



Office of General Services

DESIGN AND CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 1 TO PROJECT NO. 44947

HVAC WORK AND ELECTRICAL WORK
REPLACE CHILLER, ADMINISTRATION BUILDING 1
ULSTER CORRECTIONAL FACILITY
750 BERME ROAD
NAPANOCH, NY

March 8, 2016

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual.
Acknowledge receipt of this Addendum in the space provided on the Bid Form.

SPECIFICATION GROUP

DIVISION 01 – GENERAL REQUIREMENTS

1. SECTION 013000 ADMINISTRATIVE REQUIREMENTS: Discard the Section bound in the Project Manual and substitute the accompanying section (pages 013000 – 1 thru 013000 – 2) noted “Revised 03/02/2016”.
2. SECTION 013300 SUBMITTALS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 013300 – 1 thru 013300 – 9) noted “Revised 03/02/2016”.

ELECTRICAL WORK ONLY

3. Page 014100 – 2, Article 1.06 Utilities: Delete this Article in its entirety.

DIVISION 26 – ELECTRICAL

HVAC WORK

4. SECTION 260523 WIRING FOR MOTORS AND MOTOR CONTROLLERS: Add the accompanying section (pages 260523 – 1 thru 260523– 12) to the Project Manual.

ELECTRICAL WORK

5. DOCUMENT 260523 WIRING FOR MOTORS AND MOTOR CONTROLLERS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 260523 – 1 thru 260523 – 2) noted “Revised 03/02/2016”.

APPENDIX

HVAC WORK

6. DOCUMENT SCHEDULE OF SUBMITTALS (SOS): Discard the document bound in the Project Manual and substitute the accompanying Schedule of Submittals 44947-H document (pages 1 thru 8) noted "Revised 03/02/2016" in page layout.

ELECTRICAL WORK

7. DOCUMENT SCHEDULE OF SUBMITTALS (SOS): Discard the document bound in the Project Manual and substitute the accompanying Schedule of Submittals 44947-E document (pages 1 thru 2) noted "Revised 03/02/2016" in page layout.

END OF ADDENDUM

Margaret F. Larkin
Executive Director
Design and Construction

SECTION 013000

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Other requirements pertaining to payments are included in the General Conditions and in the various sections of the Specifications.
- B. Cost Computations: Section 012200.
- C. Submittals: Section 013300.

1.02 WAIVER OF CERTAIN SUBMITTAL REQUIREMENTS

- A. The Electronic Contractor Payments (ECP) program facilitates electronic submission of payment applications and related documents and information via a secure web-based portal. This portal is hereinafter referred to as the “Vendor Interface”. Hardcopy (paper) submission of the following forms is waived, and the information required by these forms shall be submitted via the Vendor Interface:
 - 1. BDC 169 (Contractor’s Application for Payment form).
 - 2. BDC 187 (Detailed Estimate form).
 - 3. BDC 329 (Contractor’s List of Subcontractors–Suppliers).

1.03 SCHEDULES AND RECORDS

- A. Submit the following information not later than 15 days after approval of the Contract unless the Contractor or the Director determines an earlier submission is required to properly schedule or progress the Work.
 - 1. **CONTRACTOR’S LIST OF SUBCONTRACTORS – SUPPLIERS:** An affirmative review of the subcontractor’s responsibility will be conducted. Any subcontractor disapprovals resulting from negative information derived from the State’s review will result in written notice (by letter or e-mail) to the Contractor. A responsibility meeting may result from these actions. The Contractor will defer to the provisions of Article 6, General Conditions, regarding its responsibility to prosecute the work.
 - a. Submit the **CONTRACTOR’S LIST OF SUBCONTRACTORS – SUPPLIERS** information using the required electronic entry process via the Vendor Interface.
 - b. Indicate the items of Work proposed to be accomplished by subcontractors, the name and address of each proposed subcontractor, the dollar value of the subcontract, and Minority and Women-Owned Business Enterprise (MWBE) information.
 - 1) Attach a properly completed and executed **NEW YORK STATE VENDOR RESPONSIBILITY QUESTIONNAIRE – FOR PROFIT CONSTRUCTION**

(CCA-2) and forward to the Vendor Responsibility Unit for each subcontractor whose subcontract is valued at \$100,000.00 or more unless requested otherwise by the Contracting Officer and/or the Director's Representative.

- 2) As an alternative to submitting a paper version of the form, subcontractors may opt to submit the CCA-2 on-line via the New York State VendRep System. Information on this system and the New York State vendor responsibility requirements is available at: <http://www.osc.state.ny.us/vendrep/index.htm>.

- c. Indicate the names and addresses of proposed suppliers, the dollar value of the supplies, and MWBE information.
- d. Failure in providing this information may result in payments being withheld and referral to the Contracting Officer for a responsibility determination.

- B. If after initial approval, circumstances require a change in a subcontractor or supplier or require additional subcontractors or suppliers to be used, use the Vendor Interface to submit a revised BDC 329 form that reflects the changes or additions.

1.04 DETAILED ESTIMATE

- A. Before making the first requisition for a progress payment, prepare a detailed estimate of quantities and prices for materials, labor and other items required for the Work, which shall aggregate the contract sum.
 1. Submit the DETAILED ESTIMATE information using the required electronic entry process via the Vendor Interface.
- B. The detailed estimate shall be supported by such evidence, including certified copies of subcontracts, as the Director may require.
- C. The detailed estimate must be approved by the Director who may revise it as, in his reasonable judgment, is necessary to make the various items conform to their true values.
 1. The value of each requisition for payment shall be based on the approved detailed estimate.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 013300

SUBMITTALS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Other requirements pertaining to submittals are included in the General Conditions and in the various sections of the Specifications.
- B. Summary of the Work: Section 011000.
- C. Administrative Requirements: Section 013000.
- D. Contract Closeout Submittals: Section 017716.

1.02 DEFINITIONS

- A. Deviation: Changes in products, materials, equipment and methods of construction from those required by the Contract Documents and proposed by the Contractor.
- B. Acceptable Manufacturer, Company or Product: A manufacturer, company or product capable of achieving the requirements established in the Contract Documents and demonstrating compliance.
- C. Portable Document Format (PDF): An open standard file format used for representing documents in a device-independent and display resolution-independent fixed layout document format.

1.03 DEVIATIONS FROM REQUIREMENTS OF THE CONTRACT DOCUMENTS

- A. Deviations from the requirements of the Contract Documents will not be allowed unless a request for deviation is made in writing prior to or at the time of submission and the specific deviation is approved by the Director's Representative subject to the requirements of Article 4 of the General Conditions. The request for deviation shall be made utilizing the CONTRACT DOCUMENT DEVIATION REQUEST FORM (Form BDC 49) accessible from the OGS Web Site.
 - 1. The submission of a deviation shall be done in a timely manner according to the schedule of submittals to allow the Director sufficient time for review.

1.04 "OR EQUAL" TO BRAND NAME PRODUCTS

- A. Whenever a product is specified by brand name, a comparable brand, equal to that named, may be submitted for approval subject to the requirements of Article 5 of the General Conditions.
 - 1. The Contractor shall bear the burden of proving that the proposed product is equal to the specified product. The submission of an “or equal” shall be done in a timely manner to allow the Director sufficient time to review the proposed product.
 - 2. Whenever a color or pattern is indicated by a specific manufacturer’s name or number, the intent is to communicate the required color or pattern of the material. Other manufacturers’ comparable colors or patterns may be submitted for approval as equal.

1.05 WAIVER OF CERTAIN SUBMITTAL REQUIREMENTS

- A. Unless otherwise specified, the requirement to submit product data and samples for approval will be waived for products specified by brand name if the specifically named products are furnished for the Work. In such cases, submit required Product Data to the Director’s Representative via Submittal Exchange® for information only.

1.06 ADMINISTRATIVE REQUIREMENTS

- A. Participate in the OGS’s hosted web-based collaboration service (Submittal Exchange® at www.submittalexchange.com) to transmit and track Contractor provided project related documents.
- B. Identify submittals by project title and number. Include Contractor’s name, date, and revision date. On shop drawings, product data and samples, also include the name of the supplier and subcontractor (if any), and applicable specification section number. Stamp each submittal and initial or sign the stamp to certify review and approval of submittal.
- C. Assemble submittals in accordance with the requirements in the individual sections of the Specifications and as required by this section. It is the Contractor’s responsibility to review and verify that all information required for each submittal is included in the submittal package. Errors or omissions found by the Contractor are to be corrected prior to the submission of the submittal package for approval. Incomplete submittal packages that have been submitted for review and approval will be returned.
 - 1. It is the Contractor’s responsibility to verify that portions of the submittal package to be provided by a subcontractor (or supplier) are complete, as well as portions of the submittal package being provided directly by the Contractor.
 - 2. Do not combine the submittals of more than one specification section with submittals required by other specification sections unless specifically stated in the contract Specifications.
- D. If a submittal is based on, or the result of, a change order or field order to the Contract Documents, include copies of the applicable change order or field order with the submittal.

