Project Specifications

For

CALCASIEU PARISH POLICE JURY

CALCASIEU CORRECTIONAL CENTER
AND
ADMINISTRATION IMPROVEMENTS PROJECT

Bid#: DB-2018-FM-180

Prepared by:

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March 4, 2019
PROJECT #: 17290

SET #: 
CALCASIEU PARISH POLICE JURY

CALCASIEU CORRECTIONAL CENTER

AND

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The Parish Purchasing Agent, on behalf of the Police Jury of Calcasieu Parish, Louisiana, does hereby advertise for sealed bids and will open same on:

1. Tuesday, April 30, 2019.

2. At the Office of the Parish Purchasing Agent on the second floor of the Parish Government Building, 1015 Pithon Street, Lake Charles, Louisiana, 70601, at the hour of 2:00 p.m. Central Time Zone.

3. For the Calcasieu Correctional Center and Administration Improvements Project (Bid #DB-2018-FM-180).

4. Contract documents, including drawings and technical specifications, are on file at the office of Associated Design Group, INC, 3004 Ryan Street, Lake Charles, Louisiana, 70601, or by calling 337/602-6295. Access to electronic bidding is available through [www.cppj.net](http://www.cppj.net). A CD containing a complete set of documents may be obtained from the Project Engineer. There will be no charge for the CD.

*Prime bidders is defined as licensed Building Contractors bidding this job as such.

5. Preference is given to materials, supplies, and provisions that are produced, manufactured, or grown in Louisiana, quality being equal to articles offered by competitors outside the State.

6. All bids must be accompanied by bid security equal to five percent (5%) of the sum of the base bid and all alternates, and must be in the form of a certified check or cashier’s check drawn on a bank insured by the FDIC, or a Calcasieu Parish Police Jury Bid Bond Form contained in contract documents, shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents, all in accordance with LSA—R.S. 38:2218. No Bid Bond indicating an obligation of less than five percent (5%) by any method is acceptable. If bid is submitted electronically, an electronic bid bond as described in LSA—R.S. 38:2212 E.(1) per the standards adopted by the office of the governor, division of administration and the office of the information technology as provided for in LAC 4:XV.701 will be required.

7. The successful bidder shall be required to furnish a Performance and Payment Bond in an amount equal to 100% of the Contract amount, shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents, all in accordance with LSA—R.S. 38:2219.
8. Bids shall be accepted only from contractors who are licensed under LSA—R.S. 37:2150-2163 for the classification of “Building Construction.” No bid may be withdrawn for a period of forty-five (45) days after receipt of bids, except under the provisions of LSA—R.S. 38:2214.

9. The Owner reserves the right to reject any and all bids for just cause as permitted by LA R.S. 38:2214B. The ability of an Entity to reject any bid is applicable only when administered in accordance with the Public Bid Law. In accordance with LSA—R.S. 38:2212B(1), the provisions and requirements of this Section, and those stated in the bidding documents shall not be waived by any entity.

10. The public shall incur no obligation to the Contractor until the Contract between the Parish and the Contractor is fully executed.

11. A Pre-Bid Conference will be held on Thursday, April 4, 2019, at 2:00 p.m. Central Time Zone at the Calcasieu Correctional Center, located at 5410 Broad Street, Lake Charles, Louisiana, 70615.

12. Official action on this bid will be taken within forty-five (45) days by the Calcasieu Parish Police Jury, except as may be extended by mutual written consent with the lowest responsible bidder.

13. All bids must be plainly marked and should contain the following on the outside of the envelope:

   BID FOR “Calcasieu Correctional Center and Administration Improvements Project
   (Bid # DB-2018-FM-180)”

   KEVIN WHITE, President
   Calcasieu Parish Police Jury

RUN: Lake Charles American Press – April 1, 2019
April 8, 2019
April 15, 2019
INSTRUCTIONS TO BIDDERS

ARTICLE I

Definitions

1.1 The bidding documents include the following:
Front End Documents-Bid Packages for Construction
Advertisement for Bids
Instructions to Bidders
Insurance Requirements
Scope of Work
Louisiana Uniform Public Work Bid Form
Louisiana Uniform Public Work Unit Price Form
Bid Bond
Subcontractor Listing
Contractor Compliance Certificate on State & Local Residency Requirements
Contractor Compliance Certificate on Electrical Subcontractors
Non-Collusion Affidavit of Prime Bidder
Affidavit (R.S. 38:2224 2190 2290-2296)
Attestation Form (R.S. 38:2227)
Affidavit Form (R.S. 38:2212.10)
Monthly Form State & Local Residency Requirements
Monthly Form Electrical Subcontractors Certification
General Conditions of the Contract for Construction,
AIA Document A201-2007
Supplementary Conditions
Contract Form
Performance and Payment Bond Form
Louisiana Department of Revenue Form R-1020
Change Order Form
Recommendation of Acceptance Form
Beneficial Occupancy Form
Specifications
Drawings
Addenda issued during bid period and acknowledged in Bid Form
Special Provisions
Roofing Manufacturing Warranty & Approved Applicator Letter (if applicable)
Verification of Items in Supplementary Conditions

1.1.1 Forms turned in with the bid. The Louisiana Uniform Public Work Bid Form, Bid
Bond Form, and a Corporate Resolution or written evidence of the authority of the
person signing the bid are the only forms that are turned in by the date and time
specified.
1.1.2 Forms turned in within ten (10) days after the bid opening. The Subcontractor’s Listing, the Contractor Compliance Certificate on State and Local Residency Requirements, the Contractor Compliance Certificate on Electrical Subcontractors, the Non-Collusion Affidavit of Prime Bidder, the Affidavit (LSA – R.S. 38:2224 2190 2290-2296), Attestation Form (R.S. 38:2227), Affidavit Form (R.S. 38:2212.10), and the Roofing Manufacturing Warranty and Approved Applicator Letter (if applicable). These forms can be sent to the Project Architect or Project Engineer, on behalf of the Police Jury.

1.2 All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201-2007, or in other Contract Documents are applicable to the Bidding Documents.

1.3 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.

1.4 A Bid is a complete and properly signed bid to do the work or designated portion thereof for the sums stipulated therein supported by data called for by the Bidding Documents.

1.5 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.

1.6 An Alternate Bid (or Alternate) is an item on the bid form that may either increase or decrease the quantity of work or change the type of work within the scope of the project, material, or equipment specified in the bidding documents or both.

1.7 A Unit Price Form shall be used if the contract includes unit prices and will be made a part of the bid documents, if applicable.

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

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

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

1.11 The executed Contract between the parties shall include all plans, specifications, instructions, general conditions, any addenda issued, and the proposal, including alternates, unit prices, and allowances (if applicable) of the bid.
ARTICLE II

Bidder’s Representation

2.1 Each Bidder by making his bid represents that:

2.1.1 He has read and understands the Bidding Documents and his bid is made in accordance therewith.

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

2.1.3 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 III

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 (10) 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 of misinterpretation resulting from the use of incomplete sets of Bidding Documents.

3.1.3 In accordance with LSA—R.S. 38:2212 E., Public entities shall provide, as an additional bidding option, a uniform and secure electronic interactive system for the submittal of bids for public works requiring competitive bidding. The Calcasieu Parish Police Jury has implemented the procedures related to this requirement that electronic bidding be an option for contractors to submit bids on all parish projects.
3.1.4 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 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 or 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 No substitution will be considered unless written request for approval has been submitted by the Proposer and has been received by the Architect no later than seven (7) working 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.

3.3.3 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 (72) hour 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. The Calcasieu Parish Police Jury shall be consulted prior to the 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 IV

Bidding Procedures

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 typewriter or manually in ink or electronically, if requested.

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 interlineations, 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 or Unit Prices should such be required in the Bid Form. Failure to submit alternate prices will render the bid informal and may cause its rejection.
INSTRUCTIONS TO BIDDERS

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

4.1.7 The bidding documents shall only require the following information at the time designated in the advertisement for bid opening: Bid Security or Bid Bond, Acknowledgment of Addenda, Base Bid, Alternates, Signature of Bidder, Name, Title, and Address of Bidder, Name of Firm or Joint Venture, Corporate Resolution or written evidence of the authority of the person signing the bid and Louisiana Contractors License Number, and unit price information on public works projects where required. Written evidence of authority of the person signing the bid for public works shall be submitted at the time of bidding. Written evidence of authority and all supporting documents detailed in R.S. 38:2212 (5).

4.1.8 On any Bid in excess of Fifty Thousand Dollars ($50,000), 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 of his duly authorized representative as well as on the outside of the Bid envelope.

4.2 Bid Security

4.2.1 All bids must be accompanied by bid security equal to five percent (5%) of the sum of the base bid and all alternates, and must be in the form of certified check or cashier’s check drawn on a bank insured by the FDIC, or a Police Jury Bid Bond Form contained in contract documents, shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents. No Bid Bond indicating an obligation of less than five percent (5%) by any method is acceptable.

Bid security furnished by the Contractor shall guarantee that the Contractor will, if awarded the work according to the terms of his bid, enter into the Contract and furnish the Performance and Payment Bonds as required by these Contract Documents, within fifteen (15) days after written notice that the instrument is ready for 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 stipulated 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 Electronic Submission. In accordance with LSA—R.S. 38:2212 E., Public entities shall provide, as an additional bidding option, a uniform and secure electronic interactive system for the submittal of bids for public works requiring competitive bidding. The Calcasieu Parish Police Jury has implemented the procedures related to this requirement that electronic bidding be an option for contractors to submit bids on all parish projects.

4.3.2 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 Police Jury at the appointed place and prior to the announced time for the opening of bids. Late delivery of a bid for any reason, including late delivery by U. S. Mail, or express delivery, shall disqualify the bid. The bid envelope shall be identified on the outside with the name of project, and name, address, and license number of the Bidder.

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 Post Office Drawer 3287, Lake Charles, LA 70602-3287.

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.

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

Oral, telephonic, or telegraphic bids or modifications to bids, with the exception of the electronic procedures provided for herein, are invalid and will not receive consideration. Owner will not consider notation written on outside of Bid Envelope which has 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 Bidder so agrees in submitting his bid, except in accordance with LSA—R.S. 38:2214 C., 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 of 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 V
Consideration of Bids

5.1 Opening of Bids

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

5.2 Rejection of Bids

5.2.1 The Owner reserves the right to reject any and all bids for just cause as permitted by LA 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 LSA—R.S. 38:2212 B.(1), the provisions and requirements of this Section and those stated in the bid documents shall not be waived by any entity. 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.
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5.3 Acceptance of Bid

5.3.1 Determination of the low bidder shall be on the basis of the sum of the Base Bid and Alternates accepted. The Owner reserves the right to accept Alternates in any order, which does not affect determination of the lower Bidder.

5.3.2 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 VI

Post Bid Information

6.1 Forms required within ten (10) days after the bid opening.

6.1.1 The apparent low bidder shall submit to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening, a list of all Subcontractors or other persons or organizations (if any) proposed for the principal portions of the work. Also, the Contractor shall provide a designation of the work to be performed by the Contractor with his own forces.

6.1.2 See enclosed Subcontractor’s Listing Form. The specifications on projects of public improvement shall set forth those categories of subcontractors whose names must be submitted and shall provide that no subcontractor whose name has not been included on the list submitted by the apparent low bidder to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening, may be engaged in connection with the project as bid or perform work in connection therewith unless any change or modification has been approved by the Police Jury, or unless the general contractor has submitted to the Police Jury an affidavit in the appropriate format certifying that he has entered into bona fide written contracts with the listed subcontractors. In the latter case, Police Jury approval of any modification will not be required, but notice of the change must be given to the Police Jury prior to the actual change.

6.1.3 In addition to the list of names of subcontractors submitted in conjunction with a project of public improvement, the subcontractor’s license number and federal identification number shall also be provided.

6.1.4 See enclosed Contractor Compliance Certificate on State & Local Residency Requirements. There shall be a requirement that not less than eighty percent (80%) of the persons employed in fulfilling of this contract be residents of the State of
Louisiana. In addition, there shall be a requirement that not less than fifty percent (50%) of the persons employed in fulfilling of this contract be residents of Calcasieu Parish in accordance with LA—R.S. 38:2225.1 B. (1) and (2). The Calcasieu Parish Police Jury further requests that not less than eighty percent (80%) of the persons employed in fulfilling of this contract be residents of Calcasieu Parish. This form shall be executed and submitted to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening by the apparent low bidder.

6.1.5 See enclosed Contractor Compliance Certificate on Electrician Subcontractors. There shall be a requirement that any party bidding to perform electrical work of any nature under this contract shall not be deemed a “responsible bidder” unless it certifies that it will employ electricians on the project(s) in question who are certified as participating in a program of training and education or as having successfully completed such programs that are conducted or supervised by the National Joint Apprenticeship and Training Committee of the Electrical Industry and the Louisiana Department of Labor, Office of Regulatory Services, Labor Programs Section, Apprenticeship Division. The electrical sub-contractor shall provide through the general contractor on a monthly basis a signed certificate on a form provided by the Parish verifying compliance with the provisions of this section. This form shall be executed and submitted to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening by the apparent low bidder.

6.1.6 See enclosed Non-Collusion Affidavit of Prime Bidder. The apparent low bidder shall execute the Non-Collusion Affidavit of Prime Bidder, and it must be submitted to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening.

6.1.7 See enclosed Affidavit (RS 38:2224, 2190, 2290-2296). The apparent low bidder shall execute an affidavit, in accordance with LSA—R.S. 38:2290-2296 as amended, to the effect that he has not entered in to a collusive agreement with any other person, firm or corporation in regard to any bid submitted to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening.

6.1.8 See enclosed Attestation Form (R.S.38:2227). The apparent low bidder shall execute an attestation, in accordance with LSA—R.S. 38:2227 to the effect that he has have past criminal convictions and it must be submitted to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening.
6.1.9 See enclosed Affidavit Form (RS 38:2222.10). The apparent low bidder shall execute an affidavit, in accordance with LSA—R.S. 38:2222.10 (C), that he is registered and participates in a status verification system, that he shall continue during the term of the contract, and shall require all subcontractors to submit a sworn affidavit verifying compliance. This form must be submitted to the Calcasieu Parish Police Jury, or the Project Architect or Project Engineer, on behalf of the Calcasieu Parish Police Jury, within ten (10) days after the bid opening.

6.2 At the preconstruction conference, the Contractor shall submit the following information to the Architect:

A breakdown of the contract cost into divisions of the C.S.I. No payments will be made to the Contractor until this is received.

ARTICLE VII
Performance and Payment Bonds

7.1 Bonds Required

7.1.1 The successful bidder shall be required to furnish a Performance and Payment Bond in an amount equal to 100% of the Contract amount, shall be written by a surety or insurance company currently on the U.S. Department of the Treasury Financial Management Service list of approved bonding companies which is published annually in the Federal Register, or by a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A.M. Best's Key Rating Guide to write individual bonds up to ten percent of policyholders' surplus as shown in the A.M. Best's Key Rating Guide or by an insurance company in good standing licensed to write bid bonds which is either domiciled in Louisiana or owned by Louisiana residents.

7.2 Time of Delivery and Form of Bond

7.2.2 Bond shall be in the form furnished by the Calcasieu Parish Police Jury, entitled 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 VIII
Contract
8.1 Form to be Used

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

8.2 Award

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

ARTICLE IX

Insurance Requirements

SEE ATTACHED INSURANCE REQUIREMENTS

ARTICLE X

Completion Time & Stipulated Damages

The completion of the Contract must be within the time stated in the Special Provisions section included in these bid documents, subject to such extensions as may be granted under AIA Document A201-2007, 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, Stipulated Damages in the amount as stated in the Special Provisions section included in these bid documents.

ARTICLE XI

Pre-Bid Conference

11.1 If deemed necessary, a pre-bid conference may be held at the Parish Government Building at least ten days before the date for receipt of bids. The Architect shall coordinate the setting of the date, time, and place for the pre-bid conference and shall invite, in writing, the Owner and all who have received sets of the Bidding Documents to attend. 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 XII

Local Preference

12.1 The Calcasieu Parish Police Jury has gone on official record encouraging General Contractors and Subcontractors domiciled in Calcasieu Parish to participate in this project, and further, expressing the preference of the Police Jury that such Calcasieu Parish businesses obtain the work through the bid process. Also, the Police Jury expresses its desire that fair wages be paid to employees working on the contract.

ARTICLE XIII

Use of Minority Subcontractors

13.1 The Calcasieu Parish Police Jury has gone on official record to encourage General Contractors to award at least ten percent (10%) of their subcontracted work to minority contractors.

13.2 For the purposes of this Article, minority shall be defined as stipulated by LA—R.S. 38:2233.2E. (1) (2) which are as follows:

E. (1) “Minority” means a person who is a citizen or lawful permanent resident of the United States and who is:

(a) American Indian or Alaskan Native: having origins in any of the original peoples of North America.

(b) Asian American: having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

(c) Black: having origins in any of the black racial groups of Africa.

(d) Female.

(e) Hispanic: of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish or Portuguese culture or origin regardless of race.

(2) “Minority business enterprise” or “Minority-owned business” means a small business organized for profit performing a commercially useful function which is owned and controlled by one or more minority individuals or minority business enterprises. “Owned and controlled” means a business in which one or more minorities or minority business enterprises own at least fifty-one percent or in the
case of a corporation at least fifty-one percent of the voting stock and control at least fifty-one percent of the management and daily business operations of the business.

ARTICLE XIV

Sales and Use Tax Exemption

14.1 In accordance with applicable rules adopted 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 State Department of Revenue which form shall be part of the contract between the Owner, the Calcasieu Parish Police Jury, and the contractor. A copy of this form is hereby made part of these front end documents.

The agency relationship between the Owner and the contractor and all subcontractors shall relieve the contract 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 or 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 is leased and used exclusively for the project or work. Accordingly, in preparing their bids and computing costs, the contract and subcontractors shall not consider sales and/or use taxes which would otherwise be due.

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 Police Jury.

Rules and regulations of the Louisiana Department of Revenue shall prevail over any conflicting provisions or specifications of the contract.
ARTICLE XV

Drug Screen Testing

15.1 By submittal of this bid, contractor hereby certifies that it has in place and employs a pre-employment drug screen test for each employee of contractor and administers periodic random drug screen testing for each such employee and agrees that it will not enter into any subcontractor agreement, whether verbal or written, unless said subcontractor has in place and employs pre-employment drug screen testing and periodic random drug screen testing. All such pre-employment drug screen testing and random testing shall meet or exceed the standards for drug screen testing as promulgated by the Associated General Contractors of Louisiana.

ARTICLE XVI

Dismissal of Contractor’s Employee

16.1 At the request of the Parish, the Contractor shall remove from the Parish’s project, any employee of Contractor or sub-contractor. Any work of the Contractor may be suspended until such removal has occurred. The Contractor shall indemnify the Parish against any claims arising from the removal of any such employee from the Parish’s project.
Section A - Types of Coverage Required

Where applicable, any Contractor, Subcontractor, Consultant, Architect, Engineer, Other Professional or Vendor (hereinafter referred to as Contractor collectively), who performs services for the Owner in the amount of one hundred thousand dollars or greater shall maintain the following insurance coverage with insurance companies acceptable to the Owner. Those insurance companies must be rated in the current A.M. Best Rating Guide with an “A-“rating or better. In the event that insurance requirements are included elsewhere within any other procurement documents, the requirements contained within this article shall supersede any such reference.

In connection therewith, the Contractor agrees to provide to the Owner, at the Contractor’s expense and prior to any entry on the Owner’s property, proof of liability insurance coverage set forth. The Contractor agrees to furnish to the Owner certificates evidencing said insurance coverage for the full term of this agreement which certificates shall name the Owner as an additional named insured on all policies except errors and omissions policies and shall provide for thirty (30) days advanced written notice to the Owner in the event of cancellation or alteration of the policies.

The Contractor agrees to maintain the coverage limits and endorsements as listed herein. The Contractor’s obligation to provide the required insurance will not be waived by the Contractor’s failure to provide the certificate of insurance, the Owner’s acceptance of a certificate of insurance showing coverage varying from the required coverage, or the Owner’s allowance to commence work.

No work shall commence under any contract until the following insurance coverage is obtained by the Contractor:

(1) Worker’s Compensation

   (a) Standard Louisiana Coverage (Always Required) – Worker’s Compensation coverage: (i) should cover all employees, including owners, (ii) must be statutory for medical and indemnity and (iii) should have a minimum limit for employer’s liability of:

   Employer’s Liability -
   $1,000,000 each accident
   $1,000,000 each employee – disease
   $1,000,000 policy limit – disease

   (b) Maritime Coverage

   □ Required    ☒ Not Required

   When specifically required by the Owner (as denoted with an “X” in the above “Required” box), the Contractor shall procure and maintain during the life of this contract a Worker’s Compensation Policy specifically covering maritime activities. The scope of the project will determine whether maritime insurance is required but if the project is going to be performed over any body of water then this separate coverage should be obtained.
(2) Contractor’s Liability Insurance (Always Required)

(Note: The term Contractor refers collectively, where applicable, to any Contractor, Subcontractor, Consultant, Architect, Engineer or Vendor performing services for the Owner)

(a) Contractor’s Comprehensive General Liability
("Claims Made Policies" may not be used)

$1,000,000 per occurrence
$2,000,000 general aggregate (☐ Limit applies to specific project □ Limit applies to policy)
$1,000,000 products/completed operations aggregate
$1,000,000 personal injury and advertising coverage

Sub Contractor Comprehensive General Liability – Any Sub Contractors utilized on the project will be (☐ Required □ Not Required) to maintain the above comprehensive general liability policy limits.

(b) Contractor’s Automobile Liability (Owner, Non-Owned, and Hired Car)

$1,000,000 per occurrence

Sub Contractor Automobile Liability – Any Sub Contractors utilized on the project will be (☐ Required □ Not Required) to maintain the above automobile liability policy limits.

(c) Contractor’s Umbrella Policy

Unless specifically excluded for project specific reasons, the Contractor shall procure and maintain during the life of this contract an Umbrella Policy as follows:

$5,000,000 each occurrence
$5,000,000 general aggregate

☐ Coverage Specifically Excluded For Project

(3) Owner’s Contractor Protective Liability Policy (OCP Policy)

☐ Required □ Not Required

When specifically required by the Owner (as denoted with an “X” in the above “Required” box), the Contractor shall procure and maintain during the life of this contract an Owner’s Contractor Protective Liability Policy (OCP) in a minimum amount of $1,000,000 (per occurrence) and $2,000,000 (general aggregate). This type of policy provides the Owner with separate coverage up to the above limits as opposed to shared coverage when the Owner is only named as an additional insured on the Contractor’s main policy.
(4) Property Insurance (Builder’s Risk Insurance)

- Required □ Not Required

When specifically required by the Owner (as denoted with an “X” in the above “Required” box), the Contractor shall purchase and maintain property insurance covering the work site up to the full insurable value equal to the Contract sum and the insurance shall be endorsed to comply with any waiver of rights provisions. The property insurance shall be “All Risks Builder’s Risk Completed Value Form” insurance or equivalent manuscript policy, and shall include without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft including theft of materials whether or not attached to any structure, vandalism/malicious mischief, collapse, earthquake, windstorm, false work, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any law.

The property insurance shall also contain an endorsement or specific provision to cover damages, losses and expenses incurred in the repair or replacement of any insured property (including, but not limited to charges of engineers, architects, attorneys and others). The Property insurance also shall include by endorsement or special provision the following additional coverage elections: operational testing (if risk is present), off premises storage not on the site or in transit and property in transit. When required, no work may commence on the site until the Builder’s Risk Insurance is obtained.

The Contractor is to provide Builder’s Risk Insurance to protect the Owner, Architect, Engineer, Contractor, and any Subcontractors as to any interests that may exist. Until acceptance of work by the Owner, all work in connection with a particular contract is in the custody, charge and care of the Contractor who will take every necessary precaution against injury or damage to any part thereof whether arising from execution or from the non-execution of the work.

Contractor shall be responsible for payment of the deductible for Builder’s Risk Insurance or any other property coverage deemed required to be purchased for this Contract, whether acquired by the Owner or otherwise.

(5) Errors & Omissions Policy (Professional Liability Insurance)

(Applicable Only to Professional Services Contracts including, but not limited to, Architect, Engineer, Consultant or Other Professional Contracts)

□ Required  ■ Not Required

This policy covers negligent acts, errors and omissions in its performance of professional services with minimum policy limits of $1,000,000 per occurrence and $1,000,000 general aggregate.
Section B – Other Insurance Requirements

(1) Additional Insured Classification and Waiver of Subrogation (Always Required)

The Owner must be listed as an additional insured on all policies except for worker’s compensation and professional liability insurance policies. All policies will provide a thirty day written notice of cancellation. Waiver of subrogation will be given to the Owner on all policies which means that the Contractor’s insurer(s) will have no right of recovery or subrogation against the Owner.

Except for professional liability insurance, it is the intention of the parties that the insurance policy shall protect both parties and be the PRIMARY COVERAGE for any and all losses covered. Again all policies required above shall be primary to any insurance carried by the Owner. The insurance companies shall have no recourse against the Owner for payment of any premiums or for assessments under any of the above policies.

(2) Indemnification for all Contractors, Except for Architects, Engineers or Other Licensed Professionals (Always Required)

The Contractor will indemnify, defend, and hold harmless the Owner, including the Owner’s employees and agents, from and against any and all claims or liabilities, arising from the fault of the Contractor, its employees, subcontractors or agents in carrying out the Contractor’s duties and obligations under the terms of this agreement. The Owner will indemnify, defend, and hold harmless the Contractor, including the Contractor’s employees and agents, from and against any and all claims or liabilities, arising from the fault of the Owner, its employees or agents in carrying out the Owner’s duties and obligations under the terms of any agreement. This section will survive the termination of any agreement. In the event that either party takes any action to enforce this mutual indemnity provision, the prevailing party shall be entitled to recover reasonable attorney’s fees and costs arising as a result thereof.

(3) Indemnification for Architects, Engineers or Other Licensed Professionals (Always Required)

The Contractor will indemnify and hold harmless the Owner, including the Owner’s employees and agents, from and against any and all claims or liabilities, arising from the fault of the Contractor, its employees, subcontractors or agents in carrying out the Contractor’s duties and obligations under the terms of this agreement. The Owner will indemnify and hold harmless the Contractor, including the Contractor’s employees and agents, from and against any and all claims or liabilities, arising from the fault of the Owner, its employees or agents in carrying out the Owner’s duties and obligations under the terms of any agreement. This section will survive the termination of any agreement. In the event that either party takes any action to enforce this mutual indemnity provision, the prevailing party shall be entitled to recover reasonable attorney’s fees and costs arising as a result thereof.
(4) **Statutory Employer Status (Always Required Except for Architects, Engineers or Other Licensed Professionals)**

The Owner as principal whether as the direct or statutory employer, mutually agree with the Contractor that it is their intention, and the intention of the contract between them, to recognize the Owner as the statutory employer of the Contractor’s employees, whether direct or statutory, while the Contractor’s employees, direct or statutory, are performing work or services with respect to this contract. It is also recognized that the work contemplated by this contract is a part of the trade, business or occupation of the Owner and it is an integral part of or essential to the ability of the Owner to generate its goods, products or services. It is the express intention of the Owner and the Contractor that the Owner as the statutory employer, shall, in accordance with LSA—R.S. 23:1061, be granted the exclusive remedy protections of LSA—R.S. 23:1032, and shall be liable to pay any employee employed in the execution of the work, or to his dependent, compensation which it would have been liable to pay if the employee had been immediately employed by it. In the event the Owner is required as the statutory employer to pay any workers’ compensation benefits, it shall be entitled to indemnity from the Contractor for such benefits.
CALCASIEU PARISH POLICE JURY
CALCASIEU CORRECTIONAL CENTER
AND
ADMINISTRATION IMPROVEMENTS PROJECT
Bid#: DB-2018-FM-180

SCOPE OF WORK:

The scope of this project includes the following Base Bid items:

Replacement of a portion of the existing MTI Jail Security System computers, updated software, monitors and point of use UPS systems. In addition, this project includes the replacement of four motorized slider doors (located at Intake and at the Kitchen areas) and twenty (20) double swing door assemblies in the POD areas. Work includes the replacement of the door hardware, frames, embed plates, painting, block work, interconnection back to the existing MTI Security System, etc... for a complete and fully functioning system.

Replacement of existing sewer lift station pumps and control panel. Provide backup Macho Monster grinder with extended shaft and motor. Provide new electrical service to all new Mechanical components.

In the Sheriff’s Office Administration Building, replacement of one chiller and associated piping, two chilled water pumps and VFD’s, two hot water pumps and VFD’s, and addition of hot water chemical feeder. Provide all required electrical services, equipment and wiring to accommodate new Mechanical equipment. In addition, a new backup emergency generator (diesel powered) and distribution system to power designated loads at the Radio Room and Network Spaces.

In the Calcasieu Correctional Center, replacement of one chiller, six chilled water pumps and VFD’s, one hot water pump and two VFD’s, two boilers and associated piping and accessories, and addition of chilled water and hot water chemical feeders and air separator. Provide all required electrical services, equipment and wiring to accommodate new Mechanical equipment.

As part of Add Alternate #1, provide a unit cost to provide all parts, material, labor, etc. to provide and install One (1) additional double swing doors in the facility.

A part of Add Alternate #2, provide a unit cost to provide all parts, material, labor, etc. to replace individual assemblies of the double swing doors. Also, pricing is being obtained to replace some of the existing MTI Security System wiring for control and monitoring of the doors in the PODs.
TO: CALCASIE PARISH POLICE JURY
1015 PITHON STREET
LAKE CHARLES LA 70601
(Owner to provide name and address of owner)

BID FOR: Calcasieu Parish police Jury Calcasieu Correctional Center and Administration Improvements Project
Bid #DB-2018-FM-180
(Owner to provide name of project and other identifying information)

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: Associated Design Group, Inc. and dated: March 4, 2019.

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following ADDENDA: _______________.

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 (Provide a unit price to provide all parts, material, labor, etc...and install One (1) additional double swing doors in the facility) for the lump sum of: _______________ Dollars ($ _______________)

Alternate No. 2 (Provide a unit price to provide all parts, material, labor, etc... replace wiring from the MTI PLC/controller cabinet in one (1) Pod out to one (1) swing door located in that same Pod. See Sheet E-3, Keynote 5 for approximate location of MTI PLC/controller cabinet. Contractor shall note that this wiring for one door is run in a common conduit with other similar MTI control wiring and is run from this PLC/controller cabinet out to a central junction box. From this central junction box, it branches out to each individual door. This lump sum cost shall include the wiring complete from the PLC/controller cabinet out to each respective door and shall include all control and monitoring wiring associated with that particular door) for the lump sum of: _______________ Dollars ($ _______________)

Alternate No. 3 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of: 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:
* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** 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.
LOUISIANA UNIFORM PUBLIC WORK BID FORM  
UNIT PRICE FORM  

TO: CALCASIEU PARISH POLICE JURY
1015 PITHON ST 
LAKE CHARLES LA 70601  
(Owner to provide name and address of owner)  

BID FOR: Calcasieu Parish police Jury Calcasieu Correctional Center and Administration Improvements Project  
Bid #DB-2018-FM-180 
(Owner to provide name of project and other identifying information) 

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

<table>
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<tr>
<th>REF. NO.</th>
<th>QUANTITY</th>
<th>UNIT OF MEASURE</th>
<th>UNIT PRICE</th>
<th>UNIT PRICE EXTENSION (Quantity times Unit Price)</th>
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<td>Sheets E-3/E-4</td>
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DESCRIPTION: Base Bid or Alt. # 1  
Provide and install double swing door as per keynote #2.

DESCRIPTION: Base Bid or Alt. # 2  
Provide and install replacement of wiring to swing door as per bid form.

Wording for “DESCRIPTION” is to be provided by the Owner. 
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.
BID BOND
FOR
Calcasieu Parish Police Jury Calcasieu Correctional Center and
Administration Improvements Project

Date: ________________

KNOW ALL MEN BY THESE PRESENTS:

That ___________________________ of ____________________________, as Principal, and ____________________________, as Surety, are held and firmly bound unto the Calcasieu Parish Police Jury (Obligee), in the full and just sum of five (5%) percent of the total amount of this proposal, 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:

Calcasieu Parish Police Jury Calcasieu Correctional Center and Administration Improvements

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)
SUBCONTRACTOR LISTING
(See Post Bid Information, Article VI for further instructions.)

<table>
<thead>
<tr>
<th>Work Description</th>
<th>Subcontractor &amp; Location</th>
<th>√ if minority</th>
<th>Phone #</th>
<th>L.A. Contractor’s License #</th>
<th>Federal I.D. #</th>
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THIS FORM MUST BE SUBMITTED TO THE OWNER, OR PROJECT ARCHITECT/ENGINEER ON BEHALF OF THE OWNER, WITHIN TEN (10) DAYS AFTER THE BID OPENING.
CONTRACTOR COMPLIANCE CERTIFICATE
ON STATE & LOCAL RESIDENCY REQUIREMENTS

In accordance with Article VI, I hereby certify that this construction firm will comply with the requirements that certain percentages of state and local residents be hired on this project in accordance with the provisions of LSA—R.S. 38:2225.1 B. (1) and (2).

