/2 in-wc pressure class, galvanized steel.
      c. Return and Relief Air: 1/2 in-wc pressure class, galvanized steel.
      d. General Exhaust Air: 1/2 in-wc pressure class, galvanized steel.
      e. Heating or Combustion Air: 1/2 in-wc pressure class, galvanized steel.
   2. Medium and High Pressure Service: Above 3 in-wc:
      a. Seal: Class A, apply sealing of transverse joints, longitudinal seams, and duct wall penetrations.
      b. Leakage:
         1) Rectangular: Class 6 or 6 cfm/100 sq ft.
         2) Round: Class 3 or 3 cfm/100 sq ft.

G. Duct Fabrication Requirements:
   1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
   2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
   3. Construct tees, 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 airfoil turning vanes of perforated metal with glass fiber insulation.
   4. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
   5. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
   6. Provide turning vanes of perforated metal with glass fiber insulation when an acoustical lining is required.
   7. 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.

2.02 METAL DUCTS

A. Material Requirements:
   1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

B. Fire Rated Ducts:
   1. Two-hour, Fire Rated Duct:
      a. UL labeled, construct of 18-gauge, 0.0516-inch galvanized steel.
      b. R-Value: 4.5 when tested in accordance with ASTM C177.

C. Round Metal Ducts:
   1. Round Single Wall Duct: Round lock seam duct with galvanized steel outer wall.
   2. Round Connection System: Interlocking duct connection system per SMACNA (DCS).

D. Round Spiral Duct:
   1. Round spiral lock seam duct with galvanized steel outer wall.

E. Connectors, Fittings, Sealants, and Miscellaneous:
   1. Fittings: Manufacture with solid inner wall of perforated galvanized steel.
   2. Transverse Duct Connection System: SMACNA "E" rated rigid class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).
   3. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
      a. 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.
      b. VOC Content: Not more than 250 g/L, excluding water.
      c. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
      d. For Use with Flexible Ducts: UL labeled.
      e. Manufacturers:
         1) Carlisle HVAC Products
         2) Design Polymerics
         3) Ductmate Industries, Inc, a DMI Company
         4) Elgen Manufacturing Company, Inc
         5) H.B. Fuller Construction Products, Inc
         6) Or Approved Equal.
   4. Gasket Tape:
      a. Provide butyl rubber gasket tape for a flexible seal between transfer duct connector (TDC), transverse duct flange (TDF), applied flange connections, and angle ring connections.
      b. Manufacturers:
         1) Design Polymerics
         2) Elgen Manufacturing Company, Inc
         3) Or Approved Equal.
   5. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.
   6. Hanger Fasteners: Attach hangers to structure using appropriate fasteners as follows:
      a. Concrete Wedge Expansion Anchors: Complying with ICC-ES AC193.
      b. Masonry Wedge Expansion Anchors: Complying with ICC-ES AC01.
      c. Concrete Screw Type Anchors: Complying with ICC-ES AC193.
      d. Masonry Screw Type Anchors: Complying with ICC-ES AC106.
      e. Concrete Adhesive Type Anchors: Complying with ICC-ES AC308.
      f. Other Types: As required.
      g. Manufacturers:
         1) Powers Fasteners, Inc
         2) HILTI.

3) Or Approved Equal.

F. Flexible Ducts: UL 181, Class 1, polyethylene film, mechanically fastened and rolled using galvanized steel to form a spiral helix.
   1. Insulation: R6 insulation with polyethylene vapor barrier film.
   2. Pressure Rating: 10 in-wc positive and 5 in-wc negative.
   3. Maximum Velocity: 5500 fpm.
   4. Temperature Range: Minus 20 degrees F to 250 degrees F.
   5. Manufacturers:
      a. Flexmaster USA, a brand of Masterduct, Inc
      b. Or Approved Equal.

G. Acoustic Flexible Ducts: UL 181, Class 1, spun-bond nylon, mechanically fastened and rolled using galvanized steel to form a spiral helix.
   1. Insulation: Fiberglass insulation with metalic vapor barrier.
   2. Inner Core: Spun-bonded, nonwoven inner core.
   3. Pressure Rating: 6 in-wc positive and 5 in-wc negative.
   4. Maximum Velocity: 4000 fpm.
   5. Temperature Range: Minus 20 degrees F to 250 degrees F.
   6. Manufacturers:
      a. Flexmaster USA, a brand of Masterduct, Inc.
      b. Or Approved Equal.

2.03 FLEXIBLE DUCTS

A. Flexible Air Ducts:
   1. UL 181, Class 1, polyethylene film supported by helically wound spring steel wire.
   2. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
   3. Pressure Rating: From 10 in-wc to 5 in-wc negative.
   4. Maximum Velocity: 5,500 fpm.
   5. Temperature Range: Minus 20 to 250 degrees F.
   6. Manufacturers:
      a. Flexmaster USA, a brand of Masterduct, Inc
      b. Or Approved Equal.

2.04 AIR PLENUMS AND CASINGS

A. Fabricate in accordance with SMACNA (DCS) for indicated operating pressures indicated.

B. Minimum Fabrication Requirements:
   1. Fabricate acoustic plenum or casing with reinforcing turned inward.
   2. Provide 16-gauge, 0.059-inch sheet steel back facing and 22-gauge, 0.029-inch perforated sheet steel front facing with 3/32 inch diameter holes on 5/32 inch centers.
   3. Construct panels 3 inches thick, packed with 4.5 pcf minimum glass fiber insulation media, on inverted channel of 16-gauge, 0.059-inch sheet steel.
   4. Mount floor-mounted plenum or casings on 4-inch high concrete curbs. At floor, rivet panels on 8-inch centers to angles. Where floors are acoustically insulated, provide liner of galvanized 18-gauge, 0.052-inch expanded metal mesh supported at 12-inch centers, turned up 12 inches at sides with sheet metal shields.

C. Access Doors:
   1. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection.
   2. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles.
   3. Provide clear wire glass observation ports, minimum 6 by 6 inch size.

D. Fire-Rated Metal Panels:
   1. Fire Rating: 60 minutes when tested in accordance with ASTM E119.
   2. Material: Steel-faced composite panel with noncombustible structural high density mineral fiber core, UL or ETL labeled, nonload bearing fire separations.
      a. Facing: Galvanized steel (G90), 24 gauge (0.0275 inch).
      b. Finish: Unpainted.
      c. Core: Mineral wool board.
      d. Structural: Nonload bearing.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install, support, and seal ducts in accordance with SMACNA (DCS).

B. Install products following the manufacturer's instructions.

C. Comply with safety standards NFPA 90A and NFPA 90B.

D. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering the ductwork system.

E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

F. Flexible Ducts: Connect to metal ducts with adhesive.

G. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.

H. Provide openings in ductwork as indicated to accommodate thermometers and controllers. Provide pilot tube openings as indicated for testing of systems, complete with metal can with spring device or screw to insure against air leakage. For openings, insulate ductwork and install insulation material inside a metal ring.

I. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

J. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with a crimp in the direction of airflow.

K. Use double nuts and lock washers on threaded rod supports.

L. Connect terminal units to supply ducts directly or with one foot maximum length of flexible duct. Do not use flexible duct to change direction.

M. Connect diffusers or light troffer boots to low-pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.

N. Set plenum doors at 6 to 12 inches above floor. Arrange door swings so that fan static pressure holds door in closed position.

O. At exterior wall louvers, seal duct to louver frame and install blank-out panels.

P. Louver Fit-out:
   1. Provide blank-out panels sealing available area of wall-mounted exterior-faced louver when connected ductwork is smaller than actual louver free area, and duct outlet is smaller than the louver frame.
   2. Use the same duct material painted black on the exterior side, then seal louver frame and duct.

Q. Fire Partitions: Provide firestopping sealing. See Section 078400.

R. Duct Accessories, Terminal Units, Inlets, and Outlets: Interconnect as indicated in Sections 233300, 233600, and 233700.

S. Duct Insulation: Provide duct insulation. See Section 230713.

T. Painting: Provide surface finish as indicated on drawings. See Sections 099113 and 099123.

3.02 CLEANING

A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

B. Clean thoroughly each duct system. See Section 230130.51.

C. Clean duct system by forcing air at high velocity through duct to remove accumulated dust. Clean half the system at a time to obtain sufficient air. Protect equipment that could be harmed by excessive dirt with temporary filters or bypass during cleaning.

D. Clean duct systems with high-power vacuum machines. Protect equipment that could be harmed by excessive dirt with filters or bypass during cleaning. Provide adequate access to the ductwork for cleaning purposes.

END OF SECTION 233100

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air turning devices/extractors.
B. Backdraft dampers - metal.
C. Backdraft dampers - fabric.
D. Combination fire and smoke dampers.
E. Combination fire and smoke dampers - corridor dampers.
F. Duct access doors.
G. Duct test holes.
H. Fire dampers.
I. Flexible duct connectors.
J. Smoke dampers.
K. Smoke and fire-smoke damper test module.
L. Volume control dampers.
M. Low leakage (Class 1A) control dampers.
N. Miscellaneous Products:
    1. Damper operators.
    2. Damper position switch.
    3. Internal strut end plugs.
    4. Duct opening closure film.
    5. Airflow meters, fixed-resistance type.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 230548 - Vibration and Seismic Controls for HVAC.
C. Section 233100 - HVAC Ducts and Casings.
D. Section 233600 - Air Terminal Units: Pressure regulating damper assemblies.
E. Section 253513 - Integrated Automation Actuators and Operators: Damper operators.
F. Section 253516 - Integrated Automation Sensors and Transmitters: Damper position switch.
G. Section 253523 - Integrated Automation Control Dampers: Product furnishing.

1.03 REFERENCE STANDARDS

A. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

B. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025, with Amendment (2024).

C. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

D. NFPA 92 - Standard for Smoke Control Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; 2024.

F. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.

G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

H. UL 33 - Safety Heat Responsive Links for Fire-Protection Service; Current Edition, Including All Revisions.

I. UL 555 - Standard for Fire Dampers; Current Edition, Including All Revisions.

J. UL 555S - Standard for Smoke Dampers; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - 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.

PART 2 PRODUCTS

2.01 AIR TURNING DEVICES/EXTRACTORS

A. Manufacturers:
   1. Carlisle HVAC Products
   2. Elgen Manufacturing Company, Inc
   3. Krueger-HVAC, Division of Air System Components
   4. Ruskin Company
   5. Titus HVAC, a brand of Johnson Controls
   6. Or Approved Equal.

B. Multi-blade device with blades aligned in short dimension; steel construction; with individually adjustable blades, mounting straps.

C. Multi-blade device with radius blades attached to pivoting frame and bracket, steel construction, with push-pull operator strap.

2.02 BACKDRAFT DAMPERS - METAL

A. Manufacturers:
   1. Louvers & Dampers, Inc, a brand of Mestek, Inc

2. Nailor Industries, Inc
3. Ruskin Company
4. United Enertech
5. Or Approved Equal.

B. Gravity Backdraft Dampers, Size 18 by 18 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.

C. 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 BACKDRAFT DAMPERS - FABRIC

A. Fabric Backdraft Dampers: Factory-fabricated.
1. Blades: Neoprene coated fabric material.
2. Birdscreen: 1/2 inch nominal mesh of galvanized steel or aluminum.
3. Maximum Velocity: 1000 fpm (5 mps) face velocity.

2.04 COMBINATION FIRE AND SMOKE DAMPERS

A. Manufacturers:
1. AireTechnologies, Inc, a DMI Company; _____: www.airetechnologies.com/#sle.
2. Lloyd Industries, Inc
3. Louvers & Dampers, Inc, a brand of Mestek, Inc
4. Nailor Industries, Inc
5. NCA, a brand of Metal Industries Inc
6. Pottorff
7. Ruskin Company
8. United Enertech
9. Or Approved Equal.

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 gauge, 0.0598 inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 by 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 labeled; 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. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.

2.05 COMBINATION FIRE AND SMOKE DAMPERS - CORRIDOR DAMPERS

A. Manufacturers:
1. Ruskin Company

2. United Enertech
3. Or Approved Equal.

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 gauge, 0.0598 inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 by 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 labeled; 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. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.

2.06 DUCT ACCESS DOORS

A. Manufacturers:
1. Acudor Products Inc, a Division of Nelson Industrial Inc
2. Ductmate Industries, Inc, a DMI Company
3. Nailor Industries, Inc
4. Ruskin Company
5. Or Approved Equal.

B. Fabricate in accordance with SMACNA (DCS) 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 by 48 inches: Three hinges and two compression latches with outside and inside handles.

D. Access doors with sheet metal screw fasteners are not acceptable.

2.07 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.
1. Manufacturers:
a. Carlisle HVAC Products; Dynair Test Port with Red Cap with O-Ring Seal: www.carlislehvac.com/#sle.
b. Or Approved Equal.

2.08 FIRE DAMPERS

A. Manufacturers:

1. AireTechnologies, Inc, a DMI Company
2. Lloyd Industries, Inc
3. Nailor Industries, Inc
4. Pottorff
5. Ruskin Company
6. Or Approved Equal.

B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

C. Horizontal Dampers: Galvanized steel, 22-gauge, 0.0299-inch frame, stainless steel closure spring, and lightweight, heat-retardant, non-asbestos fabric blanket.

D. Curtain Type Dampers: Galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Configure with blades out of air stream except for 1-inch pressure-class ducts up to 12 inches in height.

E. Multiple Blade Dampers: 16-gauge, 0.0598-inch galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 by 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.

F. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.09 FLEXIBLE DUCT CONNECTORS

A. Manufacturers:
1. Carlisle HVAC Products
2. Ductmate Industries, Inc, a DMI Company
3. Elgen Manufacturing Company, Inc
4. Or Approved Equal.

B. Fabricate in accordance with SMACNA (DCS) and as indicated.

C. Flexible Duct Connections: Fabric crimped into metal edging strip.

2.10 SMOKE DAMPERS

A. Manufacturers:
1. AireTechnologies, Inc, a DMI Company
2. Nailor Industries, Inc
3. Ruskin Company
4. United Enertech
5. Or Approved Equal.

B. Fabricate in accordance with NFPA 90A and UL 555S, and as indicated.

C. Dampers: UL Class 1 airfoil blade type smoke damper, normally open automatically operated by pneumatic actuator.

D. Electro Thermal Link: Fusible link melting at 165 degrees F; 120 volts, single phase, 60 Hz; UL listed and labeled.

2.11 SMOKE AND FIRE-SMOKE DAMPER TEST MODULE

A. Addressable fire alarm system proprietary controller module preconfigured for remote testing of dedicated smoke damper or combination fire-smoke damper.

B. Provide module, accessories, and connectivity to meet NFPA 80 and NFPA 105 requirements.

C. Products:
   1. Ruskin Company
   2. Or Approved Equal.

2.12 VOLUME CONTROL DAMPERS

A. Products for Automatic Controls: See Section 253523.

B. Manufacturers:
   1. AireTechnologies, Inc, a DMI Company
   2. Louvers & Dampers, Inc, a brand of Mestek, Inc
   3. Elgen Manufacturing Company, Inc
   4. MKT Metal Manufacturing
   5. Nailor Industries, Inc
   6. NCA, a brand of Metal Industries Inc.
   7. Ruskin Company
   8. Or Approved Equal.