- E. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each specification section concurrently unless instructions for partial submittals are required in a specific specification section requiring sequential submissions.
 3. Submit action submittals and informational submittals required by the same specification section as separate packages under separate transmittals.
 4. Coordinate transmittals of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. The Director's Representative reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- F. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on uploading the submittal to Submittal Exchange®. No extension of the project schedule will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow time for the initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. The Designer of Record will advise the Director's Representative when a submittal being processed must be delayed for coordination.
 2. Resubmittal Review: Allow time for review of each resubmittal.
 3. Sequential Review: Where sequential review of submittals by the project team is necessary for coordination, allow time for review.

1.07 SUBMITTALS

- A. Schedule of Submittals acknowledgement: Provide written acknowledgement that the Schedule of Submittals has been received and reviewed with Critical Submittals identified and Contractor's Projected Dates (three dates inserted into each column) are entered for each specification item.

1.08 RE-EVALUATION FEE

- A. In accordance with Article 4.7 of the General Conditions, a re-evaluation processing fee will be levied against the Contractor for each re-evaluation of a Submittal or Submittal Package submission that was returned for failure to comply with the submittal requirements relative to completeness, content or format.

1.09 ELECTRONIC SUBMITTALS

- A. Submittal Exchange® is used to provide an on-line database and repository which shall be used to transmit and track project related documents. The intent for using this service is to expedite the construction process by reducing

paperwork, improving information flow, and decreasing submittal review turnaround time.

1. Project submittals (shop drawing, product data and quality assurance submittals) shall be transmitted by the Contractor in PDF to Submittal Exchange®, where it will be tracked and stored for retrieval for review. After the submittal is reviewed it is uploaded back to Submittal Exchange® for action or use by the Contractor and Director's Representatives.
 2. The service also tracks and stores documents related to the project such as RFI's (Request for Information), IB's (Information Bulletins), CAD Coordination, Minutes, Testing, Closeout, and SWPPP documents.
- B. For each submittal, the Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents, including verification of manufacturer/product, dimensions and coordination of information with other parts of the work.
- C. It is the Contractor's responsibility to provide submittals in PDF. The Contractor may use the following options:
1. Subcontractors and suppliers provide electronic submittals in PDF to the Contractor through Submittal Exchange®.
 2. Subcontractors and suppliers provide paper submittals to the Contractor, who electronically scans and converts them to PDF.
 3. Contract a Scanning Service, which will allow the Contractor and the Contractor's subcontractors and suppliers to provide paper submittals to the Scanning Service, which electronically scans and converts them to PDF. It will be the Contractor's responsibility to transmit the scanned submittals to Submittal Exchange®.
- D. Image Quality:
1. Image resolution: The PDF files shall be created at a minimum resolution of 200 dots per inch utilizing the original document size. The Contractor will be responsible to increase the resolution of the scanned file or images being submitted as required to adequately present the information.
 2. Image Color Rendition: When information represented requires color to convey the intent and compliance, provide full color PDF reproduction.
- E. Internet Service and Equipment Requirements:
1. The Contractor will be required to have an Email address and Internet access at Contractor's main office.
 2. Unless the Contractor will exclusively be using a Scanning Service to create PDF documents, the Contractor will be required to own a PDF reviewing, creating and editing software, such as Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu® (www.bluebeam.com), or other similar PDF reviewing, creating and editing software for applying electronic stamps and comments.
- F. Training and Support:

1. Submittal web-based collaboration training and support shall be available, free of charge from Submittal Exchange®, for project participants using the submittals website.
 2. Training schedule will be coordinated through the Director's Representative.
- G. Paper prints (hardcopies) of reviewed submittals:
1. Record Copy: Each Contractor shall provide one paper copy of each submittal they are responsible for to the Director's Representative within 14 days of receipt of a released submittal (i.e. marked "Approved", "Approved As Noted", or other implied acceptance of a submittal), or meeting the requirements of Waiver Of Certain Submittal Requirements Article of this specification section.
 - a. Exception: Paper copies are not required for a submittal that is disapproved or requiring resubmission.
 - b. Paper copies shall be printed in a size format equal to the original document.
 - c. Scaled Shop Drawings shall be printed to the scale noted on the drawings.
 - d. The resolution of the printed copy shall be equal to that of the PDF file that it is being printed from.
 - e. The Record Copy shall be used by the Director's Representative during the construction of the project and shall be retained as a turn-over item to the facility at the end of the project as required under Section 017716 Contract Closeout.
 2. Use for Construction: Retain complete copies of submittals on project site. The Contractor shall not commence work for related activities until the appropriate submittals are approved and the corresponding record copies are delivered to the Director's Representative.
 3. Distribution: The Contractor will furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Maintain transmittal forms indicating distribution of submittals.

1.10 SHOP DRAWINGS

- A. Provide shop drawings in the format required by the Specifications. Show the information, dimensions, connections and other details necessary to insure that the shop drawings accurately interpret the Contract Documents. Show adjoining construction in such detail as required indicating proper connections. Where adjoining connected construction requires shop drawings or product data, submit such information for approval at the same time so that connections can be accurately checked.
- B. Electronic copies of CAD Drawings of the Contract Drawings will not be provided by the Director's Representative for Contractor's use in preparing submittals.

- C. Have shop drawings prepared by a qualified detailer. Shop drawings shall be neatly drawn and clearly legible. Machine duplicated copies of Contract Drawings will not be accepted as shop drawings.
 - 1. Where shop drawings are indicated to be drawn to scale:
 - a. Use scale normally found on an “Architect” or “Engineer” scale.
 - b. Written Scale: Clearly label scales being used on each drawing and/or on each detail on the drawing.
 - 1) Examples: $1/8" = 1'-0"$ $1" = 40'-0"$.
 - c. Graphic Scale: Adjacent to each Written Scale, provide a graphic scale delineating the scale being used. Graphic scale shall be divided into measuring units relating to the accuracy required for the drawing or details.
 - d. Clearly dimension key elements of the drawing or detail.
 - 2. When the drawing sheet is printed full size, the minimum text size shall be 1/8" (3.2 mm) for hand drafting and 3/32" (2.5 mm) for CADD drawings.
- D. Submit the shop drawings through Submittal Exchange®. The shop drawings will be reviewed and the review results will be posted on Submittal Exchange®. Contractor will receive email notice of completed review. If the review results in disposition of “DISAPPROVED” or “RETURNED FOR CORRECTION”, promptly correct the deficiencies and resubmit the shop drawings meeting Contract requirements.

1.11 PRODUCT DATA

- A. Provide product data in the format required by the Specifications. Modify product data by deleting information that is not applicable to the project or by marking the product data to identify pertinent products. Supplement standard information, if necessary, to provide additional information applicable to project.
- B. Submit the product data through Submittal Exchange®. The product data will be reviewed and the review results will be posted on Submittal Exchange®. Contractor will receive email notice of completed review. If the review results in disposition of “DISAPPROVED” or “RETURNED FOR CORRECTION”, promptly correct the deficiencies and resubmit the product data meeting Contract requirements.
- C. Comply with applicable federal and State of New York Right-to-Know Law provisions. Provide Safety Data Sheets (SDS) documents for products that have SDS data prior to use on the project site.
 - 1. Upload and maintain electronic SDS documents on the Submittal Exchange® SDS tab.
 - 2. SDS tab is organized by prime contracts. To be readily identified, name products with SDS by specification section number and product name.
 - 3. Supply and maintain one hard copy of the appropriate SDS on the project site and one hard copy with the Facility’s Right-to-Know Information Officer.

1.12 QUALITY ASSURANCE

- A. Provide quality assurance information in the format required by the Specifications, including supporting documentation as required.
- B. Submit the quality assurance information through Submittal Exchange®. The quality assurance information will be reviewed and the review results will be posted on Submittal Exchange®. Contractor will receive email notice of completed review. If the review results in disposition of “DISAPPROVED” or “RETURNED FOR CORRECTION”, promptly correct the deficiencies and resubmit the quality assurance information meeting Contract requirements.

1.13 SAMPLES

- A. Submit 2 (unless a different number is specified) of each sample required by the Specifications.
- B. Samples will become the property of the State when submitted and will not be incorporated in the Work unless specifically stated otherwise.
- C. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
- D. Record transmittal of each sample required by the Specifications through Submittal Exchange®.
- E. Consult with the Director’s Representative for direction on where Samples will be sent for review.
- F. The sample will be reviewed and the review results will be posted on Submittal Exchange®. Contractor will receive email notice of completed review.

