The following Contract Documents and Technical Specifications have been prepared under my direct supervision and
guidance in conjunction with the Plans and for the explicit use by the Owner and Contractors for bidding and
construction of this project.
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DIVISION 00

BIDDING & CONTRACT DOCUMENTS
NOTICE TO BIDDERS

The Calcasieu Parish School Board will receive sealed bids until 10:00 A.M., July 2, 2019 at its offices at the Calcasieu Parish School Board, Planning & Construction Department, Chenannut Facilities, 3800 Mallard Cove Drive, P.B.#506, Lake Charles, Louisiana 70602, for A/C Systems Upgrades to North Two-Story Building W.W. Lewis Middle School, 2017 All Districts Capital Projects Fund, Bid No. 2019-18PC. Complete plans and specifications may be obtained from Ellender Architects & Associates, LLC, 1521 Cypress Street, Sulphur, Louisiana 70663.

No Bid shall be considered or accepted unless the bid is accompanied by bid security in an amount not less than five percent (5%) of the Base Bid and all Additive Alternates. The bid security shall be in the form of certified check or cashier’s check drawn on a bank insured by the FDIC, or Calcasieu Parish School Board Bid Bond Form contained in the Front End Documents written by a surety company licensed to do business in Louisiana with a A.M. Best rating of “A” or better, countersigned by a person who is under contract with the surety company or bond insurer as a licensed agent in this state and who is residing in this state.

Bids shall be accepted only from Contractors who are licensed under L.A. R.S. 37:2150-2:63, Act 635, effective January 1, 1989, for the classification of Building Construction. No bid may be withdrawn for a period of thirty (30) days after receipt of bids, except under the provisions of L.A. R.S. 38:2214. Evidence of authority to submit the bid shall be required in accordance with L.A. R.S. 38:2212 (B) (2), (5) and/or L.A. R.S. 39:1594 (C) (4).

Bids may also be submitted by electronic means security/password protected to this location, ensuring the following information is included on all pages of all correspondence: www.centralauctionhouse.com

The Owner reserves the right to reject any and all bids for just cause as permitted by L.A. R.S. 38:2214 (B). The ability of an entity to reject any bid is applicable only when administered in accordance with the Public Bid Law. In accordance with L.A. R.S. 38:2212 (B) (1), the provisions and requirements of this section, and those stated in the Bidding Documents shall not be waived by any public entity.

A fee may be required for the Bidding Documents in accordance with L.A. R.S. 38:2212 (E).

Karl Bruchhaus Secretary
Calcasieu Parish School Board

Pc: Bourne, Heath, Architect or Designer, State License Board for Contractors, Daily Journal of Commerce, F. W. Dodge, File

Publish in the Lake Charles American Press: **June 7th, 14th & 21st**
INSTRUCTIONS TO BIDDERS

ARTICLE 1

DEFINITIONS

1.1 The Bidding Documents include the following:

- Notice to Bidders
- Instruction to Bidders
- Insurance & Bond Requirements
- General Conditions of the Contract for Construction
- Supplementary Conditions (September 2018)
- Bid Form (Louisiana Uniform Public Works Bid Form)
- Bid Bond
- Resolution
- Sub-Contractor Listing
- Attestation Form – Past Criminal Convictions of Bidders (R.S. 38.2227)
- Affidavit Form – Verification of Employees (R.S. 38.2212.10 (C))
- Contract (Owner and Contractor), Performance and Payment Bond
- Affidavit
- Change Order Form
- Beneficial Occupancy Form
- Recommendation of Acceptance Form
- Louisiana Department of Revenue Tax Exemption Form
- Approved Applicator Letter (Roofing)
- Manufacturer’s Warranty Letter (Roofing)
- Specifications dated May 2019
- Drawings dated May 2019

Addenda Issued during the bid period and acknowledged on Bid Form.

1.2 Forms turned in with the bid. Bid Form, Bid Bond, and Corporate Resolution or Written Evidence of the authority of the person signing the bid for public work (R.S. 38.2212 (B)(5)).

1.3 Forms turned in within ten (10) days after the bid opening. Sub-Contractor’s List, Attestation Form (R.S. 38.2227), Affidavit Form (R.S. 38.2212.10 (C)), Affidavit, Resolution, Approved Applicator (Roofing), Manufacturer’s Warranty Letter (Roofing), and Superintendent’s Resume’. These forms shall be sent to the Project Architect or Project Engineer on behalf of the Owner.

1.4 All definitions set forth in the General Conditions of the Contract for Construction, A.I.A. Document A201, or in other Contract Documents are applicable to the Bidding Documents.

1.5 Addenda are written on graphic instruments issued by the Architect prior to the opening of bids which modify or interpret the bidding documents by additions, deletions, clarifications, corrections and prior approvals.
1.6 A Bid is a complete and properly signed proposal to do the work or designated portion thereof for the sums stipulated therein supported by data called for by the Bidding Documents.

1.7 Base Bid is the sum stated in the Bid for which the Bidder offers to perform the work described as the Base, to which work may be added for sums stated in Alternate Bids.

1.8 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or subtracted from the amount of the base bid if the corresponding change in project scope or materials or methods of construction described in the Bidding Documents is accepted.

1.9 A Bidder is one who submits a bid for a prime contract with the Owner for the work described in the proposed contract documents.

1.10 A Sub-bidder is one who submits a bid to a Bidder for materials and/or labor for a portion of the work.

1.11 Where the word “Architect” is used in any of the Documents, it shall refer to the Prime Designer of the project, an Architect, Engineer or Landscape Architect.

ARTICLE 2

BIDDER’S REPRESENTATION

2.1 Each Bidder by making his bid represents that:

- He has read and understands the Bidding Documents and his Bid is made in accordance therewith.

- He has visited the site and has familiarized himself with the local conditions under which the work is to be performed.

- His bid is based upon the materials, systems and equipment described in the Bidding Documents as advertised and as modified by Addenda.

2.2 The Bidder must be fully qualified under any state or local licensing law for Contractors in effect at the time and at the location of the work before submitting his bid. In the State of Louisiana, Revised Statutes 37:2150, et seq. will be considered, if applicable. The Contractor shall be responsible for determining that all of his sub-bidders or prospective subcontractors are duly licensed in accordance with law.
ARTICLE 3

BIDDING DOCUMENTS

3.1 Copies

3.1.1 Bidding Documents may be obtained from the Architect for a deposit as stated in the Advertisement for Bids. The deposit will be refunded as stated in the Advertisement for Bids. No deposits will be refunded on Bidding Documents returned later than ten days after receipt of bids.

3.1.2 Complete sets of Bidding Documents shall be used in preparing bids; neither the Owner nor the Architect assumes any responsibility for errors or misinterpretation resulting from the use of incomplete sets of Bidding Documents.

3.1.3 The Owner or Architect in making copies of the Bidding Documents available on the above terms, do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

3.2 Interpretation or Correction of Bidding Documents.

3.2.1 Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding Documents or of the site and local conditions.

3.2.2 Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect, to reach him at least seven days prior to the date of receipt of bids.

3.2.3 Any interpretation, correction or change of the Bidding Documents will be made by Addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

3.3 Substitutions

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

3.3.2 Whenever the name of a particular brand, make, or manufacturer is utilized, it is solely for the purpose of denoting quality standard of product desired.

3.3.2.1 The Bidder is not limited to the particular brand, make, or manufacturer named.

3.3.2.2 Equivalent products will be acceptable, provided all other specified requirements are met.
3.3.3 No substitution will be considered unless written request for approval has been submitted by the Proposer and has been received by the Architect at least seven (7) days prior to the date for receipt of bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including model numbers, drawings, cuts, performance and test data and other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the Proposer. The Architect’s decision of approval or disapproval of a proposed substitution shall be final.

3.3.4 If the Architect approves any proposed substitution, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

3.4 Addenda

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

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

3.4.3 Addenda shall not be issued within a period of seventy-two (72) hours prior to the advertised time for the opening bids, excluding Saturdays, Sundays, and any other legal holidays; however, if the necessity arises to issue an addendum modifying plans and specifications within the seventy-two hour (72) period prior to the advertised time for the opening of bids, then the opening of bids shall be extended exactly one week, without the requirement of re-advertising. Calcasieu Parish School Board shall be consulted prior to issuance of such an Addendum, and shall approve such issuance.

3.4.4 Each Bidder shall ascertain from the Architect prior to submitting his bid that he has received all Addenda issued, and he shall acknowledge their receipt on the Bid Form.

ARTICLE 4

BIDDING PROCEDURE

4.1 Form and Style of Bids

4.1.1 Bids shall be submitted on the forms provided by the Architect.

4.1.2 All blanks on the Bid Form shall be filled in by type writer or manually in ink.

4.1.3 Where so indicated by the makeup of the Bid Form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the written words shall govern.

4.1.4 Any interlineation, alteration or erasure must be initialed by the signer of the Bid or his authorized representative.
4.1.5 Bidders are cautioned to complete all Alternates should such be required in the Bid Form. Failure to submit alternate prices will render the Proposal informal and may cause its rejection.

4.1.6 Bidder shall make no additional stipulation on the Bid Form nor qualify his Bid in any other manner.

4.1.7 The Bid shall include the legal name of Bidder and statement whether Bidder is a sole proprietor, a partnership, a corporation, or any other legal entity, legally authorized to bind the Bidder to a contract. A Bid submitted by an agency shall have a current Power of Attorney attached certifying agent’s authority to bind Bidder.

4.1.8 On any Bid in excess of fifty thousand dollars ($50,000.00), the Contractor shall certify that he is licensed under R.S. 37:2150-2163 and show his license number on the Bid above his signature or his duly authorized representative.

4.2 Bid Security

4.2.1 No Bid shall be considered or accepted unless the bid is accompanied by bid security in an amount of not less than five percent (5%) of the Base Bid and all additive Alternates. The bid security shall be in the form of a certified check or cashier’s check drawn on a bank insured by the Federal Deposit Insurance Corporation, or a bid bond written by a surety company licensed to do business in Louisiana and with an A.M. Best rating of “A” or better, countersigned by a person who is under contract with the surety company or bond insurer as a licensed agent in this state and who is residing in this state and accompanied by appropriate Power of Attorney in fact or of the State of Louisiana.

Bid security furnished by the Contractor shall guarantee that the Contractor will, if awarded the work according to the terms of his proposal, enter into the Contract and furnish Performance and Payment Bonds as required by these Contract Documents, within ten (10) days after written notice that the instrument is ready for his signature.

Should the Bidder refuse to enter into such Contract or fail to furnish such bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as penalty.

4.2.2 The Owner will have the right to retain the bid security of Bidders until either (a) the Contract has been executed and bonds have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all bids have been rejected.
4.3 Submission of Bids

4.3.1 Bids shall be sealed in an opaque envelope and will be received until the time specified and at the place specified in the Advertisement for Bids. It shall be the specific responsibility of the Bidder to deliver his sealed bid to Calcasieu Parish School Board at the appointed place and prior to the announced time for the opening of bids. Later delivery of a bid for any reason, including late delivery by United States Mail, or express delivery, shall disqualify the bid. The bid envelope shall be identified on the outside with the name of the project, and the name, address, and license number of the Bidder as required by RS 37:2163. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation “Bid Enclosed” on the face thereof. Such bids shall be sent by Registered or Certified Mail, Return Receipt Requested, addressed to: Calcasieu Parish School Board, P.O. Box 800, Lake Charles, LA 70602.

4.3.2 Bids shall be deposited at the designated location prior to the time on the date for receipt of bids indicated in the advertisement for Bids, or an extension thereof made by Addendum. Bids received after the time and date for receipt of bids will be returned unopened.

4.3.3 Bidder shall assume full responsibility for timely delivery at location designated for receipt of bids.

4.3.4 Oral, telephonic or telegraphic bids or modifications to bids are invalid and will not receive consideration. Owner will not consider notation written on outside of Bid Envelope which have the effect of amending the Bid.

4.4 Modification or Withdrawal of Bid

4.4.1 A bid may not be modified, withdrawn or canceled by the Bidder during the time stipulated in the Advertisement for Bids, for the period following the time and bid date designated for the receipt of bids, and the Bidder so agrees in submitting his bid, except in accordance with Act 111 of 1983 which states, in part, “Bids containing patently obvious mechanical, clerical or mathematical errors may be withdrawn by the Contractor if clear and convincing sworn, written evidence of such errors is furnished to the public entity within forty-eight hours of the bid opening excluding Saturdays, Sundays and legal holidays”.

4.4.2 Prior to the time and date designated for receipt of Bids, Bids submitted early may be modified or withdrawn only by notice to the party receiving bids at the place and prior to the time designated for receipt of bids.

4.4.3 Withdrawn Bids may be resubmitted up to the time designated for the receipt for bids provided that they are then fully in conformance with these Instructions to Bidders.

4.4.4 Bid Security shall be in an amount sufficient for the Bid as modified or resubmitted.
ARTICLE 5

CONSIDERATION OF BIDS

5.1 Opening of Bids

5.1.1 The properly identified bids received on time will be opened publicly and will be read aloud, and a tabulation abstract of the amounts of the Base Bids and Alternates, if any, will be made available to Bidders.

5.2 Rejection of Bids

5.2.1 The Owner shall have the right to reject any or all bids and in particular to reject a bid not accompanied by any required bid security or data required by the Bidding Documents or a Bid in any way incomplete or irregular.

5.3 Acceptance of Bid

5.3.1 Deleted

5.3.2 Any bid shall include no more than three alternates. Alternates, if accepted, shall be accepted in the order in which they are listed on the bid form. Determination of the low bidder shall be on the basis of the sum of the base bid and any alternates accepted. However, the Owner shall reserve the right to accept alternates in any order which does not affect determination of the low bidder. LA. R.S. 38:2212 (A) (3) (e); Act 868.

5.3.3 It is the intent of the Owner to award a contract to the lowest responsible Bidder in accordance with the requirements of the Bidding Documents, and if the bid does not exceed the funds available.

ARTICLE 6

POST BID INFORMATION

6.1 Proposed list of subcontractors, materials suppliers, and superintendents.

6.1.1 The lowest responsive and responsible bidder must submit to the Owner, or the Project Architect, on behalf of the Owner, within ten (10) days after the bid opening, the completed Contractor Compliance Certificate on State Residency Requirements, Attestation Form (R.S. 38.2227), Affidavit Form (R.S. 38.2212.10 (C)), Affidavit, Resolution, Approved Applicator (Roofing), Manufacturer’s Warranty Letter (Roofing), and Superintendent’s Resume’.

6.1.2 The lowest responsive and responsible bidder must also submit to the Owner within ten (10) days after bids are opened, a list of all subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to special design) proposed for principal portions of the work. Also, provide a designation of the work to be performed by the Contractor with his own forces. No bids shall be received within 24 hours before a weekend or legal holiday, unless deemed necessary by the Superintendent of Schools.
6.1.3 Subcontractors, other persons, and organizations selected by the Bidder must be used on the work for which they were proposed and shall not be changes, except with the written approval of the Owner and Architect.

6.1.4 It is recognized that the acceptance or rejection of alternates contained in the bid proposal may ultimately determine the low bidder on the project. In the event a Contractor, other than the Contractor identified as the apparent low bidder at the bid opening, becomes the low bidder as a result of such selection of alternates, this Contractor shall make the submittals required by this section within 24 hours after notification by the Owner.

6.1.5 The Contractor will be required to establish to the satisfaction of the Architect and the Owner the reliability and responsibility of the proposed subcontractors to furnish and perform the work described in the section of the specifications pertaining to such proposed subcontractors’ respective trades.

6.1.6 The Architect will notify the Contractor if the Owner, after due investigation, has reasonable and substantial objection to any person or organization on the Contractor’s list of proposed subcontractors. If there are objections the Contractor shall submit alternative subcontractor(s) for their approval.

6.1.7 Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect upon the awarding of a contract must be used on the work for which they were proposed and accepted and shall not be changed except upon the recommendation of the Architect and approved by the Owner in the form of a change order. Any changes on the tentative 24 hour list submitted by the Contractor prior to the awarding of the contract must be requested in writing to the Architect with proper justification. Any change in the tentative list of subcontractors will require recommendation from the Architect to the Owner. The recommendation and approval of the Owner must be made in writing.

6.1.8 The lowest responsible bidder shall submit to the Architect and the Owner prior to award of the contract a letter from the manufacturer that the manufacturer will issue the roof system guarantee based on the specified roof system and include the name of the applicator acceptable to the manufacturer for installing the specified roof system. This manufacturer shall be one that has received prior approval or is named in the specifications.

6.2 Additional Submissions

6.2.1 A breakdown of the contract into the 48 Divisions of the C.S.I. shall be provided to the Architect. No payments will be made to the Contractor until this is received.

6.2.2 A copy of applicable state, parish, or municipal licenses legally required for General Contractor and subcontractors shall be provided to the Architect. No payments will be made to the Contractor until this is received.

6.2.3 Federal and state tax identification numbers on General Contractors and subcontractors shall be provided to the Architect. No payments will be made to the Contractor until this is received.
ARTICLE 7

PERFORMANCE AND PAYMENT BOND

7.1 Bond Required

7.1.1 The Contractor shall furnish and pay for a Performance and Payment Bond written by a company licensed to do business in Louisiana, which shall be countersigned by a person who is contracted with the surety company or bond issuer as an agent of the company or issuer, and who is licensed as an insurance agent in this State, and who is residing in this State, in an amount equal to the 100% of the Contract amount. By issuing such Performance and Payment Bond, the surety acknowledges they are on the current U.S. Department of the Treasury Financial Management Service List of approved bonding companies, and complies with all other provisions of R.S. 38:2219.

7.2 Time of Delivery and Form of Bond

7.2.1 The Bidder shall deliver the required bond to the Owner simultaneous with the execution of the Contract.

7.2.2 Bond shall be in the form furnished by Calcasieu Parish School Board, entitled Contract Between Owner and Contractor and Performance and Payment Bond, a copy of which is included in the Contract Documents.

7.2.3 The Bidder shall require the Attorney-In-Fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of his power of attorney.

ARTICLE 8

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.1 Form to be Used

8.1.1 Form of the Contract to be used shall be furnished by Calcasieu Parish School Board, a copy of which is bound in the Bidding Documents.

8.2 Award

8.2.1 In accordance with Louisiana Law, if the Contract is awarded to the Bidder, he shall at the time of the signing of the contract execute the Non-collusion Affidavit included in the Contract Documents.

8.2.2 Before award of the contract, the successful Bidders shall furnish to the Owner a certified copy of the minutes of the corporation or partnership meeting which authorized the party executing the Bid to sign on behalf of the Contractor.

8.2.3 When a project is financed either partially or entirely with School Board bonds, the award of a contract is contingent upon the sale of bonds by the School Board. The School Board shall incur no obligation to the Contractor until the Contract Between Owner and Contractor is duly executed.
ARTICLE 9
COMPLETION TIME AND LIQUIDATED DAMAGES

9.1 The completion of the Contract must be within the time stated in Specification Section 011000 – Project Information and Basic Requirements, Article 1.7 included in these bid documents, subject to such extensions as may be granted under AIA Document A201-2017, Paragraph 8.3, Delays and Extensions of Time in the General Conditions and the Supplementary Conditions, or the Contractor will be subject to pay to the Owner, Liquidated Damages in the amount as stated in Specification Section 011000 – Project Information and Basic Requirements, Article 1.7 included in these bid documents.

ARTICLE 10
BUILDING MATERIAL EXCLUSIONS

10.1 All building materials shall be free of asbestos

10.2 All plumbing materials shall be free of lead

10.3 All paints shall be free of lead

10.4 All contractors should use the least hazardous materials on all jobs. Material Safety Data Sheets (MSDS) shall be given to the owner on all materials used.

ARTICLE 11
PRE-BID CONFERENCE

11.1 A pre-bid conference will be held at the site on Monday, June 24, 2019 at 10:00 a.m. The purpose of the pre-bid conference is to familiarize Bidders with the requirements of the Project and the intent of the Contract Documents, and to receive comments and information from interested Bidders.

11.2 Any revision of the Bidding Documents made as a result of the pre-bid conference shall not be valid unless included in an Addendum issued in accordance with Paragraph 3.4 of the Instructions to Bidders.

ARTICLE 12
APPLICABILITY

12.1 Any article located in the Instructions to Bidders found to be in conflict with the General Conditions and/or Supplementary Conditions will take precedence over the latter two set of Articles.
ARTICLE 13

FEDERAL FUNDED PROJECTS

13.1 In addition to all other conditions contained herein, if a project is funded in whole or in part by federal funds, the following provisions are applicable.

- The Contractor shall comply with the Copeland “Anti-Kickback” Act which prohibits the Contractor and his assignees from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he is otherwise entitled.

- The Contractor shall comply with the Davis-Bacon Act, which requires contractors to pay wages to laborers and mechanics at a rate not less than the minimum wages specified in a wage determination made by the U.S. Secretary of Labor. In addition, the Contractor shall be required to pay wages not less often than once a week.

- The Contractor shall comply with the Contract Work Hours and Safety Standards Act, which requires the Contractor to compute the wages of every mechanic and laborer on the basis of a standard work day of eight (8) hours and standard work week of forty (40) hours. Work in excess of the standard workday or workweek is permissible provided that the worker is compensated at a rate of not less than 1-1/2 times the in any calendar day or forty (40) hours in the work week. The Contractor shall not require any laborer or mechanic to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous to his health and safety as determined under construction, safety and health standards promulgated by the U.S. Secretary of Labor.

- For contracts in excess of $100,000, the Contractor shall comply with all applicable standards, orders or requirements issued under Section 306 of the Clean Air Act, Section 508 of the Clean Water Act Executive Order 11738 and Environmental Protection Agency (EPA) regulations which prohibit the use of facilities included on the EPA list of Violating Facilities.

- The Contractor shall comply with the standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Federal Energy Policy and Conservation Act (Public Law 94-163)

ARTICLE 14

MISCELLANEOUS PROVISIONS

14.1 The general contractor shall repair, replace, or pay for the relocation of telephones and wiring, fire alarms, intercoms, bells, TV cable, security system wiring and equipment, and any other cable type installation that may be damaged, cut or removed during the construction.

14.2 The general contractor will be responsible for the removal and relocation of any playground equipment that needs to be moved due to construction.
14.3 Calcasieu Parish School Board is hereby recognized as a statutory employer of CONTRACTOR’S employees, including but not limited to CONTRACTOR’S direct employees, immediate employees, and statutory employees. This contract recognizes the existence of a statutory employer relationship between Calcasieu Parish School Board and CONTRACTOR in accord with Act 315 of 1997.

ARTICLE 15

MINORITY PARTICIPATION

15.1 The Calcasieu Parish School Board encourages minority Contractors, Subcontractors, businesses, and residents to participate in working on this project and that are domiciled in Calcasieu Parish.

ARTICLE 16

SALES and USE TAX EXEMPTION

16.1 In accordance with applicable rules adapted and promulgated by the Louisiana Department of Revenue, the Owner shall designate the contractor and all subcontractors as its agents for the purchase and lease of materials, supplies or equipment for the project. The contractor and all subcontractors shall accept the agency designation. The designation and acceptance thereof shall be made on the form prescribed by the Louisiana Department of Revenue which form shall be part of the contract between the Owner, Calcasieu Parish School Board, and the contractor. A copy of this form is available at the Architect’s office.

The agency relationship between the Owner and the contractor and all subcontractors shall relieve the contractor and subcontractors (1) from paying any state or local sales or state or local use taxes on materials, supplies or equipment which is affixed to and/or made a part of the real estate of the project or work which is permanently incorporated into the project or work and, (2) from paying any state or local use taxes on any materials, supplies or equipment which are leased and used exclusively for the project or work. Accordingly, in preparing their bids and computing costs the contractor and subcontractors shall not consider sales and/or use taxes which would otherwise be due.

The Owner will furnish to the contractor and subcontractors its Certificate of Sales/Use Tax Exemption/Exclusion on the form prescribed by the Louisiana Department of Revenue. The contractor and subcontractors shall furnish a copy of such certificate to all vendors or suppliers of any of the materials, supplies, or equipment described above.

The contractor and subcontractors shall make all purchases and leases on behalf of and as the agent of the Calcasieu Parish School Board.

Rules and regulations of the Louisiana Department of Revenue shall prevail over any conflicting provisions or specifications of the contract.
General Conditions of the Contract for Construction

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

A/C Systems Upgrades to North Two-Story Building
W. W. Lewis Middle School
2017 All Districts Capital Projects Fund

THE OWNER:
(Name, legal status and address)
Calcasieu Parish School Board

THE ARCHITECT:
(Name, legal status and address)
Ellender Architects & Associates, LLC

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.
§ 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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User Notes:
ARTICLE 2 OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 3.9 Superintendent

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

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

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

§ 3.10 Contractor’s Construction and Submittal Schedules

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

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 3.17 Royalties, Patents and Copyrights
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.
§ 3.18 Indemnification
§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

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

ARTICLE 4 ARCHITECT
§ 4.1 General
§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.
ARTICLE 5  SUBCONTRACTORS
§ 5.1 Definitions
§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

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

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

§ 6.2 Mutual Responsibility

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

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

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

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

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

ARTICLE 7 CHANGES IN THE WORK

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 8 TIME

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
3. failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

damage to the Owner or a Separate Contractor;

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

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

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

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

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

§ 9.6 Progress Payments

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

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

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

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

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

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

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

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials and Substances

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

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

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

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

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

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

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

ARTICLE 11   INSURANCE AND BONDS
§ 11.1 Contractor’s Insurance and Bonds
§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect’s consultants shall be named as additional insureds under the Contractor’s commercial general liability policy or as otherwise described in the Contract Documents.

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

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor’s Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration.
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 proceed under such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect’s consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

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

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

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

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

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

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

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

§ 12.2.2 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.

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

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

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

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

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

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

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

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

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

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.
§ 13.4 Tests and Inspections
§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

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

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

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

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

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

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 Termination by the Contractor
§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:
  .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
  .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
  .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
  .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

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

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

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

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

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

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

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

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

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

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner’s convenience, the Contractor shall cease operations as directed by the Owner in the notice;
.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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

ARTICLE 15 CLAIMS AND DISPUTES
§ 15.1 Claims
§ 15.1.1 Definition
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 15.4.4 Consolidation or Joinder

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

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

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

These Supplementary Conditions modify, change, delete from or add to the General Conditions of the Contract for Construction AIA Document A201, 16th Edition, 2017. When any article of the General Conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by this supplement, the unaltered provisions of that article, section, paragraph, or clause shall remain in effect.

Articles, sections, paragraphs, or clauses modified or deleted have the same numerical designation as those occurring in the General Conditions.

ARTICLE 1 - GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

(In paragraph 1.1.1, delete the third sentence and add the following sentence)

“The Contract Documents shall include the bidding documents as listed in the Instructions to Bidders and any modifications made thereto by Addenda.”

ARTICLE 2 - OWNER

§ 2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

(Add the following sentence to the end of paragraph 2.3.5)

§ 2.3.5 “The Owner shall not be responsible for any explanation or interpretation of the Contract Documents.”

(Delete paragraph 2.3.6 and substitute the following)

§ 2.3.6 “After the project has been awarded and pursuant to Subsection 1.5.2, the Architect shall furnish the Contractor, free of charge, two (2) CD copies of the Construction Documents, including any addenda issued. Any additional sets shall be paid for by the Contractor.”

(Add new section 2.6)

§ 2.6 OWNER’S RIGHT OF PARTIAL OCCUPANCY

(Add new paragraph 2.6.1)

§ 2.6.1 “The Owner shall have the right to use any and all portions of the building that have reached such a stage of completion as to permit occupancy or use provided that such occupancy or use does not hamper the Contractor or prevent his
efficient completion of the Contract. Use form provided in the Contract Documents entitled “Beneficial Occupancy”.

ARTICLE 7 - CHANGES IN THE WORK

§ 7.2 CHANGE ORDERS

(Add new paragraph 7.2.2)

§ 7.2.2 “The Contractor shall include extensions of time, if any, with the change order request and shall submit substantiation for such extension of time.”

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 (Delete the second sentence of paragraph 7.3.1)

(Delete paragraphs 7.3.2, 7.3.3, 7.3.4, 7.3.5, 7.3.6, 7.3.7, 7.3.8, 7.3.9 and 7.3.10)

ARTICLE 8 - TIME

§ 8.1 DEFINITIONS

§ 8.1.2 (In paragraph 8.1.2, change the words “in the agreement” to read “by the written Notice to Proceed”.)

(Add new paragraph 8.1.5)

§ 8.1.5 “The date of Beneficial Occupancy shall be the date when a certain portion or portions of a project are complete to a point where they can be occupied by the Owner.”

§ 8.2 PROGRESS AND COMPLETION

(Delete paragraph 8.2.1 and substitute the following)

§ 8.2.1 “Time is of the essence and completion of the work must be within the time stated in the Agreement, subject to such extensions as may be granted under section 8.3. The Contractor agrees to commence work not later than ten days after the transmittal date of the written notice to proceed from the Owner and to substantially complete the project within the time stated in the Agreement. The Owner will suffer financial loss if the project is not substantially complete in the time set forth in the Contract Documents. The Contractor and his surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed and liquidated damages for each consecutive calendar day (Saturday, Sunday, and holidays included) of delay until the Work is substantially complete.”
§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 In paragraph 8.3.1, change the words “for such reasonable time as the Architect may determine” to read, “as recommended by the Architect, subject to Owner’s approval of the change order”.

(Delete paragraph 8.3.3)

ARTICLE 9 - PAYMENTS AND COMPLETION

§ 9.3.1 APPLICATIONS FOR PAYMENT

(Delete paragraph 9.3.1 and substitute the following)

§ 9.3.1 “Monthly, the Contractor shall submit to the Architect an Application of Certificate for Payment on the most recent versions of AIA Document G702, accompanied by AIA Document G703, notarized, and supported by such data substantiating the right to payment as the Owner or Architect may require. Application for payment shall be submitted on or about the first of each month for the value of labor and materials incorporated in the work and of material suitably stored on site as of the twenty-fifth (25th) day of the preceding month, less normal retainage as follows:”

1. Project with Contract sum of less than $500,000: 10% of Contract Sum

2. Project with Contract sum of more than $500,000: 5% of Contract Sum

§ 9.3.1.1 (Delete this paragraph)

§ 9.6 PROGRESS PAYMENTS

(Delete paragraph 9.6.1 and substitute the following)

§ 9.6.1 “After the Architect has issued a certificate for payment, the Owner shall make payment in a timely manner.”

§ 9.7 FAILURE OF PAYMENT

(Delete section 9.7 and substitute the following)

§ 9.7 “If the Architect does not issue a Certificate of Payment, through no fault of the Contractor, in a timely manner after receipt of the Contractor’s Application for Payment (unless held for reasons set forth in Section 9.5), or if the Owner does not pay the Contractor in a timely manner the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon written notice to the Owner and Architect, stop the work until payment of the amount owed 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 for shut-down, delay, and start-up, as provided for in the Contract Documents.”

§ 9.8  SUBSTANTIAL COMPLETION

§ 9.8.5 (Delete the second and third sentences of paragraph 9.8.5 and substitute the following)

“Upon such acceptance and consent of surety, and upon receipt of a clear lien certificate, the Owner shall make payment, including retainage, sufficient to increase the total payment to one hundred percent (100%) of the Contract Sum, less such amounts as the Architect shall determine for incomplete and/or non-conforming work, including unsettled claims.”

(Add new paragraph 9.8.6)

§ 9.8.6 “Upon the recommendation of the Architect, the Contractor shall record with the Clerk of Court a “Certificate of Substantial Completion” of the Building Contract.”

§ 9.10  FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.2 (Completely delete that part of the sentence following (5) and substitute the following)

“The Contractor shall furnish a clear lien certificate from the Clerk of Court not less than forty-five (45) days after the recordation of acceptance.”

ARTICLE 11 - INSURANCE AND BONDS

§ 11.1  CONTRACTOR’S INSURANCE AND BONDS

(Delete all paragraphs and substitute the following)

§ 11.1.1 “The Contractor shall, before commencing any work to be conducted under this Agreement, procure Workmen’s Compensation and Employer’s Liability Insurance with an insurance company authorized to write such policies of insurance in the State of Louisiana. It shall be the further responsibility of the Contractor to require that all Subcontractors have in full force and effect, a policy of Workmen’s Compensation and Employer’s Liability Insurance before proceeding with any of the Work required under this Agreement. The Contractor shall procure and maintain, during the life of this Agreement, such public liability and property damage insurance, including the operation of motor vehicles, with limits as hereinafter provided which will cover the Contractor’s legal liability arising out of the Work performed by the Contractor and any Subcontractor, and by anyone directly or indirectly employed by either of them for claims for damages for bodily injury, including accidental death, as well as claims for property damages, which may arise from operations under this contract.”

(Add new paragraph 11.1.1.1)
§ 11.1.1.1 Insurance coverage specified in the General Conditions (AIA Document A201) to be provided by the Contractor, and any other insurance described below shall be furnished with the following minimum limits:

Workmen’s Compensation:

.1 Applicable State: Standard Louisiana.
.2 Employer’s Liability: $500,000.00

(Add new paragraph 11.1.1.2)

§ 11.1.1.2 Contractor’s Liability Insurance, including Contractual Liability: Form of insurance shall be Comprehensive Liability including Broad Form CGL and the Contractor shall furnish a certificate naming the Calcasieu Parish School Board as an additional insured:

Coverage Required for Projects: <$1,000,000  >$1,000,000

.1 Bodily Injury and Property Damage
   Combined Single Limit (CSL) – Includes Products, Completed Operations, and Contractual Liability

   Each Occurrence $500,000 (CSL) $1,000,000 (CSL)
   Aggregate $500,000 (CSL) $1,000,000 (CSL)

.2 Personal Injury
   Combined Single Limit (CSL) (Aggregate Limits) – Including products and completed operations and Contractual Liability.

   Each Person Aggregate $500,000 (CSL) $1,000,000 (CSL)
   General Aggregate $500,000 (CSL) $1,000,000 (CSL)

.3 Automobile Liability
   Combined Single Limit (CSL) – Owner, non-owned and hired car bodily injury and property damage.

   $300,000 (CSL)  $500,000 (CSL)

.4 XCU Coverage. Remove Exclusion

.5 Umbrella Policy – The Contractor shall procure and maintain during the life of this agreement, an Umbrella Policy in the amount of $1,000,000 in excess of all other insurance requirements.
§ 11.1.4 NOTICE OF CANCELLATION OR EXPIRATION OF CONTRACTOR’S REQUIRED INSURANCE

(Add the following statement)

“The Contract Time and Contract Sum may be equitably adjusted for the procurement of replacement coverages as stated herein if mutually agreed upon by all parties and approved by the Owner.”

§ 11.2 OWNERS’ INSURANCE

(Delete paragraph 11.2.1 and substitute the following)

§ 11.2.1 Owner’s and Contractor’s Protective Liability Insurance shall be furnished by the Contractor naming the Calcasieu Parish School Board as an additional insured.

Coverage Required for Projects: <$1,000,000 >$1,000,000

.1 Bodily Injury and Property Damage
   Combined Single Limit (CSL) – Includes Products, Completed Operations, and Contractual Liability
   Each Occurrence $500,000 (CSL) $1,000,000 (CSL)
   Aggregate $500,000 (CSL) $1,000,000 (CSL)

(Add new paragraph 11.2.1.1)

§ 11.2.1.1 “Unless otherwise provided, the Contractor shall purchase and maintain property insurance upon the entire work at the site to the full insurable value equal to the Contract Sum.

The Contractor is to provide “Builder’s Risk Insurance” to protect the Owner, Contractor, and Subcontractors as their interests may appear.

The policy insures against “All Risk” of direct physical loss or damage subject to certain exclusions and limitations.”

(Delete paragraphs 11.2.2 and 11.2.3)

ARTICLE 13 - MISCELLANEOUS PROVISIONS

(Add new section 13.7)

§ 13.6 RECORDATION OF CONTRACT AND BOND

(Add new paragraph 13.7.1)

§ 13.6.1 “The Owner shall record the Agreement between the Owner and Contractor and Performance and Payment Bond with the Clerk of Court in the parish in which the work is to be performed.”
ARTICLE 15 – CLAIMS and DISPUTES

§ 15.1.6  CLAIMS FOR ADDITIONAL TIME

(Delete paragraph 15.1.6.2 and substitute the following)

§ 15.1.6.2  “If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the Contract Time due to weather shall not be cause for an increase in the Contract Sum, unless mutually agreed upon between the Owner, Architect, and Contractor. At the end of each month, the Contractor shall make one (1) claim for any adverse weather days occurring within the month. The claim must be accompanied by sufficient documentation evidencing the adverse days and the impact on construction/critical path. Failure to make such claim with twenty-one (21) days from the last day of the month shall prohibit any future claims for adverse days for that month.”

(Add new paragraph 15.1.6.2.1)

§ 15.1.6.2.1  “The following days are considered reasonable anticipated days of adverse weather on a monthly basis.”

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<td>December</td>
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“The Contractor shall ask for total adverse weather days. The Contractor’s request shall be considered only for days over the allowable number of days stated above.”

“Note: Agreement is on a calendar day basis.”
ARTICLE 16 - EQUAL OPPORTUNITY

§ 16.1 “The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, color, sex, or national origin. Such action shall include, but not 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 setting forth in policies of non-discrimination.”

§ 16.2 “The Contractor and all Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.”

ARTICLE 17 - DOCUMENT INTENT

§ 17.1 “The Contract Documents are intended to produce a piece of work complete in every respect and the Contractor shall furnish all things necessary to complete the work within the meaning and intent of the said documents. It shall be the responsibility of the Contractor to provide everything necessary to complete the work as enumerated in these Supplementary Conditions.”

END OF SUPPLEMENTARY CONDITIONS
TO: Calcasieu Parish School Board  
P.O Box 800  
Lake Charles, Louisiana 70602

BID FOR: A/C Systems Upgrades to  
To North Two-Story Building  
W. W. Lewis Middle School  
2017 All Districts Capital Projects Fund  
For the Calcasieu Parish School Board

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Ellender Architects & Associates, LLC and dated: May 2019.

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

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

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

Alternate No. 1 (Not Applicable):
NOT APPLICABLE Dollars ($ NOT APPLICABLE )

Alternate No. 2 (Not Applicable):
NOT APPLICABLE Dollars ($ NOT APPLICABLE )

Alternate No. 3 (Not Applicable):
NOT APPLICABLE Dollars ($ NOT APPLICABLE )

NAME OF BIDDER:  
ADDRESS OF BIDDER:  
LOUISIANA CONTRACTOR’S LICENSE NUMBER:  
NAME OF AUTHORIZED SIGNATORY OF BIDDER:  
TITLE OF AUTHORIZED SIGNATORY OF BIDDER:  
SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **:  
DATE:  

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:

** A CORPORATE RESOLUTION OR WRITTEN EVIDENCE of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

BID SECURITY in the form of a bid bond, certified check or cashier’s check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.
BID BOND
FOR
A/C Systems Upgrades to North Two-Story Building
W. W. Lewis Middle School
2017 All Districts Capital Projects Fund

Date: ______________________

KNOW ALL MEN BY THESE PRESENTS:

That ____________________________________________, as Principal, and ____________________________________________, as Surety, are held and firmly bound unto the ____________________________________________ (Obligee), in the full and just sum of five (5%) percent of the total amount of this bid, including all alternates, lawful money of the United States, for payment of which sum, well and truly be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

Surety represents that it is listed on the current U. S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater that the amount for which it obligates itself in this instrument or that it is a Louisiana domiciled insurance company with at least an A - rating in the latest printing of the A. M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the Bond amount may not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide.