I acknowledge that the Calcasieu Parish Police Jury has invoked its authority under the provisions of the statutes, which are as follows:

B. (1) When a participating political subdivision lets a contract for a public works project that is to be administered by or paid for, in whole or in part, by said political subdivision’s funds, the governing authority of the political subdivision may require, as a condition of letting the contract, that not less than eighty percent of the persons employed in fulfilling that contract be residents of the State of Louisiana.

(2) In addition, when the governing authority of Calcasieu Parish may, upon a finding that there is substantial cause to counteract grave economic and social ills, require, as a condition of letting contracts for public works to be paid for solely with parish funds, that no less than fifty percent of the persons employed in fulfilling that contract be residents of Calcasieu Parish. Notwithstanding the provisions of this Paragraph, management personnel and persons whose skills are unavailable for performing the work may be excluded from the requirements of this Paragraph, as said governing authority may determine and provide for in the bid specifications.

I will complete the “Contractor’s Monthly Certification Affidavit” similar to that enclosed in these bid documents submit same at the required times during the course of this project.

BIDDER

BY: __________________________

____________________________________________
Name & Title

____________________________________________
Address

Date: ______________________

THIS FORM MUST BE SUBMITTED TO THE OWNER, OR PROJECT ARCHITECT/ENGINEER, ON BEHALF OF THE OWNER, WITHIN TEN (10) DAYS AFTER THE BID OPENING.
CONTRACTOR COMPLIANCE CERTIFICATE  
ON ELECTRICAL SUBCONTRACTORS

In accordance with Article VI, I, the undersigned, do hereby certify that this construction firm will comply with the following requirement of the Calcasieu Parish Police Jury:

Any party bidding to perform electrical work of any nature under this contract shall not be deemed a “responsible bidder” unless it certifies that it will employ electricians on the project(s) in question who are certified as participating in a program of training and education or as having successfully completed such programs that are conducted or supervised by the National Joint Apprenticeship and Training Committee of the Electrical Industry and the Louisiana Department of Labor, Office of Regulatory Services, Labor Programs Section, Apprenticeship Division. The electrical subcontractor shall provide through the general contractor on a monthly basis a signed certificate on a form provided by the Parish verifying compliance with the provisions of this section.

I will require the electrical subcontractor(s) to submit a signed certificate on the form provided by the Parish on a monthly basis, and said certificate will be submitted by this firm along with the monthly invoice and other appropriate documents.

_________________________________________
BIDDER

BY: _____________________________________

_________________________________________
NAME & TITLE

_________________________________________
ADDRESS

DATE: ______________________

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.
NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF LOUISIANA
PARISH OF CALCASIEU

_____________________________________, being first duly sworn, deposed and says that

(1) He is ______________ of ________________________________, the Bidder that has submitted the attached Bid:

(2) He is fully informed respecting the preparations and contents of the attached Bid and of all pertinent circumstances respecting such Bid:

(3) Such Bid is genuine and is not a collusive or sham Bid:

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communications or conference with any other Bidder or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through the collusion, conspiracy, connivance or unlawful agreement any advantage against the CALCASIEU PARISH POLICE JURY, or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees or parties in interest, including this affiant.

Company Name: ________________________________

By: ________________________________

__________________________________
Title

SUBSCRIBED AND SWORN TO BEFORE ME, NOTARY PUBLIC, on this _____ day of ______________________, 20__.

__________________________________
NOTARY PUBLIC

My Commission Expires: __________________________

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.
CALCASIEU PARISH POLICE JURY
PROJECT NO. _____________________
NAME: _________________________________
LOCATION: _____________________________

STATE OF LOUISIANA
PARISH OF CALCASIEU

Before me, the undersigned authority, duly commissioned and qualified within and for the State and the 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 as 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 the Part I of Chapter 10 of Title 38 of the LA. Revised Statutes 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 purpose of this section, a “substantial financial interest” shall exclude any interest in stock being traded on the American Stock Exchange or the New York Stock Exchange.
That affiant, if subject to the provisions of this section, does hereby agree to be 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 on this ____ day of ______________, 20____.

________________________________________

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.
ATTESTATION FORM  
(R.S. 38:2227)  
(Past Criminal Convictions of Bidders)  

Calcasieu Parish Police Jury Calcasieu Correctional Center and Administration Improvements Project  
NAME OF PROJECT

Appealer, 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 
      (R.S.14:67.20)                             payments (R.S. 14:202)
   (d) False accounting (R.S. 14:70)           (i) Malfeasance in office (R.S. 14:134)
   (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)  

Calcasieu Parish Police Jury Calcasieu Correctional Center and Administration Improvements Project  
NAME OF PROJECT  

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

L.A. 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.

____________________________________  ________________________________________________  
NAME OF BIDDER  

____________________________________  ________________________________________________  
NAME OF AUTHORIZED SIGNATORY OF BIDDER  

____________________________________  ________________________________________________  
DATE  

____________________________________  ________________________________________________  
TITLE OF AUTHORIZED SIGNATORY OF BIDDER  

____________________________________  ________________________________________________  
SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER  

____________________________________  
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.
MONTHLY FORM
CONTRACTOR COMPLIANCE FOR LOCAL AND STATE RESIDENCY REQUIREMENTS

NOTE: this Contract Compliance Executed Form shall be submitted on a monthly basis to the Calcasieu Parish Police Jury along with the Contractor’s Monthly Request for Payment. It must be properly completed, executed, totaled, and certified on the last page of this form by the authorized agent.

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### MONTHLY FORM

**CONTRACTOR COMPLIANCE FOR LOCAL AND STATE RESIDENCY REQUIREMENTS**

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<td>Subcontractor/Location</td>
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I, the undersigned, do hereby certify that the information provided herein of the total work force on this project listed below for the month of ____________, 20__, is true and correct and in compliance with Article XII of the Contract Documents.

**PROJECT:** ____________________________  **GENERAL CONTRACTOR:** ____________________________

**SIGNATURE OF AGENT:** ___________________________________________  **TITLE:** ____________________________________________
MONTHLY FORM
ELECTRICAL SUBCONTRACTOR’S CERTIFICATION
(See Post Bid Information, Article VI for further instructions)

NOTE: this electrical subcontractor’s certification shall be properly filled out, executed, and submitted by the electrical subcontractor(s) through the general contractor on a monthly basis, and must be attached to the monthly invoice submitted by the general contractor to the Calcasieu Parish Police Jury. Electrical subcontractor(s) may make more copies of this form, if additional pages are necessary.

PROJECT: __________________________________________

MONTH OF ________________, 20____.        Page _____ of _____ Pages

<table>
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<tr>
<th>NAME OF EMPLOYEES IN WORK FORCE THIS MONTH</th>
<th>PARTICIPATING/COMPLETED TRAINING &amp; EDUCATION PROGRAM (please check one)</th>
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CERTIFIED BY: __________________________________________

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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9 PAYMENTS AND COMPLETION
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11 INSURANCE AND BONDS
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14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

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

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
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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 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 and certify termination of the Agreement under Section 14.2.2.

§ 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.
§ 1.2.2 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 will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment 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 this 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 material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them 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 material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM
If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

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 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the
portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 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.

§ 2.2.3 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.

§ 2.2.4 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.

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

§ 2.3 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.

§ 2.4 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 written 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 deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner’s expenses and compensation for the Architect’s additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

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 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 2.2.3, 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 make 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 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, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and 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 written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required 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 authorized by the Architect in accordance with Sections 3.12.8 or 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
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.

§ 3.6 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 21 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 an equitable adjustment 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 in writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed 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 furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply 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 SCHEDULES
§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect’s approval. The Architect’s approval shall not unreasonably be 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, 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 maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Charge Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be 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 the way by which 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 requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing 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 written 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. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, 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, accuracy and
completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.1.2.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 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, and 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 and patching shall be restored to the condition existing prior to the cutting, fitting and 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 such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's 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 or 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 Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect 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 such 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 the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such 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 which 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 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.

§ 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. Consents shall not be unreasonably withheld.

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

§ 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, except as provided in Section 3.3.1.

§ 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 report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) 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 FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect’s consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 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 13.5.2 and 13.5.3, whether or not such 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, material and equipment 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, unless otherwise specifically stated by the Architect, 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 authorize 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 duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 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 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 or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

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

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

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

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, 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, which the Contractor, by these 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 in writing; 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 such 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...
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 Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 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 other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the 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, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 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 report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report 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, except as to defects not then reasonably discoverable.

§ 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 the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 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, and the Contractor shall proceed promptly, 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 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 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.

§ 7.3.6 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.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and 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 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers’ compensation insurance;
.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 related to the Work; and
.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 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 has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.
§ 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 an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order 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
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.

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

§ 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. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material 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 material 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, material suppliers, or other persons or entities making a claim by reason of having 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 issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect’s reasons for withholding certification in whole or in part 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 comprising the Application for Payment, that, to the best of the Architect’s knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. 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. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. 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 material 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 for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

§ 9.5.3 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 material or equipment suppliers 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 Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, 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 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 material and equipment 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 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, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment 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 and 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, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 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’ written 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 shut-down, 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, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the 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 such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such 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 as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor’s written 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 and, 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 terms and conditions of 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 and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewed to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, 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. If such lien 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 such lien, 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 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 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; or
.3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material 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 or the Contractor’s Subcontractors or Sub-subcontractors; 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 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 owners and users of adjacent sites and utilities.

§ 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, except damage or loss 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, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. 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 report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such 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 in the amount of the Contractor’s reasonable additional costs of shut-down, 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 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 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 indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance 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 indemnify 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 LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor’s operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:
1. Claims under workers’ compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor’s employees;
3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor’s employees;
4. Claims for damages insured by usual personal injury liability coverage;
5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
6. Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
7. Claims for bodily injury or property damage arising out of completed operations; and
8. Claims involving contractual liability insurance applicable to the Contractor’s obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect’s Consultants as additional insureds for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.

§ 11.2 OWNER’S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.
§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment

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property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days’ prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION
The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect’s consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect’s consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner’s property insurance 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 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner’s duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner’s exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND
§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specified specifically in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.
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, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner’s expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor’s expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK
§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION
The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after 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 an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the 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 2.4.

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

§ 12.2.3 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, whether completed or partially completed, of the Owner or separate contractors 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 12.2.2.2 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 except that, 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 such 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 such assignment.

§ 13.3 WRITTEN NOTICE
Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES
§ 13.4.1 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.

§ 13.4.2 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 in writing.

§ 13.5 TESTS AND INSPECTIONS
§ 13.5.1 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 (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating the cost to the Contractor.

§ 13.5.2 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 13.5.1, 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 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 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.

§ 13.5.4 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.

§ 13.5.5 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 time of place of testing.

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

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

§ 13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time 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 13.7.

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 or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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 promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor 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' written 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 for materials or labor in accordance with the respective
      agreements between the Contractor and the Subcontractors;
   .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 above reasons exist, the Owner, upon certification by the Initial Decision Maker that
   sufficient cause exists to justify such action, 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’ written 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 therein 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 as described in 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 written notice from the Owner of such termination for the Owner’s convenience, the
   Contractor shall
   .1 cease operations as directed by the Owner in the notice;
   .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work;
      and
   .3 except for Work directed to be performed prior to the effective date of termination stated in the notice,
      terminate all existing subcontracts and purchase orders and enter into no further subcontracts and
      purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment
   for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the
   Work not executed.
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, 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.

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written 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 must 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 CONTINUING CONTRACT PERFORMANCE
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. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST
If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME
§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein 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.

§ 15.1.5.2 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.

§ 15.1.6 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 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, 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 arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no 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 such 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 an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, 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 15.1.6 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 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. 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 Either party, at its sole discretion, 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 Either party, at its sole discretion, 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 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, 2007 Edition. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

Articles, Paragraphs, Subparagraphs or Clauses modified or deleted have the same numerical designation as those occurring in the General Conditions.

ARTICLE 1

GENERAL PROVISIONS

1.1  DEFINITIONS

1.1.1  THE CONTRACT DOCUMENTS

In Subparagraph 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."

1.5  OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE  [ REFER TO R.S. 38:2317 ]

1.5.1  Delete the first sentence of the paragraph.

1.5.1  In the third sentence: delete the remainder after the word “publication”.

ARTICLE 2

OWNER

2.2  INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1  Delete this paragraph.

2.2.2  In the first sentence, delete: all before "the Owner shall secure".
CONTRACTOR

3.4 LABOR AND MATERIALS

3.4.2 Delete this paragraph

3.6 TAXES

Delete Paragraph 3.6 and add the following:

“The Contractor shall not pay any State or local sales taxes for materials and equipment which become fixed and permanent property of the governmental entity for this project. All forms and guidelines shall be in accordance with the Louisiana Department of Revenue and Taxation.”

Contained in the bidding documents, the Louisiana Department of Revenue Form R-1020 entitled Designation of Construction Contractor as Agent of Governmental Entity and Exemption Certificate, for use by the Contractor, Subcontractors, and Material Suppliers for the Project which is required by the State of Louisiana Department of Revenue and Taxation, Sales Tax Division.

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS (R.S. 40:1724[A] )

Delete Subparagraph 3.7.5 and substitute the following:

3.7.5 “If, during the course of the Work, the Contractor discovers human remains, unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Water Act.”

3.8 ALLOWANCES

Delete Subparagraph 3.8.1, 3.8.2, and 3.8.3 in their entirety and add the following new Subparagraph 3.8.1:

3.8.1 Allowances shall not be made on any of the Work.

3.9 SUPERINTENDENT

3.9.1: Add the following to the end of the paragraph: “Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.”

3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES

3.10.1: Add the following: For projects with a contract sum greater than $1,000,000.00, the Contractor shall include with the schedule, for the Owner’s and Architect’s information, a network analysis submitted with each Application and Certificate for Payment. No payment will be made until this schedule is received.

3.10.3: Add the following: If the work is not on schedule, as determined by the Architect, and the Such default may be considered grounds for termination by the Owner for cause in accordance with 14.2.

Add: 3.10.4 Submittal by the contractor of a schedule or other documentation showing a completion date for his work prior to the completion date stated in the contract shall not impose any
ARTICLE 4
ARCHITECT

4.1 GENERAL

Delete Subparagraph 4.1.1 and substitute the following:

4.1.1 "The term Architect, when used in the Contract Documents, shall mean the prime Designer Agreement and is referred to throughout the Contract Documents as if singular in number."

4.2 ADMINISTRATION OF THE CONTRACT

4.2.1 In the first sentence, delete the phrase “the date the Architect issues the final Certificate described in Section 12.2.”

4.2.2 In the first sentence, after the phrase “become generally familiar with” insert the

In the first sentence, after the phrase “portion of the Work completed,” insert the

4.2.10 Add the following sentence to the end of Subsection 4.2.10:

"There will be no restriction on the owner having a Representative."

4.2.11 Add the following sentence to the end of Subsection 4.2.11:

“If no agreement is made concerning the time within which interpretation required of the after written request is made for them.”

4.2.14 Insert the following sentence between the second and third sentence of Subsection 4.2.14:

“If no agreement is made concerning the time within which interpretation required of the after written request is made for them.”

ARTICLE 5
SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Delete Subparagraph 5.2.1, and substitute the following:

5.2.1 Unless otherwise required by the Contract Documents, the Contractor shall furnish at the Pre-Construction Conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the work. No Contractor payments shall be made until this information is received."

Delete Subparagraph 5.2.2 and substitute the following:
5.2.2 The Contractor shall be solely responsible for selection and performance of all subcontractors. The Contractor shall not be entitled to claims for additional time and/or an increase in the contract sum due to a problem with performance or non-performance of a subcontractor.

Delete Subparagraph 5.2.3 and 5.2.4 and add the following:

5.2.3 The contractor shall notify the owner when a subcontractor is to be changed and substituted with another subcontractor.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS
Delete Subparagraphs 5.4.1, 5.4.2, and 5.4.3.

ARTICLE 7
CHANGES IN THE WORK

7.1 GENERAL

Add the following paragraph:

7.1.4 As part of the pre-construction conference submittals, the contractor is to submit the

- Fixed job site overhead cost itemized with documentation to support daily rates.
- Bond Premium Rate with supporting information from the General Contractor’s carrier.
- Labor Burden by trade for both Subcontractors and General Contractor.
- Internal Rate Charges for all significant company owned equipment.

7.2 CHANGE ORDERS
Delete Subparagraph clause 7.2.1, and substitute the following paragraphs:

7.2.1 "A Change Order is a written order to the Contractor signed by the Owner and the Architect, A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time."

7.2.2 "Cost of the Work” for the purpose of Change Orders shall be costs required to be incurred in

1. Wages paid direct labor personnel, delineating a labor burden markup for applicable payroll taxes, worker’s compensation insurance, unemployment compensation, and social security taxes.
2. Cost of all materials and supplies, including the identification of each item and its cost.
3. Identify each necessary piece of machinery and equipment and its individual cost.
4. Other documented direct costs.
Credit will not be required for overhead and profit.

7.2.3 “Overhead and profit” The Contractor and Subcontractor shall be due job-site and home office

The credit to the Owner resulting from a change in the work shall be the sum of those items above, except credit will not be required for overhead and profit. Where a change results in both
credits to the Owner and extras to the Contractor for related items, overhead and profit will only be computed on the net extra cost to the Contractor.

7.2.4 The cost to the Owner resulting from a change in the work shall be the sum of:
"Cost of the Work" (as defined at 7.2.2) and “Overhead and profit” (as defined at 7.2.4), and shall be computed as follows:

7.2.4.1 When all of the work is General Contract work; 15% markup on the Cost of the Work.

7.2.4.2 When the work is all Subcontract work; 15% markup on the Cost of the Work for

7.2.4.3 When the work is a combination of General Contract work and Subcontract work; that

    Bond premiums may be included, but after the markup is added to the cost of the work.

7.2.4.4 "Subcontract cost shall consist of the items in 7.2.2 above plus overhead and profit as defined in 7.2.4.”

7.2.5 "Before a Change Order is prepared, the Contractor shall provide and deliver to the Architect the following information concerning the Cost of the Work, not subject to waiver, within a

A detailed itemized list of labor, material and equipment costs for the General Contractor's work including quantities and unit costs for each item of labor, material and equipment.

An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's work including quantities and unit costs for each item of labor, material, and equipment.

7.2.6 "After a Change Order has been approved, no future requests for extensions of time or

7.2.7 The Contractor will be due extended fixed job-site overhead for time delays only when complete stoppage of work occurs causing a contract completion extension, and the Contractor is unable to mitigate financial damages through replacement work. The stoppage must be due to acts or omissions solely attributable to the Owner. In all cases the Contractor is to notify the Designer in writing as required by article 4.3.2. Reasonable proof may be required by the architect that alternate work could not be performed. Reasonable proof may be required by the architect that the stoppage affected the Completion Date.

7.2.8 "Cost of the work whether General Contract cost or Subcontract cost shall not apply to the

Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.

Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the work.

Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in cost of the work.

Cost of supervision not specifically required by the Change Order.

7.2.9 "When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover cost of Material, Labor, Equipment, Overhead and Profit."

7.3 CONSTRUCTION CHANGE DIRECTIVES
Delete all references to Construction Change Directive and use Field Order instead.

7.3.3 At the end of the first sentence add: “, but not to exceed a specified amount.”

7.3.7 Delete the following from .1 of the list: “fringe benefits required by agreement or custom,”
Delete the following from .4 of the list: “permit fees,”
Delete the following from .5 of the list: “and field office personnel”

7.3.9 Delete Subparagraph 7.3.9 and substitute the following:

“Pending final determination of the total costs of a Field Order to the Owner, amounts not in
dispute for such changes in the Work shall be included in Applications for Payment
accompanied by a Change Order indicating the parties’ agreement with part or all of such
costs.” The Field Order requires owner’s approval.

ARTICLE 8
TIME

8.1 DEFINITIONS
Add the following:

8.1.5 The Contract Time shall not be changed by the submission of a schedule that shows an early
completion date unless specifically authorized by change order.

8.2 PROGRESS AND COMPLETION
Delete Subparagraph 8.2.1 and substitute the following:

"Time is of the essence and completion of the work must be within the Time for Completion
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 fourteen (14) days after the transmittal date of
Written Notice to Proceed from the Owner and to substantially complete the project within the time
stated in the Contract. 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 the Contractor's
Surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as
fixed, agreed and stipulated damages for each consecutive calendar day (Saturdays, Sundays, and
holidays included) of delay until the work is substantially complete. The owner shall be entitled to
the sum stated in the Contract Documents. Such Stipulated Damages shall be withheld by the owner
from the amounts due the Contractor for progress payments.

Delete Subparagraph 8.2.2.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 In the first sentence after the words “owner pending’ delete the words “mediation and
arbitration” and add the word “litigation” and delete the last word “determine” and add the
following:
"recommend, subject to Owner's approval of Change Order. If the claim is not made within the limits of Article 15, all right for future claims for that month are waived."

ARTICLE 9
PAYMENTS AND COMPLETION

9.2 SCHEDULE OF VALUES
Delete Subparagraph 9.2 and substitute the following:

9.2. At the Pre-Construction Conference, the Contractor shall submit to the Owner and the

9.2.1 The attached Schedule of Values Format shall be used. If applicable, the cost of work

9.2.2 The Total of all items shall equal the Total Contract Sum. This schedule, when

9.3 APPLICATIONS FOR PAYMENT
Delete Subparagraph 9.3.1 and clause 9.3.1.1 and 9.3.1.2 and substitute the following:

9.3.1 "Monthly, the Contractor shall submit to the Architect an Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment as the Owner or the 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 into the work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage as follows, per R.S.38:2248:

9.3.1.1 Projects with Contract price up to $500,000.00 - 10% of the Contract price.

9.3.1.2 Projects with Contract price of $500,000.00, or more - 5% of the Contract price.

9.3.1.3 No payment will be made until the revised schedule required by 3.10.1 is received.

The normal retainage shall not be due the Contractor until after substantial completion and

Delete Subparagraph 9.3.2 and substitute the following:

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. Payments for materials or equipment stored on the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, including applicable insurance."

9.5 DECISIONS TO WITHHOLD CERTIFICATION
Delete Subparagraph 9.5.3.

9.6 PROGRESS PAYMENTS
Delete Subparagraph 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 consistent with reimbursement."

9.6.2 Delete the phrase: “no later than seven days” from the first sentence.

After the end of the second sentence, add the following:

"R.S. 9:2784 (A) and (C) requires a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of 1/2 of 1% per day is due, up to a maximum of 15%, from the expiration date until paid. The contractor or subcontractor, whichever is applicable, is solely responsible for payment of a penalty."

9.6.4 Delete the first two sentences of Subparagraph 9.6.4 and add the following to the end of the

Pursuant to La. R.S. 38:2242, when the Owner receives any claim of nonpayment arising out of the Contract, the owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the recorder of mortgages of the parish where the Work has been done. When the Owner receives original proof of such guarantee from the recorder of mortgages, the claim deduction will be added back to the Contract Sum.

9.7 FAILURE OF PAYMENT

Delete Subparagraph 9.7.

9.8 SUBSTANTIAL COMPLETION: Delete this section and substitute the following:

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Architect shall determine if the project is substantially complete in accordance with this Subparagraph.

9.8.2 When the Contractor considers that the Work 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 is substantially complete. A prerequisite to the work being accepted as substantially complete, is the Owner's receipt of the executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing work is part of the Contract. Prior to inspection by the Architect, the Contractor shall notify the Architect that the project is ready for inspection by the State Fire Marshal's office. 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 for its intended use, the Contractor shall, before acceptance of the work as Substantially Complete, 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 Architect determines that the project is Substantially Complete, he shall prepare a “punch list” of exceptions and the dollar value related thereto. The monetary value assigned to this list will be the sum of the cost estimate for each particular item of work the Architect
Develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the 45 day lien period payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be accepted as substantially complete. If funds remaining are less than that required to complete the work, the Contractor shall pay the difference.

9.8.5 When the “punch list” is complete the Architect shall prepare a Recommendation of Acceptance incorporating the punch list and submit it to the Owner. Upon approval of the Recommendation of Acceptance, the Owner may issue a Notice of Acceptance of Building Contract which shall establish the Date of Substantial Completion. The Contractor will record the Notice of Acceptance with the Clerk of Court in the Parish in which the work has been performed. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the owner may record the acceptance at the Contractor's expense.

9.8.6 Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by the Owner and Contractor, security, maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner’s responsibility on the Date of Substantial Completion.

9.8.7 If all punch list items have not been completed by the end of the forty-five (45) day lien period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within forty-five (45) days after notification, the Surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at his option, contract to have the balance of the work completed and pay for such work with the unpaid funds remaining in the Contract sum. If the surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the surety.

9.9 Partial Occupancy or Use

9.9.1 Delete paragraph and substitute the following:

"Partial Occupancy is that stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The Owner may occupy or use any substantially completed portion of the Work so designated by separate agreement with the Contractor and authorized by public authorities having jurisdiction over the Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, 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 the designated portion substantially complete the Contractor shall prepare and submit a list to the Architect as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonable withheld."

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 After the first sentence, add the following:
If the Architect does not find the work acceptable under the Contract Documents, the Architect shall make one additional inspection; if the work is still not acceptable, the Architect, and each of the Architect’s principal consultants, shall be paid $150.00/hour for their time at the project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract sum. The payment shall be made by the owner and deducted from the construction contract funds.

Add the following clause 9.10.6:

9.10.6 In response to Federal Arbitrage regulations: If such compliance has not been effected within 90 days of the date of acceptance, the contract shall be terminated and no further opportunity will be granted the Contractor and no further payments will be made on this contract.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.2 In the first sentence, between the words "bearing on" and "safety", add the words "the health and",

10.3 HAZARDOUS MATERIALS

10.3.1 In the first sentence after "(PCB)" add "or lead"

10.3.2 After the first sentence, delete all remaining sentences.

Add at the end "The Contract time shall be extended appropriately."

Delete Subparagraph 10.3.3.

10.4 EMERGENCIES

Delete Subparagraph 10.4 and substitute the following:

10.4 "In an emergency affecting the safety of persons or property, the Contractor shall notify the Owner and Architect immediately of the emergency, simultaneously acting at his discretion to prevent damage, injury, or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 15 and Article 7."

ARTICLE 11

INSURANCE AND BONDS

Delete all of Paragraphs 11.1, 11.2, and 11.3 and substitute with the following document included in the bid package:

CALCASIEU PARISH POLICE JURY - INSURANCE REQUIREMENT FOR PROJECTS ONE HUNDRED THOUSAND DOLLARS AND GREATER
11.4 PERFORMANCE AND PAYMENT BOND

Add Subparagraph 11.4.3:

RECORDATION OF CONTRACT AND BOND

"The Contractor shall record within thirty (30) days the Contract Between 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 12

UNCOVERING AND CORRECTION OF WORK

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 At the end of the paragraph add the following sentences: “If the Contractor fails to correct Work identified as defective and covered by warranties, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified.

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Delete all after the word “located”

13.2 SUCCESSORS AND ASSIGNS

13.2.1 In the second sentence, Delete "Except as.......13.2.2"

Delete paragraph 13.2.2.

13.5 TESTS AND INSPECTIONS

In Subparagraph 13.5.1 delete the second sentence and substitute the following:

"The Contractor shall make arrangements for such tests, inspections and approvals with the third-party Testing Laboratory and the Contractor shall bear all related costs of tests, inspections and approvals."

Delete the last sentence of Subparagraph 13.5.1.

13.6 INTEREST

Delete Paragraph 13.6.

13.7 TIME LIMITS ON CLAIMS

Delete paragraph 13.7. (See L.R.S. 38:2189)
13.8 **FINAL VALUES**

Add this section as follows: The contractor shall provide architect/engineer at the completion of project the final values per structure and per finished items such as sidewalks, light posts, wharfs, hydro-seeding, landscaping, fountains, etc. This info is needed for insurance purposes.

**ARTICLE 14**

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 **TERMINATION BY THE CONTRACTOR**

Delete clause 14.1.1.4.

In subparagraph 14.1.3, after the word “profit” add the following “for Work completed prior to stoppage”

14.2 **TERMINATION BY THE OWNER FOR CAUSE**

Add the following clause:

14.2.1.5 "Failure to complete the punch list within the lien period as provided in 9.8.2.3."

14.2.3 Add the following sentence:

"Termination by the Owner shall not suspend assessment of stipulated damages against the surety."

14.2.5 Add the following Subparagraph:

"If an agreed sum of stipulated damages has been established, termination by the Owner under this Article will not relieve the Contractor and/or surety of his obligations under the stipulated damages provisions and the Contractor and/or surety shall be liable to the Owner for per diem stipulated damages."

**ARTICLE 15**

CLAIMS AND DISPUTES

15.1 **CLAIMS**

In the first sentence of subparagraph 15.1.1, add the phrase “extension of time,” after the word “money”.

15.1.2 Add the following to the end of the paragraph: A “Reservation of Rights” and similar stipulations shall not be recognized under this contract as having any effect. A party must make a claim as defined herein within the time limits provided.

15.1.3 In the second sentence of the subparagraph, delete “the decisions of the Initial Decision Maker” and replace with “his/her decision”.

Delete paragraph 15.1.5.2 and substitute the following:

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.

15.1.5.3 Add the following Subparagraph:

The Contractor shall ask for total adverse weather days, the Contractor's request shall be considered. Note: Contract is on a calendar day basis.

15.2 INITIAL DECISION

15.2.1 In the second sentence, delete the word “will” and replace with “shall always”

In the second sentence, delete the phrase “unless otherwise indicated in the Agreement”

In the third sentence, delete the word "mediation" and replace with “litigation”.

15.2.5 In the middle of the first sentence, delete all after the phrase “rejecting the Claim”

In the second sentence, delete the phrase “and the Architect, if the Architect is not serving as the Initial Decision Maker”.

In the third sentence, delete all after "binding on the parties".

15.2.6 Delete paragraph.

15.2.6.1 Delete subparagraph.

15.3 MEDIATION

Delete Article 15.3.

15.4 ARBITRATION

Delete Article 15.4.

ARTICLE 16

Add the following as 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 insure 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 be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.

16.2 The Contractor and all Subcontractors shall, in all solicitations or advertisement 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.
CONSTRUCTION CONTRACT BETWEEN THE
CALCASIEU PARISH POLICE JURY
AND ________________________

STATE OF LOUISIANA
PARISH OF CALCASIEU

THIS AGREEMENT is hereby made and entered into this ______ day of __________ 2019,
by and between the CALCASIEU PARISH POLICE JURY, hereinafter referred to as
"PARISH," a political subdivision of the State of Louisiana, represented herein by its duly
authorized President, Kevin White, and ____________, hereinafter referred to as
“CONTRACTOR,” and represented herein by its duly authorized President, ____________.

WHEREAS, the PARISH has solicited, received and analyzed competitive bids for the
Calcasieu Correctional Center and Administration Improvements Project, identified as
Calcasieu Parish Project No. DB-2018-FM-180, which is the legal responsibility of the
PARISH, and

WHEREAS, the PARISH has duly awarded the CONTRACTOR as the successful proposer
for the referenced construction activity, products and/or services as hereinafter set forth and in
accordance with all local, state and federal regulations governing the expenditure of public
funds as discussed in Section 3 below, and

WHEREAS, the PARISH considers the public benefit of improving the facility in order to
provide adequate safety for the employees and citizens who enter this facility to be
proportionate to the costs associated with this activity, and

WHEREAS, the CONTRACTOR shall provide all materials, equipment and labor and perform
all the work required to accomplish the designated scope of work in a thorough and
workmanlike manner to the satisfaction of the PARISH or the PARISH’S architect/engineer
and in accordance with all plans and specifications, instructions, general and/or standard terms
and conditions, any addenda issued, and the “Bid” documents, including alternates, unit prices
and allowances (when applicable) on file with the PARISH or the PARISH’S architect/engineer, which are as much a part of this agreement as if repeated verbatim herein.

NOW THEREFORE, the PARISH and the CONTRACTOR do mutually agree to the
following terms and conditions of this agreement:
1. **Scope of Work**

The PARISH hereby agrees to engage the CONTRACTOR to provide the construction activity, products and/or services inclusive in the PARISH’S “Bid” identified as “Bid” #DB-2018-FM-180. This project involves the replacement of the existing Montgomery Technology Incorporated (MTI) Jail Security System computers and the update of the software and monitors. In addition, this project involves the replacement of four (4) slider doors and twenty (20) swing doors including the door hardware, frames, embed plates, painting, and block work. This project also includes the replacement of chillers, boilers, chiller and boiler pumps, and variable frequency drives, the installation of a chemical treatment for chillers and boilers, sewer system upgrades, and the installation of a new generator.

Any additional construction activity, products and/or services not specifically listed in the “Bid” but required by the PARISH and available to the CONTRACTOR may be added to the terms of this agreement at a mutually agreed upon price, subject to the verification of cost reasonableness of said change order.

2. **Term of Agreement**

The initial term of this agreement shall commence upon execution of this agreement and shall continue until the completion of the project listed in the Scope of Work and all payments have been made. The CONTRACTOR will begin performance immediately after receiving the work order or “Notice to Proceed” and shall complete the project within (270) calendar days from that date.