1.14 REVIEW OF SUBMITTALS

- A. Items submitted for review will be reviewed for compliance with the Contract Documents, based upon the information submitted. The items will be acted upon with the following dispositions:
 - 1. Approved:
Where the submittal is marked “Approved”, the work covered by the submittal may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance.
 - 2. Approved as Noted:
Where the submittal is marked “Approved as Noted”, the work covered by the submittal may proceed provided it complies with the review comments noted on the submittal and the Contract Documents. Final acceptance will depend on that compliance.
 - 3. Disapproved:
Where the submittal is marked “Disapproved”, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity for the item submitted. Prepare a new submittal

- according to the review comments noted on the submittal and meeting the Contract Documents.
4. Returned for Correction:
Where the submittal is marked “Returned for Correction”, do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or other activity for the item submitted. Revise or prepare a new submittal according to the review comments noted on the submittal and meeting the Contract Documents.
 5. Acknowledged:
Where the submittal is marked “Acknowledged”, receipt of the submittal is acknowledged and has been recorded.
 6. No Action:
Where the submittal is marked “No Action” or “No Action Taken”, no review was made of this item, see comments noted on submittal and take appropriate action.
 7. Multi-Action:
Where the submittal is marked “Multi-Action”, separate dispositions were made for the items submitted, see the review comments for the disposition of each item submitted.

1.15 SCHEDULES AND RECORDS

- A. Submit the following Schedules and Records information not later than 15 days after approval of the Contract unless the Contractor or the Director determines an earlier submission is required to properly schedule or progress the Work.
 1. SCHEDULE OF SUBMITTALS (S.O.S.):
 - a. Follow the Instructions to the Contractor in the S.O.S (cover page of the Microsoft Excel form supplied by the State).
 - b. Confirm submittal items listed and indicate in the spaces following each item, the date the item will be submitted (Projected Transmittal Date).
 - c. Confirm critical submittals and long lead items identified by the Architect / Engineer. Identify and mark with “X” additional submittals deemed as critical or having long lead times. In addition to the date each item will be submitted, include the date approval is required (allow at least 3 weeks), and the date delivery of the material or equipment is necessary for timely completion of the Work in accordance with the Project Schedule.
 - d. Notify the Director’s Representative of modifications and/or additional submittals necessary for the project prior to requesting revisions with Submittal Exchange®.
 2. SUBMITTALS WEBSITE LOG:
 - a. The submittal website log will be populated by Submittal Exchange® by means of the S.O.S.
 - b. Review the log and verify that all long lead items and critical submittals are properly indicated according to the latest version of the S.O.S. For each item to be submitted indicate the following:
 - i. In the “Date Expected” column insert the date the item will be submitted for review and approval (this is the same date as the S.O.S “Projected Transmittal Date”).

- ii. In the “Date Requested on Site” column insert the date the item will be delivered to the project site (this is the same date as the S.O.S “Projected Delivery Date”).
- c. The submission date that is entered shall provide sufficient time for the item to be reviewed, ordered, delivered and installed for timely completion of the Work in accordance with the Project Schedule. The date entered for submittal of each item is the last day a deviation will be considered.

1.16 TRANSMITTALS

- A. Submittal Transmittal (Form BDC 42) accessible from the OGS Web Site:
 - 1. Furnish separate Form BDC 42 for each submitted item sent to Submittal Exchange® for review.
 - a. Contractor may utilize their own Transmittal Form (or Transmittal Letter) in lieu of utilizing the Form BDC 42, contingent upon the Contractor’s Transmittal Form including all information and certifications required by Form BDC 42.
 - 2. Clearly identify applicable specification section number of submitted item (product data, shop drawing, submittal number, etc.) on the Form BDC 42.
- B. All Contracts:
 - 1. Transmit items designated in the Schedule of Submittals (and project Specifications) to the Submittal Exchange®.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 260523

WIRING FOR MOTORS AND MOTOR CONTROLLERS

PART 1 GENERAL

1.01 REFERENCES

- A. NEMA, ANSI, and UL.

1.02 SUBMITTALS

- A. Shop Drawings: Complete wiring diagrams of all power and control connections (Standard diagrams will not be accepted).
- B. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS FOR CONTROL WIRING

- A. Raceways, Fittings and Accessories:
 - 1. Rigid Ferrous Metal Conduit: Steel, hot dipped galvanized on the outside and inside, UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit - Steel or Rigid Steel Conduit), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
 - 2. Intermediate Ferrous Metal Conduit: Steel, galvanized on the outside and enameled on the inside, UL categorized as Intermediate Ferrous Metal Conduit (identified on UL Listing Mark as Intermediate Metal Conduit or IMC), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
 - 3. Electrical Metallic Tubing: Steel, galvanized on the outside and enameled on the inside, UL categorized as Electrical Metallic Tubing (identified on UL Listing Mark as Electrical Metallic Tubing), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
 - 4. Flexible Metal Conduit: Galvanized steel strip shaped into interlocking convolutions, UL categorized as Flexible Metal Conduit (identified on UL Listing Mark as Flexible Steel Conduit or Flexible Steel Conduit Type RW), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or International Metal Hose Co.
 - 5. Liquid-tight Flexible Metal Conduit: UL categorized as liquid-tight flexible metal conduit (identified on UL Listing Mark as Liquid-Tight Flexible Metal Conduit, also specifically marked with temperature and environment application data), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or Universal Metal Hose Co.

6. Insulated Bushings, Plastic Bushings, Insulated Grounding Bushings: By Appleton Electric Co., Cooper/Crouse-Hinds, OZ/Gedney Co., or Thomas & Betts Corp.
7. Connectors and Couplings:
 - a. Locknuts: UL, steel/zinc electroplate; Appleton Electric Co.'s BL-50 Series, Cooper/Crouse-Hinds' 11 Series, OZ/Gedney Co.'s 1-50S Series, Raco Inc.'s 1002 Series, Steel City/T&B Corp.'s LN-101 Series, or Thomas & Betts Corp.'s 141 Series.
 - b. Couplings (For Rigid Metal and IMC Conduit): Standard galvanized threaded couplings as furnished by conduit manufacturer, Allied Tube & Conduit Corp.'s Kwik-Couple, or Thomas & Betts Corp.'s Shamrock.
 - c. Three Piece Conduit Coupling (For Rigid Metal and IMC Conduit): Steel, malleable iron, zinc electroplate; Allied Tube & Conduit Corp.'s Kwik-Couple, Appleton Electric Co.'s EC-50 Series, Cooper/Crouse-Hinds' 190M Series, OZ/Gedney Co.'s 4-50 Series, Raco Inc.'s 1502 Series, Steel City/T & B Corp.'s EK-401 Series, or Thomas & Betts Corp.'s 675 Series.
 - d. Electrical Metallic Tubing Couplings and Insulated Connectors: Compression type, steel/zinc electroplate; Appleton Electric Co.'s TW-50CS1, TWC-50CS Series, Cooper/Crouse-Hinds' 1650, 660S Series, Raco Inc.'s 2912, 2922 Series, Steel City/T & B Corp.'s TC-711 Series, or Thomas & Betts Corp.'s 5120, 5123 Series.
 - e. Flexible Metal Conduit Connectors: Arlington Industries Inc.'s Saddle-Grip, OZ/Gedney Co.'s C-8T, 24-34T, ACV-50T Series, or Thomas & Betts Corp.'s Nylon Insulated Tite-Bite Series.
 - f. Liquid-tight Flexible Metal Conduit Connectors:
 - 1) Dry, Damp Locations: Steel, malleable iron, zinc electroplate, insulated throat; Appleton Electric Co.'s STB Series, Cooper/Crouse-Hinds' LTB Series, OZ/Gedney Co.'s 4Q-50T Series, Raco Inc.'s 3512 Series, Steel City/T & B Corp.'s LT-701 Series, or Thomas & Betts Corp.'s 5332 Series.
 - 2) Wet Locations: OZ/Gedney Co.'s 4Q-TG Series (hot-dip/mechanically galvanized), or Thomas & Betts Corp.'s 3322 Series (PVC coated).
8. Conduit Bodies (Threaded):
 - a. Dry, Damp Locations: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, OZ/Gedney Co.'s Conduit Bodies, or Thomas & Betts Corp.'s Conduit Bodies.
 - b. Wet Locations: Malleable iron or cast iron alloy bodies and covers with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds' Condulets (Corro-free epoxy powder coat), Thomas & Betts Corp.'s Conduit Bodies (hot dipped galvanized), or OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized). Stainless steel cover screws, covers gasketed to suit application.