Surety further represents that it is licensed to do business in the State of Louisiana and that this Bond is signed by surety's agent or attorney-in-fact. This Bid Bond is accompanied by appropriate power of attorney.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas said Principal is herewith submitting its proposal to the Obligee on a Contract for:

________________________________________________________________________________

NOW, THEREFORE, if the said Contract be awarded to the Principal and the Principal shall, within such time as may be specified, enter into the Contract in writing and give a good and sufficient bond to secure the performance of the terms and conditions of the Contract with surety acceptable to the Obligee, then this obligation shall be void; otherwise this obligation shall become due and payable.

PRINCIPAL (BIDDER) SURETY

BY: ____________________________________________ BY: _______________________________
AUTHORIZED OFFICER-OWNER-PARTNER AGENT OR ATTORNEY-IN-FACT(SEAL)
RESOLUTION

BE IT RESOLVED that ________________________________

Officer/Owner of ________________________________

is hereby authorized to sign any contract or document on behalf of _________________________

______________________________

______________________________

______________________________

______________________________

Officer/Owner

Signature Officer/Owner

SWORN TO AND SUBSCRIBED before me this ________________________________

day of _________________, 2019 ___________, in ________________, Louisiana.

______________________________

NOTARY PUBLIC

Resolution - 1
A/C Systems Upgrades to North Two-Story Building
W. W. Lewis Middle School
2017 All Districts Capital Projects Fund
W. W. Lewis Middle School – 1752 Cypress Street, Sulphur, Louisiana 70663
Calcasieu Parish School Board

SUBCONTRACTOR LISTING
ELLENDER ARCHITECTS & ASSOCIATES, LLC
(See Post Bid Information Article VI for further instructions)

<table>
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<tr>
<th>Work Description</th>
<th>Subcontractor</th>
<th>Location</th>
<th>Phone #</th>
<th>L.A. Contractor License #</th>
<th>Federal I.D. #</th>
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Note: Also see the “Basic Requirements” Section 011000 of specifications for requirements of the proposed Project Superintendent’s resume which shall be submitted along with this Subcontractor’s Listing.

THIS FORM MUST BE FORWARDED TO THE OFFICE OF THE ARCHITECT WITHIN 10 DAYS AFTER RECEIPT OF BIDS BY THE CALCASIEU PARISH SCHOOL BOARD.
ATTESTATION FORM
(R.S. 38:2227)
(Past Criminal Convictions of Bidders)

A/C SYSTEMS UPGRADES to NORTH TWO-STORY BUILDING
W. W. LEWIS MIDDLE SCHOOL
2017 ALL DISTRICTS CAPITAL PROJECTS FUND
W. W. Lewis Middle School – 1752 Cypress Street – Sulphur, LA 70663
Caclaisieu Parish School Board

Appearer, as a Bidder on the above-entitled Public Works Project, does hereby attest that:

LA. R.S. 38:2227 PAST CRIMINAL CONVICTIONS OF BIDDERS

A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes:

(a) Public bribery (R.S. 14:118)                          (c) Extortion (R.S. 14:66)
(b) Corrupt influencing (R.S. 14:120)                    (d) Money laundering (R.S. 14:230)

B. Within the past five years from the project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

(a) Theft (R.S. 14:67)                                   (f) Bank fraud (R.S. 14:71.1)
(b) Identity Theft (R.S. 14:67.16)                       (g) Forgery (R.S. 14:72)
(c) Theft of a business record                           (h) Contractors; misapplication of payments (R.S. 14:202)
     (R.S.14:67.20)                                       (i) Malfeasance in office (R.S. 14:134)
(d) False accounting (R.S. 14:70)                       (e) Issuing worthless checks (R.S. 14:71)


NAME OF BIDDER                                       NAME OF AUTHORIZED SIGNATORY OF BIDDER

__________________________________________________  _______________________________________________
DATE                                               TITLE OF AUTHORIZED SIGNATORY OF BIDDER

__________________________________________________  _______________________________________________
SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER

THIS FORM MUST BE SUBMITTED TO THE OWNER, OR THE PROJECT ARCHITECT/ENGINEER, ON BEHALF OF THE OWNER, WITHIN TEN (10) DAYS AFTER THE BID OPENING.
Affidavit Form
(R.S. 38:2212.10(C))
(Verification of Employees E-Verify)

A/C Systems Upgrades to North Two-Story Building
W. W. Lewis Middle School
2017 All Districts Capital Projects Fund
W.W. Lewis Middle School – 1752 Cypress Street – Sulphur, LA 70663
Calcasieu Parish School Board

Appearer, as a Bidder on the above-entitled Public Works Project, does hereby attest that:

LA. R.S. 38:2212.10 Verification of Employees (E-Verify)

A. Appear is registered and participates in a status verification system (E-Verify) to verify that all employees in the state of Louisiana are legal citizens of the United States or are legal aliens.

B. If awarded the contract, Appearer shall continue, during the term of the contract, to utilize a status verification system (E-Verify) to verify the legal status of all new employees in the state of Louisiana.

C. If awarded the contract, Appearer shall require all subcontractors to submit to it a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

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Witness

Witness

__________________________
Notary Public

This form must be submitted to the owner, or the project architect/engineer, on behalf of the owner, within ten (10) days after the bid opening.
CONTRACT BETWEEN OWNER AND CONTRACTOR
AND PERFORMANCE AND PAYMENT BOND

This agreement entered into this    day of ________________________________
2019, ________________________________________________________________

hereinafter call the “Contractor”, whose business address is __________________________

and the Calcasieu Parish School Board, herein represented by the contracting officer executing
this contract, hereinafter called the “Owner”.

Witnesseth that the Contractor and the Owner, in consideration of premises and the
mutual covenants; consideration and agreement herein contained, agree as follows:

Statement of Work: The Contractor shall furnish all labor and materials and perform all
of the work required to build, construct and complete in a thorough and workmanlike manner:

A/C SYSTEMS UPGRADES to NORTH TWO-STORY BUILDING
W. W. LEWIS MIDDLE SCHOOL
2017 ALL DISTRICT CAPITAL PROJECTS FUND
1752 Cypress Street – Sulphur, Louisiana 70663
Calcasieu Parish School Board

in strict accordance with Contract Documents prepared by:

Ellender Architects & Associates, LLC
1521 Cypress Street
Sulphur, Louisiana 70663

It is recognized by the parties herein that said Contract Documents including by way of
example and not of limitation, the Drawings and Specifications dated __________ May 2019,___
Addenda number(s) _______________________ Conditions, Supplementary Conditions, any
Addenda thereto, impose duties and obligations upon the parties herein, and said parties thereby
agree that they shall be bound by said duties and obligations. For these purposes, all of the
provisions contained in the aforementioned Construction Documents are incorporated herein by
reference with the same force and effect as though said Construction Documents were herein set
out in full.
Time for Completion: The work shall be commenced on a date to be specified in a written order of the Owner and shall be substantially complete by _______________________ or any mutually agreed extension thereto.

Compensation to be Paid to the Contractor: The Owner will pay and the Contractor will accept in full consideration for the performance of the contract the sum of ______________________

DOLLARS ($___________), which sum represents the Base Bid plus Alternates ______________________.

Performance and Payment Bond: To these presents personally came and intervened ______

______________________________, herein acting for ________________________________, a corporation organized and existing under the laws of the State of ____________________, and duly authorized to transact business in the State of Louisiana, as surety, who declared that having taken cognizance of this contract and of the Construction Documents mentioned herein, he hereby in his capacity as its Attorney in Fact obligates his said company, as Surety for the said contractor, unto the said Owner, up to the sum of ______________________

______________________________.

The condition of this performance and payment bond shall be that should the Contractor herein not perform the contract in accordance with the terms and conditions hereof, or should said contractor not fully indemnify and save harmless the Owner, from all cost and damages which he may suffer by said Contractor’s non-performance or should said Contractor not pay all persons who have and fulfill obligations to perform labor and/or furnish materials in the prosecution of the work provided for herein, including by way of example workmen, laborers, mechanics, and furnishers of materials, machinery, equipment and fixtures, then said Surety agrees and is bound to so perform the contract and make said payment(s).

Provided, that any alterations which may be made in the terms, of the contract or in the work to be done under it, or the giving by the Owner of any extensions of time for the performance of the contract, or any other forbearance on the part of either the Owner or the Contractor or the Surety from their liability hereunder, notice to the Surety of any such alterations, extensions or other forbearance being hereby waived.
In Witness whereof, the parties herein on the day and year first above written have executed this agreement in six counterparts, each of which shall, without proof or accountancy for the other counterparts, be deemed an original thereof.

WITNESSES:

__________________________________  CONTRACTOR

__________________________________  BY: _________________________________

__________________________________  TITLE

__________________________________  Calcasieu Parish School Board

__________________________________  OWNER

__________________________________  BY: _________________________________

__________________________________  TITLE

__________________________________  SURETY

__________________________________  ATTORNEY IN FACT
AFFIDAVIT

Before me, the undersigned authority, duly commissioned and qualified within and for the state and parish aforesaid, personally came and appeared representing

who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

PART I

Section 2224 of Part I of Chapter 10 of Title 38 of the La. Revised Statutes of 1950 as Amended.

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

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

Section 2190 of Part I of Chapter 10 of Title 38
of the Louisiana Revised Statues of 1950 as amended.

That affiant, if he be an architect or engineer, or representative thereof, does not own a substantial financial interest, either directly or indirectly, in any corporation, firm, partnership, or other organization which supplies materials for the construction of a public building or project when the architect or engineer has performed architectural or engineering services, either directly or indirectly, in connection with the public building or project for which the materials are being supplied.

For the purposes of this section, a “substantial financial interest” shall exclude any interest in stock being traded on the American Stock Exchange of the New York Stock Exchange.

That affiant, if subject to the provisions of this section, does hereby agree to be subject to the subject to the penalties involved for the violation of this section.

PART III

That affiant does hereby state that he has read and agrees to comply with and be subject to the provisions of Part V of Chapter 10 of Title 38 of the Louisiana Revised Statutes of 1950, being Sections 2290 through 2296 of Title 38 as amended.

______________________________________

Sworn to and Subscribed Before Me This _____________ day of _____________
_________________, 2019.

______________________________________
CHANGE ORDER

Change Order No.: ____________________________________________________________
Date: ______________________________________________________________________
Contract Date: __________________________________________________________________
Project: ____________________________________________________________
A/C Systems Upgrades to North Two-Story Building
W. W. Lewis Middle School
All Districts Capital Improvements Fund
1752 Cypress Street – Sulphur, Louisiana 70663
Calcasieu Parish School Board
Project No.: ___2019-06____
To: ______________________________________________________________________

You are directed to make the following change in this contract:
(Attach Itemized Breakdown)

The Original Contract Sum $ _________________________________

Net Change by Previous Change Order $ _________________________________

Contract Sum Prior to This Change Order $ _________________________________

Contract Sum will be (increased) (decreased) (unchanged) by this Change Order $ _________________________________

New Contract Sum Including This Change Order $ _________________________________

Contract Time Will Be (Increased) (Decreased) (Unchanged) by ________ ( ?? ) Days

Revised Contract Completion Date

RECOMMENDED
Ellender Architects & Associates, LLC
(Designer)
1521 Cypress Street
Sulphur, LA 70663

ACCEPTED
_________________________
(Contractor)

APPROVED
Calcasieu Parish School Board
(Owner)
3310 Broad Street
Lake Charles,
Louisiana 70615

By: _______________ By: _______________ By: _______________
Date: _______________ Date: _______________ Date: _______________

Revised April 2018
BENEFICIAL OCCUPANCY

NOT FOR RECORDATION

DATE: _____________________________________________________________

PROJECT NAME: ____________________________ A/C Systems Upgrades to North Two-Story Building
W. W. Lewis Middle School
2017 All Districts Capital Projects Fund
1752 Cypress Street, Sulphur, Louisiana 70663
Calcasieu Parish School Board

PROJECT NO.: ___________ EA 2019-06

ARCHITECT: ____________________________ Ellender Architects & Associates, LLC

CONTRACTOR: _______________________________________________________

OWNER: ____________________________ Calcasieu Parish School Board

The below described portion of subject project is, to the best of my knowledge and belief,
complete to a point where the User desires to use in according with the Contract Documents.

PORTION OCCUPIED: ________________________________________________

DATE OCCUPIED: ______________________________________________________

WARRANTY items covered by Occupancy. (See Attached List)

ARCHITECT                      Date

CONTRACTOR         Date

OWNER          Date

Punch List  See Attached List _________________
None ________________________________

NOT FOR RECORDATION PURPOSES
RECOMMENDATION OF ACCEPTANCE

TO: ____________________________________________________________

DATE: __________________________________________________________

PROJECT NO: EA 2019-06 __________________________________________

PROJECT NAME: A/C Systems Upgrades to North Two-Story Building
                 W. W. Lewis Middle School
                 2017 All Districts Capital Projects Fund
                 1752 Cypress Street, Sulphur, Louisiana 70663
                 Calcasieu Parish School Board

DESIGNER: Ellender Architects & Associates, LLC

CONTRACTOR: __________________________________________________

OWNER: Calcasieu Parish School Board

I certify that, to the best of my knowledge and belief, this project is complete or
substantially complete in accordance with the Plans and specifications to the point where it can
be used for the purpose which was intended. It is recommended that it be accepted.

DATE OF ACCEPTANCE: __________________________________________

CONTRACT DATE OF COMPLETION: _________________________________

NUMBER OF DAYS (Overrun) (Underrun) (As of Acceptance Date): ______

LIQUIDATED DAMAGES PER DAY Stipulated in Contract $ _____________

VALUE OF PUNCH LIST (Attach Itemized List) $ ________________

Was part of project occupied prior to Acceptance: ______________________

PORTION OCCUPIED: Attach Beneficial Occupancy Forms

Sign: ___________________________

ARCHITECT

For Use of Owner
I concur in the Acceptance of this project:

Sign: ___________________________

OWNER
States government, or an agency, board, commission, or instrumentality of the State of Louisiana or its political subdivisions, including parishes, municipalities and school boards, does hereby designate the following contractor as its agent for the purpose of making sales tax exempt purchases on behalf of the governmental body:

Name of Contractor

Address

City State ZIP

This designation of agency shall be effective for purchases of component construction materials, taxable services and leases and rentals of tangible personal property for the following named construction project:

Construction Project

Contract Number

This designation and acceptance of agency is effective for the period

Beginning Date (mm/dd/yyyy)  End Date (mm/dd/yyyy)

Purchases for the named project during this period by the designated contractor shall be considered as the legal equivalent of purchases directly by the governmental body. Any materials purchased by this agent shall immediately, upon the vendor’s delivery to the agent, become the property of this government entity. This government entity, as principal, assumes direct liability to the vendor for the payment of any property, services, leases, or rentals made by this designated agent. This agreement does not void or supersede the obligations of any party created under any construction contract related to this project, including specifically any contractual obligation of the construction contractor to submit payment to the vendors of materials or services for the project.

This contractor-agent is not authorized to delegate this purchasing agency to others; separate designations of agency by this governmental entity are required for each contractor or sub-contractor who is to purchase on behalf of this governmental entity. The undersigned hereby certify that this designation is the entirety of the agency designation agreement between them. In order for a purchase for an eligible governmental entity through a designated agent to be eligible for sales tax exemption, the designation of agency must be made, accepted, and disclosed to the vendor before or at the time of the purchase transaction.

This designation of agency form, when properly executed by both the contractor and the governmental entity, shall serve as evidence of the sales tax exempt status that has been conferred onto the contractor. No other exemption certificate form is necessary to claim exemption from sales taxes. The agency agreement evidenced by this sales tax exemption certificate must be implemented at the time of contract execution with the governmental entity. The contract between the governmental entity and his agent must contain provisions to authenticate the conferment of agency.
DIVISION 01

GENERAL REQUIREMENTS
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project Information.
2. Bid Documents.
3. Issuance of Bid Documents (After Project Has Been Awarded)
4. Scope of Work.
5. Completion Time and Stipulated Damages.
6. Requirements.
8. Field Measurements.
9. Codes and Standards.
10. Contractor’s Field Office.
11. Temporary On-Site Storage.
12. Temporary Facilities and Heat.
15. Responsibility for Damages.
16. Construction Coordination.
17. Access to site.
18. Coordination with Occupants.
19. Work Restrictions.
22. Project Closeout.

1.3 PROJECT INFORMATION

A. Project Title: A/C SYSTEMS UPGRADES to NORTH TWO-STORY BUILDING, W.W. LEWIS MIDDLE SCHOOL - 2017 ALL DISTRICTS CAPITAL PROJECTS FUND - 1752 CYPRESS STREET, SULPHUR, LA 70663 - CALCASIEU PARISH SCHOOL BOARD.

B. Architect: ELLENDER ARCHITECTS AND ASSOCIATES, LLC, 1521 CYPRESS STREET, SULPHUR, LOUISIANA, 70663, (337-527-3603)

C. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Structural Engineers: CHARLES LADNER & ASSOCIATES, INC, 5393 BIG LAKE ROAD, LAKE CHARLES, LOUISIANA 70605, (337-478-2222)
2. M/E/P Engineers: ASSOCIATED DESIGN GROUP, INC., 3909 WEST CONGRESS STREET, SUITE 201, LAFAYETTE, LOUISIANA, 70506, (800-259-5710)

1.4 BID DOCUMENTS

A. The Bid Documents, including drawings and technical specifications, are on file and available at the office of ELLENDER ARCHITECTS & ASSOCIATES, LLC, 1521 Cypress Street, Sulphur, Louisiana 70663 (337) 527-3603, and various area plan rooms.

B. CD disk type media that contains drawings and technical specifications in PDF format may be obtained from the Architect upon payment of Twenty Dollars ($20.00) for each CD. This payment is non-refundable.

C. When drawings and technical specifications are distributed via CD disk type media, the bidder shall be responsible for printing any paper copies he or she may need.

D. The distribution of drawings and technical specifications via email (electronic mail), are not allowed.

1.5 ISSUANCE OF DOCUMENTS (AFTER PROJECT HAS BEEN AWARDED)

A. The Architect shall issue Two (2) copies of CD disk type media that contain the plans, specifications, and any addenda issued, in PDF format.

B. The Contractor shall be responsible for printing and/or reproducing copies he or she may need for construction purposes.

C. The Contractor shall furnish, complete with any addenda, a hard copy of the specifications and full size plan set for construction. These documents shall be present on site and maintained in legible fashion throughout the entire project. These shall be made available to the designer upon request during site visits and any scheduled meeting.

D. The Contractor shall furnish, complete with any addenda, hard copies of specifications and full size plan set for each sub-contractor. This shall include any second tier sub-contractor and/or supplier. These documents shall be present on site and maintained in legible fashion throughout the entire project.

1.6 SCOPE OF WORK

A. Scope of Work:

1. This project includes A/C System Upgrades of the North Two-Story Classroom Building including any addenda issued.

B. Type of Contract:

1. Project shall be constructed under a single prime contract.
1.7 COMPLETION TIME, SCHEDULE OF WORK, and LIQUIDATED DAMAGES

A. Completion Time: **June 1, 2020**

1. The Bidder hereby agrees to commence work under this contract on a date specified in a written “NOTICE TO PROCEED” by the Owner and fully complete the project within the above stated number of days or within the time as may be extended as stipulated in the Contract Documents. See “SCOPE OF WORK” section herein and in the specifications.

B. Schedule of Work: All work shall be handled to have minimal impact to school operations. All work shall be scheduled with the School Principal, Architect, and Director of Planning & Construction. Contractor shall allow the Owner approximately two (2) weeks to reoccupy the north building’s 2nd Floor Level between the two phases of work. The prioritizing of work shall be as follows:

**Priority One Work:** A/C Systems Upgrades and related work on the 2nd Floor Level.

**Priority Two Work:** A/C Systems Upgrades and related work on the 1st Floor Level.

C. Stipulated Damages: **Three Hundred Dollars ($300.00) Per Consecutive Calendar Day.**

1. The Bidder hereby agrees to pay as Stipulated Damages the above stated sum for each consecutive calendar day which the work is not complete beginning with the first day beyond the completion time stated above.

1.8 REQUIREMENTS

A. Unless otherwise specified, Contractor shall supply all labor, transportation, apparatus, materials, fuel, energy, lights, water, scaffolding, and tools necessary for the entire construction project and completion of the project as shown on the drawings and described in these specifications.

B. Contractor shall install, maintain and remove all construction equipment and auxiliary devices and shall be responsible for the safe, proper and lawful maintenance and use of same.

C. Bidders are requested to visit the site, compare the drawings and specifications including other work, if any being performed. Failure to do so will in no way relieve the successful bidder from furnishing any materials or performing any work that may be required to complete the work in accordance with the drawings and specifications without additional cost to the Owner.

D. Copies of Standards: Each entity engaged on this project shall be familiar with standards applicable to that activity. Copies of applicable standards are not bound to the contract documents.

E. At the pre-construction meeting, the Contractor shall provide the Schedule of Values, List of Sub-Contractors and Material Suppliers, and the Construction Schedule.
1.9 TESTING SERVICES

A. The Owner will select a testing laboratory to perform all required tests during construction and will contract for and pay for all such services. It will be the Construction Contractor’s responsibility to pay for all required re-tests due to initial failure results in the first test. The Designer will ensure that the Construction Contractor is aware of this requirement.

1.10 FIELD MEASUREMENTS

A. The contractor shall perform field measurements prior to fabrication of items as related to this project. The contractor shall check and verify all lines, levels, and measurements as he will be entirely responsible for the proper laying out and the construction of the work included in this contract.

B. No extra charge of compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the drawings; any difference which may be found shall be submitted to the Project Architect/Engineer for consideration before proceeding with the work.

1.11 CODES and STANDARDS

A. Each contractor shall comply with all applicable current and ANSI standards, in particular, provisions of ANSI A-10 Series Standards on construction safety, including A-10.3 thru A-10.15 and A-10.17, A-10.18, and A-10.22.

B. Each contractor shall comply with the latest and adopted edition of the IBC Building Code, IBC Plumbing Code, IBC Mechanical Code, and any other applicable IBC code as related to the requirements of this contract.

C. Each contractor shall comply with all current and adopted NFPA codes, in particular, NFPA Code 241 “Building Construction and Demolition Operations”.

D. Each contractor shall comply with the latest OSHA requirements and OSHA’s Hazard Communication Standard (HCS).

E. Each contractor shall comply with all requirements set forth in the latest adopted ADA standard, including any ADA addenda. Comply with mounting heights and locations, clearances, slopes, etc. All products and any associated part or component, apparatus, and control feature, etc. installed for this project shall meet and comply with the latest ADA standard. This shall include components, apparatus, and control features provided and installed by the Contractor or the manufacturer. All controls, control apparatus devices, switches, components shall be accessible and meet the latest ADA edition, included any ADA addenda.
1.12 CONTRACTOR'S FIELD OFFICE

A. The General Contractor’s field office shall be of sufficient size to hold the monthly meetings scheduled by the Architect between the Architect, General Contractor (General Contractor AND Job Superintendent) and all Sub-Contractors, as required. The field office shall be kept neat and clean in appearance and be air-conditioned. The field office shall be removed from site upon project completion.

B. The field office shall be provided with a telephone/fax, email, and printing capabilities. The aforementioned telecommunication equipment shall be maintained for the duration of this project. Notify Architect of the field office telephone/fax number and email address upon installation of such.

1.13 PROJECT SUPERINTENDENT

A. A full-time project superintendent (8+ hours daily) shall be present on this project site as the General Contractor’s Project Superintendent. This project shall be the sole responsibility assigned to this Superintendent for the duration of this project. No work shall be done on/at this project site without the Project Superintendent on this project site. The proposed Project Superintendent’s name and qualifications shall be submitted to the Architect prior to signing of the contract for the Architect’s review and approval.

B. The Contractor/Project Superintendent shall keep an orderly file of the plans and specifications as well as shop drawings on the job site for the Architect’s and Engineer’s use.

1.14 TEMPORARY ON-SITE STORAGE

A. Each contractor shall provide their own temporary on-site apparatus for storing, securing, fabrication, and similar purposes and shall locate such in accordance with the contractor for general works coordinated plan for site utilization.

B. The storage shall protect building materials and equipment as would be damaged by exposure to the weather. The storage shall be adequate for the purpose and shall be removed after project is complete.

C. All construction and material storage shall be coordinated with the Owner and the Architect. All construction and materials for construction shall be handled such that no hazard shall exist.

1.15 TEMPORARY FACILITIES and HEAT

A. Each Contractor shall establish and initiate use of each temporary facility at time first reasonably required for proper performance of the total work of project. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.
B. Conditions of Use: Each contractor shall install, operate, maintain and protect temporary facilities in manner and at locations which will be safe, non-hazardous, sanitary and protective of persons and property, free of deleterious effects.

C. If temporary heat is required for the protection the work, the contractor shall provide approved heat producing devices; he shall provide adequate and proper fuel and power as needed to maintain the heating devices as required for the protection and drying out of the work.

1.16 SANITARY FACILITIES

A. Provide either piped (wet) toilet facilities or self-contained toilet units of type acceptable to governing authorities, adequate for use of personnel at project site. Provide separate facilities for male and female personnel when both sexes are working at project site. Provide piped (wet) wash facilities during construction and remove promptly after project is complete.

1.17 PROVISIONS for SECURITY and PROTECTION

A. Types of temporary security and protection provisions required includes, but are not limited to, fire protection, barricades, warning signs/lights, and similar provisions intended to minimize property losses, personal injuries, and claims for damages at site.

1.18 RESPONSIBILITY for DAMAGES

A. The Contractor shall be responsible for replacement of all glass of every character broken until the Completion and Acceptance of this Project; he shall be responsible for the proper repair of damage to structure unless he can prove and sustain his claim to damages or destruction by other specified agencies or groups.

1.19 CONSTRUCTION COORDINATION

A. The General Contractor shall coordinate the handling of all products, materials, etc. Coordinate any space requirements, access, clearances, etc. prior to submitting shop drawings and installation.

B. Layout work prior to installation, refer to architectural, structural, mechanical, plumbing, fire protection, and electrical drawings at all times in order to avoid interference, conflicts, and undue delays in the progress of work.

C. The General Contractor shall be responsible for and ensure that work of all trades is installed without interferences. In the event of possible interference with piping, ductwork, or equipment, items that require set grade, elevation, fire protection piping, and lighting fixture locations shall have precedence over other items. Should any major interference develop, immediately notify the Architect/Engineer.

D. Coordinate and properly relate all work required to the building structure and work of all other trades.
E. Work shall be installed to meet any existing conditions found at the project site.

F. Do not rough-in for any item or equipment furnished by others or noted “Not in Contract”, until receiving rough-in information from the other trades and/or the Architect/Engineer.

1.20 ACCESS TO SITE

A. General: Contractor shall have use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to work in areas as indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Patrons, Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

   a. Scheduled deliveries for construction operations shall minimize use of driveways and entrances that have been allowed by the Owner for such use.
   b. These deliveries shall minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.21 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing adjacent building(s) during entire construction period, with the exception of areas under construction. 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 72 hours in advance of activities that will affect Owner's operations.
1.22 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. Special Security Requirements: Comply with the following directives to maintain on-site security measures.
   1. The Contractor shall submit names of all staff and personnel being used for this project.
   2. The Contractor shall submit an inventory of all tools and equipment to be used on-site.
   3. Hand and power tools may be kept and stored on site when not in use. This method of storage shall require the Contractor to provide locked job boxes. If lockable job boxes are not provided, the Contractor shall remove all hand and power tools from the site when not in use.

C. On-Site Work Hours: Limit work in the building to normal working hours of 7:00 a.m. to 3:30 p.m., Monday through Friday, unless otherwise indicated.
   1. Weekend Hours: Permissible, 48 hour notice required.
   2. Early Morning or Late Evening Hours: Permissible during daylight hours only, final approval given by Architect, Owner, and Facility Staff.
   3. Nighttime Hours: Not Permitted unless requested by Contractor and approved by Owner.
   4. Hours for Utility Shutdowns: See Below.
   5. Hours for Noisy and Vibratory Type Operations: See Below.

D. Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
   1. Notify Architect and Owner not less than four days in advance of proposed utility interruptions.
   2. Interruptions shall take place during off hours and be scheduled with the Owner.

E. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner.
   1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.

F. Nonsmoking: Smoking is not permitted on site or on Owner’s property.

G. Controlled Substances: Use of tobacco products and other controlled substances are not permitted on site or on Owner’s property.

H. Profanity: The use of profanity, obscene gestures, and discussions of improper subject matter, are prohibited on site or on Owner’s property.
I. Dress Code: Proper footwear, pants, and shirt shall be worn by personnel working on site or on Owner's property.

J. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

K. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.23 WARRANTIES and OPERATIONAL & MAINTENANCE MANUAL

A. The General Contractor shall submit one (1) hard copy of the operational and maintenance manual to the Designer for review. Submit at least two (2) weeks after the project has been formally accepted by the Owner. Submission of such in multiple parts and/or sections will not be accepted. Copies of shop drawings are not acceptable. This manual is for the Owner’s operations, maintenance, and warranty information.

B. After review by the Designer, the hard copy will be returned to the Contractor for corrections, if any. The Contractor shall then convert the hard copy to an electronically bookmarked PDF file. The PDF file shall be optimized to reduce size and “burned” onto CD type media. The CD disk media shall be delivered to the Designer for final review.

C. The front cover page shall identify the Project Title, Owner, Architect, Consulting Engineers, General Contractor, and all Sub-Contractors. Contact information for each shall be placed on the second page. The Table of Contents shall occupy the third page. The electronically bookmarked PDF shall contain the following, if utilized:

1. Fire Marshal and/or Municipality-District Completion Certificates
2. Fire Marshal and/or Municipality-District Inspection Reports
3. Fire Alarm and/or Municipality-District Completion Certificate
4. Sprinkler System Completion and Test Certificates (Above & Below Ground)
5. Warranty Certificates (Dated Originals with Signatures in “BLUE” ink)
6. Roofing Manufacturer’s Warranties (Including Certifications As Related To Wind Uplift Pressure Requirements, See Paragraph “E” Below)
7. Product/Part Information on Systems and Components (Copies of Shop Drawings Are Not Allowed)
8. Operational Manuals for Systems and Components
9. Spare Parts List For All Products and Components (Including, But Not Limited To, Hardware, Plumbing Fixtures, etc.)
10. Inspection Procedures for Systems and Components
11. Emergency Instructions and Procedures for Systems and Components
12. Fixture Lamping and Ballast and/or Driver Schedule (Include Listing of Fixtures and Lamps-LEDs-Drivers Required for Each)
13. Listing of HVAC Filter Sizes For Each Unit and Replacement Schedule for Each
14. Color and Finish Selection Schedule for Each Room, Space, and Item Being Provided with Finishes (Include Type, Manufacturer, Make and/or Model Number, Series Name and Number, Color Name and Number, Special Blend or Mix Number(s), Brick Series and Color, Roofing Series and Color, etc.). This shall include all interior and exterior finishes.
D. Certain equipment and product items in other sections of this specification shall be furnished and installed under the General Contractor's responsibility for the standard one (1) year warranty plus an additional one (1) year warranty.

E. Refer to other specification sections as related to roofing warranties.

F. Refer to other specification sections for requirements as related to furnishing of spare/extra materials. This includes, but is not limited to, fixture lamps, HVAC filters, paint and finishing materials, ceiling tiles, etc. The Contractor shall submit a list of all spare materials to the Designer for review and verification.

1.24 FINAL CLEANING

A. Special cleaning for specific units of work is specified in sections of Division 2 - 33. General cleaning during progress of work is specified in General Conditions. Provide final cleaning of the work to normal clean condition accepted for a first class building cleaning maintenance program. Comply with manufacturer's instructions for cleaning operations. Final touch up type cleaning shall be performed at the time of project acceptance.

B. The following are examples of items to be cleaned but does not limit the cleaning levels to overall project by the Contractor:

1. Remove labels which are not required as permanent labels. Clean transparent materials, including mirrors and window/door glass. All broken glass and damaged transparent material shall be replaced and all painted surfaces shall be in first class conditions.

2. Clean concrete floors, vacuum clean carpets, clean plumbing fixtures to sanitary condition, free of stains, including those resulting from water exposure. Clean and wipe surfaces of mechanical and electrical equipment, remove excess lubrication and other substances.

3. Clean overall project site of all litter and foreign substances.

4. Comply with safety standards and governing regulations for cleaning operations. Do not burn materials at site or bury debris or excess materials on Owner's property; remove waste materials from site and dispose of in a lawful manner.

5. Final touch up cleaning shall be performed at the time of project acceptance of the Owner. This shall include, but is not limited to, cleaning of glass, mirrors, plumbing fixtures, flooring, stained or soiled items, etc. for a final finished appearance at the time of the Owner's acceptance.

C. Areas of work are surrounded by lawn and paved areas. Paved areas include concrete and/or asphalt. The Contractor shall prevent damage to and maintain existing lawn and paved (concrete and/or asphalt) areas for the duration of the project. Any damaged lawn and/or paved area as a result of construction operations shall be restored to its original condition as documented at the start of the project as well as restoring/replacing any paved area (concrete and/or asphalt) damaged. Damage includes, but is not limited to, marring, broken, rutted, stained/soiled, etc.
1.25 PROJECT CLOSEOUT AND RECORD AS-BUILT DRAWING SET

A. The General Contractor shall keep and maintain at least one (1) set of project drawings in the job shack for the sole purpose of marking up any changes to the work. This set shall become the record “As Built” set of drawings for project closeout. The set shall be maintained clear and legible for viewing and interpretation. Markup changes shall be made in “RED” ink and initialed by the person responsible for the change.

B. These drawings will be subject to review by the Architect on a weekly basis. Failure by the General Contractor and the Subcontractors to properly document changes on the drawings could result in the Architect withholding payment on the monthly draw request.

C. At the end of the project, the General Contractor shall be responsible for completing and verifying the accuracy of the record “As Built” drawings. The General Contractor shall review the set with the Architect present to make sure all changes are properly delineated. All delineated changes made to these drawings shall be neat, precise, and legible manner as stated above and approved by the Architect. This delineation shall be completed prior to the Contractor being paid the retainage on this project.

D. The General Contractor shall have the final set of record “As Built” drawings scanned and converted to electronic PDF file format. All sheets shall be combined into one (1) electronic PDF file. This file shall be optimized for file size reduction and burned onto CD type media. The CD disk media shall be delivered to the Designer for final review. At the Contractor’s option, this PDF file may be burned onto the same CD media being used for the Operational and Maintenance Manual…but, as a separate PDF file.

E. List of items required by specifications to be submitted to Architect’s office prior to recommendation of acceptance:
   1. Submit statement showing final accounting of changes to Contract Sum.
   2. Advise Owner of pending insurance change-over requirements.
   3. Submit record drawings, maintenance manuals and similar final record information as called for.
   4. Advise Owner’s Personnel of change over in security provisions.
   5. Complete start-up testing of systems and instruction of Owner’s operating/maintenance personnel.
   6. Remove temporary facilities and services and similar elements from site.
   7. Complete final cleaning.
   8. Touch-up or otherwise repair and restore all marred and unsatisfactory finishes.
   9. Submit Warranties, and Operational Maintenance documentation as called for.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SCOPE OF WORK
A. The Contractor shall furnish one (1) 4' x 8' x ¾" construction site sign as detailed herein and located on site where directed by the Architect. The sign shall be two (2) sided.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONSTRUCTION SITE SIGN
A. The construction site sign shall be installed prior to beginning construction and placed on site where directed by the Architect.

3.2 COLOR REQUIREMENTS
A. The two 4x4 treated posts, the 2x6 bottom support, and the painted band adjacent to the 2x4 edge frame shall be “Pantone Cool Gray 7C” or equal.
B. The 2x4 edge frame and the ½” wide painted bands shall be “Pantone 326C” or equal.
C. The plywood sign field areas (containing the text and graphics) shall be “Pantone Cool Gray 3C” or equal.
D. The Ellender Architects logo and all text shall be “Black”.

3.3 SHOP DRAWING
A. Submit shop drawing of construction sign for review.
B. Shop drawing of sign shall be to scale and illustrated in accurate colors as called for herein.
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements 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.

B. Types of allowances include the following:

1. Contingency allowance.
2. See Mechanical Specifications for additional allowances.

1.3 SELECTION AND PURCHASE

A. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

B. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 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.
1.6 COORDINATION
A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 CONTINGENCY ALLOWANCE
A. Use the contingency allowance only as directed by Architect for Owner’s purposes and document amounts to be charged to the allowance by field order(s).
B. Overhead, profit, and related costs for products and equipment ordered by the Architect are included in the allowance without further markup by the General Contractor.
C. This amount shall be used in preparing the bid.
D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer or supplier for replacement.

3.2 PREPARATION
A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES
A. Contingency Allowance: Include the sum of $35,000.00 dollars for use according to the Owner’s and Architect’s written instructions.
   1. This allowance includes material and labor costs, delivery, receiving, handling, and installation, taxes if applicable, equipment rental, and similar costs.

END OF SECTION 012100
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements for submittals required for performance of the work, including:

1. Contractor's Construction Schedule
2. Shop Drawings
3. Product Data
4. Samples

B. Administrative Submittals: Refer to other Division 01 Sections and/or other Contract Documents for requirements for administrative submittals which include, but are not limited to:

1. Permits
2. Applications for Payment
3. Insurance Certificates
4. List of Subcontractors
5. Name & Qualifications of Job Superintendent

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

1.4 ELECTRONIC SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

C. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by need to review submittals concurrently for coordination.

D. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

E. Processing: Allow sufficient review time that installation will not be delayed as a result of time required to process submittals, including time for resubmittals.
   1. Allow two (2) weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will promptly advise Contractor when a submittal being processed must be delayed for coordination.
   2. If an intermediate submittal is necessary, process the same as the initial submittal.
   3. Allow two (2) weeks for reprocessing each submittal.
   4. No extension of contract time will be authorized due to failure to transmit submittals to the Architect sufficiently in advance of the work to permit processing.

F. Submittal Preparation: Identify and incorporate information in each electronic submittal file as follows:
   1. Assemble each submittal package, complete, into a single electronic PDF file.
   2. Name file with description, revision identifier, and date.
      a. Example: Wood Doors – R0 – 20140101
   3. Revision identifiers shall be as R0, R1, R2, etc.
   4. All submittals shall be provided with a cover page. Submittals without the proper cover page will be returned for correction with no action taken.
   5. Provide cover page for each submittal and include the following information for processing and recording action taken:
      a. Project Name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Name & Address of Sub-Contractor.
      f. Name & Address of Supplier.
      g. Name of Manufacturer.
      h. Number & Title of Appropriate Specification Section(s).
      i. Drawing Number & Detail References, as appropriate.
j. On the cover page, provide a space approximately 4" x 5" to record the Architect's review stamp, approval markings, and action taken. This space shall be free and clear of text and graphics. Failure to do will render the submittal unacceptable.