If the time frame extends beyond the completion time period then the CONTRACTOR will notify the PARISH or the PARISH’S architect/engineer and follow the specific procedures identified in the plans and specifications, instructions, general and/or standard terms and conditions, any addenda issued, and the “Bid” documents, where applicable. Stipulated damages will be assessed in accordance with the plans and specifications, instructions, general and/or standard terms and conditions, any addenda issued, and the “Bid” documents, where applicable for any project not completed within the contractually authorized time period. If these referenced documents are silent with respect to this information then stipulated damages will be assessed in the amount of five hundred dollars ($500) per day for any project not completed within the contractually authorized time period.

3. **Payment Terms**

Under this agreement, the PARISH agrees to pay the CONTRACTOR ____________ dollars ($__________) which is inclusive of all amounts properly due under the terms and conditions set forth in the “Bid” documents. If the “Bid” documents are silent with respect to payment and related terms then the CONTRACTOR will issue at least monthly invoices for which the PARISH will, in all good faith, attempt to review and process for payment within a reasonable time period. If the “Bid” documents are silent with respect to retainage amounts, then ten (10) percent of the total payment amount will be withheld for projects less than five hundred
thousand ($500,000) dollars or five (5) percent of the total payment amount will be withheld for projects equal to or greater than five hundred thousand ($500,000) dollars both of which are provided in Louisiana Revised Statute 38:2248.

If this agreement extends beyond the current fiscal year and notwithstanding anything to the contrary and when applicable, the CONTRACTOR acknowledges and agrees that pursuant to the applicable state law, this agreement is subject to an annual appropriation dependency requirement to the effect that the renewal of this agreement is contingent upon the appropriation of funds to fulfill the requirements of this agreement. If the PARISH fails to appropriate sufficient monies to provide for payments under this agreement, then this agreement shall terminate on the last day of the last fiscal year for which funds were appropriated.

4. Amendments and Assignments

If there is a need to review and/or revise this agreement, the requesting party shall comply with the provisions of the “Bid” documents. If the “Bid” documents are silent with respect to amendments then the requesting party shall submit a written amendment to the other party, with the understanding that no amendment to this agreement shall be valid unless it is agreed and signed by both parties. This agreement shall not be assignable by either party without written consent of the other, except for assignment resulting from merger, consolidation, or reorganization of the assigning party.

5. Records and Audits

For audit purposes, all records will be made available by both parties to any authorized representative of either party and said records will be retained for three (3) years from the final contractual payment under this agreement. It is also agreed that all records shall be made available to either party at no additional charge for such information. If any confidential information is obtained during the course of this agreement, both parties agree not to release that information without the approval of the other party unless instructed otherwise by court order, grantor, auditor, public information request or as required by law.

6. Liability, Indemnity and Insurance

The CONTRACTOR shall perform the scope of work hereunder in accordance with all plans and specifications, instructions, general and/or standard terms and conditions, any addenda issued and the “Bid” documents, including alternates, unit prices and allowances (if applicable) as well as complying with all applicable laws and regulations. All construction activity, products and/or services will be provided or performed in a thorough and workmanlike manner to the satisfaction of the PARISH.

This agreement is intended for the benefit of the PARISH and the CONTRACTOR and does not confer any rights upon any other third parties. All rights by and between the PARISH and
the CONTRACTOR are limited to the actions outlined in the applicable local, state and federal laws, regulations and policies.

The CONTRACTOR will indemnify, defend, and hold harmless the PARISH, including the PARISH’S employees and agents, from and against any and all claims or liabilities arising from the fault of the CONTRACTOR, its employees, subcontractors or agents in carrying out the CONTRACTOR’S duties and obligations under the terms of this agreement. The PARISH will indemnify, defend, and hold harmless the CONTRACTOR, including the CONTRACTOR’S employees and agents, from and against any and all claims or liabilities arising from the fault of the PARISH, its employees or agents in carrying out the PARISH’S duties and obligations under the terms of this agreement. This section will survive the termination of this agreement. In the event that either party takes any action to enforce this mutual indemnity provision, the prevailing party shall be entitled to recover reasonable attorney’s fees and costs arising as a result thereof.

The CONTRACTOR will comply with the insurance requirements as specified in the “Bid” documents and attached as Exhibit A. Evidence of compliance with the attached insurance requirements will be provided to the PARISH prior to the commencement of any work.

As specified in the “Bid” documents, the CONTRACTOR is also required to provide the appropriate Payment and Performance Bonds in amounts equal to one hundred percent (100%) of the contract amount, estimated currently to be ________________ dollars ($_________). The CONTRACTOR is also required to maintain all contracting and/or other licenses as may be required by the Louisiana State Licensing Board for Contractors as well as other regulatory agencies.

7. Independent Contractor Status

The CONTRACTOR shall provide the services contemplated under this agreement as an independent contractor and not as an employee, agent, joint venturer, subcontractor or partner of the PARISH. Nothing in this agreement shall be construed as creating any other relationship between the CONTRACTOR and the PARISH, or between any employee, agent, joint venturer, subcontractor or agent of the CONTRACTOR and the PARISH. During the term of this agreement, all persons employed by the CONTRACTOR shall be an employee of the CONTRACTOR for purposes of the CONTRACTOR’S benefit programs for plans now existing or hereafter created, workers’ compensation, compensation, and payment and withholding of federal, state and local income, social security, unemployment, Medicare, and other payroll taxes.

The CONTRACTOR acknowledges independent contractor status within the meaning of Louisiana workers’ compensation law, specifically Louisiana Revised Statute 23:1021 (6). The CONTRACTOR is rendering a service, other than manual labor, for a specified recompense for a specified result either as a unit or as a whole, under the control of the PARISH as to the result of this work only, and not as to the means by which such result is accomplished.
8. Warranties, Termination of Agreement and Dispute Resolution

The CONTRACTOR warrants the following: (a) that it has the experience and ability to perform the scope of work required in this agreement, (b) that it will perform said scope of work in a professional, competent and timely manner, (c) that its services, reports and materials furnished hereunder will be as represented, (d) that it has the power to enter into and perform this agreement, and (e) that its performance of this agreement shall not infringe upon or violate any third party’s rights or any federal, state or municipal law, including the proper handling of any waste disposals that may result from the services provided herein.

While both parties agree to negotiate all contractual disputes in good faith, the PARISH reserves the right to terminate this agreement at any time upon written notice of termination, in which event, the CONTRACTOR will be reimbursed for all activity, products and/or services satisfactorily provided up until the date of termination. The CONTRACTOR may terminate this agreement “for cause” with written notice to the PARISH within fifteen (15) days stating the cause for termination. Upon receipt, the PARISH shall have thirty (30) days to satisfactorily remedy, correct or remove the cause for termination. If the notice of termination is by the PARISH then the PARISH may withhold payment of any costs and fees related to, arising from or incidental to the stated cause or causes for termination.

If the parties are unable to independently and satisfactorily resolve any disagreement then both parties agree that any contractual disagreement will be resolved under the jurisdiction of the 14th Judicial District Court for Calcasieu Parish, Louisiana. In addition, if it is necessary to enforce this agreement in any judicial forum, then the parties agree that whoever substantially prevails in the litigation shall be entitled to reasonable attorney’s fees and costs as fixed by the Court.

9. Severability, Entire Agreement and Captions

This agreement shall be governed by and construed in accordance with the laws of the State of Louisiana. If any provision of this agreement is held invalid, void or unenforceable under any law or regulation or by a court of competent jurisdiction, such provision will be deemed amended in a manner which renders it valid, or if it cannot be so amended, it will be deemed to be deleted. Such amendment or deletion will not affect the validity of any other provision of this agreement. This agreement, any attached documents, and any referenced documents, including the “Bid” documents, represent the entire agreement between the PARISH and the CONTRACTOR and supersede all prior negotiations, representations or agreements, either written or oral. In the event of a conflict between this agreement and other documents, the terms of this agreement shall control.

Each paragraph of this agreement has been supplied with a caption to serve only as a guide to the contents. The caption does not control the meaning of any paragraph or in any way determine its interpretation.
10. No Authorship Presumptions

The PARISH and the CONTRACTOR have had an opportunity to negotiate the language of this agreement in consultation with legal counsel prior to its execution. No presumption shall arise or adverse inference be drawn by virtue of authorship. The PARISH and the CONTRACTOR hereby waive the benefit of any rule of law that might otherwise be applicable in connection with the interpretation of this agreement, including but not limited to, any rule of law to the effect that any provision of this agreement shall be interpreted or construed against the party who (or whose counsel) drafted that provision. The rule of no authorship presumption set forth in this paragraph is equally applicable to any person that becomes a party by reason of assignment and/or assumption of this agreement and any successor to a signatory party.

11. Address of Notices and Communications

All notices between the PARISH and the CONTRACTOR provided for pursuant to this agreement shall be in writing. The name and address of the PARISH’S representative is:

    Mr. Bryan C. Beam, Administrator  
    Calcasieu Parish Police Jury  
    P.O. Box 1583  
    Lake Charles, Louisiana 70602

The name and address of the CONTRACTOR’S representative is:

    ____________________________  
    ____________________________  
    ____________________________  

In the event that the mailing address of the PARISH or the CONTRACTOR changes during the terms of this agreement, or that there is a change in the designated points of contact, the party with the address change or change of contact shall immediately notify the other party of the change.

[The remainder of this page is intentionally left blank.]
THUS DONE AND SIGNED on the ___ day of _____________ 2019, in Lake Charles, Louisiana, and in the presence of the undersigned witnesses and Notary Public, after a due reading of the whole.

WITNESSES:

____________________________________
Witness Signature

____________________________________
Printed Witness Name

____________________________________
Witness Signature

____________________________________
Printed Witness Name

CALCASIEU PARISH POLICE JURY:

BY: ________________________________
KEVIN WHITE, PRESIDENT

____________________________________
NOTARY PUBLIC

____________________________________
Notary Printed/Stamped Name
and Identification Number
THUS DONE AND SIGNED on the ____ day of _____________ 2019, in Lake Charles, Louisiana, and in the presence of the undersigned witnesses and Notary Public, after a due reading of the whole.

WITNESSES:  

________________________________________________________________________
Witness Signature

__________________________
Printed Witness Name

________________________________________________________________________
Witness Signature

__________________________
Printed Witness Name

____________________________________
NOTARY PUBLIC

__________________________
Notary Printed/Stamped Name 
and Identification Number
PERFORMANCE AND PAYMENT BOND

To these presents personally came and intervene ____________________________, 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, Calcasieu Parish Police Jury, up to the sum of ____________________________ ($________________) DOLLARS.

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, Calcasieu Parish Police Jury, from all costs 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, Calcasieu Parish Police
Jury, of any extensions of time for the performance of the contract, or any other forbearance on the part of either the Owner, Calcasieu Parish Police Jury, or the Contractor to the other shall not in any way release 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 this _____ day of ____________, 20___, have executed this agreement in five (5) counterparts, each of which shall, without proof of accountancy for the other counterparts, be deemed an original thereof.

WITNESSES: As to Principal

__________________________________________  ___________________________________________

__________________________________________  ___________________________________________

WITNESSES: As to Surety

__________________________________________  ________________________________

SURETY

__________________________________________

__________________________________________  (Attorney-In-Fact)

__________________________________________
Designation of Construction Contractor as Agent of a Governmental Entity and Exemption Certificate

General Information

Purpose of the R-1020 Form: Agencies and instrumentalities of federal or Louisiana state or local government may designate a construction contractor as its authorized agent for the purpose of purchasing construction materials, leasing and renting tangible personal property, and purchasing taxable services. Form R-1020 serves as the documentation by which the government entity and contractor document the agency relationship to vendors of materials and services. It also serves as documentation that the contractor’s purchases are sales tax exempt, and therefore serves as an exemption certificate, which the vendor must retain on file to support the deduction he will claim on his sales tax return. Effective 11-1-2004, the R-1032 exemption certificate will no longer be necessary.

Use of the R-1020 Form: The form must be signed by both parties, contractor and governmental entity. After signature, both the contractor/agent and the governmental entity must keep an original copy of the form on file, along with other documents that pertain to the construction project. (Effective 11-1-2004) Do not send a copy of the R-1020 form to the Louisiana Department of Revenue. Retain your copy of the original certificate on file. The contractor/agent must reproduce the original copy as needed to attach a copy to each purchase order for materials for the project. The reproduced copy will serve as the exemption certificate that will document the exempt sale of materials to the contractor/agent.

Subcontractors. A designated contractor may not re-designate his subcontractors as authorized agents for the governmental entity. Each subcontractor must obtain its own designation from the governmental entity.

Title to Property: Any materials purchased by the agent through the use of this certificate immediately become the property of the governmental entity upon delivery to the contractor/agent.

Restrictions as to Vendors: The governmental entity may choose to restrict the agent/contractor to making purchases from a pre-selected list of vendors and providers of services. This restriction, if applicable, must be incorporated into a contractual agreement between the governmental entity and the designated agent. If there are no vendor restrictions, the contractor/agent may use the R-1020 Exemption Certificate to make sales tax exempt purchases from any vendor.
Designation of Construction Contractor as Agent of a Governmental Entity
Sales Tax Exemption Certificate

Calcasieu Parish Police Jury, an agency of the United 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:

<table>
<thead>
<tr>
<th>Name of Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Designation of Agency</th>
<th>Acceptance of Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Authorized Designator</td>
<td>Name of Contractor's or Subcontractor's Acceptor</td>
</tr>
<tr>
<td>Date (mm/dd/yyyy)</td>
<td>Date (mm/dd/yyyy)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Governmental Entity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcasieu Parish Police Jury</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1015 Pithon Street 2nd Floor Finance</td>
</tr>
</tbody>
</table>

| City | State | ZIP |
|----------------------------------------|
| Lake Charles | LA | 70601 |

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.

PRIME CONTRACTOR’S NAME: ___________________________
CHANGE ORDER

CHANGE ORDER NO.: __________  DATE: ______________________________

PROJECT:  Calcasieu Parish Police Jury Calcasieu Correctional Center and Administration Improvements Project

PROJECT NO.: DB-2018-FM-180  PURCHASE ORDER NO.: ___________

TO: ________________________________________________________________________
________________________________________________________________________

You are hereby directed to make the following change(s) in this contract as per the attached itemized breakdown:

The Original Contract Sum  ________________________

Net Change by Previous Change Orders  ________________________

Contract Sum prior to this Change Order  ________________________

Contract Sum will be (increased/decreased)  ________________________
by this Change Order –Attach Details

New Contract Sum including this Change Order  ________________________

Contract Time will be _______________________ by ______ days

Revised Contract Completion Date ______________________

RECOMMENDED

Architect/Engineer/Project Manager:  Contractor:
Associated Design Group, Inc.
3004 Ryan St.
Lake Charles, LA 70601

By: _______________________________  By: ________________________________
Dated: ____________________________  Dated: ____________________________

APPROVED

Calcasieu Parish Police Jury
Post Office Box 1583
Lake Charles, LA  70602-1583

By: _______________________________
Dated: ____________________________
RECOMMENDATION OF ACCEPTANCE

TO: ________________________________________________ Dated: ___________________

Project No.: DB-2018-FM-180
Project Name: Calcasieu Parish Police Jury Calcasieu Correctional Center and Administration Improvements Project

Architect/Engineer: Associated Design Group, Inc.

Contractor: ___________________________________________________________________

Using Agency: Calcasieu Parish Police Jury

I certify to the best of my knowledge and belief that 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 by Architect/Engineer: ______________________________

Contract Date of Completion: ______________________________

Number of Days (Overrun) (Underrun): ______________________________

Liquidated Damages Per Day Stipulated in Contract: ______________________________

Value of Punch List (Attach Itemized List): ______________________________

Was part of the project occupied prior to Acceptance? If so, portion occupied, attach Beneficial Occupancy Form.

Accepted:

_________________________________________
Architect/Engineer

Below Completed by Owner:

Contract accepted as substantially complete by the Calcasieu Parish Police Jury on ______________________________.

__________________________________________
President

CPPJ-Revised 2015/01
BENEFICIAL OCCUPANCY

PROJECT: Calcasieu Parish Police Jury Calcasieu Correctional Center and Administration Improvements Project

PROJECT NO.: DB-2018-FM-180

Architect/Engineer: Associated Design Group, Inc.

Contractor: __________________________________________________

OWNER: Calcasieu Parish Police Jury

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.

The Owner’s occupancy of any portion of this building does not violate any applicable warranties.

Date Occupied: ________________

Architect/Engineer                       Contractor
By:_________________________________  By:_________________________________
Date: ________________                 Date: ________________

Calcasieu Parish Police Jury

By: _________________________________

Date: ________________

Punch List:

NONE _______________
SPECIAL PROVISIONS

The work shall be completed on or before **TWO HUNDRED SEVENTY (270)** consecutive calendar days from the date of Notice to Proceed.

If the duration of the work exceeds the total contract time, the amount of **FIVE HUNDRED DOLLARS ($500.00)** per calendar day for each day of delinquent completion shall be deducted from payments due to the Contractor as stipulated damages.
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
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

PLUMBING GENERAL PROVISIONS 22 00 00 - 4
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 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 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.

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 22 00 00

PLUMBING GENERAL PROVISIONS

22 00 00 - 11
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. Lift Station Piping:

1. Ductile Iron Pipe: AWWA C151
2. Fittings: AWWA C110, standard thickness.
5. Listed and internally lined with cement or epoxy coated.

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 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 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. Valves and unions shall be as follows:
### Copper Pipe

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<th>Size</th>
<th>Company</th>
<th>Crane Code</th>
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<td>Over 2&quot;</td>
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<tr>
<td>Gate Valve</td>
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<td>Crane</td>
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<td>Globe Valve</td>
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<td>Unions</td>
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<td>Crane Std. Gal.</td>
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<td>Check Valve</td>
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### Iron Pipe

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C. All valves, unions, etc. where pipe is chrome plated shall have similar finish. All exposed supplies to plumbing fixtures shall be chrome plated.

### 2.4 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.

END OF SECTION 22 05 00
SECTION 22 13 29 – SANITARY SEWERAGE PUMPS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Remove existing lift station pumps and replace with new pumps and VFD control panel. Include 1-year renewable service agreement as part of the bid. Provide SCADA system for remote monitoring of pump alarms.

1.2 PUMPS

A. REQUIREMENTS

a. Furnish and install Flygt NP 3153-464 submersible non-clog wastewater pump(s). Each pump shall be equipped with an 15 HP submersible electric motor, connected for operation on 480 volts, 3 phase, 60 hertz, wire service, with 50 feet of shielded submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

B. PUMP DESIGN CONFIGURATIONS (Dry pit installation)

a. The pump shall be supplied with a mating cast iron 3-15/16 inch discharge connection and be capable of delivering 533 GPM at 66.6 FT. TDH. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with lifting chain or stainless steel cable. Field verify length required. The working load of the lifting system shall be 50% greater than the pump unit weight.

C. PUMP CONSTRUCTION

a. Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be of stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

b. Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

c. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.
D. COOLING SYSTEM (Cooling Jacket Equipped)

a. Each unit shall be provided with an integral motor cooling system. A stainless steel motor cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F (40°C). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

E. CABLE ENTRY SEAL

a. The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. The grommets shall be compressed by the cable entry unit, thus providing a strain relief function. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered equal.

F. MOTOR

a. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel.

b. The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.
c. The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C ambient and shall have a NEMA Class B maximum operating temperature rise of 80°C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

d. Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

G. Shielded Power Cable:

   a. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The power cable shall be of a shielded design in which an overall tinned copper shield is included and each individual phase conductor is shielded with an aluminum coated foil wrap. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater. This cable is required for use with Flygt SmartRun™ intelligent controls.

H. BEARINGS

   a. The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a two row angular contact ball bearing. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L₁₀ bearing life shall be 50,000 hours at any usable portion of the pump curve.

I. MECHANICAL SEALS

   a. Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.
b. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

c. The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

d. A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

e. Seal lubricant shall be non-hazardous.

J. PUMP SHAFT

a. The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be stainless steel – ASTM A479 S43100-T. Shaft sleeves will not be acceptable.

K. IMPELLER

a. The impeller shall be of Hard-Iron™ (ASTM A-532 (Alloy III A) 25% chrome cast iron), dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The leading edges of the impeller shall be hardened to Rc 60 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impeller shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

L. VOLUTE / SUCTION COVER

a. The pump volute shall be a single piece grey cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of Hard-Iron™ (ASTM A-532 (Alloy III A) 25% chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

M. PROTECTION
a. Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.

b. The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

1.2 LEVEL CONTROL SYSTEM WITH DEDICATED PUMP DRIVE

A. REQUIREMENTS

a. Furnish and install Flygt SmartRun™ SRC 300 Series Pump drive designed for waste water transport pumping. Each pump shall be equipped with a Pump drive SmartRun SRC 311 unit sized to match, to submersible electric motor connected for operation on 480 volts, 3-phase, 60 hertz, _____ with ____ meter of submersible screened cable for variable speed. The power cable shall be sized according to IEC and also include at least two leads to convey pump monitoring device signals.

b. The drive, motor and pump shall be matched for optimal performance.

B. INTERNATIONAL STANDARD AND APPROVAL

a. The pump drive shall be tested and approved in accordance with national and international standards, the European safety directive 98/37/EC, the Low Voltage Directive 2006/95/EC, the Low Voltage Directive 2004/108/EC and in accordance with the European standards: EN 61800-5-1:2003; EN 61800-3; EN 55011:2007; EN60529 and EN 60204-1. It shall be designed and manufactured in accordance with the following harmonized European standards.

i. Adjustable speed electrical power drive systems. Safety requirements. Electrical, thermal and energy.

ii. Adjustable speed electrical power drive systems. EMC requirements and specific test methods

iii. Limits and Methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment (EMC)

iv. Specifications for degrees of protection provided by enclosures

C. PUMP DRIVE PRODUCT DESCRIPTION

a. The Pump drive shall be equipped with dedicated application functionality and integrated frequency drive functionality for the application waste water-pumping.

b. The pump drive shall be an integrated component in the system solution for sewage pumping consisting of pressure sensor "inverse level control" and high level switch, which control the waste water pumping system in a reliable and energy efficient
way. One Pump drive per pump should be used to allow full redundancy and alternation.

c. The application software shall be programmed with all parameters and settings pre-configured for an efficient operation with Flygt N-pumps.

D. PUMP DRIVE SYSTEM

a. A pump drive shall be provided for each pump in the system, sized for the appropriate voltage and power. The pump drive shall be provided by the pump manufacturer and designed for wastewater pumping and with functionality pre-programmed for the specific pump model used. The pump drive shall provide all level control functionality, hand/auto operation, pump alternation, pump over temperature monitoring, seal leakage monitoring, pump self-cleaning, sump cleaning and pipe cleaning algorithms. The pump drive shall also include capability to monitor station inflow, pump speed and energy consumption in order to automatically operate the pump station at optimal energy efficiency.

E. PUMP DRIVE CONSTRUCTION

a. The pump drive shall be freestanding for wall mounting or cabinet installation construction, for 230-480V 50/60HZ 3Phase supply. It holds an IP55 and IP66 isolation class.

F. PUMP DRIVE COOLING SYSTEM

a. The pump drive shall have an air ventilated system, with or without fan driven ventilation having a maximum ambient temperature of up to 40°C (104°F) without derating. Max altitude without derating is 1000m

G. COMMUNICATION

a. The pump drive shall include provision for external communication to higher-level system. Communication shall be via 2-wire RS-485 connection to the pump drive. Communication shall be available as MODBUS RTU.

b. Serial communication capabilities shall include, but not be limited to set Start- and stop level, Pump clean interval, speed and ramp times as well as PID control parameters.

c. The communication telegram shall include process variable feedback like Sump level, power (kW), Output speed/frequency, current (A), % torque, relay outputs, digital inputs and drive status and fault information.

H. POWER AND MONITORING CABLE

a. The power cable shall be sized to the IEC standards and shall be of sufficient length to reach the junction box without the need of any splices. The motor cable shall be a screened cable and sized and installed according to IEC requirement.

I. USER INTERFACE/MENUS

a. The pump drive shall incorporate an (OLED) LCD screen to display drive operating status, alarms, liquid level and parameters.
b. The pump drive shall include 7 pushbuttons with the following functions: Pump Start, Pump Stop, Hand (Manual) Operation, Auto Operation, Menu Access, Increase Value, and Decrease Value.

c. Pump Start Level, Operating Parameter Adjustment and Alarm History shall be accessed via menu structure. Menu shall have at least 2 levels of security, limiting access to qualified personnel only.

d. The LCD screen shall display status information in 4 modes: Off, Standby, Active Auto and Active Manual.

e. The information shown shall be as follows:

   OFF: Firmware name, Status (“STOP”), Rating (kW/hp)
   STANDBY: Status and Name, Operating Mode, Sump Level
   ACTIVE AUTO: Status and Name, Operating Mode, Motor Freq., Power, Sump Level, Current
   ACTIVE MANUAL: Status and Name, Operating Mode, Motor Freq., Power, Sump Level, Current

J. PUMP DRIVE OPERATIONAL FUNCTIONALITY

a. High/Low Level Sump Control:

   i. The pump drive shall provide automatic level control via means of a submersible pressure transducer (4-20mADC). User-programmable Start Level shall indicate the point at which the pump will start. Upon activation the pump shall run at maximum speed for a pre-determined period, then ramp down to the energy efficient Optimal speed, calculated by the pump drive. When the water level reaches the Stop Level, the pump shall stop. The Optimal Speed shall either be calculated by the pump drive or manually entered by the user.

   ii. In case of high inflow, the pump drive shall increase pump speed until the water level begins to decrease. When the water level reaches the Stop Level, the pump shall stop.

   iii. In case of very high inflow, in a duplex installation, when a single pump is unable to overcome the inflow conditions even at maximum speed, additional pumps shall be activated and run at maximum speed until the Stop Level is reached. If water levels continue to rise, a High Level Alarm shall be activated.

   iv. The pump drive shall incorporate a Minimum Speed function that prevents the pump from operating at speeds too low to move water based on the pump curve.

b. Run Time Averaging (Duplex Application Only):

   i. In cases of duplex pumps/drives, the pump drive shall provide capability to balance run times for even wear. This shall be an internal function of the drive and not require external devices, such as an Alternating Relay. The function shall operate by determining a “random” start level based on the Start Level setting. Each drive shall determine its own random start level independent of each other. New random start levels will be determined every 24 hours. The pump with the lowest random start level shall be first to
start on any given pump cycle. The second pump shall remain in Standby capacity in case the lead pump shall not be able to lower the water level as described in the section above. By recalculating the random start levels every 24 hours, balanced run times are accomplished.

c. Pump Cleaning Function:

i. The Pump drive shall incorporate a “self-cleaning” function to remove debris from the impeller. The cleaning shall be triggered by the following circumstances:

1. Soft Clogging: When motor current is increasing over a certain period of time defined by the pump supplier.

2. Hard Clogging: When motor current is increased drastically and pump stops.

ii. The cleaning function shall consist of forced stopping, reversal and forward runs timed to allow for debris to clear from the impeller. After cleaning cycle is complete, drive shall resume to automatic operation.

d. Sump Cleaning Function:

i. The pump drive shall incorporate a sump cleaning function to ensure surface solids and grease are regularly removed from the sump. The sump cleaning function shall be performed regularly when enabled by the operator. Sump cleaning shall consist of the following functions

1. Sump cleaning is triggered when internal timer expires and during a normal pump down cycle

2. Pump is automatically ramped to maximum speed

3. Pump runs at maximum speed for designated time or until the pump are “snoring.”

4. When Sump Cleaning is over, the pump is shut off and resumes normal operation.

e. Pipe Cleaning Function:

i. The pump drive shall incorporate a pipe cleaning function to avoid discharge pipe sedimentation and clogging due to reduced pump speed. This shall be an automatic feature that initiates with every pump cycle. Upon reaching Pump Start Level, the drive shall operate the pump at 100% speed for a determined time before ramping down to the most energy efficient speed for the duration of the cycle.

f. Energy efficient speed finder:

i. The pump drive shall provide a function that automatically calculates the most energy efficient speed for the pump based on station inflow characteristics. An algorithm calculates the optimal speed whereby the most water is pumped using the least amount of energy, the optimal speed is constantly adjusted to account for changes inflow without requiring operator adjustment, multiple setpoints, etc.
ii. The energy efficient function prevents the drive from running off of the system curve for the pump. This will ensure maximum hydraulic efficiency as well as electrical efficiency is maintained.

g. Alarms & Monitoring:

i. The pump drive shall provide alarms and monitoring for the drive, pump and sump. Alarms shall be presented on the LCD display, via a Summary Alarm relay and via Modbus registers. All alarms, when occurring, shall remain active until reset. Alarms shall have a built-in 4 second delay to prevent nuisance tripping. Alarms shall be as follows:

1. Pump Monitoring:
   a. Pump Over Temperature (thermal contacts in motor stator)
   b. Pump Seal Leak (Flygt FLS leakage sensor)

2. Sump Monitoring:
   a. High Sump Level (via level float switch or submersible transducer)
   b. Submersible transducer Sensor Error (Submersible transducer is not connected, reports faulty values or the wrong start level is used)

3. Pump drive Monitoring (includes, but not limited to):
   a. Drive Overcurrent
   b. Drive Overload Trip
   c. Drive Overvoltage
   d. Drive Undervoltage
   e. Drive Overtemperature (internal)
   f. Drive Overtemperature (ambient)
   g. Drive Undertemperature (ambient)
   h. Input Phase Loss
   i. Drive Output Max Torque Exceeded

1.3 PUMP CONTROLLER

A. Pump Control Equipment (Primary Control System):
The pump controller shall provide automatic control of pumps with an HMI display interface. The minimum features available in the pump controller shall include:

1. Pump control of up to 6 pumps; including pump grouping and pump alternation.

2. Intelligent Hand-Off-Auto Control for each pump from the main display keypad as follows:
   a. Hand mode (semi-automatic, non-maintained manual mode), the pump switches off at the deactivation set point and then resets to Auto mode for the next pump run cycle.
   b. Hand mode (fully manual, maintained mode). To pump beyond the off (deactivation) set point, the Hand-Off-Auto button must be held down by the user for failsafe control.

3. Level set point adjustment for pump activation, deactivation and station level alarms.

4. Level device inputs shall include: 4-20mA analog signals, conductive probes or floats.

5. Redundant level device inputs with automatic fault control (input device switching).

6. Selectable charge (fill) or discharge (empty) modes.

7. Pre-configured station optimization features shall include:
   a. Maximum pumps to run
   b. Maximum starts per hour
   c. Maximum pump run time
   d. Pump maintenance run function
   e. Blocked pump detection
   f. Well mixer control capability
   g. Well clean out control capability
   h. High inflow mitigation
   i. Function to minimize buildup of fat or grease deposits

8. Pump alternation modes shall include:
   a. Standard alternation of pumps
   b. Fixed sequence pump control
   c. User defined alternation using a (N:1) or (N:M) ratio
   d. Alternation based on the most efficient pump
   e. Alternation by the number of hours run
   f. Alternation by the number of starts within a specified time period

9. Pump decommissioning mode to allow one or more pumps to be fully decommissioned.

10. Up to (6) unique user defined profiles of set points shall be available to control pumps during specific site conditions or events. Features shall include:
    a. Automatic profile change based on date and time
b. Profile selection option from SCADA (remote control), digital input, logic tag or local keypad

11. Locked level alarm function to indicate a level device fault.

12. Analog input signal watcher function to monitor analog input values for control and alarm uses.

13. Level simulation function for pump station commissioning and general testing.

14. A data logger for user-defined faults and events shall include:
   c. Recording of up to 50,000 events to internal flash memory
   d. Download capability up to 10,000,000 events in the form of a (csv), comma delimited file

15. Three phase supply voltage monitoring and supply fault management for the following conditions:
   a. Under-voltage
   b. Over-voltage
   c. Phase fail
   d. Phase rotation

16. Monitoring of dc power supply, battery voltage, and internal controller temperature.

17. Energy, power and pump efficiency monitoring:
   a. kW, kVA, power factor, kWHr, KVAH calculation for each pump
   b. Pump efficiency calculation (gallons per KWHr) for each pump
   c. Power supply data (voltage, frequency and phase angle information)

18. Motor fault protection features:
   a. 3-phase current monitoring for each pump
   b. Over current fault detection
   c. Under current fault detection
   d. Ground fault detection
   e. Current phase imbalance fault
   f. Motor insulation resistance failure detection

19. Flow measurement: (when enabled by software key)
   a. Calculated flow by liquid level draw down method
   b. Flow monitoring by inputs from a flow meter (analog input and pulsed signal input)
   c. Flow alarms for pump(s) and total station flow

20. VFD speed control function (when enabled by software key)

21. Fault handling functions:
a. Pump hold out function

b. Automatic reset function after fault condition is no longer present

c. Manual reset of fault (if user intervention of fault reset is required)

22. Remote control functions via remote telemetry: (when enabled with software key)

a. Change the operating mode of pump(s) (hand/off/auto operations)
b. Reset of pump faults and station faults
c. Change pump and alarm set point values
d. Change the operational profile of the pump(s)

23. Security

a. User defined password management for access to programming areas in the controller

b. Automatic data logging of personnel who have entered the programming areas

c. Automatic logging of all unsuccessful login attempts with a date and time stamp

d. Digital input option for controlled access to programming areas

24. SD and USB media access ports shall be available for the following operations:

a. Firmware upgrades
b. Saving or loading pump controller configuration information
c. Exporting or importing MODBUS and DNP3 points list information
d. Downloading data logs

25. Advanced programming functions: (when enabled by software key)

a. The pump controller shall have the ability to be used with IEC61131-3 and IEC61499 compliant PLC programming languages to enhance or modify existing functionality.

b. IsaGraf software programming and Logic Engine scripting language shall be supported.