C. Fabricate in accordance with SMACNA (DCS) and as indicated.

D. Splitter Dampers:
   1. Material: Same gauge as duct to 24 inches size in either direction, and two gauges heavier for sizes over 24 inches.
   2. Blade: Fabricate of single thickness sheet metal to streamline shape, secured with continuous hinge or rod.
   3. Operator: Minimum 1/4 inch diameter rod in self aligning, universal joint action, flanged bushing with set screw.

E. Single Blade Dampers:
   1. Fabricate for duct sizes up to 6 by 30 inch.
   2. Blade: 24 gauge, 0.0239 inch, minimum.

F. Multi-Blade Damper: Fabricate consisting of opposed blades with maximum blade sizes 8 by 72 inches. Assemble center- and edge-crimped blades in prime-coated or galvanized-channel frame with suitable hardware.
   1. Blade: 18 gauge, 0.0478 inch, minimum.

G. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
   1. Manufacturers:
      a. Carlisle HVAC Products
      b. Elgen Manufacturing Company, Inc
      c. Or Approved Equal.

2.13 LOW LEAKAGE (CLASS 1A) CONTROL DAMPERS

A. Manufacturers:

1. Ruskin Company
2. United Enertech
3. Or Approved Equal.

B. Maximum Leakage Allowed: 3 cfm/sq ft at 1 in-wc.

C. Frame:
1. Material: 20-gauge galvanized steel.
2. Free-area: Single cross section.

D. Blade:
1. Type: Single-blade rectangle shape.
2. Operation: Opposed type.
3. Maximum Individual Blade Height: 8 inches.
4. Material: 12-gauge galvanized steel.
5. Authority: Opposed type, 5 to 50 percent (typically 10 percent).

E. Insulation: Water-resistant sound absorbing material.

F. Temperature Service Range: Minus 25 to 185 degrees F.

2.14 MISCELLANEOUS PRODUCTS

A. Damper Operators: Provide electric operators; see Section 253513.

B. Damper position switch; see Section 253516.

C. Internal Strut End Plugs: Combination end-mounting and sealing plugs for metal conduit used as internal reinforcement struts for metal ducts; plug crimped inside conduit with outside gasketed washer seal.

D. Duct Opening Closure Film: Mold-resistant, self-adhesive film to keep debris out of ducts during construction.
1. Thickness: 2 mils.
2. High tack water based adhesive.
3. UV stable light blue color.
4. Elongation Before Break: 325 percent, minimum.
5. Manufacturers:
a. Carlisle HVAC Products
b. Elgen Manufacturing Company, Inc
c. Or Approved Equal.

E. Airflow Meters, Fixed-Resistance Type:
1. Manufacturers:
a. Air Monitor, a Brand of Onicon, Inc
b. KMC Controls
c. Or Approved Equal.
2. Sensor Type: Provide duct-inserted probe, duct-inserted pitot-tube assembly, and wall-mounted assembly for outside air with built-in transmitter.
3. Flow Range: Equivalent velocity pressure required to match scheduled flow range with 100-to-1 signal turndown ratio.
4. Accuracy: Two percent over a 30 to 50 millisecond response time, adjustable.
5. Linearity: 0.1 percent of calibrated span.
6. Minimum Overpressure: 150 percent over highest range value.
7. Display Interface: Built-in, graphic type.

8. Output: Two-wire, 4 to 20 mA.
9. Access Box: NEMA EN 10250, Type 1 with hinged cover housing and cable access ports.

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 (DCS). See Section 233100 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 by 8 inch size access door for hand and shoulder access, or as indicated on drawings. Provide minimum 4 by 4 inch size access door 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.

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. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.

J. Use splitter dampers only where indicated.

K. 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 233300

SECTION 233416 - CENTRIFUGAL HVAC FANS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Backward inclined centrifugal fans.
B. Forward curved centrifugal fans.
C. Bearings and drives.
D. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 230513 - Common Motor Requirements for HVAC Equipment.
B. Section 230548 - Vibration and Seismic Controls for HVAC.
C. Section 230713 - Duct Insulation.
D. Section 233300 - Air Duct Accessories: Backdraft dampers.
E. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015 (Reaffirmed 2026).
B. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
C. AMCA 99 - Standards Handbook; 2025.
D. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2025.
E. AMCA 300 - Reverberation Room Methods of Sound Testing of Fans; 2024.
F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2022.
G. NEMA MG 00001 - Motors and Generators; 2024.
H. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on centrifugal fans and accessories including fan curves with specified operating point plotted, power, rpm, sound power levels for both fan inlet

and outlet at rated capacity, and electrical characteristics and connection requirements.

1.05 FIELD CONDITIONS

A. Permanent fans may not be used for ventilation during construction.

B. Permanent fans 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. ACME Engineering and Manufacturing Corporation

B. Carnes, a division of Carnes Company Inc

C. Loren Cook Company

D. PennBarry, Division of Air System Components

E. Rosenberg USA, Inc

F. Twin City Fan & Blower

G. Greenheck.

H. Or Approved Equal

2.02 PERFORMANCE REQUIREMENTS

A. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.

B. Sound Ratings: AMCA 301, tested to AMCA 300, and bear AMCA Certified Sound Rating Seal.

C. Fabrication: Comply with AMCA 99.

D. Performance Base: Sea level conditions.

E. Temperature Limit: Maximum 300 degrees F.

F. Static and Dynamic Balance: Eliminate vibration or noise transmission to occupied areas.

2.03 WHEEL AND INLET

A. Backward Inclined: Steel or aluminum construction with smooth curved inlet flange, heavy back plate, backwardly curved blades welded or riveted to flange and backplate; cast iron hub riveted to back plate and keyed to shaft with set screws.

B. Forward Curved: Black enameled steel construction with inlet flange, backplate, shallow blades with inlet and tip curved forward in direction of airflow, mechanically secured to flange and back plate; steel hub swaged to backplate and keyed to shaft with set screw.

2.04 HOUSING

A. Heavy gauge steel, spot welded for AMCA 99 Class I and II fans, and continuously welded for Class III, adequately braced, designed to minimize turbulence with spun inlet bell and shaped cut.

B. Factory finish before assembly to manufacturer's standard. For fans handling air downstream of humidifiers, provide two additional coats of paint. Prime coating on aluminum parts is not required.

C. Provide bolted construction with horizontal flanged split housing, where indicated.

D. Fabricate plug fans without volute housing using steel-lined cabinet; see Section 230713.

2.05 BEARINGS AND DRIVES

A. Bearings: Heavy duty pillow block type, selfgreasing ball bearings, with ABMA STD 9 life at 50,000 hours.

B. Shafts: Hot rolled steel, ground and polished, with keyway, protectively coated with lubricating oil, and shaft guard.

C. Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves for motors 15 hp and under, selected so required rpm is obtained with sheaves set at mid Fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.

D. Belt Guard: Fabricate to SMACNA (DCS); 0.106 inch thick, 3/4 inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

2.06 ACCESSORIES

A. Fixed Inlet Vanes: Steel construction with fixed cantilevered inlet guide vanes welded to inlet bell.

B. Discharge Dampers: Parallel blade heavy-duty steel damper assembly with blades constructed of two plates formed around and welded to shaft, channel frame, sealed ball bearings, with blades linked out of air stream to single control lever.

C. Inlet/Outlet Screens: Galvanized steel welded grid.

D. Access Doors: Shaped to fit scroll, with quick opening latches and gaskets.

E. Scroll Drain: 1/2 inch steel pipe coupling welded to low point of fan scroll.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install fans with resilient mountings and flexible electrical leads, see Sections 230548 and 260583.

C. Install flexible connections between fan inlet and discharge ductwork; see Section 233300. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.

D. Install fan restraining snubbers; see Section 230548. Adjust snubbers to prevent tension in flexible connectors when fan is operating.

E. Provide fixed sheaves required for final air balance.

F. Provide safety screen where inlet or outlet is exposed.

G. Pipe scroll drains to nearest floor drain.

H. Provide backdraft dampers on exhaust fans located at discharge side; see Section 233300.

END OF SECTION 233416

SECTION 233600 - AIR TERMINAL UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single-duct terminal units.
   1. Constant-volume units.
   2. Variable-volume units.

1.02 RELATED REQUIREMENTS

A. Section 230548 - Vibration and Seismic Controls for HVAC.
B. Section 232113 - Hydronic Piping: Connections to heating coils.
C. Section 232114 - Hydronic Specialties: Connections to heating coils.
D. Section 233100 - HVAC Ducts and Casings.
E. Section 233300 - Air Duct Accessories.
F. Section 233700 - Air Outlets and Inlets.

1.03 REFERENCE STANDARDS

A. AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils; 2001, with Addenda (2011).
B. AHRI 880 (I-P) - Performance Rating of Air Terminals; 2017 (Reaffirmed 2023).
C. ASHRAE Std 62.1 - Ventilation for Acceptable Indoor Air Quality; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. ASTM A492 - Standard Specification for Stainless Steel Rope Wire; 1995 (Reapproved 2019).
E. ASTM A603 - Standard Specification for Metallic-Coated Steel Structural Wire Rope; 2019.
F. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems; 2024.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings that indicate airflow, static pressure, and NC designation. Include electrical characteristics and connection requirements.

1.05 QUALITY ASSURANCE

PART 2 PRODUCTS

2.01 SINGLE-DUCT, VARIABLE-VOLUME AND CONSTANT-VOLUME UNITS

A. Manufacturers:
   1. Carrier, a part of UTC Building and Industrial Systems, a unit of United Technologies Corp.; _____
   2. Krueger-HVAC
   3. Price Industries
   4. Tuttle and Bailey
   5. Or Approved Equal.

B. General:
   1. Factory-assembled, AHRI 880 (I-P) rated and bearing the AHRI seal, air volume control terminal with damper assembly, flow sensor, externally mounted volume controller, duct collars, and all required features.
   2. Control box bearing identification, including but not necessarily limited to nominal cfm, maximum and minimum factory-set airflow limits, coil type and coil (right or left hand) connection, where applicable.

C. Unit Casing:
   1. Minimum 22 gauge, 0.0299 inch galvanized steel.
   2. Air Inlet Collar: Provide round, suitable for standard flexible duct sizes.
   3. Unit Discharge: Rectangular, with slip-and-drive connections.
   4. Acceptable Liners:
      a. Liner not to contain pentabrominated diphenyl ether (CAS #32534-81-9) or octabrominated diphenyl ether.

D. Damper Assembly:
   1. Heavy-gauge, galvanized steel, or extruded aluminum construction with solid steel, nickel-plated shaft pivoting on HDPE, self-lubricating bearings.
   2. Provide integral position indicator or alternative method for indicating damper position over full range of 90 degrees.
   3. Incorporate low leak damper blades for tight airflow shutoff.

E. Hot Water Heating Coil:
   1. Coil Casing: Minimum 22 gauge, 0.0299 inch galvanized steel, factory-installed on terminal discharge with rectangular outlet, duct connection type.
   2. Coil Fins: Aluminum or aluminum plated fins, mechanically-bonded to seamless copper tubes.
   3. Coil leak tested to minimum 350 psig.
   4. Base performance data on tests run in accordance with AHRI 410 and units to bear AHRI 410 label.

F. Controls:
   1. Terminal Unit Controls:
      a. Provide accessories for field interfaced controller including ball valve and thermostat.

b. Factory ship DDC controller including airflow sensor, integral airflow transmitter, integral damper actuator, and duct-mounted temperature sensor.
c. Sequence of Operation: Zone temperature control with airflow and coil discharge monitoring.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are suitable for installation.
B. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install the inlets of air terminal units and air flow sensors a minimum of four duct diameters from elbows, transitions, and duct takeoffs.
C. Provide ceiling access doors or locate units above easily removable ceiling components.
D. Support units individually from structure with wire rope complying with ASTM A492 and ASTM A603 in accordance with SMACNA (SRM). See Section 23 0548.
E. Do not support from ductwork.
F. Connect to ductwork in accordance with Section 233100.

END OF SECTION 233600

SECTION 233700 - AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Diffusers:

B. Rectangular ceiling diffusers.

C. Slot ceiling diffusers.

D. Registers/grilles:
   1. Ceiling-mounted, exhaust and return register/grilles.
   2. Ceiling-mounted, linear exhaust and return register/grilles.
   3. Ceiling-mounted, supply register/grilles.
   4. Wall-mounted, supply register/grilles.
   5. Wall-mounted, exhaust and return register/grilles.

E. Duct-mounted supply and return registers/louvers.

F. Fabric air distribution devices.

G. Louvers:
   1. Combination louvers.

H. Goosenecks.

I. Gravity ventilators.

1.02 REFERENCE STANDARDS

A. AHRI 880 (I-P) - Performance Rating of Air Terminals; 2017 (Reaffirmed 2023).

B. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2023.

C. ASHRAE Std 70 - Method of Testing the Performance of Air Outlets and Air Inlets; 2023.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2026.

E. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

F. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2027.

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

H. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

J. UL 2518 - Standard for Safety Air Dispersion Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 013000 - 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. Project Record Documents: Record actual locations of air outlets and inlets.

1.04 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. American Louver Company

B. Carnes, a division of Carnes Company Inc

C. Krueger-HVAC

D. Linx Industries, Inc, a DMI Company

E. Price Industries

F. Prihoda North America

G. Ruskin Company

H. Titus, a brand of Air Distribution Technologies

I. Tuttle and Bailey

J. Or Approved Equal.

2.02 RECTANGULAR CEILING DIFFUSERS

A. Type: Provide rectangular and square formed adjustable and core removable ceiling diffusers constructed to maintain 360 degree discharge air pattern with sectorizing baffles where indicated.

B. Connections: Round.

C. Frame: Provide surface mount and inverted T-bar type. In plaster ceilings, provide plaster frame and ceiling frame.

D. Fabrication: Steel with baked enamel finish.

E. Color: As selected by Architect from manufacturer's standard range.

F. Accessories: Provide radial opposed blade volume control damper; removable core, wire guard, equalizing grid, operating rod extension, anti-smudging device, and gaskets for surface mounted diffusers with damper adjustable from diffuser face.

2.03 CEILING SLOT DIFFUSERS

A. Type: Continuous 1/2 inch wide slot, 1 slots wide, with adjustable vanes for left, right, or vertical discharge; integral ceiling fire damper.

B. Fabrication: Aluminum extrusions with factory clear lacquer finish.

C. Color: To be selected by Architect from manufacturer's standard range.

D. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket, mitered end border.

E. Plenum: Integral, galvanized steel, insulated.

2.04 DUCT-MOUNTED SUPPLY AND RETURN REGISTERS/LOUVERS

A. Type: Duct-mounted, rectangular register for round-spiral duct with adjustable pivot-ended blades, end caps, built-in volume damper, and dual cover flanges to lay flush on duct surface regardless of diameter. Performance to match manufacturer's catalog data.

B. Material: 22 gauge, 0.0299 inch.

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: 1-1/4 inch margin with countersunk screw mounting and gasket.

C. Color: As selected by Architect from manufacturer's standard range.

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, vertical face.

B. Frame: 1-1/4 inch margin with countersunk screw mounting.

C. Fabrication: Steel with 20 gauge, 0.0359 inch minimum frames and 22 gauge, 0.0299 inch minimum blades, steel and aluminum with 20 gauge, 0.0359 inch minimum frame, or aluminum extrusions, with factory baked enamel finish.