G. Submittal Transmittal Form: Package each submittal appropriately for transmittal and handling using a transmittal form. A transmittal form shall be used for each submittal. This form shall be integrated into and become the cover for the PDF submittal. Submittals received from sources other than General Contractor will be returned without action. Transmittals shall be assigned a number as follows:

1. Transmittal: Consecutively Numbered.
2. Transmittal for Resubmittals: Use previously assigned number for the resubmitted product followed by an R0, R1, R2, etc. as the revision identifier.

H. On the transmittal, record relevant information and requests for data. On the form or separate sheet, record deviation from Contract Document requirements, including minor variation and limitations. Include the Contractor's Certification that information complies with the Contract Document requirements.

I. Resubmittals: Make resubmittals in same form as the initial submittal, electronic PDF format.

PART 2 - PRODUCTS

2.1 CONTRACTOR’S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart type Contractor’s Construction Schedule. Submit with thirty (30) days of date established for “Commencement of the Work”.

1. Indicate completion in advance of the date established for Substantial Completion/Recommendation of Acceptance. Indicate Substantial Completion on schedule to allow time for Architect’s procedures necessary for certification of Substantial Completion.
2. Distribution: Following response to initial submittal, print three (3) copies for the Architect. Print and distribute copies to all subcontractors and other parties required to comply with scheduled dates. Post copy in the job shack or temporary field office.
3. Revise the schedule after each meeting or activity, where revisions have been recognized or made. When revisions are made, distribute to same parties and post in same locations.

2.2 SHOP DRAWINGS

A. Submit shop drawings via email as a single electronic PDF file.

2. Informational Submittals: Refer to 1.3 (B) and 3.3 (B).

3. Certificates and Certification Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
   b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Submit newly prepared information, drawn accurate to scale. **Shop drawings shall be not be electronic reproductions of the Contract Drawings.** Highlight, encircle or otherwise indicate deviations from Contract Documents. Standard information prepared without specific reference to project is not considered Shop Drawings.

C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
   1. Dimensions.
   2. Identification of Products & Materials Included.
   3. Compliance with Specified Standards.
   4. Notation of Coordination Requirements.
   5. Notation of Dimensions Established by Field Measurements
   6. Signature of General Contractor or his representative indicating that submittals have been reviewed by him prior to submittal to Architect
   7. **Sheet Size:** Except for templates, patterns and similar full-size drawings, submit shop drawings on sheets at least 8 - 1/2” x 11” but no larger than 36” x 24”.
   8. Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.

D. Coordination drawings are special type shop drawings showing the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in space provided or function as intended.
   1. Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

PART 3 - EXECUTION

A. Collect product data into single submittal for each element of construction or system. Product data shall include information such as manufacturer’s installation instructions, catalog cuts, standard color charts, rough-in diagrams and templates, standard wiring diagrams and performance curves.

B. Mark products to show applicable choices and options. Where product data includes information on several products, some of which are not required, mark selections to indicate the applicable information. Include the following information:
   1. Manufacturer’s Recommendations
2. Compliance with Recognized Trade Association Standards
3. Compliance with Recognized Testing Agency Standards
4. Application of Testing Agency Labels & Seals
5. Notation of Dimensions verified by field measurement
6. Notation of Coordination Requirements
7. Signature of General Contractor or his representative that submittals have been reviewed by him prior to submittal to Architect.

C. Do not submit product data until compliance with requirements of the contract documents have been confirmed.

D. Preliminary Submittal: Submit preliminary product data where selection of options is required.

E. Submittals: Submit one (1) single electronic PDF file for each required submittal. Architect will retain one (1) annotated electronic PDF file and return one (1) annotated electronic PDF file marked with action taken and corrections or modifications required.

1. Do not proceed with installation until an applicable copy of product data applicable is in installer’s possession.
2. Do not permit use of product data in connection with construction without the Architect’s Approval Stamp.

3.2 SAMPLES

A. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Where variation in color, pattern, texture or other characteristics are inherent in material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
2. Submit manufacturer’s full color charts and samples. Color charts printed from websites is strictly prohibited.

B. Field samples specified in individual sections are special types of sample. Field samples are full-size examples erected on site to illustrate finishes, coating, or finish materials and to establish standard by which the work will be judged.

1. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

3.3 ARCHITECT’S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required to requested, Architect will review each submittal, mark to indicate action taken, and return promptly to the General Contractor.
B. **Informational Submittals:** The Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. The Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect without action.

F. Compliance with specified characteristics is the Contractor's responsibility.

END OF SECTION 013300
1.1 DEFINITIONS

A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids.

1.2 PROCUREMENT SUBSTITUTIONS

A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.

B. Procurement Substitution Requests will be received and considered by the Architect when the following conditions are satisfied; otherwise requests will be returned without action:

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
3. The request is fully documented and properly submitted.

1.3 SUBMITTALS

A. Procurement Substitution Request: Submit to Architect and/or Engineer. Procurement Substitution Request shall be made in writing and in compliance with the following requirements:

1. Requests for substitution of materials and equipment will be considered if received no later than 7 days prior to date of bid opening.
2. Submittal Format: Submit via mail, fax, or email. Email submissions shall be made in PDF format. Sheet size shall be no larger than 8½ inch x 11 inch.
3. Required Information: Submit the following information:
   a. Identify the product and/or material to be substituted.
   b. When submitting multiple items, submit each separately.
   c. Include related Specifications Sections and drawing number.
   d. Provide complete documentation on both the product specified and the proposed substitute, include the following information as appropriate:
      1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
      2) Copies of current, independent third-party test data of salient product or system characteristics.
      3) Samples where applicable or when requested by Architect.
4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. 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.

5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

6) Research reports, where applicable, evidencing compliance with building code in effect for Project.

7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.

e. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.

f. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.

B. Architect's Action:

1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.

C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

D. Architect's approval of a particular manufacturer does not suggest or imply any deviation from the Contract Documents. All products shall comply with the drawings and specifications. The Contractor shall note that prior approval will by manufacturer's name only. The Contractor shall ensure that the products used in preparation of his proposal and proposed to be used on this project, is equivalent to that specified in all aspects. Any material, product, or component found to not be equivalent to that specified will be rejected. Prior approval of one manufacturer does not automatically prior approve any subsidiary, parent, and/or sister company, and their associated products.

END OF SECTION 013350
DIVISION 02

TECHNICAL SPECIFICATIONS

EXISTING CONDITIONS
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. Demolition and removal of selected portions of existing exterior walls where indicated on plans to facilitate new a/c systems.
   2. Replacement of suspended acoustical ceilings where scheduled.
   3. Sawcutting and removing portions of exterior sidewalks.

B. Related Requirements:
   1. New structural steel stud walls shall be installed prior to openings for a/c equipment being cut into walls. Cut openings with caution to protect existing building. See structural plans.
   2. Mechanical and electrical subcontractors shall be coordinated by the General Contractor to remove certain utilities prior to demolition.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor; however, the Owner has first right of refusal.

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.

1.5 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.7 FIELD CONDITIONS

A. Provide temporary watertight construction over openings until new construction/equipment is installed. Coordinate demo schedule such that length of time of temporary wall is minimal.

B. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

E. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

F. Storage or sale of removed items or materials on-site is not permitted.

G. 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. 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. 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.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

B. 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. Arrange to shut off indicated utilities with utility companies.
3. 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.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain, and fire watch if required by the local authority having jurisdiction, and portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.

6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

9. Dispose of demolished items and materials promptly. Send materials to properly licensed and permitted construction waste facility.

B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Store items in a secure area until delivery to Owner.
3. Transport items to Owner's storage area designated by Owner.
4. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Protect items from damage during transport and storage.
3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, and cleaned if necessary, and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.
3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119
DIVISION 05

TECHNICAL SPECIFICATIONS

METALS
RELATED DOCUMENTS:

Drawings and general provisions of the contract, including the General and Supplementary Conditions and Division #1 Specifications sections, apply to work of this Section.

GENERAL:

All studs, joists, and accessories shall be the type, size, gauge and spacing specified and shall be as manufactured by Gold Bond Building Products. This contractor shall sit all exterior wall sole plates on foam seal sill gasket. Also provide furring systems where indicated on plans. Anchor studs securely to slab and overhead structural framing.

Steel Galvanized Studs and Accessories: Studs shall be sizes shown on drawings. All studs shall be 16 gauge unless otherwise shown. Studs shall be provided at sixteen inches (16") maximum spacing. Double up studs around all openings such as doors and windows for a rigid header and jamb condition. Provide bridging centered at ceiling elevation above the finished floor. Provide top and bottom tracks. All studs shall be prepunched for electrical raceways.

Steel Galvanized Support Headers: Support headers shall be installed for grab bar and cabinetwork/millwork support. Headers shall be 6” x 16 gauge and installed where shown on drawings. Headers and supports shall run continuous the entire length of upper and lower cabinets/countertops, but in no case spanning less than three (3) studs of grab bars. Refer to 06402 – Interior Architectural Cabinetwork for fastening of cabinet work to headers and supports.

QUALITY STANDARD

All structural members shall be designed in accordance with AISC Specification for the Design of Cold Formed Steel Structural Members” latest edition.

All framing members shall be galvanized as per ASTM A446 with a minimum yield strength of 40 ksi for SJ and CS style studs, 33 ksi for CR runners.

FABRICATION

Fastening of all components shall be with self drilling screws or welding. Galvanized or cadmium screws shall be of sufficient size and number to insure the strength of the connection. Wire tying of components is not permitted. All welds shall be touched up with acceptable cold galvanizing product. All top plates and sole plates shall be securely fastened to adjoining members.

ERECITION
Runners shall be securely anchored to the supporting structure. Complete, uniform and level bearing support shall be provided for the bottom runner. Abutting lengths of runner shall each be securely anchored to a common structural element, butt welded or spliced.

Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners.

Temporary bracing where required shall be provided until erection is complete. Splices in studs shall not be permitted.
RELATED DOCUMENTS:
Drawings and general provisions of the contract, including the General and Supplementary Conditions and Division #1 Specifications sections, apply to work of this Section.

RELATED SECTIONS
- Metal Stud Framing – Section 051250
- Formed Metal Wall Panels – Section 074213.17
- Sheet Metal Flashing & Trim – Section 076100

DESCRIPTION OF WORK
This section consists of 12” wide ¼” steel checkered galvanized drain plates with 1/12” x ½” x ¼” galvanized angle framing.

This section also consists of galvanized bent plate covers over condensate drains. Plates shall be 5” x 5” x 1/8” plates with 1/8” galvanized steel ears to securely anchor to existing masonry yet be removable in future for maintenance access – discuss with Architect.

WORKMANSHIP
All work shall result in a finished appearance as approved by Architect.
Steel shall be fabricated such that no rough edges result.

SHOP DRAWINGS
Fabricator shall provide drawings for approval of Architect prior to any fabrication. No fabrication shall start until fabricator has approved shop drawings in hand.

COORDINATION
General Contractor shall coordinate piping requirements and verify drain plates are properly sized to accommodate mechanical piping requirements.

END OF SECTION 058000
SECTION 060110 - CARPENTRY

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the contract, including the General and Supplementary Conditions and Division No. 1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK

This specification section includes finish and rough carpentry work not specified as part of other sections and which is related to the construction within the school as well as any nailers, wood grounds and blocking for interior and exterior work.

Related specification section - See Lightweight Cold Formed Steel Framing, Section 054200.

Note: All nails shall be galvanized.

For all wood structural framing, provide the following grade and species:

- Douglas Fir graded under WC LIB or WWPA rules
- Hem Fir graded under WWPA rules
- Southern Pine graded under SPIB rules

Any species and grade which meets or exceeds the following values:

- \( F_b \) (min. extreme fiber stress in bending); 1,500 psi
- \( E \) (min. modulus of elasticity); 1,500,000 psi

All lumber shall be wolmanized.

PRODUCT HANDLING

Delivery & Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar material.

For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

PROJECT CONDITIONS

Coordination: Fit carpentry work to other work; scribe and cope nailers, blocking, grounds and similar supports to allow attachment of other work.
PART 2 - PRODUCTS

LUMBER - GENERAL

Provide dressed lumber, S4S, unless otherwise indicated.

Provide seasoned lumber with 19% maximum moisture content (max) at time of dressing and shipment for sizes 2” or less in nominal thickness, unless otherwise indicated.

Provide lumber with 15% maximum moisture content at time of dressing and shipment for sizes 2” or less in nominal thickness unless otherwise indicated.

END OF SECTION 060110
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. Wall sheathing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

2.2 WALL SHEATHING

A. Extruded-Polystyrene-Foam Wall Sheathing: ASTM C 578, Type IV, in manufacturer's standard lengths and widths.

1. Subject to compliance with requirements, provide products by one of the following:
   a. DiversiFoam Products.
   b. Dow Chemical Company (The).
   c. Owens Corning.
   d. Pactiv, Inc.

2. Thickness: As indicated.
3. Width: 16" or 24", fit between wall ties or light gauge furring channels.
4. R-Value: No less than 5.0 per inch.
5. Surface Burning Characteristics (ASTM E 84):
   b. Smoke Development: Less than 450.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153.

B. Nails, Brads, and Staples: ASTM F 1667.


2.4 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Adhesive or Mastic Sealant for Foam Sheathing: Adhesive or mastic as recommended by the sheathing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
C. Securely attach to substrate by fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.9.1, "Fastening Schedule," in ICC’s "International Building Code."

D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 FOAM-PLASTIC SHEATHING INSTALLATION

A. Comply with manufacturer’s written instructions.

B. Foam-Plastic Wall Sheathing: Install vapor-relief strips or equivalent for permitting escape of moisture vapor that otherwise would be trapped in stud cavity behind sheathing.

C. Apply adhesive or mastic sealant to joints and edges to seal each board tightly as boards are pressed into place. Fill voids and around penetrations and all items that penetrate with adhesive or mastic. Complete work in accordance with manufacturer’s instructions. Overlap flashings and sheathing.

END OF SECTION 061600
DIVISION 07

TECHNICAL SPECIFICATIONS

THERMAL & MOISTURE PROTECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Modified bituminous sheet waterproofing also referred to on plans as “Ice and Water Shield”.

1.3 SUBMITTALS

A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

B. Samples: For the following products:
   1. 12-by-12-inch square of waterproofing sheet.
   2. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm that is acceptable to waterproofing manufacturer for installation of waterproofing required for this Project.

B. Source Limitations: Obtain waterproofing materials through one source from a single manufacturer.

C. Pre-installation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing.

B. Store rolls according to manufacturer's written instructions.

C. Protect stored materials from direct sunlight.
1.6 **PROJECT CONDITIONS**

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

   1. Do not apply waterproofing in snow, rain, fog, or mist.

1.7 **WARRANTY**

A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to replace waterproofing material that does not comply with requirements or that fails to remain watertight within specified warranty period.

   1. Warranty Period: Five years from date of Substantial Completion.

**PART 2 - PRODUCTS**

2.1 **MODIFIED BITUMINOUS SHEET WATERPROOFING**

A. Modified Bituminous Sheet: Not less than 40-mil thick, self-adhering sheet consisting of rubberized asphalt laminated to a polymer surface film with release liner on the adhesive side.

   1. Subject to compliance with requirements, provide one of the following:

      a. IMETCO, Inc.; Dry-Dek.
      b. Tamko Roofing Products, Inc.; TW Underlayment.

   2. Physical Properties:

      a. Verify that products retained meet physical properties in subparagraphs below. Revise to suit project requirements.
      e. Exposure: 90 days.
      f. High Temperature Resistance: 250 deg F.

**PART 3 - EXECUTION**

3.1 **EXAMINATION**

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Bridge and cover joints and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips.

3.3 MODIFIED BITUMINOUS SHEET WATERPROOFING APPLICATION

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and according to recommendations.

B. Apply and firmly adhere sheets over area to receive waterproofing. Apply only when ambient temperatures are above 40 deg F.

C. Horizontal Application:
   1. Apply sheets from low point to high point of decks to ensure that laps shed water.
   2. Overlap edge seams 4". End seams should be lapped 6" and staggered.

D. Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.

E. Seal exposed edges of sheets at terminations not concealed by metal counterflashings or ending in reglets with mastic.

F. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.

G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fish-mouths and blisters. Patch with sheet waterproofing extending 12 inches beyond repaired areas in all directions.

H. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

I. If exposure to weathering elements exceed the manufacturer's recommended and stated time period for any area(2), the Contractor shall replace the material for subject area(s) at no additional cost to the Owner.
3.4 PROTECTION

A. Protect waterproofing from damage and wear during construction period.

END OF SECTION 071326
PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the contract, including the General and Supplementary Conditions and Division No. 1 Specification sections, apply to work of this section.

GENERAL

The new components of the perimeter envelope consisting of the new exterior stud walls shall have continuous insulation.

The work under this section of the specification shall include furnishing all supervision, labor, materials, tools and equipment and perform all operations necessary for the complete insulation system as described in the drawings and specifications in a first class workmanlike manner.

All materials must be delivered in original unopened packages with manufacturer’s name and contents legibly indicated and stored in a safe enclosed area protected from damage until ready for use.

All work by other trades to be concealed by insulation must be completed prior to the installation of insulation.

INSULATION MATERIALS

All batt insulation shall be unfaced.

At new exterior stud walls, provide 3 1/2” R-11 Owens Corning or equal unfaced fiberglass insulation.

Above all new ceilings within the existing building renovative spaces provide 3 1/2” R-11 Owens Corning or equal unfaced fiberglass insulation.

THERMAL BARRIER

Provide 3/4” rigid insulation barrier (see drawings Sheet A3.1) where window walls are to be removed. Provide Owens Corning or equal and install in accordance with manufacturer’s specifications and with no flying joints.

GENERAL REQUIREMENTS

All insulation shall meet a flame spread of 25 and a smoke development of 50.

Contractor shall verify particular insulation installed in fire walls and shall meet UL Certification.
Install insulation in all walls by the friction fit method. Fit insulation around outlets, junction boxes and other irregularities for full acoustical performance.

All insulation shall be as manufactured by Owen-Corning Fiberglass Corporation or an approved equal.

INSTALLATION

Installation of insulation shall be in strict accordance with manufacturer’s printed instructions for the specific product and shall be installed in all areas as shown on the plans and specified herein. All insulation shall be installed so as to provide a complete insulation blanket around heated, cooled and noise controlled areas.

Insulation shall not be installed within three inches (3”) of or over fixtures containing lights, fans or other heat generating electrical devices.

END OF SECTION 072500
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. Concealed-fastener, metal wall panels.

1.3 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.

2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.

4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.

5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.

6. Review governing regulations and requirements for insurance, certificates, tests, and inspections if applicable.

7. Review temporary protection requirements for metal panel assembly during and after installation.


9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:
1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.
1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including rupturing, cracking, or puncturing.
   b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: 5 years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft.
B. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F ambient; 180 deg F, material surfaces.

### 2.2 CONCEALED-FASTENER, METAL WALL PANELS

A. General: Provide factory-formed metal panels designed to be field assembled by and interconnecting side edges of adjacent panels and mechanically attaching panel to supports using concealed clips and fasteners. Include accessories required for weathertight installation.

B. Concealed-Fastener Metal Wall Panels: Asymmetrical with flat areas between beads, two (2) beads per panel.

1. Manufacturers: Subject to compliance with requirements of this Section, provide one of the following products:
   a. IMETCO, Inc.; FW-120.
   b. MBCI; FW-120.

2. Substitutions: Submit procurement substitution requests per Section 013350.

3. Metallic-Coated Steel Sheet: Aluminum-zinc alloy coated steel sheet complying with ASTM A 792, Class AZ50 coating designation; structural quality. Factory finished by the coil-coating process to comply with ASTM A 755.
   a. Nominal Thickness: 24 gauge.
   b. Panel Width: Approximately 12 inches, two (2) beads per panel.
   d. Color: As selected by Architect from manufacturer's full range of standard and custom/designer colors.

### 2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Sub-framing and Furring: G90 coating designation. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. **Closures:** Provide closures fabricated of the same metal as the metal panels.

2. **Backing Plates:** Provide metal backing plates at panel end splices, fabricated from material recommended by the manufacturer.

3. **Closure Strips:** Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1 inch thick, flexible closure strips; cut or pre-molded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. **Flashing and Trim:** Provide flashing and trim formed from the same material as the metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, end-walls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with the same finish system as adjacent metal panels.

D. **Panel Fasteners:** Stainless self-tapping screws as recommended by the panel manufacturer for fastening panels to the substrate and fastening laps, all concealed.

E. **Panel Sealants and Sealant Tape:** Provide sealant type recommended by the manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish.

### 2.4 **Fabrication**

A. **General:** Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. **Provide panel profile, including major beads, for full length of panel.**

C. **Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.**

D. **Sheet Metal Flashing and Trim:** Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

2. **Sealed Joints:** Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.

3. **Conceal fasteners and expansion provisions.** Exposed fasteners are not allowed on faces of accessories exposed to view.

4. **Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.**
a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Steel Panels and Accessories:
   1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

   1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
   2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

   a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.
3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistant barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes; three (3) fasteners at each 16 ga. strap.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels, if applicable.

B. Fasteners:


C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6 inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer’s written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including the General and Supplementary Conditions and Division No. 1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Extent of each type of flashing and sheet metal work is indicated on drawings and by provisions of this section.

B. Types of work specified in this section include the following:

1. Metal counter flashing and base flashing (if any).
2. Metal wall flashing and expansion joints.
3. Exposed metal trim/fascia units.
5. Elastic flashing.
6. Compression type flashing.

C. Roofing accessories which are installed integral with roofing membrane are specified in roofing system sections as roofing work.

D. Roof accessory units of premanufactured, set-on type are specified in Division 7 section “Roof Accessories”.

1.3 SUBMITTALS

A. Product data: Flashing, sheet metal, and accessories: Submit manufacturer’s product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

B. Shop Drawings: Flashing, sheet metal, and accessories: Submit shop drawings showing layout, joining, profiles, and anchorages of fabricated work, including major counter-flashings, trim/fascia units, details at 3” scale.

1.4 JOB CONDITIONS

A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.
PART 2 - PRODUCTS

2.1 FLASHING & SHEETMETAL ACCESSORIES

A. Prefinished sheet metal shall be Colorklad or approved equal.

B. Zinc-Coated Steel: Commercial quality with 0/20% copper, ASTM A 525, except ASTM A 527 for lock forming, G90 hot-dip galvanized, 24 ga. except as otherwise indicated. Smooth primed and finished one side with Colorklad Kynar based fluoropolymer coating 1.0 ± 0.1 mil total dry thickness.

C. Elastic Sheet Flashing/Membrane: Manufacturer’s standard flexible, elastic, black, nonreinforced, flashing sheet of 50 - 65 mils thickness; 50 - 70 Shore A hardness (ASTM D 2240); 1200 psi tensile strength (ASTM D 412); 120 lbs. per lin. in. tear resistance (ASTM D 624, Die C); ultimate elongation of 250 % (ASTM D 412); brittleness temperature of -30ºF (ASTM D 746); resistance to ozone aging of no cracks for 10% elongated sample for 100 hours in 50 ppm (50.5 mPa) ozone at 104º (ASTM D 1149); resistance to heat aging of maximum hardness increase of 15 points, elongation, reduction of 40%, and tensile strength reduction of 30% for 70 hours at 212ºF (ASTM D 573).

D. Provide neoprene synthetic rubber sheet.

E. Aluminum Mullion Covers where indicated on drawings (See Section 4 of Drawing Sheet A3.1). Provide .054 aluminum mullion covers. Match existing aluminum finish and width of mullions with additional covers. This is required to fur-out. Mullions to align with face of new metal siding.

F. Miscellaneous Materials & Accessories
   1. Solder: For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32) with rosin flux.
   2. Fasteners: Same metal as flashing/sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
   3. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.
   4. Mastic Sealant: Polyisobutylene, non-hardening, non-skinning, non-drying, non-migrating sealant.
   5. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed, compounded for 15 mil dry film thickness per coat.
   7. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather resistant seaming and adhesive application of flashing sheet.

G. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work matching or compatible with material being installed, noncorrosive, size and gage required for performance.
H. Roofing Cement: ASTM D 2822, asphaltic.

2.2 FABRICATED UNITS

A. General Metal Fabrication: Shop fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA “Architectural Sheet Metal Manual” and other recognized industry practices. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

B. Seams: Fabricate nonmoving seams in sheet metal with flat lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.

C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1” deep, filled with mastic sealant (concealed within joints).

D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

E. Separation: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. General: Except as otherwise indicated, comply with manufacturer’s installation instructions and recommendations, and with SMACNA “Architectural Sheetmetal Manual”. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

B. Bed Flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
C. Install elastomeric flashing in accordance with manufacturer’s recommendations. Where required, provide for movement at joints by forming loops or bellows in width of flashing. Locate cover or filler strips at joints to facilitate complete drainage of water from flashing. Seam adjacent flashing sheets with adhesive, seal and anchor edges in accordance with manufacturer’s recommendations.

D. Fabricate seams at joints between units with minimum 3” overlap, to form a continuous waterproof system.

3.2 CLEANING & PROTECTION

A. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 076100
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:
   2. Downspouts and Straps.

1.3 REFERENCES

1. ASTM A-446 Specification for Steel Sheet.
3. ASTM B-221 Specification for Aluminum Extruded Shape.
4. ASTM A792 Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process.
5. ASTM B32 Solder Metal.
6. ASTM B209 Aluminum and Alloy Sheet and Plate.
7. ASTM B486 Paste Solder.
8. ASTM D226 Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
9. ASTM D486 Asphalt Roof Cement, Asbestos-free.
10. FS O-F-50 Flux, Soldering, Paste and Liquid.
11. WH Warnock Hersey International, Inc. Middleton, WI.

1.4 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak-proof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.
   1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product, including hoods, and all other sheet metal fabrications.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
   2. Indicate type, gauge, and finish of metal.

B. Shop drawings: For sheet metal flashing and trim, indicate material profile, jointing pattern, jointing details, fastening methods, flashing, terminations, and installation details.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.
   1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
   2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
   3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
   4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.7 QUALITY ASSURANCE

A. Reference Standards:
   1. Comply with details and recommendations of SMACNA Architectural Sheet Metal Manual for workmanship, methods of joining, anchorage, provisions for expansion, etc. Conform to dimensions and profiles shown unless more stringent requirements are indicated.
   2. ASCE 7-10.
   3. IBC 2015.
B. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance a minimum of 5 years.

1.8 CONTRACTOR'S WARRANTY

A. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

1.9 WARRANTY

A. Special Warranty on Finishes (Shall Be Included with the SBS Roofing System Warranty): Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
   a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
   b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
   c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.

B. Stack performed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

C. Prevent contact with materials which may cause discoloration or staining.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA’s "The NRCA Roofing Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.

2.2 MATERIALS AND GAUGES

A. Where sheet metal is required and no material or gauge is indicated, furnish and install the highest quality and gauges commensurate with referenced standard to match existing.

1. Box Curb Caps, and Pipe Hoods:
   a. ASTM A 67; commercial quality, 2D annealed finish, 304 stainless steel, 24 gauge.

2. Downspouts, Downspout Straps:

2.3 NAILS, RIVETS, AND FASTENERS

A. Nails: Copper, Stainless Steel or Galvanized depending on application.

B. Rivets: Copper, Aluminum, Stainless Steel or Galvanized depending on application.

C. Exposed Fasteners and Washers: Stainless Steel Screws with covered neoprene gaskets.

D. Unexposed Fasteners and Washers: Cadmium plated.

2.4 RELATED MATERIALS

A. Flux: Raw Muriatic Acid killed with Zinc Chloride.

B. Solder: Conform to current ASTM B-12. 50% tin and 50% lead.

C. Burning Rod for Lead: Same composition as lead sheet.

D. Joint Sealant: Polyurethane, see Joint Sealant Section.

E. Underlayment: Vinyl Membrane.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify all existing work is complete to a point where this installation may commence.

B. In the event of discrepancy, notify Architect. Do not proceed until discrepancies have been resolved.

C. Sheet metal items scheduled for replacement shall be field measured prior to fabrication. Sizes shall match existing.

D. Field measure site conditions prior to fabricating work.

3.2 FABRICATION

A. Shop fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of NRCA, SMACNA, and other industry practices.

B. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of work.

C. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.

3.3 GENERAL INSTALLATION

A. Where any metal flashings stop or terminate at an exposed edge, exposed corner, etc., the metal shall be returned and opening closed off with the same material to prevent and seal from water penetration. The metal shall be shaped, corners mitered, etc. to match the profile of the metal flashing.

3.4 CLEANING

A. Clean exposed metal surface removing substances which might cause corrosion of metal or deterioration of finish.

B. Remove protective plastic sheeting from metal surfaces.

END OF SECTION 076200
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. Urethane joint sealants.
B. Related Sections:
   1. Division 07 Section “Sheet Metal Flashing and Trim”.

1.3 ACTION SUBMITTALS
A. Product Data: For each joint-sealant product indicated.

1.4 QUALITY ASSURANCE
A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
D. Pre-installation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS
A. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L
2. Sealant Primers for Nonporous Substrates: 250 g/L
3. Sealant Primers for Porous Substrates: 775 g/L

C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

E. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

F. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 URETHANE JOINT SEALANTS

A. Single-Component, Non-sag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Subject to compliance with requirements, provide one of the following:

   a. BASF Building Systems; Sonolastic NP1.
   b. Tremco Incorporated; Vulkem 116.

2. Submit procurement substitution requests per Section 013350.
2.3 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant
manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

   a. Concrete.
   b. Masonry.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

   a. Metal.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer’s written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer’s written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079210
DIVISION 09

TECHNICAL SPECIFICATIONS

FINISHES
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board - water-resistant and abuse resistant 5/8”.
2. Interior gypsum board - water-resistant ½”.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, provide products from one of the following:

1. Certainteed Corporation.
2. Georgia-Pacific Gypsum LLC.
3. USG Corporation.

B. Gypsum Board, Type X: ASTM C 1396.

1. Georgia-Pacific Gypsum LLC; ToughRock Fire Guard.
2. USG Corporation; Sheetrock Brand FIRECODE Core.
   b. Long Edges: Tapered.

C. Moisture- and Mold-Resistant Gypsum Board for Thermal Barrier, Type X: ASTM C 1396. With moisture- and mold-resistant core and paper surfaces.

1. Georgia-Pacific Gypsum LLC; Fireguard X, ToughRock Mold-Guard.
2. USG Corporation; Sheetrock Brand Mold Tough.
   a. Core: 5/8 inch, Type X.
   b. Long Edges: Tapered.
   c. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.


1. Georgia-Pacific Gypsum LLC; DensArmor Plus Abuse Resistant.
2. USG Corporation; Fiberock Abuse Resistant.
   a. Core: 5/8 inch, Type X.
   b. Long Edges: Tapered.
c. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3273.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
   1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
   2. Shapes:
      a. Corner bead.
      b. LC-Bead: J-shaped; exposed long flange receives joint compound.
      c. Expansion (control) joint.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:
   1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or successive coats.
   1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
   3. Fill Coat: For second coat, use drying-type, all-purpose compound.
   4. Finish Coat: For third coat, use drying-type, all-purpose compound.
   5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
   1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

C. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

D. Vapor Retarder: As specified in Section 072100 "Thermal Insulation."
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Joints: Ensure framing and support members are beneath each joint in both directions. Flying joints are not acceptable.

D. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

F. Form control and expansion joints with space between edges of adjoining gypsum panels.

G. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.
H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. **Type X:** As indicated on Drawings.
2. **Ceiling Type Thermal Barrier, Type X:** As indicated on Drawings.
3. **Shaft Liner Panels:** As indicated on Drawings per UL Fire Rated Standards and/or industry recognized testing groups.

B. Single-Layer Application:

1. On thermal barrier ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
   
   a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
   b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. **Fastening Methods:** Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On thermal barrier ceilings, apply gypsum board indicated for base layers before applying face layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. **Fastening Methods:** Fasten base layers and face layers separately to supports with screws.
3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings.

C. Interior Trim: Install in the following locations:
   1. Cornerbead: Use at outside corners unless otherwise indicated.
   2. LC-Bead: Use at exposed panel edges.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Gypsum board shall be finished and sanded smooth, and where applicable, to the finished floor. Remove excess joint compound, fill any depressions, repair surface defects, and sand smooth. The gypsum board shall be flat, sanded smooth, and ready to receive wall base material where applicable. This applies to new and existing gypsum board substrates.

C. Prefill open joints and damaged surface areas.

D. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

E. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
   1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   2. Level 2: Panels that are substrate for tile.
   3. Level 3: As indicated on Drawings.
   4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
      a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
   5. Level 5: All locations unless noted otherwise.
      a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900
SECTION 092901 - EXTERIOR SHEATHING PANELS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the contract, including the General and Supplementary Conditions and Division No. 1 Specification sections, apply to work of this section.

DESCRIPTION

Work in this section includes, but is not limited to: Wall sheathing at exterior stud walls. Make up joints and cover walls with Ice & Water Shield for a moisture resistant barrier.

Related work specified elsewhere:

Carpentry Section 060110
Self-Adhering Sheet Waterproofing Section 071326

SUBMITTALS

Product Data: Submit manufacturer’s descriptive literature indicating material composition, thickness, and fire resistance.

QUALITY ASSURANCE

Fire-resistance ratings: Where applicable, provide materials and construction that are identical to those of assemblies whose fire-resistance ratings are indicated.

DELIVERY, STORAGE and HANDLING

Delivery: Deliver materials to the job site in manufacturer’s original packaging, containers and bundles with manufacturer’s brand name and identification intact and legible.

SHEATHING BOARD


Composition: Gypsum sheathing manufactured in accordance with ASTM C 1177 with glass mats both sides and long edges, water-resistance treated core.

ACCESSORIES

Joint tape: 2” wide 10 x 10 glass mesh tape.

Joint compound: ToughRock setting-type joint compound.
Screws, metal framing: Bugle head, self-tapping, rust-resistant, fine thread for heavy-steel gauge; Bugle head, rust-resistant sharp point, fine thread for light-gauge metal framing or furring.

PREPARATION

Examine subframing; verify that surface of framing and furring members to receive sheathing does not vary more than 1/8” from the placement of faces of adjacent members.

SHEATHING

Provide DensGlass Gold Exterior Sheathing where indicated on drawings. Install sheathing in accordance with manufacturer’s instructions and applicable instructions in GA-253 and ASTM C 1280. Provide one (1) layer 5/8” Densglass Gold Exterior Sheathing in accordance with UL reference to meet the desired hour rating mentioned on plans.

Install DensGlass Gold Exterior Sheathing with gold side out.

Use maximum lengths possible to minimize number of joints.

Attach DensGlass Gold Exterior Sheathing to metal framing with screws spaced 8” o.c. at perimeter where there are framing supports; and 8” o.c. along intermediate framing in field.

Drive fasteners to bear tight against and flush with surface of sheathing. Do not countersink. Locate fasteners minimum 3/8” from edges and ends of sheathing panels, tight against and flush with surface of sheathing.

Cover entire exterior face of gypsum sheathing with Ice & Water Shield or equal.

END OF SECTION 092900
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section includes acoustical panels and exposed suspension systems for ceilings.

1.3 PREINSTALLATION MEETINGS
A. Pre-installation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Samples for Initial Selection: For components with factory-applied color finishes.
C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
   1. Acoustical Panel: Set of 6-inch-square Samples of each type, color, pattern, and texture.
   2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch-long Samples of each type, finish, and color.

1.5 INFORMATIONAL SUBMITTALS
A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
   1. Suspended ceiling components.
   2. Structural members to which suspension systems will be attached.
   3. Size and location of initial access modules for acoustical panels.
   4. Items penetrating finished ceiling including the following:
      a. Lighting fixtures.
      b. Speakers.
      c. Access panels.
   5. Perimeter moldings.
1.6 CLOSEOUT SUBMITTALS
   A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS
   A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
      1. Acoustical Ceiling Panels: Full-size panels equal to 4 boxes of each panel type installed.

1.8 DELIVERY, STORAGE, AND HANDLING
   A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
   B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
   C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.9 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
   A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
      2. Smoke-Developed Index: 50 or less.
   B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations: 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 Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

D. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

2.3 ACOUSTICAL PANELS

A. Products: Subject to compliance with requirements, provide one of the following products:

2. CertainTeed Corp; Fine Fissure, FFSB-157.

B. Classification: Provide panels and if required, fire resistance rated panels, complying with ASTM E1264 for type, form, and pattern as follows:

1. Type and Form: Type III, mineral base with painted finish, Form 2.

C. Color: White.

D. LR: Not less than 0.80.

E. NRC: Not less than 0.55.

F. CAC: Not less than 35.

G. Edge/Joint Detail: Square.

H. Thickness: Not less than 5/8 inch.

I. Modular Size: 24 by 24 inches.

J. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273 and evaluated according to ASTM D3274 or ASTM G 21.
2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

1. High-Humidity Finish: Comply with ASTM C 635/C 635M requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch-diameter wire.

D. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

E. Impact Clips: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

2.5 METAL SUSPENSION SYSTEM

A. Products: Subject to compliance with requirements, provide one of the following:

1. Armstrong World Industries, Inc.; Prelude XL.
2. CertainTeed Corp; Classic Stab.
3. Rockfon; Chicago Metallic 280.

B. Wide-Face, Capped, Double-Web, Hot-Dip Galvanized, G30, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; hot-dip galvanized according to ASTM A 653, G30 coating designation; with prefinished, cold-rolled, 15/16-inch-wide aluminum cap on flanges.

1. Structural Classification: Heavy-duty system.
2. Face Design: Flat, flush.
3. Face Finish: Painted white.

2.6 METAL EDGE MOLDINGS AND TRIM

A. Products: Subject to compliance with requirements, provide one of the following products:
SECTION 095113 - ACOUSTICAL PANEL CEILINGS

2. CertainTeed Corp; WA15-15.
3. Rockfon; Chicago Metallic 1409 Series.

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 circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Suspend ceiling hangers from building's structural members and as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.

6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

7. Do not attach hangers to steel deck tabs.

8. Do not attach hangers to steel roof deck. Attach hangers to structural members.

9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.

2. Install hold down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. Section Includes:
   1. Resilient base.
B. All resilient products installed for this project shall be produced and supplied by the same manufacturer.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples.

1.4 DELIVERY, STORAGE, AND HANDLING
A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.5 FIELD CONDITIONS
A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.
B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
C. Install resilient products after other finishing operations, including painting, have been completed.
PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Burke Mercer Flooring Products.
2. Flexco.
4. Roppe.

B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).

1. Style and Location:
   b. Style C, Butt to: Provide at rubber stair landings.

C. Thickness: 0.125 inch.

D. Height: 5 1/2” inches.

E. Lengths: Coils in manufacturer's standard length, uninterrupted from comer to comer to eliminate running joints.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Colors: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
   a. Cove Base Adhesives: 50 g/L.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
   1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
   4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:
      a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
      b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are the same temperature as the space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### 3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:
   1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
      a. Form without producing discoloration (whitening) at bends.
   2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
      a. Cope corners to minimize open joints.

### 3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum horizontal surfaces thoroughly.
   3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513
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. Vinyl composition floor tile.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: For each type of floor tile.
C. Samples: Full-size units of each color and pattern of floor tile required.