9. Sealant for Raceways Exposed to Different Temperatures: Sealing compounds and accessories to suit installation; Appleton Electric Co.'s DUC, or Kwiko Sealing Compound with fiber filler, Cooper/Crouse-Hinds' Chico A Sealing Compound with Chico X fiber, Electrical Products Division 3M Scotch products, OZ Gedney Co.'s DUX or EYC sealing compound with EYF damming fiber, or Thomas & Betts Corp.'s Blackburn DX.
 10. Vertical Conductor Supports:
 - a. Dry, Damp Locations: Kellems/Hubbell Inc.'s Conduit Riser Grips, or OZ/Gedney Co.'s Type M, Type R.
 - b. Wet Locations: Kellems/Hubbell Inc.'s Conduit Riser Grips (stainless steel or tin coated bronze), or OZ/Gedney Co.'s hot dipped galvanized finish Type CMT or Type W.
- B. Outlet/Device, Junction and Pull Boxes:
1. Galvanized Steel Boxes for Concealed Work: Standard galvanized steel boxes and device covers by Appleton Electric Co., Beck Mfg./Picoma Industries, Cooper/Crouse-Hinds, Racor/Div. of Hubbell, or Steel City/T & B Corp.
 2. Galvanized Steel Junction and Pull boxes for Exposed Work: Code gage, galvanized steel screw cover boxes by Delta Metal Products Inc., Hoffman Enclosures Inc., Hubbell Wiegmann, Lee Products Co., or Rittal/Electromate.
 3. Threaded Type Boxes for Exposed Work:
 - a. Outlet Boxes:
 - 1) For Dry, Damp Locations: Zinc electroplate malleable iron or cast iron alloy boxes by Appleton Electric Co., Cooper/Crouse-Hinds Co., OZ/ Gedney Co., or Thomas & Betts Corp. with zinc electroplate steel covers to suit application.
 - 2) For Wet Locations: Malleable iron or cast iron alloy boxes with hot dipped galvanized or other specified corrosion resistant finish as produced by Cooper/Crouse-Hinds (hot dipped galvanized or Corro-free epoxy powder coat), OZ/Gedney Co. (hot dipped galvanized), or Thomas & Betts Corp. (hot dipped galvanized) with stainless steel cover screws, and malleable iron covers gasketed to suit application.
 - b. Junction And Pull Boxes:
 - 1) For Dry, Damp Locations: Zinc electroplate cast iron boxes by Appleton Electric Co., Cooper/Crouse-Hinds, OZ/Gedney Co., or Thomas & Betts Corp. with zinc electroplate steel or cast iron cover.
 - 2) For Wet Locations: Cast iron boxes by Cooper/Crouse-Hinds' (hot dipped galvanized or Corro-free epoxy powder coat), OZ/Gedney Co. (hot dipped galvanized), or Thomas & Betts Corp. (hot dipped galvanized) with stainless steel cover screws and cast iron cover gasketed to suit application.

- c. Conduit Bodies, Threaded (Provided with a Volume Marking):
 - 1) For Dry, Damp Location: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, OZ/Gedney Co.'s Conduit Bodies, or Thomas & Betts Corp.'s Conduit Bodies.
 - 2) For Wet Locations: Malleable iron or cast iron alloy bodies with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds' Condulets (hot dipped galvanized or Corro-free epoxy power coat), OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized), or Thomas & Betts Corp.'s Conduit Bodies (hot dipped galvanized) with stainless steel cover screws and malleable iron covers gasketed to suit application.
 - 4. Specific Purpose Outlet Boxes: As fabricated by manufacturers for mounting their equipment.
 - 5. For Fire Rated Construction:
 - a. Parameters For Use of Listed Metallic Boxes: UL Electrical Construction Equipment Directory - Metallic Outlet Boxes (QCIT).
 - b. Wall Opening Protective Materials: As listed in UL Fire Resistance Directory - Wall Opening Protective Materials (CLIV), or UL Electrical Construction Equipment Directory - Wall Opening Protective Materials (QCSN).
- C. Conductors and Accessories:
 - 1. Date of Manufacture: No insulated conductor over one year old when delivered to the site will be acceptable.
 - 2. Conductors: Annealed uncoated copper or annealed coated copper in conformance with the applicable standards for the type of insulation to be applied on the conductor.
 - 3. Class 1 Wiring:
 - a. No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, NFPA 70 types KF-2, KFF-2, PAFF, PF, PFF, PGF, PGFF, PTFE, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF.
 - b. Larger than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with NFPA 70 Article 310.
 - c. Conductor with other types and thickness of insulation may be used if listed for Class 1 circuit use.
 - 4. Class 2 Wiring:
 - a. Multiconductor Cables: NFPA 70 Article 725, Types CL2P, CL2R, CL2.
 - b. Other types of cables may be used in accordance with NFPA 70 Table 725-61 "Cable Uses and Permitted Substitutions", as approved.

5. Class 3 Wiring:
 - a. Single Conductors No. 18 and No. 16 AWG: Same as Class 1 No. 18 and No. 16 AWG conductors, except that:
 - 1) Conductors are also listed as CL3.
 - 2) Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings.
 - b. Multiconductor Cables: NFPA 70 Article 725, Types CL3P, CL3R, CL3.
 - c. Other types of cables may be used in accordance with NFPA 70, Table 725-61 "Cable Uses and Permitted Substitutions", as approved.
6. Connectors:
 - a. General: Connectors specified are part of a system. Furnish connectors and components, and use specific tools and methods as recommended by connector manufacturer to form complete connector system.
 - b. Splices:
 - 1) Spring Type:
 - a) Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s B-Cap, Electrical Products Div./3M's Scotchlok Type Y, R, G, B, O/B+, R/Y+, or B/G+, or Ideal Industries Inc.'s Wing Nuts or Wire Nuts.
 - b) Rated 150° C, 600V; Ideal Industries Inc.'s High Temperature Wire-Nut Model 73B, 59B.
 - 2) Indent Type with Insulating Jacket:
 - a) Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s Crimp Connectors, Ideal Industries Inc.'s Crimp Connectors, Penn-Union Corp.'s Penn-Crimps, or Thomas & Betts Corp.'s STA-KON.
 - 3) Indent Type (Uninsulated): Anderson/Hubbell's Versa-Crimp, VERSAtile, Blackburn/T&B Corp.'s Color-Coded Compression Connectors, Electrical Products Div./3M's Scotchlok 10000, 11000 Series, Framatome Connectors/Burndy's Hydent, Penn-Union Corp.'s BCU, BBCU Series, or Thomas & Betts Corp.'s Compression Connectors.
 - 4) Connector Blocks: NIS Industries Inc.'s Polaris System, or Thomas & Betts Corp.'s Blackburn AMT Series.
 - 5) Resin Splice Kits: Electrical Products Div./3M's Scotchcast Brand Kit Nos. 82A Series, 82-B1 or 90-B1, or Scotchcast Brand Resin Pressure Splicing Method.
 - 6) Heat Shrinkable Splices: Electrical Products Div./3M's ITCSN, Raychem Corp.'s Thermofit Type WCS, or Thomas & Betts Corp.'s SHRINK-KON Insulators.
 - 7) Cold Shrink Splices: Electrical Products Div./3M's 8420 Series.

7. Terminals: Nylon insulated pressure terminal connectors by Amp-Tyco/Electronics, Electrical Products Div./3M, Framatome Connectors/Burndy, Ideal Industries Inc., Panduit Corp., Penn-Union Corp., Thomas & Betts Corp., or Wiremold Co.
 8. Insulation Tapes:
 - a. Plastic Tape: Electrical Products Div./3M's Scotch Super 33+ or Scotch 88, Plymouth Rubber Co.'s Plymouth/ Bishop Premium 85CW.
 - b. Rubber Tape: Electrical Products Div./3M's Scotch 130C, or Plymouth Rubber Co.'s Plymouth/Bishop W963 Plysafe.
 9. Moisture Sealing Tape: Electrical Products Div./3M's Scotch 2200 or 2210, or Plymouth Rubber Co.'s Plymouth/Bishop 4000 Plyseal-V.
 10. Wire Management Products: Cable clamps and clips, cable ties, spiral wraps, etc., by Catamount/T&B Corp., or Ideal Industries Inc.
- D. Supporting Devices:
1. "C" Beam Clamps:
 - a. For 1 Inch Conduit Maximum: B-Line Systems Inc.'s BG-8-C2 and BP-8-C1 Series, or Caddy Fastener Div./Erico Products Inc.'s BC-8P and BC-8PSM Series.
 - b. For 3 Inch Conduit Maximum: Appleton Electric Co.'s BH-500 Series beam clamp with H50W/B Series hangers, Kindorf/T&B Corp.'s 500 Series beam clamp with 6H0-B Series hanger, or OZ/Gedney Co.'s IS-500 Series beam clamp with H-OWB Series hanger.
 - c. For 1/4 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy Fastener Div./Erico Products Inc.'s BC, Kindorf/T&B Corp.'s 500-SC, 510, or Unistrut Corp.'s P1648S, P2398S, P2675, P2676.
 - d. For 3/8 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy Fastener Div./Erico Products Inc.'s BC, Kindorf/T&B Corp.'s E231-3/8, 502, or Unistrut Corp.'s P1649AS, P2401S, P2675, P2676.
 2. Pipe Straps: Two hole steel conduit straps; Kindorf/T&B Corp.'s C-144 Series.
 3. Pipe Clamps: One hole malleable iron clamps; Kindorf/T&B Corp.'s HS-400 Series, or OZ/ Gedney Co.'s 14-50 Series.
 4. Supporting Fastener (Metal Stud Construction): Metal stud supports, clips and accessories as produced by Caddy Fastener Div./Erico Products Inc.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

- A. Power Wiring: As specified in other Electrical Sections.