D. Color: To be selected by Architect from manufacturer's standard range.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.07 CEILING LINEAR EXHAUST AND RETURN GRILLES

A. Type: Streamlined blades with 90 degree one-way deflection, 1/8 by 3/4 inch on 1/4 inch centers.

B. Frame: 1-1/4 inch margin, extra heavy for floor mounting, with countersunk screw mounting.

C. Fabrication: Steel with 20 gauge, 0.0359 inch minimum frames and 22 gauge, 0.0299 inch minimum blades, steel and aluminum with 20 gauge, 0.0359 inch minimum frame, or aluminum extrusions, with factory baked enamel finish.

D. Color: To be selected by Architect from manufacturer's standard range.

E. 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, vertical face, single deflection.

B. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille with two-way deflection.

C. Frame: 1-1/4 inch margin with countersunk screw mounting and gasket.

D. Fabrication: Steel with 20 gauge, 0.0359 inch minimum frames and 22 gauge, 0.0299 inch minimum blades, steel and aluminum with 20 gauge, 0.0359 inch minimum frame, or aluminum extrusions, with factory baked enamel finish.

E. Fabrication: Aluminum extrusions with factory clear lacquer finish.

F. Color: To be selected by Architect from manufacturer's standard range.

G. Damper: Integral, gang-operated opposed blade type with removable key operator, operable from face.

2.09 WALL EXHAUST AND RETURN REGISTERS/GRILLES

A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with spring or other device to set blades, vertical face.

B. Frame: 1-1/4 inch margin with countersunk screw mounting.

C. Fabrication: Steel frames and blades, with factory baked enamel finish.

D. Color: To be selected by Architect from manufacturer's standard range.

E. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.10 FABRIC AIR DISTRIBUTION DEVICES

A. General Requirements:
   1. Diffuser material to comply with ASTM E84, UL 723, UL 2518, NFPA 90A, and NFPA 90B.
   2. Air Dispersion Method:
   3. Hanger Supports:

2.11 LOUVERS

A. Type: 4 inch deep frame with blades on 45 degree slope with center baffle and return bend, heavy channel frame, 1/2 inch square mesh screen over intake or exhaust end.

B. Fabrication: 16 gauge, 0.0598 inch (1.52 mm) thick galvanized steel thick galvanized steel welded assembly, with factory prime coat finish.

C. Color: To be selected by Architect from manufacturer's standard range.

D. Mounting: Furnish with interior flat flange for installation.

2.12 GOOSENECKS

A. Fabricate in accordance with of minimum 18 gauge, 0.0598 inch galvanized steel.

B. Mount on minimum 12 inch high curb base where size exceeds 9 by 9 inch.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Comply with SMACNA (ASMM) for flashing/counter-flashing of roof penetrations and supports for roof curbs and roof mounted equipment.

C. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

D. Install diffusers to ductwork with air tight connection.

E. Provide balancing dampers on duct take-off to diffusers and grilles and registers, despite whether dampers are specified as part of diffuser, or grille and register assembly.

F. Paint ductwork visible behind air outlets and inlets matte black, see Section 099123.

3.02 CLOSEOUT ACTIVITIES

A. Demonstrate operational system to Owner's representative.

B. Instruct Owner's representative to maintain system and use occupant controls or interfaces, as required.

3.03 PROTECTION

A. Protect installed products until completion of project.

B. Replace, repair, or touch-up damaged products before Substantial Completion.

END OF SECTION 233700

SECTION 234000 - HVAC AIR CLEANING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electronic air cleaners.

1.02 REFERENCE STANDARDS

A. UL 867 - Electrostatic Air Cleaners; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on filter media, filter performance data, filter assembly and filter frames, dimensions, motor locations and electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 ELECTRONIC AIR CLEANERS

A. Manufacturers:
   1. Honeywell; _____: www.honeywell.com/#sle.
   2. ProtectED; _____: www.protecteducation.com/#sle.
   3. United Air Specialists, Inc, a Clarcor Company; _____: www.uasinc.com/#sle.
   4. Universal Air & Gas Products Corporation; _____: www.uapc.com/#sle.
   5. Or Approved Equal.

B. Assembly: UL 867; galvanized steel assembly containing electronic agglomerator and disposable panel filters.

C. Electronic Agglomerator: Independently supported and nested collection cells of aluminum construction including ionizing section consisting of alternately spaced grounded struts and charged ionizing wires, and collecting section consisting of alternately grounded and charged plates, with insulators located out of air stream.

D. Power Supply: Self-contained, pre-wired rectifying unit to convert 120 VAC, single phase, 60 Hz to approximately 12,000 VDC for ionizer and 6,000 VDC for collector, including overload protection, on-off switch, and pilot light indicating operating status.

E. Safety Accessories: Manual reset safety switches and warning lights for filter plenum access doors, signal lights and safety switching upstream and downstream of unit within duct, and enameled high voltage warning signs.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install air cleaning devices in accordance with manufacturer's instructions.

B. Prevent passage of unfiltered air around filters with felt, rubber, or neoprene gaskets.

C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with clean set.

END OF SECTION 234000

SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured breechings.

1.02 REFERENCE STANDARDS

A. NFPA 54 - National Fuel Gas Code; 2024.

B. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances; 2027.

C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

D. UL 103 - Factory-Built Chimneys for Residential Type and Building Heating Appliances; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights, electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 BREECHINGS, CHIMNEYS, AND STACKS - GENERAL REQUIREMENTS

A. Regulatory Requirements:
   1. Comply with applicable codes for installation of natural gas burning appliances and equipment.
   2. Factory-built vents and chimneys used for venting natural draft appliances to comply with NFPA 211 and UL listed and labeled.

2.02 MANUFACTURED BREECHINGS

A. Provide factory-built, modular connector and manifold system, tested to UL 103 with positive pressure rating.

B. Assembly to be UL listed for use with building equipment in accordance with NFPA 211.

C. Fabricate with 1-inch minimum body soluble fiber insulation between walls, and construct inner liner of 20-gauge, 0.0375-inch 304 stainless steel and outer jacket of 24-gauge, 0.0239-inch aluminized steel.

1. Protect aluminized steel surfaces exposed to elements with a minimum of one base coat of primer and one finish coat of corrosion-resistant paint suitable for outer jacket skin temperatures of application.

D. Design, fabricate, and install gastight to prevent products of combustion from leaking into building.
   1. Securely connect inner joints, and seal with factory-supplied overlapping V-bands and appropriate sealant in accordance with manufacturer's instructions.
   2. Design system to compensate for all flue-gas-induced thermal expansion.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 54

C. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.

D. Rigidly support breechings from building structure with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12-foot spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA (DCS) for equivalent duct support configuration and size.

E. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.

END OF SECTION 235100

SECTION 235216 - CONDENSING BOILERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured units.
B. Boiler construction.
C. Boiler trim.
D. Fuel burning system.
E. Factory installed controls.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete.
B. Section 230913 - Instrumentation and Control Devices for HVAC.
C. Section 232114 - Hydronic Specialties.
D. Section 232123 - Hydronic Pumps.
E. Section 232500 - HVAC Water Treatment.
F. Section 235100 - Breechings, Chimneys, and Stacks.
G. Section 251500 - Integrated Automation Software.
H. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. AHRI Directory of Certified Product Performance - Air-Conditioning, Heating, and Refrigeration Institute (AHRI); Current Edition.
B. ANSI Z21.13 - American National Standard for Gas-Fired Low-Pressure Steam and Hot Water Boilers; 2022.
C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. ASME BPVC-IV - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers; 2025, with Errata.
E. NBBI Manufacturer and Repair Directory - The National Board of Boiler and Pressure Vessel Inspectors (NBBI); Current Edition.
F. NFPA 54 - National Fuel Gas Code; 2024.
G. SCAQMD 1146.1 - Emissions of Oxides of Nitrogen from Small Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters; 1990, with Amendment (2018).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittals procedures.

B. Product Data: Provide data indicating general assembly, components, controls, safety controls, and wiring diagrams with electrical characteristics and connection requirements, and service connections.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Natural Gas, Propane, or Combination Natural Gas/Propane for Indoor Applications:
   1. RBI Boilers; _____: www.RBIWaterheaters.com/#sle.
   2. Lochinvar LLC; _____: www.lochinvar.com/#sle.
   3. The Fulton Companies; _____: www.fulton.com/#sle.
   4. Or Equal.
   5. Substitutions: See Section 016000 - Product Requirements.

2.02 MANUFACTURED UNITS

A. Factory assembled, factory fire-tested, self-contained, readily transported unit ready for automatic operation except for connection of water, fuel, electrical, and vent services.

B. Unit: Metal membrane wall, water or fire tube, condensing boiler on integral structural steel frame base with integral fuel burning system, firing controls, boiler trim, insulation, and removable jacket, suitable for indoor application.

2.03 BOILER CONSTRUCTION

A. Comply with the minimum requirements of ASME BPVC-IV and ANSI Z21.13 for construction of boilers.

B. Assembly to bear the ASME "H" stamp and comply with the efficiency requirements of the latest edition of ASHRAE Std 90.1 I-P.

C. Required Directory Listings:
   1. AHRI Directory of Certified Product Performance - Air-Conditioning, Heating, and Refrigeration Institute (AHRI); current edition at www.ahrinet.org.
   2. NBBI Manufacturer and Repair Directory - The National Board of Boiler and Pressure Vessel Inspectors (NBBI); current edition at www.nationalboard.org.

D. Heat Exchanger: Construct with materials that are impervious to corrosion where subject to contact with corrosive condensables.

E. Provide adequate tappings, observation ports, removable panels, and access doors for entry, cleaning, and inspection.

F. Insulate casing with insulation material, protected and covered by heavy-gauge metal jacket.

G. Factory apply boiler base and other components, that are subject to corrosion, with durable, acrylic, powder coated, painted, or weather-proofed finish.

2.04 BOILER TRIM

A. ASME rated pressure relief valve.

B. Flow switch.

C. Electronic Low Water Cut-off: Complete with test light and manual reset button to automatically prevent firing operation whenever boiler water falls below safe level.

D. Temperature and pressure gauge.

E. Pressure Switches:
   1. High gas pressure.
   2. Low gas pressure.
   3. Air pressure.

F. Manual reset high limit.

G. Boiler Pump (where required by boiler design):
   1. Primary pump, factory supplied and sized for field installation to ensure minimum, continuous circulation through boiler.
   2. Where pump is not provided by boiler manufacturer, provide pump in accordance with boiler manufacturer's recommendations.
   3. Pump time delay.

2.05 FUEL BURNING SYSTEM

A. Provide forced draft automatic burner or pulse combustion, integral to boiler, designed to burn natural gas, propane, and No. 2 fuel oil, and maintain fuel-air ratios automatically.
   1. Blower Design: Statically and dynamically balanced to supply combustion air; direct connected to motor.
   2. Forced Draft Design: Mixes combustion air and gas to achieve 90 percent combustion efficiency.
   3. Pulse Combustion Design: Self-aspirating, not requiring blower for combustion.
   4. Combustion Air Filter: Protects fuel burning system from debris.

B. Gas Train: Plug valve, safety gas valve, gas-air ratio control valve, and pressure regulator controls air and gas mixture.

C. Emission of Oxides of Nitrogen Requirements: Comply with SCAQMD 1146.1 for natural gas fired system, as applicable.

D. Intakes: Combustion air intake capable of accepting free mechanical room air or direct outside air through a sealed intake pipe.

2.06 FACTORY INSTALLED CONTROLS

A. Option for internal or external (0-10) VDC control.

B. Temperature Controls:
   1. Automatic reset type to control fuel burning system on-off and firing rate to maintain temperature.
   2. Manual reset type to control fuel burning system to prevent boiler water temperature from exceeding safe system water temperature.
   3. Low-fire start time delay relay.

C. Electronic PI setpoint/modulation control system.

D. Microprocessor-based, fuel/air mixing controls.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install boiler and provide connection of natural gas service in accordance with requirements of NFPA 54 and applicable codes.

C. Install boiler on concrete housekeeping base, sized minimum of 4 inches larger than boiler base in accordance with Section 033000.

D. Coordinate factory installed controls with Section 230913.

E. Coordinate provisions for water treatment in accordance with Section 232500.

F. Pipe relief valves to nearest floor drain.

G. Pipe cooled condensate produced by the combustion process from the boiler condensate connection and/or flue stack with suitable piping material to neutralizer prior to discharging into nearest floor drain.

H. Install primary boiler pump in accordance with Section 232123.

I. Provide piping connection and accessories in accordance with Section 232114.

J. Provide for connection to electrical service in accordance with Section 260583.

K. Connect vent combustion generated fumes to breeching, chimney or exhaust stack; see Section 235100.

L. Coordinate BAS, BMS, or Integrated Automation linking between unit controller(s) and remote front-end interface; see Section 251500.

END OF SECTION 235216

SECTION 237416 - PACKAGED ROOFTOP AIR-CONDITIONING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Packaged, small-capacity, rooftop air-conditioning units.

B. Packaged, intermediate-capacity, rooftop air-conditioning units.

C. Split-system rooftop units.

1.02 RELATED REQUIREMENTS

A. Section 076200 - Sheet Metal Flashing and Trim.

B. Section 077200 - Roof Accessories: Placement and installation of factory fabricated roof mounting curbs.

C. Section 230548 - Vibration and Seismic Controls for HVAC.

D. Section 230913 - Instrumentation and Control Devices for HVAC: Control components, time clocks.

E. Section 230913 - Instrumentation and Control Devices for HVAC: Installation of thermostats and other control components.

F. Section 260583 - Wiring Connections: Installation and wiring of thermostats and other control components; wiring from unit terminal strip to remote panel.

G. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.

B. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. Modbus (PS) - The Modbus Organization Communications Protocol.; Latest Update.

D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

C. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.

E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

F. Warranty: Submit manufacturer's warranty and ensure forms have been filled out 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 016000 - Product Requirements for additional provisions.

1.05 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carrier Corporation

B. Johnson Controls International, PLC

C. Rheem Manufacturing Company Inc

D. Trane Technologies, PLC

E. Or Approved Equal.

2.02 PACKAGED, SMALL-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS

A. General: Roof mounted units having gas burner and electric refrigeration that are 6 tons and smaller in capacity.

B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, heat recovery coil, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

C. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.

D. Disconnect Switch: Factory mount disconnect switch in control panel.

2.03 PACKAGED, INTERMEDIATE-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS

A. General: Roof mounted units having gas burner and electric refrigeration that are 7.5 tons to 25 tons in capacity.

B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, heat recovery coil, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

C. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.

D. Disconnect Switch: Factory mount disconnect switch in control panel.

2.04 SPLIT-SYSTEM ROOFTOP UNITS

A. Manufacturers:
   1. Daikin Applied
   2. LG Electronics U.S.A., Inc
   3. Or Approved Equal.

B. General: Roof mounted units having gas burner and electric refrigeration that are 3 to 6 tons in capacity.

C. Description: Split-system, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, heat recovery coil, controls, air filters, refrigerant cooling coil.

D. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.

E. Disconnect Switch: Factory mount disconnect switch in control panel.

2.05 CASING

A. Cabinet: Steel with baked enamel finish, including access panels with screwdriver-operated flush, cam type fasteners. Structural members to be minimum 18 gauge, 0.0478 inch, with access doors or panels of minimum 20 gauge, 0.0359 inch.