26. Status indication

The following parameters shall be displayed on the main screen:

a. Liquid level in percent, meters, feet, inches or other custom defined units
b. Set points for pump control and level alarms
c. Pump status (running, stopped or next to run)
d. Pump availability indication
e. Pump fault indication
f. (3) user configurable lines of information to display pump station status and data

27. Pump Station Information
The main screen shall include an INFO button to view the following pump station information:

a. Hours Run counter for each pump and the pump station to include:
   • minutes run for last pump cycle
   • total minutes (hourly)
   • total hours today, total hours yesterday
   • total hours this week, total hours last week
   • total accumulated hours

b. Pump Start counter for each pump and the pump station including:
   • pump starts this hour, pump starts last hour
   • pump starts today, pump starts yesterday
   • pump starts this week, pump starts last week
   • total accumulated pump starts

c. Flow values (when enabled by software key)
   • station inflow rate
   • pump flow rate
   • total station volume
   • overflow data (including overflow start time, duration, estimated volume)

d. Power and Efficiency
   • pump efficiency in gallons or litres per KWHr - or KVAh
   • power in kW, KVA
   • power factor
   • energy accumulators per pump in KWHr and KVAH

e. Insulation resistance value for each pump motor in (Ohms)

f. I/O Status
   • Digital I/O status and accumulated values
   • Analog I/O status with a value in (mA) and a scaled value
   • 3-phase voltage, frequency, phase angle, power factor

g. Database viewer function to review statistics and tag data information in real time

h. Communications information and statistics

28. Pump Station Fault Information

The main screen shall include a FAULT button to view fault information as follows:

a. The fault screen will provide fault details along with a date/time stamp for each fault

b. A fault reset option shall be presented to the user when alarms are allowed to be reset

29. Pump Station Historical Information
The main screen shall include a HISTORY button to browse history information as follows:

a. View all recorded pump station events along with a date/time stamp for each event
b. The history log shall be capable of being filtered to display individual events

30. Pump Station Settings

The main screen shall include a SETTINGS button to configure the pump controller as follows:

a. Set point programming of pump activation/deactivation values and level alarm values
b. Enable/Disable level alarms, faults and historical data recording
c. Configuration of Inputs and Outputs
d. Setup parameters for each type of fault available in the pump controller
e. Set alternation mode for pumps
f. Configure station optimization parameters
g. Configure voltage supply monitoring parameters
h. Configure motor monitoring parameters
i. Configure communications parameters
j. Configure data logging parameters
k. Enable level simulation session
l. Create or restore backup copies of the pump controller configuration settings
m. Restart the pump controller

31. Hardware Specifications

a. The pump controller inputs and outputs shall be modular and shall be expandable.

b. Available I/O types shall include:
   1. Digital Inputs (discrete, voltage free input)
   2. Digital Outputs (dry contact type, rated at 240VAC/DC, 5A resistive)
   3. Analog Inputs (10bit)
   4. Analog Outputs (10bit)

c. Digital Inputs shall be configurable based on specific input requirements as follows:
   1. Pump sensor inputs: Flygt FLS circuit, Conductive Seal, PTC Thermistor (overtemp)
   2. Conductive probe sensing (for liquid level monitoring)
   3. (2) High speed counter inputs
d. The pump controller shall include the following data communication ports:
   1. (2) Ethernet ports (10Mbit/s)
   2. (2) RS232 ports (115kBit/s)
   3. (2) RS485 ports (115kBit/s)
   4. (1) USB device port
32. Communication Architecture
   a. The pump controller shall support the following communication types:
      1. TCP/IP Ethernet
      2. UDP
      3. RS232 Serial Data
      4. RS485 Serial Data
      5. Private radio over RS232
      6. PSTN (Dial-up)
      7. Wireless LAN
      8. Cellular Communications
   b. The pump controller shall support the following communication protocols:
      (when enabled)
      1. DNP3 (master & slave, level 2 compliant)
      2. Modbus (master & slave) as follows: Modbus TCP, Modbus RTU, Modbus ASCII

33. Performance and Environmental Specifications
   a. Central Processing Unit Speed: 566MHz
   b. Central Processing Unit RAM Size: 256MByte
   c. Central Processing Unit Flash Memory Size: 64MByte
   d. Real Time Clock (with battery backup)
   e. Working temperature -10°C to +60°C
   f. Storage temperature -40°C to +90°C
   g. Humidity 5% to 95% (non-condensing)
   h. IP Ratings: Controller Base Unit (IP20, NEMA 1), Display Keypad (IP65, NEMA 4)

34. Warranty (Multismart Pump Controller)
   a. The pump controller shall have a (5) year limited manufacturer’s warranty.

1.4 PREVENTATIVE MAINTENANCE AGREEMENT

A. Provide one year (renewable) contract for annual preventive maintenance services as follows:
   a. Agreement shall include:
      i. Travel time and mileage to pump station(s)
      ii. Lifting equipment to remove pumps from and replace pumps into sump
      iii. Labor and tools to perform services listed on 21 Point Check List
      iv. Makeup coolant up to 20% of total capacity (If required, additional or replacement of fluids is an additional charge)
      v. Preparation of summary report detailing equipment status and any recommendations for future action
   b. Preventive maintenance services shall be scheduled in advance with the owner’s “Scheduling Contact”. Annual contracts shall expire on the term end date unless
renewed. Multi-year agreements shall be scheduled for the subsequent maintenance visit 12 months after the previous preventive maintenance visit, plus or minus 30 days.

c. The agreement shall not include parts or labor for additional services that may be required to bring pumps or controls back to proper working condition. Some additional services can be performed at the time preventive maintenance is performed provided the “Approval Contact” is readily available to authorize the additional charges. More extensive repairs will require the pump to be pulled and returned to a service center upon authorization by the “Approval Contact”.

d. After the initial 21 point inspection and within 12 months from each subsequent 21 point inspection, pumps installed in this contract qualify for a 20% discount on service company labor only for future unscheduled pump diagnostics and repairs.

e. Payment Terms Are Net 30 Days After Invoice

f. Invoicing will be prorata after completion of each 21 point inspection

g. All pumps must be retrievable from the wet well top without entry into the sump. Additional charges will apply when workers are required to enter the wet well.

h. **21 Point Check List**
   1. Pump motor winding insulation integrity check (each motor winding is meggered for ground fault condition).
   2. Measure winding resistance through the power cable for each phase.
   3. Measure voltage for each phases on the power supply side of the electrical control panel with pump off.
   4. Measure pump run voltages on the load side of starter for each phase with motor running.
   5. Measure pump run amperage for each phase.
   6. Check for faulty connections in control panel and MCC.
   7. Verify pump safety device function; seal failure, motor thermals. (if applicable).
   8. Inspect pump retrieval system and operation and clean as required.
   9. Inspect pump impeller condition (check for wear, loose connection, and / or damage).
   10. Inspect condition of pump volute, insert ring (N type), cutter ring (F type), impeller wear ring (C type), or grinder wear parts (M type) for wear and damage.
   11. Verify and set proper clearance for impeller relative to insert ring or wear rings.
   12. Verify proper pump rotation.
13. Inspect fluids condition (oil or glycol coolant depending on model) for indication of lower mechanical seal leakage to verify proper sealing.

14. Inspect fluid quantity and add up to 20% makeup fluid (note additional fluids or replacement of fluids are an added charge).

15. Inspect stator chamber for indication of upper seal leakage to verify proper sealing.

16. Verify integrity of pump power cable by checking for cracks, cuts, or abrasion to outer sheath.

17. Inspect discharge connection for proper sealing.

18. Remove control system level sensor, clean and verify sensor cable integrity.

19. Operate pumps under normal operating conditions and observe for noise, vibration, or other abnormalities. Confirm proper starting/stopping/alternation of pumps in both manual and automatic modes.

20. Visually inspect condition and operation of pump station check valves, isolations valves, and air release valves.

21. Observe pump station for security/safety purposes; control panel/access cover/station fence is locked; fall through protection provided, corroded/damaged parts, sink holes around station, etc.

END OF SECTION 221329
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, 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 22 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 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.

1.6 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.

1.7 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.

1.8 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.

1.9 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 15 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 15 contractor shall provide duly licensed professional engineering consultants working on behalf of the Division 15 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 15 contractor’s licensed professional engineering consultants and the Division 15 contractor assume any and all responsibility for the design and suitability in terms of performance, of hybrid systems installed, as Division 15 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 15 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 15 contractor’s (V/E Items) professional of record (either employees, or independent consultants to the Division 15 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 15 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.

1.10 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.

1.11 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. 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.

1.12 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.

1.13 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.

1.14 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.

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.

1.15 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.

1.16 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.

1.17 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.

1.18 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. 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.
C. 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.

D. Where return air plenums above ceilings are utilized, Division 22 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.

E. 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.

1.19 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.

3.4 CLEANING AND ADJUSTING

A. Blow out, clean and flush each system of piping, and equipment as required to thoroughly clean the systems.

1. Clean all materials and equipment, and leave in condition ready to operate and receive succeeding finishes where required.

2. Adjust and align all equipment interconnected with couplings or belts.

   a. Adjust valves of all types and operating equipment of all types to provide proper operation.

   b. Remove and clean elements in all steam trap bodies.

   c. Clean all strainers.

B. Lubricate equipment as recommended by the manufacturer, during temporary construction use, and provide complete lubrication just prior to acceptance.

C. Permanent equipment operated during construction shall not be abused or be used in service different from its design application.
1. Temporary disposable filters shall be used during temporary operation.
2. All expendable media, including belts used for temporary operation and similar expendable materials shall be replaced just prior to acceptance.
3. Packing boxes of equipment operated during construction must be replaced just prior to system acceptance, using materials and methods specified by the supplying manufacturer.

D. Equipment furnished with factory finishes shall be retouched and repainted as required to present a new appearance.

E. Furnish and maintain protection for all of the work whether completed or in progress.
   1. Furnish and install coverings and enclosures as required.

F. New and existing operating equipment and systems shall be clean and dust free inside and out.
   1. Concealed and unoccupied areas such as plenums, pipe and duct spaces and Equipment Rooms shall be free of rubbish and swept clean at time of acceptance.

G. All installed ductwork shall be in a clean, new, first class condition. The contractor is responsible for keeping the ductwork clean during construction as required using such methods as sealing all openings except when attaching additional sections. Air handling units, ductwork and all associated items shall be cleaned or replaced at no cost to the Owner if allowed to get dirty. All air systems shall have appropriate filters in place during construction and replaced with permanent filters upon completion of project.

1.20 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.

1.21 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.

1.22 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.

1.23 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.

1.24 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.
1.25 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.

1.26 LABELING MECHANICAL EQUIPMENT

A. All mechanical equipment (A/C units, air handlers, fan coil units, fan powered boxes, water heaters, etc.) furnished under Division 22 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
SECTION 230500 - BASIC MATERIALS AND METHODS

1.01 PIPE

A. Equipment Drain Lines:
   1. These shall be Government Type "L" hard copper.

B. Chilled Water and Heating Hot Water (above slab):
   1. Shall 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.

C. Victaulic Couplings:
   1. At the contractor's option, Victaulic couplings and fittings may be used for the HVAC piping systems inside building in lieu of connections hereinbefore specified.
   2. Couplings shall be Victaulic Style 77, Aeroquip, or equal with housing fabricated in two or more parts of malleable iron castings, in accordance Federal Specification QQ-I-666c, Grade II. Couplings gasket shall be Victaulic Grade "E" molded synthetic rubber, per ASTM D-75-61, Grade No. R615BZ. Coupling bolts shall be oval neck track head type with hexagonal heavy nuts, per ASTM A-183-60.
   3. All pipe fittings used with Victaulic pipe couplings shall be fabricated of malleable iron castings in accordance with Federal Specifications QQ-1-666c, Grade II. Where Victaulic malleable fitting pattern is not available, fittings fabricated from schedule 40 steep pipe or standard wall seamless welded fittings with grooved ends may be used.
   4. Before assembly of couplings, lighting coat pipe ends and outside of gaskets with cup grease or graphite paste to facilitate installation.
   5. Pipe grooving shall be performed with tools manufactured by coupling and fitting manufacturer and shall be installed in accordance with the manufacturer's specifications contained in latest published literature.

D. Installation of Piping:
   1. All pipe shall be true and straight, without sags or traps.
   2. The Contractor shall exercise care in cleaning joints after making cuts on pipe to prevent pipe particles from entering the system.
   3. All pipe fittings shall be same as piping specified unless indicated otherwise.
   4. 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.
   5. 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.
   6. 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.
7. Locate groups of pipes parallel to each other and building lines; space them at distance to permit access for servicing, valves, and to create most practical appearance when racked with conduits, refrigerant, etc., provided by other contractors.

8. 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.

9. Install horizontal piping to coordinate with other trades and install without sags or humps.

10. 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.

11. Grade other piping as specified under heading or service where used, or as directed.

12. Keep piping free from scale and dirt, protect open pipe ends wherever work is suspended during construction. To prevent foreign bodies entering and lodging in pipe, use temporary plugs or other approved material.

13. Where changes in pipe sizes occur, do not bush down; use only reducing fittings. For drainage piping changes in direction, use longsweep bends where possible; otherwise, short sweep 1/4 bends or combination Y and 1/8 bends; also Y's in combination with other bends.

14. Provide shut off valves at all supply connections to all equipment. Supplier of equipment shall provide rough-in drawings and this contractor shall fully connect all items, supply necessary piping and fittings as required, unless otherwise noted individually.

15. Do not locate valves with stems below horizontal.

16. 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.

17. Provide unions, screwed or flanged, where indicated, and in following locations even if not indicated.

18. In by-passes around equipment.

19. In connection to equipment requiring disconnection for repairs or replacement. Locate between shut-off and equipment.

20. Weld-O-let fittings shall be used in iron pipe.

21. All screwed fittings and pipe shall have threads cut to standard pipe thread dimensions. Pipe shall be properly reamed after cutting of threads.

22. Joint compound, Rector Seal Series 100, LACO Series Slick-tite or equal thread lubricant shall be applied to male threads of the screwed pipe and fittings only.

23. Approved expansion joints or flexible couplings shall be provided as necessary.

24. Care shall be taken in making up pipe and fittings such that the pipe does not extend into fitting sufficiently to reduce the waterway.

25. 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.

26. Bushings may be used only where standard, one-piece reducing fittings are not available and shall be subject to the following:

   a. Bushings shall be of the face or flush type.
   b. Bushings shall not be used in elbow fittings.
   c. Bushings shall not be used when the reduction in size of the outlet is less than 1/2".
   d. Bushings shall not be used in more than one outlet of any tee or two outlets of any cross fitting.

1.02 PIPE SPECIALTIES

A. Dielectric unions shall be used between copper and iron pipe.
1.03 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.

1.04 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 Grinnell, 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 Grinnell, 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.

1.05 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. All gas cocks, valves, etc. on gas lines shall have local utility company and AGA approval.

E. 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.
F. Gate Valves, 2-Inch and Smaller: MSS SP-80; Class 125, body and bonnet of ASTM B 62 cast bronze; with threaded or solder ends, solid disc, copper-silicon alloy or bronze stem, brass packing gland, "Teflon" impregnated packing, and malleable iron handwheel. Provide Class 150 valves meeting the above where system pressure requires.

G. Gate Valves, 2-Inch and Smaller: (Hot Water Heating) MSS SP-80; Class 150, body and union bonnet of ASTM B 62 cast bronze; with threaded or solder ends, solid disc, copper-silicon alloy or bronze stem, brass packing gland, "Teflon" impregnated packing, and malleable iron handwheel. Do not use solder end valves for hot water heating piping applications.

H. Gate Valves, 2-1/2-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.

I. 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 specifications, with threaded end connections, where system pressure requires or where Class 125 valves are not available.

J. 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.

K. 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.

L. 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.

M. 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.

N. 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.

O. 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.
2. Steel Pipe Sizes, 2 Inch and Smaller: Threaded or grooved end.
3. Steel Pipe Sizes, 2-1/2 Inch and Larger: Grooved end or flanged.
1.06 INSTALLATION OF VALVES
A. Use ball and butterfly valves for shut-off 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, unions, etc. where pipe is chrome plated shall have similar finish. All exposed supplies to plumbing fixtures shall be chrome plated.
H. All valves, on insulated piping shall be complete with extended lever handle stem.

1.07 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.

1.08 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.

1.09 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.

1.10 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 the equivalent. 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:

<table>
<thead>
<tr>
<th></th>
<th>Piping</th>
<th>Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chilled Water Supply</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Chilled Water Return</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hot Water Supply</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Hot Water Return</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

C. Pipe markers with arrows shall indicate lines content and shall be located 20 feet on center and at each change 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.

END OF SECTION
PART 1 - GENERAL

1.1 GENERAL

A. The Mechanical Contractor shall furnish to the Electrical Contractor for installation, all motor starters, start-stop switches, pilot lights, etc., 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, and electrical terminations required for the installation of such mechanical equipment.

C. All electrical equipment shall have the UL label and shall meet the standards of the National Electrical Code and NEMA Rated. I.E.C. is not acceptable.

D. All starters and VFD’s shall have “on-off-auto” selector switches, phase failure protection, and interface with building automation controls.

1.2 MOTORS

A. All motors on equipment shall be “Premium High Efficiency” type motors.

B. Motors shall be of the 40° rise type, Class F insulation, NEMA Design B and totally enclosed fan-cooled (TEFC) design as a minimum. All motors shall be wound for plus or minus 10% of the specified voltage.

C. Motors shall meet the following horsepower ratings, and minimum full load efficiencies (U.S. IEEE 122A)

<table>
<thead>
<tr>
<th>Motor Hp</th>
<th>Minimum Full Load Efficiency (Nominal)</th>
</tr>
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<tbody>
<tr>
<td>0-2</td>
<td>84%</td>
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<tr>
<td>3</td>
<td>85%</td>
</tr>
<tr>
<td>5</td>
<td>87%</td>
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<tr>
<td>7, 5, 10</td>
<td>89%</td>
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<tr>
<td>15</td>
<td>90%</td>
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<tr>
<td>20</td>
<td>91%</td>
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<tr>
<td>25, 30</td>
<td>92%</td>
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<tr>
<td>40 and above</td>
<td>93%</td>
</tr>
</tbody>
</table>

D. Motors shall have 1.15 service factor rating for 3-phase motors and 1.35 for single-phase motors.

E. Motors shall be as manufactured by Century III E-Plus, Marathon Series Premium Blue Chip XRI or approved equivalent.

F. Motors which are controlled/started by variable frequency drives (Inverters) shall be Inverter Duty Motors. Motors shall be of the totally enclosed fan cooled (TEFC) type with Class F Insulation, ball bearings, Continuous Duty 40° C Ambient, Cast Iron Frame, Class H magnet wire. Motors shall comply with NEMA MG1 Part 30/Part 31 requirements/specifications.
G. Motors shall be as Manufactured by Marathon Blue Max Inverter Duty, Baldor Super-E, or approved equivalent. Provide factory installed SGR bearing protection rings.

H. All motors shall be specifically designed for specific application specified (i.e. AHU, pump, etc.), and shall have built-in thermal overload protection.

I. The supplier shall provide a list of motors with nameplate data for each new motor submitted. Submit in shop drawings with associated motor efficiency.

1.3 MOTOR STARTERS

A. Refer to Electrical Plans and provide fusible type combination starter/disconnects where required.

B. Exception Manual starters can be furnished for fractional horsepower motors that are not controlled automatically or remotely. Refer to Temperature Controls section of these specifications and mechanical drawings to determine if fractional horsepower motors are controlled automatically or remotely.

C. Microprocessor-Based Motor Control Where specified under specific starter sizes, provide Microprocessor-based Motor Control as Specified herein. The microprocessor-based motor control shall meet the latest applicable sections of Underwriters Laboratories (UL) and National Electrical Manufacturers Association (NEMA).

1. Provide motor contactors with NEMA size 1 through 6 ratings as shown on the plans. Provide motor contactors with replaceable fixed and movable contacts. Provide contactors of the electro-mechanical type with the coil controlled by an application specific microprocessor. The microprocessor shall measure control circuit voltage and prevent closing of the coil on low voltage (78 volts ac) and/or high voltage (135 volts ac) conditions which are outside of the coil ratings.

2. Microprocessor shall apply voltage to the coil such that a guaranteed maximum of 2 milliseconds of main contact bounce occurs on contactor closure. The microprocessor shall continuously measure coil circuit voltage and current so as to maintain constant coil power at a level to maintain main contact closure and minimize coil power consumption. Provide electronic circuitry such that the coil is isolated from surges to the point where surge suppressers are not required. Manufacturer is to provide lifetime free coil replacement of any failed coil.

3. Microprocessor is to wait for three (3) half (½)-cycles of control start signal prior to activating a close to prevent starts resulting from momentary voltage spikes, switching transients, fluttering contacts, and shorted Programmable Logic Control outputs.

4. Provide control modules to perform the indicted input/output control functions. Module shall incorporate faceplates having membrane type pushbuttons, and LED’s. All push-button and LED functions to be furnished with clear written identification. Control Modules to be provided with individual hand, off, auto push buttons and overload alarm, overload trip with LED and reset push buttons.

D. In addition, provide motor starter with the below listed features

1. Motor starters shall monitor current in each phase to provide phase loss and phase unbalance protection. Provide phase loss/unbalance protection which requires no time delay for reset.

2. Motor starters to provide Class II ground fault protection. Ground fault protection shall be set at 20% of maximum continuous ampere rating and have a start delay of 20 seconds, and a run delay of 1 second to prevent nuisance trip on starting.
3. All starters shall be complete with H-O-A (Hand-Off-Auto) selector switch.
4. All starters shall have a green "Stop" and a red "Run" pilot light.
5. All starters shall have automatic re-start after a power disturbance (power failure, blown-out, phase failure, etc.)

E. Single Phase AC Fractional Horsepower Manual Starters - 1HP or Less  
FHP manual starters shall be Cutler Hammer AN16 or Allen Bradley Bulletin 600. The manual starters shall consist of a hand-off-auto switch equipped with Bimetallic ambient compensated overload relays adjustable + 24%.

1. Thermal unit shall be of one-piece construction and interchangeable. The starter shall be inoperative if thermal unit is removed. Contacts shall be double break, silver alloy visible from both sides of starter.
2. All Fractional Horse Power Manual Starters shall be double-pole type with one (1) thermal overload relay and red pilot light.

F. Single and Three Phase AC Microprocessor-Based Starter (All Motors Between 1 HP and 10 HP)

1. Motor starters shall be rated in accordance with NEMA sized and horsepower ratings. No starter shall be listed as a ½-size. Motor starters shall be used in discrete control, in motor control centers, and in other user and OEM custom control panels. (IEC contactors are not acceptable).
2. Contacts shall be silver alloy, double break, and shall be inspectible on NEMA Sizes 00 through 4 without use of tools. Size 5 and larger shall be inspectible with standard tools. They shall be replaceable without removing the line, load, or control wiring from the starter, and replaceable without removing the starter from the enclosure.
3. Coils shall be the encapsulated type, and shall be replaceable on NEMA Sizes 00 through 4 without the use of tools. Size 5 and larger shall be replaceable with standard tools. They should be replaceable without removing the line, load, or control wiring from the starter, and replaceable without removing the starter from the enclosure.

4. Overload protection shall be provided by solid state electronic overload relay. Single-phase starters shall provide one-or two-leg overload protection; Three-phase starters shall provide three-leg overload protection.
5. Furnish Motor Starter with Solid-State Overload Relay Installed. GE Type 300-Line Enclosed Non-combination Starters, with Solid-State Overload Relay, Housed in Type 1 or 3R NEMA enclosure. Allan Bradley Type No. 509 or prior approved equivalent.
6. Electrical characteristics shall be as indicated in drawings.
7. Applications (Typical) Direct or Belted to motor equipment and components, fans/blowers, pumps compressors and etc.
8. Starter shall be full voltage non-reversing consisting of one contactor and one overload relay assembled together and provided with
   a. Hand-Off-Auto selector switch
   b. Red on Light;
   c. NC auxiliary contact;
   d. Terminal Strips
   e. Phase loss and phase unbalance relay
9. Starter shall be suitable for straight through wiring, with separate provision for control power connections at the L1 and L2 terminals
10. Starter shall have a NEMA solid state electronic overload relay and provide the user with following selectable settings.
a. Selectable Class 10, 20 and 30, protection.
b. Visible trip indicator with manual reset.
c. Built in thermal memory to prevent hot motor restarts.
d. Relay shall be capable of monitoring for motor single phasing with adjustable current unbalance of 20 to 50 percent, and incorporating a signal to an external device.
e. Shall have a reset mechanism that resets on the upstroke only.

11. Protection Functions
a. 21 Adjustable full load amps with tactile feedback dial.
b. Protection against complete phase current loss.
c. Accuracy plus or minus 2%.
d. Repeatability plus or minus 2%.
e. Self-powered @ 50% of maximum current range.
f. Size 1-6 (0.40A-50A, 600 V, 50/60 Hz).
g. Unbalance trip signal for PLC operation
h. Manual trip.
i. Built-in line/load straps.
j. Adjustable trip adjustment – Plus or minus 10%. By turning a dial in the overload relay face.
k. Be ambient insensitive within an operating temperature range to minus 20 to plus 70 degrees Celsius.
l. Relative humidity 95 percent non-condensing.

12. Options
a. Control power transformer fusing shall be provided by two primary fuses plus on secondary fuse. Control power transformer secondary voltage shall be 120 VAC.

13. Auxiliary Contacts
a. Contactor to be designed to accommodate two (2) auxiliary contact blocks, each capable of a combination of up to four (4) normally closed (NC) or four (4) normally open (NO) auxiliary contacts.
b. Provide and install a minimum of one (1) spare NO contact and one (1) spare NC contact in addition to any auxiliary contacts specified or required for the proper operation of the temperature control system.

G. Reduced Voltage AC Solid State Starters - (All Motors 10 H.P. and Above) All starters for motors 10 H.P. and above shall be a Cutler Hammer Type EA or Allen Bradley.

1. The controller shall be supplied for use on an electrical system as indicated on drawings.
2. The Reduced Voltage Starter shall be sized to control horsepower, as indicated on drawings.
3. The solid-state reduced voltage starter shall be UL and CUL listed and consist of an SCR based power section, logic board and paralleling bypass contactor.
4. The SCR based power section shall consist of six (6) back-to-back SCR’s and shall be rated for a minimum peak inverse voltage rating of 1500 PIV. Units using triacs or SCR/diode combinations shall not be acceptable.
5. The logic board shall be mounted for ease of testing, service and replacement. It shall have quick disconnect plug-in connectors for current transformer inputs, line and load voltage inputs and SCR gate firing output circuits.
6. The paralleling bypass contactor shall energize when the motor reaches full speed and close/open under 1X motor current. The bypass contactor shall be equal to Cutler Hammer W200.
7. The following logic board adjustments are required
   a. Ramp Time; 1-45 seconds, on hexadecimal switch
   b. Current limit; 75-500% current, on hexadecimal switch
   c. FLA of motor; 4-1 range of starter, on (Dip switch)
8. Maximum continuous operation shall be at 115% of continuous amp rating.
9. Refer to description of microprocessor starters for details regarding contactors and starters internal to this device.

1.4 VARIABLE FREQUENCY MOTOR SPEED CONTROLLERS

A. General The Contractor shall supply variable frequency drive units equivalent to the specifications below as manufactured by Danfoss Graham, Square D, G.E., ABB or approved equivalent. Provide variable frequency drive units to Electrical Contractor for installation.

B. All HP ratings shall meet or exceed Table 430-150 of the National Electric code. Three Phase Motor Full Load Currents, HP, Maximum Current and Rated Voltage shall appear on the drive nameplate.

1.5 CODES/STANDARDS

A. VFD and options shall be UL™ 508-C listed.

B. NEMA 12 enclosed VFD shall be UL™ approved for mounting in environments containing air-born dusts.


D. All pilot devices, operator controls, bypass controls and terminal strip connections shall be industrial rated and tested to verify proper operation.

E. BASIC DESCRIPTION The VFD shall be a fully digital PWM using very large scale integration (VLSI) techniques as well as surface-mount technology for increased reliability. The VFD shall use two 32-bit microprocessors with 12-bit resolution to allow step-less motor control from 0.1% to 110% of motor base speed. The output frequency and voltage of the drive shall be adjustable such that a constant volts/Hz ratio is maintained throughout the base operating range.

F. All programmable settings shall be held in non-volatile memory and shall not be affected by power outages, brownouts, power dips, etc. The VFD shall have initial programmable settings intact from the factory without the need of battery backup. The VFD shall not need to be programmed at the job site prior to being able to run a motor, but shall be ready to run a motor as soon as power connections are made.

G. QUALITY ASSURANCE Each drive shall be field subjected to the following test and quality control procedures. A written report stating findings shall be submitted to Engineer prior to substantial completion.

1. Every VFD shall be functionally tested under motor load. During this load test the VFD shall be monitored for correct phase current, Phase voltages, and motor speed. Correct Current Limit operation shall be verified by simulating a motor overload.
2. Verification of proper factory presets by scrolling through all parameters shall be performed to ensure proper microprocessor settings. The computer port should also verify that the proper factory settings are loaded correctly in the drive.
3. All options shall be functionally tested including operation of a motor in the bypass mode. Proper heater coil installation in motor overload, if supplied, shall be
4. Quality control systems shall conform to the ISO9001 standard. Under this system, quality assurance for design/development, production, installation and servicing of the proposed manufactures equipment shall be certified ISO9001.

H. SERVICE  The VFD manufacturer shall maintain and staff worldwide service centers. The manufacturers shall have the ability to test both the drives and motors in these service centers.

1. Factory start-up shall be included for each VFD provided.
2. Service engineers shall be employed by the manufacturer or be certified by the manufacturer and provide start-up service including physical inspection of drive and connected wiring and final adjustments to meet specified performance requirements.

I. BASIC FEATURES  The VFD shall have the following basic features

1. Drives that automatically reduce the carrier frequency as load is increased shall not be supplied. Operator controls shall be mounted on the door of the cabinet and consist of a membrane command center which will serve as a means to configure controller parameters such as Minimum Speed, Maximum Speed, Acceleration and Deceleration Times, Volts/Hz Ratio, Torque Boost, Slip Compensation, Over frequency Limit, and Current Limit. The controller shall have an internal means of deactivating keypad parameter adjustments to eliminate unauthorized data entry.
2. An electronic overload circuit designed to protect an A-C motor operated by the VFD output from extended overload operation on an inverse time basis. This electronic overload shall be UL™ and NEC recognized as adequate motor protection. No additional hardware such as motor overload relays or motor thermostats shall be required.
3. Drive shall be complete with internal 120 volt A/C control power circuit with transformer and protective fuses.
4. Drive shall be completely digital.
5. The drive shall have the ability to “catch” a spinning motor and then ramp up to controlled speed.
6. The drive shall be complete with speed potentiometer and hand-off-auto (H-O-A) switch.
7. The drive shall serve as an NEC approved disconnection means.
8. As a protective feature, the drive unit shall immediately protect itself from the removal of all loads.
9. The VFD unit shall be rated for operation in ambient temperatures of 0°C to 50°C without de-rating of the drive unit output capacity or varying carrier frequency.
10. The carrier frequency shall be field adjustable and shall be capable of operating from 4kHz to 8kHz.
11. The VFD shall be complete with proper interface module for control of the VFD by the existing Building Automation System (BAS).
12. The exact location of the VFD shall be coordinated with the room’s equipment to ensure that all NEC required clearances are maintained.
13. An LCD/LED display mounted on the door of the cabinet that digitally indicates:
   a. Frequency output
   b. Voltage output
   c. Current output
   d. Motor RPM
   e. Input KW
   f. Elapsed Time
   g. Time Stamped Fault Indications
14. Relay contacts for remote indication of drive fault or motor running for inter-wiring to other user supplied devices.
15. An automatic restart circuit which is adjustable by number of restart attempts and time interval between restarts.
16. Three critical frequency avoidance bands, which can be programmed in the field, enable the controller to avoid resonate frequencies of the driven equipment. Each critical frequency avoidance band shall have a bandwidth adjustable via keypad entry of up to 10 Hz.
17. The VFD shall have the capability of riding through power dips up to 10 seconds without a controller trip depending on load and operating condition.
18. RS232 Port for Configuration, Control and Monitoring.
19. An isolated 0-20mA, 4-20mA or 0-4, 0-8, 0-10 volt analog speed input follower.
20. An isolated 0-10 V or 4-20 mA output signal proportional to speed or load.
21. EMI and RFI filters.
22. The drive's power section shall be insensitive to phase rotation of the input AC line.
23. The VFD unit(s) shall be sized to operate a variable torque load.