- B. Control Wiring: Provide control wiring and connections.
 - 1. Where control circuit interlocking is required between individually mounted motor controllers, provide a single pole on-off switch in a threaded type box mounted adjacent to motor safety switches which are remote from the control transformer (to enable interlock circuit to be opened when the motor safety switch is opened).

3.02 RACEWAY INSTALLATION

- A. Conduit Installed Concealed:
 - 1. Install conduit concealed unless otherwise indicated on the drawings.
 - 2. Existing Construction:
 - a. Run conduit in existing chases and hung ceilings.
 - b. If conduit cannot be installed concealed due to conditions encountered in the building, report such conditions and await approval in writing before proceeding.
- B. Conduits Penetrating Concrete Floor Slabs (Concrete slabs that are both ceilings and floors shall be treated as floor slabs):
 - 1. Provide a minimum of 2 inches between conduits that vertically penetrate elevated concrete slabs.
 - 2. Provide firestopping and spray on fireproofing at locations where conduits penetrate surface of floor slab and slab is part of fire rating required for construction.
- C. Conduit Installed Exposed:
 - 1. Install conduit exposed where indicated on the drawings. If not indicated, conduit may be installed exposed, as approved, in:
 - a. Unfinished spaces and finished spaces housing mechanical or electrical equipment that is generally accessible only to facility maintenance personnel.
 - b. Areas where existing conduits have been installed exposed.
 - c. Areas where conduit cannot be installed concealed.
 - 2. Install conduit tight to the surface of the building construction.
 - Exceptions:
 - a. Where otherwise indicated or directed.
 - b. Where conduit is exposed in wet locations. Install entire wiring system including conduit, boxes, and fittings so that there is 1/4 inch air space between it and the wall or supporting surface.
 - 3. Install vertical runs perpendicular to the floor.
 - 4. Install runs on the ceiling perpendicular or parallel to the walls.
 - 5. Install horizontal runs parallel to the floor.
 - 6. Do not run conduits near heating pipes.
 - 7. Installation of conduit directly on the floor will not be permitted.
- D. Conduit Size: Not smaller than 1/2 inch electrical trade size.

- E. Raceways Exposed to Different Temperatures: Where portions of an interior raceway system are exposed to widely different temperatures, seal interior and exterior of raceway to prevent circulation of air from a warmer to a colder section through the raceway installation.
1. Refrigerated Rooms: Install conduit body or junction box in the raceway system on warm side of refrigerated room. After conductors are installed, seal interior of the raceway at the conduit body or junction box.
 2. Heated Areas to Unheated Areas: After conductors are installed, seal interior of the raceway at the nearest conduit body, outlet or junction box in the heated area adjoining the unheated area.

F. Raceway Schedule:

1. Rigid Ferrous Metal Conduit: Install in all locations unless otherwise specified or indicated on the drawings.
2. Intermediate Metal Conduit: May be installed in all dry and damp locations except:
 - a. Hazardous areas.
 - b. Where other type raceways are specified or indicated on the drawings.
3. Electrical Metallic Tubing:
 - a. May be installed concealed above suspended ceilings where conduit does not support equipment.
 - b. May be installed concealed in hollow areas in dry locations, including:
 - 1) Hollow concrete masonry units, except where cores are to be filled.
 - 2) Drywall construction with sheet metal studs, except where studs are less than 3-1/2 inches deep.
 - c. May be installed exposed as branch circuit conduits in dry non-hazardous locations at elevations over 10'-0" above finished floor where conduit does not support equipment.
4. Flexible Metal Conduit: Install equipment grounding conductor in the flexible metal conduit and bond at each box or equipment to which conduit is connected:
 - a. Use 1 to 3 feet of flexible metal conduit for final conduit connection to:
 - 1) Equipment subject to vibration (dry locations).
 - 2) Equipment requiring flexible connection for adjustment or alignment (dry locations).
 - b. Use above existing non-removable suspended ceilings where rigid type raceways cannot be installed due to inaccessibility of space above ceiling.
 - c. May be installed concealed in drywall construction with sheet metal studs, except where studs are less than 3-1/2 inches deep.
5. Liquid-tight Flexible Metal Conduit: Use 1 to 3 feet of liquid-tight flexible metal conduit (UL listed and marked suitable for the installation's temperature and environmental conditions) for final conduit connection to:
 - a. Equipment subject to vibration (damp and wet locations).
 - b. Equipment requiring flexible connection for adjustment or alignment (damp and wet locations).

- G. Fittings and Accessories Schedule:
1. General:
 - a. Use fittings and accessories that have a temperature rating equal to, or higher than the temperature rating of the conductors to be installed within the raceway.
 - b. Use zinc electroplate or hot dipped galvanized steel/malleable iron or cast iron alloy fittings and accessories in conjunction with ferrous raceways in dry and damp locations unless otherwise specified or indicated on the drawings.
 - c. Use malleable iron or cast iron alloy fittings and accessories having hot dipped/mechanically galvanized finish or other specified corrosion resistant finish in conjunction with ferrous raceways in wet locations unless otherwise specified or indicated on the drawings.
 - d. Use caps or plugs to seal ends of conduits until wiring is installed (to exclude foreign material).
 - e. Use insulated grounding bushings on the ends of conduits that are not directly connected to the enclosure (such as stub-ups under equipment, etc.) and bond between bushings and enclosure with equipment grounding conductor.
 - f. Use expansion fittings where raceways cross expansion joints.
 - g. Use deflection fittings where raceways cross expansion joints that move in more than one plane.
 - h. Use 2 locknuts and an insulated bushing on end of each conduit entering sheet metal cabinet or box in dry or damp locations.
 - 1) Plastic bushings may be used on 1/2 and 3/4 inch conduit in lieu of insulated bushing.
 - 2) Terminate conduit ends within cabinet/box at the same level.
 - i. Use watertight hub on end of each conduit entering cabinets or boxes (in wet locations) that are not constructed with integral threaded hubs.
 2. For Rigid and Intermediate Metal Conduit: Use threaded fittings and accessories. Use 3 piece conduit coupling where neither piece of conduit can be rotated.
 3. For Electrical Metallic Tubing: Use compression type connectors and couplings.
 4. For Flexible Metal Conduit: Use flexible metal conduit connectors.
 5. For Liquid-tight Flexible Metal Conduit: Use liquid-tight connectors.

3.03 OUTLET, JUNCTION AND PULLBOX INSTALLATION

- A. Boxes For Concealed Conduit System:
1. Non-Fire Rated Construction:
 - a. Depth: To suit job conditions and comply with NFPA 70 Article 370.
 - b. For Junction and Pull Boxes: Use galvanized steel boxes with flush covers.

- c. For Devices:
 - 1) Plaster or Cast-In-Place Concrete Walls: Use 4 inch or 4-11/16 inch galvanized steel boxes with device covers.
 - 2) Walls Other Than Plaster or Cast-In-Place Concrete: Use type of galvanized steel box that will allow device to cover the opening made for the installation of the box.
 - 2. Recessed Boxes in Fire Rated (2 hour maximum) Bearing and Nonbearing Wood or Steel Stud Walls (Gypsum Wallboard Facings):
 - a. Use listed single and double gang metallic device boxes. The surface area of individual device box shall not exceed 16 square inches.
 - b. The aggregate surface area of the boxes shall not exceed 100 square inches per 100 square feet of wall surface.
 - c. Securely fasten boxes to the studs. Verify that the opening in the wallboard facing is cut so that the clearance between the box and the wallboard does not exceed 1/8 inch.
 - d. Separate boxes located on opposite sides of walls or partitions by a minimum horizontal distance of 24 inches. This minimum separation distance may be reduced when wall opening protective materials are installed according to the requirements of their classification.
 - e. Use wall opening protective material in conjunction with boxes installed on opposite sides of walls or partitions of staggered stud construction in accordance with the classification requirements for the protective material.
 - 3. Other Fire Rated Construction: Use materials and methods to comply with the listing requirements for the classified construction.
- B. Boxes For Exposed Conduit System:
- 1. Dry and Damp Locations: Use zinc electroplate or hot dipped galvanized threaded type malleable iron or cast iron alloy outlet, junction, and pullboxes or conduit bodies provided with a volume marking in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
 - a. Galvanized steel boxes may be used in conjunction with conduit sizes over 1 inch in non-hazardous dry and damp locations.
 - b. Galvanized steel boxes may be used in conjunction with electrical metallic tubing where it is installed exposed as branch circuit conduits at elevations over 10'-0" above finished floor.
 - 2. Wet Locations: Use threaded type malleable iron or cast iron alloy outlet junction, and pullboxes or conduit bodies (provided with a volume marking) with hot dipped galvanized or other specified corrosion resistant coating in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
 - 3. Finishing Collar or Combination Finishing Collar/Outlet Box (Surface Mounted Equipment Used With Exposed Raceway):
 - a. Use finishing collar where surface mounted equipment is installed on an exposed raceway outlet box and the equipment base is larger than the outlet box.