B. Insulation: One-inch thick, neoprene-coated glass fiber with edges protected from erosion.

2.06 FANS

A. Supply and Return Fan: Forward curved centrifugal type, resiliently mounted with V-belt drive, adjustable variable pitch pulley, and rubber isolated hinge mounted. Provide with high efficiency motor or direct drive as indicated. Isolate complete fan assembly. See Section 230548.

2.07 BURNERS

A. Gas Burner: Atmospheric type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame-sensing device, and automatic 100 percent shutoff pilot.

B. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after airflow proven and slight delay, allow gas valve to open.

C. High Limit Control: Temperature sensor with fixed stop at maximum permissible setting, de-energize burner on excessive bonnet temperature, and energize burner when temperature drops to lower safe value.

D. Supply Fan Control: Temperature sensor sensing bonnet temperatures and independent of burner controls, with provisions for continuous fan operation.

2.08 EVAPORATOR COIL

A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.

B. Provide capillary tubes or thermostatic expansion valves for units of 6 tons capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons cooling capacity and larger.

2.09 CONDENSER COIL

A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.

B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

C. Provide refrigerant pressure switches to cycle condenser fans.

2.10 HEAT RECOVERY COIL

A. Provide copper tube aluminum fin coil assembly with multiple circuits arranged to provide heat recovery.

2.11 COMPRESSORS

A. Provide hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and filter drier.

2.12 MIXED AIR CASING

A. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Outside air damper to fall to closed position. Relief dampers may be gravity balanced.

B. Gaskets: Provide tight fitting dampers with edge gaskets.

C. Damper Operator: 24 volts with gear train sealed in oil.

D. Damper Operator, Units 7.5 Ton Cooling Capacity and Larger: 24 volt with gear train sealed in oil with spring return on.

E. Mixed Air Controls: Maintain selected supply air temperature and return dampers to minimum position on call for heating and above 75 degrees F ambient, or when ambient air temperature exceeds return air temperature.

2.13 AIR FILTERS:

A. 2-inch thick, glass fiber disposable media in metal frames.

2.14 OPERATING CONTROLS

A. Provide low voltage, adjustable room thermostat to control burner operation, compressor and condenser fan, and supply fan to maintain temperature setting.
   1. Include system selector switch heat-off-cool and auto-on fan control switch.

B. Provide remote-mounted auto-on fan control switch.

2.15 OPERATING CONTROLS - SINGLE ZONE UNITS

A. Electric solid state microcomputer-based room thermostat, located as indicated in service area with remote sensor located as indicated in service area with remote sensor.

B. Room thermostat to incorporate:
   1. Automatic switching from heating to cooling.
   2. Preferential rate control to minimize overshoot and deviation from setpoint.
   3. Set up for four separate temperatures per day.
   4. Instant override of setpoint for continuous or timed period from one hour to 31 days.
   5. Short cycle protection.
   6. Programming based on weekdays, Saturday and Sunday.
   7. Switch selection features including imperial or metric display, 12- or 24-hour clock, keyboard disable, remote sensor, fan on-auto.

C. Room thermostat display to include:
   1. Actual room temperature.
   2. Programmed temperature.
   3. Programmed time.
   4. Time of day.
   5. Day of week.
   6. System model indication: heating, cooling, auto, off, fan auto, fan on.

2.16 OPERATING CONTROLS - VARIABLE VOLUME UNITS

A. Temperature transmitter located in supply air to signal electronic logic panel to control mixing dampers and cooling in sequence. Mixing section to operate as first stage of cooling and revert to minimum outside air above approximately 75 degrees F as determined by enthalpy of return and outdoor air.

B. Control cooling by cycling compressors, cylinder unloading, and hot gas bypass.

C. Control logic to allow supply air reset under low load or airflow conditions.

D. Seven day time clock with spring carry over or electronic clock with battery backup to control unit on occupied/unoccupied schedule. At night, unit to switch off. Locate clock in remote control panel with status lights.

E. Provide two stage morning warm-up thermostat to hold outdoor dampers closed and energize heat until return air temperature reaches setpoint.

F. Provide within roof curb, bypass dampers, bypassing air from supply fan discharge to return fan inlet to control duct static pressures. Control operation by sensing current to supply fan motor.

2.17 ROOF CURBS

A. Roof Mounting Curb: 14 inches high, galvanized steel, channel frame with gaskets, nailer strips.

2.18 AIR-SOURCE OUTDOOR UNITS FOR SPLIT-SYSTEM ROOFTOP UNITS

A. Manufacturers:
   1. Heat Recovery, Cooling and Heating Outdoor Units:
      a. Daikin
      b. LG Electronics U.S.A., Inc
      c. Mitsubishi Electric Trane HVAC US, LLC
      d. Or Approved Equal.

B. Air Conditioning Type:
   1. DX refrigeration unit piped to one or more compatible indoor units either directly or indirectly through one or more intermediate refrigeration branch units.

C. Unit Cabinet:
   1. Capable of being installed with wiring and piping to the left, right, rear, or bottom.
   2. Designed to allow side-by-side installation with minimum spacing and vibration isolation.
   3. Weatherproof and corrosion resistant; rust-proofed mild steel panels coated with baked enamel finish.

D. Heat Sink Side:
   1. Condenser Fans:
      a. Provide minimum of two fans for each condenser within the outdoor unit.
      b. Minimum External Static Pressure: Factory set at 0.12 in-wc.
      c. Fan Type: Vertical discharging, direct-driven propeller type with variable speed operation using DC-controlled ECM motors mechanically connected using permanently lubricated bearings having whole assembly protected with fan guards.
   2. Condenser Coils:
      a. Copper tubes expanded into aluminum fins to form mechanical bond; waffle louver fin and rifled bore tube design to ensure high efficiency performance.

E. Refrigeration Side:
   1. Factory assembled and wired with instrumentation, switches, and controller(s) to handle unit specifics with direct coordination of remote controller(s) from indoor unit(s).
   2. Refrigeration Circuit: ECM driven dual scroll compressors, fans, condenser heat sink coil, expansion valves, solenoid valves, distribution headers, capillaries, filters, shutoff valves, oil separators, service ports, and refrigerant regulator.
   3. Refrigerant: R-410a factory charged. Controller to alarm when charge is below capacity.
   4. Variable Volume Control: Modulate compressed refrigerant capacity automatically to maintain constant suction and condensing pressures under

varying refrigerant volume required to handle remote loads. Include defrost control.

5. Provide refrigerant subcooling to ensure the liquid refrigerant does not flash when supplying to indoor units.
6. Capable of heating operation at low end of operating range as specified, without additional low ambient controls or auxiliary heat source; during heating operation, reverse cycle, oil return, or defrost is not permitted due to potential reduction in space temperature.
7. Power Failure Mode: Automatically restarts operation after power failure without loss of programmed settings.
8. Safety Devices: High pressure sensor with cut-out switch, low pressure sensor with cut-out switch, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, overcurrent protection for the inverter and antirecycling timers.
9. Oil Recovery Cycle: Automatic, occurring 2 hours after start of operation and then every 8 hours of operation; maintain continuous heating during oil return operation.

F. Local Controls:
   1. Include factory-wired instruments, sensors, switches, and safeties for unit control.
   2. Configure to coordinate internal unit operation with remote indoor units and with built-in capacity to coordinate other manifolded outdoor units and remote refrigerant branch unit(s).
   3. Include screen and button interface to setup operating schedules, setpoints, alarms, and remote unit setpoint coordination. Also used for system troubleshooting.
   4. Self diagnostic, auto-check functions to detect malfunctions and display the type and location.

G. Power:
   1. Electrical Requirement: 208 to 230 VAC, 3-phase, 60 Hz.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that roof is ready to receive work and opening dimensions are as required by manufacturer.

B. Verify that proper power supply is available.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 90A.

C. Mount units on factory built roof mounting curb providing watertight enclosure to protect ductwork and utility services. Install roof mounting curb level.

3.03 SYSTEM STARTUP

A. Prepare and start equipment. Adjust for proper operation.

3.04 MAINTENANCE

A. Provide service and maintenance of packaged rooftop units for one year from Date of Substantial Completion.

B. Provide routine maintenance service with a two-month interval as maximum time period between calls.

C. Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.

D. After each service call, submit copy of service call work order or report that includes description of work performed.

END OF SECTION 237416

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2024).

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).

E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2024.

F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2020.

G. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

H. NECA 120 - Standard for Installing Armored Cable (AC) and Type Metal-Clad (MC) Cable; 2018.

I. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.

J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

L. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

M. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

N. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

O. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

Q. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.02 PROJECT INCLUDES

A. Single conductor building wire.

B. Metal-clad cable.

C. Wire and cable for 600 volts and less.

D. Wiring connectors.
E. Electrical tape.
F. Heat shrink tubing.
G. Wire pulling lubricant.

1.03 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 260513 - Medium-Voltage Cable: Cables and terminations for systems 601 V through 35,000 V.
C. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
D. Section 283100 - Fire Detection and Alarm: Fire alarm system conductors and cables.
E. Section 312316 - Excavation.
F. Section 312316.13 - Trenching: Excavating, bedding, and backfilling.

1.04 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2001 (Reapproved 2007).
B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011.
C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010.
D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2009).
E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010.
F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2008.
G. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
H. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); National Electrical Contractors Association; 2006.
I. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; National Electrical Manufacturers Association; 2009 (ANSI/NEMA WC 70/ICEA S-95-658).
J. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.
K. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
L. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

M. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

N. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

O. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

P. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.

Q. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

R. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.05 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.

1.06 SUBMITTALS

A. See Section 013000 - 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. Product Data: Provide for each cable assembly type.

D. Test Reports: Indicate procedures and values obtained.

E. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors. Include proposed modifications to raceways, boxes, wiring gutters, enclosures, etc. to accommodate substituted conductors.

F. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

G. Project Record Documents: Record actual locations of components and circuits.

1.07 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.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees Fahrenheit, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.

C. Products: Furnish products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 PRODUCTS

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. Nonmetallic-sheathed cable is not permitted.

D. Underground feeder and branch-circuit cable is not permitted.

E. Service entrance cable is not permitted.

F. Armored cable is not permitted.

G. 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. In addition to other applicable restrictions, may not be used:
      a. Where not approved for use by the authority having jurisdiction.
      b. Where exposed to view.
      c. Where exposed to damage.
      d. For damp, wet, or corrosive locations.
      e. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.

H. Concealed Dry Interior Locations: Use only building wire with Type THHN insulation in raceway.

I. Exposed Dry Interior Locations: Use only building wire with Type THHN insulation in raceway.

J. Above Accessible Ceilings: Use only building wire with Type THHN insulation in raceway.

K. K.Wet or Damp Interior Locations: Use only building wire with Type THWN insulation in raceway.

L. Exterior Locations: Use only building wire with Type THWN insulation in raceway.

M. Underground Installations: Use only building wire with Type THWN insulation in raceway.

N. Use solid conductor for feeders and branch circuits 10 AWG and smaller.

O. Use stranded conductors for control circuits.

P. Use conductor not smaller than 12 AWG for power and lighting circuits.

Q. Use conductor not smaller than 18 AWG for control circuits.

R. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.

S. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.

2.02 CONDUCTOR AND CABLE MANUFACTURERS

A. Cerro Wire LLC: www.cerrowire.com.

B. Southwire Company: www.southwire.com.

C. Substitutions: See Section 016000 - Product Requirements.

2.03 ALL CONDUCTORS AND CABLES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose indicated.

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 for Grounding and Bonding: Also comply with Section 260526.

I. IConductors 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 200 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. 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.
a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
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. Isolated Ground, All Systems: Green with yellow stripe.
e. Travelers for 3-Way and 4-Way Switching: Pink.
f. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
g. For control circuits, comply with manufacturer's recommended color code.

2.04 2.4 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
1. Copper Building Wire:
a. Cerro Wire LLC: www.cerrowire.com.
b. Encore Wire Corporation: www.encorewire.com.
c. Southwire Company: www.southwire.com.
d. Substitutions: See Section 016000 - Product Requirements.

B. Description: Single conductor insulated wire.

C. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: 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.
      b. Fixture Wiring Within Luminaires: Type TFFN/TFN for luminaires with labeled maximum temperature of 194 degrees Fahrenheit; Approved suitable type for luminaires with labeled maximum temperature greater than 90 degrees C.

2.05 METAL-CLAD CABLE

A. Manufacturers:
   1. AFC Cable Systems Inc: www.afcweb.com.
   2. Encore Wire Corporation: www.encorewire.com.
   3. Southwire Company: www.southwire.com.
   4. Substitutions: See Section 016000 - 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:
   1. Size 10 AWG and Smaller: Solid.
   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.

2.06 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 260526.

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. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees Fahrenheit for standard applications and 302 degrees Fahrenheit 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.
      b. Ideal Industries, Inc: www.idealindustries.com.
      c. NSI Industries LLC: www.nsiindustries.com.
      d. Substitutions: See Section 016000 - Product Requirements.

H. Mechanical Connectors: Provide bolted type or set-screw type.
   1. Manufacturers:
      a. Burndy: www.burndy.com.
      b. Ilsco: www.ilsco.com.
      c. Thomas & Betts Corporation: www.tnb.com.
      d. Substitutions: See Section 016000 - Product Requirements.

I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
   1. Manufacturers:
      a. Burndy: www.burndy.com.
      b. Ilsco: www.ilsco.com.
      c. Thomas & Betts Corporation: www.tnb.com.
      d. Substitutions: See Section 016000 - Product Requirements.

2.07 WIRING ACCESSORIES

A. Electrical Tape:
   1. Manufacturers:
      a. 3M: www.3m.com.
      b. Plymouth Rubber Europa: www.plymouthrubber.com.
      c. Substitutions: See Section 016000 - Product Requirements.
   2. Vinyl Color Coding Electrical Tape: Integrally 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.
4. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
5. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.
6. Varnished Cambric Electrical Tape: Cotton cambric fabric tape, with or without adhesive, oil-primed and coated with high-grade insulating varnish; minimum thickness of 7 mil; suitable for continuous temperature environment up to 221 degrees F.
7. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
   1. Manufacturers:
      a. 3M: www.3m.com.
      b. Burndy: www.burndy.com.
      c. Thomas & Betts Corporation: www.tnb.com.
      d. Substitutions: See Section 016000 - Product Requirements.

C. 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.
      b. American Polywater Corporation: www.polywater.com.
      c. Ideal Industries, Inc: www.idealindustries.com.
      d. Substitutions: See Section 016000 - 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 permitted, under the following conditions:
      a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
      b. Increase size of conductors as required to account for ampacity derating.
      c. Size raceways, boxes, etc. to accommodate conductors.
   8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three 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.
   9. Provide oversized neutral/grounded conductors where indicated and as specified below.
      a. Provide 200 percent rated neutral for feeders fed from K-rated transformers.
      b. Provide 200 percent rated neutral for feeders serving panelboards with 200 percent rated neutral bus.

B. Install products in accordance with manufacturer's instructions.

C. Install conductors and cable in a neat and workmanlike manner in accordance with NECA 1.

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. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

G. 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.
   1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
   2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.