1.4 CLOSEOUT SUBMITTALS
A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Floor Tile: Furnish one box for every 30 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE
A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Build mockups for floor tile including resilient base and accessories.
a. Size: Minimum 100 sq. ft. for each type, color, and pattern in locations directed by Architect.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to the following ASTM standards or NFPA 253 by a qualified testing agency.

1. Flame Spread: 75 or less per ASTM E 84.
2. Smoke Density: 450 or less per ASTM E 662.
3. Smoke Development: 450 or less per ASTM E 84.
2.2 **VINYL COMPOSITION FLOOR TILE**

A. Subject to compliance with requirements, provide one of the following:
   1. Armstrong Standard Excelon Imperial.
   2. Johnsonite-Azrock; Standard & Solids VCT.

B. Tile Standard: ASTM F 1066, Class 2, through-pattern and through-color tile.

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch.

E. Size: 12 by 12 inches.

F. Colors and Patterns: As selected by Architect from full range of industry colors. Allow for up to three (3) different color floor tiles.

2.3 **TRANSITION ACCESSORY**

A. Description: Resilient transition edge strips and reducer strips for resilient floor covering.
   1. Burke Mercer Flooring Products; 600 Series reducer, 700 Series transition edge strip.
   2. Johnsonite; RRS Series reducer, CTA-D Series transition edge strip.

C. Material: Rubber.

D. Profile and Dimensions: As indicated.

2.4 **INSTALLATION MATERIALS**

A. Trowelable Leveling and Patching Compounds: Polymer-modified, Portland cement based patching compound or a product approved by floor tile manufacturer for applications indicated. The patching compound shall attain a minimum compressive strength of 3500psi at 28 days.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
   1. Adhesives shall comply with the following limits for VOC content:
      a. Vinyl Composition Tile Adhesives: 50 g/L or less.

C. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
   2. Remove substrate coatings and other substances that are incompatible with adhesives leveling and patching products and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
   4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:

      a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
      b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

   1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer’s written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles in pattern indicated or as directed by the Designer.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain direction as directed by the Designer.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer’s written instructions for cleaning and protecting floor tile.
B. Perform the following operations immediately after completing floor tile installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.
   4. Do not wash surfaces until after time period recommended by manufacturer.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
   1. Apply three coat and buff to ultra-shine finish.
   2. Coordinate selection of floor polish with Owner's maintenance service.

E. Cover floor tile until Substantial Completion.

F. Do not move heavy and sharp objects directly over surfaces. Place cardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION 096519
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Steel.
2. Galvanized metal.

B. Related Requirements:

1. Section 058000 "Miscellaneous Structural Steel" for shop priming of metal substrates with primers specified in this Section.
2. Section 099123 "Interior Painting" for surface preparation and the application of paint systems on interior substrates.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. VOC content.
1.4 **MAINTENANCE MATERIAL SUBMITTALS**

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 **QUALITY ASSURANCE**

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
   a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
   b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
   a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 **DELIVERY, STORAGE, AND HANDLING**

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.7 **FIELD CONDITIONS**

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.
2. Sherwin-Williams Company (The).

B. All paint products for this project shall be from a single manufacturer.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

C. Colors: As selected by Architect from manufacturer's full range.

2.3 METAL PRIMERS

A. Primer, Steel and Galvanized, Water Based.

1. Benjamin Moore; Ultra Spec HP Acrylic Metal Primer, HP04.
2. Sherwin Williams; Pro Industrial Pro-Cryl Universal Primer, B66W1310 Series.

2.4 SOLVENT-BASED PAINTS

A. Alkyd, Exterior, Semi-Gloss (Gloss Level 5).

1. Benjamin Moore; Corotech Urethane Enamel, V200 Series.
2. Sherwin Williams; Pro-Industrial Urethane Enamel, Semi-Gloss, B53 W01151 Series.

2.5 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when
samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

2. Testing agency will perform tests for compliance with product requirements.

3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncompliant paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that all factory-primed steel products such as, but not limited to, hollow metal doors, hollow metal frames, and structural steel is compatible with the paint products specified herein.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer or one of the following.
1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

   a. After removing the rust, scaling, and existing paint/primers as described above, apply a rust inhibiting product such as Ospho or Gem to the surface. Allow proper drying time prior to priming.

E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

### 3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view:
   a. Equipment, including panelboards and switch gear.
   b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.

3.4 FIELD QUALITY CONTROL
A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION
A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 CLOSEOUT
A. Paint Maintenance Manual: Upon completion of the project, the Contractor or paint manufacturer/supplier shall furnish the Designer, two (2) copies of a paint maintenance manual. The manual shall be of the spiral bound type. The manual shall include an area summary with finish schedule, area detail designating where each product/color/finish was used, product data pages, MSDS documentation, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

3.7 EXTERIOR PAINTING SCHEDULE
A. Steel and Galvanized-Metal Substrates:
   1. Alkyd System:
c. Topcoat: Alkyd, exterior, semi-gloss (Gloss Level 5).

END OF SECTION 099113
DIVISION 10

TECHNICAL SPECIFICATIONS

SPECIALTIES
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. Section Includes:
   1. Corner guards.

1.3 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, impact strength, fire test response characteristics, dimensions of individual components and profiles, and finishes for each corner guard unit.

B. Shop Drawings: For each corner guard unit showing locations and extent. Include sections, details, and attachments to other work.

C. Samples for Initial Selection: For each configuration of corner guard unit indicated.

D. Samples for Verification: For each type of exposed finish required, include Samples of accent strips to verify color selected.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Contractor shall have at least three (3) years of experience in installing corner guard products specified herein.

B. Source Limitations: Obtain corner guard units from single source from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store corner guard units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

B. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
C. Keep plastic sheet material out of direct sunlight.

D. Store plastic corner guard components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.

E. Store corner-guard covers in a vertical position.

1.6 **PROJECT CONDITIONS**

A. Environmental Limitations: Do not deliver or install corner guard units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F for not less than 72 hours before beginning installation and for the remainder of the construction period.

**PART 2 - PRODUCTS**

2.1 **MATERIALS**

A. PVC Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout; thickness as indicated.

1. Impact Resistance: Minimum 25.4 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
2. Chemical and Stain Resistance: Tested according to ASTM D 543.
3. Self-extinguishing when tested according to ASTM D 635.
4. Flame-Spread Index: 25 or less.
5. Smoke-Developed Index: 450 or less.

2.2 **CORNER GUARDS: Twelve (12)**

A. Surface-Mounted, Opaque-Plastic Corner Guards: Fabricated from PVC plastic, acrylic-modified vinyl sheet or opaque polycarbonate sheet; with formed edges; fabricated with 90- or 135-degree turn to match wall condition.

B. Manufacturers: available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. IPC Door and Wall Protection Systems; 150BN, 150DBN, and 130BN.
2. Korogard Wall Protection Systems; G200, G210, and KoroSeal Wall Covering.

   a. Wing Size: Nominal 3 inches.
   b. Height: 48 inches.
   c. Retainer: Continuous aluminum.
   d. Mounting: Stainless steel fasteners suitable for substrate encountered.
   e. Color and Texture: As selected by Architect from manufacturer’s full range.
SECTION 102613 - CORNER GUARDS

2.3 FABRICATION
A. Fabricate corner guard units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.
B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION
A. General: Install corner guards level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
B. Install corner guards in locations and at mounting heights indicated on Drawings.
C. Each corner guard shall be installed in one (1) piece without splices.

3.4 CLEANING
A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.

END OF SECTION 102613
DIVISION 12

TECHNICAL SPECIFICATIONS

FURNISHINGS
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

   1. Solid-surface-material window sills.

1.3 ACTION SUBMITTALS

A. Product Data: For window sills.
B. Shop Drawings: For countertops and window sills. Show materials, finishes, edge profiles, methods of joining, and any cutouts.
C. Samples for Initial Selection: For each type of material exposed to view.
D. Samples for Verification: For the following products:

   1. One full-size solid-surface-material window sill, with front edge, 8 by 10 inches, of construction and in configuration specified.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions of window sills by field measurements.

PART 2 - PRODUCTS

2.1 SOLID-SURFACE-MATERIAL WINDOW SILLS

A. Configuration: Provide window sills with the following style:

   1. Front: Radius edge with apron, 1-1/2 inches high with 1/2-inch radius.

B. Window Sills: 3/4-inch-thick, solid surface material with front edge built up with same material.
C. Fabrication: Fabricate in one piece with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

2.2 WINDOW SILL MATERIALS

A. Adhesives: Adhesives shall not contain urea formaldehyde.

B. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1.

1. Subject to compliance with requirements, provide products by one of the following:
   a. Formica Corporation.
   b. Wilsonart International.

2. Type: Provide Standard Type unless Special Purpose Type is indicated.

3. Colors and Patterns: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install window sills level to a tolerance of 1/8 inch in 8 feet.

B. Pre-drill holes for screws, if any required, as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

END OF SECTION 123661
DIVISION 22

TECHNICAL SPECIFICATIONS

PLUMBING
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions) and Division 0 as appropriate, apply to the Work specified in this Section.

B. Refer to all Sections, as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding all work.

1.2 SCOPE OF WORK

A. Furnish all labor and material necessary to provide and install the complete plumbing portion of this Contract as called for herein and on accompanying drawings. Parts of the plumbing division may be bid separately or in combination, at the Contractor's option; however, it shall be the responsibility of the General Contractor to assure himself that all items covered in the Plumbing Division have been included if he chooses to accept separate bids.

B. It is the intent of this specification that all materials with temperatures below ambient conditions or conveying any fluid/gas at temperatures below 70 deg. F be insulated to completely eliminate the potential for condensation. Unless specified elsewhere in these specifications, for materials that do not require access, insulate with 2" thick 3/4# density fiberglass duct wrap insulation with foil face (seal all joints air and water tight). For materials requiring occasional access, use 2" thick closed cell rubberized insulation with re-sealable fabric joints (hook and loop type).

C. Contractor shall refer to the Architectural and Structural drawings and install equipment, piping, etc. to meet building and space requirements. No equipment shall be bid on or submitted for approval if it will not fit in the space provided.

D. It is the intention of these specifications that all plumbing systems shall be furnished complete with all necessary valves, controls, insulation, piping devices, equipment, etc. necessary to provide a satisfactory installation that is complete and in good working order.

E. Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.
F. This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be sufficient cause for the Architect to reject any piece of equipment.

1.3 DEMOLITION

A. The contractor shall visit the site prior to bid to determine the extent of work required to complete the project.

B. Contractor shall coordinate demolition with owner. All equipment shall be salvaged for owner. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractors expense.

C. Contractor shall coordinate all work with general contractor and phase work as required by project.

D. All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.

E. Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.

F. Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.

G. Contractor shall be responsible for draining down of existing systems to complete demolition. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.

H. All shutdown of services shall be done at night during a time period approved by owner. The systems shall be required to be back up and running each morning unless otherwise approved by the owner.

1.4 GROUNDS AND CHASES

A. This Contractor shall see that all required chases, grounds, holes and accessories necessary for the installation of his work are properly built in as the work
progresses; otherwise, he shall bear the cost of providing them.

1.5 CUTTING AND PATCHING

A. Initial cutting and patching shall be the responsibility of the General Contractor, with the Mechanical Contractor being responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimbled without first receiving the approval of the Architect. After initial surfacing has been done, any further cutting, patching and painting shall be done at this Contractor’s expense.

1.6 FILL AND CHARGES FOR EQUIPMENT

A. Fill and charge with materials or chemicals all those devices or equipment as required to comply with the manufacturer’s guarantee or as required for proper operation of the equipment.

1.7 BIDDING REQUIREMENTS AND RESPONSIBILITIES

A. Prime bidder is responsible for all work, of all trades and sub-contractors bidding this project. It is the prime bidders responsibility, prior to submitting a bid to ensure that sub-contractors coordinate all aspects of the work between trades, sub-contractors, etc. to the fullest extent possible.

B. Prime bidder shall ensure that all sub-contractors, suppliers, equipment vendors, etc., obtain all necessary and pertinent contract document information pertaining to their work prior to the submission of a bid. Contractor shall realize that different sub-contractors may furnish equipment, accessories, devices, etc. necessary for a complete and working installation, that require provision of services by another sub-contractor or trade.

C. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Structural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.

D. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of
contract documents) to the prime bidder in accordance with Division 0 & 01 requirements, prior to bidding.

E. All timely, pertinent, questions provided in writing prior to bids, in accordance with Division 0 & 01 requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance in Division 0 & 01 requirements.

F. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.

G. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with Division 0 & 01 requirements.

H. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all Division 0 & 01 requirements, that they have indicated in writing, prior to bidding, all questions or concerns requiring clarification and/or explanation and have documented any and all specific exclusions involving work that would generally be considered to be work of their trade. The prime bidder shall coordinate all work so that anything excluded by the bidder of all or any portions of this section or division, have been addressed prior to bids in one of the following manners:

1. The work has been confirmed, by the prime bidder, to be work of another trade or subcontractor (whose proposal is also being accepted).
2. Clarification of the matter has been made through the prime design professional via written addendum and is clearly and mutually understood by the prime bidder and the party raising the issue/question, or seeking clarification.
3. The work has been accepted as the responsibility of the prime contractor directly.

1.8 MATERIAL AND EQUIPMENT

A. The term "provide" when used in the Contract Documents includes all items
necessary for the proper execution and completion of the Work.

B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgement of the Architect expressed in writing is equal to that specified.

C. Coordinate and properly relate all Work of this Division to building structure and work of all other trades.

D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with Division 0.

E. Do not rough-in for any item or equipment furnished by others or noted “Not in Contract” (NIC), without first receiving rough-in information from physically examining the existing equipment, receiving specific cut sheet information from the Owner’s representative, other trades and/or Architect. Rough-in services for “NIC” equipment as required, as the work progresses.

F. Provide storage and protection for all equipment and materials in accordance with requirements of Division 0 & 01. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to Owner.

G. Keep premises clean in accordance with requirements of Division 0 & 01.

1.9 SUBSTITUTIONS

A. Substitutions are only allowed by approval of the Architect prior to Bid Date as stipulated in Division 0 and/or Division 0 & 01.

B. Design of systems is based on specific equipment. If the use of other manufacturer’s equipment, even though approved by Architect, involves additional cost due to space requirements, foundation requirements, increased mechanical or electrical services, the cost of such extra work shall be borne by manufacturer of substituted equipment. Even though a manufacturer’s name appears in the Contract Documents as having acceptable equipment, their equipment with different model numbers shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from Contract Document requirements. Furnish all options specified or reasonably implied from the contract documents. Specifically identify any variance is regard to submittal versus specified performance on the cover sheet of each submittal.
1.10 VALUE ENGINEERING (V/E):

A. While it may be in the project Owner’s interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, Division 22 contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.

B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, Division 22 contractor shall provide duly licensed professional engineering consultants working on behalf of the Division 22 contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The Division 22 contractor’s licensed professional engineering consultants and the Division 22 contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as Division 22 contractor’s Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.

C. Division 22 contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and complete responsibility for the hybrid design. Further, the Division 22 contractor’s (V/E Items) professional of record (either employees, or independent consultants to the Division 22 contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner’s original A/E team (Professional of Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact on the Division 22 systems altered, affected or modified, in whole or in part. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.

1.11 DRAWINGS AND SPECIFICATIONS

A. The specific intent of these Contract Documents is to provide the various systems,
equipment, etc. to the Owner complete and in a thoroughly calibrated functional condition.

B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and elevations shall have precedence over other items. Should any major interference develop, immediately notify the Architect.

C. In laying out Work, refer to mechanical, electrical, structural, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.

1.12 CODES AND REGULATIONS

A. Work shall be in full accord with the most stringent interpretation of the State Sanitary Code, local ordinances, building codes, and other applicable national, local, and state regulations.

B. Equipment shall conform to requirements and recommendations of the National bureau of Fire Underwriters and National Fire Protection Association (NFPA).

C. Items provided under this Division shall comply with the American National Standards Institute (ANSI) "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People," ANSI A 117.1

D. In the possible event of conflict between codes or regulations and Contract Documents, the most stringent interpretation of either shall govern (provided if exceeds the requirements of other codes. In the event of an irreconcilable difference between codes or regulations notify the Architect/Engineer immediately.

E. In addition to the codes heretofore mentioned, all mechanical work and equipment shall conform to the applicable portions of the following specifications, codes and/or regulations:

1. National Electrical Code (NEC)
2. National Fire Protection Association (NFPA)
3. American Society of Mechanical Engineers (ASME)
4. American Gas Association (AGA)
5. Underwriters Laboratories (UL)

F. All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All
materials shall be new and of the best quality and first class in every respect. Whenever directed by the Architect, the Contractor shall submit a sample for approval before proceeding.

G. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.

H. All unfired and fired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel. Contractor shall provide and pay for first operating certificate as per State Fire Marshal Regulations.

1.13 FEES, PERMITS, AND TAXES

A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.

B. Pay any and taxes levied for Work of this Division, including municipal and/or state sales tax where applicable.

C. All permits, fees, certificates, etc. for the installation, inspections, plan review, service connections locations, and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor.

D. The Contractor shall make all tests required by the Architect, Engineer or other governing authorities at no additional cost to the Owner.

E. The Contractor shall notify the Architect and local governing authorities before any tests are made, and the tests are not to be drawn off a line covered or insulated until examined and approved by the authorities. In event defects are found, these shall be corrected and the work shall be retested.

F. Prior to requesting final inspection by the Architect, the Contractor shall have a complete coordination and adjustment meeting of all of his sub-contractors directly responsible for the operation of any portion of the system. At the time of this meeting, each and every sequence of operation shall be checked to assure proper operation. Notify the Architect in writing ten (10) days prior to this meeting, instructing him of the time, date and whom you are requesting to be present.
G. This project shall not be accepted until the above provisions are met to the satisfaction of the Architect.

1.14 MANUFACTURER'S DIRECTIONS

A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.

1.15 SUBMITTAL DATA

A. Submit shop drawings, project data, and samples in accordance with requirements of Division 0/and or Division 0 & 01.

B. Shop drawings shall consist of published ratings or capacity data, detailed construction drawings for fabricated items, wiring and control diagrams, performance curves, installation instructions, manufacturer's installation drawings, and other pertinent data. Submit drawings showing revisions to equipment layouts due to use of alternate or substitute equipment.

C. Where approved manufacturers and suppliers of equipment, materials, etc. are unable to fully comply with Contract Document requirements, specifically call such deviations to attention of Architect on submittals. Type deviations on a separate sheet; underlined statements or notations on standard brochures, equipment fly sheets, etc. will not be accepted.

D. Approval of submittals shall not relieve Contractor from furnishing required quantities and verifying dimensions. In addition, approval shall not waive original intent of Contract Documents.

E. Failure to obtain written approval of equipment shall be considered sufficient grounds for rejection of said equipment regardless of the stage of completion of the project.

1.16 REVIEW OF MATERIALS:

A. Whenever manufacturers or trade names are mentioned in these Plans or Specifications, the words "or approved equivalent" shall be assumed to follow whether or not so stated. Manufacturers or trade names are used to establish a standard of quality only, and should not be construed to infer a preference. Equivalent products which meet the Architect's approval will be accepted; however, these products must be submitted to the Architect a minimum of ten (10) days prior to the Bid Date.
B. Submission shall include the manufacturer’s name, model number, rating table and construction features.

C. Upon receipt and checking of this submittal, the Architect will issue an addendum listing items which are approved as equivalent to those specified. THE CONTRACTOR SHALL BASE HIS BID SOLELY ON THOSE ITEMS SPECIFIED OR INCLUDED IN THE “PRIOR APPROVAL ADDENDUM”, AS NO OTHER ITEM WILL BE ACCEPTABLE.

D. Prior approval of a particular piece of equipment does not mean automatic final acceptance and will not relieve the Contractor of the responsibility of assuring himself that this equipment is in complete accord with the Plans and Specifications and that it will fit into the space provided. Shop drawings must be submitted on all items of equipment for approval as hereinafter specified.

E. Before proceeding with work and/or within thirty (30) days after the award of the General Contract for this work, the Mechanical Contractor shall furnish to the Architect complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves and other pertinent information.

F. The Architect’s approval of shop drawings shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors which may be contained in these drawings. Any omission from the shop drawings or specifications, even through approved by the Architect, shall not relieve the Contractor from furnishing and erecting same.

G. Seven (7) sets of shop drawings shall be submitted to the Architect for approval. These submittals shall be supplied as part of this Contractor’s contract. Any drawings not approved shall be resubmitted until they are approved. SUBMIT ALL SHOP DRAWINGS AT THE SAME TIME. NO SEPARATE ITEMS WILL BE ACCEPTED.

H. Submit one (1) sepia with two (2) blueline prints of all mechanical room layouts showing locations of all equipment, piping, etc. to insure all will fit in space provided. Submit drawings at 1/4” scale.

1.17 PROJECT RECORD DOCUMENTS

A. Keep Project Record Documents in accordance with requirements of Division 0 & 01.
B. During construction period, keep accurate records of installations made under this Division, paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.

C. The Contractor shall obtain at his cost, two sets of blueline prints of the original bid documents by the Architect. One set shall be kept on the site with all information as referenced below, and shall update same as the work progresses. The other set will be utilized to record all field changes to a permanent record copy for the Owner.

D. If the Contractor elects to vary from the Contract Documents and secures prior approval from the Architect for any phase of the work, he shall record in a neat and readable manner, ALL such variances on the blueline print in red. The original bluelines shall be returned to the Architect for documentation.

E. All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.

F. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.

G. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.

H. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The Architect's/Engineer's decision in this matter will be final.

I. The following requirements apply to all "As-Built" drawings:

1. They shall be maintained at the Contractor's expense.
2. All such drawings shall be done carefully and neatly, and in a form approved by the Architect/Engineer.
3. Additional drawings shall be provided as necessary for clarifications.
4. These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/Engineer; and when necessary, to establish clearances for other parts of the work.
5. "As-built" drawings shall be returned to the Architect upon completion of the work and are subject to approval of the Architect/Engineer.

1.18 EXCAVATING AND BACKFILLING

A. Provide excavating and backfilling necessary for Work of this Division. Comply with provisions of Division 2, Site Work, if applicable.

B. Trenches shall be inspected by Code Authorities and/or Owner's Representative before and after piping is laid. Give Owner's Representative 24-hour notice for each inspection. If any trenches are filled without Owner's Representative inspection and as subsequently found to be deficient, the trenches shall be uncovered, inspected, and then re-filled, if requested by Owner's Representative.

C. Provide minimum 18 inches of cover or in compliance with local published frost line data (if greater than 18 inches) to finish grades or paving at water piping.

D. For piping, provide bell holes at trench bottom to assure uniform bearing. Accurately grade trench bottoms by instrument before laying any pipe.

E. Protect and maintain trenches in dry condition until piping has been inspected and approved. Immediately after approval, backfill trenches in tamped layers.

F. Compact fill to satisfaction of Architect and/or Owner's Representative.

1.19 CUTTING AND PATCHING

A. Comply with requirements of Division 0 and Division 0 & 01 regarding cutting and patching. Locate and timely install sleeves as required to minimize cutting and patching.

B. Cutting, fitting, repairing, patching, and finishing of Work shall be done by craftsmen skilled in their respective trades. Where cutting is required, cut in such a manner as not to weaken structure, partitions, or floors. Holes required to be cut must be cut or drilled without breaking out around the holes. Where patching is necessary in finished areas of the building, the Architect will determine the extent of such patching and refinishing.

C. Repairing Roadways and Walks: Coordinate all roadway work with authorities having jurisdiction. Cut and/or bore under roadways for connection of utilities as required. Coordinate work through General Contractor. Where this contractor cuts or breaks roadways or walks to lay the piping, he shall repair or replace these sections to match existing, unless specifically identified as the responsibility of others.
1.20 PAINTING

A. Painting shall be provided by General Contractor’s painting sub-contractor, unless specified otherwise. Leave exposed piping, materials, and equipment clean and free of rust, grease, dirt, etc. before and after painting.

B. Factory finished equipment, fixtures, and materials which are marred, chipped, scratched, or otherwise unacceptable shall be repaired or replaced under this Division to Architect satisfaction, at no additional cost to Owner.

C. Coordinate all painting requirements with prime bidder prior to bids.

D. Paint all exposed piping inside and outside of building. Label all piping after painting as required. Utilize industry standard paint colors for respective system unless directed otherwise by Architect. Review proposed color scheme with Architect/Engineer prior to ordering materials.

E. All piping shall be color coded per the following:

1. Domestic Cold Water Piping Yellow
2. Domestic Hot Water Piping Blue

1.21 CLEANING AND ADJUSTING:

A. Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.

1.22 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.

COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.

B. This information shall be bound in plastic hardbound notebooks with the job name, Architect and Engineer names permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Architect for approval.
C. In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.

D. The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract.

1.23 GUARANTEE

A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.

B. If the Contractor’s office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect for his approval.

1.24 LOCAL CONDITIONS

A. The location and elevation of all utility services is based on available surveys and utility maps and are reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.

B. The Contractor shall contact the various utility companies, determine the extent of their requirements and he shall include in his bid all lawful fees and payments required by these companies for complete connection and services to the building, including meters, connection charges, street patching, extensions from meters to main, etc.
SECTION 220000 – PLUMBING GENERAL PROVISIONS

C. In case major changes are required, this fact, together with the reasons therefor, shall be submitted to the Architect, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

1.25 MINOR DEVIATIONS

A. Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes and manner of erecting work. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Architect for approval before proceeding. Extra charges shall not be allowed for these changes.

B. The Contractor shall realize that the drawings could delve into every step, sequence or operation necessary for the completion of the project, without drawing on the Contractor’s experience or ingenuity. However, only typical details are shown on the Plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.

C. In general, the drawings are diagrammatic and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Architect is to state which item was first installed.

1.26 VALVE TAGS

A. Secure metal tags to all valves. Labeling on all valve tags shall include type of system the valve controls and the area of building, zone, or equipment number affected by valve operation. Tag shall be 2”minimum diameter brass, engraved with code number, service and size. A framed list of the valves, giving manufacturer’s name, model number, type and location shall be mounted in the main basement equipment room.

1.27 LABELING MECHANICAL EQUIPMENT
A. All equipment furnished under Division 0 & 01 of contract documents shall be labeled with permanent laminated plate secured to equipment. Units shall be labeled as indicated on plans and schedules.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 220000
PART 1 - GENERAL

1.1 SANITARY SEWER AND SANITARY VENT PIPE

A. Sanitary Sewer Waste and Vent Lines and fittings: These shall be Schedule 40 plastic PVC sewer pipe and fittings with solvent joints.

B. Sanitary sewer pipe penetrating concrete slabs shall be wrapped with Virginia Chemical K-501 or equal foam insulation tape.

C. Provide tracer wire for all PVC piping below grade.

1.2 LAB SINK WASTE PIPE

A. Shall be acid-resistant polypropylene pipe and fittings

1.3 DOMESTIC COLD AND HOT WATER LINES

A. All such lines shall be Government Type "L", hard copper water tubing of standard weight and thickness as made by Mueller, Chase, Anaconda or equivalent, unless indicated otherwise. Use 95-5 solder on all piping above slab. Use Silfos 1000° solder on all piping beneath the slab.

B. Domestic cold water piping on site up to within 5'-0" of building may be Schedule 40 PVC plastic pipe with solvent welded joints, or slip joint fittings with EPDM seals. Provide thrust blocks all at changes in direction. Installation shall be in accordance with manufacturer's recommendations.

C. Domestic water lines shall be insulated at all penetrations through slab per insulation.

1.4 WATER HEATER RELIEF LINES, EQUIPMENT DRAIN LINES, REFRIGERANT LINES

A. Refrigerant lines these shall be Government Type "L" hard copper.

B. Equipment Emergency Drain Pan Lines and Condensate Drain Lines: These shall be Government Type "L" hard copper.
1.5 **TRAP PRIMER LINES**
   A. All such lines shall be Type "L" soft copper, without joints.

1.6 **PIPE SPECIALTIES**
   A. Dielectric unions shall be used between copper and iron pipe.

1.7 **PIPE HANGERS AND SUPPORTS**
   A. This Contractor shall furnish and install all foundations and supports required for his equipment unless indicated otherwise on the Drawings.

   B. This Contractor shall furnish and install all escutcheons, inserts, thimbles, hangers, etc. required for the proper support and installation of his equipment and piping and he shall cooperate with other trades in locating and placing these items.

1.8 **PROVIDE SLEEVES FOR ALL PIPES PASSING THROUGH WALLS, FLOORS, BEAMS, ETC.**
   A. Sleeves passing through structural members or concrete footings shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through nonstructural walls or floors shall be of 26 gauge galvanized iron. Joints between sleeves and pipes passing through floors shall be made weather tight with plastic materials. Where pipes pass through water proofing membrane, flashing sleeves shall be installed.

   B. Provide Grinnel, Fee & Mason, or equivalent malleable iron split ring hangers with rod supports throughout. STRAP HANGERS OR WIRE WILL NOT BE ACCEPTED.

   C. Maximum spacing of hangers for cast iron pipes shall be 5 ft.; for other than soil, use 10 ft.

   D. Provide galvanized iron shields between hangers and pipe covering.
E. Provide Grinnel, Fee & Mason, Crane or equivalent heavy steel riser clamps on vertical risers at floors to support pipes.

F. Provide producer speciality, Jones Manufacturing or equal chrome plated brass escutcheons wherever pipes pass through floors, walls or ceilings in exposed or finished areas.

G. All piping projecting from chases shall be rigidly supported in the wall or chase. Loosely supported fixtures or accessories will not be accepted.

1.9 VALVES AND UNIONS

A. Furnish and install all valves, unions, stops, connections, etc. shown on plans and necessary to make a complete system in working order. Provide valves on inlet and outlet of all equipment and fixtures and on branch lines to fixtures or groups of fixtures.

B. Ball Valves, 3” and smaller, rated for 150 PSI saturated steam pressure, 600 PSI WOG pressure; shall be 2-piece construction, bronze body conforming to ASTM B-62, conventional port, chrome-plated brass ball, replaceable TFE seats and seals, blow-out proof stem, and vinyl-covered steel handle. Provide solder ends for condenser water, chilled water and domestic hot and cold water service of NIBCO Design S-580-70, Milwaukee BA-150-S or equal, threaded ends of heating hot water and low pressure steam of NIBCO Design T-580-70, Milwaukee BA-100-S or equal. For chilled water insulated piping systems, provide ball valves with extended stem, insulated handle with protective thermal barrier sleeve to prevent condensate moisture drip and pipe insulation deterioration. At Contractor’s option, Victaulic Style 722 or 721 ball valves may be used.

C. All valves, unions, etc. where pipe is chrome plated shall have similar finish. All exposed supplies to plumbing fixtures shall be chrome plated.

D. Domestic water valves (below grade): M & H AWWA Series C-509 resilient gate valve with low torque operation, positive shut-off, O- Ring seals, full epoxy coating and square valve stem end. Provide two (2) adjustable "TEE" handle valve wrenches to be turned over to the owner after construction is complete.

E. Gate Valves, 3 Inch and Larger: MSS SP-70; Class 125 iron body,
bronze mounted, with body and bonnet conforming to ASTM A 126 Class B; with flanged ends "Teflon" impregnated packing, and two-piece backing bland assembly.

F. Globe Valves, 2-Inch and Smaller: NSS SP-80; Class 125; body and screwed bonnet of ASTM B 62 cast bronze; with threaded or solder ends, brass or replaceable composition disc, copper-silicon alloy stem, brass packing gland, "Teflon" impregnated packing, and malleable iron handwheel. Provide Class 150 valves meeting the above where system pressure requires.

G. Butterfly Valves, 2-1/2-Inch and Larger: MSS SP-67; rated at 200 psi; cast-iron body conforming to ASTM A 126, Class B. Provide valves with field replaceable EPDM sleeve, nickel-plated ductile iron disc (except aluminum bronze disc for valves installed in condenser water piping), stainless steel stem, and EPDM O-ring stem seals. Provide lever operators with locks for sizes 2 through 6 inches and gear operators with position indicator for sizes 8 through 24 inches. Provide "Non-Leakage" full threaded lug flange body type capable of being broken down at one side of the valve remaining closed. Drill and tap valves on dead-end service or requiring additional body strength. At Contractor’s option Victaulic 300 BFV for grooved piping systems maybe used.

H. Swing Check Valves, 2 Inch-and Smaller: MSS SP-80; Class 125 cast-bronze body and cap conforming to ASTM B 62; with horizontal swing, Y-pattern, and bronze disc; and having threaded or solder ends. Provide valves capable of being reground while the valve remains in the line. Provide Class 150 valves meeting the above specifications, with threaded end connections, where system pressure requires or where Class 125 valves are not available.

I. Swing Check Valves, 2-1/2-Inch and Larger: MSS SP-71; Class 125 (Class 175 FM approved for fire protection piping system), cast iron body and bolted cap conforming to ASTM A 126, Class B; horizontal swing, and bronze disc or cast-iron disc with bronze disc ring; and flanged ends. Provide valves capable of being refitted while the valve remains in the line. At Contractor’s option, Victaulic Style 716 for grooved piping systems may be used.
J. Wafer Check Valves: Class 2500, cast-iron body; with replaceable bronze seat, and non-slam design lapped and balanced twin bronze flappers and stainless steel trim and torsion spring. Provide valves designed to open and close at approximately one foot differential pressure.

K. Lift Check Valves, 2 Inch-and Smaller: Class 125; cast-bronze body and cap conforming to ASTM B 62; horizontal or angle pattern, lift-type valve, with stainless steel spring, bronze disc holder with renewable "Teflon" disc, and threaded ends. Provide valves capable of being refitted and grounded while the valve remains in the line.

L. Select Valves with the following ends or types of pipe/tube connections:

1. Copper Tube Size 2 Inch and Smaller: Solder ends, except provide threaded ends for heating hot water.

1.10 PIPE MARKERS

A. Provide pipe markers and directional arrows on all piping in building and on both sides of all valves located above ceiling. Markers shall be as manufactured by W.H. Bradley Co., or equal. All letters shall be color-coded and sized as recommended by OSHA. Samples of the type of letters to be used shall be submitted with shop drawings.

B. The following pipe and valves shall be identified: Domestic cold, hot water, natural gas pipe and valves throughout project.

C. Pipe markers with arrows shall indicate lines content and shall be located 20 feet on center and at each charge of direction of line. Identification bands shall be color coded to match pipe markers and shall be provided 10 feet on center. Pipe identification markers shall be taped at each end and shall be taped around the entire circumference of pipe.

1.11 PIPING SYSTEMS GENERALLY

A. Arrange, install piping approximately as indicated, straight, plumb and as direct as possible; form right angles, or parallel lines with building walls. The most practical appearance of piping runs is required. Keep pipes close to walls, partitions, ceilings; off-set only where necessary to follow
walls as directed.

B. Before installing piping, check plumbing and HVAC drawings with architectural, mechanical, structural, electrical drawings; make accurate layout of plumbing and HVAC piping. Where interferences may appear and departures from indicated arrangements are required, consult with other trades involved; come to agreement as to changed locations and elevations of piping; obtain approval of proposed changes. Note runs of other contractor’s piping and large conduits and cooperate to achieve neat appearance.

C. Unless otherwise indicated, conceal all piping in building construction in finished areas. Install such piping in time so as not to cause delay to work of other trades and to allow ample time for tests and approval; do not cover before approval is obtained.

D. Locate groups of pipes parallel to each other and building lines; space them at distance to permit access for serving, valves, and to create most practical appearance when racked with conduits, refrigerant, etc., provided by other contractors.

E. Keep fixture branches concealed to points above floor close to fixtures; expose only as much as necessary for final connection. Rigidly support pipes projecting from walls, chases, etc., in wall or chase to make firm, well-braced installation. Loosely supported pipe or accessory is not acceptable.

F. Install horizontal piping to coordinate with other trades and install without sags or humps.

G. Grade inside sewer piping at uniform slope of 1/4 inch per foot, minimum; where this is impossible, maintain slope as directed but in no case less than 1/8 inch per foot. Waste lines 3 inches and smaller must grade at minimum 1/4 inch per foot. See drawings for fall on exterior sewer lines.

H. Grade other piping as specified under heading or service where used, or as directed.

I. Keep piping free from scale and dirt, protect open pipe ends whenever work is suspended during construction. To prevent foreign bodies
entering and lodging in pipe, use temporary plugs or other approved material.

J. Where changes in pipe sizes occur, do not bush down; use only reducing fittings. For drainage piping changes in direction, use long sweep where possible; otherwise, short-sweep 1/4 bends or combination Y and 1/8 bends; also Y’s in combination with other bends.

K. Provide shut off valves at all supply connections to all equipment. Suppliers of equipment shall provide rough-in drawings and this contractor shall fully connect all items, supplying necessary piping and fittings as required, unless otherwise noted individually.

L. Do not locate valves with stems below horizontal.

M. Locate valves for easy access and operations. Where concealed, notify General Contractor of exact location in order that he may leave openings for access panels. Provide access panels.

N. Provide unions, screwed or flanged, where indicated, and in following locations even if not indicated and one inch by-passes around equipment.

O. All 90 deg changes in direction shall be poured in concrete thrust blocks (4000 PSI concrete).

P. All straight joints shall be insulated and sealed as per manufacturer standard procedures.

Q. Complete installation shall be in accordance with manufacturers recommendations.

R. The Contractor shall exercise care in cleaning joints after making cuts on pipe to prevent pipe particles from entering the system.

S. Drilled “T” shall be acceptable for use in hard copper pipe. Weld-O-let fittings shall be used in iron pipe.

T. Provide dielectric unions between copper and iron pipe.

U. All piping penetrations thru fire and/or smoke rated partitions shall be
sealed with 3M fire stop or approved fire rated sealant.

1.12  **SHOCK ABSORBERS**

   A. All water service to fixtures or groups of fixtures shall have concealed air chambers. Air chambers shall be of the same diameter as the supply or header pipes and 12 inches long on both hot and cold water branches. Locate shock absorbers close to fixture or at end of header.

   B. Shock arresters shall be installed for sterilizer water supplies.

1.13  **SLEEVES**

   A. Provide sleeves in new construction for all pipes passing through walls, floors, beams, etc. Sleeves passing through structural members shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through non-structural walls or floors shall be of 26 gauge galvanized iron or manufactured plastic sleeves. Joints between sleeves and pipes passing through non-structural walls or floors shall be of 26 gauge galvanized iron or manufactured plastic sleeves. Joints between sleeves and pipes passing through floors shall be made watertight with plastic materials. Where pipes pass through waterproofing membrane, flashing sleeves shall be installed.

1.14  **ESCUTCHEONS**

   A. Provide escutcheons for all exposed lines passing through floors, walls, and ceilings. They shall be chrome plated brass and shall be of such flange size as to cover necessary penetrating openings.

1.15  **FLASHING**

   A. Flash all vent penetrations through roof. Extend flashing approximately 10 inches in all directions at base and turn ends down into top of pipe. Off-set vents where necessary to provide 4 feet minimum clearance from other flashing such as outside walls, curbs, etc. Note: All vents shall be 25 feet from fresh air intakes.

1.16  **TEST**
A. Make such tests of work as specified, or required by Architect or by State and Municipal Bureaus having jurisdiction, and under their supervision. Perform tests in presence of Architect's representative. Notify Architect two days prior to testing.