J. PROTECTIVE CIRCUITS AND FEATURES The VFD shall include the following protective circuits and features:
1. Motor current exceeds 200% of drive continuous current rating.
3. Total ground fault under any operating condition.
4. High input line voltage.
5. Low input line voltage.
6. Loss of input or output phase.
7. External fault. (This protective circuit shall permit wiring of remote N.C. safety contact to shut down the drive). User supplied end switches, thermal switches, fire stats, freeze-stats inputs will be connected to this VFD supplied circuit.
8. Metal oxide varistors for surge suppression shall be provided at the VFD input terminals.

K. ADJUSTMENTS The following adjustments shall be provided:
1. Maximum frequency (1 - 120 Hz) with factory setting at 60 Hz.
2. Minimum frequency (5 to 60 Hz) - separately adjustable from maximum frequency.
3. Acceleration (0.1 to 999.9 seconds).
4. Deceleration (0.1 to 999.9 seconds).
5. Volts/Hz ratio factory set for 460 Volts at 60 Hz or 208 Volts at 60 Hz.
6. Current limit (50 to 100%) drive continuous rating.

L. SPECIFIC FEATURES TO BE INCLUDED The following options shall be included as specified in the document:
1. Complete contactor bypass shall be provided to allow motor to be safely transferred from VFD output to the A-C line, or from the A-C line to the VFD, while the motor is at zero speed. The contactor bypass shall utilize two 3-pole motor contactors electrically interlocked. One contactor is to open and close the connection between the VFD output and the motor. The other contactor will open and close the connection between the bypass power line and the motor, providing "across the line" starting. Motor protection is to be provided in the "bypass" mode by a bi-metallic Class 20 Smart Motor Protection adjustable overload relay. Relay
control logic shall also be included within the VFD enclosure to allow the same “START/STOP” command to operate the motor in either mode. The relay logic shall be 120 volts.

2. The bypass circuit shall include a second disconnect installed in the VFD to provide the ability to safely troubleshoot and test the controller, both energized and de-energized, while the motor is running in the “bypass” mode. A contact closure shall be provided to indicate that the drive is in the “bypass” mode. A Remote/Local selector switch shall also be provided to transfer control from the keypad to user wired signals. Form “C” Normally Open and Normally Closed contacts shall be provided for both Run and IET/Drive Stopped. The entire bypass option shall be packaged with the controller enclosure and be mechanically isolated from the VFD.

3. Input line fuses shall provide protection for the input rectification circuit using Class J fuses with interrupting rating of 200,000 AIC. The series interrupting rating of the VFD and fuses shall be a minimum of 10,000 AIC and shall be stated in the VFD instruction manual as required by UL.

4. A main input disconnect shall mount as an integral part of the NEMA 12 enclosure for positive power disconnect of the VFD. It shall have the capability for door padlocking.

5. A three-phase 3% impedance Input Line Reactor shall be provided and installed to minimize drive harmonics on the A-C line and protect the drive from damaging electrical system transients. In addition, a three-phase 3% impedance output line reactor shall be provided and installed.

6. Control voltage shall be protected by a phase failure relay monitoring the input power to the main disconnect. This relay shall disconnect the control power to the input contactors if a phase failure, unbalance or reversal is detected. The relay shall automatically re-set after normal phase operation is returned to the disconnect.

7. The VFD units(s) provided as part of this project shall be sized in accordance with the controlled motor's nameplate full load amperage. VFD's shall not be sized based upon horsepower.


10. VFD shall automatically restart after a phase-failure, under/over voltage, and/or phase failure fault is cleared.
SECTION 230593 - TESTING, ADJUSTING, AND BALANCING

1.1 SECTION INCLUDES

A. All Division 15 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 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. VAV Boxes  
F. Coils (Air Temperatures)  
G. Valves  
H. Vibration Isolators  

1.4 HYDRONIC SYSTEMS  
A. System Mains and Branches  
B. Coils  
C. Pumps  

1.5 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.  

1.6 QUALIFICATIONS  
A. Agency Qualifications: The TAB Agency shall be a current member of the AABC or the NEBB.  

1.7 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.  

1.8 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.

1.9 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.

1.10 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).

1.11 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 + or - 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.

1.12 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 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 VAV Systems:

1. Identify the type, location, and size of each terminal box. This information shall be recorded on terminal box data sheets.
2. Test, adjust and record the maximum and minimum box air quantities for each VAV box.
3. Set volume regulators on all terminal boxes to meet design maximum and minimum CFM requirements.
4. Test and record entering and leaving air temperature of hot water coils with full heating air flow and water flow.
5. Insure the entering static pressure is sufficient for normal, proper box operation.

G. 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.

1.13 HYDRONIC SYSTEMS

A. The TAB agency shall, as applicable, verify that all hydronic equipment, piping, and coils have been filled and purged; that strainers have been cleaned; and that all balancing valves (except bypass valves) are set full open. As applicable, it shall check air vents and expansion or compression tank for proper operation. The TAB agency shall perform the following testing and balancing functions in accordance with the AABC National Standards:

B. For System Mains and Branches:

1. Adjust water flow in pipes to within design GPM requirements. As applicable, at least one branch balancing valve shall be completely open.

C. For Coils:

1. Tolerances - Test, adjust, and balance all chilled-water and hot water coils within 10% of design requirements.
2. Verification - Verify the type, location, final pressure drop and GPM of each coil. This information shall be recorded on coil data sheets.

D. For Pumps:

1. Balance pump triple duty valves.
1.14  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.

1.15  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 23 05 93
SECTION 230700 - INSULATION

1.01 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 where recommended by the manufacturer 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.

1.02 THERMAL INSULATION

A. After all work has been tested and approved, insulate as follows:

1. INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

1.03 CONDENSATE DRAIN PIPING

A. Insulate with 1/2" Aerotube or Armaflex pipe insulation applied in accordance with manufacturer's recommendations and instructions.

1.04 CHILLED WATER SUPPLY AND RETURN PIPING

A. Insulate lines above slab with foamglass or approved equivalent pipe covering, with all joints firmly butted together. Seal all laps and butt joint strips with vapor barrier adhesive. Fittings to be insulated with pre-fabricated fitting covers and finished with an envelope coverage of vapor barrier mastic reinforced with Glassfab. Provide an all service jacket (ASJ) with 25/50 flame spread for all foam glass chilled water pipe insulation (delete reference to flame bar jacket). Provide PVC jacket in addition to ASJ for piping exposed in the pump room and on the mezzanine mechanical platform.

B. Thickness to be 1" for pipe sizes up to and included 2" and 1-1/2" thick for pipe sizes 2-1/2" and above.

C. All voids around valves, fittings, housings and other devices installed in the piping system shall be filled with loose fiberglass insulation. Insulation vapor barrier shall be maintained to prevent moisture penetration through outer cover.

D. Finish piping on the interior of the building and at the mezzanine mechanical deck with a white 0.030 PVC covering fittings with clear solvent weld joints.
E. Lines on the exterior of the building shall be covered with smooth 0.160 aluminum jacket and elbows.

1.05 CALIBRATED BALANCING VALVES

A. Insulate calibrated balancing valves with molded insulated furnished with the unit and provide strap bands for access.

1.06 CHILLED WATER PUMP:

A. Insulate pump housing with 1-1/2" thick foamglass block or ceramic foam insulation and arrange so that it can be removed without destroying the insulation. Finish with a vapor barrier mastic and glassfab BF30-35, Insulacoustic 501-C or equal.

1.07 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.

1.08 CHILLED AND HOT WATER EXPANSION TANKS

A. Shall be insulated with 1/2" aerotube, armaflex or equal sheets adhered to tank with contact adhesive and sealed at all joints. Finish with white vapor barrier mastic and glassfab BF30-35, insulacoustic 501-C or equal.

1.09 AIR SEPARATORS AND CHEMICAL FEEDERS

A. Shall be insulated with 3/4" thick aerotube, armaflex or equal sheets of closed cell insulation, adhered to tank with contact adhesive and sealed at all joints. Finish with white vapor barrier and glassfab BF30-35, insulacoustic 501-C or equal.

1.10 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 in 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 hangers are used on domestic copper pipe, insulation may cover pipe and hanger. Provide 18 gauge metal saddles between all hangers and insulation.

END OF SECTION
1.1 SCOPE OF WORK

A. The Building Automation System (BAS) manufacturer shall furnish and install a fully integrated building automation system, incorporating direct digital control (DDC) for energy management, equipment monitoring and control, and subsystems with open communications capabilities as herein specified.

Provide open communications system. The system shall be an open architecture with the capabilities to support a multi-vendor environment. To accomplish this effectively, system shall be capable of utilizing standard protocols as follows as well as be able to integrate third-party systems via existing vendor protocols. System shall be capable of BACnet communication according to ASHRAE standard ANSI/ASHRAE 135-2001. System shall be capable of OPC server communications according to OPC Data Access 2.0 and Alarms and Events 1.0. The system shall not be limited to only use open communication protocols, but also be able to integrate a wide variety of third-party devices and applications via existing vendor protocols and through the latest software standards.

The controls system for this building must tie into the existing CPPJ DESIGO Siemens workstation located at the 901 Bldg.

B. The installation of the control system shall be performed under the direct supervision of the controls manufacturer with the shop drawings, flow diagrams, bill of materials, component designation or identification number and sequence of operation all bearing the name of the manufacturer. The installing manufacturer shall certify in writing, that the shop drawings have been prepared by the equipment manufacturer and that the equipment manufacturer has supervised their installation. In addition, the equipment manufacturer shall certify, in writing, that the shop drawings were prepared by their company and that all temperature control equipment was installed under their direct supervision.

C. All materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed specially for this project. All systems and components shall have been thoroughly tested and proven in actual use for at least two years.

D. BAS manufacturer shall be responsible for all BAS and Temperature Control wiring for a complete and operable system. All wiring shall be done in accordance with all local and national codes.

1.2 WORK BY OTHERS

A. Mechanical contractor installs all wells, valves, taps, dampers, flow stations, etc. furnished by BAS manufacturer.

B. Electrical Contractor provides:
   1. 120V power to all BAS an/or Temperature control panels
   2. Wiring of all power feeds through all disconnect starters to electrical motor.
3. Wiring of any remote start/stop switches and manual or automatic motor speed control devices not furnished by BAS manufacturer
4. Wiring of any electrical sub-metering devices furnished by BAS manufacturer.

C. Products furnished but not installed under this section
   1. Hydronic Piping:
      a. Control Valves
      b. Flow Switches
      c. Temperature Sensor Wells and Sockets
      d. Flow Meters
   2. Refrigerant Piping:
      a. Pressure and Temperature Sensor Wells and Sockets
   3. Duct-work Accessories:
      a. Automatic Dampers
      b. Air-flow Stations
      c. Terminal Unit Controls

D. Products installed but not furnished under this section
   1. Refrigeration Equipment:
      a. Pressure Transmitters
      b. Temperature Transmitters
      c. Power Transmitters
      d. Refrigerant Leak Detectors

E. Products integrated to but not furnished or installed under this section
   1. Refrigeration Equipment:
      a. BACnet Chiller Control Panel
   2. Heating Equipment:
      a. Boiler Controls
   3. Or any equipment required by the equipment manufacturer to provide the BAS contractor with a BACnet interface point.

1.3 RELATED WORK
   A. Division 01000  General and Special Conditions
   B. Division 23000  Mechanical
   C. Division 26000  Electrical

1.4 QUALITY ASSURANCE
   A. The BAS system shall be designed and installed, commissioned and serviced by manufacturer employed, factory trained personnel. Manufacturer shall have an in-place support facility within 100 miles of the site with technical staff,
spare parts inventory and necessary test and diagnostic equipment. Distributors or licensed installing contractors are not acceptable.

The manufacturer shall provide full time, on site, experienced project manager for this work, responsible for direct supervision of the design, installation, start up and commissioning of the B.M.S.

The Bidder shall be regularly engaged in the manufacturing, installation and maintenance of BMS systems and shall have a minimum of five (5) years of demonstrated technical expertise and experience in the manufacture, installation and maintenance of B.M.S. systems similar in size and complexity to this project. A maintained service organization consisting of at least ten (10) competent servicemen for a period of not less than ten years and provide a list of 10 projects, similar in size and scope to this project, completed within the last five years.

B. Materials and equipment shall be the catalogued products of manufacturers regularly engaged in production and installation of automatic temperature control systems and shall be manufacturer's latest standard design that complies with the specification requirements.

C. All BAS peer-to-peer network controllers, central system controllers and local user displays shall be UL Listed under Standard UL 916, category PAZX; Standard ULC C100, category UUKL7; and under Standard UL 864, categories UUKL, UDTZ, and QVAX. and be so listed at the time of bid. All floor level controllers shall comply, at a minimum, with UL Standard UL 916 category PAZX; Standard UL 864, categories UDTZ, and QVAX. and be so listed at the time of Bid.

D. The BAS peer-to-peer network controllers and local user display shall also comply with the Australian Electromagnetic Compatibility (EMC) Framework, and bear the C-Tic Mark to show compliance. The purpose of the regulation is to minimize electromagnetic interference between electronic products, which may diminish the performance of electrical products or disrupt essential communications.

E. DDC peer-to-peer controllers shall be compliant with the European EMC Directive, Standards EN 50081-2 and EN 50082-2, at the Industrial Levels. Additionally the equipment shall be compliant with the European LVD Directive and bear the CE mark in order to show compliance to both Directives.”

F. All electronic equipment shall conform to the requirements of FCC Regulation, Part 15, Governing Radio Frequency Electromagnetic Interference and be so labeled.

G. The manufacturer of the building automation system shall provide documentation supporting compliance with ISO-9002 (Model for Quality Assurance in Production, Installation, and Servicing) and ISO-140001 (The application of well-accepted business management principles to the environment). The intent of this specification requirement is to ensure that the products from the manufacturer are delivered through a Quality System and Framework that will assure consistency in the products delivered for this project.

H. This system shall have a documented history of compatibility by design for a minimum of 15 years. Future compatibility shall be supported for no less than 10 years. Compatibility shall be defined as the ability to upgrade existing field panels
Compatibility shall be defined as the ability for any existing field panel microprocessor to be connected and directly communicate with new field panels without bridges, routers or protocol converters.

1.5 SUBMITTALS

A. Submit 10 complete sets of documentation in the following phased delivery schedule:

1. Valve and damper schedules
2. Equipment data cut sheets
3. System schematics, including:
   • sequence of operations
   • point names
   • point addresses
   • interface wiring diagrams
   • panel layouts
   • system riser diagrams
4. Auto-CAD compatible as-built drawings

B. Upon project completion, submit operation and maintenance manuals, consisting of the following:

   • Index sheet, listing contents in alphabetical order
   • Manufacturer's equipment parts list of all functional components of the system
   • Auto-CAD disk of system schematics, including wiring diagrams
   • Description of sequence of operations
   • As-Built interconnection wiring diagrams
   • Operator's Manual
   • Trunk cable schematic showing remote electronic panel locations and all trunk data
   • List of connected data points, including panels to which they are connected and input device (ionization detector, sensors, etc.)
   • Conduit routing diagrams

1.6 WARRANTY

A. Provide all services, materials and equipment necessary for the successful operation of the entire BAS system for a period of one year after beneficial use.

B. The adjustment, required testing, and repair of the system includes all computer equipment, transmission equipment and all sensors and control devices.

C. The on-line support services shall allow the local BAS subcontractor to dial out over telephone lines to monitor and control the facility's building automation system. This remote connection to the facility shall be within 2 hours of the time that the problem is reported. This coverage shall be extended to include normal business hours, after business hours, weekends and holidays.
If the problem cannot be resolved on-line by the local office, the national office of
the building automation system manufacturer shall have the same capabilities for
remote connection to the facility. If the problem cannot be resolved with on-line
support services, the BAS manufacturer shall dispatch the appropriate personnel
to the job site to resolve the problem within 3 hours of the time that the problem is
reported.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Siemens Industry, Inc. – DESIGO CC

2.2 NETWORKING COMMUNICATIONS

A. The design of the BAS shall network operator workstations and stand-alone DDC
Controllers. The network architecture shall consist of multiple levels for
communication efficiency, a campus-wide (Management Level Network) Ethernet
network based on TCP/IP protocol, high performance peer-to-peer building level
network(s) and DDC Controller floor level local area networks with access being
totally transparent to the user when accessing data or developing control programs.

B. The design of BAS shall allow the co-existence of new DDC Controllers with existing
DDC Controllers in the same network without the use of gateways or protocol
converters.

1. System shall have the capability to communicate with a BACnet network over
Ethernet backbone (network switch and static IP addresses provided by
owner) or BACnet/IP (according to Annex J). The intent is to use the system
provided under this contract to communicate with control systems provided
by other vendors. A PICS must be provided describing the BACnet,
ANSI/ASHRAE 135-2001 implementation. Minimum system functionality
must include monitoring, commanding, and alarming for daily operator
functions from a common workstation.

2. System shall have the capability to be an OPC Client and Server for dynamic
communication with OPC Clients or Servers over an Ethernet network. At a
minimum, the following must be supported:

3. The system must be of the Native BACNet open protocol. It must tie
seamlessly into the existing Siemens DESIGO CC workstation in place. The
system must be able to process reports with the existing system with no third
party integration.

   a. Data Access 1.0 (96), 1.0A (97) and 2.0 (11/98)

   b. Alarms & Events 1.0 (1/99)

C. Peer-to-Peer Building Level Network:

1. All operator devices either network resident or connected via dial-up modems
shall have the ability to access all point status and application report data or
execute control functions for any and all other devices via the peer-to-peer
network. No hardware or software limits shall be imposed on the number of devices with global access to the network data at any time.

2. The peer-to-peer network shall support a minimum of 100 DDC controllers and PC workstations

3. Each PC workstation shall support a minimum of 4 peer to peer networks hardwired or dial up.

4. The system shall support integration of third party systems (fire alarm, security, lighting, PCL, chiller, boiler) via panel mounted open protocol processor. This processor shall exchange data between the two systems for interprocess control. All exchange points shall have full system functionality as specified herein for hardwired points.

5. Field panels must be capable of integration with open standards including Modbus, BACnet, and Lonworks as well as with third party devices via existing vendor protocols.

6. The peer-to-peer Building Level Network shall use the TCP/IP over Ethernet. All devices must:

   a. Auto-sense 10/100 Mbps networks.
   b. Receive an IP Address from a Dynamic Host Configuration Protocol (DHCP) Server or be configured with a Fixed IP Address.
   c. Resolve Name to IP Addresses for devices using a Domain Name Service (DNS) Server on the Ethernet network.
   d. Allow access using Telnet.

2.3 DDC CONTROLLER FLOOR LEVEL NETWORK:

   A. This level communication shall support a family of application specific controllers and shall communicate with the peer-to-peer network through DDC Controllers for transmission of global data.

2.4 DDC & HVAC MECHANICAL EQUIPMENT CONTROLLERS

   A. The DDC & HVAC Mechanical Equipment Controllers shall reside on the Building Level Network.

   B. DDC & HVAC Mechanical Equipment Controllers shall use the same programming language and tools. DDC & HVAC Mechanical Equipment Controllers which require different programming language or tools on a network are not acceptable.

   C. DDC & HVAC Mechanical Equipment Controllers which do not meet the functions specified in Section 2.4.1 and Section 2.5 for DDC Controllers or Section 2.4.2 and Section 2.5 for HVAC Mechanical Equipment Controllers are not acceptable.
2.4.1 DDC CONTROLLER

A. DDC Controllers shall be a 16-bit stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules. Controller size shall be sufficient to fully meet the requirements of this specification and the attached point I/O schedule. Each controller shall support a minimum of three (3) Floor Level Application Specific Controller Device Networks.

B. Each DDC Controller shall have sufficient memory to support its own operating system and databases, including:

1. Control processes
2. Energy management applications
3. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
4. Historical/trend data for points specified
5. Maintenance support applications
6. Custom processes
7. Password-protected Operator I/O
8. Dial-up communications
9. Manual override monitoring

C. Each DDC Controller shall support firmware upgrades without the need to replace hardware.

D. Provide all processors, power supplies and communication controllers so that the implementation of a point only requires the addition of the appropriate point input/output termination module and wiring.

E. DDC Controllers shall provide a RS-232C serial data communication ports for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals. DDC Controllers shall allow temporary use of portable devices without interrupting the normal operation of permanently connected modems, printers or terminals.

F. As indicated in the point I/O schedule, the operator shall have the ability to manually override automatic or centrally executed commands at the DDC Controller via local, point discrete, on-board hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points.

1. Switches shall be mounted either within the DDC Controllers key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides.
2. DDC Controllers shall monitor the status of all overrides and inform the operator that automatic control has been inhibited. DDC Controllers shall also collect override activity information for reports.

G. DDC Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Graduated intensity LEDs or analog indication of value shall also be provided for each analog output. Status indication shall be visible without opening the panel door.
H. Each DDC Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all panel components. The DDC Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.

I. Isolation shall be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:

1. RF-Conducted Immunity (RFCl) per ENV 50141 (IEC 1000-4-6) at 3 V
2. Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact
3. Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500 V signal, 1 kV power
4. Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)
5. Isolation shall be provided at all peer-to-peer panel's AC input terminals to suppress induced voltage transients consistent with:
   b. UL 864 Supply Line Transients
   c. Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)

J. In the event of the loss of normal power, there shall be an orderly shutdown of all DDC Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 60 days.

1. Upon restoration of normal power, the DDC Controller shall automatically resume full operation without manual intervention.
2. Should DDC Controller memory be lost for any reason, the user shall have the capability of reloading the DDC Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.

K. Provide a separate DDC Controller for each AHU or other HVAC system as indicated in Section 3.02. It is intended that each unique system be provided with its own point resident DDC Controller.

2.4.2 HVAC MECHANICAL EQUIPMENT CONTROLLERS

A. HVAC Mechanical Equipment Controllers shall be a 12-bit stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors.

B. Each HVAC Mechanical Controller shall have sufficient memory to support its own operating system and databases, including:
1. Control processes
2. Energy management applications
3. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
4. Historical/trend data for points specified
5. Maintenance support applications
6. Custom processes
7. Operator I/O
8. Remote communications

C. HVAC Mechanical Equipment Controllers shall provide a RS-232C serial data communication port for operation of operator I/O devices such as industry standard printers, operator terminals, modems and portable laptop operator's terminals.

D. HVAC Mechanical Equipment Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device.

E. Each HVAC Mechanical Equipment Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all components. The HVAC Mechanical Equipment Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.

F. Isolation shall be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with:
   - RF-Conducted Immunity (RFCl) per ENV 50141 (IEC 1000-4-6) at 3 V
   - Electro Static Discharge (ESD) Immunity per EN 61000-4-2 (IEC 1000-4-2) at 8 kV air discharge, 4 kV contact
   - Electrical Fast Transient (EFT) per EN 61000-4-4 (IEC 1000-4-4) at 500 V signal, 1 kV power
   - Output Circuit Transients per UL 864 (2,400V, 10A, 1.2 Joule max)
Isolation shall be provided at all peer-to-peer panel's AC input terminals to suppress induced voltage transients consistent with:
   - IEEE Standard 587-1980
   - UL 864 Supply Line Transients
   - Voltage Sags, Surge, and Dropout per EN 61000-4-11 (EN 1000-4-11)

G. In the event of the loss of normal power, there shall be an orderly shutdown of all HVAC Mechanical Equipment Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 72 hours.

1. Upon restoration of normal power, the HVAC Mechanical Equipment Controller shall automatically resume full operation without manual intervention.

2. Should HVAC Mechanical Equipment Controller memory be lost for any reason, the user shall have the capability of reloading the HVAC Mechanical Equipment Controller via the local RS-232C port, via telephone line dial-in or from a network workstation PC.
2.5 DDC & HVAC MECHANICAL EQUIPMENT CONTROLLER RESIDENT SOFTWARE FEATURES

A. General:

1. The software programs specified in this Section shall be provided as an integral part of DDC and HVAC Mechanical Equipment Controllers and shall not be dependent upon any higher level computer for execution.

2. All points shall be identified by up to 30 character point name and 16 character point descriptor. The same names shall be used at the PC workstation.

3. All digital points shall have user defined two-state status indication (descriptors with minimum of 8 characters allowed per state (i.e. summer/winter)).

B. Control Software Description:

1. The DDC and HVAC Mechanical Equipment Controllers shall have the ability to perform the following pre-tested control algorithms:

   a. Two-position control
   b. Proportional control
   c. Proportional plus integral control
   d. Proportional, integral, plus derivative control
   e. Automatic tuning of control loops

C. DDC and HVAC Mechanical Equipment Controllers shall provide the following energy management routines for the purpose of optimizing energy consumption while maintaining occupant comfort.

1. Start-Stop Time Optimization (SSTO) shall automatically be coordinated with event scheduling. The SSTO program shall start HVAC equipment at the latest possible time that will allow the equipment to achieve the desired zone condition by time of occupancy. The SSTO program shall also shut down HVAC equipment at the earliest possible time before the end of the occupancy period, and still maintain desired comfort conditions.

   a) The SSTO program shall operate in both the heating and cooling seasons.

      1) It shall be possible to apply the SSTO program to individual fan systems.
      2) The SSTO program shall operate on both outside weather conditions as well as inside zone conditions and empirical factors.
b) The SSTO program shall meet the local code requirements for minimum outside air while the building is occupied.

2. Event Scheduling: Provide a comprehensive menu driven program to automatically start and stop designated points or groups of points according to a stored time.

a) It shall be possible to individually command a point or group of points.

b) For points assigned to one common load group, it shall be possible to assign variable time delays between each successive start or stop within that group.

c) The operator shall be able to define the following information:

1. Time, day
2. Commands such as on, off, auto, and so forth.
3. Time delays between successive commands.
4. There shall be provisions for manual overriding of each schedule by an appropriate operator.

d) It shall be possible to schedule events up to one year in advance.

1. Scheduling shall be calendar based.
2. Holidays shall allow for different schedules.

3. Enthalpy switchover (economizer). The Energy Management Control Software (EMCS) will control the position of the air handler relief, return, and outside air dampers. If the outside air dry bulb temperature falls below changeover set point the EMCS will modulate the dampers to provide 100 percent outside air. The user will be able to quickly changeover to an economizer system based on dry bulb temperature and will be able to override the economizer cycle and return to minimum outside air operation at any time.

4. Temperature-compensated duty cycling.

a) The DCCP (Duty Cycle Control Program) shall periodically stop and start loads according to various patterns.

b) The loads shall be cycled such that there is a net reduction in both the electrical demands and the energy consumed.

5. Automatic Daylight Savings Time Switchover: The system shall provide automatic time adjustment for switching to/from Daylight Savings Time.

6. Night setback control: The system shall provide the ability to automatically adjust setpoints for night control.

7. The Peak Demand Limiting (PDL) program shall limit the consumption of electricity to prevent electrical peak demand charges.
a) PDL shall continuously track the amount of electricity being consumed, by monitoring one or more electrical kilowatt-hour/demand meters. These meters may measure the electrical consumption (kWh), electrical demand (kW), or both.

b) PDL shall sample the meter data to continuously forecast the demand likely to be used during successive time intervals.

c) If the PDL forecasted demand indicates that electricity usage is likely to exceed a user preset maximum allowable level, then PDL shall automatically shed electrical loads.

d) Once the demand peak has passed, loads that have been shed shall be restored and returned to normal control.

D. DDC and HVAC Mechanical Equipment Controllers shall be able to execute custom, job-specific processes defined by the user, to automatically perform calculations and special control routines.

1. A single process shall be able to incorporate measured or calculated data from any and all other DDC and HVAC Mechanical Equipment Controllers on the network. In addition, a single process shall be able to issue commands to points in any and all other DDC and HVAC Mechanical Equipment Controllers on the network. Database shall support 30 character, English language point names, structured for searching and logs.

2. Processes shall be able to generate operator messages and advisories to operator I/O devices. A process shall be able to directly send a message to a specified device or cause the execution of a dial-up connection to a remote device such as a printer or pager.

3. DDC and HVAC Mechanical Equipment Controller shall provide a HELP function key, providing enhanced context sensitive on-line help with task orientated information from the user manual.

4. DDC and HVAC Mechanical Equipment Controller shall be capable of comment lines for sequence of operation explanation.

E. Alarm management shall be provided to monitor and direct alarm information to operator devices. Each DDC and HVAC Mechanical Equipment Controller 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 DDC and HVAC Mechanical Equipment Controllers ability to report alarms be affected by either operator or activity at a PC workstation, local I/O device or communications with other panels on the network.

1. All alarm or point change reports shall include the point's English language description and the time and date of occurrence.

2. The user shall be able to define the specific system reaction for each point. Alarms shall be prioritized to minimize nuisance reporting and to speed operator response to critical alarms. A minimum of six priority
levels shall be provided for each point. Point priority levels shall be combined with user definable destination categories (PC, printer, DDC Controller, etc.) to provide full flexibility in defining the handling of system alarms. Each DDC and HVAC Mechanical Equipment Controller shall automatically inhibit the reporting of selected alarms during system shutdown and start-up. Users shall have the ability to manually inhibit alarm reporting for each point.

3. Alarm reports and messages will be directed to a user-defined list of operator devices or PCs based on time (after hours destinations) or based on priority.

4. In addition to the point's descriptor and the time and date, the user shall be able to print, display or store a 200 character alarm message to more fully describe the alarm condition or direct operator response.

5. In dial-up applications, operator-selected alarms shall initiate a call to a remote operator device.

F. A variety of historical data collection utilities shall be provided to manually or automatically sample, store and display system data for points as specified in the I/O summary. The entire collection process shall be automated so that the data collection definition, amount of data to be collected, collection report and scheduling take the form a wizard, or online assist utility, in order to complete this process within a short amount of time for a large group of points. Ability to produce a summary of changes in a log file.

1. Any point, physical or calculated may be designated for trending. Any point, regardless of physical location in the network, may be collected and stored in each DDC and HVAC Mechanical Equipment Controllers point group. Two methods of collection shall be allowed: either by a pre-defined time interval or upon a pre-defined change of value. Sample intervals of 1 minute to 7 days shall be provided. Each DDC and HVAC Mechanical Equipment Controller shall have a dedicated RAM-based buffer for trend data and shall be capable of storing data samples. All trend data shall be available for transfer to a Workstation without manual intervention.

a. Time-interval based trending shall have the capability of synchronizing the trend sampling of discrete points. This allows for the comparison of values of several different points at the same moment in time.

b. Trended points shall have the option of sampling data values based on the condition of a “trigger” point. (i.e., conditional trending). Options for sampling shall include: always sampling as defined, only sampling when the trended point is in the alarm condition, or not sampling.

2. DDC and HVAC Mechanical Equipment Controllers shall also provide high resolution sampling capability for verification of control loop performance. Operator-initiated automatic and manual loop tuning algorithms shall be provided for operator-selected PID control loops as identified in the point I/O summary.
a. Loop tuning shall be capable of being initiated either locally at the DDC and HVAC Mechanical Equipment Controller, from a network workstation or remotely using dial-in modems. For all loop tuning functions, access shall be limited to authorized personnel through password protection.

G. DDC and HVAC Mechanical Equipment Controllers shall be capable of automatically accumulating and storing run-time hours for digital input and output points and automatically sample, calculate and store consumption totals for analog and digital pulse input type points, as specified in the point I/O schedule.

H. The peer to peer network shall allow the DDC and HVAC Mechanical Equipment Controllers to access any data from or send control commands and alarm reports directly to any other DDC and HVAC Mechanical Equipment Controller or combination of controllers on the network without dependence upon a central or intermediate processing device. DDC and HVAC Mechanical Equipment Controllers shall send alarm reports to multiple workstations without dependence upon a central or intermediate processing device. The peer to peer network shall also allow any DDC and HVAC Mechanical Equipment Controller to access, edit, modify, add, delete, back up, and restore all system point database and all programs.

I. The peer-to-peer network shall allow the DDC and HVAC Mechanical Equipment Controllers to assign a minimum of 50 passwords access and control priorities to each operator individually. The logon password (at any PC workstation or portable operator terminal) shall enable the operator to monitor, adjust and control the points that the operator is authorized for. All other points shall not be displayed on the PC workstation or portable terminal (e.g. all base building and all tenant points shall be accessible to any base building operators, but only tenant points shall be accessible to tenant building operators). Passwords and priorities for every point shall be fully programmable and adjustable.

1. Passwords shall have the option to be configured to expire within a selected timeframe (1-365 days).
   a. Configuring the password expiration shall also enable the functionality to lock-out a user account after three failed log-on attempts.

2.6 FLOOR LEVEL NETWORK APPLICATION SPECIFIC CONTROLLERS (ASC)

A. Each DDC Controller shall be able to extend its performance and capacity through the use of remote application specific controllers (ASCs) through Floor Level LAN Device Networks.

B. Each ASC shall operate as a stand-alone 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. Each ASC shall be capable of control of the terminal device independent of the manufacturer of the terminal device.

C. Terminal Equipment Controllers:
1. Provide for control of each piece of equipment, including, but not limited to, the following:
   a. Variable Air Volume (VAV) boxes
   b. Constant Air Volume (CAV) boxes
   c. Dual Duct Terminal Boxes
   d. Unit Conditioners
   e. Heat Pumps
   f. Unit Ventilators
   g. Room Pressurization

2. Controllers shall include all point inputs and outputs necessary to perform the specified control sequences. Analog outputs shall be industry standard signals such as 24V floating control, 3-15 psi pneumatic, 0-10v, allowing for interface to a variety of modulating actuators.

3. All controller sequences and operation shall provide closed loop control of the intended application. Closing control loops over the FLN, BLN or MLN is not acceptable.