H. 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.

I. Install conductors with a minimum of 12 inches of slack at each outlet.

J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

K. 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.

L. 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.
   1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
      a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.
      b. For taped connections likely to require re-entering, including motor leads, first apply varnished cambric electrical tape, followed by adequate amount of rubber splicing electrical tape, followed by outer covering of vinyl insulating electrical tape.
   2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
      a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
      b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.

3. Wet Locations: Use heat shrink tubing.

M. Insulate ends of spare conductors using vinyl insulating electrical tape.

N. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

P. 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. Perform inspection, testing, and adjusting in accordance with Section 014000.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD 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.

1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

COPART 1 GENERAL

1.01 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2025.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.

D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. NFPA 780 - Standard for the Installation of Lightning Protection Systems; 2023.

F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.02 PROJECT INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Ground bars.

D. Ground rod electrodes.

E. Grounding and bonding components.

1.03 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 033000 - Cast-in-Place Concrete.

1.04 1.3 REFERENCE STANDARDS

A. IEEE 81 - Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System; 1983.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; National Electrical Manufacturers Association; 2007.

D. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

E. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 780 - Standard for the Installation of Lightning Protection Systems; National Fire Protection Association; 2011.

G. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify exact locations of underground metal water service pipe entrances to building.
   2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.06 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms.

1.07 SUBMITTALS

A. See Section 013000 - 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:
   1. Indicate proposed arrangement for signal reference grids. Include locations of items to be bonded and methods of connection.

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.

E. Field quality control test reports.

F. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.08 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. Installer Qualifications for Signal Reference Grids: Company with minimum five years documented experience with high frequency grounding systems.

1.09 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. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. 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.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. 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 according to IEEE 81 using "point-to-point" methods.

E. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Metal Underground Water Pipe(s):
      a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet at an accessible location not more than 5 feet from the point of entrance to the building.
      b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
      c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
   3. Metal Building or Structure Frame:
      a. Provide connection to metal building or structure frame effectively grounded in accordance with NFPA 70 at nearest accessible location.

4. Ground Rod Electrode(s):
    a. Provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.
    b. Space electrodes not less than 10 feet from each other and any other ground electrode.
    c. Where location is not indicated, locate electrode(s) at least 5 feet outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
5. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.
6. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service-supplied system grounding to this ground bar.
    a. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.
    b. Where ground bar location is not indicated, locate in accessible location as near as possible to service disconnect enclosure.
    c. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

F. Service-Supplied System Grounding:
1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

G. Grounding for Separate Building or Structure Supplied by Feeder(s) or Branch Circuits:
1. Provide grounding electrode system for each separate building or structure.
2. Provide equipment grounding conductor routed with supply conductors.
3. For each disconnecting means, provide grounding electrode conductor to connect equipment ground bus to grounding electrode system.
4. Do not make any connections and remove any factory-installed jumpers between neutral (grounded) conductors and ground.

H. Separately Derived System Grounding:
1. Separately derived systems include, but are not limited to:
    a. Transformers (except autotransformers such as buck-boost transformers).
    b. Uninterruptible power supplies (UPS), when configured as separately derived systems.
    c. Generators, when neutral is switched in the transfer switch.
2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.
3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the

derived system. Make connection at same location as grounding electrode conductor connection.

4. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

I. 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 gas piping.

J. Communications Systems Grounding and Bonding:
1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with NFPA 70.
2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.
    a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
    b. Raceway Size: 3/4 inch unless otherwise indicated or required.
    c. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.
    d. Ground Bar Mounting Height: 18 inches above finished floor unless otherwise indicated.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
1. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated.

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 260519:
   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.
   4. Manufacturers - Mechanical and Compression Connectors:
      a. Burndy: www.burndy.com.
      b. Harger Lightning & Grounding: www.harger.com.
      c. Thomas & Betts Corporation: www.tnb.com.
      d. Substitutions: See Section 016000 - Product Requirements.

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:
      a. Erico International Corporation: www.erico.com.
      b. Harger Lightning & Grounding: www.harger.com.
      c. ThermOweld, a brand of Continental Industries, Inc: www.thermoweld.com.
      d. Substitutions: See Section 016000 - Product Requirements.

E. Ground Rod Electrodes:
   1. Comply with NEMA GR 1.
   2. Material: Copper-bonded (copper-clad) steel.
   3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.
   4. Manufacturers:
      a. Erico International Corporation: www.erico.com.
      b. Galvan Industries, Inc: www.galvanelectrical.com.
      c. Harger Lightning & Grounding: www.harger.com.
      d. Substitutions: See Section 016000 - Product Requirements.

2.03 PRODUCTS

A. Rod Electrodes: Copper.
   1. Diameter: 3/4 inch.
   2. Length: 10 feet.

B. Foundation Electrodes: 2/0 AWG.

2.04 CONNECTORS AND ACCESSORIES

A. Mechanical Connectors: Bronze.

B. Exothermic Connections:

C. Wire: Stranded copper.

D. Grounding Electrode Conductor: Size to meet NFPA 70 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. Install grounding and bonding system components in a neat and workmanlike manner in accordance with NECA 1.

C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches deep in accordance with NFPA 70 or provide ground plates.
   1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches below finished grade.

D. 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.

E. Identify grounding and bonding system components in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL

A. Perform inspection in accordance with Section 014000.

B. Inspect and test in accordance with NETA STD ATS except Section 4.

C. Perform inspections and tests listed in NETA STD 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 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

D. MFMA-4 - Metal Framing Standards Publication; 2004.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 5B - Strut-Type Channel Raceways and Fittings; Current Edition, Including All Revisions.

1.02 PROJECT INCLUDES

A. Support and attachment components for equipment, conduit, cable, boxes, and other electrical work.

1.03 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.

B. Section 260534 - Conduit: Additional support and attachment requirements for conduits.

C. Section 260537 - Boxes: Additional support and attachment requirements for boxes.

D. Section 265100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.

E. Conduit and equipment supports.

F. Anchors and fasteners.

1.04 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2012.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2011.

D. MFMA-4 - Metal Framing Standards Publication; Metal Framing Manufacturers Association; 2004.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

F. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 5B - Strut-Type Channel Raceways and Fittings; Current Edition, Including All Revisions.

1.05 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 033000.

1.06 SUBMITTALS

A. See Section 013000 - 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.

1.07 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.

1.08 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 by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated, 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 with a minimum safety factor with accordance to local AHJ. 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.
   6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
      c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. 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:
      a. Cooper Crouse-Hinds, a division of Cooper Industries: www.cooperindustries.com.
      b. Erico International Corporation: www.erico.com.
      c. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
      d. Thomas & Betts Corporation: www.tnb.com.
      e. Substitutions: See Section 016000 - Product Requirements.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
   1. Manufacturers:
      a. Cooper Crouse-Hinds, a division of Cooper Industries: www.cooperindustries.com.
      b. Erico International Corporation: www.erico.com.
      c. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
      d. Thomas & Betts Corporation: www.tnb.com.
      e. Substitutions: See Section 016000 - 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.
   1. Comply with MFMA-4.
   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: 12 gauge.
   5. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
   6. Manufacturers:
      a. Cooper B-Line, a division of Cooper Industries: www.cooperindustries.com.
      b. Thomas & Betts Corporation: www.tnb.com.
      c. Unistrut, a brand of Atkore International Inc: www.unistrut.com.
      d. Substitutions: See Section 016000 - Product Requirements.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. aEquipment Supports: 1/2 inch diameter.
      b. Single Conduit up to 1 inch trade size: 1/4 inch diameter.
      c. Single Conduit larger than 1 inch trade size: 3/8 inch diameter.
      d. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
      e. Outlet Boxes: 1/4 inch diameter.
      f. 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.
   4. Hollow Masonry: Use toggle bolts.
   5. Hollow Stud Walls: Use toggle bolts.
   6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
   7. Sheet Metal: Use sheet metal screws.
   8. Plastic and lead anchors are not permitted.
   9. 9.Powder-actuated fasteners are not permitted.
   10. Hammer-driven anchors and fasteners are not permitted.
   11. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.

a. Comply with MFMA-4.
b. Channel Material: Use galvanized steel.
c. Minimum Channel Thickness: 12 gauge.
d. Manufacturer: Same as manufacturer of metal channel (strut) framing system.

12. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
13. Manufacturers - Mechanical Anchors:
    a. Hilti, Inc: www.us.hilti.com.
    b. ITW Red Head, a division of Illinois Tool Works, Inc: www.itwredhead.com.
    c. Powers Fasteners, Inc: www.powers.com.
    d. Simpson Strong-Tie Company Inc: www.strongtie.com.
    e. Substitutions: See Section 016000 - Product Requirements.

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. Install support and attachment components in a neat and workmanlike manner in accordance with NECA 1.

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. 3Use 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 260534.

J. Box Support and Attachment: Also comply with Section 260537.

K. Interior Luminaire Support and Attachment: Also comply with Section 265100.

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.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - 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 260529

SECTION 260534 - CONDUIT

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2025.

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.

C. ANSI C80.5 - American National Standard for Electrical Rigid Metal Conduit - Aluminum (ERMC-A); 2025.

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

E. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.

F. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit; 2004.

G. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2025.

H. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

I. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.

J. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.

K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

M. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

N. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.

O. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.

P. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

Q. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

R. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

S. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit; Current Edition, Including All Revisions.

1.02 PROJECT INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Aluminum rigid metal conduit (RMC).

C. Flexible metal conduit (FMC).
D. Liquidtight flexible metal conduit (LFMC).
E. Electrical metallic tubing (EMT).
F. Rigid polyvinyl chloride (PVC) conduit.
G. Liquidtight flexible nonmetallic conduit (LFNC).
H. Conduit fittings.
I. Accessories.
J. Conduit, fittings and conduit bodies.

1.03 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Concrete encasement of conduits.
B. Section 078400 - Firestopping.
C. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Metal clad cable (Type MC) and armored cable (Type AC), including uses permitted.
D. Section 260526 - Grounding and Bonding for Electrical Systems.
   1. Includes additional requirements for fittings for grounding and bonding.
E. Section 260529 - Hangers and Supports for Electrical Systems.
F. Section 260535 - Surface Raceways.
G. Section 260537 - Boxes.
H. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
I. Section 271005 - Structured Cabling for Voice and Data - Inside-Plant: Additional requirements for communications systems conduits.

1.04 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2005.
B. ANSI C80.3 - American National Standard for Steel Electrical Metallic Tubing (EMT); 2005.
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); National Electrical Contractors Association; 2006.
E. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit; National Electrical Contractors Association; 2004.
F. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); National Electrical Contractors Association; 2003.
G. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2012 (ANSI/NEMA FB 1).

H. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; National Electrical Manufacturers Association; 2003.

I. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; National Electrical Manufacturers Association; 2004.

J. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.

L. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

M. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.

N. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.

O. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

P. UL 651 - Schedule 40 and 80 Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

Q. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

R. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit; Current Edition, Including All Revisions.

1.05 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.

1.06 SUBMITTALS

A. See Section 013000 - 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. Include proposed locations of roof penetrations and proposed methods for sealing.

D. Project Record Documents: Record actual routing for conduits installed underground and conduits 2 inch trade size and larger.

1.07 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for purpose specified and shown.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

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. Underground:
   1. Under Slab on Grade: Use rigid PVC conduit.
   2. Exterior, Direct-Buried: Use rigid PVC conduit.
   3. Exterior, Embedded Within Concrete: Use rigid PVC conduit.
   4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
   5. Where rigid polyvinyl (PVC) conduit larger than 2 inch trade size is provided, use galvanized steel rigid metal conduit elbows for bends.

D. Embedded Within Concrete:
   1. Within Slab on Grade: Not permitted.
   2. Within Slab Above Ground: Not permitted.
   3. Within Concrete Walls Above Ground: Use galvanized steel rigid metal conduit.
   4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from concrete.

5. Where electrical metallic tubing (EMT) emerges from concrete into salt air, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges.

E. Concealed Within Masonry Walls: Use electrical metallic tubing (EMT).

F. Concealed Within Hollow Stud Walls: Use electrical metallic tubing (EMT).

G. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).

H. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.

I. Exposed, Interior, Not Subject to Physical Damage: Use electrical metallic tubing (EMT).

J. 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.
      b. Where exposed below 20 feet in warehouse areas.

K. Exposed, Exterior: Use galvanized steel rigid metal conduit.

L. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit.

M. Corrosive Locations Above Ground: Use aluminum rigid metal conduit.
   1. Corrosive locations include, but are not limited to:
      a. Cooling towers.

N. Hazardous (Classified) Locations: Use galvanized steel rigid metal conduit.

O. OConnections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
   1. Maximum Length: 6 feet.

P. 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.

Q. Fished in Existing Walls, Where Necessary: Use flexible metal conduit.

2.02 PRODUCTS

A. Electrical Service Conduits: Also comply with Section 262701.

B. Communications Systems Conduits: Also comply with Section 271005.

C. Fittings for Grounding and Bonding: Also comply with Section 260526.

D. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

E. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated.

F. Minimum Conduit Size, Unless Otherwise Indicated:

1. Branch Circuits: 3/4 inch trade size.
2. Branch Circuit Homeruns: 3/4 inch trade size.
3. Control Circuits: 1/2 inch trade size.
4. Flexible Connections to Luminaires: 1/2 inch trade size.
5. Underground, Interior: 3/4 inch trade size.
6. Underground, Exterior: 1 inch trade size.

G. 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:
   1. Allied Tube & Conduit: www.alliedeg.com.
   2. Republic Conduit: www.republic-conduit.com.
   3. Wheatland Tube Company: www.wheatland.com.
   4. Substitutions: See Section 016000 - 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:
      a. Bridgeport Fittings Inc: www.bptfittings.com.
      b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
      c. Thomas & Betts Corporation: www.tnb.com.
      d. Substitutions: See Section 016000 - 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.
      a. Do not use die cast zinc fittings.
   4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 ALUMINUM RIGID METAL CONDUIT (RMC)

A. Manufacturers:
   1. Allied Tube & Conduit: www.alliedeg.com.
   2. Republic Conduit: www.republic-conduit.com.
   3. Wheatland Tube Company: www.wheatland.com.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Description: NFPA 70, Type RMC aluminum rigid metal conduit complying with ANSI C80.5 and listed and labeled as complying with UL 6A.

C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com.
      b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
      c. Thomas & Betts Corporation: www.tnb.com.

d. Substitutions: See Section 016000 - 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 aluminum.
4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.
4. Substitutions: See Section 016000 - 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:
a. Bridgeport Fittings Inc: www.bptfittings.com.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.
d. Substitutions: See Section 016000 - 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.
a. Do not use die cast zinc fittings.

2.06 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.
4. Substitutions: See Section 016000 - 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:
a. Bridgeport Fittings Inc: www.bptfittings.com.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
c. Thomas & Betts Corporation: www.tnb.com.
d. Substitutions: See Section 016000 - 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.
    a. Do not use die cast zinc fittings.

2.07 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
    1. Allied Tube & Conduit: www.alliedeg.com.
    2. Republic Conduit: www.republic-conduit.com.
    3. Picoma; http://www.picoma.com.
    4. Wheatland Tube Company: www.wheatland.com.
    5. Substitutions: See Section 016000 - 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:
        a. Bridgeport Fittings Inc: www.bptfittings.com.
        b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
        c. Thomas & Betts Corporation: www.tnb.com.
        d. Substitutions: See Section 016000 - 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.
        a. Do not use die cast zinc fittings.
    4. Connectors and Couplings: Use compression (gland) type.
        a. Do not use indenter type connectors and couplings.