B. Provide apparatus, temporary piping connections, or other requirements necessary for tests. Take precautions to prevent damage to building or contents by tests. Contractor is required to repair and make good at his expense damage so caused.

C. Correct leaks, defects, or deficiencies discovered as result of tests. Repeat tests until test requirements are fully complied with caulking of pipe joints to remedy leaks is not permitted, except on lead and oakum joints.

1.17 VALVE TAGS

A. Provide metal valve tags on all valves.

B. All valve tags shall have identification number. Contractor shall obtain numbering sequence from owner.

C. Provide catalog listing of each valve tag number with identification as to type of system valve controls and area of building or equipment affected when valve is closed. Include in an index to other valves required for isolation.

D. Contractor shall also provide and install on ceiling grid location as directed by owner, white gravoply 1/8" thick, 1" wide length as required for name tag, with colored capital letters as following:

1. Domestic cold water, and domestic hot water, cut off valves above ceilings - color to be determined by owner during shop drawing stage.

1.18 INSTALLATION OF VALVES

A. General Application: Use gate ball, and butterfly valves for shut-off duty; globe, ball, and butterfly for throttling duty.
B. Locate valves for easy access and provide separate support where necessary.

C. Install valves and unions for each fixture and item of equipment arranged to allow equipment removal without system shutdown. Unions are not required on flanged devices.

D. Install three-valve bypass around each pressure reducing valve using throttling-type valves.

E. Install valves in horizontal piping with stem at or above the center of the pipe.

F. Install valves in a position to allow full stem movement.

G. All valves, on insulated piping shall be complete with extended lever handle stem.

1.19 ACCESS PANELS

A. Furnish and install access panels where valves, dampers, control boxes, etc. are concealed in walls, ceilings, floors, or otherwise inaccessible or where specifically called for on plans. Panels shall be Milcor Style DW, or Bar-Co. Model 500, J-L Industries Model WB, or equal sized as required and furnished with prime coat finish.

1.20 RATED WALL PENETRATIONS

A. Contractor shall refer to fire stopping section for proper installation of all pipes penetrating rated walls.

END OF SECTION 22 05 00
PART 1 - GENERAL

1.1 GENERAL

A. Pipe insulation shall not begin until all work has been tested and found to be tight. All insulation adhesives, sealers, tapes and mastic shall meet the latest NFPA requirements and shall meet 25/50/50 flame spread and smoke developed ratings.

B. All insulation shall be installed in strict accordance with the manufacturer’s recommendations.

C. All pipe insulation exterior of building shall be banded with aluminum bands, three to a section and with one band on each side of each fitting, valve, etc.

D. Insulation shall be continuous through walls and ceilings.

E. All valves, strainers, etc. shall be insulated the same as its adjacent piping and the covering shall extend all the way up to the equipment.

F. USE HIGH DENSITY INSULATION INSERTS AT HANGERS ON ALL PIPING 1-1/2” AND ABOVE TO PREVENT CRUSHING OF INSULATION.

1.2 THERMAL INSULATION: After all work has been tested and approved, insulate as follows:

A. INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S RECOMMENDATIONS AND INSTRUCTIONS.

1.3 DOMESTIC WATER PIPING:

A. Cover all domestic cold and hot water piping, valves and fittings above slab with 1” thick, high density fiberglass insulation with Universal Fire Retardant Jacket, Owens/Corning "25 ASJ/SSL", Knauf ASJ-SSL, or equal. All laps are to be sealed and stapled in place. Fittings are to be mitered segments of insulation held in place with white vapor barrier tape for concealed areas and Zeston 25/50 PVC, Knauf 25/50 rated PVC, pre-molded insulated fitting covers in exposed areas.

B. All water lines exposed in the vehicle bays and on the outside of the building exposed to the weather shall be covered with 0.160 smooth aluminum jacket and elbows in addition to fiberglass insulation.
C. Domestic cold and hot water lines run below slab within building shall be insulated with 1/2" thick closed cell tube insulation. Apply two (2) coats of mastic on insulation.

1.4 INSULATION THROUGH HANGERS AND SLEEVES

A. The insulation shall be continuous through pipe hangers and pipe sleeves. At hangers where the pipe is supported by insulation, provide a galvanized iron protection shield. Provide pipes 2-inch i.p.s. and larger with insulation inserts at points of hanger supports. The inserts shall be of calcium silicate, cellular glass, prestressed molded glass fiber of minimum 13-pound density, or other approval material of the same thickness as adjacent insulation and not less than 13-pound density. The inserts shall have sufficient compression strength to adequately support the pipe without compressing the inserts to a thickness less than the adjacent insulation. Inserts shall be 180 degrees and not less than the length of the protection shield. Vapor barrier facing of the insert shall be the same as the facing on the adjacent insulation. Where copper clad hanger are used on domestic copper pipe, insulation may cover pipe and hanger.

1.5 CONDENSATE WASTE LINES & P-TRAPS

A. P-traps and drain lines receiving HVAC condensate shall be insulated with 2-1/8" thick 3/4 # density fiberglass ductwrap insulation with aluminum foil vapor barrier. Insulation shall be sealed at all seams and joints.

END OF SECTION 22 07 00
PART 1 - GENERAL

1.1 SERVICE

A. The Contractor shall extend water throughout the project as indicated on the Drawings.

B. Contractor shall coordinate any outages with owner prior to connection and schedule as required. Water outage will be accomplished after normal working hours or weekend. Contractor shall have figure in base bid to make connections after normal hours or weekends.

1.2 GENERAL

A. All water supply piping shall be of materials hereinbefore specified. Make provisions for expansion and contraction of hot water lines by means of expansion bends or loops as required.

B. All water lines shall be disinfected in accordance with The State of Louisiana Sanitary Code, Latest Standard Plumbing Code with amendments.

C. Submit three (3) copies of "Certificate of Performance" at completion of the project.

D. Make up the complete water supply system. Connect to all fixtures and outlets requiring water.

E. At each fixture or group of fixtures with lines 1-1/4" or below, furnish and install a 12" high air chamber of same size as branch feed line. On lines 1-1/4" and above and at fixtures with quick closing valves such as dishwashers, tempered water valves, etc., install "Shocktrol", "Precision Plumbing Products" or equal water hammer arrester properly sized for each unit.

1.3 TESTING

A. All domestic water lines, unless elsewhere specified, shall be tested not less than 200 psi hydrostatic pressure for a minimum of five hours.

END OF SECTION 221100
SECTION 221300 – WASTE WATER DISPOSAL

PART 1 - GENERAL

1.1 SERVICE
A. Connect to sewer shown on plans. Verify invert prior to rough-in. Contractor shall pay all service and connection charges.

1.2 GENERAL
A. The system of sewage and drainage in general shall be as hereinbefore specified.

B. All work shall be in strict accordance with the State Plumbing Code, IBC, and with all local codes. Piping shall be routed as shown on Plans or in an acceptable manner to meet building conditions. Venting shall be as shown on plumbing riser diagrams.

C. Connections between traps and cast iron pipes are to be made with heavy brass ferrules or cast iron pipe.

D. All p-traps installed below slab shall be 6” deep-seal p-traps.

E. Provide reducers, increasers, special flanges, and fittings where required between piping work and fixtures in order to connect and complete work and render it ready for use. Make any offsets required to avoid construction.

F. All water closets shall be mounted with 4” closet bends.

G. All lines 2” and smaller shall be sloped 1/4” per foot; all lines 3” and larger shall be sloped 1/8” per foot. Piping shall be laid so slope is continuous.

H. All sewer vents shall extend 8” above roof and terminate in an appropriate flashing collar. No vents shall penetrate roof within 48” of an exterior wall. Offset in ceiling as required. All back vents shall be taken off as near trap as possible.

1.3 TESTING
A. Test all sanitary sewer waste, acid waste and vent lines inside building with a minimum of 10’ water head for 15 minutes, in accordance with the State Plumbing Code and Standard Plumbing Code.

B. All exterior sewer piping shall be air tested under 5 psi for 15 minutes.

END OF SECTION 221300
DIVISION 23

TECHNICAL SPECIFICATIONS

HEATING, VENTILATING, and AIR CONDITIONING (HVAC)
PART 1 - GENERAL

1.1 RELATED DOCUMENT
A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions, Division 0) and Division 01 as appropriate, apply to the Work specified in this Section.

B. Refer to all Division as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding mechanical work.

1.2 SCOPE OF WORK
A. Furnish all labor and material necessary to provide and install the complete mechanical portion of this Contract, including plumbing, air conditioning, heating and ventilating systems as called for herein and on accompanying drawings. Parts of the mechanical division may be bid separately or in combination, at the Contractor's option; however, it shall be the responsibility of the General Contractor to assure himself that all items covered in the Mechanical Division have been included if he chooses to accept separate bids.

B. It is the intent of this specification that all Division 23 materials with temperatures below ambient conditions or conveying any fluid/gas at temperatures below 70 deg. F be insulated to completely eliminate the potential for condensation. Unless specified elsewhere in these specifications, for materials that do not require access, insulate with 2-1/8" thick 3/4# density fiberglass duct wrap insulation with foil face (seal all joints air and water tight). For materials requiring occasional access, use 2" thick closed cell rubberized insulation with re-sealable fabric joints (hook and loop type).

C. Contractor shall refer to the Architectural and Structural drawings and install equipment, piping, etc. to meet building and space requirements. No equipment shall be bid on or submitted for approval if it will not fit in the space provided.

D. It is the intention of these specifications that all mechanical systems shall be furnished complete with all necessary valves, controls, insulation, piping devices, equipment, etc. necessary to provide a satisfactory installation that is complete and in good working order. The HVAC system shall ensure that under all circumstances, the building shall be kept at temperatures and indoor space relative humidities that when compared to outside temperatures and relative humidities protect building finishes installed under this contract and/or existing floor, wall and ceiling finishes within the building from damage due to excessive temperature or
humidity. HVAC system shall ensure that building remain under a slight positive pressure and shall alarm in the event of a negative pressure condition. In addition Contractor shall provide training to Owner in regard to the need for space temperature and humidity control whenever the outdoor dew point (wetbulb temperature) exceed 62.5 deg. F and freeze protection procedures whenever the outdoor temperature (drybulb temperature) drops below 32 deg. F. Contractor shall obtain written sign-off on the part of the Owner to the receipt of all training including the above and all required training referenced hereafter, throughout these specifications. Failure to obtain this sign-off shall be constructed as evidence that proper training was not given.

E. Contractor shall visit the site and acquaint himself thoroughly with all existing facilities and conditions which would affect his portion of the work. Failure to do so shall not relieve the Contractor from the responsibility of installing his work to meet the conditions.

F. This Contractor shall protect the entire system and all parts thereof from injury throughout the project and up to acceptance of the work. Failure to do so shall be sufficient cause for the Architect to reject any piece of equipment.

1.3 DEMOLITION

A. The contractor shall visit the site prior to bid to determine the extent of work required to complete the project.

B. Contractor shall coordinate demolition with owner. All equipment shall be salvaged for owner. Locate equipment as directed by owner. All equipment and materials not salvaged by the owner shall be removed from the site and discarded at the contractors expense.

C. Contractor shall coordinate all work with general contractor and phase work as required by project.

D. All equipment piping, etc. required to be removed to accommodate the modifications shall be removed.

E. Contractor shall maintain services to existing facilities which shall remain during and after construction is complete.

F. Contractor shall coordinate any shutdown of services with the owner. It is intended that the building will remain occupied during construction. Contractor shall schedule shut down of services with the owner in order to prevent disruption of building occupancy.
G. Contractor shall be responsible for draining down of existing systems to complete demolition. All work shall be scheduled with the owner. Contractor shall also be responsible for refilling system and removing all air in order to return the systems to proper operating conditions.

H. All shutdown of services shall be done at night during a time period approved by owner. The systems shall be required to be back up and running each morning unless otherwise approved by the owner.

1.4 GROUNDS AND CHASES

A. This Contractor shall see that all required chases, grounds, holes and accessories necessary for the installation of his work are properly built in as the work progresses; otherwise, he shall bear the cost of providing them.

1.5 CUTTING AND PATCHING

A. Initial cutting and patching shall be the responsibility of the General Contractor, with the Mechanical Contractor being responsible for laying out and marking any and all holes required for the reception of his work. No structural beams or joists shall be cut or thimbled without first receiving the approval of the Architect. After initial surfacing has been done, any further cutting, patching and painting shall be done at this Contractor's expense.

1.6 FILL AND CHARGES FOR EQUIPMENT

A. Fill and charge with materials or chemicals all those devices or equipment as required to comply with the manufacturer's guarantee or as required for proper operation of the equipment.

1.7 BIDDING REQUIREMENTS AND RESPONSIBILITIES

A. Prime bidder is responsible for all work, of all trades and sub-contractors bidding this project. It is the prime bidders responsibility, prior to submitting a bid to ensure that sub-contractors coordinate all aspects of the work between trades, sub-contractors, etc. to the fullest extent possible.

B. Prime bidder shall ensure that all sub-contractors, suppliers, equipment vendors, etc., obtain all necessary and pertinent contract document information pertaining to their work prior to the submission of a bid. Contractor shall realize that different sub-contractors may furnish equipment, accessories, devices, etc. necessary for a complete and working installation, that require provision of services by another sub-contractor or trade.
C. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Structural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.

D. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of contract documents) to the prime bidder in accordance with Division 0 & 01 requirements, prior to bidding.

E. All timely, pertinent, questions provided in writing prior to bids, in accordance with Division 0 & 01 requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance in Division 0 & 01 requirements.

F. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.

G. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with Division 0 & 01 requirements.

H. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all Division 0 & 01 requirements, that they have indicated in writing, prior to bidding, all questions or concerns requiring clarification and/or explanation and have documented any and all specific exclusions involving work that would generally be considered to be work of their trade. The prime bidder shall coordinate all work so that anything excluded by the bidder of all or any portions of this section or division, have been addressed prior to bids in one of the following manners:

1. The work has been confirmed, by the prime bidder, to be work of another trade or subcontractor (whose proposal is also being accepted).
2. Clarification of the matter has been made through the prime design professional via written addendum and is clearly and mutually understood.
by the prime bidder and the party raising the issue/question, or seeking clarification.

3. The work has been accepted as the responsibility of the prime contractor directly.

1.8 MATERIAL AND EQUIPMENT

A. The term "provide" when used in the Contract Documents includes all items necessary for the proper execution and completion of the Work.

B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgement of the Architect expressed in writing is equal to that specified.

C. Coordinate and properly relate all Work of this Division to building structure and work of all other trades.

D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with Division 0.

E. Do not rough-in for any item or equipment furnished by others or noted "Not in Contract" (NIC), without first receiving rough-in information from physically examining the existing equipment, receiving specific cut sheet information from the Owner’s representative, other trades and/or Architect. Rough-in services for “NIC” equipment as required, as the work progresses.

F. Provide storage and protection for all equipment and materials in accordance with requirements of Division 0 and Division 0 & 01. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to Owner.

G. Keep premises clean in accordance with requirements of Division 0 and Division 01.

1.9 SUBSTITUTIONS

A. Substitutions are only allowed by approval of the Architect prior to Bid Date as stipulated in Division 0 and/or Division 01.

B. Design of systems is based on specific equipment. If the use of other manufacturer’s equipment, even though approved by Architect, involves additional
cost due to space requirements, foundation requirements, increased mechanical or electrical services, the cost of such extra work shall be borne by manufacturer of substituted equipment. Even though a manufacturer’s name appears in the Contract Documents as having acceptable equipment, their equipment with different model numbers shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from Contract Document requirements. Furnish all options specified or reasonably implied from the contract documents. Specifically identify any variance is regard to submittal versus specified performance on the cover sheet of each submittal.

1.10 VALUE ENGINEERING (V/E):

A. While it may be in the project Owner’s interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, Division 23/23 contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.

B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, Division 23 contractor shall provide duly licensed professional engineering consultants working on behalf of the Division 23 contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The Division 23 contractor’s licensed professional engineering consultants and the Division 23 contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as Division 23 contractor’s Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.

C. Division 23 contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and complete responsibility for the hybrid design. Further, the Division 23 contractor’s (V/E Items)professional of record (either employees, or independent consultants to the Division 23 contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner’s original A/E team (Professional of Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact
on the Division 23 systems altered, affected or modified, in whole or in part. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.

1.11 DRAWINGS AND SPECIFICATIONS

A. The specific intent of these Contract Documents is to provide the various systems, equipment, etc. to the Owner complete and in a thoroughly calibrated functional condition.

B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and elevations shall have precedence over other items. Should any major interference develop, immediately notify the Architect.

C. In laying out Work, refer to mechanical, electrical, structural, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.

D. Furnish all plumbing fixtures (with required accessories) shown on either the plumbing drawings or the architectural drawings. Review Architectural casework elevations and identify fixtures indicated. Provide fixtures indicated. Rough-in for all fixtures as work progress. Verify prior to fixture shop drawing submittal.

1.12 CODES AND REGULATIONS

A. Work shall be in full accord with the most stringent interpretation of the State Sanitary Code, local ordinances, building codes, and other applicable national, local, and state regulations.

B. Equipment shall conform to requirements and recommendations of the National bureau of Fire Underwriters and National Fire Protection Association (NFPA).

C. Items provided under this Division shall comply with the American National Standards Institute (ANSI) "Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People," ANSI A 117.1

D. In the possible event of conflict between codes or regulations and Contract Documents, the most stringent interpretation of either shall govern (provided if exceeds the requirements of other codes. In the event of an irreconcilable difference between codes or regulations notify the Architect/Engineer immediately.
SECTION 230000 – HVAC GENERAL PROVISIONS

E. In addition to the codes heretofore mentioned, all mechanical work and equipment shall conform to the applicable portions of the following specifications, codes and/or regulations:

1. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
2. National Electrical Code (NEC)
3. National Fire Protection Association (NFPA)
4. American Society of Mechanical Engineers (ASME)
5. American Gas Association (AGA)
6. Underwriters Laboratories (UL)

F. All materials, equipment and accessories installed under this Contract shall conform to all rules, codes, etc. as recommended by National Associations governing the manufacturer, rating and testing of such materials, equipment and accessories. All materials shall be new and of the best quality and first class in every respect. Whenever directed by the Architect, the Contractor shall submit a sample for approval before proceeding.

G. Where laws or local regulations provide that certain accessories such as gauges, thermometers, relief valves and parts be installed on equipment, it shall be understood that such equipment be furnished complete with the necessary accessories, whether or not called for in these Specifications.

H. All unfired and fired pressure vessels shall be built in accordance with the A.S.M.E. Code and so stamped. Furnish shop certificates for each vessel. Contractor shall provide and pay for first operating certificate as per State Fire Marshal Regulations.

1.13 FEES, PERMITS, AND TAXES

A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.

B. Pay any and taxes levied for Work of this Division, including municipal and/or state sales tax where applicable.

C. All permits, fees, certificates, etc. for the installation, inspections, plan review, service connections locations, and/or construction of the work which are required by any authority and/or agencies having jurisdiction, shall be obtained and paid for by the Contractor.
SECTION 230000 – HVAC GENERAL PROVISIONS

D. The Contractor shall make all tests required by the Architect, Engineer or other governing authorities at no additional cost to the Owner.

E. The Contractor shall notify the Architect and local governing authorities before any tests are made, and the tests are not to be drawn off a line covered or insulated until examined and approved by the authorities. In event defects are found, these shall be corrected and the work shall be retested.

F. Prior to requesting final inspection by the Architect, the Contractor shall have a complete coordination and adjustment meeting of all of his sub-contractors directly responsible for the operation of any portion of the system. At the time of this meeting, each and every sequence of operation shall be checked to assure proper operation. Notify the Architect in writing ten (10) days prior to this meeting, instructing him of the time, date and whom you are requesting to be present.

G. This project shall not be accepted until the above provisions are met to the satisfaction of the Architect.

1.14 MANUFACTURER'S DIRECTIONS

A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.

1.15 SUBMITTAL DATA

A. Submit shop drawings, project data, and samples in accordance with requirements of Division 0/and or Division 01.

B. Shop drawings shall consist of published ratings or capacity data, detailed construction drawings for fabricated items, wiring and control diagrams, performance curves, installation instructions, manufacturer's installation drawings, and other pertinent data. Submit drawings showing revisions to equipment layouts due to use of alternate or substitute equipment.

C. Where approved manufacturers and suppliers of equipment, materials, etc. are unable to fully comply with Contract Document requirements, specifically call such deviations to attention of Architect on submittals. Type deviations on a separate sheet; underlined statements or notations on standard brochures, equipment fly sheets, etc. will not be accepted.

D. Approval of submittals shall not relieve Contractor from furnishing required quantities and verifying dimensions. In addition, approval shall not waive original intent of Contract Documents.
SECTION 230000 – HVAC GENERAL PROVISIONS

E. Failure to obtain written approval of equipment shall be considered sufficient grounds for rejection of said equipment regardless of the stage of completion of the project.

1.16 REVIEW OF MATERIALS:

A. Whenever manufacturers or trade names are mentioned in these Plans or Specifications, the words "or approved equivalent" shall be assumed to follow whether or not so stated. Manufacturers or trade names are used to establish a standard of quality only, and should not be construed to infer a preference. Equivalent products which meet the Architect's approval will be accepted; however, these products must be submitted to the Architect a minimum of ten (10) days prior to the Bid Date.

B. Submission shall include the manufacturer's name, model number, rating table and construction features.

C. Upon receipt and checking of this submittal, the Architect will issue an addendum listing items which are approved as equivalent to those specified. THE CONTRACTOR SHALL BASE HIS BID SOLELY ON THOSE ITEMS SPECIFIED OR INCLUDED IN THE "PRIOR APPROVAL ADDENDUM", AS NO OTHER ITEM WILL BE ACCEPTABLE.

D. Prior approval of a particular piece of equipment does not mean automatic final acceptance and will not relieve the Contractor of the responsibility of assuring himself that this equipment is in complete accord with the Plans and Specifications and that it will fit into the space provided. Shop drawings must be submitted on all items of equipment for approval as hereinafter specified.

E. Before proceeding with work and/or within thirty (30) days after the award of the General Contract for this work, the Mechanical Contractor shall furnish to the Architect complete shop and working drawings of such apparatus, equipment, controls, insulation, etc. to be provided in this project. These drawings shall give dimensions, weights, mounting data, performance curves and other pertinent information.

F. The Architect's approval of shop drawings shall not relieve the Contractor from the responsibility of incorrectly figured dimensions or any other errors which may be contained in these drawings. Any omission from the shop drawings or specifications, even through approved by the Architect, shall not relieve the Contractor from furnishing and erecting same.
G. Seven (7) sets of shop drawings shall be submitted to the Architect for approval. These submittals shall be supplied as part of this Contractor’s contract. Any drawings not approved shall be resubmitted until they are approved. **SUBMIT ALL SHOP DRAWINGS AT THE SAME TIME. NO SEPARATE ITEMS WILL BE ACCEPTED.**

H. Submit one (1) sepia with two (2) blueline prints of all mechanical room layouts showing locations of all equipment, piping, etc. to insure all will fit in space provided. Submit drawings at 1/4” scale.

### 1.17 PROJECT RECORD DOCUMENTS

A. Keep Project Record Documents in accordance with requirements of Division 0 and/or Division 01.

B. During construction period, keep accurate records of installations made under this Division, paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.

C. The Contractor shall obtain at his cost, two sets of blueline prints of the original bid documents by the Architect. One set shall be kept on the site with all information as referenced below, and shall update same as the work progresses. The other set will be utilized to record all field changes to a permanent record copy for the Owner.

D. If the Contractor elects to vary from the Contract Documents and secures prior approval from the Architect for any phase of the work, he shall record in a neat and readable manner, **ALL** such variances on the blueline print in red. The original bluelines shall be returned to the Architect for documentation.

E. All deviations from sizes, locations, and from all other features of the installations shown in the Contract Documents shall be recorded.

F. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions and the like, as well as other features of the work which will be concealed underground and/or in the finished building.

G. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.

H. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in...
relation to the spaces in the building near which it was actually installed. The Architect's/Engineer's decision in this matter will be final.

I. The following requirements apply to all "As-Built" drawings:

1. They shall be maintained at the Contractor's expense.
2. All such drawings shall be done carefully and neatly, and in a form approved by the Architect/Engineer.
3. Additional drawings shall be provided as necessary for clarifications.
4. These drawings shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/Engineer; and when necessary, to establish clearances for other parts of the work.
5. "As-built" drawings shall be returned to the Architect upon completion of the work and are subject to approval of the Architect/Engineer.

1.18 EXCAVATING AND BACKFILLING

A. Provide excavating and backfilling necessary for Work of this Division. Comply with provisions of Division 2, Site Work, if applicable.

B. Trenches shall be inspected by Code Authorities and/or Owner's Representative before and after piping is laid. Give Owner's Representative 24-hour notice for each inspection. If any trenches are filled without Owner's Representative inspection and as subsequently found to be deficient, the trenches shall be uncovered, inspected, and then re-filled, if requested by Owner's Representative.

C. Provide minimum 18 inches of cover or in compliance with local published frost line data (if greater than 18 inches) to finish grades or paving at water piping.

D. For piping, provide bell holes at trench bottom to assure uniform bearing. Accurately grade trench bottoms by instrument before laying any pipe.

E. Protect and maintain trenches in dry condition until piping has been inspected and approved. Immediately after approval, backfill trenches in tamped layers.

F. Compact fill to satisfaction of Architect and/or Owner's Representative.

1.19 CUTTING AND PATCHING

A. Comply with requirements of Division 0 and Division 01 regarding cutting and patching. Locate and timely install sleeves as required to minimize cutting and patching.
B. Cutting, fitting, repairing, patching, and finishing of Work shall be done by craftsmen skilled in their respective trades. Where cutting is required, cut in such a manner as not to weaken structure, partitions, or floors. Holes required to be cut must be cut or drilled without breaking out around the holes. Where patching is necessary in finished areas of the building, the Architect will determine the extent of such patching and refinishing.

C. Where return air plenums above ceilings are utilized, Division 23 Contractor shall ensure that return air openings are provided in walls run to deck, for proper return air flow back to the AHU. Cut walls as required to provide openings sized for maximum 1000 feet per minute air flow velocity through openings above ceiling. Provide a fire damper at openings of fire walls and a smoke damper at openings of smoke walls. Coordinate electric or pneumatic services to smoke dampers via automatic temperature control/EMS Contractor.

D. Repairing Roadways and Walks: Coordinate all roadway work with authorities having jurisdiction. Cut and/or bore under roadways for connection of utilities as required. Coordinate work through General Contractor. Where this contractor cuts or breaks roadways or walks to lay the piping, he shall repair or replace these sections to match existing, unless specifically identified as the responsibility of others.

1.20 PAINTING

A. Painting shall be provided by General Contractor’s painting sub-contractor, unless specified otherwise. Leave exposed piping, materials, and equipment clean and free of rust, grease, dirt, etc. before and after painting.

B. Factory finished equipment, fixtures, and materials which are marred, chipped, scratched, or otherwise unacceptable shall be repaired or replaced under this Division to Architect satisfaction, at no additions cost to Owner.

C. Coordinate all painting requirements with prime bidder prior to bids.

D. Paint all exposed piping inside and outside of building. Label all piping after painting as required. Utilize industry standard paint colors for respective system unless direct otherwise by Architect. Review proposed color scheme with Architect/Engineer prior to ordering materials.

1.21 CLEANING AND ADJUSTING:

A. Upon completion of his work, the Contractor shall clean and adjust all equipment, controls, valves, etc.; clean all piping, ductwork, etc.; and leave the entire installation in good working order.
1.22 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.

B. COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.

C. This information shall be bound in plastic hardbound notebooks with the job name, Architect and Engineer names permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Architect for approval.

D. In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.

E. The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract.

1.23 GUARANTEE

A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class condition. This guarantee shall exclude only the changing or cleaning of filters. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.

B. If the Contractor’s office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect for his approval.

1.24 LOCAL CONDITIONS
A. The location and elevation of all utility services is based on available surveys and utility maps and are reasonably accurate; however, these shall serve as a general guide only, and the Contractor shall visit the site and verify the location and elevation of all services to his satisfaction in order to determine the amount of work required for the execution of the Contract.

B. The Contractor shall contact the various utility companies, determine the extent of their requirements and he shall include in his bid all lawful fees and payments required by these companies for complete connection and services to the building, including meters, connection charges, street patching, extensions from meters to main, etc.

C. In case major changes are required, this fact, together with the reasons therefor, shall be submitted to the Architect, in writing, not less than seven (7) days before the date of bidding. Failure to comply with this requirement will make the Contractor liable for any changes, additions and expenses necessary for the successful completion of the project.

1.25 MINOR DEVIATIONS

A. Plans and detail sketches are submitted to limit, explain and define conditions, specified requirements, pipe sizes and manner of erecting work. Structural or other conditions may require certain modifications from the manner of installation shown, and such deviations are permissible and shall be made as required. However, specified sizes and requirements necessary for satisfactory operation shall remain unchanged. It may be necessary to shift ducts or pipes, or to change the shape of ducts, and these changes shall be made as required. All such changes shall be referred to the Architect for approval before proceeding. Extra charges shall not be allowed for these changes.

B. The Contractor shall realize that the drawings could delve into every step, sequence or operation necessary for the completion of the project, without drawing on the Contractor’s experience or ingenuity. However, only typical details are shown on the Plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.

C. In general, the drawings are diagrammatic and the Contractor shall install his work in a manner so that interferences between the various trades are avoided. In cases where interferences do occur, the Architect is to state which item was first installed.

1.26 VALVE TAGS

A. Secure metal tags to all valves. Labeling on all valve tags shall include type of system the valve controls and the area of building, zone, or equipment number.
affected by valve operation. Tag shall be 2" minimum diameter brass, engraved with code number, service and size. A framed list of the valves, giving manufacturer's name, model number, type and location shall be mounted in the main basement equipment room.

1.27 MACHINERY GUARDS

A. This Contractor shall provide v-belt guards for each v-belt drive or other hazardous drive. The guard shall enclose the drive entirely and shall have a hole for taking a tachometer reading.

1.28 LABELING MECHANICAL EQUIPMENT

A. All mechanical equipment (A/C units, air handlers, fan coil units, fan powered boxes, water heaters, etc.) furnished under Division 23 of contract documents shall be labeled with permanent laminated plate secured to equipment. Units shall be labeled as indicated on plans and schedules.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 23 00 00
PART 1 - GENERAL

1.1 DESCRIPTION

A. Work in this section includes furnishing and installing all piping for project as hereinafter described.

B. Related Work: All piping shall be coordinated with Plumbing, Air Conditioning and Ventilation section of these specifications.

PART 2 - PRODUCTS

2.1 PIPE

A. Refrigerant lines and condensate drain lines shall be ACR hard copper pipe and fittings. (All above grade refrigerant pipe shall be hard copper. Soft copper may be used below grade in PVC)

B. Hot Water Piping (Above Slab):

1. All be standard black steel, schedule 40. Fittings two inches and below shall be malleable screw fittings. Piping above two inches shall be electrically welded utilizing welded fittings. All elbows shall be long radius type. At Contractor's option, Victaulic grooved piping systems may be used.

2.2 PIPE FITTINGS

A. All pipe fittings shall be same as piping specified unless indicated otherwise.

B. All screwed fittings and pipe shall have threads cut to standard pipe thread dimensions. Pipe shall be properly reamed after cutting of threads.

C. Joint compound, Crane Thread lubricant or equal, shall be applied to male threads of the screwed pipe and fittings only.

D. Approved expansion joints or flexible couplings shall be provided as necessary.

E. Care shall be taken in making up pipe and fittings such that pipe does not extend into fitting sufficiently to reduce the waterway.

F. Unions for use on above grade pipe larger than 2 inches shall be cast iron, screwed
SECTION 230500 – BASIC MATERIALS AND METHODS

flanges, 125 pound flat face with 1/16” non-asbestos composition gasket.

G. All risers 3” or larger shall have a flanged joint at each floor.

H. Standard, one-piece reducing fittings of approved design shall be used wherever a change in size is made. Changes in pipe sizes shall not be made by means of reducing flanges.

2.3 PIPE HANGER AND SUPPORTS

A. This Contractor shall furnish and install all foundations and supports required for his equipment unless otherwise indicated on the drawings.

B. This Contractor shall furnish and install all escutcheons, inserts, thimbles, hangers, etc. required for the proper support and installation of his equipment and piping. Cooperate with other trades in locating and placing these items.

C. Provide sleeves for all pipes passing through walls, floors, beams, etc. Sleeves passing through structural members shall be of cast iron or Schedule 40 steel pipe. Sleeves passing through non-structural walls or floors shall be of 26 gauge galvanized iron. Joints between sleeves and pipes passing through floors shall be made watertight with plastic materials. Where pipes pass through waterproofing membrane, flashing sleeves shall be installed.

D. Provide Grinnell # 108, Fee and Mason Fig. 57, Carpenter & Patterson # 34, Michigan # 450, or equal malleable iron split ring hangers with rod supports throughout. Strap hangers or wire will not be accepted. Maximum spacing of hangers for cast iron pipes shall be 5’; for other than soil, use 10’.

E. Provide galvanized iron shields between hangers and pipe covering.

F. Provide Grinnell, Fee and Mason, Crane, or equivalent heavy steel riser clamps on vertical risers at floors to support pipes.

G. Provide chrome plated brass escutcheons wherever pipes pass through floors, walls or ceilings in exposed or finished areas.

H. All piping projecting from chases shall be rigidly supported in the wall or chase. Loosely supported fixtures or accessories will not be accepted.

2.4 MOTORS, STARTERS, AND ELECTRICAL WORK
A. The Mechanical Contractor shall furnish to the Electrical Contractor for installation, all the motor starters, start-stop switches and pilot lights for each piece of motor driven equipment unless shown otherwise.

B. The Electrical Contractor shall install all motor starters, start-stop switches and pilot lights as furnished by the Mechanical Contractor. The Electrical Contractor shall also do all power wiring required for the installation of such mechanical equipment.

C. The Mechanical Contractor shall furnish and install equipment interlocking, control wiring, etc., as hereinafter specified under Temperature Controls. All work shall be done in accordance with the National Electric Code requirements. The Mechanical Contractor shall be responsible for coordinating all work to provide a complete system in working order.

D. All electrical equipment shall have the U.L. Label and shall meet the standards of the National Electrical Code and NEMA.

E. All motors for the mechanical equipment shall be of the 40°C rise type and shall be furnished and installed by the Mechanical Contractor. All motors shall be wound for plus or minus 10% of the specified voltage. Motors ½ HP and smaller shall be 120 volt, single phase, 60 cycle. Motors above ½ HP shall be the voltages as indicated on the Drawings. All motors shall be PREMIUM EFFICIENCY type with a minimum motor efficiency of: 1, 1.5 and 2 HP-84%; 3 HP-85%; 5 HP-87%; 7.5 and 10 HP-89%; 15 HP-90%; 20 HP-91%; 25 and 30 HP-92%; 40 HP-93%. Contractor shall submit certification after project is complete indicating minimum motor efficiency requirement has been met. All motors shall be rated for inverter duty.

F. Mechanical contractor shall furnish magnetic type starters for all motors regardless of horse power and phase.

G. Exception: Manual starters can be furnished for fractional horsepower motors that are not controlled automatically or remotely. Refer to Section 15800 (Temperature Control) and mechanical drawings to determine if fractional horsepower motors are controlled automatically or remotely.

H. SINGLE PHASE AC FRACTIONAL HORSEPOWER MANUAL STARTERS - 1HP OR LESS FHP manual starters shall be Square D Class 2150 or Allen Bradley Bulletin 600.

1. The manual starters shall consist of a manually operated toggle switch equipped with melting alloy type thermal overload relay. Thermal unit shall be of one-piece construction and interchangeable. Starter shall be
inoperative if thermal unit is removed. Contacts shall be double break, silver alloy visible from both sides of starter.

2. All FHP MANUAL STARTERS shall be double-pole type with one thermal overload relay and general purpose enclosure and red pilot light.

I. SINGLE AND THREE PHASE AC MAGNETIC STARTERS - LINE VOLTAGE TYPE (ALL MOTORS BELOW 10 HP)

1. Motor starters shall be Square “D” Class 8536 or Allen Bradley Bulletin 509. Motor starters shall be across-the-line magnetic type rated in accordance with NEMA Standards, sizes and horsepower ratings. Starters shall be mounted in general purpose enclosures unless otherwise indicated on plans.

2. Across-the-line magnetic starters through NEMA Size seven shall be equipped with double break silver alloy contacts. Single break contacts shall be supplied on Size eight. All contacts shall be replaceable without removing power wiring or removing starter from panel. The starter must have straight-through wiring.

3. Coils shall be of molded construction through NEMA Size seven. Coils on size eight starters shall be form wound, taped, varnished and baked. All coils shall be replaceable from the front without removing the starter from the panel.

4. Overload relays shall be thermo letting alloy type with a replaceable control circuit module. Thermal units shall be of one-piece construction and interchangeable. The starter shall be inoperative if the thermal unit is removed.

5. NEMA Size 0 thru 7 starters shall be suitable for the addition of at least four external auxiliary contacts of any arrangement normally open or normally closed; Sizes 0-7 external auxiliary contacts shall be field convertible. Size 00 and Size 8 starters shall be suitable for the addition of up to three external auxiliary contacts of any arrangement normally open or normally closed. A minimum of two auxiliary contacts (one normally open and one normally closed) shall be provided.

J. Single and Three-Phase Starter:

1. All magnetic starters shall be equipped with a "HAND-OFF-AUTO" SELECTOR SWITCH, A RED RUN PILOT LIGHT, and a control circuit transformer with two fuses in primary circuit and one fuse in secondary.
Control voltage shall be coordinated with other trades.

K. Three Phase Starters:

1. All three phase starters shall be equipped with an individual phase relay for protection against phase failures, phase voltage unbalance, and phase reversal. This relay shall have a response delay adjustable from $\frac{1}{2}$ to 1 second and an adjustable unbalance voltage level of 5 or 30%.

L. REDUCED VOLTAGE AC MAGNETIC STARTERS - (ALL MOTORS 10 HP AND ABOVE)

1. All starters for motors 10 HP and above shall be autotransformer type containing a starter and contactors with a vertically actuated magnet and armature assembly, and horizontally actuated contacts through NEMA Size 4, contacts, on NEMA Size 5 through NEMA size 7.

2. The controller will be supplied for use on an electrical system as indicated on drawings.

3. The Reduced Voltage Starter will be sized to control horsepower, as indicated on drawings.

4. The Reduced Voltage Starter shall be Square "D" Class 8606 or Allen Bradley Bulletin 570 and shall have the following features: hand-off-automatic selector switch, pilot light (red), control circuit transformer with two fuses in the primary circuit, and one fuse in the secondary circuit. Control voltage shall be coordinated with other trades.

M. All three phase starters shall be equipped with an individual phase relay for protection against phase failures, phase voltage unbalance, and phase reversal. This relay shall have a response delay of approximately 3 seconds. After either the undervoltage or voltage unbalance limits are exceeded.

REFER TO DESCRIPTION OF MAGNETIC STARTERS FOR DETAILS REGARDING CONTACTORS AND STARTERS INTERNAL TO THIS DEVICE.