- b. Use combination finishing collar/outlet box where surface mounted equipment is not indicated to be installed on an exposed raceway outlet box, but raceway cannot be run directly into equipment body due to equipment design.
- C. Specific Purpose Outlet Boxes: Use to mount equipment when available and suitable for job conditions. Unless otherwise specified, use threaded type boxes with finish as specified for exposed conduit system, steel (painted) for surface metal raceway system and galvanized steel for recessed installations.

3.04 CONDUCTOR INSTALLATION

- A. Install conductors in raceways.
- B. Conductor Size: Install conductors of size shown on drawings. Where size is not indicated for control wiring, the minimum size allowed is:
 - 1. For Class 1 Circuits:
 - a. No. 18 and No. 16 AWG may be used provided they supply loads that do not exceed 6 amps (No. 18 AWG), or 8 amps (No. 16 AWG).
 - b. Larger than No. 16 AWG: Use to supply loads not greater than the ampacities given in NFPA 70 Section 310-15.
 - 2. For Class 2 Circuits: Any size to suit application.
 - 3. For Class 3 Circuits: No. 18 AWG.
- C. Color Code for Control Circuits: In accordance with ICEA/NEMA WC-30 "Color Coding of Wires and Cables". Other coding methods may be used, as approved.
- D. Wire Management: Use wire management products to bundle, route, and support wiring in junction boxes, pullboxes, wireways, gutters, channels, and other locations where wiring is accessible.
- E. Insulated Conductor Schedule:
 - 1. Class 1 Circuits: Use Class 1 wiring specified in Part 2 (except where special type insulation is required).
 - 2. Class 2 Circuits: Use Class 2 wiring specified in Part 2 (except where special type insulation is required).
 - 3. Class 3 Circuits: Use Class 3 wiring specified in Part 2 (except where special type insulation is required).
- F. Connector Schedule:
 - 1. Splices:
 - a. Dry Locations: For Conductors No. 8 AWG or Smaller: Use spring type pressure connectors, indent type pressure connectors with insulating jackets, or connector blocks (except where special type splices are required).
 - b. Damp Locations: As specified for dry locations, except apply moisture sealing tape over the entire insulated connection (moisture sealing tape not required if heat shrinkable splices or cold shrink splices are used).

- c. Wet Locations: Use uninsulated indent type pressure connectors and insulate with resin splice kits, cold shrink splices or heat shrinkable splices. Exception: Splices above ground which are totally enclosed and protected in NEMA 3R, 4, 4X enclosures may be spliced as specified for damp locations.
- 2. Terminations:
 - a. For Conductors No. 10 AWG or Smaller: Use terminals for connecting control wiring to terminal strips, and to equipment designed for use with terminals.

3.05 SUPPORTING DEVICE INSTALLATION

- A. Attachment of Conduit System:
 - 1. Wood Construction: Attach conduit to wood construction by means of pipe straps or pipe clamps and wood screws or lag bolts.
 - 2. Masonry Construction: Attach conduit to masonry construction by means of pipe straps or pipe clamps and masonry anchorage devices.
 - 3. Steel Beams: Attach conduit to steel beams by means of "C" beam clamps and hangers.
 - 4. Conduit Above Suspended Ceiling: Do not rest conduit directly on runner bars, T-bars, etc. Support conduit from ceiling supports or from construction above suspended ceiling.
- B. Metal Stud Construction: Attach raceways and boxes to metal studs by means of supporting fasteners manufactured specifically for the purpose.
 - 1. Support and attach outlet boxes so that they cannot torque/twist. Either:
 - a. Use bar hanger assembly, or:
 - b. In addition to attachment to the stud, also provide far side box support.

END OF SECTION

SECTION 260523

WIRING FOR MOTORS AND MOTOR CONTROLLERS

PART 1 GENERAL

1.01 PRODUCTS INSTALLED BUT FURNISHED BY OTHERS

- A. The following items will be furnished under related contracts for installation, and connection to power wiring.
 - 1. Motor controllers for all Contracts.
 - 2. Line voltage thermostats for HVAC Work Contract.

1.02 SUBMITTALS

- A. Not Required. (Related contractors will deliver 2 copies of approved wiring diagrams required for power wiring and connections under the Electrical Work Contract).

PART 2 PRODUCTS

2.01 POWER WIRING

- A. Materials: As specified in other Electrical Sections.

2.02 NAMEPLATES

- A. General: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
 - 1. Phenolic: Two color laminated engravers stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
 - 2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
 - 3. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Power Wiring: Provide power wiring and connections for equipment installed under related contracts. Exception:
 - 1. Where a power source has been provided under this Contract and it is indicated that a related trade contractor is required to provide the power wiring from the power source to the equipment.

- B. Control Equipment: Set and connect the items to power wiring, listed under 1.01
- PRODUCTS INSTALLED BUT FURNISHED BY OTHERS.
- C. Control Wiring: Not included in Electrical Work Contract. (Provided by related contractors).
- D. Nameplates: Identify each motor controller, indicating motor controlled:
 - 1. NEMA 1 Enclosures: Rivet or bolt nameplate to the cover.
 - 2. NEMA 12 Enclosures: Rivet or bolt and gasket nameplate to the cover.
 - 3. NEMA 3R, 4, 4X, 7, 9 Enclosures: Attach nameplates to the cover using adhesive specifically designed for the purpose, or mount nameplate on wall or other conspicuous location adjacent to switch. Do not penetrate enclosure with fasteners.

END OF SECTION



SCHEDULE OF SUBMITTALS								
PROJECT NO.: 44947-E								
SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
007213			GENERAL CONDITIONS					
007213		PD	ARTICLE 6: Designate in writing competent supervision and/or management representatives as required - include contact number in case of an emergency after work hours, including weekends and holidays (see 011000 Summary of Work)	F				
007213		PD	ARTICLE 8: Permits and licenses	F				
013113			PROJECT SCHEDULE					
013113		QCS	CMU-01 Agreement Form	S	X			
013300			SUBMITTALS					
013300		PD	Schedule of Submittals (This form completed and edited)	F	X			
013300		QCS	Proof of Payment	F	X			
013300		QCS	Submittal Coordinator Qualifications	F/O	X			
017716			CONTRACT CLOSEOUT					
017716		CCS	Project Record Documents	F				
017716		CCS	Operation and maintenance, 2 copies	F				
017716		CCS	Warranties	F				
017716		CCS	Spare Parts and Maintenance Materials	F				
018119			CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT					
018119		PD	A copy of the Construction IAQ Management Plan and the Sequence Installation Plan, as defined in CONSTRUCTION IAQ MANAGEMENT PLAN Article	F				
018119		PD	Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets shall be submitted with the Contactor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the project	F				
018119		PD	Provide the Director's Representative with a minimum of 18 photographs comprising of at least six photographs taken on three different occasions during construction.	F				
260501			BASIC ELECTRICAL MATERIALS AND METHODS					
260251		PD	Rigid Ferrous Metal Conduit	F/O,D				
260501		PD	Intermediate Ferrous Metal Conduit	F/O,D				