2.08 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Manufacturers:
    1. Cantex Inc: www.cantexinc.com.
    2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com.
    3. JM Eagle: www.jmeagle.com.
    4. Substitutions: See Section 016000 - Product Requirements.

B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 194 degrees Fahrenheit.

C. Fittings:
    1. Manufacturer: Same as manufacturer of conduit to be connected.
    2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.09 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC)

A. Manufacturers:
    1. AFC Cable Systems, Inc: www.afcweb.com.

2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.
4. Substitutions: See Section 016000 - Product Requirements.

B. Description: NFPA 70, Type LFNC liquidtight flexible nonmetallic conduit listed and labeled as complying with UL 1660.

C. Fittings:
1. Manufacturer: Same as manufacturer of conduit to be connected.
2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; suitable for the type of conduit to be connected.

2.10 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.

PART 3 EXECUTION

3.01 EXAMINATION

A. A. Verify that field measurements are as shown on drawings.

B. B. Verify that mounting surfaces are ready to receive conduits.

C. 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 conduit in a neat and workmanlike manner in accordance with NECA 1.

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install aluminum rigid metal conduit (RMC) in accordance with NECA 102.

E. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

F. Install liquidtight flexible nonmetallic conduit (LFNC) in accordance with NECA 111.

G. 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.

H. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 260529 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 trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
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.
10. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

I. 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. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
   7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

J. 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. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
   7. 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.
   8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

K. Underground Installation:
   1. Provide trenching and backfilling in accordance with Sections 312316 and 31 2323.
   2. Minimum Cover, Unless Otherwise Indicated or Required:
      a. Underground, Exterior: 24 inches.
      b. Under Slab on Grade: 12 inches to bottom of slab.
   3. Provide underground warning tape in accordance with Section 260553 along entire conduit length.

L. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide concrete in accordance with Section 033000 with minimum concrete cover of 3 inches on all sides unless otherwise indicated.

M. 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.

N. 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.
   3. Where conduits penetrate coolers or freezers.

O. 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.

P. Provide grounding and bonding in accordance with Section 260526.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - 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.

END OF SECTION 260534

SECTION 260536 - CABLE TRAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025a.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.02 SECTION INCLUDES

A. Cable trays and accessories.

B. Firestopping within (not around) cable trays.

1.03 RELATED REQUIREMENTS

A. Section 078400 - Firestopping: Firestopping around cable trays.

B. Section 260526 - Grounding and Bonding for Electrical Systems.

C. Section 260529 - Hangers and Supports for Electrical Systems.

1.04 1.REFERENCES

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for fittings and accessories.

C. Shop Drawings: Indicate tray type, dimensions, support points, and finishes.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Project Record Documents: Record actual routing of cable tray and locations of supports.

1.07 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 experience.

C. Products: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. CabloFil.

B. EZ Tray

C. Or Approved Equal.

D. Substitutions: See Section 016000 - Product Requirements.

2.02 BASKET-TYPE TRAY

A. Description: Continuous, rigid, welded steel wire mesh cable management system.
   1. Mesh System: Permits continuous ventilation of cables and maximum dissipation of heat.
   2. Safety Edge: Continuous safety edge T-welded wire lip.
   3. Wire Mesh: Welded at all intersections.
   4. UL Classification: Straight sections 2 x 8, 12, and 18 inches, UL classified.
   5. Material: Carbon steel wire, ASTM A 510, Grade 1008. Wire welded, bent, and surface treated after manufacture.
   6. Finish for Carbon Steel Wire:
      a. Finish applied after welding and bending of mesh.
         1) Electro-Plated Zinc Galvanizing: ASTM B 633, Type III, SC-1.
   7. Nominal Dimensions:
      a. Mesh: 2 x 4 inches (50 x 100 mm).
      b. Straight Section Lengths: 80 inches and 118 inches.
      c. Width: 18 inches.
      d. Depth: 4 inches.
      e. Wire Diameter: 0.177 inch, minimum.
   8. Fittings:
      a. Field fabricated in accordance with manufacturer's instructions from straight sections.

b. Above ceiling installation:
1) Center Hangar, provide 3/8” threaded rod and associated hardware to structure.
2) Fasteners: Not required.

9. Hardware: Hardware, including splice connectors and support components furnished by manufacturer.

B. ACCESSORIES:
1. Shielding Divider Strips: Provide divider strips to follow contour of cable tray run for shielding to run data and sound system cables in same tray. Pre-galvanized steel, 2 x 1-1/2 inches.
2. Cable Drop Outs: Provide drop out accessory at each location on the basket tray where cables exit the tray to enter the room or space served by the cables. Tie wrap cables to drop out assembly. Use “Velcro” type tie wraps.
3. Grounding: Grounding lugs for attachment on tray of continuous ground conductor fixing system.
4. Tees and Level Changes: Provide all necessary hardware as recommended by manufacturer for the formation of 90 degree tees and level changes.

C. PART 3 - EXECUTION
1. EXAMINATION:
a. Exam areas to receive cable management system. Notify the Engineer of conditions that would adversely affect the installation or subsequent utilization of the system. Do not proceed with installation until unsatisfactory conditions are corrected.
2. INSTALLATION:
a. Install cable management system at locations indicated on the drawings and in accordance with manufacturer's instructions.
b. Load Span Criteria: Install and support cable management system in accordance with span load criteria of L/240.
c. Cutting:
1) Cut wires in accordance with manufacturer's instructions.
2) Cut wires with side action bolt cutters to ensure integrity of galvanic protective layer.
3) Cut each wire with 1 clean cut to eliminate grinding or touch-up.
4) Install cable management system using hardware, splice connectors, support components, and accessories furnished by manufacturer.
5) The Contractor is responsible for coordination with other trades. Coordinate with HVAC and Plumbing Contractors prior to hanging tray.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Support trays in accordance with Section 260529. Provide supports at each connection point, at the end of each run, and at other points to maintain spacing between supports of ____ ft maximum.

B. Use expansion connectors where required.

C. Provide firestopping under provisions of Section 078400 to sustain ratings when passing cable tray through fire-rated elements.

D. Ground and bond cable tray under provisions of Section 260526.
   1. Provide continuity between tray components.
   2. Provide 2 AWG bare copper equipment grounding conductor through entire length of tray; bond to each component.
   3. Connections to tray may be made using mechanical or exothermic connectors.

E. Install warning signs at 50 feet centers along cable tray, located to be visible.

END OF SECTION 260536

SECTION 260537 - BOXES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.02 PROJECT 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.

C. Pull and junction boxes.

1.03 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

B. Section 083100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.

C. Section 260526 - Grounding and Bonding for Electrical Systems.

D. Section 260529 - Hangers and Supports for Electrical Systems.

E. Section 262726 - Wiring Devices:
   1. Wall plates.
   2. Floor box service fittings.

1.04 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.

C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; National Electrical Manufacturers Association; 2012 (ANSI/NEMA FB 1).

D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; National Electrical Manufacturers Association; 2008 (Revised 2010) (ANSI/NEMA OS 1).

E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.

F. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

H. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

I. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.

J. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.05 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.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for outlet and device boxes, junction and pull boxes, floor boxes, and underground handhole 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 handhole enclosures.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.

1.07 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.08 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 by Underwriter's Laboratories Inc. (UL) or testing firm acceptable to authority having jurisdiction as suitable for the purpose indicated.
   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 cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit, or exposed intermediate metal conduit (IMC) is used.
   4. Use suitable concrete type boxes where flush-mounted in concrete.

5. Use suitable masonry type boxes where flush-mounted in masonry walls.
6. Use raised covers suitable for the type of wall construction and device configuration where required.
7. Use shallow boxes where required by the type of wall construction.
8. Do not use "through-wall" boxes designed for access from both sides of wall.
9. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
10. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
11. 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. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes.
13. Minimum Box Size, Unless Otherwise Indicated:
14. Wall Plates: Comply with Section 262726.
15. Manufacturers:

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
   1. Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. NEMA EN 10250 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 sq feet and Larger: Provide sectionalized screw-cover or hinged-cover enclosures.
   4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
   5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
   6. Manufacturers:

PART 3 EXECUTION

3.01 3.1 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. Perform work in a neat and workmanlike manner in accordance with NECA 1 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. Provide separate boxes for emergency power and normal power systems.

E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

H. Box Locations:
   1. Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.

I. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 260529 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.
   3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
   4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

J. Install boxes plumb and level.

K. KFlush-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.

L. Install boxes as required to preserve insulation integrity.

M. Underground Handhole Enclosures:
   1. Install enclosure on gravel base, minimum 6 inches deep.
   2. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

N. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

P. Close unused box openings.

Q. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

R. Provide grounding and bonding in accordance with Section 260526.

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 260537

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2023.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2023.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2027.

E. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.02 PROJECT INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Wire and cable markers.

D. Voltage markers.

E. Warning signs and labels.

1.03 RELATED REQUIREMENTS

A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

B. Section 262726 - Wiring Devices: Device and wallplate finishes; factory pre-marked wallplates.

C. Section 271005 - Structured Cabling for Voice and Data: Identification for communications cabling and devices.

1.04 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2007.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2007.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.05 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.

1.06 SUBMITTALS

A. See Section 013000 - 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.

1.07 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.08 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. 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 voltage, phase, and AIC rating.
         2) Identify power source and circuit number. Include location when not within sight of equipment.
         3) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
      b. Motor Control Centers:
         1) Identify voltage and phase.

2) Use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

c. Panelboards:
1) Identify voltage, phase, and AIC rating.
2) Identify power source and circuit number. Include location when not within sight of equipment.
3) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
4) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

d. Transformers:
1) Identify kVA rating.
2) Identify voltage and phase for primary and secondary.

e. Enclosed switches, circuit breakers, and motor controllers:
1) Identify voltage and phase.
2) Identify load(s) served. Include location when not within sight of equipment.

f. Enclosed Contactors:
1) Identify ampere rating.
2) Identify voltage and phase.
3) Identify configuration, e.g., E.O.E.H. (electrically operated, electrically held) or E.O.M.H. (electrically operated, mechanically held).
4) Identify load(s) and associated circuits controlled. Include location.

g. Transfer Switches:
1) Identify voltage and phase.
2) Identify power source and circuit number for both normal power source and standby power source. Include location when not within sight of equipment.
3) Identify load(s) served. Include location when not within sight of equipment.

2. Emergency System Equipment:
a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.
b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.

3. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".

4. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
a. Minimum Size: 3.5 by 5 inches.
b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.

5. Use warning signs to identify electrical hazards for entrances to all rooms and other guarded locations that contain exposed live parts operating at 600 V nominal or less with the word message "DANGER; Electrical hazard; Authorized personnel only" or approved equivalent.
6. Use warning signs to identify electrical hazards for entrances to all buildings, vaults, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".
7. Use warning labels to identify electrical hazards for equipment, compartments, and enclosures containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".
8. Use warning labels, identification nameplates, or identification labels to identify electrical hazards for equipment where multiple power sources are present with the word message "DANGER; Hazardous voltage; Multiple power sources may be present; Disconnect all electric power including remote disconnects before servicing" or approved equivalent.

B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
2. Identification for Communications Conductors and Cables: Comply with Section 271005.
3. 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.
4. Use underground warning tape to identify direct buried cables.

C. Identification for Devices:
1. Identification for Communications Devices: Comply with Section 271005.
2. Wiring Device and Wallplate Finishes: Comply with Section 262726.
3. Use identification label to identify fire alarm system devices.
    a. For devices concealed above suspended ceilings, provide additional identification on ceiling tile below device location.

2.02 PRODUCTS

A. Identification Nameplates:
1. Manufacturers:
    a. Brimar Industries, Inc: www.brimar.com.
    b. Kolbi Pipe Marker Co: www.kolbipipemarkers.com.
    c. Seton Identification Products: www.seton.com.
    d. Substitutions: See Section 016000 - 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.

a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.

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:
a. Brady Corporation: www.bradyid.com.
b. Brother International Corporation: www.brother-usa.com.
c. Panduit Corp: www.panduit.com.
d. Substitutions: See Section 016000 - Product Requirements.
2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
a. Use only for indoor locations.
b. 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) Fire Alarm System: Identify with text "FIRE ALARM".
b. Equipment designation or other approved description.
c. Other information as indicated.
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.
5. Color:
a. Normal Power System: White text on black background.
b. Emergency Power System: White text on red background.
c. Fire Alarm System: White text on red background.

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.
4. Minimum Text Height: 1/4 inch.
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 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.
4. Minimum Text Height: 3/16 inch.
5. Color: Red text on white background.

G. Nameplates: Engraved three-layer laminated plastic, black letters on white background.

H. Locations:
1. Each electrical distribution and control equipment enclosure.
2. Communication cabinets.

I. Letter Size:
1. Use 1/8 inch letters for identifying individual equipment and loads.
2. Use 1/4 inch letters for identifying grouped equipment and loads.

J. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. Use only for identification of individual wall switches and receptacles, and control device stations.

K. Wire Markers
1. Manufacturers:
2. Brady Corporation: www.bradyid.com.
3. HellermannTyton: www.hellermanntyton.com.
4. Panduit Corp: www.panduit.com.
a. Substitutions: See Section 016000 - Product Requirements.

L. 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.

M. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

N. Legend: Power source and circuit number or other designation indicated.

O. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
1. Do not use handwritten text.

P. Minimum Text Height: 1/8 inch.

Q. Color: Black text on white background unless otherwise indicated.

2.03 WARNING SIGNS AND LABELS

A. Manufacturers:
1. Brimar Industries, Inc: www.brimar.com.
2. Clarion Safety Systems, LLC: www.clarionsafety.com.
3. Seton Identification Products: www.seton.com.
4. Substitutions: See Section 016000 - Product Requirements.

B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

C. Warning Signs:
   1. Materials:
      a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
      b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
   2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
   3. 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.
      a. Do not use labels designed to be completed using handwritten text.
   2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
   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:
   1. Surface-Mounted Equipment: Enclosure front.
   2. Flush-Mounted Equipment: Inside of equipment door.
   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. Conductors and Cables: Legible from the point of access.
   8. 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. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.

G. Secure rigid signs using stainless steel screws.

H. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - 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 260553

SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ANSI C136.10 - American National Standard for Roadway and Area Lighting Equipment - Locking-Type Photocontrol Devices and Mating Receptacles - Physical and Electrical Interchangeability and Testing; 2023.

B. ANSI C136.24 - American National Standard for Roadway and Area Lighting Equipment—Nonlocking (Button)–Type Photocontrols; 2026.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 773 - Plug-in, Locking Type Photocontrols for Use with Area Lighting; Current Edition, Including All Revisions.

H. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.

I. UL 916 - Energy Management Equipment; Current Edition, Including All Revisions.

J. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.

1.02 SECTION INCLUDES

A. Occupancy sensors.

B. Outdoor photo controls.

1.03 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.

B. Section 260537 - Boxes.

C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

D. Section 260918 - Remote Control Switching Devices: Remotely controlled devices for lighting control, including networked lighting controls, programmable relay panels, and remote control switching relays.