N. Refer to electrical plans and provide combination starters and disconnects where required.

O. All starters which are to be energized from remote "start-stop" stations shall be equipped with a step-down transformer to 120 volts.
2.5 ACCESS PANELS

A. Furnish and install access panels where valves, drains, dampers, etc. are concealed in walls, ceilings, or floors, or otherwise inaccessible. Panels shall be Milcor, or equivalent, sized as required and furnished with prime coat finish.

END OF SECTION 23 05 00
SECTION 230593 – TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. All Division 23 specifications, drawings, and general provisions of the contract apply to work of this section, as do other documents referred to in this section.

1.2 SCOPE OF WORK

A. The Mechanical Contractor shall obtain the services of an independent Test and Balance Company which specializes in the testing and balancing of heating, ventilating and air conditioning (HVAC) systems to test, adjust and balance all HVAC systems in the construction area.

B. The work included in this section consists of furnishing labor, instruments, and tools required in testing, adjusting and balancing the HVAC systems, as described in these specifications or shown on accompanying drawings. Services shall include checking equipment performance, taking the specified measurements, and recording and reporting the results.

C. Representatives of the Test and Balance Company shall visit the job site at 90% completion of installation of the HVAC equipment, piping and ductwork to review the installation. After each site visit, the Test and Balance Company shall report to the Architect any items that are not installed properly, are missing from the Contract Documents or items that are required to enable him to perform the testing and balancing of the HVAC systems as per normal standard practice. After review, the Architect shall instruct the Contractor to implement the recommendations at no additional cost to the Owner if these items were specified in the original scope of the project.

D. Upon completion of the HVAC system installation, the Test and Balance Company shall perform all required testing and balancing with the full cooperation of the Contractor and his Sub-contractors. The Contractor shall make changes and/or adjustments to the HVAC system components that are required by the Test and Balance Company to accomplish proper balancing. The TAB agency shall not supply or install any materials or balancing devices such as pulleys, drives, belts, etc. All of this work by the Contractor shall be performed at no additional cost to the Owner.
E. The test and balance report shall be submitted to the Architect for review by his Mechanical Engineer. If the Mechanical Engineer agrees with the report, he shall meet with the Test and Balance Company to determine what needs to be done to obtain a properly balanced system.

F. After the Mechanical Engineer signs the testing and balancing report, the Test and Balance Company shall supply four (4) copies of the final and complete report to the Architect for inclusion in the Operation and Maintenance Manuals.

G. The items requiring testing, adjusting, and balancing include (but are not restricted to) the following:

1.3 AIR SYSTEMS

A. Supply Fan AHU
B. Exhaust Fans, Fresh Air Fans
C. Zone branch and main ducts
D. Diffusers, Registers, Grilles and Dampers
E. Coils (Air Temperatures)
F. Vibration Isolators

1.4 DEFINITIONS, REFERENCES, STANDARDS

A. All work shall be in accordance with the latest edition of the Associated Air Balance Council (AABC) National Standards or the latest standards of the National Environmental Balancing Bureau (NEBB). If these contract documents set forth more stringent requirements than the AABC National Standards or the NEBB Standards, these contract documents shall prevail.

1.5 QUALIFICATIONS

A. Agency Qualifications: The TAB Agency shall be a current member of the AABC or the NEBB.

1.6 SUBMITTALS

A. Qualifications: The TAB agency shall submit a company resume listing personnel and project experience in air and hydronic system balancing and a copy of the agency’s test and balance engineer (TBE) certificate.
B. Procedures and Agenda: The TAB agency shall submit the TAB procedures and agenda proposed to be used.

C. Sample Forms: The TAB agency shall submit sample forms, which shall include the minimum data required by the AABC National Standards or the NEBB Standards.

1.7 TAB PREPARATION AND COORDINATION

A. Shop drawings, submittal data, up-to-date revisions, change orders, and other data required for planning, preparation, and execution of the TAB work shall be provided when available and no later than 30 days prior to the start of the TAB work.

B. System installation and equipment startup shall be complete prior to the TAB agency’s being notified to begin.

C. The building control system (BCS) contractor shall provide and install the control system, including all temperature, pressure and humidity sensors. These shall be calibrated for accurate control. If applicable, the BCS contractor shall install all necessary computers and computer programs, and make these operational. Assistance shall be provided as required for reprogramming, coordination, and problem resolution.

D. All test points, balancing devices, identification tags, etc., shall be accessible and clear or insulation and other obstructions that would impede TAB procedures.

E. Qualification installation or startup personnel shall be readily available for the operation and adjustment of the systems. Assistance shall be provided as required for coordination and problem resolution.

F. If, upon commencing the work, the TAB contractor finds that the systems are not ready, or if a dispute occurs as to the readiness of the systems, the TAB contractor may request an inspection to be made by the Designer’s Mechanical Engineer. This inspection shall establish to the satisfaction of the represented parties whether or not the systems meet the basic requirements for testing and balancing. Items that are determined to be not ready for testing and balancing shall be completed by the Mechanical Contractor and placed in operational readiness before TAB services are again requested.

1.8 REPORTS

A. Final TAB Report - The TAB agency shall submit the final TAB report for review by the Architect. On plans provide, all outlets, devices, HVAC equipment, etc., shall be identified, along with a numbering system corresponding to report unit identification. The TAB agency shall submit an AABC “National Project
Performance Guaranty” (or similar NEBB Guarantee) assuring that the project systems were tested, adjusted and balanced in accordance with the project specifications and AABC National Standards (or similar NEBB Standards).

B. Submit 4 copies of the Final TAB Report to the Architect for inclusion in the Operation and Maintenance Manuals.

1.9 INSTRUMENTATION

A. All instruments used for measurements shall be accurate and calibrated. Calibration and maintenance of all instruments shall be in accordance with the requirements of AABC National Standards (or similar NEBB Standards).

1.10 EXECUTION

A. GENERAL

1. The specified systems shall be reviewed and inspected for conformance to design documents. Testing, adjusting and balancing on each identified system shall be performed. The accuracy of measurements shall be in accordance with AABC National Standards (or similar NEBB Standards). Adjustment tolerances shall be ± 10% unless otherwise stated.

2. Equipment settings, including manual damper quadrant positions, valve indicators, fan speed control levers, and similar controls and devices shall be marked to show final settings.

3. All information necessary to complete a proper TAB project and report shall be per AABC or NEBB standards unless otherwise noted. The descriptions of work required, as listed in this section, are a guide to the minimum information needed.

4. TAB contractor shall cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. Upon completion, patch insulation, ductwork and housings using materials identical to those removed. Seal insulation to reestablish integrity of the vapor barrier.

5. TAB work shall include additional inspection and adjustment of components during the season following the initial balance to include re-balance of any items influenced by seasonal changes or as directed by the Owner.

1.11 AIR SYSTEMS

A. The TAB agency shall verify that all ductwork, splitters, extractors, dampers, grilles, registers, and diffusers have been installed per design, are functional and set full open. Any leakage in the ductwork shall be repaired prior to the test. The TAB
agency shall perform the following TAB procedures in accordance with the AABC National Standards or NEBB Standards:

B. For Supply Fans:

1. Fan speeds - Test and adjust fan RPM to achieve design CFM requirements.
2. Current and Voltage - Test and record motor voltage and amperage, and compare data with the nameplate limits to ensure fan motor is not in or above the service factor.
3. Pitot-Tube Traverse - Perform a Pitot-tube traverse of main supply and return ducts, as applicable to obtain total CFM. If a Pitot-tube traverse is not practical an explanation of why a traverse was not made must appear on the appropriate data sheet.
4. Outside Air - Test and adjust the outside air on applicable equipment using a Pitot-tube traverse. If a traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet. If a traverse is not practical use the mixed-air temperature method if the inside and outside temperature difference is at least 20 degrees Fahrenheit or use the difference between Pitot-tube traverses of the supply and return air ducts.
5. Static Pressure - Test and record system static pressure, including the static pressure profile of each supply fan.

C. For Exhaust Fans and Fresh Air Fans:

1. Fan speeds - test and adjust fan RPM to achieve design CFM requirements.
2. Current and Voltage - Test and record motor voltage and amperage, and compare data with the nameplate limits to ensure motor is not in or above the service factor.
3. Pitot-Tube Traverse - Perform a Pitot-tube traverse of main exhaust ducts to obtain total CFM. If a Pitot-tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet.
4. Static Pressure - Test and record system static pressure, including the static pressure profile of each exhaust fan.

D. For Zone, Branch and Main Ducts:

1. Adjust ducts to within design CFM requirements. As applicable, at least one zone balancing damper shall be completely open. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open.
E. For Diffusers, Registers and Grilles:

1. Tolerances - Test, adjust, and balance each diffuser, grille, and register to within 10% of design requirements. Minimize drafts include required CFM, initial test CFM and final CFM.

2. Identification - Identify the type, location, and size of each grille, diffuser, and register. This information shall be recorded on air outlet data sheets.

F. For Coils:

1. Air Temperature - Once air flows are set to acceptable limits, take wet bulb and dry bulb air temperatures on the entering and leaving side of each cooling coil. Dry-bulb temperature shall be taken on the entering and leaving side of each heating coil.

1.12 INDOOR AIR QUALITY VERIFICATION

A. The Tab agency shall take measurements at minimum outside air. It shall measure temperature and humidity uniformity throughout the space, check filter installation for proper fit, seal, and operation, and verify condensate drain operation. The TAB agency shall note any water damage or obvious contamination sources from inside or outside.

B. The TAB agency shall conduct the following air sampling tests using TWA limits shown in ASHRAE Standard 62-1989, Table C-1:

1. Carbon Dioxide - Air Handling Unit

C. The TAB agency shall prepare a short report showing the results and location of each test, a summary of the HVAC operating conditions, and a listing of any discrepancies.

1.13 ADDITIONAL TAB SERVICES

A. Job Site Inspections: During construction, the TAB agency shall inspect the installation of pipe systems, sheet metal work, temperature controls, and other component parts of the HVAC systems. Inspections shall be conducted a minimum of two times. (Typically, these are performed when 60% of the total system is installed and again when 90% of the total system is installed, prior to insulation of the duct and piping). The TAB agency shall submit a written report of each inspection to the Architect.

B. Verification of HVAC Controls: The TAB agency shall be assisted by the building control systems contractor in verifying the operation and calibration of all HVAC and temperature control systems. The following tests shall be conducted:
1. Verify that all control components are installed in accordance with project requirements and are functional, including all electrical interlocks, damper sequences, air and water resets, fire and freeze stats, and other safety devices.

2. Verify that all controlling instruments are calibrated and set for design operating conditions.

C. Temperature Testing: To verify system control and operation, a series of three temperature tests shall be taken at approximately two-hour intervals in each separately controlled zone. The resulting temperatures shall not vary more than two degrees Fahrenheit from the thermostat or control set point during the tests. Outside temperature and humidity shall also be recorded during the testing periods.

D. TAB Report Verification: At the time of final inspection, the TAB agency may be required to recheck, in the presence of the owner’s representative, specific and random selections of data, air quantities, and air motion recorded in the certified report. Points and areas for recheck shall be selected by the owner’s representative. Measurements and test procedures shall be the same as approved for the initial work for the certified report. Selections for recheck, specific plus random, will not exceed 10% of the total number tabulated in the report.

E. Fire and Smoke Testing: The TAB agency shall test fire/smoke dampers to assure operation. It shall verify that an access door has been installed for each fire and smoke damper. For fire dampers, the TAB agency shall open the access door, disconnect the fusible link, and allow the damper to close. Operation should be smooth and the damper must close completely. The TAB agency shall then reset the damper.

F. For the smoke damper, the TAB agency shall open the access door, activate the damper, and observe operation. The damper must close quickly and completely. The TAB agency shall then reset the damper and observe its complete opening.

G. Life Safety Controls: The TAB agency shall test and record life safety control operation of the HVAC equipment. It shall verify the installation of required smoke detectors in air handling equipment (AHE), and shall verify operation of the smoke detector by activating the smoke detector and observing air handler shutdown. With the controls and alarm contractors, the TAB agency shall verify the operation of interconnected systems such as the AHE smoke detector’s activation of the fire alarm system and the alarm system’s activation of the life safety control sequences.

END OF SECTION 230593
PART 1 - GENERAL

1.1 GENERAL

A. Pipe insulation shall not begin until all work has been tested and found to be tight. All insulation adhesives, sealers, tapes and mastic shall meet the latest NFPA requirements and shall meet 25/50/50 flame spread and smoke developed ratings.

B. All insulation shall be installed in strict accordance with the manufacturer’s recommendations.

C. All pipe insulation exterior of building shall be banded with aluminum bands, three to a section and with one band on each side of each fitting, valve, etc.

D. Insulation shall be continuous through walls and ceilings.

E. All valves, strainers, etc. shall be insulated the same as its adjacent piping and the covering shall extend all the way up to the equipment.

F. USE HIGH DENSITY INSULATION INSERTS AT HANGERS ON ALL PIPING 1-1/2" AND ABOVE TO PREVENT CRUSHING OF INSULATION.

1.2 THERMAL INSULATION: After all work has been tested and approved, insulate as follows:

A. INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER’S RECOMMENDATIONS AND INSTRUCTIONS.

1.3 CONDENSATE DRAIN PIPING

A. Insulate with 3/4" Aerotube or Armaflex pipe insulation applied in accordance with manufacturer’s recommendations and instructions. Tape all joints.

1.4 REFRIGERANT LINES

A. Insulate with 3/4” closed cell, tube insulation, Aerotube, Armaflex or equivalent. Apply two coats of UV resistant and weatherproof mastic on all piping below grade or exposed to weather.
1.5 HVAC DUCTWORK INSULATION

A. Low pressure supply ductwork, return air ductwork, fresh air, and exhaust ductwork shall be wrapped on outside with 2.33" thick 3/4# density R-6 fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.

B. Refer to air distribution section of mechanical specifications for low pressure duct insulation supplied by the sheet metal sub-contractor.

C. Transfer ductwork across walls shall be internally lined with 1" thick acoustical insulation.

1.6 HOT WATER HEATING SUPPLY AND RETURN LINES

A. Above grade with 1" thick 3-1/2 pound density fiberglass pipe covering. Finish to be factory applied flame safe vapor barrier jacket sealed and stapled in place.

B. Finish entire installation with white 0.030 PVC covering and fittings similar to above.

C. Lines on the exterior of the building shall be covered with smooth 0.160 aluminum jacket and elbows.

1.7 HVAC FLEX-CONNECTIONS

A. Shall be wrapped on outside with 2.33" thick 3/4 # density fiberglass insulation with aluminum foil vapor barrier. Insulation shall be taped at all joints and installed per the manufacturer's recommendations.

1.8 INSULATION THROUGH HANGERS AND SLEEVES

A. The insulation shall be continuous through pipe hangers and pipe sleeves. At hangers where the pipe is supported by insulation, provide a galvanized iron protection shield. Provide pipes 2-inch i.p.s. and larger with insulation inserts at points of hanger supports. The inserts shall be of calcium silicate, cellular glass, prestressed molded glass fiber of minimum 13-pound density, or other approval material of the same thickness as adjacent insulation and not less than 13-pound density. The inserts shall have sufficient compression strength to adequately support the pipe without compressing the inserts to a thickness less than the adjacent insulation. Inserts shall be 180 degrees and not less than the length of the protection shield. Vapor barrier facing of the insert shall be the same as the facing on the adjacent insulation. Where copper clad hanger are used on
domestic copper pipe, insulation may cover pipe and hanger.

1.9 WASTE LINE P-TRAPS

A. P-traps receiving HVAC condensate (exposed to weather or above ceilings) shall be insulated with 2-1/8" thick 3/4 # density fiberglass ductwrap insulation with aluminum foil vapor barrier. Insulation shall be sealed at all seams and joints.

END OF SECTION 230700
1.01 SCOPE OF WORK

A. Furnish, install, program, and place into operations an extension of the Facility Management System (FMS), including Direct Digital Temperature Controls (DDC) as specified herein and as shown on the drawings. All hardware, software, and firmware points provided with the direct digital control system provided as part of this scope of work shall be displayed and controlled from the Central Workstation. The controls system shall be an extension of the existing Johnson Controls Facility Management System located throughout the school district.

B. Although such work is not specifically indicated, provide all supplementary or miscellaneous items, software, appurtenances, and devices necessary for a sound, secure, and complete system.

1.02 QUALITY ASSURANCE

A. The system shall be installed by competent mechanics and checked out by trained, experienced technicians directly employed by the FMS equipment manufacturer.

B. Single source responsibility of the FMS contractor shall include installation, calibration, programming and check-out of the stand-alone subsystems, as well as the complete operation of the integrated system.

1.03 REFERENCED STANDARDS, CODES AND ORDINANCES

A. It is the responsibility of the FMS contractor to be familiar with all codes, rules, ordinances, and regulations of the Authority Having Jurisdiction and their interpretations which are in effect at the site of the work.

B. The latest issue of applicable standards and recommended practices of the following agencies in effect shall form a part of the specification to the extent each agency's relative standards or recommended practices apply to the Systems and its components as specified herein.

1. Federal Communications Commission (FCC)
2. American National Standards Institute (ANSI)
3. American Society of Mechanical Engineers (ASME)
4. Electronic Industries Association (EIA)
5. Institute of Electrical and Electronics Engineers (IEEE)
6. National Electrical Manufacturers Association (NEMA)
7. National Fire Protection Association (NFPA)
8. Underwriters Laboratories (UL)
9. Occupational Safety and Health Administration (OSHA)
10. American Society of Heating, Refrigeration and Air Conditioning Engineers

C. This contractor shall be solely responsible for compliance with all health and safety regulations, performing the work in a safe and competent manner, and the use industry accepted installation procedures required for the work as outlined in these documents.
D. All systems equipment, components, accessories, and installation hardware shall be new and free from defects and shall be UL listed where applicable. All components shall be in current production and shall be a standard product of the system or device manufacturer. Refurbished or reconditioned components are unacceptable. Each component shall bear the make, model number, device tag number (if any), and the UL label as applicable. All system components of a given type shall be the product of the same manufacturer.

1.04 SUBMITTALS

A. Provide eight (8) copies of submittal data.

B. Submittals shall consist of:

1. Data sheets of all products, including software and hardware.
2. Valve schedule, including sizing calculations and actuator information.
3. Damper schedule, including actuator information.

C. Wiring and piping interconnection diagrams including panel and device power, and sources.

1. List of materials of all proposed devices and equipment.
2. Software documentation:
   a. Sequence(s) of operation, in text form.
   b. Application programs
   c. Statement of compatibility with existing programs
   d. Hardware requirements
   e. Point schedules
3. Controls schematics and system diagrams

1.05 WORK BY OTHERS

A. Automatic control valves: Installed under applicable Mechanical section under supervision of the FMS Contractor. All reducers and fittings necessary to install smaller than pipe size valves shall be furnished and installed under applicable piping sections.

B. Piping penetrations; water pressure and differential taps, valve manifolds, flow switches, thermal wells: Installed by Mechanical under supervision of FMS Contractor.

C. Power source wiring: It is the responsibility of this contractor to verify power wiring on the electrical drawings. If power is not shown where needed, this contractor is responsible.

1.06 CONTROL AND SENSING HARDWARE

A. Actuators: Units for modulating service shall be analog electric (4-20mA or 0-10VDC) and shall be smooth and quiet in operation. Units for two-position service shall operate on 24 VAC. All actuators shall be of sufficient size and power to operate control devices to which they are connected with 20% spare capacity. Use an individual actuator on each automatic valve or damper.
B. Instrument control cabinets: Furnish and install, for components other than room thermostats and unit controllers, cabinets to house control equipment. Cabinets shall consist of extruded frames with all corners securely riveted and supported by angle brackets. The cabinet is to have removable face and back panels and these panels are to be made of aluminum bonnet on both sides over a poly wood core. The cabinet door is to be supported by non-removable piano-type hinge which spans the entire height of the cabinet. All temperature and status indications and toggle switches are to be flush mounted on the face of the cabinet. Cabinets installed outdoors shall be rated NEMA 3R or better.

C. FMS SENSING/CONTROL (Provide the following devices as required by the monitoring and control functions)

1.07 TEMPERATURE SENSORS

A. Room temperature:

1. Local setpoint adjustment None
2. Local RJ-11 communications Yes
3. Temperature monitoring range +32/+130F
4. Output signal Changing resistance
5. Factory calibration point 70 degree F (21 C)
6. Accuracy at calibration point +/- 0.7% @ 70F

B. Start/stop and Control Relays:

1. Power requirements 24 VAC at .015 amps
2. Relay contacts SPDT – 10 amps at 120 VAC
3. Data UL listed, CSA approved
4. Indication LED – on when energized
5. Override built-in H-O-A switch

1.08 FACILITY MANAGEMENT SYSTEM (Existing)

A. The Facility Management System shall integrate multiple building functions including equipment supervision and control, energy management, information management, and historical data collection and archiving.

B. The facility management system shall consist of the following:

1. Network Control Modules
2. Application specific controllers (HVAC etc.)
3. Personal Computer Operator Workstation
4. Communication Network

C. The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, Network Control Modules, and operator devices. System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. Each Network Control Modules shall operate independently by performing its own specified control, alarm management, operator I/O, and historical data collection. The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices.
1.09 OPERATOR INTERFACE

A. The new controls shall operate on the existing workstation.

B. Text-Based Displays: The operator interface shall provide consistent text-based displays, on each graphic, for all system point and application data described in this specification.

C. Point identification, engineering units, status indication, and application naming conventions shall be the same at all operator devices.

D. User Interface: System shall employ standard graphical user interface components (i.e. menu bar, tool bar, status bar, scroll bar, tool tips, etc.) for ease of use. The user interface shall also include the following features:
   1. Simplistic point and click navigation between and within application components

E. Dockable alarm panel which may be temporarily hidden

F. Provides a tabbed workspace environment which is fully ActiveX compliant

G. User can add additional ActiveX workspaces on line

H. Enhanced terminal workspace providing pass through VT-100 interface with mouse/keyboard navigation, user selectable display preferences and screen prints.

I. Operator Commands: The operator interface shall allow the operator to perform commands including, but not limited to, the following:
   1. Start-up or shutdown selected equipment
   2. Adjust setpoints
   3. Add/Modify/Delete time programming
   4. Enable/Disable process execution
   5. Lock/Unlock alarm reporting for each point
   6. Enable/Disable Totalization for each point
   7. Enable/Disable Trending
   8. Enter temporary override schedules
   9. Define Holiday Schedules
   10. Change time/date
   11. Enter/Modify analog alarm limits
   12. Enable/Disable demand limiting
   13. Enable/Disable average/high/low signal select and reset

J. Logs and Summaries: Reports shall be generated manually, and directed to the displays.

K. As a minimum, the system shall allow the user to easily obtain the following types of reports:
   1. Trend
   2. Change of State
   3. Alarm Summary
   4. Point Summary
   5. System Summary
   6. Schedule Summary
1.10 NETWORKING

A. Inherent in the system's design shall be the ability to expand or modify the network either via a local area network, or auto-dial telephone line modem connections, or via a combination of those two networking schemes.

B. Access to system data shall not be restricted by the hardware configuration of the facility management system or network. The hardware configuration of the system shall be transparent to the user when accessing data or developing control programs.

1.11 NETWORK CONTROL MODULES

A. General: The new main controller shall be installed in the field in a centralized location. Network Control Modules shall be microprocessor-based, multi-tasking, multi-user, digital control processors.

B. Each Network Control Panel shall have sufficient memory to support its own operating system and data bases including:

1. Control Processes
2. Energy Management Applications
3. Alarm Management
4. Trend Data
5. Maintenance Support Applications
6. Operator I/O
7. Dial-Up Communications

C. Expandability: The system shall be modular in nature, and shall permit easy expansion through the addition of field controllers, sensors, and actuators.

D. Serial Communication Ports: Network Control Modules shall provide at least two data communication ports for simultaneous operation of multiple operator I/O devices, such as laptop computers, Personal Computers, and Video Display terminals.

1.12 SYSTEM SOFTWARE FEATURES (Existing)

A. General: All necessary software to form a complete and single operating system, as described in this specification, shall be provided. The software programs specified in this section shall be provided as an integral part of the Network Control Module, and shall not be dependent upon any higher level computer for execution.

B. CONTROL SOFTWARE DESCRIPTION

1. Equipment Cycling Protection: Control software shall include a provision for limiting the number of times each piece of equipment may be cycled within any one-hour period.

2. Heavy Equipment Delays: The system shall provide protection against excessive demand situations during start-up periods by automatically introducing time delays between successive start commands to heavy electrical loads.

3. Powerfail Motor Restart: Upon the resumption of normal power, the Network Control Panels shall analyze the status of all controlled equipment, compare it with normal occupancy scheduling, and turn equipment on or off as necessary to resume normal operation.
4. Network Control Modules shall perform any and all of the following energy management routines:

   a. Time of Day Scheduling
   b. Calendar Based Scheduling
   c. Holiday Scheduling
   d. Optimal Start
   e. Optimal Stop
   f. Demand Limiting
   g. Load Rolling
   h. Heating/Cooling Interlock
   i. Average/High/Low Signal Select and Reset

5. All programs shall be executed automatically without the need for operator intervention, and shall be flexible enough to allow user customization. Programs shall be applied to building equipment described in the "Sequence of Operation" portion of this specification.

C. Programming Capability: Network Control Modules shall execute configured processes defined by the user to automatically perform calculations and control routines.

   1. It shall be possible to use any of the following in a configured process:

      a. Any system-measured point data or status
      b. Any calculated data
      c. Any results from other processes
      d. Boolean logic operators (and, or)

D. Configured processes may be triggered based on any combination of the following:

   1. Time of day
   2. Calendar Date
   3. Other process
   4. Events (e.g., point alarms)

E. Data Access: A single process shall be able to incorporate measured or calculated data from any and all other ASCs. In addition, a single process shall be able to issue commands to points in any and all other ASCs on the local network.

F. Alarm Management: Alarm management shall be provided to monitor, buffer, and direct alarm reports to operator devices and memory files. Each Network Control Panel shall perform distributed, independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, minimize network traffic, and prevent alarms from being lost. At no time shall the Digital Panel's ability to report alarms be affected by either operator activity at the local I/O device, or communications with other ASCs on the network.

   1. Point Change Report Description: All alarm or point change reports shall include the point's English language description, and the time and date of occurrence.
   2. Report Routing: Alarm reports and messages shall be directed to an operator device.
3. Alarm Messages: In addition to the point's descriptor and the time and date, the user shall be able to print, display or store a 60-character alarm message to more fully describe the alarm condition or direct operator response. Each Network Control Panel shall be capable of storing a library of at least 100 Alarm Messages. Each message may be assignable to any number of points in the panel.

4. Remote Alarm Horn: Each Network Control Panel shall be capable of triggering a binary output on an ASC when a critical or network alarm is received. The alarm horn feature shall be silenced when the critical alarm is acknowledged.

G. Runtime Totalization: Network Control Modules shall automatically accumulate and store runtime hours for binary input and output points specified in the "Sequence of Operation" portion of this specification.

   1. The Totalization routine shall have a sampling resolution of one minute.
   2. The user shall have the ability to define a warning limit for Runtime Totalization.
   3. Unique, user-specified messages shall be generated when the limit is reached.

1.13 APPLICATION SPECIFIC CONTROLLERS

A. Each Network Control Module shall be able to extend its performance and capacity through the use of remote Application Specific Controllers (ASCs).

B. Each ASC shall operate as a standalone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each ASC shall be a microprocessor-based, multi-tasking, real-time digital control processor.

C. Each ASC shall have sufficient memory to support its own operating system and databases including:

   1. Control Processes
   2. Energy Management Applications
   3. Operator I/O

D. The operator interface to any ASC point data or programs shall be through any Operator Workstation or portable operator's terminal connected to the Network Control Module.

E. Power fail Protection: All system setpoints, proportional bands, control algorithms, and any other programmable parameters shall be stored such that a power failure of any duration does not necessitate reprogramming the controller.

F. Configuration and Download: The ASCs shall have the capability of receiving configuration and program loading by both of the following: 1) locally, via a direct connect portable laptop service tool, 2) over the network, from the portable laptop service tool, and; 3) from the Operator Workstation, via the communication networks.

G. Application Specific Controllers shall support, but not be limited to, the following configurations of systems to address current requirements described in the "Execution" portion of this specification, and for future expansion.

   1. Boiler and/or chiller plants with control logic
   2. Generic system interlocking through hardware or software
   3. Complex air handling unit configurations
4. HVAC Application Specific Controller Configuration

H. The Application Specific Controllers shall be configured using an intuitive, easy-to-use configuration tool. Standard, pre-tested, HVAC applications will be "built-in" the tool. It is the intent that a non-programmer, fluent with HVAC systems, and not necessarily with computer programming, be capable of using the configuration tool with minimal training.

I. The tool will utilize a question and answer format to aid the user in configuration. The tool will automatically query the user for desired operational characteristics, along with desired fail-safe and fault condition configurations, in order to assure proper HVAC system operation and protection.

J. Systems that require free-form programming will not be acceptable.

1.14 GENERAL

A. All work described in this section shall be mounted, terminated, circuit tested, programmed and calibrated by factory trained technicians and mechanics qualified for this work and in the regular employ of the system manufacturer.

B. All temperature control and interlock wiring and cable shall be installed in accordance with approved wiring diagrams. Power wiring (over 90 volts) shall be run in separate conduit from sensor and network wiring and cables.

1.15 INSTALLATION

A. All wiring, conduit and tubing shall be properly supported and run in a neat and workmanlike manner.

B. This contractor shall be responsible for all electrical installation which is necessary for a fully functional FMS and temperature control system. All wiring shall also be in accordance with applicable local and national codes.

1. All wiring and cabling installed shall be installed in conduit in mechanical rooms and where exposed. Conduit installed in dry indoor locations shall be EMT. Conduit installed exposed outdoors shall be rigid steel type with weather tight fittings. Plenum rated cable is acceptable above accessible ceilings and concealed spaces.

2. Electrical power for control panels and the Operator Workstation shall be provided via dedicated circuits at a power panel specifically for controls.

C. Control wiring:

   1. Include all low voltage wiring (100 volts and less) required for the FMS and temperature control systems under this section.
   2. Conductors for low voltage control signals: No. 18 AWG copper conductors or larger as required.
      a. Conductors may be assembled in cable with PVC insulation minimum of 0.016 IN thick.
      b. Cable outer sheathing as standard with manufacturer.
3. Line voltage (120VAC) wire for temperature control suitable for 600 volts, 168 deg. F temperature with Type THW plastic covering, minimum No. 12 AWG.
4. Supporting devices:
   a. Conduit supports
      (i) Must conform to seismic restraint criteria established by governing authority.
      (ii) Single runs: Galvanized conduit straps or ring bolt type hangers with specialty spring clips. Do not use plumber's perforated straps.
      (iii) Multiple runs: Conduit rack with 25 percent spare capacity.
      (iv) Vertical runs: Channel support with conduit fittings.

D. Anchor methods:
1. Hollow masonry: Toggle bolts or spider type expansion anchors.
2. Solid masonry: Lead expansion anchors or present inserts.
5. Concrete surfaces: Self drilling anchors or power driver studs.

E. Equipment:
1. Temperature sensing wells: provide list of well locations with shop drawing(s) to mechanical contractor.
2. Mount local control panels or thermostats at convenient locations adjacent to equipment served.
   a. Mount all relays, transformers, controllers, pressure switches, etc., internal to the temperature control panels.
3. Mounting of field microprocessors (ASC's) directly on air handling units shall not be allowed.

1.16 COMMISSIONING
A. Control system to be set up and checked out by factory trained competent technicians skilled in the setting, programming, tuning and adjustment of FMS equipment used in this project. All technicians shall be experienced in the type of systems associated with this FMS.

1.17 TRAINING
A. Provide a minimum of 8 hours of instructions to Owner's personnel in the operation and maintenance of the control system. Provide training after the system has been installed and operations verified.

1.18 WARRANTY
A. At completion of final test of installation and acceptance by Owner, provide any service incidental to proper performance for a period of one year.
B. Equipment shall be warranted for one year (including defects in workmanship and material) under normal use and service. During warranty period supplier shall also replace or repair, free of charge, any equipment proven to be defective in workmanship or material.
1.19 SEQUENCES OF OPERATIONS

A. BARD UNITS:

1. Units shall be stand alone with electric thermostat (for space temperature control) and an electric humidistat (for humidity control). Compressor shall cycle for room temperature control high humidity levels will be controlled via the humidistat. When the humidistat detects high humidity in the space (adjustable set point), the unit compressor will engage, and the hot gas recovery system (within Bard unit) will engage, and de-humidify the discharge air (therefore, de-humidify the space) and maintain space temperature set point by reheat). The cycle will continue until the space humidistat is satisfied (set point), or the thermostat calls for cooling. When the thermostat calls for cooling, the hot gas recovery system will disengage, and the compressor will continue to run (de-humidification cooling will take place simultaneously in the normal operation mode).

2. Heat recovery: Commercial Room Ventilator: The motorized commercial room ventilator will be controlled via the CO2 monitor. The commercial room ventilator shall not be energized unless the compressor is actuated. As the CO2 levels with the space increase to a pre-set amount (ASHRAE 62-1999 6.2.1.-1000 parts/million) the CRV will engage and provide outside air to the space. CO2 levels will be maintained at a level, less than 1000 parts/million at all times during the occupied mode. In un-occupied mode, the CRV shall be shut.

3. T-Stat (Furnished and installed by controls contractor)
   Humidistat (Furnished by unit manufacturer and installed by controls contractor)
   CO2 Sensor (Furnished by unit manufacturer and installed by controls contractor)

B. VRF Systems:

1. Provide JCI Bacnet connection to VRF master controller.
2. Start/stop: The systems will be enabled/disabled according to the schedule.
3. Map each individual ceiling cassette zone temperature with a corresponding space name on the JCI controls systems for remote setpoint adjustment. Provide capability for setback based on schedule.
4. Display alarms from VRF master controller on JCI controls system.

C. FMS Point List:

BARD Units:

| Start/Stop | Binary Output |
| Space Temperature | Analog Input |
| Set-point Adjustment | Analog Input |

VRF Systems:

| Start/Stop | Binary Output |
| Individual Zone Space Temperature | Analog Input |
| Individual Zone Set-point Adjustment | Analog Input |
| Alarms | Binary/Analog Input |

END OF SECTION
PART 1 - GENERAL

1.1 GENERAL

A. Furnish and install all ducts for Air Conditioning, Heating and Ventilating System as shown on the plans and as may be required to provide complete system. Ductwork shall be complete with grilles, vanes, flashings, hangers, flexible connections, splitters, dampers, fresh air inlets, louvers, reinforcing angles, etc. All ductwork shall be concealed and insulated as hereinafter specified. All ductwork indicated on drawings shall be metal-to-metal outside dimensions.

1.2 DUCT HANGERS AND SUPPORTS

A. All ductwork shall be properly braced to prevent rattling, breathing or other unnecessary noise. No sharp edges or obstructions shall project into the air stream. (1” wide x 16 gauge minimum)

1.3 LOW PRESSURE DUCTWORK

A. All ductwork for constant air units shall be galvanized steel and shall be of gauges and construction as recommended by ASHRAE Guide and Data Book. Gauges are as follows, with longest side governing.

<table>
<thead>
<tr>
<th>Dimensions of longest side</th>
<th>Sheet Metal Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>0”-12”</td>
<td>26 Gauge</td>
</tr>
<tr>
<td>13”-30”</td>
<td>24 Gauge</td>
</tr>
<tr>
<td>31”-54”</td>
<td>22 Gauge</td>
</tr>
<tr>
<td>55”-84”</td>
<td>20 Gauge</td>
</tr>
</tbody>
</table>

B. Joints and reinforcing shall be as per ASHRAE Guide and Data Book and all slips shall be installed without edge of internal part of slip facing downstream.

C. All joints shall be sealed with hard cast FTA adhesive and hardcast DT 5300 tape.

D. Construction standards of Article 110 of the National Board of Fire Underwriters, Bulletin 90, latest edition, shall apply throughout.

E. Flashings shall be sheet copper, and shall be furnished and installed around all outside openings used for ducts of fans and wherever required. Roof flashings shall extend at least 8” above roof.
SECTION 233000 – AIR DISTRIBUTION

F. All ducts shall be straight and true and installed in a neat and workmanlike manner.

G. All edges shall be straight and true, and all bends shall be made with vaned turns. Where long radius turns cannot be used, the Contractor shall use square turns and use air splitters spaced not more than 3" center to center, and of a length so air will be properly distributed over the ducts.

1.4 SPIRAL DUCTWORK

A. All exposed ductwork in the classrooms shall be 2" double wall, insulated spiral lock-seam ductwork with perforated liner and paint grip finish for painting by the painting contractor. Double wall, spiral lock-seam ductwork with perforated liner shall be United McGill ACOUSTI-k27 or approved equal.

1.5 DUCTWORK SEALANT

A. All ductwork shall be air tight. All seams, both shop made and field installed, and shall be sealed with tape and glue. All transverse joints shall be sealed as well as spin collar takeoffs and rough duct connections. All duct connections and seams shall be sealed with a UL approved non-flammable tape and mastic system. Strict adherence to manufacturers installation instruction is required. The duct sealant shall be equal to Hardcast FTA20/DT5300, United McGill Unit-Sealer Tape and Glue or 3M Company Sealing System.

1.6 DUCT ACCESSORIES

A. Dampers of the fusible link operated type shall be provided in all ductwork passing through the floor or firewalls. In all cases, the time rating of damper shall be equal to or greater than the time rating of the wall.

B. Provide quadrant or adjustable splitters and mark shaft to give position of splitter damper in duct.

C. Provide vanes behind every supply grille or diffuser. Splitters shall be provided where shown on Plans and where located in concealed, non-accessible space, provide Young Regulators to operate splitter. Vanes shall be Tuttle and Bailey "Ducturns", Barber Coleman Uniflo or equivalent. Shop fabricated vanes will be acceptable. All dampers shall be constructed of 14 gauge steel.

1.7 REGISTERS, GRILLES AND DIFFUSERS
A. Square or rectangular ceiling supply outlets, unless noted otherwise, shall be Anemostat, Metalaire, Price, Titus or equal, as indicated in schedules. Color shall be white. Grilles shall be of aluminum construction with baked enamel finish. Where noted on plans, grilles with the fire dampers in ceiling shall be steel construction with fire rated blanket behind grille as required by grille type scheduled.

B. All wall supply grilles shall be complete with horizontal and vertical adjustable deflectors and opposed blade volume control damper. Grilles shall be manufactured by Titus, Anemostat, Metalaire, Price or prior approved equivalent.

C. Return air grilles shall be as manufactured by Anemostat, Metalaire, Titus, Price or equivalent, and shall be of the style called for on the Plans. Provide filters in filter back grilles.

D. All supply outlets shall have a sponge rubber gasket.

E. "Stamped" grilles and diffusers are not approved.

F. Unless otherwise shown on Drawings, all grilles installed in walls and doors shall be furnished with prime coat finish suitable for painting by painting sub-contractor.