2.7 FIELD DEVICES

A. Provide instrumentation as required for monitoring, control or optimization functions. All devices and equipment shall be approved for installation in the City of Pineville, LA.

B. Room Temperature Sensors
   1) Digital room sensors shall have LCD display, day/night override button, and setpoint slide adjustment override options. The setpoint slide adjustment can be software limited by the automation system to limit the amount of room adjustment.

   *Flush mount room sensors to be used in Patient Rooms.

<table>
<thead>
<tr>
<th>Sensor Type</th>
<th>Monitoring Range</th>
<th>Output Signal</th>
<th>Accuracy at Calibration point</th>
<th>Set Point and Display Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>+20/120°F (-13° to 49°C)</td>
<td>Changing resistance</td>
<td>±0.5°F (+/- 0.3°C)</td>
<td>55° to 95° F (13° to 35°C)</td>
</tr>
<tr>
<td>Liquid immersion temperature</td>
<td>+30/250°F (-1°/121°C)</td>
<td>Changing resistance</td>
<td>±0.5°F (+/-0.3°C)</td>
<td></td>
</tr>
<tr>
<td>Duct (single point)</td>
<td>+20/120°F (-7°/49°C)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4) Duct Average temperature:
   Temperature monitoring range   +20° ±120°F (−7°/+49°C)
   Output signal     4 – 20 mA DC
   Accuracy at Calibration point   ±0.5°F (+/-0.3°C)
   Sensor Probe Length    25' L (7.3m)

5) Outside air temperature:
   Temperature monitoring range   -58°±122° F (-50ºC to +50ºC)
   Output signal     4 – 20 mA DC
   Accuracy at Calibration point   ±0.5°F (+/-0.3°C)

C. Liquid Differential Pressure Transmitter

Ranges
   0-5/30 inches H20
   0-25/150 inches H20
   0-125/750 inches H20

Output       4 – 20 mA DC
Calibration Adjustments     Zero and span
Accuracy      ±-0.2% of span
Linearity      ±-0.1% of span
Hysteresis      ±-0.05% of span

D. Differential pressure:

1. Unit for fluid flow proof shall be Penn P74.
   Range     8 to 70 psi
   Differential 3 psi
   Maximum differential pressure 200 psi
   Maximum pressure 325 psi

2. Unit for air flow shall be Siemens Building Technologies SW141.
   Set point ranges:  0.5" WG to 1.0" WG (124.4 to 248.8 Pa)
   1.0" WG to 12.0" WG (248.8 to 497.6 Pa)

E. Static pressure sensor:

Range
   0 to .5" WG (0 to 124.4 Pa)
   0 to 1" WG (0 to 248.8 Pa)
   0 to 2" WG (0 to 497.7 Pa)
   0 to 5" WG (0 to 1.2 kPa)
   0 to 10" WG (0 to 2.5 kPa)

Output Signal     4 – 20 mA VDC
Combined static error    0.5% full range
Operating Temperature   -40º to 175º F (-40C to 79.5ºC)

F. Air Pressure Sensor:

Range:
   0 to 0.1 in. water (0 to 24.9 Pa)
   0 to 0.25 in. water (0 to 63.2 Pa)
   0 to 0.5 in. water (0 to 124.5 Pa)
   0 to 1.0 in. water (0 to 249 Pa)
   0 to 2.0 in water 90 to 498 Pa)
   0 to 5.0 in. water (0 to 1.25 kPa)
   0 to 10.0 in. water (0 to 2.49 kPa)
G. Humidity Sensors:
Range
Sensing Element
Output Signal
Accuracy
0 to 100% RH
Bulk Polymer
4 – 20 mA DC
At 77°F(25ºC) ± 2% RH

H. Insertion Flow Meters (Equal to Onicon Series F-1200)
Sensing Method
Accuracy
Maximum Operating Pressure
Output Signal
Impedance Sensing
± 2% of Actual Reading
400 PSI
4 – 20 mA

Bi-directional where required.

I. Pressure to Current Transducer
Range
Output signal
Accuracy
3 to 15 psig (21 to 103 kPa) or
3 to 30 psig (21 to 207 kPa)
4 – 20 mA
± 1% of full scale (+ 0.3 psig)

J. Control Valves (all control valves shall have electric actuators).
1. Electric Control
Rangeability
Flow Characteristics
Control Action
Medium
Body Type
Body Material
Body Trim
Stem
Actuator
40:1
Modified. Equal percentage
Normal open or closed as selected
Steam, water, glycol
Screwed ends 2” and smaller, flanged
Valves 2½” and larger
Bronze
Bronze
Stainless Steel
0-10 VDC, 4-20 MA or 2 position
24 VAC/120VAC

2. All automatic temperature control valves in water lines shall be provided with
Characterized throttling plugs and shall be sized for minimum 25% of the system
pressure drop or 5 psi, whichever is less.

a) Positive positioning relays shall be provided on pneumatic control when
required to provide sufficient power for sequencing.

b) Two position valves shall be line size.

K. Damper Actuators
1. Electric control shall be direct coupled actuators.
2. Damper actuators shall be Brushless DC Motor Technology with stall protection, bi-directional, fail safe spring return, all metal housing, manual override, independently adjustable dual auxiliary switch.

   a) The actuator assembly shall include the necessary hardware and proper mounting and connection to a standard ½” diameter shaft or damper blade.

3. Actuators shall be designed for mounting directly to the damper shaft without the need for connecting linkages.

4. All actuators having more than 100 lb-in torque output shall have a self-centering damper shaft clamp that guarantees concentric alignment of the actuator’s output coupling with the damper shaft. The self-centering clamp shall have a pair of opposed “v” shaped toothed cradles; each having two rows of teeth to maximize holding strength. A single clamping bolt shall simultaneously drive both cradles into contact with the damper shaft.

5. All actuators having more than a 100 lb-in torque output shall accept a 1” diameter shaft directly, without the need for auxiliary adapters.

6. All actuators shall be designed and manufactured using ISO900 registered procedures, and shall be Listed under Standards UL873 and CSA22.2 No. 24-93 l.

2.8 MISCELLANEOUS DEVICES

A. Thermostats

   1. Room thermostats shall be of the gradual acting type with adjustable sensitivity.

   2. They shall have a bi-metal sensing element capable of responding to a temperature change of one-tenth of one degree. (Provide all thermostats with limit stops to limit adjustments as required.)

   3. Thermostats shall be arranged for either horizontal or vertical mounting.

   4. In the vertical position thermostat shall fit on a mullion of movable partitions without overlap.

   5. Mount the thermostat covers with tamper-proof socket head screws.

B. Freezestats:

   1. Install freezestats as indicated on the plans and provide protection for every square foot of coil surface area with one linear foot of element per square foot of coil.

      a) Upon detection of low temperature, the freezestats shall stop the associated supply fans and return the automatic dampers to their normal position. Provide manual reset.

C. Firestats:

   1. Provide manual reset, fixed temperature line voltage type with a bi-metal actuated switch.

      a) Switch shall have adequate rating for required load.
D. Electronic Airflow Measurement Stations and Transmitters (At Duct Locations).

1. Stations – each insertion station shall contain an array of velocity sensing elements and straightening vanes. The velocity sensing elements shall be of the RTD or thermistor type. The sensing elements shall be distributed across the duct cross section in a quality to provide accurate readings. The resistance to airflow through the airflow measurement station shall not exceed 0.08 inches water gage at an airflow of 2,000 fpm. Station construction shall be suitable for operation at airflow of up to 5,000 fpm over a temperature range of 40 to 120 degrees F, and accuracy shall be plus or minus 3 percent over a range of 125 to 2,500 fpm scaled to air volume. Each transmitter shall produce a linear, temperature compensated 4 to 40 mA DC, output corresponding to the required velocity pressure measurement.

E. Current Sensing Relay:

1. Provide solid-state, adjustable, current operated relay. Provide a relay which changes switch contact state in response to an adjustable set point value of current in the monitored A/C circuit.
2. Adjust the relay switch point so that the relay responds to motor operation under load as an “on” state and so that the relay responds to an unloaded running motor as an “off” state. A motor with a broken belt is considered an unloaded motor.
3. Provide for status device for all fans and pumps.

PART 3 - EXECUTION

3.1 PROJECT MANAGEMENT

Provide a designated project manager who will be responsible for the following:

- Construct and maintain project schedule
- On-site coordination with all applicable trades, subcontractors, and other integration vendors
- Authorized to accept and execute orders or instructions from owner/architect
- Attend project meetings as necessary to avoid conflicts and delays
- Make necessary field decisions relating to this scope of work
- Coordination/Single point of contact

3.2 SEQUENCE OF OPERATION

TBD

3.3 POINT SCHEDULE MATRIX - I/O SCHEDULE

TBD

3.4 START-UP AND COMMISSIONING

A. When installation of the system is complete, calibrate equipment and verify transmission media operation before the system is placed on-line. All testing, calibrating, adjusting and final field tests shall be completed by the manufacturer.
Verify that all systems are operable from local controls in the specified failure mode upon panel failure or loss of power.

B. Provide any recommendation for system modification in writing to owner. Do not make any system modification, including operating parameters and control settings, without prior approval of owner.

C. After manufacturer has completed system start-up and commissioning. Joint commissioning of integrated system segments shall be completed.

3.5 ELECTRICAL WIRING AND MATERIALS

A. Install, connect and wire the items included under this Section. This work includes providing required wire, fittings, and related wiring accessories. All wiring shall be plenum rated.

B. Provide wiring between thermostats, aquastats and unit heater motors, all control and alarm wiring for all control and alarm devices for all Sections of Specifications.

C. Provide 120 volt, single phase, 60 hertz emergency power to every B.M.S. DDC Controller panel, HVAC/Mechanical Equipment Controller, PC console, power supply, transformer, annunciator, modems, printers and to other devices as required. It is the intent that the entire building management system except terminal equipment shall be operative under emergency power conditions in the building. The power supplies are to be extended in conduit and wire from emergency circuit breakers.

D. Provide status function wiring for equipment covered under this Section.

E. Provide wiring between the B.M.S. panels and the temperature, humidity, or pressure sensing elements, including low voltage control wiring.

F. Provide control wiring for devices specified in this Section.

G. Provide signal wiring between motor starters in motor control centers and high and/or low temperature relay contacts and remote relays in B.M.S. panels located in the vicinity of motor control centers.

H. Provide wiring between the PC workstation, electrical panels, metering instrumentation, indicating devices, miscellaneous alarm points, remotely operated contractors, and B.M.S. panels, as shown on the drawings or as specified.

I. All wiring to be compliant to local building code and the NEC.

K. Provide electrical wall box and conduit sleeve for all wall mounted devices.

3.6 CONTROL AIR AND SENSING LINES

1. Air lines cannot be hidden within duct insulation. All piping and tubing shall be properly supported using straps, cleats, or hangers as approved. Use of wire will not be permitted. Where this specification permits the use of plastic tubing for some parts of the piping system, and where the control manufacturer has obtained such approval, multiple virgin polyethylene tube, with a molecular weight of not less than 25,000 and a melt index of not more than .3 dg./min., positioned adjacent and parallel to each other and contained in an overall jacket of flame retardant polyethylene compound sheath complying with UL94
vertical burning test may be supplied. The sheath may be excluded in panel piping. Pressure rating: 160 psi/72 degrees F. Ambient temperature rating: 100 to 175 degrees F. In bundled tubing, individual lines shall be identified by numbers at 2” intervals or by color. Tubing shall be supported with pipe rests or other supporting methods as to prevent the lines from stress conditions.

2. Tubing passing through or buried in concrete shall be hard drawn copper in rigid steel conduit.

3. Air tubing run exposed in mechanical equipment rooms shall be hard drawn copper.

4. Air tubing in finished areas shall be run concealed.

5. Air tubing for high pressure mains (over 20 psig) shall be copper.

6. Single Tube Polyethylene plastic tubing will be permitted in lieu of copper, except for high pressure mains or smoke control, in the following locations:
   a. Within thin wall electric conduit (EMT).
   b. Within control panels.

7. Air piping associated with smoke control functions shall be hard drawn copper only.

3.7 PERFORMANCE

A. Unless stated otherwise, control temperatures within plus or minus 2oF humidity within plus or minus 3% of the set point and static pressure within 10% of set point.

3.8 COMMISSIONING, TESTING AND ACCEPTANCE

A. Perform a three-phase commissioning procedure consisting of field I/O calibration and commissioning, system commissioning and integrated system program commissioning. Document all commissioning information on commissioning data sheets which shall be submitted prior to acceptance testing. Commissioning work which requires shutdown of system or deviation from normal function shall be performed when the operation of the system is not required. The commissioning must be coordinated with the owner and construction manager to ensure systems are available when needed. Notify the operating personnel in writing of the testing schedule so that authorized personnel from the owner and construction manager are present throughout the commissioning procedure.

1. Prior to system program commissioning, verify that each control panel has been installed according to plans, specifications and approved shop drawings. Test, calibrate and bring on line each control sensor and device. Commissioning to include, but not be limited to:
   a. Sensor accuracy at 10, 50 and 90% of range.
   b. Sensor range.
   c. Verify analog limit and binary alarm reporting.
d. Point value reporting.
e. Binary alarm and switch settings.
f. Actuator ranges.
g. Fail safe operation on loss of control signal, electric power, network communications.

B. After control devices have been commissioned (i.e. calibrated, tested and signed off), each BMS program shall be put on line and commissioned. The contractor shall, in the presence of the owner and construction manager, demonstrate each programmed sequence of operation and compare the results in writing. In addition, each control loop shall be tested to verify proper response and stable control, within specified accuracy’s. System program test results shall be recorded on commissioning data sheets and submitted for record. Any discrepancies between the specification and the actual performance will be immediately rectified and retested.

C. After all BMS programs have been commissioned, the contractor shall verify the overall system performance as specified. Tests shall include, but not be limited to:

1. Data communication, both normal and failure modes.
2. Fully loaded system response time.
3. Impact of component failures on system performance and system operation.
4. Time/Date changes.
5. End of month/ end of year operation.
7. Global application programs and point sharing.
8. System backup and reloading.
10. Diagnostic functions.
11. Power failure routines.
12. Battery backup.
13. Smoke Control, stair pressurization, stair, vents, in concert with Fire Alarm System testing.
14. Testing of all electrical and HVAC systems with other division of work.

D. Submit for approval, a detailed acceptance test procedure designed to demonstrate compliance with contractual requirements. This Acceptance test procedure will take place after the commissioning procedure but before final acceptance, to verify that sensors and control devices maintain specified accuracy’s and the system performance does not degrade over time.
E. Using the commissioning test data sheets, the contractor shall demonstrate each point. The contractor shall also demonstrate all system functions. The contractor shall demonstrate all points and system functions until all devices and functions meet specification.

F. The contractor shall supply all instruments for testing and turn over same to the owner after acceptance testing.

1. All test instruments shall be submitted for approval.

   Test Instrument Accuracy:

   Temperature: 1/4F or 1/2% full scale, whichever is less.

   Pressure: High Pressure (psi): ½ psi or 1/2% full scale, whichever is less.

   Low Pressure: 1/2% of full scale (in w.c.)

   Humidity: 2% RH

   Electrical: 1/4% full scale

G. After the above tests are complete and the system is demonstrated to be functioning as specified, a thirty day performance test period shall begin. If the system performs as specified throughout the test period, requiring only routine maintenance, the system shall be accepted. If the system fails during the test, and cannot be fully corrected within eight hours, the owner may request that performance tests be repeated.

3.10 TRAINING

A. The manufacturer shall provide factory trained instructor to give full instruction to designated personnel in the operation of the system installed. Instructors shall be thoroughly familiar with all aspects of the subject matter they are to teach. The manufacturer shall provide all students with a student binder containing product specific training modules for the system installed. All training shall be held during normal working hours of 8:00 am to 4:30 PM weekdays.

B. Provide 8 hours of training for Owner's designated operating personnel. Training shall include:

   Explanation of drawings, operations and maintenance manuals
   Walk-through of the job to locate control components
   Operator workstation and peripherals
   DDC controller and ASC operation/function
   Operator control functions including graphic generation and field panel programming
   Operation of portable operator's terminal
   Explanation of adjustment, calibration and replacement procedures
   Student binder with training modules

D. Since the Owner may require personnel to have more comprehensive understanding of the hardware and software, additional training must be available
from the Manufacturer. If such training is required by the Owner, it will be contracted at a later date.

END OF SECTION 230900
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 water-treatment systems for the following:
   1. Chilled-water system.
   2. Heating Hot Water System

1.3 SYSTEM DESCRIPTION

A. Closed Systems: One bypass feeder for each system, with isolating and drain valves
   installed around balancing valve downstream of circulating pumps, unless otherwise
   indicated.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and
   Division 1 Specification Sections.

B. Product data for each type of product specified. Include manufacturer's technical product
   data, rated capacities of selected equipment clearly indicated, water-pressure drops, weights
   (shipping, installed, and operating), furnished specialties, accessories, and installation and
   startup instructions.

C. Shop drawings from manufacturer detailing equipment assemblies and indicating
   dimensions, weights, loadings, required clearances, method of field assembly, components,
   and location and size of each field connection.

D. Wiring diagrams detailing power and control wiring and differentiating clearly between
   manufacturer-installed wiring and field-installed wiring.

E. Field test reports indicating and interpreting test results relative to compliance with specified
   requirements.

F. Maintenance data for chemical water treatment to include in the operation and maintenance
   manual specified in Division 1. Include detailed manufacturer's instructions and parts list for
   each item of equipment, control, and accessory. Include troubleshooting maintenance guide.

1.5 QUALITY ASSURANCE

A. Qualifications: A recognized chemical water treatment Testing Agency in the Project's vicinity
   and that is or employs an experienced consultant, available at reasonable times during the
   course of the Work to consult with Contractor, Architect, and Owner about water treatment.

B. Chemical Standards: Meet state and local pollution-control regulations.
C. Comply with NFPA 70 for components and installation.

D. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

E. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

F. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

1.6 MAINTENANCE

A. Service Period: Provide a service program for period of one year from startup date of equipment, including the following:

1. Initial water analysis and recommendations.
2. Startup assistance.
3. Training of operating personnel.
4. Periodic field service and consultation.
5. Customer report charts and log sheets.
6. Laboratory technical assistance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Chemical Water Treatment Products:
      (i) Southwest Engineers, Inc.
      (ii) ANCO, Inc.
      (iii) Betz/ Dearborn Inc.
      (iv) NALCO, Inc.

2.2 CHEMICAL WATER TREATMENT SYSTEM

A. Bypass (Pot) Feeders: Cast iron or steel, for introducing chemicals into system; with funnel, shutoff valve on top, air release valve on top, drain valve on bottom, and recirculating shutoff valves on sides.

B. Working Pressure: 175 psi.

2.3 CHEMICALS

A. The Contractor will furnish chemicals recommended by water treatment system manufacturer for treating water to meet specified water quality. Only chemicals that are compatible with piping materials, seals, and accessories will be used.

B. System Cleaner (Contractor Supplied): Liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products.
C. Closed System (Water) Chemicals: Sequestering agent to reduce deposits and adjust pH, corrosion inhibitors, and conductivity enhancers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install treatment equipment level and plumb, according to manufacturer’s written instructions, rough-in drawings, the original design, and referenced standards.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 Sections. The Drawings indicate the general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

B. Install piping adjacent to equipment to allow servicing and maintenance.

C. Electrical: Conform to applicable requirements of Division 26 Sections for connecting electrical equipment.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: A qualified independent testing agency employed and paid by Owner will perform field quality-control testing.

1. Testing Agency: Provide the services of a qualified independent testing agency to perform field quality-control testing.

3.4 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris; repair damaged finishes, including chips, scratches, and abrasions.

B. Ensure that system is operational, filled, started, and vented prior to cleaning. Place terminal control valves in OPEN position during cleaning.

C. Add cleaning chemicals as recommended by manufacturer.

D. Circulate for 48 hours, then drain. Refill with clean water, circulate for 24 hours, then drain. Refill with clean water and repeat until system cleaner is removed.

3.5 COMMISSIONING

A. Startup Services: Provide the services of a factory-authorized service representative to provide startup service and to demonstrate and train Owner’s maintenance personnel as specified below.
3.6 DEMONSTRATION

A. Train Owner's maintenance personnel for a minimum period of four (4) hours on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.

B. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Contract Closeout."

C. Schedule training with Owner, through the Architect, with at least 7 days' advance notice.

END OF SECTION 23 25 13
PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes packaged, factory-fabricated and -assembled, gas-fired, fire-tube condensing boilers, trim and accessories for generating hot water.

1.3 SUBMITTALS

A. Product Data: Include performance data, operating characteristics, furnished specialties and accessories.

1. Prior to flue vent installation, engineered calculations and drawings must be submitted to Architect/Engineer to thoroughly demonstrate that size and configuration conform to recommended size, length and footprint for each submitted boiler.

B. Efficiency Curves: At a minimum, submit efficiency curves for 100%, 50% and 7% input firing rates at incoming water temperatures ranging from 80°F to 160°F. Test protocols shall conform to AERCO's AE-1 standards.

C. Pressure Drop Curve. Submit pressure drop curve for flows ranging from 0 GPM to 375 gpm

1. If submitted material is different from that of the design basis, boiler manufacture shall incur all costs associated with reselection of necessary pumps. Possible differences include, but are not limited to, the pump type, pump pad size, electrical characteristics and piping changes.

D. Shop Drawings: For boilers, boiler trim and accessories include:

1. Plans, elevations, sections, details and attachments to other work
2. Wiring Diagrams for power, signal and control wiring

E. Source Quality Control Test Reports: Reports shall be included in submittals.

F. Field Quality Control Test Reports: Reports shall be included in submittals.

G. Operation and Maintenance Data: Data to be included in boiler emergency, operation and maintenance manuals.
H. Warranty: Standard warranty specified in this Section 1.6, A., 1., a., b., c.

I. Other Informational Submittals:

1. ASME Stamp Certification and Report: Submit "A," "S," or "PP" stamp certificate of authorization, as required by authorities having jurisdiction, and document hydrostatic testing of piping external to boiler.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices and Accessories: Boilers must be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. I=B=R Performance Compliance: Condensing boilers must be rated in accordance with applicable federal testing methods and verified by AHRI as capable of achieving the energy efficiency and performance ratings as tested within prescribed tolerances.

C. ASME Compliance: Condensing boilers must be constructed in accordance with ASME Boiler and Pressure Vessel Code, Section IV “Heating Boilers”.

D. ASHRAE/IESNA 90.1 Compliance: Boilers shall have minimum efficiency according to "Gas and Oil Fired Boilers - Minimum Efficiency Requirements."


F. UL Compliance: Boilers must be tested for compliance with UL 795, "Commercial-Industrial Gas Heating Equipment." Boilers shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.

G. NOx Emission Standards: When installed and operated in accordance with manufacturer's instructions, condensing boilers shall comply with NOx emissions of less than 20ppm, corrected to 3% oxygen at all firing rates. Certificate or report of compliance is to be supplied upon request.

1.5 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement and formwork requirements are specified in Division 03.

1.6 WARRANTY

A. Standard Warranty: Boilers shall include manufacturer's standard form in which manufacturer agrees to repair or replace components of boilers that fail in materials or workmanship within specified warranty period.
1. Warranty Period for Fire-Tube Condensing Boilers
   a. The pressure vessel/heat exchanger shall carry a 10-year from shipment, non-prorated, limited warranty against any failure due to condensate corrosion, thermal stress, mechanical defects or workmanship.
   b. Manufacturer labeled control panels are conditionally warranted against failure for (2) two years from shipment.
   c. All other components, with the exception of the igniter and flame detector, are conditionally guaranteed against any failure for 18 months from shipment.

PART 2 PRODUCTS

3.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Subject to compliance with requirements, provide AERCO BMK, or approved equal.

3.2 CONSTRUCTION

A. Description: Boiler shall be natural gas fired, fully condensing, fire tube design. Power burner shall have full modulation (the minimum firing rate shall not exceed 200,000 BTU/HR input. Boilers that have an input greater than 200,000 BTU/Hr at minimum fire will not be considered) and discharge into a positive pressure vent. Boiler efficiency shall increase with decreasing load (output), while maintaining setpoint. Boiler shall be factory-fabricated, factory-assembled and factory-tested, fire-tube condensing boiler with heat exchanger sealed pressure-tight, built on a steel base, including insulated jacket, flue-gas vent, combustion-air intake connections, water supply, return and condensate drain connections, and controls.

B. Heat Exchanger: The heat exchanger shall be constructed of 439 stainless steel fire tubes and tubesheets, with a one-pass combustion gas flow design. The fire tubes shall be 5/8" OD, with no less than 0.049” wall thickness. The upper and lower stainless steel tubesheet shall be no less than 0.25” thick. The pressure vessel/heat exchanger shall be welded construction. The heat exchanger shall be ASME stamped for a working pressure not less than 160 psig. Access to the tubesheets and heat exchanger shall be available by burner and exhaust manifold removal. Minimum access opening shall be no less than 14-inch diameter.

C. Pressure Vessel: The pressure vessel shall have a maximum water volume of 55 gallons. The boiler water pressure drop shall not exceed 3 psig at 258 gpm. The boiler water connections shall be 4-inch flanged connection. The pressure vessel shall be constructed of SA53 carbon steel, with a 0.25-inch thick wall and 0.50-inch thick upper head. Inspection openings in the pressure vessel shall be in accordance with ASME Section IV pressure vessel code. The boiler shall be designed so that the thermal efficiency increases as the boiler firing rate decreases.
D. Modulating Air/Fuel Valve and Burner: The boiler burner shall be capable of a 15-to-1 turndown ratio of the firing rate without loss of combustion efficiency or staging of gas valves. The burner shall produce less than 14 Ng/J or 20 ppm of NOx corrected to 3% excess oxygen. The burner shall be metal-fiber mesh covering a stainless steel body with pilot ignition system and flame rectification. All burner material exposed to the combustion zone shall be of stainless steel construction. There shall be no moving parts within the burner itself. A modulating air/fuel valve shall meter the air and fuel input. The modulating motor must be linked to both the gas valve body and air valve body with a single linkage. The linkage shall not require any field adjustment. A variable frequency drive (VFD), controlled cast aluminum pre-mix blower shall be used to ensure the optimum mixing of air and fuel between the air/fuel valve and the burner.

E. Minimum boiler efficiencies shall be as follows at a 20 degree delta-T:

<table>
<thead>
<tr>
<th>EWT °F</th>
<th>100% Fire</th>
<th>50% Fire</th>
<th>5% Fire</th>
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<tbody>
<tr>
<td>160</td>
<td>87%</td>
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<td>140</td>
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<td>120</td>
<td>89%</td>
<td>90%</td>
<td>90.5%</td>
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<tr>
<td>100</td>
<td>93.7%</td>
<td>95%</td>
<td>95%</td>
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<tr>
<td>80</td>
<td>96%</td>
<td>98%</td>
<td>98.6%</td>
</tr>
</tbody>
</table>

F. Exhaust Manifold: The exhaust manifold shall be of corrosion resistant cast aluminum or 316 stainless steel with an 8-inch diameter flue connection. The exhaust manifold shall have a collecting reservoir and a gravity drain for the elimination of condensation.

G. Blower: The boiler shall include a VFD controlled fan to operate during the burner firing sequence and pre-purge the combustion chamber.
   1. Motors: Blower motors shall comply with requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
      a. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require a motor to operate in the service factor range above 1.0.

H. Ignition: Ignition shall be via spark ignition with 100 percent main-valve shutoff and electronic flame supervision.

I. The boiler’s manufacturer recommended annual replacement parts shall cost no more than $250 to the end customer.

J. The boiler shall be designed such that the combustion air is drawn from the inside of the boiler enclosure, decoupling it from the combustion air supply and preheating the air to increase efficiency.

K. Enclosure: The sheet metal enclosure shall be fully removable, allowing for easy access during servicing.

3.3 CONTROLS

A. Refer to Division 23, Section "Instrumentation and Control of HVAC."
B. The boiler control system shall be segregated into three components: “C-More” Control Panel, Power Box and Input/Output Connection Box. The entire system shall be Underwriters Laboratories recognized.

C. The control panel shall consist of six individual circuit boards using state-of-the-art surface-mount technology in a single enclosure. These circuit boards shall include:
   1. A display board incorporating LED display to indicate temperature and a vacuum fluorescent display module for all message enunciation
   2. A CPU board housing all control functions
   3. An electric low-water cutoff board with test and manual reset functions
   4. A power supply board
   5. An ignition/stepper board incorporating flame safeguard control
   6. A connector board
   7. Each board shall be individually field replaceable.

D. The combustion safeguard/flame monitoring system shall use spark ignition and a rectification-type flame sensor.

E. The control panel hardware shall support both RS-232 and RS-485 remote communications.

F. The controls shall annunciate boiler and sensor status and include extensive self-diagnostic capabilities that incorporate a minimum of eight separate status messages and 34 separate fault messages.

G. The control panel shall incorporate three self-governing features designed to enhance operation in modes where it receives an external control signal by eliminating nuisance faults due to over-temperature, improper external signal or loss of external signal. These features include:
   1. Setpoint High Limit: Setpoint high limit allows for a selectable maximum boiler outlet temperature and acts as temperature limiting governor. Setpoint limit is based on a PID function that automatically limits firing rate to maintain outlet temperature within a 0 to 10 degree selectable band from the desired maximum boiler outlet temperature.
   2. Setpoint Low Limit: Allow for a selectable minimum operating temperature.
   3. Failsafe Mode: Failsafe mode allows the boiler to switch its mode to operate from an internal setpoint if its external control signal is lost, rather than shut off. This is a selectable mode, enabling the control can to shut off the unit upon loss of external signal, if so desired.

H. The boiler control system shall incorporate the following additional features for enhanced external system interface:
   1. System start temperature feature
   2. Pump delay timer
   3. Auxiliary start delay timer
   4. Auxiliary temperature sensor
   5. Analog output feature to enable simple monitoring of temperature setpoint, outlet temperature or fire rate
   6. Remote interlock circuit
   7. Delayed interlock circuit
   8. Fault relay for remote fault alarm
I. Each boiler shall include an electric, single-seated combination safety shutoff valve/regulator with proof of closure switch in its gas train. Each boiler shall incorporate dual over-temperature protection with manual reset, in accordance with ASME Section IV and CSD-1.

J. Each boiler shall have an oxygen monitoring system that will measure the oxygen content of the exhaust gasses in real-time. Output of O2 information shall be displayed on the C-More control panel.

K. Each boiler shall have integrated Boiler Sequencing Technology (BST), capable of multi-unit sequencing with lead-lag functionality and parallel operation. The system will incorporate the following capabilities:
   1. Efficiently sequence 2-to-8 units on the same system to meet load requirement.
   2. Integrated control and wiring for seamless installation of optional isolation valve. When valves are utilized, the system shall operate one motorized valve per unit as an element of load sequencing. Valves shall close with decreased load as units turn off, minimum of one must always stay open for recirculation.
   3. Automatically rotate lead/lag amongst the units on the chain and monitor run hours per unit and balance load in an effort to equalize unit run hours.
   4. Designated master control, used to display and adjust key system parameters.
   5. Automatic bump-less transfer of master function to next unit on the chain in case of designated master unit failure; master/slave status should be shown on the individual unit displays.
   6. Designated master control, used to display and adjust key system parameters.

L. For boiler plants greater than 8 units, the Boiler Manufacturer shall supply as part of the boiler package a completely integrated AERCO Control System (ACS) to control all operation and energy input of the multiple boiler heating plant. The ACS shall be comprised of a microprocessor based control utilizing the MODBUS protocol to communicate with the Boilers via the RS-485 port. One ACS controller shall have the ability to operate up to 32 AERCO boilers.

M. The controller shall have the ability to vary the firing rate and energy input of each individual boiler throughout its full modulating range to maximize the condensing capability and thermal efficiency output of the entire heating plant. The ACS shall control the boiler outlet header temperature within ±2ºF. The controller shall be a PID type controller and uses Ramp Up/Ramp Down control algorithm for accurate temperature control with excellent variable load response. The ACS controller shall provide contact closure for auxiliary equipment such as system pumps and combustion air inlet dampers based upon outdoor air temperature.

N. The ACS shall have the following anti-cycling features:
   1. Manual designation of lead boiler and last boiler.
   2. Lead boiler rotation at user-specified time interval.
   3. Delay the firing/shutting down of boilers when header temperature within a pre-defined dead band.

O. When set on Internal Setpoint Mode, temperature control setpoint on the ACS shall be fully field adjustable from 50ºF to 190ºF in operation. When set on Indoor/Outdoor Reset Mode, the ACS will operate on an adjustable inverse ratio in response to outdoor temperature to control the main header temperature. Reset ratio shall be fully field adjustable from 0.3 to 3.0 in operation. When set on 4ma to 20ma Temperature Control Mode,
the ACS will operate the plant to vary header temperature setpoint linearly as an externally applied 4-20 ma signal is supplied.

P. When set on MODBUS Temperature Control Mode, the ACS will operate the plant to vary header temperature setpoint as an external communication utilizing the MODBUS protocol is supplied via the RS-232 port. The ACS controller shall have a vacuum fluorescent display for monitoring of all sensors and interlocks. Non-volatile memory backup of all control parameters shall be internally provided as standard. The controller will automatically balance the sequence of operating time on each boiler by a first-on first-off mode and provide for setback and remote alarm contacts. Connection between central ACS system and individual boilers shall be twisted pair low voltage wiring, with the boilers ‘daisy-chained’ for ease of installation.