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-E

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
260501		PD	Electrical Metallic Tubing	F/O,D				
260501		PD	Flexible Metal Conduit	F/O,D				
260501		PD	Connectors and Couplings	F/O,D				
260501		PD	Conduit Bodies (Threaded)	F/O,D				
260501		PD	Expansion Fittings	F/O,D				
260501		PD	Deflection Fittings	F/O,D				
260501		PD	Sealing Fittings	F/O,D				
260501		PD	Sealant for Raceways Exposed to Different Temperatures	F/O,D				
260501		PD	Vertical Conductor Supports	F/O,D				
260501		PD	Galvanized Steel Outlet Boxes	F/O,D				
260501		PD	Galvanized Steel Junction and Pull Boxes	F/O,D				
260501		PD	Threaded Type Boxes	F/O,D				
260501		PD	Specific Purpose Outlet Boxes	F/O,D				
260501		PD	Outlet Boxes and Related Products for Fire Rated Construction:	F/O,D				
260501		PD	Conductors and Accessories	F/O,D				
260501		PD	Wiring Devices	F/O,D				
260501		PD	Supporting Devices	F/O,D				
260501		PD	Safety Switches (Single Throw)	F/O,D				
260501		PD	Grounding and Bonding	F/O,D				
260501		PD	Nameplates and Tags	F/O,D				
260519			WIRING, GENERAL - 600 VOLTS AND UNDER					
260519		SD	For Electrical Circuit Protective Systems: Show proposed routes and installation details (include UL classification data, listing, and system number)	F/O,D				
260519		PD	Insulated Conductors and Cables	F/O,D				
260532			INTERIOR RACEWAYS, FITTINGS, AND ACCESSORIES					
260532		CCS	Spare Parts: Touch up coating compound for plastic coated rigid metal conduit (one spray type can and one non-spray can with brush top)	F				
260534			OUTLET, JUNCTION, AND PULL BOXES					
260534		PD	Galvanized Steel Outlet Boxes	F/O,D				
260534		PD	Galvanized Steel Junctions and Pull Boxes	F/O,D				
260534		PD	Threaded Type Boxes	F/O,D				
262812			SAFETY SWITCHES					
262812		PD	SAFETY SWITCHES (SINGLE THROW) - NEMA 1, 3R, 4 (Stainless Steel), 12	F/O,D				
262812		PD	Nameplates	F/O,D				



SCHEDULE OF SUBMITTALS								
PROJECT NO.: 44947-H								
SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
007213			GENERAL CONDITIONS					
007213		PD	ARTICLE 6: Designate in writing competent supervision and/or management representatives as required - include contact number in case of an emergency after work hours, including weekends and holidays (see 011000 Summary of Work)	F				
007213		PD	ARTICLE 8: Permits and licenses	F				
013113			PROJECT SCHEDULE					
013113		QCS	CMU-01 Agreement Form	S	X			
013300			SUBMITTALS					
013300		PD	Schedule of Submittals (This form completed and edited)	F	X			
013300		QCS	Proof of Payment	F	X			
013300		QCS	Submittal Coordinator Qualifications	F/O	X			
018119			CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT					
018119		PD	A copy of the Construction IAQ Management Plan and the Sequence Installation Plan, as defined in CONSTRUCTION IAQ MANAGEMENT PLAN Article	F				
018119		PD	Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets shall be submitted with the Contactor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the project	F				
018119		PD	Provide the Director's Representative with a minimum of 18 photographs comprising of at least six photographs taken on three different occasions during construction.	F				
023313			UNDERGROUND UTILITY LOCATOR SERVICE					
023313		PD	Submit detailed experience and qualifications description of underground utility locator service	F/O,D	X			
023313		CCS	At conclusion of project, provide 3 sets of paper and 1 electronic plans documenting all utilities located and identified.	F	X			
055000			METAL FABRICATIONS (Broadscope)					
055000		SD	Application to Project: Locate anchor bolts required for installation in other Work	F/O,D	X			

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
				F/O				
				D				
				S				
055000		SD	Application to Project: Indicate shop and field welds by standard AWS welding symbols in accordance with AWS A2.4.	F/O,D	X			
055000		SD	Application to Project: Floor Grating	F/O,D	X			
055000		PD	Fixed Ladders	F/O,D	X			
055000		PD	Loose Bearing Plates	F/O,D	X			
055000		PD	Steel Pipe Railings and Handrails	F/O,D	X			
055000		PD	Safety Nosings	F/O,D	X			
055000		PD	Floor Grating	F/O,D	X			
061000			ROUGH CARPENTRY					
061000		QCS	Certificates: Dip Treatment	F/O,D				
061000		QCS	Certificates: Pressure Treatment	F/O,D				
061000		QCS	Certificates: Waterbourne Preservatives	F/O,D				
061000		QCS	Certificates: Fire-Retardant Treatment	F/O,D				
072100			BUILDING INSULATION					
072100		PD	Mineral Fiber Insulation: Glass or other inorganic fibers and resinous binders formed into flexible blankets, batts or rolls; ASTM C 665.	F/O,D				
072100		PD	Vapor Barrier	F/O,D				
079200			JOINT SEALERS					
079200		PD	Type 1 Sealant	F/O,D				
079200		PD	Type 2A Sealant	F/O,D				
079200		PD	Sealant Colors	F/O,D				
079200		PD	Backer Rod	F/O,D				
079200		PD	Cleaning Solvents	F/O,D				
092116			GYPSUM BOARD SYSTEMS					
092116		PD	Framing	F/O,D				
092116		PD	Gypsum Board	F/O,D				
092213			NON-LOAD BEARING FRAMING AND FURRING					
092213		PD	Studs, Tracks, Furring	F/O,D				
092213		PD	Fasteners	F/O,D				
095300			SUSPENDED ACOUSTICAL CEILING SYSTEMS					
095300		PD	Metal Suspension System	F/O,D				
095300		PD	Acoustical Unit - Type III	F/O,D				
099103			MECHANICAL PAINTING					
099103		PD	Painting Schedule - Exterior Substrates	F/O,D				
099103		PD	Painting Schedule - Interior Substrates	F/O,D				
099103		PD	Type EAL-2: Exterior Acrylic Latex, Semigloss Enamel	F/O,D				
099103		PD	Type IAL-4: Interior Acrylic Latex, Gloss Enamel	F/O,D				
099103		PD	Type ISP: Interior Steel Primer, Flat.	F/O,D				
099103		QCS	Certificates of Quality Assurance Article	F				

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
230520			METERS AND RECORDERS					
230520		PD	BTU meters and recorders, and all appurtenance data.	F/O,D	X			
230523			VALVES - Broadscope					
230523		PD	Valve Schedule	F/O,D				
230523		PD	Gate Valves - Type A	F/O,D				
230523		PD	Globe and Angle Valves - Type J	F/O,D				
230523		PD	Check Valve - Type S	F/O,D				
230523		PD	Butterfly Valves Type BF	F/O,D				
230523		PD	Combination Balancing and Shut-off Valves	F/O,D				
230523		PD	Water Pressure Reducing Valves	F/O,D				
230523		PD	Gage Cocks	F/O,D				
230523		PD	Grooved End Valves	F/O,D				
230523		PD	Ball Valves	F/O,D				
230529			PIPE HANGERS AND SUPPORTS					
230529		SD	Details of trapeze hangers and upper hanger attachments for piping 4 inches in diameter and over.	F/O,D				
230529		SD	Details of pipe anchors.	F/O,D				
230529		PD	Combination clevis hanger, pipe insulation shield and vapor barrier	F/O,D				
230529		PD	Pipe Insulation Shields	F/O,D				
230529		PD	Pipe Covering Protection Saddles	F/O,D				
230529		PD	Pipe Hangers	F/O,D				
230529		PD	Adjustable Floor Rests and Base Flanges	F/O,D				
230529		PD	Hanger Rods	F/O,D				
230529		PD	Restraints, Anchors, and Supports for Grooved End Piping Systems	F/O,D				
230529		PD	Sleeve Anchors	F/O,D				
230529		PD	Wedge Anchors	F/O,D				
230529		PD	Self-Drilling Anchors	F/O,D				
230529		PD	Non-Drilling Anchors	F/O,D				
230529		PD	Stud Anchors	F/O,D				
230529		PD	Vibration Isolation for Piping	F/O,D				
230549			CONCRETE PADS FOR EQUIPMENT					
230549		PACK	Submit product data for design mix and materials for concrete specified below at the same time as a package	F/O,D				
230549		SD	Placing drawings for bar reinforcement	F/O,D				
230549		PD	Concrete design mix with name and location of batching plant	F/O,D				
230549		PD	Portland Cement	F/O,D				
230549		PD	Fly Ash	F/O,D				
230549		PD	Air-Entraining Admixture	F/O,D				
230549		PD	Aggregates	F/O,D				
230549		PD	Bonding Agent (Adhesive)	F/O,D				
230550			VIBRATION ISOLATION					
230550		SD	Details of intermediate structural steel members and method of attachment required for installation of vibration isolating devices	F/O,D				