1.8 MOTORIZED DAMPERS

A. Mechanical Contractor shall furnish and install motorized dampers at outdoor intakes as indicated on mechanical and architectural drawings. Damper shall be parallel blade motorized type equivalent to Ruskin CD36/PB, Arrow Series 1770, or equal. Motorized dampers shall be operated by 120/1/60 electric actuator as indicated on plans. Damper shall be complete with outboard support bearing, blade and jamb seals. Dampers shall be low - leakage type.

1.9 FILTERS

A. Unless noted otherwise, AHU filter media shall be 1" thick and of the non-woven cotton fabric type. The filter media shall have an average efficiency of 25-30% on ASHRAE Test Standard 52-76. It shall have an average arrestance of 90-92% in accordance with that test standard. Media support grid shall be a welded wire grid with an effective open area not less than 96%. The welded wire grid shall be bonded to the filter media to eliminate the possibility air bypass. Filters shall be Farr 30/30 or A.A.F. AM 300.

B. Provide one (1) set of filters for start-up and replace with new set after building is turned over to owner.
C. Provide one (1) additional set of filters for every piece of equipment to owner for stock.

1.10 DUCT ACCESS PANELS

A. Access panel shall be Flexmaster “Inspector Series” Model SDSM low leakage spin-in access door. Door shall be 1” insulated type and shall be 24 gauge steel with 24 gauge steel frame. A continuous 3/8” wide by 3/16” thick open cell adhesive neoprene gasket shall be installed in the door frame to provide a positive seal upon insertion and locking of door. The door shall be held secure with every spaced cast aluminum cam latches for even pressure against the gasket.

1.11 MANUAL DAMPERS

A. Mechanical contractor shall furnish and install manual dampers at outdoor air intakes and in other rectangular ductwork as indicated on plans. Damper shall be complete with outboard support bearing, and manual locking quadrant lever for balancing, blade and jamb seals.

B. Manual balancing dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall consist of: a 16 ga galvanized steel hat channel frame with 5 in depth; triple V type blades fabricated from 16 ga galvanized steel; 0.5 india. plated steel axles; external (out of the airstream) blade-to-blade linkage. Damper manufacturer's printed application and performance data including pressure, velocity and temperature limitations shall be submitted for approval showing damper suitable for pressures to 4 in wg, velocities to 2,000 ft/min and temperatures to 180 F. Testing and ratings to be in accordance with AMCA Standard 500. Basis of design is Greenheck's Model MBD-15, Nailor 1022, Ruskin MBD-35.

C. Manual balancing damper and motorized damper sizes shall be 6” in height. Transition 4” high fresh air ductwork to standard manual and motorized damper sizes.

D. All dampers shall meet the latest Class 1 leakage requirements.

1.12 SPIN COLLARS:

A. All round low pressure connections to rectangular ducts shall be made with a factory fabricated spin collar fitting with damper and constructed of minimum 26 ga galvanized steel. The damper shall have a 2” raised handle with a high quality locking quadrant. A 3/8” continuous rod with “U” bolts connects the damper to the rod. Nylon end bearings are required where the rod penetrates the spin collar barrel. Provide Dace #SM-7 SPININ-W/SOLQ-CR, Flexmaster #FLD-B03, or prior
approved equal. A sample must be submitted for engineer’s approval prior to installation.

END OF SECTION 233000
PART 1 - GENERAL

1.1 GENERAL
A. The air conditioning system, in general, shall be for the entire building, providing cooling and dehumidification in summer and heating in winter. A constant amount of fresh air shall be taken into the system and all air shall be filtered.

1.2 LABELING EQUIPMENT
A. All equipment shall be labeled with permanent laminated plate riveted to unit. Units shall be labeled as indicated in schedules. Plate shall be black with white unit numbers. Height of unit number shall be minimum of one (1) inch. Label shall also indicate area serviced by unit as noted in schedules. Height of letters shall be minimum of one-half (1/2) inch. Submit sample to Architect for approval.

1.3 TESTING REFRIGERANT PIPING SYSTEMS
A. Refrigerant lines shall be tested under 1.5 times the working pressure with carbon dioxide pressure for 5 hours using soap suds at joints to test for leaks. Evacuate system and charge with refrigerant.

1.4 DUCTLESS SPLIT SYSTEM
A. The Heat Pump system shall be a Mitsubishi Electric split system (or approved equal) with Variable Speed Inverter Compressor technology. The system shall consist of a horizontal discharge, single phase outdoor unit, a matched capacity indoor section that shall be equipped with a wired wall-mounted thermostat. Install per manufacturer’s installation instructions.

B. The units shall have a manufacturer’s parts and defects warranty for a period five (5) year from date of installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

END OF SECTION 238000
1.0 GENERAL

1.1 SUBMITTALS
Provide in accordance with Division 01 and Section 23.

Submittals for Single Packaged Vertical Indoor Mount heat pump or air conditioner shall include: equipment performance, dimensions, and electrical requirements. Two stage equipment shall include the following performance data: CFM, EER, COP, IPLV, Total, Sensible, Latent capacities at standard AHRI conditions, for and all stages of operation.

Factory tested sound data per ANSI S12.60. Dba levels at all operating conditions and ERV speeds including exterior sound level.

Complete exterior Louver performance information. Louver shall be provided by SPVU manufacturer.

Factory Warranty documentation verifying 5 year compressor, and 5 year parts warranty.

Control submittal if controller is provided by equipment manufacturer.

1.2 QUALITY ASSURANCE
Design, construction, testing and installation shall comply with the following standards as applicable:

- Certificate of performance by AHRI or other independent third party testing agency. AHRI or third party testing will be in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units (SPVU). Self- test data provided “in accordance with AHRI 390-2003” will not be accepted or considered as alternate. Consideration for exceptions will require testing by a third party agency preapproved by the specifier and accompanying statement of indemnification from the Manufacturer.

1.3 OPERATING CHARACTERISTICS
Unit shall be capable of simultaneous heating duty and defrost cycle operation when using accessory electric strip heat. Unit electric nameplate shall display required electric circuit. Factory installed adjustable control allowing for optional low amp draw operation preventing simultaneous operation of compressor and strip heat shall not be allowed. Only dedicated low ampacity units manufactured and shipped with correct electric nameplate data shall be accepted.

Motor shall automatically adjust to maintain constant cfm at rated airflow independent of external static pressure up to .5 external static pressure.
1.4 WARRANTY
Unit shall include a full 5-year parts warranty covering compressor, sealed refrigeration system, heat exchange coils, ventilation packages, as defined by the terms and conditions of Bard Limited Warranty agreement. Labor is excluded in the Bard standard warranty. Any 5 year compressor, 1 year parts warranty shall not be accepted. All parts warranty documentation shall be included in submittal data. Any exceptions to a manufacturer’s standard warranty must be acknowledged in writing by the Manufacturer’s senior manager.

2.0 GENERAL EQUIPMENT REQUIREMENTS
Capacities of Heat Pumps as indicated on drawing and schedules are net capacities actually required. Efficiencies shall be at AHRI conditions, submitted performance shall be at specified conditions.

Furnish and install a self-contained, vertical, floor standing, interior mount, thru-the-wall, heat pump, to be manufactured by Bard Manufacturing Company. Units shall be, self-contained vertical packaged (SPVU) heat pump. Cooling performance shall be tested and certified by AHRI per Standard 390-2003 and listed in the AHRI database. AHRI certificate shall be included in submittal data. If AHRI documentation is not available, third party performance certification by an agency preapproved by the specifier may be considered. Third party submittals of capacity and efficiency in heating and cooling shall be provided 10 days prior to bid and include statement of performance indemnification from the Manufacturer.

Units shall be UL or ETL listed and labeled, classified in accordance ANSI/UL 1995/CSA 22.2 No. 235-05 fourth edition. Unit shall be constructed following ISO: 9001 quality control procedures and be factory assembled, fully charged internally wired, 100% run tested. Run test data shall be stored and available upon request.

2.1 CONSTRUCTION
Constructed of 20 gauge prepainted steel consisting of galvanized steel in accordance with ASTM A653, modified acrylic primer .25 MIL., top coat paint shall be .75 MIL. Exterior panels shall be double wall construction. No screws exposed on the exterior panels. Front panel is hinged and lockable for filter service and access to primary functional electrical controls. Front and side panels are easily removable for separation of top and bottom sections. Back of unit to be painted in neutral color to reduce visibility from outdoors. Colors options: Beige, Gray or white.

No fiberglass shall not be utilized in any part of the unit.

Exterior panels shall be easily removable, and cabinet shall consist of two modules with refrigeration system contained in top section. The two sections can easily be separated by removing 4 bolts. Fork slots allow for the top module to be lifted and separated. Each module shall pass thru a standard door frame, and/or into standard sized elevator doors without tilting or laying equipment down.

Unit shall be suitable for right or left hand corner installation without modification. No clearance is required. All service access shall be thru the front of the unit. Side supply grilles on accessory ductless plenum box shall include adjustable
opposed damper to balance airflow for each side discharge, and in corner installations.

2.2 FILTERS
Unit shall be factory furnished with 2” pleated filters and have a Minimum Efficiency Reporting Value of MERV8 per ASHRAE standard 52.2.

Filters shall be accessible thru front of unit. Filter size shall be readily available commercial sizes.

2.3 COMPRESSORS
Shall be 2-stage hermetically sealed scroll compressor with internal unloading providing 2 stages of heating and cooling operation.

The refrigeration circuit shall be equipped with factory installed high and low pressure control with resettable lockout circuit. An internal overload shall protect the compressor against excessive motor temperatures and currents. Refrigerant shall be R-410A.

Refrigeration circuit will include thermostatic expansion valve (TXV), liquid line filter dryer, refrigerant service ports and discharge muffler. Service gauge access ports shall be available without removing any panels.

The compressor shall be mounted on double floating isolation mounting system and fitted with a factory installed sound attenuation jacket.

2.4 CONDENSATE DRAIN SYSTEM
Condensate shall be removed from the unit by connections located in the back of the unit. Both indoor and outdoor coil drain pans shall be constructed of non-corrosive materials and shall not allow standing water in the drain pan. A factory installed condensate overflow protection system shall monitor both drain pans and shut down system to prevent condensate overflow.

2.5 MODULATING CONDENSER MOTOR
The condenser fan motor shall be electronically commutated motor-ECM. Motor shall provide variable speed operation, ball bearing, 6kV surge protection and matched to a sweep designed low noise composite condenser fan. Factory integrated modulating low ambient control shall be provided as standard.

2.6 INDOOR BLOWER MOTOR
The indoor blower motor shall be electronically commutated variable speed (ECM), factory programmed to produce rated air flow from 0 to .5 inch WC of external static pressure.

The motor is to be self-adjusting to provide proper rated air flow at high static pressures without user adjustment or wiring changes by the user. The motor shall be pre-programmed for 20-second ramp up and 60-second down rate for quiet, smooth starting and stopping. PSC motor shall not be acceptable. Motor shall automatically adjust to proper blower speeds matching compressor
operation: ultra-quiet ventilation only, stage 1 cooling, stage 2 cooling, stage 1 heating, and stage 2 heating, continuous circulation ventilation mode.

2.7 ELECTRICAL COMPONENTS AND CONTROLS

Electrical components shall be easily accessible for routine inspection and maintenance through front service panels. Circuit breaker shall be standard on all 208/230 volt models and a disconnect standard on all 460 volt models. Circuit breaker/disconnect access is through lockable access panel. Lock and key are to be provided with each unit. Unit shall have single point entry for line voltage. Electrical component access point shall be located at standard eye level to allow easy serviceability.

The internal low voltage control circuit shall consist of a current limiting 24 VAC type 75 VA transformer with circuit breaker.

Defrost control shall be by temperature and time. After 30, 60, or 90 minutes (selectable) the heat pump control shall place the system in defrost mode. The defrost circuit shall consist of a solid state electronic heat pump control. A 90-minute timer (factory setting) shall initiate a defrost cycle if the outdoor coil temperature indicates the possibility of an iced condition. The thermistor sensor, speed-up terminal for service, and a ten-minute defrost override shall be all be standard on the electronic heat pump control.

To prevent rapid compressor short cycling, a five-minute time delay circuit shall be incorporated into the heat pump control board. A low pressure bypass shall be incorporated into the heat pump control board to prevent nuisance tripping during low temperature start-up.

All units with 3-phase power shall include factory mounted phase rotation monitor. This device shall protect scroll compressor from reverse rotation and also protect unit from phase failure. If 3-phase power is incorrectly connected at the field power connections, the phase monitor shall lock out the unit and a red light will illuminate indicating incorrect phase. If unit is wired correctly a green light will illuminate. If a power leg is lost, the phase monitor will lockout the unit due to phase imbalance. Once the condition is corrected, turning the power off at the circuit breaker or disconnect will reset the phase monitor.

2.8 DEHUMIDIFICATION AND HOT GAS REHEAT

(Factory installed)

The dehumidification option shall incorporate an independent reheat coil in the supply air stream in addition to the standard evaporator coil, 2 way valve, solid state dehumidification circuit board, and independent dehumidification terminal on 24 volt control terminal strip. The coil shall be mounted after the evaporator coil, and sized to nominally match the sensible cooling capacity. The solid state dehumidification circuit will monitor the 24 volt terminal for a call for dehumidification. If the humidity rises above a set point the dehumidification terminal is energized the dehumidification control board shall:
Monitor unit operation. If dry bulb temperature is satisfied and no call for cooling or heating is active, the unit will energize in cooling mode and also energize the 2 way valve so that reheat coil becomes active.

- If the unit is operating in cooling or heating at the time of the call for dehumidification, the unit shall remain in cooling or heating until comfort temperature set point is satisfied. If the high humidity call is still active, the unit will then operate in dehumidification mode.

- If a call for cooling or heating is received during dehumidification operation, the solid state board will deenergize the 2 way valve. The unit will operate in active cooling or heating mode until dry bulb set point is satisfied.

- If the humidity set point control is satisfied and no call for cooling or heating is active the unit will cycle off.

2.9 I-TEC™ models are designed to provide independent control of ventilation air with a dedicated low voltage ventilation terminal connection. Operation of supply air fan is also required for ventilation operation.

3.0 Optional ventilation packages are available to meet all of your ventilation and indoor air quality requirements. All ventilation packages are factory installed.

4.0 COMMERCIAL ROOM VENTILATOR
The commercial room ventilator shall be factory installed and provide intake and exhaust fans to allow outside ventilation air, up to 525 cfm to be introduced through the air inlet openings. Positive shut off of intake and return air path is required to prevent infiltration of outside air during occupied and unoccupied periods. Condenser fan operation shall not be required for ventilation powered exhaust. The airflow rate shall be easily adjustable to 4 cfm rates. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy or schedule, or demand control using CO2 controller with relay output.

5.0 REQUIRED ACCESSORIES

5.1 WALL SLEEVE
SPVU manufacturer shall furnish a properly sized wall plenum for intake and exhaust condenser air, including intake and exhaust air path for ventilation air. Sleeve shall be telescoping for adjustable width, and adjustable 3” height from 31” to 34” AAF, or higher with factory supplied subbase. Wall sleeve shall be constructed of galvanized steel, coated with an epoxy primer and baked on polyester enamel paint. Wall sleeve casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117.

5.2 OUTDOOR LOUVER
Exterior Louver shall be a product of the SPVU manufacturer that has been designed, tested and rated to meet the manufacturers rated performance standards as a system. Louver shall be available in 1”, 2” or 4” depths. Louvers shall be constructed of mill finish aluminum and powder coated to color. Factory standards colors include: dark bronze, medium bronze, or aluminum.

6.0 OPTIONAL ACCESSORIES
6.1 TOP DISCHARGE PLENUM BOX
Supply air discharge plenum box shall be provided by manufacturer. Exterior finish shall match unit, lined with sound deadening insulation. Insulation shall be covered with acoustically designed perforated galvanized metal. Plenum box shall include 1 or 2 front discharge diffusers, and may include one diffuser on each side of the plenum box.

6.2 SIDE TRIM KIT
Side trim pieces, 4” or 6” in depth manufactured of prepainted steel matching unit color shall be used to trim out space between rear sides of unit and exterior wall.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This section describes the design, performance and installation of an air purification system intended for use as part of another manufacturer’s air handling unit or mounted on the duct as shown on the plans, details and equipment schedules.

1.2 REFERENCED CODES & STANDARDS

A. The following codes and standards are referenced throughout. The edition to be used is that currently enforced by the authority having jurisdiction (AHJ) or in absence of such direction that referenced by the current enforceable IBC code or as indicated by the contract documents, except where specifically referenced by this section of the specifications.

1. ASHRAE Standards 62 & 52
2. National Electric Code NFPA 70
3. UL 867 including ozone chamber test

1.3 RELATED WORK

A. Testing, Adjusting and Balancing
B. Facility Access and Protection
C. Ductwork
D. Filters
E. Electrical Wiring
F. Control Wiring

1.4 QUALITY ASSURANCE

A. The Air Purification System shall be a product of an established manufacturer in the USA and shall be manufactured and assembled in the USA.

B. A qualified representative from the manufacturer shall be available to inspect the installation of the air purification system to ensure installation in accordance with manufacturer's recommendation.

C. Technologies that do not address gas disassociation such as UV lights, powered particulate filters and/or polarized media filters shall not be considered. Uni-polar ion generators shall not be acceptable. “Plasma” particulate filters shall not be acceptable.
D. Projects designed using ASHRAE Standard 62.1 IAQ Procedure shall require the manufacturer to provide Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled. The manufacturer shall provide independent test data on a previous installation in a similar application that proves compliance to ASHRAE 62.1 and the accuracy of the calculations.

E. The Air Purification Technology shall have been tested by UL or Intertek/ETL to prove conformance to UL 867-2007 including the ozone chamber testing and peak ozone test for electronic devices. All manufacturers shall submit their independent UL 867 test data with ozone results to the engineer during the submittal process. All manufacturers shall submit a copy with their quotation. Contractors shall not accept any proposal without the proper ozone testing documentation.

F. The maximum allowable ozone concentration per the UL 867-2007 chamber test shall be 0.001 PPM. The maximum peak ozone concentration per the UL 867-2007 peak test as measured 2 inches away from the electronic air cleaner’s output shall be no more than 0.0012 PPM. Manufacturers with ozone output exceeding these ozone values shall not be acceptable.

1.5 SUBMITTALS

A. Submit manufacturer’s technical product data for ion generators including:

1. Schedule of plasma generators indicating model number and quantity of each type required for each unit/application.
2. Submittal sheet for each type of plasma generator and accessories furnished; indicating construction, dimensions, electrical data, and mounting details.
3. Indoor Air Quality calculations using the formulas within ASHRAE Standard 62.1-2007 to validate acceptable indoor air quality at the quantity of outside air scheduled (when projects are designed with reduced outside air).
4. Product drawings detailing all physical, electrical and control requirements.
5. Copy of UL 867 independent ozone test.

B. Operating & Maintenance Data: Submit O&M data and recommended spare parts list.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of products shall be in factory fabricated shipping cartons. Identify on outside of carton the type of product contained within. Avoid crushing or bending.

B. Store in original cartons and protect from weather and construction work traffic.

C. Store indoors and in accordance with the manufacturers’ recommendation for storage.

1.7 WARRANTY

A. Equipment shall be warranted by the manufacturer against defects in material and workmanship for a period of eighteen months from owner acceptance, whichever occurs
first. Labor to replace equipment under warranty shall be provided by the installing contractor.

PART 2 - PRODUCTS

2.1 GENERAL

A. The air purification system(s) shall be of the size, type, arrangement and capacity indicated and required by the unit furnished and shall be manufactured by Plasma Air International (www.plasma-air.com). Equal by Aerisa (www.aerisa.com) shall also be acceptable.

B. All other suppliers of comparable products requesting prior approval shall:

1. Submit a request for prior approval at least 15 days prior to bid date. Request received after that time will not be considered.

2. In addition, as part of the prior approval request, Bipolar Ionization manufacturers must submit their IAQ calculations that prove conformance to ASHRAE Standard 62.1-2007 with the reduction of outside air to the scheduled values. A letter on the manufacturer’s letterhead requesting prior approval must accompany the request for prior approval stating their calculations are ASHRAE compliant. A third party validation study performed on a previous installation of the same application shall also be included.

3. Submit independent test data from ETL or UL on the ozone chamber test.

4. Submit pathogen testing per section 2.2.

5. Submit at least two other end user references in the same application with contact phone number, email, equipment used and application for the equipment at that facility. Manufacturers not having the above references in similar applications using the same equipment models as proposed on the current project shall not be acceptable.

2.2 BI-POLAR IONIZATION DESIGN & PERFORMANCE CRITERIA

A. Each piece of air handling equipment, so designated on the plans, details, equipment schedules and/or specifications shall contain a plasma ion generator with bipolar ionization output as described here within.

B. The Bi-polar Ionization system shall be capable of:

1. Effectively killing microorganisms downstream of the bipolar ionization equipment (mold, bacteria, virus, etc.).

2. Controlling gas phase contaminants generated from human occupants, building structure, furnishings and outside air contaminants.

3. Reducing space static charges.

4. Reducing space particle counts.

5. When mounted to the air entering side of a cooling coil, keep the cooling coil free from pathogen and mold growth.
6. All manufacturers shall provide documentation by an independent NELEC accredited laboratory that proves the product has minimum kill rates for the following pathogens given the allotted time and in a space condition:
   a. MRSA: 99.5% in 60 minutes or less
   b. E. Coli: 93.5% in 30 minutes or less
   c. H1N1: 86.6% in 60 minutes or less
   d. Aspergillus: 74.8% in 60 minutes or less

7. Manufacturers not providing the equivalent space kill rates shall not be acceptable.
   All manufactures requesting prior approval shall provide to the engineer independent test data from a NELEC accredited independent lab confirming kill rates and time meeting the minimum requirements stated in section 2.2 B, points 6a, 6b and 6c.

C. The bipolar ionization system shall operate in such a manner that equal amounts of positive and negative ions are produced. Single pole ion devices shall not be acceptable.

   1. Airflow rates may vary through the full operating range of a VAV system. The quantity of air exchange shall not be increased due to requirements of the air purification system.
   2. Velocity Profile: The air purification device shall not have a maximum velocity profile.

D. Humidity: Plasma Generators shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0 - 100%, condensing, shall not cause damage, deterioration or dangerous conditions to the air purification system.

E. Ionization Equipment Requirements:

   1. Electrode Specifications (Bi-polar Ionization)
      a. Each plasma generator with bipolar ionization output shall include the required number of electrodes and power generators sized to the air handling equipment capacity.
      b. Electrodes shall be energized when the main unit disconnect is turned on and the fan is operating.
      c. Ionization output from each electrode shall be a minimum of 5 million ions/cc when tested at 2" from the ion generator.
      d. Manufacturer shall demonstrate that no voltage potential exists due to exposed electrical components in the duct system or plenum. Exposed needles protruding into the air steam will not be accepted.

   2. Duct mounted units
      a. Where so indicated on the plans and/or schedules to be duct mounted, plasma ion generators similar to Plasma Air 7000 series shall be supplied and installed by the mechanical contractor and manufacturer. The contractor shall follow all manufacturer IOM instructions during installation.
b. 7000 series ion generators shall be furnished with a factory-equipped gasketed mounting flange to prevent air leakage. Gasketed flange shall be a minimum of 1 1/8" wide around the perimeter of the ionizer to insure no leakage occurs.

c. Ion generators shall be field installed in a location that is convenient for visual inspection, removal, and servicing. They shall include an ion indicator light clearly visible from below the installed location.

d. Needles on duct mounted units shall be recessed for safety and to avoid fouling of any exposed needles.

3. Certifications

a. Bipolar ionization units shall be tested and listed by either UL or ETL according to UL Standard 867 – Electrostatic Air Cleaners.

b. The operation of the electrodes or bipolar ionization units shall conform to UL 867 with respect to ozone generation.

F. Electrical Requirements:

1. Ion generators shall contain a built-in power supply and operate on 24V AC and shall connect to the fan and common terminals of the fan coil unit or air handling unit served. Ion generators requiring a loose 24V, 120V or 230V transformer or power supply shall not be accepted.

2. Wiring, conduit and junction boxes shall be furnished and installed by the installing contractor within housing plenums and shall be UL and NEC NFPA 70 approved.

G. Control Requirements:

1. All plasma ion generators shall include internal short circuit protection, overload protection, and automatic fault reset. Manual fuse replacement shall not be accepted.

2. All plasma ion generators shall include an external BMS interface to indicate ion generator status and alarm.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for maintaining all air systems until the owner accepts the building (Owner Acceptance).

3.2 ASSEMBLY & INSTALLATION: PLASMA GENERATOR WITH BI-POLAR IONIZATION

A. All equipment shall be assembled and installed with a high level of workmanship to the satisfaction of the owner, architect and engineer.

B. Any material damaged by handling, water or moisture shall be replaced by the mechanical contractor at no cost to the owner.

C. All equipment shall be protected from damage on a daily basis throughout construction.
3.3 COMMISSIONING & TRAINING

A. A manufacturer’s authorized representative shall provide start-up supervision and training of owner’s personnel in the proper operation and maintenance of all equipment.

B. Provide to the owner a portable hand held ion counter with a calibrated range of 0 to 20,000 ions/cm³ and an accuracy of +/- 25% within the specified range. Ion counter shall have automatic zeroing capability on 10 minute intervals.

END OF SECTION 238010
SECTION 26 00 01 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions as appropriate, apply to the Work specified in this Section.

B. Refer to all Electrical Divisions of the Specifications as well as the Specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 BIDDING REQUIREMENTS AND RESPONSIBILITIES

A. Bidders of all or any portions of this section or division are required to review all contract documents including but not limited to Architectural drawings, Mechanical drawings, Plumbing drawings, Electrical drawings, etc. to coordinate requirements and responsibilities with and through prime bidder.

B. Bidders of all or any portions of this section or division, by furnishing a bid on a portion of the prime contract are indicating that they have received all contract documents and coordinated services provided under their portion of the work with the prime bidder; they are indicating that they have expressed any pertinent questions (which would result from a detailed, thorough review of the entire set of contract documents) to the prime bidder in accordance with the general provisions of the Specifications requirements, prior to bidding.

C. All timely, pertinent, questions provided in writing prior to bids, in accordance with the general provisions of the Specifications requirements, will be clarified, defined, or otherwise explained in a written addendum and/or addendums prior to bids, in accordance with the general provisions of the Specifications requirements.

D. It is not the intention of these contract documents to leave any issue relating to coordination between trades or sub-contractors vaguely defined. The intention is to define all issues, coordination matters, equipment requirements, sizes, routing, etc. to the satisfaction of the prime bidder, prior to receipt of bids.

E. Bidders of all or any portions of this section or division, by virtue of the submission of a bid to the prime bidder, are indicating that they have reviewed the entire set of contract documents with due diligence and regard for the Owner's desire for a comprehensive and complete bid proposal; that they have expressed all concerns or questions requiring clarification on matters of coordination between trades and/or sub-contractors; that they have expressed any such concerns or questions in writing in accordance with contract document's General Provisions requirements.

1.3 MATERIAL AND EQUIPMENT

A. The term "provide" when used in the Contract Documents includes all items necessary for the proper execution and completion of the work.

B. Specific reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and
the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgement of the Architect expressed in writing is equivalent to that specified.

C. Coordinate and properly relate all work of this Division to building structure and work of all other trades.

D. Visit premises and become thoroughly familiar with existing conditions; verify all dimensions in field. Advise Architect of any discrepancies prior to Bid Date in accordance with contract document’s General Provisions.

E. Do not rough-in for any item or equipment furnished by others or noted "Not in Contract" (NIC), without first receiving rough-in information or determining rough-in requirements from other trades and/or Architect.

F. Provide storage and protection for all equipment and materials in accordance with requirements of contract document’s General Provisions. Replace any equipment and materials damaged by improper handling, storage, or protection, at no additional cost to the Owner.

G. Keep premises clean in accordance with requirements of contract document’s General Provisions.

1.4 SUBSTITUTIONS

A. Substitutions are allowed under La. R.S. 38:2291 and La R.S. 38:2292. Any requests for prior approval (as provided for under La. R.S. 38:2295) including any re-submitted data, shall be received by the Engineer a minimum of ten (10) working days prior to bid date. Submittals sent via facsimile and/or electronic mail will not be accepted. The Contractor shall recognize that it may be necessary to submit certain requests for prior approval sooner than the final date listed in the Instructions to Bidders, depending upon the complexity and completeness of the submittal. If, in the opinion of the Engineer, there is neither sufficient time available nor adequate descriptive data attached to the submittal, the submittal will not be considered. Except as otherwise specified, materials and equipment shall be new and bear the approval label of the Underwriters Laboratories, Inc. for the type of installation required.

B. Basis of design of systems is based on specific equipment for performance, size, shape, color, construction material, etc... If the use of other manufacturer's equipment, even though approved by Architect, involves additional cost due to space requirements, foundation requirements, increased mechanical or electrical services, the cost of such extra work shall be borne by the contractor. Even though a manufacturer's name appears in the Contract Documents as having acceptable equipment, his equipment shall be classified as being a substitute to the equipment originally designed for and named in the Contract Documents. Substitute equipment, materials, etc., will not be allowed to deviate from basis of design requirements.

C. All requests for prior approval shall identify where proposed material matches or exceeds the performance of the equipment specified. In addition, such submittal shall also clearly identify all deficiencies compared to specified product. Submittal of general cut sheets will be returned rejected.

D. Prior approval requests shall include calculations (point-by-points) of all areas calling for new luminaires.
1.5 DRAWINGS AND SPECIFICATIONS

A. The specific intent of these Contract Documents is to provide the various systems, equipment, etc. to the Owner complete and in a thoroughly calibrated and functional condition.

B. The Drawings shall not be construed as shop drawings. In the event of a possible interference with piping or equipment of another trade, items requiring set grade and elevations shall have precedence over other items. Should any major interference develop, immediately notify the Architect.

C. In laying out Work, refer to mechanical, electrical, and architectural drawings at all times in order to avoid interference and undue delays in the progress of the Work.

1.6 CODES AND REGULATIONS

A. Work shall be in full accord with the LA State Sanitary Code, 2014 N.E.C. (NFPA 70), local ordinances, building codes, and other applicable national, state, and local regulations.

B. Equipment shall conform to requirements and recommendations of the National Bureau of Fire Underwriters and National Fire Protection Association (NFPA).


D. Work called for in these Plans and Specifications shall be executed by competent workmen.

E. In the possible event of conflict between codes or regulations and Contract Documents, notify the Architect/Engineer immediately.

F. The drawings show approximate locations only of feeders, branch circuits, outlets, etc., except where specific routing or dimensions are indicated. The Architect reserves the right to make reasonable changes in locations indicated, before roughing-in, without additional cost to the Owner.

1.7 FEES, PERMITS, AND TAXES

A. Obtain and pay for permits required for the Work of this Division. Pay fees in connection therewith, including necessary inspection fees.

B. Pay any and all taxes levied for Work of this Division, including municipal and/or state sales tax where applicable.

1.8 MANUFACTURER'S DIRECTIONS

A. Install and operate equipment and material in strict accord with manufacturer's installation and operating instructions. The manufacturer's instructions shall become part of the Contract Documents and shall supplement Drawings and Specifications.
1.9 SUBMITTAL DATA

A. Submit shop drawings, project data, and samples in accordance with requirements of the General Provisions of the contract documents. Submittals shall be received no later than thirty (30) consecutive calendar days from effective date of “Notice to Proceed”.

B. Shop drawings shall consist of published ratings or capacity data, detailed construction drawings for fabricated items, wiring and control diagrams, performance curves, installation instructions, manufacturer's installation drawings, and other pertinent data. Submit drawings showing revisions to equipment layouts due to use of alternate or substitute equipment.

C. Where manufacturers and suppliers of equipment, materials, etc. are unable to fully comply with Contract Document basis of design requirements, specifically call such deviations to attention of Architect/Engineer on submittals. Typed deviations on a separate sheet; underlined statements or notations on standard brochures, equipment fly sheets, etc. will not be accepted. Submittals shall clearly indicate where material submitted meets and/or exceeds the performance criteria of the equipment used as the basis of design of the project. Failure to note compliance with the basis of design material/equipment shall result in rejection of submittals.

D. Approval of submittals shall not relieve Contractor from furnishing required quantities and verifying dimensions. In addition, approval shall not waive original intent of Contract Documents.

E. Failure to obtain written approval of equipment shall be considered sufficient grounds for rejection of said equipment regardless of the stage of completion of the project.

F. Contractor shall submit Submittals/Shop Drawings on all equipment listed below. In addition, contractor shall refer to subsequent sections of the Electrical portion of the specifications for additional shop drawing submittal requirements.

1. Lighting Fixtures
2. Electrical Gear (Panelboards, Safety Switches, Circuit Breakers, Transformers).
3. Receptacles
4. Wire

G. Shop Drawings/submittals shall be submitted in individual books as grouped together and stated below.

1. Light Fixtures
2. Electrical Gear
3. Receptacles and Wire

1.10 PROJECT COORDINATION

A. Refer to applicable Electrical Specification Sections for products work of this Division.

B. Refer to all plumbing, mechanical and fire protections specifications sections for related products affecting work of these electrical sections.

C. Coordinate handling of all products, materials, etc., through the Contractor. Coordinate space, access, clearances, etc., through the Contractor prior to preparation of shop drawing submittal.
D. The Contractor is herein cautioned to note that the work involved is a complicated renovation and a new addition project requiring continuous owner occupancy. The Contractor should review the phasing plans/descriptions and visit the project site to determine existing conditions. The Contractor will be held responsible for allowing for these conditions in his bid.

1.11 SERVICE CONTINUITY

A. At all times during the construction of the project, electric service shall be maintained to all portions of the site and existing facility, except with prior written approval from the Architect/Engineer of interruptions. It shall be the responsibility of the contractor to provide, install and maintain (fuel included) any required rental generators to accomplish said task. Any required interruptions of electric service due to work being performed under this Contract shall be scheduled in writing a minimum of forty-eight (48) hours in advance after consultation with the Architect/Engineer and the Owner, and shall occur when permitted by the Architect/Engineer. The Contractor shall be responsible for any overtime pay required to meet these requirements, at no additional cost to the Owner.

1.12 VALUE ENGINEERING (V/E):

A. While it may be in the Owner’s interest to consider the first cost money saving that may be generated via alternatives and options generated via participation in Value Engineering, contractor shall realize that substantive offers of Value Engineering (V/E), if accepted by the Owner, constitute a design-build agreement (offer and acceptance) with the owner, and drastically change the design concept of the project, as developed by the Professional of Record identified on the Contract Documents.

B. Should contractor offer, and the owner accept value engineering options that alter aspects of the system design, equipment, performance and/or performance verification or monitoring of respective systems, the contractor shall provide duly licensed professional engineering consultants working on behalf of the contractor (including sub-contractors and equipment vendors/manufacturers) to review, approve and take professional responsibility for performance and suitability of V/E hybrid systems, materials or operational changes related to respective V/E items. The contractor’s licensed professional engineering consultants and the contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as contractor’s Professional of Record, absolving the original project Professional of Record (identified on the original Contract Documents, released for the original project Bid/Negotiation) from responsibility for the V/E hybrid systems portion of the work.

C. The contractor, via the offer and acceptance of value engineering items on the project agrees to provide professional engineering design services and take full and complete responsibility for the hybrid design. Further, the contractor’s (V/E Items) professional of record (either employees, or independent consultants to the contractor) through the offer and acceptance of V/E items, agree to indemnify and hold harmless the project owner, the owner’s original A/E team (Professional of Record on behalf of the owner for the original Contract Documents) their heirs and assigns in regard to the V/E changes and their impact on the systems altered, affected or modified, in whole or in part. The Professional of Record shown on the original Contract Documents in regard to the systems altered, adjusted, revised, modified or otherwise affected by the value engineering items implemented, shall be absolved of design responsibility as a result of implementation of V/E items, and their original use of Engineering Seals used for original Contract Documents, shall not apply.
1.13 PROJECT RECORD DOCUMENTS

A. Keep Project Record Documents in accordance with general provision requirements of the specifications.

B. During construction period, keep accurate records of installations paying particular attention to major interior and exterior underground and concealed piping, ductwork, etc.

C. The Contractor shall obtain a minimum of one (1) set of the contract documents including all addenda and change orders as prepared by the Architect/Engineer.

D. If the Contractor elects to vary from the Contract Documents and secures prior approval from the Architect/Engineer for any phase of the work, he shall record in a neat and readable manner all such variances on the contract documents in red ink. Prior to requesting substantial completion the marked-up set of contract documents shall be returned to the Architect/Engineer for approval.

E. All deviations from sizes, locations and from all other features of the installation shown in the Contract Documents shall be recorded.

F. In addition, it shall be possible using these drawings to correctly and easily locate, identify and establish sizes of all piping, directions, and the like, as well as other features of work which will be concealed underground and/or in the finished building.

G. Locations of underground work shall be established by dimensions to columns, lines or walls, locating all turns, etc. and by properly referenced centerline or invert elevations and rates of fall.

H. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension. In others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. The decision of the Architect/Engineer in this matter will be final.

I. The following requirements apply to all Record Drawings:

1. They shall be maintained at the Contractor's expense.
2. All such drawings shall be done carefully and neatly.
3. Additional drawings shall be obtained at the Contractor's expense.
4. They shall be kept up-to-date during the entire course of the work and shall be available upon request for examination by the Architect/Engineer and when necessary, by other trades, to establish clearances for other parts of the work.
5. Record Drawings shall be returned to the Architect/Engineer upon completion of the work and are subject to approval of the Architect/Engineer.

1.14 OPERATION AND MAINTENANCE DATA

A. Refer to the specific Section related to PROJECT CLOSEOUT or OPERATION AND MAINTENANCE DATA for procedures and requirements for preparation and submittal of maintenance manuals.

B. Provide the Owner with three (3) copies of printed instructions indicating various pieces of equipment by name and model number, complete with parts lists, maintenance and repair instructions and test and balance report.
C. COPIES OF SHOP DRAWINGS WILL NOT BE ACCEPTABLE AS OPERATION AND MAINTENANCE INSTRUCTIONS.

D. This information shall be bound in plastic hardbound notebooks with the job name, Architect and Engineer names permanently embossed on the cover. Rigid board dividers with labeled tabs shall be provided for different pieces of equipment. Submit manuals to the Architect for approval.

E. In addition to the operation and maintenance brochure, the Contractor shall provide a separate brochure which shall include registered warranty certificates on all equipment, especially any pieces of equipment which carry warranties exceeding one (1) year.

F. The operation and maintenance brochure shall be furnished with a detailed list of all equipment furnished to the project, including the serial number and all pertinent nameplate data such as voltage, amperage draw, recommended fuse size, rpm, etc. The Contractor shall include this data on each piece of equipment furnished under this contract including but not limited to those items listed below.

1. Lighting Fixtures
2. Electrical Gear (Panelboards, Safety Switches, Circuit Breakers, Transformers).
3. Receptacles
4. Wire

1.15 EXCAVATING AND BACKFILLING

A. Provide excavating and backfilling necessary for Work of this Division. Comply with provisions of specification section pertaining to Site Work, if applicable.

B. Trenches shall be inspected by Code Authorities and/or Owner's Representative before and after piping is laid. Give Owner's Representative 24-hour notice for each inspection. If any trenches are filled without Owner's Representative and/or authority having jurisdiction inspection and as subsequently found to be deficient, the trenches shall be uncovered, inspected, and then re-filled, if requested by Owner's Representative. Prior to covering any and all underground facilities, including but not limited to conduit, ground rods, terminations, etc., Contractor shall take clear and concise digital photos and shall forward said photos to Engineer prior to covering said utilities.