3.4 ELECTRICAL POWER

A. Controllers, Electrical Devices and Wiring: Electrical devices and connections are specified in Division 26 sections.

B. Single-Point Field Power Connection: Factory-installed and factory-wired switches, motor controllers, transformers and other electrical devices shall provide a single-point field power connection to the boiler.

C. Electrical Characteristics:

<table>
<thead>
<tr>
<th></th>
<th>Option 1</th>
<th>Option 2</th>
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</thead>
<tbody>
<tr>
<td>1. Voltage:</td>
<td>208 – 230 V</td>
<td>460 V</td>
</tr>
<tr>
<td>2. Phase:</td>
<td>Three</td>
<td>Three</td>
</tr>
<tr>
<td>3. Frequency:</td>
<td>60 Hz</td>
<td>60 Hz</td>
</tr>
<tr>
<td>4. Full-Load Current</td>
<td>16.0 Amps</td>
<td>8.0 Amps</td>
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3.5 VENTING

A. The exhaust vent must be UL Listed for use with Category II, III and IV appliances and compatible with operating temperatures up to 230°F, condensing flue gas service. UL-listed vents Al 29-4C stainless steel or polypropylene must be used with boilers.

B. The minimum exhaust vent duct size for each boiler is eight-inch diameter.

C. Combustion-Air Intake: Boilers shall be capable of drawing combustion air from the outdoors via a metal or PVC duct connected between the boiler and the outdoors.

D. The minimum ducted combustion air duct size for each boiler is eight-inch diameter.

E. Common vent and common combustion air must be an available option for boiler installation. Consult manufacturer for common vent and combustion air sizing.
F. Follow guidelines specified in manufacturer’s venting guide.

3.6 SOURCE QUALITY CONTROL

A. Burner and Hydrostatic Test: Factory adjust burner to eliminate excess oxygen, carbon dioxide, oxides of nitrogen emissions and carbon monoxide in flue gas, and to achieve combustion efficiency. Perform hydrostatic testing.

B. Test and inspect factory-assembled boilers, before shipping, according to ASME Boiler and Pressure Vessel Code.

1. If boilers are not factory assembled and fire-tested, the local vendor is responsible for all field assembly and testing.

C. Allow Owner access to source quality-control testing of boilers. Notify Architect fourteen days in advance of testing.

PART 3 EXECUTION

3.1 EXAMINATION

A. Before boiler installation examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations and piping and electrical connections to verify actual locations, sizes and other conditions affecting boiler performance, maintenance and operations.

1. Final boiler locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections.

B. Examine mechanical spaces for suitable conditions where boilers will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 BOILER INSTALLATION

A. Install boilers level on concrete bases. Concrete base is specified in Division 23 Section "Common Work Results for HVAC," and concrete materials and installation requirements are specified in Division 03.

B. Install gas-fired boilers according to NFPA 54.
C. Assemble and install boiler trim.

D. Install electrical devices furnished with boiler but not specified to be factory mounted.

E. Install control wiring to field-mounted electrical devices.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 sections. Drawings indicate general arrangement of piping, fittings and specialties.

B. Install piping adjacent to boiler to permit service and maintenance.

C. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve if required.

D. Connect gas piping to boiler gas-train inlet with unions. Piping shall be at least full size of gas train connection. Provide a reducer if required.

E. Connect hot-water piping to supply and return boiler tappings with shutoff valve and union or flange at each connection.

F. Install piping from safety relief valves to nearest floor drain.

G. Boiler Venting
   1. Install flue venting kit and combustion-air intake.
   2. Connect venting full size to boiler connections. [Comply with requirements in Division 23 Section "Breechings, Chimneys and Stacks."

H. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

I. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections
   1. Perform installation and startup checks according to manufacturer's written instructions.
   2. Perform hydrostatic test. Repair leaks and retest until no leaks exist.
3. Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.

4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
   a. Check and adjust initial operating set points and high- and low-limit safety set points of fuel supply, water level and water temperature.
   b. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

C. Remove and replace malfunctioning units and retest as specified above.

D. Occupancy Adjustments: When requested within 2 months of date of Substantial Completion, provide on-site assistance adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.

END OF SECTION 23 52 16
1.1 SECTION INCLUDES

A. Chiller package.
B. Charge of refrigerant and oil.
C. Controls and control connections.
D. Chilled water connections.
E. Starters.
F. Electrical power connections.

1.2 REFERENCES

D. ANSI/ASME SEC 8 - Boiler and Pressure Vessel Code
E. ANSI/NEMA MG 1 - Motors and Generators.
F. ANSI/UL 1995 - Central Cooling Air Conditioners.
I. California Administrative Code - Title 24
J. ASTM B117 - Standard Method of Salt Spray (Fog) Testing
K. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
L. ASTM A525 - Zinc (Hot-Dip Galvanized) Coatings on Sheet Steel Products
M. ASTM D1654 - Evaluation of Painted or Coated Specimens, Subjected to Corrosive Environments
1.3 SUBMITTALS

A. Submit drawings indicating components, assembly, dimensions, weights and loadings, required clearances, and location and size of field connections. Indicate accessories where required for complete system.

B. Submit product data indicating rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.

C. Submit manufacturer's installation instructions.

1.4 OPERATION AND MAINTENANCE DATA

A. Submit operation data.

B. Include start-up instructions, maintenance data, controls, and accessories.

C. Submit maintenance data.

1.5 REGULATORY REQUIREMENTS


B. Conform to ANSI/UL 1995 code for construction of water chillers. In the event the unit is not UL approved, the manufacturer shall, at manufacturer expense, provide for a field inspection by an UL representative to verify conformance to UL standards. If necessary, contractor shall perform modifications to the unit to comply with UL, as directed by the UL representative.

C. Conform to ANSI/ASME SEC 8 Boiler and Pressure Vessel Code for construction and testing of water chillers.

D. Conform to ANSI/ASHRAE 15 code for construction and operation of water chillers.

E. Conform to the most recent versions of the International Building Code (IBC) for seismic applications.

F. Chiller must be built in an ISO 9001 classified facility.

1.6 STORAGE AND HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

B. Protect units from physical damage. Factory coil shipping covers shall be kept in place until installation.
C. Unit controls shall be capable of withstanding 203 Deg F (95 Deg C) storage
   temperatures in the control compartment for an indefinite period of time.

1.7 WARRANTY

A. Provide a five year total parts and labor warranty.

B. A 5-year motor/transmission/compressor warranty shall be provided.

PART 2 PRODUCTS

2.1 SUMMARY

A. The contractor shall furnish and install air-cooled water chillers as shown as scheduled
   on the contract documents. The chillers shall be installed in accordance with this
   specification and perform at the specified conditions as scheduled.

2.2 COMPRESSORS

A. Construct chiller using semi-hermetic helical rotary screw compressors with two
   independent circuits.

B. Statically and dynamically balance rotating parts.

C. Provide oil lubrication system with oil charging valve and oil filter to ensure adequate
   lubrication during starting, stopping, and normal operation.

D. Provide compressor with automatic capacity reduction equipment consisting of capacity
   control slide valve. Compressor must start unloaded for soft start on motors.

E. Provide constant speed 3600 rpm for 60Hz (or 3000 rpm for 50Hz) compressor motor,
   suction gas cooled with robust construction and system design protection, designed for
   across-the-line or wye-delta starting. Furnish with starter.

F. Provide compressor heater to evaporate refrigerant returning to compressor during shut
   down. Energize heater when compressor is not operating.

G. Provide sound absorbing panels to attenuate compressor noise.

2.3 EVAPORATOR

A. The evaporator shall be designed, tested, and stamped in accordance with ASME code
   for a refrigerant side working pressure of 200 psig. Waterside working pressure shall be
   150 psig.

B. Insulate the evaporator and water boxes with a minimum of 3/4 inch (K=0.26) insulation.
   If field installed the additional money to cover this in the field should be included in the
   bid.
C. Evaporator heat tape shall be factory installed and shall protect unit down to -20 F. Contractor shall wire separate power to energize heat tape and protect cooler while chiller is disconnected from the main power.

D. Provide shell and tube type evaporator, seamless or welded steel construction with cast iron or fabricated steel heads, seamless internally and externally finned copper tubes, roller expanded into tube sheets.

E. Provide ability to remove evaporator tubes from end or side of the heat exchanger. Refer to and comply with manufacturer's installation instructions.

F. Provide water drain connection, vent and fittings for factory installed leaving water temperature control and low temperature cutout sensors.

G. Water connections shall be grooved pipe. Evaporator shall have only one entering and one leaving connection. If manufacturer provides 2 separate evaporators, contractor shall provide manifold and pressure gauges to ensure equal flow is provided to each evaporator.

H. Proof of flow shall be provided by the equipment manufacturer, mechanically installed and electrically wired, at the factory of origin.

2.4 CONDENSER AND FANS

A. Provide vertical discharge direct driven propeller type condenser fans with fan guard on discharge. Entire fan assembly shall be statically and dynamically balanced and fan assembly shall be either painted or zinc coated steel. Fan guard shall be either PVC, chrome, or zinc coated.

B. Provide TEAO (Totally Enclosed Air Over) fan motors with permanently lubricated ball bearings.

C. Chiller shall be able to operate in ambient

D. Construct condenser coils of aluminum fins mechanically bonded to seamless copper tubing. Provide sub-cooling circuits. Air test under water to 506 psig.

E. Provide coil protection for shipping. Entire condenser coil shall be covered with heavy plastic to prevent inadvertent damage to coil during shipment or rigging.

F. Provide architectural louvers over condenser coil.

2.5 ENCLOSURES / STARTERS

A. House components in a galvanized steel frame and mounted on welded structural steel base. Hot-dip galvanized steel frame coating shall be Underwriters Laboratories Inc. (UL) recognized as G90-U, UL guide number DTHW2.
B. Unit panels and control panels shall be finished with a baked on powder paint. Control panel doors shall have door stays. Paint system shall meet the requirements for outdoor equipment of Federal Government Agencies.

C. Mount starters and Terminal Blocks in weatherproof panel provided with full opening access doors.

D. Casings fabricated from steel that do not have a Zinc coating conforming to ASTM A 123 or ASTM A525 shall be treated for the prevention of corrosion with a factory coating or paint system. The coating or paint system shall withstand 500 hours in a salt-spray fog test in accordance with ASTM B 117. Each specimen shall have a standard scribe mark as defined in ASTM D 1654. Upon completion of exposure, the coating or paint system shall be evaluated and rated in accordance with procedures A and B of ASTM D 1654. The rating of failure at the scribe mark shall be not less than six (average creepage not greater than 1/8 inch). The rating of the unscribed area shall not be less than ten (no failure). Thickness of coating or paint system on the actual equipment shall be identical to that on the test specimens with respect to materials, conditions of application, and dry-film thickness.

E. For each compressor provide a wye-delta starter. Delta-Delta and Solid State Starters shall be unacceptable because they accomplish a smaller reduction in inrush than Y-delta.

F. Provide unit mounted disconnect/circuit breaker.

2.6 REFRIGERANT CIRCUIT

A. All units shall have 2 refrigeration circuits to provide redundancy, each with one or two (manifolded) compressors on each circuit. Single refrigerant circuit chillers are not acceptable.

B. Provide for each refrigerant circuit:

1. Liquid line shutoff valve.
2. Suction Service Valve
3. Filter (replaceable core type).
4. Liquid line sight glass.
5. Electronic or thermal expansion valve sized for maximum operating pressure.
6. Charging valve.
7. Discharge and oil line check valves.
8. High side pressure relief valve.
9. Full operating charge of HFC-134a and oil for packaged units only. Units with remote evaporator option selected will ship with an oil charge and a nitrogen holding charge.

C. Capacity Modulation: Provide capacity modulation that includes linear unloading to maintain close leaving water temperature control. Unit shall be capable of operation down to 20%.
2.7 CONTROLS

A. Chilled water temperature control shall be microprocessor-based, proportional and integral controller to show water and refrigerant temperature, refrigerant pressure, and diagnostics. This microprocessor-based controller is to be supplied with each chiller by the chiller manufacturer. Controls shall include the following readouts and diagnostics:

1. Phase reversal/unbalance/single phasing and over/under voltage protection.
2. Low chilled water temperature protection.
3. High and low refrigerant pressure protection.
4. Load limit thermostat to limit compressor loading on high return water temperature.
5. Condenser fan sequencing to automatically cycle fans in response to load, expansion valve pressure, condenser pressure, and differential pressure to optimize unit efficiency.
6. Display diagnostics.
7. Oil pressure control based off of maintaining system differential pressure.
8. Compressors: Status (on/off), %RLA, anti-short cycle timer, and automatic compressor lead-lag.

B. On chiller, mount weatherproof control panel, containing starters, power and control wiring, factory wired with terminal block power connection. Provide primary and secondary fused control power transformer and a single 115 volt 60 Hz single phase connection for evaporator freeze protection heaters.

1. The unit controller shall utilize a microprocessor that will automatically take action to prevent unit shutdown due to abnormal operating conditions associated with: evaporator refrigerant temperature, high condensing pressure and motor current overload.

C. In the above case, the chiller will continue to run in an unloaded state, and will continue to produce some chilled water in an attempt to meet the cooling load. However, if the chiller reaches the trip-out limits, the chiller controls will take the chiller off line for protection, and a manual reset will be required. Once the "near-trip" condition is corrected, the chiller will return to normal operation and can then produce full load cooling.

D. Provide the following safety controls with indicating lights or diagnostic readouts.

1. Low chilled water temperature protection.
2. High refrigerant pressure.
3. Low oil flow protection.
4. Loss of chilled water flow.
5. Contact for remote emergency shutdown.
7. Phase reversal/unbalance/single phasing.
8. Over/under voltage.
9. Failure of water temperature sensor used by controller.
10. Compressor status (on or off).

E. Provide the following operating controls:

1. Eight (8) or more step leaving chilled water temperature controller which cycles compressors and activates cylinder unloaders or slide valve based on PI algorithms. If manufacturer is unable to provide at least 8 steps of unloading, providing hot gas bypass shall be required.
2. Five minute solid state anti-recycle timer to prevent compressor from short cycling. Compressor minimum stop-to-start time limit shall be 2 minutes. If a greater than 5 minute start-to-start, or greater than 2 minute stop-to-start timer is included, hot gas bypass shall be provided to insure accurate chilled water temperature control in light load applications.
3. Chilled water pump output relay that closes when the chiller is given a signal to start.
4. Load limit thermostat to limit compressor loading on high return water temperature to prevent nuisance trip outs.
5. High ambient unloader pressure controller that unloads compressors to keep head pressure under control and help prevent high pressure nuisance trip outs on days when outside ambient is above design.
6. Compressor current sensing unloader unit that unloads compressors to help prevent current overload nuisance tripouts.
7. Auto lead-lag functions that constantly even out run hours and compressor starts automatically. If contractor cannot provide this function then cycle counter and hour meter shall be provided for each compressor so owner can be instructed by the contractor on how to manually change lead-lag on compressors and even out compressor starts and running hours.
8. Low ambient lockout control with adjustable setpoint.
9. Condenser fan sequencing which automatically cycles fans in response to ambient, condensing pressure and expansion valve pressure differential thereby optimizing unit efficiency.

F. Provide user interface on the front of the panel. If display is on the inside of the panel, then a control display access door shall be provided to allow access to the display without removal of panels. Provide user interface with a minimum of the following features:

1. Leaving chilled water setpoint adjustment from LCD input
2. Entering and leaving chilled water temperature output
3. Percent RLA output for each compressor
4. Pressure output of condenser for circuits one and two
5. Pressure output of evaporator for circuits one and two
6. Ambient temperature output
7. Voltage output
8. Current limit setpoint adjustment from LCD input.

G. Digital Communications to BAS system shall consist of a BACnet interface.
PART 3  EXECUTION

3.1  INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Align chiller package on steel or concrete foundations.
C. Install units on vibration isolators.
D. Connect to electrical service.
E. Connect to chilled water piping.
F. Arrange piping for easy dismantling to permit tube cleaning.

3.2  MANUFACTURER’S FIELD SERVICES

A. OEM Startup is performed by factory trained and authorized servicing technicians
   confirming equipment has been correctly installed and passes specification checklist prior
   to equipment becoming operational and covered under OEM warranty.

B. The manufacturer shall furnish complete submittal wiring diagrams of the package unit as
   applicable for field maintenance and service.

END OF SECTION 23 64 23
SECTION 238000 - HVAC EQUIPMENT

PART 1 - GENERAL

1.01 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.

1.02 SCOPE OF WORK

A. This section calls for furnishing all labor and materials necessary to provide and install the complete air conditioning, heating and ventilating system. It is the intention of these specifications that the mechanical system shall be furnished complete with all necessary valves, controls, insulation, piping, devices, equipment, etc. necessary to provide a satisfactory installation in working order.

B. All ductwork and piping shall be concealed and insulated as hereinafter specified unless noted otherwise.

C. Provide a temperature control system.

PART 2 - PRODUCTS

2.01 CIRCULATING PUMPS:

A. Furnish and install circulating pumps where shown on plans with capacities and type indicated in schedules. Pumps shall be of non-overloading type, especially built for type of service required. Pump body shall be cast iron, impeller shall be bronze and unit shall have mechanical seals. Pump motor shall be high efficiency type.

B. Pump couplings shall have EPDM inserts as manufactured by Woods Sureflex with JE Type Sleeve; Lovejoy S Flex with JE Sleeve or prior approved equivalent.

C. The base mounted pumps shall be direct driven with pump and motor on heavy base. Grout in all base mounted pumps and align after setting.

D. In-line pumps shall be direct driven and supported from structure in accordance with manufacturer's recommendations.

E. Provide gauge cocks and gauges on suction and discharge of all pumps.

2.02 FLEXIBLE CONNECTIONS:

A. Provide flexible stainless steel connections in piping to all pumps, etc. as shown on the plans. Flexible connections shall be complete with limit controller. Connections shall be 150# flanged type. Flexible connections shall be as manufactured by MetraFlex "Metrasphere" or Southeastern Hose #SECF. At Contractor's option, the use of three (3) Victaulic style 75 or 77 flexible couplings may be used when installed in accordance with manufacturer's requirements.

2.03 SUCTION DIFFUSER:

A. Suction diffusers shall be as installed at each pump and shall be angle type cast iron body, with
steel inlet vanes and 16 mesh bronze strainer with pressure gauge tappings, adjustable leg
support and strainer blowdown connection. Unit shall have flanged or grooved end connections.
Gauge port connection with gauge shall be provided at inlet.

2.04 TRIPLE DUTY VALVES:

A. Triple duty valves shall be installed at each pump and shall be non-slam check valve with spring-
loaded disc and a calibrated adjustment feature permitting regulation of pump discharge flow and
shut-off. Sensing ports shall be provided integral to valve to measure pressure differential across
valve. The unit shall have a cast iron body construction suitable for maximum working pressure of
175 psig and maximum operating temperature of 300°F. The unit shall be as manufactured by
B&G "Tripe Duty", Taco "Plus-One" or approved equivalent. At contractor’s option, Victaulic style
779 Venturi Check Valve and Victaulic 377 Vic-Plug valve combination may be used when
installed in accordance with manufacturer's recommendations.

2.05 AIR SEPARATOR:

A. Furnish and install, as shown on plans, a centrifugal type air separator. Air separator shall be as
manufactured by B & G Rolairtrol, Taco ACF or approved equivalent.

B. The separator shall have side inlet and outlet connections as sized on plans, internal air collector
tube, removable strainer, drain connection on bottom and air discharge connection on top. Unit
shall be constructed of carbon steel in accordance with ASME pressure vessel code and be
furnished with baked enamel finish.

2.06 INSTALLATION OF PIPING

A. Furnish and install complete piping systems as shown on the plans. Valve equipment on both inlet and
outlet. Pipe on all vent valves and relief valves to drains.

B. Furnish and install a drain valve in each of the supply and return mains at the low points in the system.

C. Furnish and install an adequate means of eliminating the air from the chilled water and hot water
piping systems. Provide automatic float type air vents, Bell and Gosset No. 87 or Maid-O-Mist #75 at
all points where air might be trapped. In addition, provide manual air vent valves at all high points of
risers, etc. All automatic air vents shall have shut-off cock between vent and piping (minimum 1").

D. Provide hose connection, valves, air vents, etc. on all chilled water piping, so that the piping can be
tested. All new piping shall be properly flushed prior to final connections to existing piping.

E. All pipe shall be true and straight, without sags or traps. All taps to feed equipment shall be from
the top of the main.

F. Furnish and install all butterfly valves, ball valves, check valves, balancing valves, hangers, floor and
ceiling plates, etc., to make the system complete.

G. Screw joints shall be made up with graphite and oil, or other approved compound for a water system.

2.07 PRESSURE AND TEMPERATURE STATIONS

HVAC EQUIPMENT
A. Supply and install in the supply, return and bypass of each chilled water coil and hot water coil a T & P plug (1/4" MPT) fitting to receive either a temperature or pressure probe having 1/8" diameter stems. Fittings shall be solid brass with self-sealing valve core of Nordel, suitable for pressures to 1000 psig and temperatures at 275°F. Fitting cap shall be installed to extend above insulation.

B. Provide four (4) Marsh Model 0-100, Weksler Model BA14-Y or equivalent pressure gauges with gauge adapter, with 1/8" diameter probe.

C. Provide four (4) Marsh #603 or Weksler #1ROS pocket testing thermometers with 5" stem with external calibration - 0° to 220° temperature range.

2.08 TESTING HYDRONIC PIPING SYSTEMS

A. Chilled water piping shall be tested under 200 psi hydrostatic pressure for a minimum of 5 hours.

2.09 BALANCING VALVES

A. Balancing valves 3" and smaller shall be bronze balance type, B&G "Circuit Setters" Taco "CS" Series Tour & Anderson "CBV" or equal and shall be complete with readout valves, readout parts filtered with integral EPT check valves, indexing pointer, calibrated nameplate and pre-formed polyurethane insulation saddle. Balancing valves shall be rated at 125 psig and shall be screw type. Valves shall not be installed with meter connections pointed downward. Balancing valves 4" and larger shall be butterfly valves as previously specified. Provide pressure and temperature (P&T) taps on each side of the valve.

B. At contractor's option, balancing valves may be "Flowset" Balancing Valves as manufactured by Olympic Valve, Inc., with ball valve, with bronze body, plated ball, teflon seats, heavy duty steel handle with vinyl grip and extended stem for insulation clearances. Valve shall be complete with shipping/insulation sleeve. Refer to detail for piping arrangement.

2.10 AUTOMATIC AIR VENT

A. Furnish air vents at all points within the system and as indicated on the plans. Standard capacity air vents shall be float type, with a maximum rating of 145 psi working pressure at 240°F. Housing shall be constructed of forged brass, with internal valve, seat, polypropylene float and stainless steel lever. Units shall have 1/8" system connection size. Air vents shall be as manufactured by B&G Model 87, Maid-O-Mist No. 75, Taco Hy-Vent Series 400 or equal.

2.11 PRESSURE GAUGES

A. Furnish and install pressure gauges where indicated on the plans. Gauges shall have 4-1/2" dial, corrosion resistant stainless steel case and ring, plastic lens, balanced adjustable black pointer, and accuracy within 1% of range.

B. Gauge shall have silver soldered phosphor bronze tube with brass socket suitable for chilled water applications. Easy to read dial shall have white background with black numerals and graduations.

C. Gauges shall be as manufactured by Weksler Model EA-14, Conbraco Model No. 56 or qual.

2.12 GAUGE COCKS

A. Furnish and install gauge cocks where indicated on the plans. Gauge cocks shall be solid brass
suitable for pressures to 200psi.

B. Gauge cocks shall be as manufactured by Weksler Model A-10, Marsh Model J8046 or equal.

2.13 THERMOMETERS AND WELLS

A. Furnish and install thermometers and wells as indicated on the plans. Thermometers shall be bi-metal, adjustable angle dial type. The dial shall be 3" (minimum) with sealed glass lens, white background and black numerals and graduations. Thermometer shall be complete with 3/4" separable wells for insulation in piping.

B. Thermometer and wells shall be as manufactured by Weksler Model AF/L3B, Marsh Model K6025 or equal.

2.14 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.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All A/C installations shall comply with manufacturer's recommendations.

3.02 INSTALLATION OF EQUIPMENT

A. Install all equipment where indicated on drawings, in accordance with equipment manufacturer’s published installation instructions, and with recognized industry practices, to ensure equipment comply with other trades as necessary to insure the equipment is installed and interfaced with other associated equipment to insure a complete installation and the equipment operates properly and serves its intended purposes.

B. Provide access to equipment for servicing as for the published manufacturers installation drawing and instruction and as per accepted trade practices dictate.

C. Install electrical devices furnished by the manufacturer but not specified to be factory mounted. Furnish copy of manufacturer’s submittal and installation requirements of Division 16 section. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

D. Piping connections are to be according to Division 23. Provide piping, valves, accessories, gauges, supports, and flexible connector as indicated on drawings and equipment manufacturers submittals if applicable.

E. All connections i.e., duct connections are to be per Division 15 and equipment manufacturer’s submittals. Provide all necessary accessories to make connection complete as per acceptable trade practices.
F. Provide positive equipment ground for all installed equipment as per equipment manufacturer’s specifications.

3.03 FIELD QUALITY CONTROL

A. Upon completion of installation of equipment start-up operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning equipment and retest to demonstrate compliance.

END OF SECTION
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 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.
F. Prime bidders, by submission of a comprehensive bid on the project are indicating that the subcontractors selected in their bid have complied with all contract document’s General Provisions 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.

1.3 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 use any article, device, product, material, fixture, form or type of construction which in the judgement of the Engineer expressed in writing prior to bidding 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 Engineer 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 Engineer.

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.

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, structural, 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 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.

G. Because of the small scale of the drawings, it is not possible to indicate all of the offsets, fittings, and accessories required. The Contractor shall investigate the structural and finish conditions affecting his work and shall arrange such work accordingly, fittings, bends, junction boxes, pull boxes, access panels, and accessories required to meet such conditions at no additional costs 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 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 (Loadcenters, Panelboards, Safety Switches, Circuit Breakers, Contactors/Relays).
3. Pull Boxes
4. Generators
5. Transfer Switches
6. Generator Fuel System
7. Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)
G. Shop Drawings/submittals shall be submitted in individual books as grouped together and stated below.

1.  Light Fixtures
2.  Electrical Gear, Pullboxes
3.  Generator(s), Transfer Switches, Generator Fuel Systems
4.  Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)

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 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 Engineer and the Owner and shall occur when permitted by the 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 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 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 Engineer and when necessary, by other trades, to establish clearances for other parts of the work.
5. Record Drawings shall be returned to the Engineer upon completion of the work and are subject to approval of the Engineer.

1.14 OPERATION AND MAINTENANCE DATA

A. Refer to the specification Sections 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, 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 Engineer 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 (Loadcenters, Panelboards, Safety Switches, Contactors/Relays),
3. Pull Boxes
4. Generators
5. Transfer Switches
6. Generator Fuel System
7. Transient Voltage Surge Suppressors (TVSS)/Surge Protective Devices (SPDs)

1.15 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 Engineer will determine the extent of such patching and refinishing.
1.16 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 Owner’s satisfaction, at no additional cost.
C. Coordinate all painting requirements with prime bidder prior to bids.

1.17 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. The drawings show approximate locations only of feeders, branch circuits, outlets, etc., except where specific routing or dimensions are indicated. The Engineer reserves the right to make reasonable changes in locations indicated, before roughing-in, without additional cost to the Owner.

1.18 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 Engineer's satisfaction shall be sufficient cause for the rejection of the particular piece of apparatus in question.

1.19 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.

1.20 SALVAGED MATERIALS
A. The Owner shall have priority for the selection of salvaged material and equipment. Any equipment, light fixtures, devices, 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.

1.21 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.

1.22 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 Engineer prior to commencement of work on this project.

1.23 CAD FILES

A. ADG will provide, upon request, AutoCAD files to the contractors for use in preparing submittals and record drawings. Plans will be provided at a cost of $10.00 per drawing sheet requested. Prior to release of the AutoCAD files, contractor will be required to complete a CAD Release form.

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 using final approved room numbers, etc., as directed by the owner. Refer to specification section – Electrical Distribution System for additional requirements.

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 Engineer 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.

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 Engineer. 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 Engineer 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 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.

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 or THHN. 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 where specifically denoted on the drawings. Where conduit is called out interior raceways shall be EMT, exterior raceways shall be RGS.

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 electrical metallic tubing (EMT), except on exterior of building - these installations shall utilize RGS.

B. EMT shall be used for conduit not encased in concrete, not exposed to the weather, not run underground, and not run in hazardous areas.

C. All conduit shall be new and shall bear the inspection label of the Underwriters Laboratories, Inc. (U.L.).

D. 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.

E. 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.

F. 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 where specifically called for on the drawings.

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. Boxes for lighting fixtures shall be four-inch (4") octagon, not less than 1-1/2" deep. Where boxes are installed in concrete, boxes designed for this application shall be used.
C. 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.

D. Outlet boxes for switches and receptacles installed in exposed conduit system shall be cast iron or cast aluminum Type FD or approved equivalent.

E. Where multiple outlet boxes are shown to be installed at the same location, they shall be installed using B-Line Series BB8 mounting bracket or approved equivalent. Where single boxes are shown to be installed, the B-Line Series BB2 mounting bracket or approved equivalent shall be used.

2.5 PULL BOXES

A. Furnish and install pull boxes as shown – sized appropriately for feeders indicated. Boxes shall be code gauge galvanized steel with screw attached access panels unless noted otherwise in top, side or bottom as required.

B. All pullboxes shall include a permanent label as to “contents” – as approved by the Owner and Engineer.

2.6 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 stainless steel.

2.7 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 Owner (Match existing).

1. 20A 125V 2P 3W Duplex
   Smooth Face
   Grounded Receptacle

PART 3 - EXECUTION

3.1 MOUNTING HEIGHTS

A. Unless otherwise noted on the drawings or required by the Architect/Engineer, the mounting heights set forth below shall apply. Dimensions given are from finished floor to the top of the device backbox – NOT CENTERLINE.

1. Intercom Staff Stations 4'-0"
2. Toggle Switches 4'-0"
3. Receptacles 1'-6"
4. Panelboards 6'-7" to top of can
5. Tele/Data Outlets 1'-6"
6. Motor Control Equipment 5'-0"
7. Clock and Bell Outlets 7'-6"
<table>
<thead>
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<th></th>
<th>Description</th>
<th>Location Details</th>
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<tr>
<td>8.</td>
<td>Fire Alarm Audio/Visual</td>
<td>6&quot; from ceiling on wall *</td>
</tr>
<tr>
<td>9.</td>
<td>Fire Alarm Hand Stations</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>10.</td>
<td>Fire Alarm Visual Only</td>
<td>6&quot; from ceiling on wall *</td>
</tr>
<tr>
<td>11.</td>
<td>Electric Water Cooler</td>
<td>Concealed behind unit **</td>
</tr>
</tbody>
</table>

* Mounting height shall be 6" from ceiling or maximum 80" above finished floor, whichever is lowest.

** Contractor shall be responsible for coordinating exact location in field with the plumbing contractor.

B. Where overcurrent or safety switch devices are shown to serve exterior equipment, the Contractor shall review in detail with the Engineer proposed exterior mounting locations, mounting heights, conduit routing, etc., and receive approval prior to rough-in.

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, fixturewhips 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. Each isolated ground receptacle circuit shall be wired as follows (Refer to Isolated Ground System Wiring Schematic)

1. There shall be phase, neutral, ground, and isolated ground conductors for each branch circuit, whether located in a separate raceway or grouped, (maximum of three (3) isolated ground branch circuits in any one (1) raceway).

2. Each raceway shall have a separate grounding conductor for the equipment and/or outlet box grounding.

I. 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 750 C., (1670 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.

J. 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.

3.3 CONDUIT

A. 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 Engineer.

B. Couplings and connectors for EMT shall be compression type or cast-iron set screw type.

C. 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.

D. 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.

E. Unless otherwise noted, conduit shall be run concealed. Conduit runs from wall mounted receptacles, shall be run concealed in walls whenever possible.

F. 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.

G. 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

H. 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.

I. All conduit runs shall be installed in accordance with all applicable sections of the National Electrical Code and local codes or ordinances.

J. Where empty conduits are shown, a #14 pull wire shall be installed and conduits shall be capped.

K. Terminations to all mechanical equipment shall be made using a minimum of 24" liquid-tight flexible metallic conduit.

L. At each 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.
M. 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 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.

3.6 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 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.

B. All new circuit breakers installed in existing electrical equipment shall be of same manufacturer and AIC ratings of said existing equipment.

1.3 SERIES RATING OF EQUIPMENT

A. The electrical gear provided and installed as part of this project shall not be series rated.

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 be finished as directed by the Engineer. 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. Directories shall be made only after permanent room numbers have been assigned. Room numbers shown on the construction drawings shall not be used for making directories. Each circuit shall be clearly identified as to use and location (ex: Receptacles Rooms 201, 202 or Lighting Rooms 207, 209, 211, and 213).