E. Section 260919 - Enclosed Contactors: Lighting contactors.

F. Section 262726 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, fan speed controllers, and wall plates.

G. Section 265100 - Interior Lighting.

H. Section 265561 - Theatrical Lighting: Controls for stage lighting units.

I. Section 265600 - Exterior Lighting.

1.04 REFERENCE STANDARDS

A. ANSI C136.24 - American National Standard for Roadway and Area Lighting Equipment - Nonlocking (Button) Type Photocontrols; 2004 (R2010).

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.

C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2008.

D. DNEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Fluorescent Ballasts; National Electrical Manufacturers Association; 2011.

E. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 773 - Plug-in Locking Type Photocontrols for Use with Area Lighting; Current Edition, Including All Revisions.

G. UL 773A - Nonindustrial Photoelectric Switches for Lighting Control; Current Edition, Including All Revisions.

H. UL 916 - Energy Management Equipment; Current Edition, Including All Revisions.

I. UL 917 - Clock-Operated Switches; Current Edition, Including All Revisions.

1.05 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 wall switch occupancy sensors with actual installed door swings.
   3. 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.
   4. Coordinate the placement of photo sensors for daylighting controls with windows, skylights, and luminaires to achieve optimum operation. Coordinate placement with ductwork, piping, equipment, or other potential obstructions to light level measurement installed under other sections or by others.
   5. 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 lighting control devices until final surface finishes and painting are complete.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.

1. Occupancy Sensors: Include detailed motion detection coverage range diagrams.

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. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. 1.See Section 016000 - Product Requirements, for additional provisions.

H. Project Record Documents: Record actual installed locations and settings for lighting control devices.

1.07 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.

1.08 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.

1.09 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for all occupancy sensors.

PART 2 PRODUCTS

2.01 ALL LIGHTING CONTROL DEVICES

A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

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 Fluorescent Ballasts: Tested and rated to be suitable for peak inrush currents specified in NEMA 410.

2.02 OCCUPANCY SENSORS

A. Manufacturers:
   1. Hubbell Building Automation, Inc: www.hubbellautomation.com
   2. WattStopper: www.wattstopper.com.
   3. Substitutions: See Section 016000 - Product Requirements.
   4. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

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 (PIR) Occupancy Sensors: Designed to detect occupancy by sensing movement of thermal energy between zones.
      b. Ultrasonic Occupancy Sensors: Designed to detect occupancy by sensing frequency shifts in emitted and reflected inaudible sound waves.
      c. 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. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
   6. Passive Infrared Lens Field of View: Field customizable by addition of factory masking material, adjustment of integral blinders, or similar means to block motion detection in selected areas.
   7. Turn-Off Delay: Field adjustable, up to a maximum time delay setting of not less than 15 minutes and not more than 30 minutes.
   8. Sensitivity: Field adjustable.
   9. Adaptive Technology: Field selectable; capable of self-adjusting sensitivity and time delay according to conditions.
   10. Integral Photocell: For field selectable and adjustable inhibition of automatic turn-on of load when ambient lighting is above the selected level.
   11. Compatibility: 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.

12. Load Rating for Line Voltage Occupancy Sensors: As required to control the load indicated on the drawings.
13. Isolated Relay for Low Voltage Occupancy Sensors: SPDT dry contacts, ratings as required for interface with system indicated.

C. Wall Switch Occupancy Sensors:
   1. All Wall Switch Occupancy Sensors:
      a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.
      b. Unless otherwise indicated or required to control the load indicated on the drawings, provide line voltage units with self-contained relay.
      c. Where indicated, provide two-circuit units for control of two separate lighting loads, with separate manual controls and separately programmable operation for each load.
      d. Operation: Field selectable to operate either as occupancy sensor (automatic on/off) or as vacancy sensor (manual-on/automatic off).
      e. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.
   2. Passive Infrared (PIR) Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 sq feet.
   3. Ultrasonic Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 400 sq feet.
   4. Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 sq feet.

D. Ceiling Mounted Occupancy Sensors:
   1. All Ceiling Mounted Occupancy Sensors:
      a. Description: Low profile occupancy sensors designed for ceiling installation.
      b. Unless otherwise indicated or required to control the load indicated on the drawings, provide low voltage units, for use with separate compatible accessory power packs.
      c. Provide field selectable setting for disabling LED motion detector visual indicator.
      d. Occupancy sensor to be field selectable as either manual-on/automatic-off or automatic on/off.
      e. Finish: White unless otherwise indicated.
   2. Passive Infrared (PIR) Ceiling Mounted Occupancy Sensors:
      a. Standard Range Sensors: Capable of detecting motion within an area of 450 sq feet at a mounting height of 9 feet, with a field of view of 360 degrees.
      b. Extended Range Sensors: Capable of detecting motion within an area of 1,200 sq feet at a mounting height of 9 feet, with a field of view of 360 degrees.
   3. Ultrasonic Ceiling Mounted Occupancy Sensors:
      a. Standard Range Sensors: Capable of detecting motion within an area of 500 sq feet at a mounting height of 9 feet, with a field of view of 360 degrees.
      b. Extended Range Sensors: Capable of detecting motion within an area of 2,000 sq feet at a mounting height of 9 feet.

4. Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:
    a. Standard Range Sensors: Capable of detecting motion within an area of 450 sq feet at a mounting height of 9 feet, with a field of view of 360 degrees.
    b. Extended Range Sensors: Capable of detecting motion within an area of 1,200 sq feet at a mounting height of 9 feet, with a field of view of 360 degrees.

E. Power Packs for Low Voltage Occupancy Sensors:
1. Description: Plenum rated, self-contained low voltage class 2 transformer and relay compatible with specified low voltage occupancy sensors for switching of line voltage loads.
2. Provide quantity and configuration of power and slave packs with all associated wiring and accessories as required to control the load indicated on the drawings.
3. Input Supply Voltage: Dual rated for 120/277 V ac.
4. Load Rating: As required to control the load indicated on the drawings.

2.03 OUTDOOR PHOTO CONTROLS

A. Manufacturers:
1. Intermatic, Inc: www.intermatic.com.
2. Paragon, a brand of Invensys Controls: www.invensyscontrols.com.
3. Tork, a division of NSI Industries LLC: www.tork.com.
4. Substitutions: See Section 016000 - Product Requirements.
5. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

B. Stem-Mounted Outdoor Photo Controls:
1. Description: Direct-wired photo control unit with threaded conduit mounting stem and field-adjustable swivel base, listed and labeled as complying with UL 773A.
2. Housing: Weatherproof, impact resistant polycarbonate.
3. Photo Sensor: Cadmium sulfide.
4. Provide external sliding shield for field adjustment of light level activation.
5. Light Level Activation: 1 to 5 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
6. Voltage: As required to control the load indicated on the drawings.
7. Failure Mode: Fails to the on position.
8. Load Rating: As required to control the load indicated on the drawings.
9. Provide accessory wall-mounting bracket where indicated or as required to complete installation.

C. Locking Receptacle-Mounted Outdoor Photo Controls
1. Description: Plug-in locking type photo control unit complying with ANSI C136.10 for mounting on a compatible receptacle, listed and labeled as complying with UL 773.
2. Housing: Weatherproof, impact resistant UV stabilized polypropylene, color to be selected.
3. Photo Sensor: Cadmium sulfide.
4. Light Level Activation: 1 to 3 footcandles turn-on and 1.5 to 1 turn-off to turn-on ratio with instant turn-on and delayed turn-off.
5. Voltage: As required to control the load indicated on the drawings.

6. Failure Mode: Fails to the on position.
7. Load Rating: As required to control the load indicated on the drawings.
8. Surge Protection: 160 joule metal oxide varistor.

D. Button Type Outdoor Photo Controls
1. Description: Direct-wired photo control unit complying with ANSI C136.24 with weatherproof gasketed wall plate where required or indicated, listed and labeled as complying with UL 773A.
2. Housing: Weather resistant polycarbonate.
3. Photo Sensor: Cadmium sulfide.
4. Light Level Activation: 1 to 3 footcandles turn-on and 3 to 1 turn-off to turn-on ratio with delayed turn-off.
5. Voltage: As required to control the load indicated on the drawings.
6. Failure Mode: Fails to the on position.
7. Load Rating: As required to control the load indicated on the drawings.

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 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. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 260537 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 to the top of the box.

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 262726.

G. 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.

H. Identify lighting control devices in accordance with Section 260553.

I. Occupancy Sensor Locations:
   1. Location Adjustments: Locations indicated are diagrammatic and only intended to indicate which rooms or areas require devices. Provide quantity and locations as required for complete coverage of respective room or area based on manufacturer's recommendations for installed devices.
   2. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.

J. Outdoor Photo Control Locations:
   1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.
   2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by the photo control itself.

K. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into the photo control.

L. Unless otherwise indicated, install power packs for lighting control devices above accessible ceiling or above access panel in inaccessible ceiling near the sensor location.

M. Where indicated, install separate compatible wall switches for manual control interface with lighting control devices or associated power packs.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - 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. Test outdoor photo controls to verify proper operation, including time delays where applicable.

E. 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. 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.

D. Adjust external sliding shields on outdoor photo controls under optimum lighting conditions to achieve desired turn-on and turn-off activation as indicated or as directed by Architect.

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. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.
   3. Instructor: Qualified contractor familiar with the project and with sufficient knowledge of the installed lighting control devices.
   4. Location: At project site.

END OF SECTION 260923

SECTION 262200 - LOW-VOLTAGE TRANSFORMERS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. IEEE C57.94 - IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type Distribution and Power Transformers; 2025.

B. IEEE C57.96 - IEEE Standard Guide for Loading Dry-Type Distribution and Power Transformers; 2013.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

D. NECA 409 - Standard for Installing and Maintaining Dry-Type Transformers; 2015.

E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

F. NEMA ST 20 - Dry Type Transformers for General Applications; 2021.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 506 - Standard for Specialty Transformers; Current Edition, Including All Revisions.

I. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers; Current Edition, Including All Revisions.

1.02 SECTION INCLUDES

A. General purpose transformers.

1.03 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.

B. Section 260526 - Grounding and Bonding for Electrical Systems.

C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

D. Section 260534 - Conduit: Flexible conduit connections.

E. Section 262416 - Panelboards.

1.04 1.3 REFERENCE STANDARDS

A. IEEE C57.94 - Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers; 1982 (R2006).

B. IEEE C57.96 - Guide for Loading Dry-Type Distribution and Power Transformers; 1999 (R2004).

C. NECA 409 - Standard for Installing and Maintaining Dry-Type Transformers; 2009.

D. NEMA ST 20 - Dry-Type Transformers for General Applications; National Electrical Manufacturers Association; 1992 (R1997).

E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2008

F. NEMA TP 1 - Guide for Determining Energy Efficiency for Distribution Transformers; 2002.

G. NETA STD ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems; International Electrical Testing Association; 2009.

H. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

I. UL 506 - Standard for Specialty Transformers; Current Edition, Including All Revisions.

J. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers; Current Edition, Including All Revisions.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors required for mounting of transformers.

1.06 1SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated temperature rise, efficiency, sound level, enclosure ratings, outline and support point dimensions, weight, required clearances, service condition requirements, and installed features.
   1. Vibration Isolators: Include attachment method and rated load and deflection.

C. Shop Drawings: Provide dimensioned plan and elevation views of transformers and adjacent equipment with all required clearances indicated.

D. Source Quality Control Test Reports: Include reports for tests designated in NEMA ST 20 as design and routine tests.

E. Field Quality Control Test Reports.

F. 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.

G. Maintenance Data: Include recommended maintenance procedures and intervals.

H. Project Record Documents: Record actual locations of transformers.

1.07 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.

1.08 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 in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

1.09 FIELD CONDITIONS

A. Ambient Temperature: Do not exceed 86 degrees Fahrenheit average or 104 degrees Fahrenheit maximum measured during any 24 hour period during and after installation of transformers.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Eaton Corporation; Cutler-Hammer Products: www.eaton.com.

B. General Electric Company: www.geindustrial.com.

C. Schneider Electric; Square D Products: www.schneider-electric.us.

D. Substitutions: See Section 016000 - Product Requirements.

E. Source Limitations: Furnish transformers produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 ALL TRANSFORMERS

A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed and labeled by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

B. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:
   1. Altitude: Less than 3,300 feet.
   2. Ambient Temperature: Not exceeding 86 degrees Fahrenheit average or 104 degrees Fahrenheit maximum measured during any 24 hour period.

C. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent pressure throughout core length.

D. Impregnate core and coil assembly with non-hydroscopic thermo-setting varnish to effectively seal out moisture and other contaminants.

E. Basic Impulse Level: 10 kV.

F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

G. Isolate core and coil from enclosure using vibration-absorbing mounts.

H. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

2.03 GENERAL PURPOSE TRANSFORMERS

A. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.

B. Primary Voltage: 480 volts delta, 3 phase.

C. Secondary Voltage: 208Y/120 volts, 3 phase.

D. Insulation System and Allowable Average Winding Temperature Rise:
   1. Less than 15 kVA: Class 365 degrees Fahrenheit insulation system with 239 degrees Fahrenheit average winding temperature rise.
   2. 15 kVA and Larger: Class 428 degrees Fahrenheit insulation system with 302 degrees Fahrenheit average winding temperature rise.

E. Coil Conductors: Continuous copper windings with terminations brazed or welded.

F. Winding Taps:
   1. Less than 3 kVA: None.
   2. 3 kVA through 15 kVA: Two 5 percent full capacity primary taps below rated voltage.
   3. 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.
   4. 500 kVA and Larger: Two 2.5 percent full capacity primary taps above and two 2.5 percent full capacity primary taps below rated voltage.

G. Energy Efficiency: Standard efficiency complying with NEMA TP 1.

H. Sound Levels: Standard sound levels complying with NEMA ST 20.

I. Mounting Provisions:
   1. Less than 15 kVA: Suitable for wall mounting.
   2. 15 kVA through 75 kVA: Suitable for wall, floor, or trapeze mounting.
   3. Larger than 75 kVA: Suitable for floor mounting.

J. Transformer Enclosure: Comply with NEMA ST 20.
   1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor clean, dry locations: Type 1.
      b. Outdoor locations: Type 3R.
   2. Construction: Heavy gage steel.
      a. Less than 15 kVA: Totally enclosed, non-ventilated.
      b. 15 kVA and Larger: Ventilated.
   3. Finish: Manufacturer's standard grey, suitable for outdoor installations.
   4. Provide lifting eyes or brackets.

K. Accessories:
   1. Mounting Brackets: Provide manufacturer's standard brackets.
   2. Weathershield Kits: Provide for ventilated transformers installed outdoors to provide a listed NEMA EN 10250, type 3R assembly.
   3. Lug Kits: Sized as required for termination of conductors as indicated on the drawings.

2.04 SOURCE QUALITY CONTROL

A. Factory test transformers according to NEMA ST 20.

B. Sound Level Tests: Perform factory test designated in NEMA ST 20 as "design" test on each production unit.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that suitable support frames and anchors are installed where required and that mounting surfaces are ready to receive transformers.

C. Perform pre-installation tests and inspections on transformers per manufacturer's instructions and as specified in NECA 409. Correct deficiencies prior to installation.

D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1.

B. Install transformers in accordance with manufacturer's instructions.

C. Install transformers in accordance with NECA 409 and IEEE C57.94.

D. Use flexible conduit, under the provisions of Section 260534, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

E. Arrange equipment to provide minimum clearances as specified on transformer nameplate and in accordance with manufacturer's instructions and NFPA 70.

F. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by the manufacturer.

G. Mount floor-mounted transformers on properly sized 3 inch high concrete pad constructed in accordance with Section 033000.

H. Mount floor-mounted transformers using vibration isolators suitable for isolating the transformer noise from the building structure.

I. Mount trapeze-mounted transformers as indicated.

J. Provide seismic restraints.

K. Provide grounding and bonding in accordance with Section 260526.

L. Remove shipping braces and adjust bolts that attach the core and coil mounting bracket to the enclosure according to manufacturer's recommendations in order to reduce audible noise transmission.

M. Where not factory-installed, install lugs sized as required for termination of conductors as shown on the drawings.

N. Where furnished as a separate accessory, install transformer weathershield per manufacturer's instructions.

O. Identify transformers in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL

A. Perform field inspection, testing, and adjusting in accordance with Section 014000.

B. Inspect and test in accordance with NETA STD ATS, except Section 4.

C. Perform inspections and tests listed in NETA STD ATS Sections 7.2.1.1 and 7.2.1.2. Tests and inspections listed as optional are not required.

3.04 ADJUSTING

A. Measure primary and secondary voltages and make appropriate tap adjustments.

B. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

A. Clean dirt and debris from transformer components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262200

SECTION 262717 - EQUIPMENT WIRING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).

B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.02 SECTION INCLUDES

A. Electrical connections to equipment.

1.03 RELATED REQUIREMENTS

A. Section 26 0534 - Conduit.

B. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables (600 V and Less).

C. Section 26 0537 - Boxes.

D. Section 26 2818 - Enclosed Switches.

1.04 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005).

B. NEMA WD 6 - Wiring Devices - Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R2008).

C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide wiring device manufacturer’s catalog information showing dimensions, configurations, and construction.

1.06 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. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Wiring Devices: As specified in Section 26 2726.

C. Flexible Conduit: As specified in Section 26 0534.

D. Wire and Cable: As specified in Section 26 0519.

E. Boxes: As specified in Section 26 0537.

PART 3 EXECUTION

3.01 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 interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION 262717

SECTION 262726 - WIRING DEVICES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2014h (Validated 2022).

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush Mounted (General Specification); 2017g (Validated 2023).

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.

E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).

F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

L. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

1.02 PROJECT INCLUDES

A. Wall switches.

B. Wall dimmers.

C. Receptacles.

D. Wall plates.

E. Floor box service fittings.

F. Poke-through assemblies.

1.03 RELATED REQUIREMENTS

A. Section 260537 - Boxes.

1.04 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Federal Specification; Revision G, 2001.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Federal Specification; Revision F, 1999.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

D. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2005).

E. NEMA WD 6 - Wiring Device -- Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R2008).

F. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

H. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

I. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

J. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

K. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Leviton.

B. Hubbell

C. Thomas & Betts

2.02 APPLICATIONS

2.03 ALL WIRING DEVICES

A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

B. Finishes:

2.04 WALL SWITCHES

A. Manufacturers:

B. All Wall Switches: 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.

2.05 WALL DIMMERS

A. All Wall Dimmers: Provide low-voltage Lighting Control System dimmers and controls in Media Center including Hubbell NX local room controllers (on, off, dim). NX room controllers will operate as stand-alone systems within the Media Center.

2.06 RECEPTACLES

A. Manufacturers:

B. All Receptacles: 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:

D. GFI Receptacles:
   1. All GFI Receptacles: Provide with feed-through protection, light to indicate ground fault tripped condition and loss of protection, and list as complying with UL 943, class A.
   2. Weather Resistant GFI Receptacles: Commercial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

E. Clock Hanger Receptacles: Single, 15A, 125V, NEMA 5-15R.

2.07 WALL PLATES

A. Manufacturers:

B. All Wall Plates: Comply with UL 514D.
   1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
   2. Size: Standard.
   3. Screws: Metal with slotted heads finished to match wall plate finish.

C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.

D. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.

E. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected.

2.08 FLOOR BOX SERVICE FITTINGS

A. Manufacturers:

B. Description: Service fittings compatible with floor boxes provided under Section 260537 with all components, adapters, and trims required for complete installation.

2.09 POKE-THROUGH ASSEMBLIES

A. Manufacturers:

B. Description: Assembly comprising floor service fitting, poke-through component, fire stops and smoke barriers, and junction box for conduit termination; fire rating listed to match fire rating of floor and suitable for floor thickness where installed.

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 core drilled holes for poke-through assemblies are in proper locations.

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. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 260537 as required for installation of wiring devices provided under this section.
    1. Mounting Heights: Unless otherwise indicated, as follows:
    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.
    5. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.

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. For isolated ground receptacles, connect wiring device grounding terminal only to identified branch circuit isolated equipment grounding conductor. Do not connect grounding terminal to outlet box or normal branch circuit equipment grounding conductor.

I. Provide GFI receptacles with integral GFI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

J. Install wiring devices plumb and level with mounting yoke held rigidly in place.

K. Install wall switches with OFF position down.

L. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

M. Do not share neutral conductor on branch circuits utilizing wall dimmers.

N. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

O. 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.

P. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

Q. Install poke-through closure plugs in all unused core holes to maintain fire rating of floor.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection, testing, and adjusting in accordance with Section 014000.

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. Operate each wall switch with circuit energized and verify proper operation.

E. Verify that each receptacle device is energized.

F. Test each receptacle to verify operation and proper polarity.

G. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.

H. 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 262726

SECTION 262813 - FUSES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements; Current Edition, Including All Revisions.

1.02 1SECTION INCLUDES

A. Fuses.

1.03 RELATED REQUIREMENTS

A. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

B. Section 26 2818 - Enclosed Switches: Fusible switches.

1.04 REFERENCE STANDARDS

A. NEMA FU 1 - Low Voltage Cartridge Fuses; National Electrical Manufacturers Association; 2002 (R2007).

B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 248-1 - Low-Voltage Fuses - Part 1: General Requirements; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 3000 - 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.

1.06 MAINTENANCE MATERIALS

A. See Section 01 6000 - Product Requirements, for additional provisions.

B. Furnish two fuse pullers.

C. Furnish three of each size and type fuse installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cooper Bussmann, a division of Cooper Industries: www.cooperindustries.com.

B. Mersen (formerly Ferraz Shawmut): ferrazshawmut.mersen.com.

C. Littelfuse, Inc: www.littelfuse.com.

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FUSES

A. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose indicated.

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. Main Service Switches Larger than 600 amperes: Class L (time delay), Low-peak.

H. Main Service Switches: Class RK1 (time delay), Low-peak.

I. Power Load Feeder Switches Larger than 600 amperes: Class L (time delay), Low-peak.

J. Power Load Feeder Switches: Class RK1 (time delay), Low-peak.

K. Motor Load Feeder Switches: Class RK1 (time delay), Fusetron.

L. Lighting Load Feeder Switches Larger than 600 amperes: Class L time delay, Low-peak.

M. Lighting Load Feeder Switches: Class RK1 (time delay), Low-peak.

N. General Purpose Branch Circuits: Class RK1 (time delay), Low-peak.

O. Motor Branch Circuits: Class L time delay, Fusetron.

PART 3 EXECUTION

3.01 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 262813

SECTION 262818 - ENCLOSED SWITCHES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

B. NEMA BS 31047 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013 (Reaffirmed 2023).

C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

F. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

G. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

1.02 SECTION INCLUDES

A. Enclosed safety switches.

B. Fusible switches.

C. Nonfusible switches.

1.03 RELATED REQUIREMENTS

A. Section 26 0526 - Grounding and Bonding for Electrical Systems.

B. Section 26 0529 - Hangers and Supports for Electrical Systems.

C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

D. Section 26 2813 - Fuses.

1.04 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2008.

C. NEMA FU 1 - Low Voltage Cartridge Fuses; National Electrical Manufacturers Association; 2002 (R2007).

D. NEMA BS 31047 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum); National Electrical Manufacturers Association; 2001 (R2006).

E. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.

G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.

H. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 3000 - 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Siemens Industry, Inc: www.sea.siemens.com.

B. Eaton Corporation; Cutler-Hammer Products: www.eaton.com.

C. General Electric Company: www.geindustrial.com.

D. Schneider Electric; Square D Products: www.schneider-electric.us.

2.02 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break, enclosed safety switches complying with NEMA BS 31047, type HD (heavy duty), and listed and labeled as complying with UL 98; ratings, configurations, and features as indicated on the drawings.

B. Provide products listed and labeled by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

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 Fahrenheit and 104 degrees Fahrenheit.

D. Horsepower Rating: Suitable for connected load.

E. Voltage Rating: Suitable for circuit voltage.

F. Short Circuit Current Rating:

G. Provide with switch blade contact position that is visible when the cover is open.

H. Conductor Terminations: Suitable for use with the conductors to be installed.

I. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

J. Enclosures: Comply with NEMA BS 31047 and NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:

K. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

L. Heavy Duty Switches:
   1. Conductor Terminations:
      a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   2. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

2.03 COMPONENTS

A. Fusible Switch Assemblies: NEMA BS 31047, Type HD enclosed load interrupter knife switch.
   1. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
   2. Handle lockable in OFF position.
   3. Fuse clips: Designed to accommodate NEMA FU1, Class R fuses.

B. Nonfusible Switch Assemblies: NEMA BS 31047, Type HD enclosed load interrupter knife switch.
   1. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
   2. Handle lockable in OFF position.

C. Enclosures: NEMA BS 31047.
   1. Interior Dry Locations: Type 1.
   2. Exterior Locations: Type 3R.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install enclosed switches in accordance with manufacturer's instructions.

B. Install enclosed switches securely, in a neat and workmanlike manner in accordance with NECA 1.

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 0529.

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 0526.

H. Provide identification nameplate for each enclosed switch in accordance with Section 26 0553.

I. Provide arc flash warning labels in accordance with NFPA 70.

J. Install fuses in fusible disconnect switches.

K. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

END OF SECTION 262818

SECTION 265100 - INTERIOR LIGHTING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ANSI C82.4 - American National Standard for Lamp Ballasts - Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps; 2017, with Editorial Revision (2022).

B. ANSI C82.11 - American National Standard for Lamp Ballasts - High Frequency Fluorescent Lamp Ballasts; 2023.

C. IEEE C62.41.2 - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Corrigendum 2012).

D. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.

E. NECA 500 - Standard for Installing and Maintaining Indoor Commercial Lighting Systems; 2025.

F. NECA 502 - Standard for Installing Industrial Lighting Systems; 2006.

G. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2025.

H. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.

I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.

L. UL 1029 - High-Intensity-Discharge Lamp Ballasts; Current Edition, Including All Revisions.

M. UL 1598 - Luminaires; Current Edition, Including All Revisions.

N. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.02 1PROJECT INCLUDES

A. Interior luminaires.

B. Ballasts.

C. Lamps.

D. Luminaire accessories.

1.03 RELATED REQUIREMENTS

A. Section 260537 - Boxes.

B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 260918 - Remote Control Switching Devices: Remote controls for lighting, including remote control switching relays.

D. Section 260919 - Enclosed Contactors: Lighting contactors.

E. Section 260923 - Lighting Control Devices: Automatic controls for lighting including occupancy sensors, outdoor motion sensors, time switches, outdoor photo controls, and daylighting controls.

F. Section 262726 - Wiring Devices: Manual wall switches and wall dimmers.

G. Section 265600 - Exterior Lighting.

1.04 REFERENCE STANDARDS

A. ANSI C82.4 - American National Standard for Ballasts for High-Intensity-Discharge and Low Pressure Sodium Lamps (Multiple-Supply Type); 2002.

B. ANSI C82.11 - American National Standard for Lamp Ballasts - High Frequency Fluorescent Lamp Ballasts - Supplements; Consolidated-2002.

C. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (R2008).

D. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002.

E. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association; 2006.

F. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; National Electrical Contractors Association; 2006.

G. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Fluorescent Ballasts; National Electrical Manufacturers Association; 2011.

H. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; National Electrical Manufacturers Association; 2006.

I. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.

K. UL 1029 - High-Intensity-Discharge Lamp Ballasts; Current Edition, Including All Revisions.

L. UL 1598 - Luminaires; Current Edition, Including All Revisions.

M. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.05 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. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.06 SUBMITTALS

A. See Section 013000 - 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.

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. Ballasts: Include wiring diagrams and list of compatible lamp configurations.
   2. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.
   3. LED emitters and drivers: Include rated life, color temperature, lumen output of system.

D. Certificates for Dimming Ballasts and Drivers: Manufacturer's documentation of compatibility with dimming controls to be installed. The contractor shall be responsible for providing and installing all required wiring for control of 0-10v dimming systems.

E. Field Quality Control Reports.

F. 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.

G. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.

I. Project Record Documents: Record actual connections and locations of luminaires and any associated remote components.

1.07 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Conform to requirements of NFPA 70 and NFPA 101.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.08 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.

1.09 FIELD CONDITIONS

A. Maintain field conditions within manufacturers required service conditions during and after installation.

1.10 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide two year manufacturer warranty for all linear fluorescent ballasts.

C. Provide minimum five year warranty for LED drivers.

D. Products: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: See Section 016000 - Product Requirements.

1. If Alternates are to be installed, Contractor shall be responsible for verifying light levels, performance, and the circuiting is adequate and make any necessary changes to accommodate the new fixtures.

2.02 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, drivers, reflectors, lenses, housings, mounting accessories and other components required to position, energize and protect the lamp and distribute the light.

E. 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.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:
   1. Ceiling Compatibility: Comply with NEMA LE 4.
   2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.
   3. Luminaires Recessed in Sloped Ceilings: Provide suitable sloped ceiling adapters.

H. LED Luminaires: Listed and labeled as complying with UL 8750. Provide LED Drivers with the luminaire as a complete package.

2.03 LAMPS

A. Manufacturers:
   1. Refer to Luminaire Fixture Schedule on the drawings
      a. Substitutions: See Section 016000 - Product Requirements.
      b. Manufacturer Limitations: Where possible, provide lamps produced by a single manufacturer.
      c. Where a specific manufacturer or model is indicated elsewhere in the luminaire schedule or on the drawings, substitutions are not permitted unless explicitly indicated.

B. All Lamps:
   1. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
   2. 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.

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 260537 as required for installation of luminaires provided under this section.

B. B. Install products according to manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 1 (general workmanship), NECA 500 (commercial lighting), and NECA 502 (industrial lighting).

D. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

E. 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. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
   7. Provide steel cable support from opposing corners to structure above in addition to the safety clips provided with the luminaire.

F. 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.

G. 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 in length, with no more than 4 feet between supports.
   4. Install canopies tight to mounting surface.
   5. Unless otherwise indicated, support pendants from swivel hangers.

H. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

I. LED Luminaires as a single continuous fixture with emergency circuit: continuous fixture shall be rated as dual circuit.

J. Verify Maximum Remote wiring distances with manufacturer for remote mounted ballasts and drivers. Where distances exceed physical conditions, notify Engineer prior to release of fixtures for ordering.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - 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. 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.

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 017800 - Closeout Submittals, for closeout submittals.

B. See Section 017900 - Demonstration and Training, for additional requirements.

C. Demonstration: Demonstrate proper operation of luminaires to Architect, and correct deficiencies or make adjustments as directed.

D. Just prior to Substantial Completion, replace all lamps that have failed.

3.08 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 265100