C. Provide minimum 24 inches of cover to finish grades or paving at raceways.

D. Protect and maintain trenches in dry condition until piping has been inspected and approved. Immediately after approval, backfill trenches in tamped layers. Repeat backfill and tamping 6 months after initial coverage has been accomplished to avoid swale development from sinking soils.

E. Compact fill to satisfaction of Architect and/or Owner's Representative.

F. Prior to any excavating, Contractor shall be responsible for having all utilities in the area of excavation located and marked by an approved company with a minimum of five (5) years’ experience locating underground facilities. This includes all owner owned utilities on their site.

G. Approximate locations shown on the drawings shall not be used. Any facility damaged by the Contractor's underground work shall be repaired and/or replaced at no additional cost to the Owner.
1.16 CUTTING AND PATCHING

A. Comply with requirements of the Specifications regarding cutting and patching. Locate and timely install sleeves as required to minimize cutting and patching.

B. Cutting, fitting, repairing, patching, and finishing of Work shall be done by craftsmen skilled in their respective trades. Where cutting is required, cut in such a manner as not to weaken structure, partitions, or floors. Holes required to be cut must be cut or drilled without breaking out around the holes. Where patching is necessary in finished areas of the building, the Architect will determine the extent of such patching and refinishing.

C. Repairing Roadways and Walks: Where this contractor cuts or breaks roadways or walks to lay the piping, he shall repair or replace these sections to match existing, unless specifically identified as the responsibility of others.

1.17 PAINTING

A. Painting shall be provided under the Specification section regarding painting, unless specified otherwise. Leave exposed piping, materials, and equipment clean and free of rust, grease, dirt, etc. before and after painting.

B. Factory finished equipment, fixtures, and materials which are marred, chipped, scratched, or otherwise unacceptable shall be repaired or replaced under this Division to Architect satisfaction, at no additional cost to Owner.

C. Coordinate all painting requirements with prime bidder prior to bids.

D. All exposed conduit, materials, hangers, anchors, etc., are to be primed and painted. Color shall match adjacent surfaces where not specifically designated otherwise. All galvanized materials shall be suitably treated prior to painting to ensure adhesion.

1.18 EXISTING CONDITIONS

A. The Electrical Contractor shall visit the building site to determine existing conditions and will be held responsible for allowing for these conditions in his bid.

B. Note that this area of work will have storm drainage, mechanical and electrical utilities located underground and within and under the buildings. It is part of this work for the Contractor to determine the scope and location of all utilities to be installed with this project and arrange his work around others. There will be no extra consideration for work discovered as being hidden after the bid, and no change orders for extra cost that may be caused by unknown after bid conditions. The drawings show approximate locations only of feeders, branch circuits, outlets, etc., except where specific routing or dimensions are indicated. The Architect reserves the right to make reasonable changes in locations indicated, before roughing-in, without additional cost to the Owner.

1.19 PROTECTION OF APPARATUS

A. The Contractor shall take precautions necessary at all times to properly protect his apparatus from damage. Failure on the part of the Contractor to comply with the above to the Architect’s satisfaction shall be sufficient cause for the rejection of the particular piece of apparatus in question.
1.20 MINOR DEVIATIONS
A. The Contractor shall realize that the drawings cannot delve into every step, sequence, or operation necessary for the completion of the project without drawing on the Contractor's experience. Only typical details are shown on the plans. In cases where the Contractor is not certain about the method of installation of his work, he shall ask for details. Lack of details will not be an excuse for improper installation.

1.21 SALVAGED MATERIALS
A. The Owner shall have priority for the selection of salvaged material and equipment. Any equipment, light fixtures, devices, ballasts, materials, etc. selected to remain property of the Owner shall be removed and delivered to a location on the site as designated by the Owner. Material and equipment not retained by the Owner shall become the property of this Contractor and shall be removed from the site by him.
B. The Contractor shall obtain written approval of all material and equipment determined not to be salvaged by the Owner.

1.22 SAFETY PRECAUTIONS
A. Work methods and project safety are the Contractor's sole responsibility.
B. Contractor shall furnish and place proper guards for prevention of accidents. He should provide and maintain any other necessary construction required to secure safety of life or property, including maintenance of sufficient lights during all day and night hours as required to secure such protection.
C. Temporary electrical services during construction should be maintained in perfect condition. Frayed, lose or opened connections should not be used for temporary services. The Contractor should use only equipment in first class working condition for construction services.

1.23 SUPERVISION
A. Contractor shall personally, or through an authorized and competent representative, constantly supervise the work done from beginning to completion and final acceptance. To the best of his ability he shall keep the same foreman and workmen throughout the project duration. Foreman shall be present at project site at all times while work under this section of the contract documents is being performed. Foreman shall be accessible by cellular phone at all times. Respective telephone numbers shall be forwarded to Architect/Engineer prior to commencement of work on this project.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS
A. Panelboards, safety switches, equipment cabinets, motor starters and other equipment shown on the drawings and furnished and/or installed under this section of the Specifications shall be labeled with laminated plastic nameplates inscribed to identify equipment with description shown on the drawings for panels, the name of the equipment controlled for motor starters or the system or function involved for other equipment. Provide typewritten panelboard directories indicating the equipment served and its location.
PART 3 - EXECUTION

3.1 COORDINATION OF TRADES

A. Where work is in close proximity to the work of other contractors, the Contractor shall review plans of other contractors and coordinate his work with theirs. The Electrical Contractor shall verify the location of lighting fixtures, beams, structural members, conduit, ductwork, pipes or other obstructions before beginning his work in the area. Notify the Architect where proper clearances do not occur or where the work of others would interfere with the safe and/or proper operation of this work.

3.2 SUPPORTS AND FOUNDATIONS

A. Support all items covered by this Specification directly from building structural members independent of any ceilings or any other installed item. Panelboards and switches may be attached to suitably reinforced walls. Ground or slab mounted equipment shall be mounted on a separate four inch high concrete slab. Extending 6” beyond equipment footprint on all sides

B. Do not attach items of this Specification to HVAC ductwork, ceiling grids and ceiling support members, piping or other equipment unless specifically shown otherwise. Where applicable, all equipment including conduit shall be supported from overhead wall, floor or roof structures using galvanized channel or angle members for a rigid support. Position supports and equipment such that access through lay-in ceilings or panels is not impaired and all Code required clearances are maintained.

C. Where applicable, under no circumstances is the Contractor to attach to or support from any bar joist bridging. Any supports to the bar joists or any structural systems shall be approved by the Architect. All supplemental angle or channel iron required to support equipment of this Specification shall be furnished by the Electrical Contractor.

3.3 EQUIPMENT LAYOUT

A. The physical location and arrangements of electrical equipment is shown on the Plans and is to be used by the Contractor as a guideline in construction. It is the responsibility of the Contractor to review the Plans with the proposed equipment and equipment of other contractors that are affected, and to ensure that all Code required clearances, wiring distances and maintenance accesses, including equipment heights, of all items are maintained. Alternate arrangements to accomplish the above due to field conditions or changes in physical size of the equipment proposed for the project are to be submitted to the Architect for review before any work is begun or equipment ordered.

B. All electrical gear arrangements shall be presented in a 1/4 inch scaled drawing showing all equipment, including those of other contractors. This includes all electrical rooms, mechanical rooms, mechanical yards, electrical yards, service platforms, boiler rooms, etc… Include shop drawing cut sheets and applicable information. Indicate on the drawing by dimension all required Code clearances, wiring distances and maintenance access requirements. Where equipment heights are required to be coordinated with architectural or other items, indicate revised heights. Refer to "MOUNTING HEIGHTS."

3.4 GUARANTEE

A. The Contractor shall guarantee all materials, equipment and workmanship for a period of one (1) year from the date of final acceptance of the project. This guarantee shall include furnishing of all labor and material necessary to make any repairs, adjustments or replacement of any equipment, parts, etc. necessary to restore the project to first class
condition. This guarantee shall include the replacement of lamps. Warranties exceeding one (1) year are hereinafter specified with individual pieces of equipment.

B. If the Contractor’s office is in excess of a fifty (50) mile radius of the project, he shall appoint a local qualified contractor to perform any emergency repairs or adjustments required during the guarantee period. The name of the contractor appointed to provide emergency services shall be submitted to the Architect/Engineer for approval.

3.5 CLEANING

A. Refer to the Specification Section relating to PROJECT CLOSEOUT or FINAL CLEANING for general requirements for final cleaning.

B. Clean all light fixtures and lenses prior to final acceptance. Replace all inoperative drivers.

END OF SECTION 26 00 01
SECTION 26 05 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions; as appropriate, apply to the work specified in this section.

B. Refer to all portions of the Contract Documents as well as the plans and specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

PART 2 - PRODUCTS

2.1 WIRE (600 VOLT AND BELOW)

A. All conductors used in the work shall be soft drawn annealed copper having a composition of not less than 98% of pure copper. Conductors shall be standard code gauge in size, insulated, and shall have insulation rated for use at 600 volts. The contractor’s bid shall reflect the use of all copper conductors.

B. Unless otherwise noted or specified, insulation shall be Type THWN. Wires shall be of the single conductor type and shall be stranded. Wire insulation shall not contain any asbestos materials.

C. Wire #8 AWG and smaller may be type MC-cable.

D. Throughout the system, conductors shall be identified as to phase and voltage of system by color-coding. Color-coding shall be continuous the full length of wire for all wire sizes. Identification by permanent paint bands or tags at outlets will not be acceptable. Surface printing at regular intervals on all conductors shall indicate manufacturer, size, voltage, and insulation type. White and/or gray colored insulation shall be used for grounded conductors and only for grounded conductors.

E. The color code assigned to each phase wire shall be consistently followed throughout the project. The following systems of color-coding shall be strictly adhered to:

1. 208/120 V Systems
   a. Grounding leads green
   b. Grounded neutral leads white
   c. Ungrounded phase wires black, red and blue

2. 120/240 V 1 Phase Systems
   a. Grounding leads green
   b. Grounded neutral leads white
   c. Ungrounded phase wires black, red

3. 120/240 V 3 Phase Systems
   a. Grounding leads green
   b. Grounded neutral leads white
   c. Ungrounded phase wires black, blue
   d. Ungrounded phase “wild” leg wire orange

4. 277/480 V Systems
   a. Grounding leads green
   b. Grounded neutral leads gray
   c. Ungrounded phase wires brown, orange, yellow
F. Where multiple neutral conductors are installed in a common raceway, the neutral conductor for each circuit shall be separately identified in accordance with the National Electric Code (NEC).

2.2 CONDUIT

A. Unless otherwise specified or shown on the drawings, all conduit shall be rigid galvanized steel (RGS), electrical metallic tubing (EMT), or rigid nonmetallic conduit (PVC) as allowed in the paragraphs below:

1. RGS may be used for conduit used in concrete slabs, and shall be used for conduit run exposed to the weather (locations defined as damp locations and wet locations in Article 100 of the NEC) and shall be run in hazardous areas.

2. EMT shall be used for conduit not encased in concrete, not exposed to the weather, not run underground, and not run in hazardous areas.

3. PVC may be used for conduit run in concrete slabs or may be run underground (underground only where permitted by NEC and local ordinances). Concrete encasement will not be required on underground runs unless specifically noted or specified elsewhere. PVC shall not be run exposed nor concealed in walls nor above ceilings nor in hazardous areas.

4. Where PVC is utilized for underground installations, RGS 90° elbows and conduit shall be utilized to turn conduit vertical and to rise up to above grade/slab.

B. All conduit shall be new and shall bear the inspection label of the Underwriters Laboratories, Inc. (U.L.).

C. Fittings for rigid steel conduit and EMT shall be hot-dipped galvanized and shall be of an approved type specially designed and manufactured for their purpose.

D. All flexible conduit, where installed indoors and outdoors, shall be of the flexible liquid tight metallic type. Flexible weatherproof electrical conduit is prohibited from use on this project.

E. Metallic conduit shall be metallized, sheradized, or hot-dipped galvanized.

2.3 METAL-CLAD CABLE (600 VOLTS AND BELOW)

A. Where permitted by NEC and local codes and ordinances, metal-clad (MC) cables may be used in lieu of conduit and wiring specified elsewhere herein.

B. Installation of MC cables shall be in compliance with the National Electric Code (NEC).

C. Conductors shall be softdrawn annealed copper having a composition of not less than 98% of pure copper.

D. Conductors shall be solid-type, standard Code gauge in size, insulated, and shall be rated for use at 600 volts or below. Minimum size shall be No. 12.

E. Conductor insulation shall be of a type listed in the NEC and be rated for 75 deg. C (167 deg. F) as a minimum and shall be of a type approved for use in MC cable.

2.4 OUTLET BOXES

A. Outlet boxes in concealed conduit systems shall be flush mounted. Boxes shall be galvanized steel of sufficient size to accommodate devices shown and shall have raised covers. Requirements of the NEC shall be minimum.
B. Outlet boxes for switches and receptacles in concealed work shall be 4” square, and not less than 1-1/2” deep. Flush mounted outlet boxes shall be installed with plaster rings.

C. Outlet boxes for switches and receptacles installed in exposed conduit system shall be cast iron or cast aluminum Type FD or approved equivalent.

2.5 OUTLET COVER PLATES

A. Unless otherwise noted, all outlets shall be fitted with cover plates of the type indicated below.

B. Cover plates shall be uniform in design and finish for switches, receptacles, and other outlets requiring cover plates. Plates shall be one (1) piece of the required number of gangs. Sectional plates shall not be used.

C. Cover plates shall be brushed aluminum.

D. Exterior cover plates shall be Hubbell RW 58350 or equal.

2.6 WIRING DEVICES

A. Wiring devices shall be as listed in the following table, except that color of device shall match color of outlet cover plate. Where cover plates are aluminum, device color shall be as selected by the Architect. Provide and install hospital grade devices in all areas as required by NEC Article 517.

1. 20A 125V 2P 3W Duplex Smooth Face Grounded Receptacle

2. 20A 125V 2P 3W Duplex GFCI Receptacles

3. 20A 125V 2P 3W Duplex GFCI – WR Receptacles

2.7 PHOTOELECTRIC CONTROLS

A. Unless otherwise noted on the drawings, photoelectric controls shall be Tork 2100 Series or equivalent by Precision Multiple or Paragon to suit voltage and power requirements of circuits controlled.

PART 3 - EXECUTION

3.1 MOUNTING HEIGHTS

A. Where overcurrent or safety switch devices are shown to serve exterior equipment, the Contractor shall review in detail with the Architect/Engineer proposed exterior mounting locations, mounting heights, conduit routing, etc., and receive approval prior to rough-in.

B. Where overcurrent or safety switch devices are shown to serve condensing units, the top of the overcurrent device shall be 3'- 0" AFG or level with the top of the condensing unit(s) whichever is lower. Refer to detail on plans for additional requirements.
3.2 WIRE (600 VOLT AND BELOW)

A. Service entrance, feeders, and motor circuit conductors shall be run their entire length without joints or splices. Splices and joints in branch circuit wiring shall be only at outlets or in accessible junction boxes.

B. Joints and splices in branch circuit wiring shall be made with compression type solderless connectors. Connectors of the nonmetallic screw on type are not acceptable.

C. Terminations or splices for conductors # 6 AWG and larger shall utilize Burndy Unitap, Polaris Black or equivalent connectors.

D. Unless otherwise specified, all wiring shall be installed in conduit.

E. No wire shall be smaller than No. 12 for power or lighting service, fixture whips or for switch legs. Wire for each branch circuit shall be of a single size and type from the branch circuit protective device to the last outlet on the circuit unless noted otherwise.

F. Not more than three (3) branch circuits shall be installed in a raceway for three-phase electrical systems. For single phase electrical systems, the number of circuits in any one raceway shall be limited to two (2).

G. Branch circuits shall have a 200% rated neutral where more than one (1) branch circuit is in a raceway and the neutral conductor is shared. The neutral should match the branch phase wire size when only one (1) circuit is in a raceway and when the neutral conductor is not shared. Refer to the "Multiple Circuit Neutral Wiring Diagram." Provide multi-pole breakers to simultaneously trip all phase conductors for shared neutral circuits.

H. Type THWN conductors may be connected directly to recessed fixtures only when the fixtures are equipped with outlet boxes approved by Underwriters Laboratories, Inc. for use with wires having insulation rated for maximum operating temperature of 75°C, (167°F); otherwise, conductors with Type SF2 insulation shall be run from fixture terminal connections to an outlet box placed at least one foot (1') from the fixture, such a tap shall extend for at least four feet (4'), but not more than six feet (6'), in flexible metal conduit.

I. Branch circuit home run numbers shown on the drawings shall be used for connection of circuit wiring to similarly numbered protective devices in branch circuit panelboards.

J. Where the length of a home run, from panel to the first outlet exceeds 75 feet (75') for 120-volt circuits or 175 feet (175') for 277-volt circuits, the conductor size shall be No. 10 AWG or that shown on the drawings, whichever is larger.

3.3 CONDUIT

A. When conduits are shown to be installed in the floor slab, under the floor slab, or underground, whenever possible and approved by the Architect/Engineer, conduits one-inch (1") trade size and smaller shall be installed in the concrete floor slab. Conduits embedded in concrete slabs shall have lateral spacing not less than three diameters except where the slab has been specially designed to accommodate closer spacing.

B. Conduits larger than one-inch (1") trade size shall not be installed in the floor slab and shall be installed a minimum of twelve inches (12") below the floor slab.

C. Conduits shown underground but not in or under a floor slab shall be installed not less than thirty inches (30") below grade. Conduit locations shall be identified by means of 4" wide, detectable, Red warning/ marker tape installed in trench in accordance with NEC requirements.
D. Prior to backfilling of trenches and/or providing concrete encasement, contractor shall take photographs of conduit installation including spacers/supports and concrete support blocks. In addition, prior to backfilling trenches and after concrete encasement, take additional photographs of installation. Submit photographs to engineer upon request.

E. Rigid conduit joints shall be made with threaded fittings made up tight with at least five threads fully engaged. Compression type threadless fittings and setscrew type fittings shall not be used for RGS unless specifically approved in writing by the Architect/Engineer.

F. Couplings and connectors for EMT shall be compression type or cast-iron set screw type.

G. Where conduits enter boxes or cabinets that do not have threaded hubs the conduit shall be secured in place with galvanized locknuts inside and outside and shall have bushings inside for interior locations. All exterior terminations shall be made with Meyers hubs or approved equivalent. Conduits larger than one inch (1") shall have galvanized insulating bushings.

H. All conduits shall be installed as indicated or scheduled on the drawings and shall be of sufficient size to accommodate the required number of insulated conductors including equipment-grounding conductor. A grounding conductor shall be pulled in every raceway and properly terminated. The Contractor shall increase the conduit size from that shown on the drawings where necessary to accommodate the equipment-grounding conductor and/or where to comply with the NEC.

I. Unless otherwise noted, conduit shall be run concealed. Conduit runs from wall mounted receptacles, toggle switches, etc. shall be run concealed in walls whenever possible.

J. Conduit runs shall be straight; elbows and bends shall be uniform, symmetrical, and free from dents or flattening. All conduit shall be installed with runs parallel or perpendicular to walls, ceilings and structural members.

K. Conduit shall not be run nearer than three inches (3") to hot water or steam pipes except where crossings are unavoidable. Conduit shall be kept at least one-inch (1") from covering of pipe crossed and the conductor size shall be increased one (1) size

L. Conduit shall be held securely in place by approved hangers and fasteners of appropriate design and dimensions for the particular application. Support shall be such that no strain will be transmitted to the outlet box and/or pull box supports. Conduit shall be secured only to the building structure.

M. All conduit runs shall be installed in accordance with all applicable sections of the National Electrical Code and local codes or ordinances.

N. Where empty conduits are shown, a #14 pull wire shall be installed and conduits shall be capped.

O. Termination to all mechanical equipment and to all dry-type transformers shall be made using a minimum of 12" to a maximum of 24" liquid-tight flexible metallic conduit.

P. At each concealed junction box in the power and lighting system, identify the panel and circuit number(s) contained in the junction box by writing in permanent marker on the outside of the junction box cover.
Q. Where conduits are run from condition spaces to/thru un-conditioned spaces, the ends of the conduits shall be sealed (after conductor installation) to prevent the transmission of air from non-conditioned spaces in to the conditioned spaces. Expanding spray foam and EYS seals are approved methods of sealing conduits.

3.4 METAL-CLAD CABLE (600 VOLTS AND BELOW)

A. The metallic sheath shall be galvanized steel or aluminum corrugated sheath type and shall be terminated at outlet boxes, cabinets, etc. with fittings specifically approved for such use, which shall properly ground the metallic sheath.

B. Each metal-clad cable assembly shall have one (1) green insulated ground conductor sized as required by NEC for the application as a minimum size.

C. Where run in walls, cable shall be fastened using B-Line Series BX4 or approved equivalent cable fasteners. Cable shall be fastened to wall stud not more than 8" from entry into device box.

3.5 WIRING DEVICES

A. All wiring devices installed shall be identified as to which panel serves it and which overcurrent protective device protects the wiring device. This shall be accomplished via panel name and circuit number being written using a permanent marker on the back side of the coverplate.

3.6 MANUFACTURER’S DIRECTION

A. Contractor shall be responsible for coordinating all aspects of equipment electrical service installation for all electrical gear, devices, mechanical, plumbing, fire protection, architectural, and owner furnished equipment including any and all medical equipment. Contractor shall obtain and review actual manufacturer’s installation instructions and shall install electrical facilities to said equipment in accordance with the instructions, NEC, NFPA and contract documents. Should a discrepancy exist between the manufacturer’s installation directions and the contract documents, the engineer shall be notified in writing immediately.

3.7 COORDINATION WITH OTHER TRADES

A. Prior to purchasing and installing any wire and/or conduit for all circuitry to mechanical equipment, medical equipment, owner furnished equipment, and other equipment requiring electrical power furnished by other trades as part of this project, contractor shall review equipment cut sheets and shall verify exact equipment electrical requirements. Any discrepancies between contract documents and equipment submittals shall be immediately brought to the architect/engineer’s attention for clarification.

END OF SECTION 26 05 00
SECTION 26 27 13 - ELECTRICAL DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary, and other Conditions); as appropriate, apply to the work specified in this section.

B. Refer to all Electrical specification sections, as well as the plans and specifications for the other various trades and materials and be thoroughly familiar with all provisions regarding electrical work.

1.2 ELECTRIC SERVICE (EXISTING)

A. Contractor shall be responsible for determining the proper breakers and connectors to tie into the existing electrical systems. Short circuit current interrupting rating of new breakers shall match rating of existing breakers. Contractor shall be responsible for examining the panelboards to be tied into, building structure, and site, and shall include in his bid all materials and time (regular pay and overtime pay) to install the new work avoiding conflicts with existing equipment to remain.

1.3 GENERAL

A. All electrical gear furnished as part of this project, panelboards, safety switches, etc. shall be of the same manufacturer unless specified otherwise. Electrical equipment manufactured by a subsidiary or parent company of manufacturer that is prior approved is not itself prior approved unless its own manufacturer's name specifically is listed as being prior approved.

PART 2 - PRODUCTS

2.1 PANELBOARDS

A. Panelboards shall be circuit breaker type using quick-make, quick-break, trip free, thermal magnetic trip indicating, bolt-on circuit breakers. Two and three pole branches and mains shall be common trip. Panelboards shall be dead front safety type with main breaker or main lugs, and number and size of branches as shown on the drawings. Panelboards shall have single, feed through, or double lugs, to accommodate feeder conductors as shown on the drawings, and shall have neutral and ground bus for termination of conductors. Bussing shall be copper.

B. Doors shall be fitted with flush cylinder locks, keys to which shall all on project be alike. Two (2) keys shall be furnished for each lock. Cabinet fronts shall not be removable with door in the locked position. Provide for each panel a directory frame with waterproof transparent plastic window on inside of door and place therein a typewritten identification of all circuits.

C. Cabinets shall be galvanized steel not less than twenty inches (20") in width unless "Column Width" is indicated on the Panel Schedule. Gutters shall not be smaller than minimum dimensions required by the National Electrical Code.

D. Panelboards shall be as shown in the schedules and shall be completely factory assembled. Do not purchase panelboards or cabinets until shop drawings have been approved. Approved manufacturers include:
1. General Electric
2. Square D

E. Where a specific interrupting rating is shown on the drawings, in the panel schedules, or as required to match existing AIC ratings, panelboards and associated circuit breakers shall be rated for that value as a minimum at no additional cost to the owner.

F. Construction of panelboards shall be such that, where applicable, any three (3) adjacent single-pole devices are individually connected to each of the three different phases in such a manner that 2 or 3 pole devices, when available, can be installed at any location.

G. UL Listing: Panelboards shall be listed by UL and bear the UL label.

H. Interior panelboards shall be NEMA I unless noted otherwise.

I. Exterior panelboards shall be NEMA 3R unless noted otherwise.

2.2 LABELS

A. All panelboards, safety switches and fused safety switches installed by this contractor shall have laminated phenolic engraved tags with 1/4" characters embossed thereon identifying the equipment by name, voltage, ampacity, phase and number of current carrying conductors such as:

Panel Name
120/208 V - 400A
3 Phase - 4 Wire
Fed from Panel: _____________, Circuit _______________

The tags shall be fixed to the center of the equipment cover/door with a suitable heavy duty industrial grade adhesive.

2.3 SAFETY SWITCHES

A. Furnish and install safety switches at locations and in capacities shown on the drawings, as hereinafter specified and/or as required by the latest edition of the National Electrical Code.

B. Safety switches mounted on interior of building shall be rated NEMA 1, General Duty.

C. Safety switches exposed to the weather shall be rated NEMA 3R, Heavy Duty.

D. Safety switches shall be of the solid neutral type where required by circuit or feeder specified, fused where denoted ‘FDS’ on drawings.

E. Safety switch covers shall be internally mechanically held closed when in the ON position and shall be allowed to open in the OFF position. The switch shall come equipped with provisions to allow the switch to be padlocked in the off position.

F. Galvanized angle or other suitable supports shall be provided for switches that cannot be mounted on walls or other rigid surfaces. Switches shall not be supported by conduit alone and shall not be mounted on HVAC or other equipment unless specifically approved by the Architect/Engineer. Verify mounting heights for all exterior locations with Architect/Engineer prior to rough-in.

G. Safety switches shall be General Electric or Square "D".
2.4 FUSES

A. Unless otherwise noted or specified, all fuse holders shall be equipped with dual-element, time-lag, and current limiting fuses. Provide one (1) spare set of fuses for each size initially installed, with a minimum of three (3) fuses of each size. Spare fuses shall be turned over to the Owner’s maintenance supervisor prior to requesting substantial completion inspection.

B. Fuses shall be Gould, Bussman, or approved equivalent.

2.1 DRY-TYPE TRANSFORMERS

A. Dry-type transformers shall be three phase, 60 cycle with 480 volt delta primary windings and 120/208 volt, 4-wire wye secondary windings with capacities and mounting arrangements as indicated on the drawings. Each transformer shall have four (4) 2-1/2% FCBN taps, except that two (2) full current taps above normal and two (2) below normal will be acceptable where this is manufacturer's standard for the particular size.

B. Transformers shall have internally isolated core and coil and shall be built with 220 Class insulation and shall have a temperature rise not to exceed 150 C where installed outdoors. Windings shall be aluminum.

C. Units shall be designed for quiet operation with core and coil completely isolated from the enclosure by vibration absorbing mounts. Sound levels shall not exceed 45 db for 75 KVA or below, or 50 db for units above 75 KVA in an ambient of 24 db.

D. Enclosures shall be NEMA I for secured interior locations, NEMA 3R for secured exterior locations, and totally enclosed for all unsecured locations.

E. Enclosures shall be constructed of heavy code gauge steel with terminal compartments located at the bottom of each unit. Circuit connections shall be made through flexible metallic conduit.

F. Transformers shall be as manufactured by Square D or General Electric.

PART 3 - EXECUTION

3.1 MANUFACTURER’S DIRECTION

A. All electrical gear shall be installed in accordance with the manufacturer’s directions. Contractor shall review these directions prior to rough-in. Should any discrepancies exist between the contract documents and the manufacturer’s direction, contractor shall advise the engineer in writing.

B. All electrical terminations shall be properly tightened to manufacturer’s specifications. Where manufacturer’s specifications are not available, contractor shall refer to the NEC and adjust tightness valves (torque) to the NEC published values.

C. Install all safety switches, breakers, disconnects, etc., in accordance with manufacturer’s directions and maintain all required NEC clearances. Coordinate exact locations in field with applicable contractors.

END OF SECTION 26 27 13
DIVISION 31

TECHNICAL SPECIFICATIONS

EARTHWORK
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. Locating and protecting existing underground and overhead utilities.
2. Providing French drains for a/c condensate water. See plans for reference.
3. Provide wood matting for temporary access road from north concrete parking lot to west end of the North Two-Story Building. See Site Plan of drawings.
4. Temporary erosion- and sedimentation-control measures.

Provide steel reinforced concrete culverts or Schedule 40 PVC 20’ long x 12” diameter for drainage.

Provide chain link medium duty gates or (pair of 10’ gates) in existing fencing intersecting with temporary road.

The temporary road shall be removed once job is accepted and Punch List(s) are completed. Contractor shall leave site in as good or better condition than it existed when work began. Grade site to eliminate ruts and to have acceptable drainage.

B. Related Sections:

Section 024119 “Selective Demolition” for partial demolition of buildings or structures.

1.3 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally 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 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

A. Stripped topsoil and other materials indicated to be stockpiled shall remain on the Owner's property, unless noted or otherwise indicated.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises or where indicated.

C. Utility Locator Service: Notify Louisiana One Call for area where Project is located before site clearing.

D. Do not commence site clearing operations until temporary erosion control, sedimentation control, and tree/plant-protection measures are in place.

E. The following practices are prohibited within protection zones:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Foot traffic.
   4. Erection of sheds or structures.
   5. Impoundment of water.
   6. Excavation or other digging unless otherwise indicated.
   7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

F. Prohibit heat sources, flames, and ignition sources within or near protection zones.

G. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."
   1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer.
   1. Use coating with a VOC content of 3.5 lb/gallons or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Flag each tree trunk at 54 inches above the ground.

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
SECTION 311000 - SITE CLEARING

3.3 TREE AND PLANT PROTECTION

A. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
   1. Arrange with utility companies to shut off indicated utilities.
   2. Owner will arrange to shut off indicated utilities when requested by Contractor.

B. Locate, identify, and disconnect utilities indicated to be abandoned in place.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Architect not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Architect’s written permission.

D. Removal of underground utilities is included in earthwork sections and with applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security and utilities sections and Section 024116 “Structure Demolition” and Section 024119 “Selective Demolition.”

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
   1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
   2. Grind down stumps and remove roots, obstructions, and debris to a depth of 24 inches below exposed subgrade.
   3. Use only hand methods for grubbing within protection zones.
   4. Remove tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth as specified in the “Earth Moving” section, and compact each layer to a density equal to adjacent original ground.
3.6 **TOPSOIL STRIPPING**

A. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials.

B. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.7 **SITE IMPROVEMENTS**

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

3.8 **DISPOSAL OF SURPLUS AND WASTE MATERIALS**

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner’s property.

END OF SECTION 311000
DIVISION 32

TECHNICAL SPECIFICATIONS

EXTERIOR IMPROVEMENTS
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. Sidewalks
   2. Concrete Pads for Equipment

B. Related Sections:
   1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Action Submittals:
   1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experience installer who has completed pavement work 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.

B. Source Limitations: Obtain each type and class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

C. Concrete Testing Service: The Owner shall engage a qualified testing agency to perform field tests, material evaluation tests, and prepare test reports.
D. ACI Publications: Comply with ACI 301 unless otherwise indicated.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
   1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

C. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

D. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

E. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

F. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:
   1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C 150, Type I/II. Supplement with the following:
      a. Fly Ash: ASTM C 618, Class C or Class F. Maximum 15% by volume.

B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source.
      a. Do not use fine or coarse aggregates containing substances that will cause spalling.

C. Water: Potable and complying with ASTM C 94.

2.4 ADMIXTURES


B. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
   1. Water-Reducing Admixture: ASTM C 494, Type A.
   2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
   3. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
   4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Anti-Hydro International, Inc.; A-H Curing Compound #2 WP WB.
      b. Conspec by Dayton Superior; D.O.T. Resin Cure White.
c. Kaufman Products, Inc.; Thinfil 450.
d. Lambert Corporation; AQUA KURE - WHITE.
e. L&M Construction Chemicals, Inc.; L&M CURE R-2.
f. Meadows, W. R., Inc.; 1100-WHITE SERIES.

2.6 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881/C 881M, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Plastic Sheeting or Visqueen: 6 mil thickness, clear.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
3. Slump Limit: 4 inches, plus or minus 1 inch.

C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Fly Ash: 15 percent of total cementitious material maximum.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Furnish batch certificates for each batch discharged and used in the Work.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after non-conforming conditions have been corrected and subgrade is ready to receive pavement.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Butt Joints in Walks (Not for Use in Parking and Drive Paving): Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Isolation Joints: Form isolation joints of preformed 3/4” wide asphalt impregnated joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Where shown, locate expansion joints at intervals of 50 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint. Apply pavement sealant to flush with pavement slab.

D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, visqueen placement, and items to be embedded or cast-in.

B. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

C. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

D. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

E. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

F. Place welded wire fabric or fabricated bar mats immediately into final position, centered in slab unless noted or detailed otherwise.

1. Remove and replace lower portions of pavement that have been placed for more than 15 minutes without being covered with a top layer of concrete or use a bonding agent if approved by the Designer.

G. Screed paving surface with a straightedge and strike off.

H. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

I. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1.

J. Hot-Weather Placement: Comply with ACI 301 when hot-weather conditions exist.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surface to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish for Walks: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during
finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 1/4 inch.
3. Surface: Gap below 10-foot long, unleveled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Representative samples of fresh concrete shall be obtained according to ASTM C 172, according to the following requirements:

1. Testing Frequency: ASTM C 69; one (1) set for each day's pour of each concrete class exceeding 5 cubic yards, but less than 25 cubic yards, plus one (1) set for each additional 50 cubic yards. One (1) sample shall be tested at 7 days and two
(2) samples at 28 days. One (1) sample shall be retained in reserve for later testing if required.

a. When total quantity of a given class of concrete is less than 50 cubic yards, the Designer may waive compressive strength testing if adequate evidence of satisfactory strength is provided.

b. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143; one test at point of placement for each compressive strength test, but not less than one test for each day’s pour of each concrete mixture. Additional tests shall be required when concrete consistency appears to change.

3. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of four (4) standard cylinder specimens for each compressive strength test, unless otherwise indicated. Additional tests will be required when concrete consistency changes.

4. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

   a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Designer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor’s expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.
3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Designer.

B. Drill test cores, where directed by Designer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with Portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313
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. Chain-link fences.

B. Related Sections:
   1. Section 033053 "Miscellaneous Cast-in-Place Concrete" for cast-in-place concrete post footings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.
   1. Fence and gate posts, rails, and fittings.
   2. Chain-link fabric, reinforcements, and attachments.
   3. Gates and hardware.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For the following to include in operation and maintenance manuals:
   1. Gate hardware.
1.6 QUALITY ASSURANCE

A. Pre-installation Conference: Conduct conference at Project site.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.8 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which manufacturer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

   1. Failures include, but are not limited to, the following:
      a. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist. Comply with CLFMI Product Manual and with requirements indicated below:

   1. Fabric Height: As indicated on Drawings.
   2. Steel Wire Fabric: Wire with a diameter of 0.148-inch, 9 gauge.
      a. Mesh Size: 2 inches.
      b. Zinc-Coated Fabric: ASTM A 392, Type II, Class 2, 2.0 oz./sq. ft. with zinc coating applied before weaving.

   3. Selvage: Knuckled at both selvages.

2.2 FENCE FRAMING

A. Posts and Rails: Comply with ASTM F 1043 for framing, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 and ASTM F 1083 based on the following:

   1. Fence Height: As indicated on Drawings.
2. Heavy Industrial Strength: Material Group IA, round steel pipe, Schedule 40, hot dipped galvanized.
   a. Line Post: 2.5-inch nominal O.D.
   b. End, Corner and Pull Post: 3-inch nominal O.D.

   a. Top Rail: 1.66-inch nominal O.D.


5. Metallic Coating for Steel Framing:
   a. Type A, consisting of not less than minimum 2.0-oz/sq. ft. average zinc coating per ASTM A 123.

2.3 TENSION WIRE

A. Metallic-Coated Steel Wire: 7 gauge, 0.177-inch-diameter, marcelled tension wire complying with ASTM A 817 and ASTM A 824, with the following metallic coating:
   1. Type II, zinc coated (galvanized) by hot-dip process, with the following minimum coating weight:

2.4 SWING GATES

A. General: Comply with ASTM F 900 for gate posts and single swing gate types.
   1. Gate Leaf Width: As indicated.
   2. Gate Fabric Height: As indicated.

B. Pipe and Tubing:
   1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083.
      a. Frame: 2-inch nominal O.D., provide center rail member.
   2. Gate Posts: Match fencing end posts.

C. Frame Corner Construction: Welded.

D. Hardware:
   1. Hinges: 360-degree inward and outward swing.
   2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Drop Rods: Where double gates are installed over paved areas, provide one drop rod for each leaf of the double gate. Install galvanized pipe stops in slab to secure gates in open and closed positions.
   a. Diameter and Material: 1/2-inch diameter, galvanized.
   b. Length: 36 inches.

2.5 FITTINGS

A. General: Comply with ASTM F 626.

B. Post Caps: Provide for each post.
   1. Provide line post caps with loop to receive top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:
   1. Top Rail Sleeves: Galvanized, pressed-steel or round-steel tubing not less than 6 inches long.
   2. Rail Clamps: Line and corner boulevard clamps for connecting rails in the fence line-to-line posts.

E. Tension and Brace Bands: Galvanized steel.

F. Tension Bars: Hot dipped galvanized steel, 3/4-inch wide, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and tumbuckle or other means of adjustment.

2.6 ANCHORING CEMENT

A. Erosion-Resistant Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer, for exterior applications.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.

1. Install fencing on established boundary lines inside property line.

3.3 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete.

2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter. Post bottom shall set no less than 3 inches above the excavation bottom.

   a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
   b. Concealed Concrete: Top below grade as indicated on Drawings to allow covering with surface material.
   c. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
   d. Posts Set into Voids in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with anchoring cement, mixed and placed to comply with anchoring
material manufacturer’s written instructions, and finished sloped to drain water away from post.

C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more.

D. Line Posts: Space line posts uniformly at approximately 10 feet on center.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at mid-height of fabric higher than 72 inches, on gates, and on fences with top rail and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch-diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches on center. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:

1. Extended along bottom of fence fabric. Install bottom tension wire within 2 inches of bottom of fabric and tie to each post with not less than same diameter and type of wire.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

H. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 12 inches on center.

J. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches on center and to braces at 24 inches on center.

K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.
3.4 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.5 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware, gate operator if applicable, and other moving parts.

END OF SECTION 323113