D. Cabinets shall be galvanized steel not less than twenty inches (20") in width. Gutters shall not be smaller than minimum dimensions required by the National Electrical Code.

E. Double section panelboards shall be comprised of cabinets of equal dimensions.
F. All panels rated NEMA 1, shall be of the door-in-door type construction providing tool-less access to interior of the panelboard(s).

G. 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

H. In branch circuit panelboards having two (2) vertical columns of devices, circuit numbers shall be such that, starting at the top, odd numbers shall be used in sequence down the left hand side. See Schedule of Panelboards on drawings for circuit device sizes and number of poles.

I. 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.

J. UL Listing: Panelboards shall be listed by UL and bear the UL label.

K. Interior panelboards shall be NEMA I unless noted otherwise. All exterior panelboards shall be rated NEMA 3R.

2.2 LABELS

A. All panelboards, contactors, safety switches and fused safety switches installed by this contractor shall have laminated phenolic 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.

B. Color Coding of labels shall be as follows:

   Normal Power White Background with Black Letters
   Emergency Power Red Background with White Letters

2.3 MAGNETIC CONTACTORS

A. The Contractor shall furnish and install contactors where shown on the drawings.

B. Contactors shall be suitable for use at the voltage rating of the circuits controlled and shall have the number of poles and ampere rating shown on the drawings as a minimum. Where ampere ratings are not shown, ratings shall be 20 amperes minimum, or as required to match the supply feeder protective device.

C. Main contacts shall be double break silver alloy to silver alloy type protected by arching contacts.
D. Contactors shall be Underwriters' Laboratories, Inc. listed under UL 508, 11th Edition. Contactors shall be fully rated and marked for use with motor loads, tungsten lamp loads, and ballast lamp loads.

E. Remote control stations shall be three-wire momentary contact red mushroom push button type. Stations shall be arranged as indicated on the drawings.

F. Contactors shall be in suitable enclosures for locations shown with hinged cover and latch.

2.4 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 shall be rated heavy duty and fusible.

C. Safety switches exposed to the weather shall be rated NEMA 3R.

D. Safety switches shall be of the solid neutral type where required by circuit or feeder specified.

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 Engineer. Verify mounting heights for all exterior locations with Engineer prior to rough-in.

G. Safety switches shall be General Electric or Square "D".

2.5 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.

2.6 SURGE PROTECTIVE DEVICE (See Drawings for locations and specifics)

A. The Surge Protection Device (SPD) covered under this section includes all service entrance type surge protection devices suitable for use as Type 1 or Type 2 devices per UL1449 4th Edition, applied to the line or load side of the utility feed inside the facility.

B. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to finish and install surge protection devices. Include factory start-up and commissioning.
C. Quality Assurance

1. Reference Standard: Comply with the latest edition of the applicable provisions and recommendations of the following, except as otherwise stated in this document:
   a. UL 1449 4th Edition I Nominal rating of no lower than 20kA.
   b. UL 1283.
   c. ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low-Voltage AC Power Circuits
   e. UL96A
   f. IEEE 1100 Emerald Book
   g. National Fire Protection Association (NFPA 70: National Electrical Code)
   h. Device shall 3rd party testing to verify surge current rating

D. Approved Manufacturer

2. Prior Approved equivalent.

E. Manufactured Units/ Electrical Requirements

1. Declared Maximum Continuous Operating Voltage (MCOV) shall be greater than 115 percent of the nominal system operating voltage and in compliance with test and evaluation procedures outlined in the nominal discharge surge current test of UL1449 4th Edition, section 37.7.3. MCOV values claimed based on the component’s value or on the 30-minute 115% operational voltage test, section 38 in UL1449 will not be accepted.

2. Unit shall have no more than 10% deterioration or degradation of the UL1449 4th Edition Voltage Protection Rating (VPR) when exposed to a minimum of 15,000 repeated category C3 (20kV/10kA) surges. The SPD manufacturer must provide a test report validating the repetitive surge test was performed.

3. Protection Modes UL1449 4th Edition VPR (6kV, 3kA) for grounded WYE/delta and High Leg Delta circuits with voltages of (480Y/277), (208Y/120), (600Y/347). 3-Phase, 4 wire circuits, (120/240) split phase shall be as follows and comply with test procedures outlined in UL1449 4th Edition section 37.6:

<table>
<thead>
<tr>
<th>SYSTEM VOLTAGE</th>
<th>MODE</th>
<th>MCOV</th>
<th>B3 RINGWAVE 6kV, 500A</th>
<th>C3 Comb. Wave 20kV, 10kA</th>
<th>UL 1449 Third Edition VPR Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/240</td>
<td>L-N</td>
<td>150</td>
<td>490</td>
<td>980</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>L-G</td>
<td>150</td>
<td>570</td>
<td>980</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>N-G</td>
<td>150</td>
<td>640</td>
<td>1170</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>L-L</td>
<td>300</td>
<td>500</td>
<td>1600</td>
<td>1200</td>
</tr>
<tr>
<td>120/208</td>
<td>L-N</td>
<td>320</td>
<td>450</td>
<td>1420</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>L-G</td>
<td>320</td>
<td>540</td>
<td>1540</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>N-G</td>
<td>320</td>
<td>570</td>
<td>1600</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>L-L</td>
<td>552</td>
<td>530</td>
<td>2600</td>
<td>2000</td>
</tr>
<tr>
<td>277/480</td>
<td>L-N</td>
<td>320</td>
<td>450</td>
<td>1420</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>L-G</td>
<td>320</td>
<td>540</td>
<td>1540</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>N-G</td>
<td>320</td>
<td>570</td>
<td>1600</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>L-L</td>
<td>552</td>
<td>530</td>
<td>2600</td>
<td>2000</td>
</tr>
</tbody>
</table>
4. Electrical Noise Filter- each unit shall include a high performance EMI/RFI noise rejection filter with a maximum attenuation of 54dB per MIL-STD-220B.
   a. SPD shall include a EMI/RFI noise rejection filter for all L-N modes as well as a removable filter in the N-G mode.

5. Integral Disconnect Switch
   a. The device shall have a NEMA compliant safety interlocked integral disconnect switch with an externally mounted metal manual operator.
   b. The switch shall disconnect all ungrounded circuit conductors from the distribution system to enable testing and maintenance without interruption to the facility’s distribution system.
   c. The switch shall be rated for 600Vac.
   d. The SPD device shall be tested to UL1449 4th Edition listed with the integral disconnect switch and the UL1449 VPR ratings shall be provided.
   e. The integral disconnect switch shall be capable of withstanding, without failure, the published maximum surge current magnitude without failure or damage to the switch.
   f. The line side of the integral disconnect shall be blocked off so that when the SPD is opened there is no direct access to the voltage present on the line side of the disconnect.

6. The UL1449 Voltage Protective Rating (VPR) shall be permanently affixed to the SPD unit.

7. The UL1449 Nominal Discharge Surge Current Rating shall be 20ka

8. The SCCR rating of the SPD shall be 200kAIC without the need for upstream over current protection.

9. The SPD shall be listed as Type1 SPD, suitable for use in Type1 or Type2 applications.

10. The SPD shall include the following monitoring features:
    a. Time Date stamp, duration and magnitude for the following power quality events (sags, swells, surges, dropouts, outages, THD, frequency, Volts RMS per phase)
    b. SPD monitoring shall track surge protection and display it as a percentage
    c. SPD shall provide a surge counter with three categories to be defined as Low Level surge (100A-500A) Medium Level surge (500A-3,000A) High Level surge (>3,000A)
    d. Remote communications via ModBus or Ethernet

11. Warranty on defective material and workmanship shall be for 10 years parts including 5 years on-site labor. Devices that must be removed and sent to the manufacturer for repair will not be accepted.

12. Copy of Warranty to be sent with shop drawing submittal.
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
SECTION 26 32 13 - EMERGENCY GENERATOR - DIESEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. It is the intent of these specifications to procure for the owner a generator set, new and to
the best industry standard of construction and design. The generator shall be of certified
output as manufactured by the Blue Star Power Systems Corporation model PD 100 or
prior approved equal. The entire generator set shall be UL 2200 labeled. Any request for
approval of an alternate product or the local supplier must be received no later than 10
working days prior to the bid date. This request must include a paragraph by paragraph
statement of compliance or deviation to the written specification. Any requests for
deviations to the specification must include adequate engineering data to warrant
approval. Requests for approval that are incomplete or that cause the specifier to ponder
as to what is being offered will be rejected. There are no exceptions to these
requirements.

1.2 SUBMITTAL

A. Submittal shall include specification sheets showing all standard and optional
accessories to be supplied, schematic wiring diagrams, dimension drawings, and
interconnection diagrams identifying by terminal number each required interconnection
between the generator set, the transfer switch, and other remote devices if included
elsewhere in these specifications.

B. Where a “Standard Specification” (i.e. ANSI, UL, etc.) is referenced and no
manufacturers are listed the Contractor shall submit manufacturers for Prior Approval in
adherence with the specified standard.

1.3 TESTING

A. To assure that the equipment has been designed and built to the highest reliability and
quality standards, the manufacturer shall be responsible for design prototype tests as
described herein: Components of the emergency system, such as the engine/generator
set, transfer switch, and accessories shall not be subjected to prototype tests since the
tests are potentially damaging. Rather, similar design prototypes which will not be sold,
shall be used for these tests. Prototype test programs shall include the requirements of
NFPA-110 and the following:

1. Maximum power (kW).
2. Maximum starting (kVA) at 35% instantaneous voltage dip.
3. Alternate temperature rise by embedded thermocouple and by resistance method
   per NEMA MG1-22.40 and 16.40.
4. Governor speed regulation under steady-state and transient conditions.
5. Voltage regulation and generator transient response.
6. Fuel consumption at 1/4, ½, 3/4, and full load.
7. Harmonic analysis, voltage waveform deviation, and telephone influence factor.
9. Cooling air flow.
10. Torsional analysis testing to verify that the generator set is free to harmful
torsional stresses.
1.4 WARRANTY AND PREVENTIVE MAINTENANCE

A. The emergency generator system (including but not limited to automatic transfer switches, fuel system, generator, engine, enclosure, annunciator, etc.) shall be warranted by the manufacturer for five (5) years from the date of substantial completion. This warranty shall be a full, non-limited, non-pro-rated warranty and shall cover all parts, labor, trip charges, and incidental materials.

B. As part of this five year warranty/preventive maintenance program, the contractor shall provide a full preventive maintenance program providing all recommended and required maintenance care on the complete generator, transfer switch(s) and fuel system. This program shall be based upon an annual run-time of one hundred fifty (150) hours. Program shall include but not be limited to all fluid changes, filter changes, inspections, belts, hoses, trip charges, materials, labor, disposal fee, etc....for a complete and all-inclusive maintenance program. For service intervals where the manufacturer indicates to replace oil and oil filters, contractor shall provide a complete oil and filter change. Simple testing of the oil (and replacement determined by the testing) is not acceptable. Similarly, this applies to all manufacturer recommended fluid changes.

PART 2 - PRODUCTS

2.1 GENERAL

A. The standby generator set shall be rated standby power (defined as continuous operation for the duration of any power outage) 100/KW/125KVA - 120/208 volts, 3 phase, 4 wire 60Hz, .8 power factor, (269 cu. in. displacement; 161 rated hp; 1800 rpm; EPA Tier 3 certified) at 500 feet altitude, 32-122 degrees Fahrenheit. Vibration isolators shall be provided between the engine-generator and welded steel base or between the base and the floor.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Blue Star
2. Cummins
3. Caterpillar
4. Kohler

2.3 FINAL PRODUCTION TESTS

A. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:

2. Transient and steady-state governing.
3. Safety shutdown device testing.
4. Voltage regulation.
5. Rated Power.

2.4 ENGINE

A. The engine shall be equipped with the following:
1. Engine: Engine shall be stationary, liquid cooled, with a fuel system that is compatible with #2 ULSD diesel fuel. Design shall be four cycle, turbo charged and after-cooled. Engine equipment shall include, but not be limited to the following:
   a. 48 hour – 100% load day tank with auxiliary fuel pumps solenoid fuel shut off valve, fuel filter, battery, batteries charger and flexible fuel connection.

2. Engine protection devices shall have sensing elements located on the engine to initiate the following preliminary alarms and shutdowns:
   a. Low coolant temperature alarm.
   b. Low lube oil pressure alarm.
   c. High coolant temperature alarm.
   d. Low lube oil pressure shutdown.
   e. High coolant temperature shutdown.
   f. Overspeed shutdown.
   g. Overcrank lockout and shutdown.

3. Electronic governing system to control generator system frequency, speed regulation of +/- .25% minimum from no load to full load with automatic overspeed shutdown. Maintain 60Hz at any load from no load to full load.

4. Provide low coolant level shutdown which shall activate high coolant temperature lamp.

5. Engine starting batteries - Optima Red Label or equivalent AGM type.

6. Static duel rate 10 ampere automatic battery charger.

7. Engine mounted thermostatically controlled jacket water heater to maintain jacket water temperature of 90 degrees F. minimum. (120V; 1500W)

8. Positive displacement, mechanical full pressure lube oil pump, full flow lube oil filter with replaceable element, pressure relief valve, and oil drain valve with hose extension. Furnish a bypass valve to allow lube oil circulation in the event of a failure of the filtering system.

9. A unit mounted radiator sized for operation in a 122 degree F. ambient temperature shall be provided. Also include a 50/50 mix of ethylene glycol. Maximum airflow restriction = .5"WC

10. A critical grade exhaust silencer shall be provided along with a stainless steel flexible exhaust connection as recommended by generator set manufacturer. Silencer shall be internally mounted within the generator enclosure and shall be factory insulated.

11. Heavy duty, dual element air cleaner

12. Water separator

13. Duplex fuel filter

14. Deep sump oil pan

15. Duplex oil filter

16. Heavy duty starting motor

17. All required fluids and lubricants for proper operation of system.

2.5 GENERATOR

A. The power generator will be of the salient pole synchronous type. The generator will be rated at 60 Hertz. The generator will be equipped with amortisseur windings for efficient paralleling. The generator will be equipped with bearing flange-mounted design. The bearing will be a sealed, frictionless, cartridge type. The coupling will be a laminated, steel, semi-flexible, piloting type. The exciter will be direct connected brushless design. Insulation class will be in accordance with the most recent NEMA-MG-1.22.40 requirements for the generator. The generator will be provided with a power terminal cabinet of adequate size for connection of load conductors. PMG excitation must be of the true PMG design. The alternator shall be rated at the stated output with a maximum temperature rise of 105 deg.C. Factory documentation of these requirements shall be
made a part of the approval submittals prior to release to production. No exception to these requirements will be allowed. The alternator shall be capable of producing a minimum of 240 SKVA at an instantaneous voltage dip of 20%. Sustained voltage dips do not meet this requirement. Provide factory documentation to verify this requirement.

B. The voltage regulator shall be a digital, microprocessor design with solid state voltage build-up. No voltage build-up relay or other relays are acceptable. The unit shall be encapsulated for humidity and abrasion protection. The regulator shall include 1/4% regulation, true volts per hertz operation with adjustable cut in, loss of sensing continuity shutdown, over-excitation shutdown, three-phase RMS sensing, over-voltage protection, and provisions for parallel operation.

C. On application of any load up to the rated load, the instantaneous voltage dip shall not exceed 20% and shall recover to ± 0.5% of rated voltage within one second.

D. The generator shall be capable of sustaining at least 250% of rated current for at least 10 seconds under a 3 phase symmetrical short by inherent design or by the addition of an optional current boost system.

E. The generator shall be capable of accepting the loads that were specified with the stated rated load being the largest running loads and 10% being the largest instantaneous voltage dip when loads are started as specified on the loads report.

F. The generator, having a single maintenance free bearing, shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.

2.6 CONTROLLER

A. Set-mounted controller capable of facing right, left, or rear shall be vibration isolated on the generator enclosure. The microprocessor control board shall be moisture proof and capable of operation from -40c to 85c. Relays will only be acceptable in high current circuits.

B. Circuitry shall be of plug-in design for quick replacement. Controller shall be equipped to accept a plug-in device capable of allowing maintenance personnel to test controller performance without operating the engine. The controller shall include:

1. Fused DC circuits.
2. Complete two-wire start/stop control which shall operate on closure of a remote contact.
3. Speed sensing and a second independent starter motor disengagement systems shall protect against the starter engaging with a moving flywheel. Battery charging alternator voltage will not be acceptable for this purpose.
4. The starting system shall be designed for restarting in the event of a false engine start, by permitting the engine to completely stop and then re-engage the starter.
5. Cranking cycler with 15-second ON and OFF cranking periods.
6. Overcrank protection designed to open the cranking circuit after 75 seconds if the engine fails to start.
7. Circuitry to shut down the engine when signal for high coolant temperature, low oil pressure, or overspeed are received.
8. Adjustable engine cool down timer factory set at five minutes to permit unloaded running of the standby set after transfer of the load to normal.
9. Three-position (Automatic - OFF - TEST) selector switch. In the test position, the engine shall start and run regardless of the position of the remote starting contacts. In the automatic position, the engine shall start when contacts in the remote control circuit close and stop five minutes after those contacts open. In
the off position, the engine shall not start even though the remote start contacts close. This position shall also provide for immediate shutdown in case of an emergency. Reset of any fault lamp shall also be accomplished by putting the switch to the off position.

10. Indicating lights to signal:
   a. (Not-in-auto (flashing red))
   b. (Overcrank (red))
   c. (Emergency stop (red))
   d. (High engine temperature/low coolant level (red))
   e. (Overspeed (red))
   f. (Air damper (red))
   g. (Battery charger malfunction (red))
   h. (Low battery voltage (red))
   i. (Low fuel (red))
   j. (System ready (green))
   k. (Pre-alarm high engine temp. (yellow))
   l. (Pre-alarm low oil pressure (yellow))

11. Test button for indicating lights.
13. Terminals shall be provided for each signal in 10 above for connection to remote monitoring devices.
14. Remote annunciator indicating conditions listed in Item 10 above shall be installed where shown on the plans.

2.7 INSTRUMENT PANEL

A. A set mounted instrument panel shall include:
   1. Dual range voltmeter, 3 ½ inch, ± or - 2% accuracy.
   2. Dual range ammeter, 3 1/2/inch, ± or - 2% accuracy.
   4. Lights to indicate high or low meter scale.
   5. Direct reading pointer-type frequency meter, 3 ½ inch, ± or - 5% accuracy, 45 to 65 Hz scale.
   6. Panel illuminating lights.
   7. Battery charging meter.
   8. Coolant temperature gauge (liquid cooled models).
   9. Oil pressure gauge.
   10. Running time meter.
   11. Voltage adjust rheostat (+ or - 5% range).

2.8 ACCESSORIES

A. The following accessories shall be provided:
   1. Overvoltage protection will shut down the unit after one second of 15% or more overvoltage.
   2. Battery rack, battery cables, 12-volt battery(ies) capable of delivering the minimum cold-cranking amps required at zero degrees Fahrenheit per SAE Standard J-537.
   3. Gasproof, seamless, stainless steel, flexible exhaust connector(s) ending in pipe thread.
   4. Flexible fuel line(s) rated 300 degrees F and 100 PSI ending in pipe thread.
   5. Engine exhaust silencer, coated to be temperature and rust resistant, rated for critical applications. Exhaust noise shall be limited to 68’ dba as measured at 10 feet in a free-field environment.
6. Block heater thermostatically controlled to maintain engine coolant at 90 degrees Fahrenheit (32 degrees Celsius) to meet the start-up requirement of NFPA-99 or NFPA-110 Regulations.

7. 10-Ampere automatic float and equalize battery charger with + - 1% constant voltage regulation from no load to full load over + - 10% AC input line variation, current limited during engine cranking and short circuit conditions, temperature compensated for ambient temperatures from -10 degrees C to + 50 degrees C, 5% accurate voltmeter and ammeter, fused, reverse polarity and transient protected. Provide alarm circuit board to meet the requirements of NFPA-110 for low battery voltage, high battery voltage, and battery charger malfunction. Charger shall be factory mounted within generator weatherproof enclosure and wired to a terminal strip.

8. 16-light remote annunciator shall monitor all controller functions described in Article 10 of the controller section plus line power and generator power monitoring. An integral lamp test and horn silence switch shall be included that meets NFPA-110.

9. Main-line circuit breaker 208 V., 3 pole 100% rated – 350 Amp with parallel output lugs.

10. Spring-type, heavy duty, vibration isolators shall be provided between engines/generator and frame and between frame and concrete pads.

2.9 OUTDOOR GENERATOR SET ENCLOSURE

A. Description: Weatherproof aluminum housing. Multiple panels are lockable and provide adequate access to components requiring maintenance. Panels are removable by one person without tools.

B. Fixed Louvers: At air inlet and discharge. Louvers prevent entry of rain and snow.

C. Fixed Dampers: At air inlet and discharge

D. Air Flow Through Housing: Adequate to maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at the top of the range specified under “System Service Conditions.”

E. Rated for windload of 150 mph sustained winds with 15mph gust factor.

F. When generator unit is installed on a sub-base fuel tank provide and install a 4’ wide welded aluminum work platform on all four (4) sides of unit complete with ADA compliant hand-rails and fixed stairs.

G. Enclosure shall be of the sound attenuating type. Enclosure shall limit total unit noise at 7 meters to a maximum sound pressure level of 68 db.

2.10 FINISHES

A. Outdoor Enclosures: Custom color (color shall be selected by Owner during shop drawing submittals) Field applied final finish over corrosion-resistant pretreatment and manufacturer's standard primer.

2.11 SUB-BASE FUEL TANK

A. Unit shall be complete with factory, double-wall, containment sub-base fuel tank.
B. UL 2085 listed.
C. Emergency tank and rupture basin vents.
D. Tank mounted mechanical fuel gauge.
E. Low and high level fuel switches (interface with generator set annunciator).
F. Basin drain.
G. Integral 5-gallon spill basin.
H. Sized for a continuous run-time of forty-eight (48) consecutive run-hours at 100% of unit’s rated maximum load.

PART 3 - EXECUTION

A. The equipment shall be installed as shown on the plans, in accordance with the manufacturer’s recommendation and all applicable codes.

3.2 SITE TEST

A. An installation check, start-up and building load test shall be performed by the manufacturer’s local representative. The engineer, regular operators, and the maintenance staff shall be notified a minimum of one (1) calendar week prior to test of the time and date of the site test. The tests shall include:

1. Fuel, lubricating oil, and antifreeze (liquid cooled models) shall be checked for conformity to the manufacturer’s recommendations under the environmental conditions present and expected.
2. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. This shall include: engine heaters, battery charger, generator strip heaters, remote annunciator, etc.
3. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and phase rotation.
4. Automatic start-up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper systems coordination. Engine temperature, oil pressure and battery charge level along with generator voltage, amperes, and frequency shall be monitored throughout the test.
5. Load Bank test at 25% power for ½ hour, 50% power for ½ hour, 75% power for 1 hour and at full power for two (2) hours. Contractor shall be responsible for all costs to refill fuel tank to maximum capacity three (3) times complete.
6. During load bank test, record the following parameters in fifteen minute intervals. Submit results prior to requesting substantial completion for project.
   a. Voltage L-L
   b. Voltage L-N
   c. Current/Phase
   d. Oil Pressure
   e. Coolant Temperature
   f. Generator mounted volt meter readings (all settings)
   g. Generator mounted amp meter readings (all settings)
   h. Hour meter readings
3.3 TRAINING

A. Provide six (6) hours of factory authorized training. These six (6) hours shall be divided into two (2) three hour training sessions.

B. Field training shall cover all the items contained in the Operation and Maintenance Manuals.

C. As part of project close-out documents, submit original sign-in sheets of both training sessions.

END OF SECTION 26 32 13
SECTION 26 36 00 - TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Automatic transfer switch (ATS).

1.2 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and all Specification Sections.

B. Shop drawings or published product data for each transfer switch, including dimensioned plans, sections, and elevations showing minimum clearances; conductor entry provisions; gutter space; installed features and devices; and materials lists.

C. Wiring diagrams, elementary or schematic, differentiating between manufacturer-installed and field-installed wiring.

D. Single-line diagrams of transfer switch units showing connections between automatic transfer switch, bypass/isolation switch, power source, and load, plus interlocking provisions.

E. Operation and maintenance data for each type of product, for inclusion in Operating and Maintenance Manual specified in Division 1. Include all features and operating sequences, both automatic and manual. List all factory settings of relays and provide relay setting and calibration instructions.

F. Manufacturer's certificate of compliance to the referenced standards and tested short-circuit closing and withstand ratings applicable to the protective devices and current ratings used in this Project, as indicated and as specified in paragraph "Tested Fault Current Ratings."

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms are experienced in manufacturing equipment of the types and capacities indicated and have a record of successful in-service performance.

B. Emergency Service: Manufacturer maintains a service center capable of providing emergency maintenance and repairs at the Project site with an 8-hour maximum response time.


E. Comply with NEMA ICS 1, "General Standards for Industrial Control," ICS 2, "Industrial Control Devices, Controllers and Assemblies," and ICS 6, "Enclosures for Industrial Controls and Systems."
F. UL Compliance: Comply with UL Standard 1008, "Automatic Transfer Switches," except where requirements of these Specifications are stricter.

G. Single-Source Responsibility: Obtain generator (s) ATSs, and remote annunciators, fuel system(s) from a single manufacturer that assumes responsibility for all system components furnished.

H. The automatic transfer switch shall be warranted by its manufacturer for five (5) consecutive calendar years from the date of substantial completion. This warranty shall be in full, non-limited, non-pro-rated warranty and shall cover all parts, labor, trip charges and incidental materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Cummins
2. Asco
3. Caterpillar
4. Kohler

2.2 TRANSFER SWITCH PRODUCTS, GENERAL

A. Current and Voltage Ratings: As indicated on the drawings.

B. Tested Fault-Current Ratings: Closing and withstand ratings exceed the indicated available rms symmetrical fault current at the equipment terminals based on testing according to UL Standard 1008, conducted at full-rated system voltage and 20 percent power factor. Rate each product for withstand duration time as follows when tested for rated short-circuit current correlated with the actual type of circuit protective device indicated for transfer switches for this Project:

1. Molded-Case Circuit Breakers, 150 Amperes or Smaller: 1.5 closing and withstand duration cycles.
2. Molded-Case Circuit Breakers, Larger than 150 Amperes: 3 closing and withstand duration cycles.

C. Solid-State Controls: Repetitive accuracy of all settings is plus or minus 2 percent or better over an operating temperature range of minus 20 deg C to 70 deg C.

D. Resistance to Damage by Voltage Transients: Components meet or exceed voltage surge withstand capability requirements when tested according to ANSI C37.90.1, IEEE Guide for Surge Withstand Capability (SWC) Tests. Components meet or exceed voltage impulse withstand test of NEMA ICS 1.

E. Four-Pole Switches: 4-pole switches shall be provided and shall provide full-capacity over-lapping neutral switching.

F. Enclosures: General-purpose NEMA 3R gasketed, conforming to UL Standard 508, "Electric Industrial Control Equipment," except as otherwise indicated.
G. Factory Wiring: Train and bundle factory wiring and identify consistently with shop drawings, either by color code or by numbered or lettered wire and cable tape markers at terminations.

1. Designated terminals accommodate field wiring.
2. Power Terminals Arrangement and Field Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
3. Terminals: Pressure-type, suitable for copper or aluminum conductors of sizes indicated.
4. Control Wiring: Equipped with lugs suitable for connection to terminal strips.

H. Electrical Operation: Where indicated, accomplish by a non-fused, momentarily energized solenoid or electric motor-operated mechanism, mechanically and electrically interlocked in both directions. Switches using components of molded-case circuit breakers or contactors not designed for continuous-duty, repetitive switching between active power sources are not acceptable.

I. Switch Action: Mechanically held in both directions for double-throw switches.

J. Switch Contacts: Use silver composition for switching load current. Units rated 225 amperes and more have separate arcing contacts.

K. Overcurrent devices are not part of switch products.

L. Refer to electrical riser diagram for voltage and amperage of switch(s).

2.3 AUTOMATIC TRANSFER SWITCHES (ATSs)

A. Comply with Level 1, Type 10 equipment according to NFPA 110, "Standard for Emergency and Standby Power Systems." Emergency power system shall start and assume load within ten (10) seconds of a power outage.

B. Switching Arrangement: Double-throw type, with synchronized (in-phase monitoring to prevent switching when phase angle between sources is greater than thirty degrees) transition normal functioning.

2.4 AUTOMATIC TRANSFER SWITCH FEATURES

A. Voltage sensing for each phase of normal source. Pick-up voltage is adjustable from 85 percent to 100 percent nominal, and drop-out voltage is adjustable from 75 percent to 98 percent pick-up value. Factory set for pick-up at 90 percent and drop-out at 85 percent.

B. Time-delay override of normal source voltage-sensing delays transfer and engine start signals. Adjustable 0 to 6 seconds, and factory set at 1 second.

C. Voltage/Frequency Lockout Relay: Prevent premature transfer. Voltage pick-up is adjustable from 85 percent to 100 percent nominal. Factory set to pick-up at 90 percent. Pick-up frequency is adjustable from 90 percent to 100 percent nominal. Factory set to pick-up at 95 percent.

D. Retransfer Time Delay: Adjustable from 0 to 30 minutes and factory set at 10 minutes. Provides automatic defeat of the delay upon loss of voltage or sustained under-voltage of the emergency source, provided the normal supply has been restored.
E. Test Switch: Simulates normal source failure.

F. Switch-Position Pilot Lights: Indicate source to which the load is connected.

G. Source-Available Indicating Lights: Supervise sources via the transfer switch normal and emergency source-sensing circuits.
   1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."

H. Unassigned Auxiliary Contacts: Two normally open SPDT contacts for each switch position.
   1. Rating: 10 amperes at 240 V a.c.

I. Transfer Override Switch: Overrides automatic retransfer control so the ATS will remain connected to the emergency power source regardless of the condition of the normal source. A pilot light indicates the override status.

J. Engine Starting Contacts: One isolated normally closed and 1 isolated normally open. Contacts are gold flashed or gold plated and rated 10 amperes at 32 V d.c. minimum.

K. Engine Shut-Down Contacts: Time delay adjustable from 0 to 5 minutes; factory set at 5 minutes.

2.5 FINISHES

A. Enclosures: Indoor NEMA I installations. Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.

2.6 SOURCE QUALITY CONTROL

A. Factory test components, assembled switches, and associated equipment to ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for conformance with specified requirements. Perform dielectric strength test conforming to NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Wall mounting of Transfer Switches; Level and anchor the unit to the wall.

3.2 WIRING TO REMOTE COMPONENTS

A. Match the type and number of cables and conductors to the control and communications requirements of the transfer switches used. Increase raceway sizes at no additional cost to the Owner if necessary to accommodate required wiring.
3.3 CONNECTIONS
A. Tighten factory-made connections, including connectors, terminals, bus joints, mountings, and grounding. Tighten field-connected connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque tightening values. When manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standards 486A and 486B. Provide and install all required raceways and conductors/cables for a complete and fully operational system.

3.4 GROUNDING
A. Make equipment grounding connections for transfer switch units as indicated and as required by the NEC.

3.5 FIELD QUALITY CONTROL
A. Manufacturer's Field Services: Provide services of a factory-authorized service representative to supervise field tests.

B. Preliminary Tests: Perform electrical tests as recommended by the manufacturer and as follows:

1. Measure phase-to-phase and phase-to-ground insulation resistance levels with insulation resistance tester, including external annunciator and control circuits. Use test voltages and procedure recommended by the manufacturer. Meet manufacturer's specified minimum resistance.
2. Check for electrical continuity of circuits and for short circuits.

C. Field Tests: Give 7-day advance notice of the tests and perform tests in presence of Owner's representative.

D. Coordinate tests with tests of generator plant and run them concurrently.

E. Tests: As recommended by the manufacturer and as follows:

1. Contact Resistance Test: Measure resistance of power contacts for ATSs, NATSs, and BP/ISs. Resolve values in excess of 500 micro-ohms and differences between adjacent poles exceeding 50 percent.
2. Ground Fault Tests: Coordinate with testing specified in Division 16 Section "Overcurrent Protective Devices" to ensure sensors are properly selected and located to optimize ground-fault protection where power is being delivered from either source.
   a. Verify grounding points and sensor ratings and locations.
   b. Apply simulated fault current at the sensors and observe reaction of circuit interrupting devices.
3. Operational Tests: Demonstrate interlock, sequence, and operational function for each switch at least 3 times.
   a. Simulate power failures of normal source to ATSs and of emergency source with normal source available.
   b. Simulate low phase-to-ground voltage for each phase of normal source of ATSs.
   c. Verify time-delay settings and pick-up and drop-out voltages.
F. Test Failures: Correct deficiencies identified by tests and prepare for retest. Verify that equipment meets the specified requirements.

G. Reports: Maintain a written record of observations and tests. Report defective materials and workmanship and retest corrected items. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.6 DEMONSTRATION

A. Training: Furnish the services of a factory-authorized service representative to instruct Owner’s personnel in the operation, maintenance, and adjustment of transfer switches and related equipment. Provide a minimum of 4 hours of instruction scheduled 7 days in advance. As part of project close-out documents, Contractor shall submit original sign-in sheet of all persons present at instruction session.