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
230550		SD	Design Calculations	F/O,D				
230550		SD	Vibration Isolation Base Details	F/O,D				
230550		PD	Vibration isolator schedule showing usage	F/O,D				
230550		PD	Rubber-In-Shear	F/O,D				
230550		PD	Steel Spring Isolators	F/O,D				
230550		PD	Vibration Isolation Bases	F/O,D				
230550		PD	Combination Rubber and sprink isolators	F/O,D				
230550		PD	Pad Type Isolators	F/O,D				
230552			FLEXIBLE VIBRATION ELIMINATORS					
230552		PD	Metal Flexible Vibration Eliminators - Stainless Steel Units	F/O,D				
230552		PD	Teflon Flexible Vibration Eliminators	F/O,D				
230553			PIPE AND VALVE IDENTIFICATION					
230553		PD	Snap-on Marker	F/O,D				
230553		PD	Strap-on Marker	F/O,D				
230553		PD	Stick-On Marker	F/O,D				
230553		PD	Pipe Service Identification Tags	F/O,D				
230553		PD	Valve Service Identification Tags	F/O,D				
230554			DUCT AND EQUIPMENT IDENTIFICATION					
230554		PD	Paint	F/O,D				
230593			CLEANING AND TESTING					
230593		QCS	Test Reports - Submit data for each system tested, and/or disinfected	F/O,D				
230594			BALANCING OF SYSTEMS					
230594		QCS	Testing, Adjustment and Balancing Reports: Hydronic Systems	F/O,D				
230594		QCS	Testing, Adjustment and Balancing Reports: Air Systems	F/O,D				
230594		QCS	Testing, Adjustment and Balancing Reports: Final testing and balancing results	F/O,D				
230719			INSULATION					
230719		PD	Material Schedule	F/O,D				
230719		PD	Fibrous Glass (Mineral Fiber) Insulation - Preformed Pipe Insulation	F/O,D				
230719		PD	Fibrous Glass (Mineral Fiber) Insulation - Premolded Fitting Insulation	F/O,D				
230719		PD	Fibrous Glass (Mineral Fiber) Insulation - Insulation Inserts for PVC Fitting Jackets	F/O,D				
230719		PD	Fibrous Glass (Mineral Fiber) Insulation - Block or Board Insulation	F/O,D				
230719		PD	Fibrous Glass (Mineral Fiber) Insulation - Thermal and Acoustic Board Insulation	F/O,D				
230719		PD	Fibrous Glass (Mineral Fiber) Insulation - Blanket Insulation	F/O,D				
230719		PD	Flexible Elastomeric Foam Insulation	F/O,D				

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
230719		PD	High Density Jacketed Insulation Inserts for Hangers and Supports	F/O,D				
230719		PD	Cements	F/O,D				
230719		PD	Laminated Vapor Barrier Jackets for Piping	F/O,D				
230719		PD	Canvas Jackets	F/O,D				
230719		PD	Premolded PVC Fitting Jackets	F/O,D				
230719		PD	Metal Jacketing	F/O,D				
230719		PD	Lagging Adhesive (Canvas Jackets)	F/O,D				
230719		PD	Vapor Seal Adhesive (Fibrous Glass Insulation)	F/O,D				
230719		PD	Vapor Barrier Mastic/Joint Sealer (Fibrous Glass Insulation)	F/O,D				
230719		PD	Adhesive (Flexible Elastomeric Foam)	F/O,D				
230719		PD	Adhesive (Reinforcing Membrane)	F/O,D				
230719		PD	Mastic (Reinforcing Membrane)	F/O,D				
230719		PD	Sealant (Metal Pipe Jacket)	F/O,D				
230719		PD	Insulation Fasteners for Ductwork and Equipment	F/O,D				
230719		PD	Pressure Sensitive Tape for Sealing Laminated Jackets	F/O,D				
230719		PD	Wire, Bands, and Wire Mesh	F/O,D				
230719		QCS	Installers Qualification Data	F/O,D				
230923			DIRECT DIGITAL BUILDING CONTROL SYSTEM					
230923		PACK	Submit the shop drawings, product data, and quality control submittal specified below at the same time as a package	F/O,D				
230923		SD	Provide a system architecture drawing that diagrammatically shows connection to existing DCPs, their locations	F/O,D				
230923		SD	Sketches of all graphics	F/O,D				
230923		SD	Graphic penetration tree showing all graphics and all points.	F/O,D				
230923		SD	Composite wiring and/or schematic diagrams of the complete system as proposed to be installed	F/O,D				
230923		SD	Scaled floor plan and elevation drawings showing location of all major components associated with the system	F/O,D				
230923		SD	Scaled drawings of each primary operators station (POS) showing layout of, and indicating the function of each switch, button, lamp, and accessory.	F/O,D				
230923		SD	Scaled drawings of the fire fighter smoke control panel showing layout of, and indicating the function of each annunciator module, switch module, and accessory.	F/O,D				
230923		PD	Bill of Materials	F/O,D				
230923		PD	Detailed Description of system operation	F/O,D				
230923		PD	Point description, program list, and sequences	F/O,D				
230923		PD	Name, address and telephone number of nearest fully equipped service organization.	F/O,D				
230923		PD	Variable Speed Pump Control	F/O,D				
230923		PD	Automatically operated dampers	F/O,D				
230923		PD	Actuators	F/O,D				
230923		PD	Markers and Nameplates	F/O,D				

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
230923		PD	Accessories	F/O,D				
230923		PD	Wiring	F/O,D				
230923		QCS	Installer's Qualifications Data	F/O,D				
230923		QCS	Company Field Advisor Data	F/O,D				
230923		QCS	Test Reports: Existing sub-system Test Reports	F/O,D				
230923		CCS	System Acceptance Test Report	F/O,D				
230923		CCS	Certificate: Affidavit, signed by the Company Field Advisor and notarized certifying the system meets the contract requirements and is operating properly	F/O,D				
230923		CCS	Operation and Maintenance Data - 2 copies	F				
230923		CCS	Provide 2 hard copy back-up disks and CD-ROM backup of all software programs and configurations	F				
230923		CCS	Provide all revisions and/or upgrades made to the system software during the one year guarantee warranty period	F				
232000			HVAC PIPING					
232000		PD	Material Schedule	F/O,D				
232000		PD	Steel Pipe and Fittings	F/O,D				
232000		PD	Copper and Brass Pipe, Tubing and Fittings	F/O,D				
232000		PD	Couplings and Fittings for Grooved End Pipe	F/O,D				
232000		PD	Joining and Sealant Materials	F/O,D				
232000		PD	Dielectric Connectors	F/O,D				
232000		PD	Pipe Sleeves - Type A	F/O,D				
232000		PD	Pipe Sleeves - Type B	F/O,D				
232000		PD	Pipe Sleeves - Type D	F/O,D				
232000		QCS	Welder Qualification Data	F/O,D				
232000		QCS	Welding Procedures	F/O,D				
232000		QCS	Welders' Certificates	F/O,D				
232000		CCS	Copy of Final Hydrostatic Testing Record Log	F/O,D				
232001			STRAINERS					
232001		PD	Strainer - Y	F/O,D				
232003			THERMOMETERS AND GAUGES					
232003		PD	Thermometers for Measuring Liquid Temperature	F/O,D				
232003		PD	Thermometers for Measuring Air Temperature	F/O,D				
232003		PD	Pressure and Compound Gauges	F/O,D				
232006			HYDRONIC SPECIALTIES					
232006		PD	Expansion Tank	F/O,D				
232006		PD	Combination Air Separator and System Strainer	F/O,D				
232006		PD	Centrifugal Separator	F/O,D				
232006		PD	Air control Fittings	F/O,D				
232006		PD	Air Vents	F/O,D				
232006		CCS	Operation and Maintenance Data - 2 copies	F				
232123			PUMPS					
232123		PD	Pump Schedule	F/O,D	X			

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
232123		PD	Circulating Waterpumps - Close-Coupled Pump with VFD	F/O,D	X			
232123		QCS	Performance curves for each pump, showing gpm, brake HP and efficiency from free delivery to shut-off	F/O,D	X			
232123		QCS	Certificates: Affidavit required under QUALITY ASSURANCE Article.	F/O,D				
232123		QCS	Company Field Advisor Data	F/O,D				
232123		CCS	Operation, Maintenance Data, and Parts Lists: 2 copies	F				
232123		CCS	Spare Parts: Deliver one spare set of mechanical seals for each size and type of pump equipped with mechanical seals	F				
233113			METAL DUCTWORK					
233113		SD	Layouts of mechanical equipment rooms and penthouses	F/O,D				
233113		SD	Method of attachment of duct hangers to building construction	F/O,D				
233113		SD	Coordinate shop drawings with related contracts prior to submission	F/O,D				
233113		PD	Sheet Metal	F/O,D				
233113		PD	Duct Hangers	F/O,D				
233113		PD	Miscellaneous Fasteners and Upper Hanger Attachments	F/O,D				
233113		PD	Gage	F/O,D				
233113		PD	Type of Joints	F/O,D				
233113		PD	Sealing Material	F/O,D				
233113		PD	Reinforcement for each duct size range	F/O,D				
233113		PD	Sketches or SMACNA plate numbers for joints, method of fabrication and reinforcing	F/O,D				
233113		QCS	Company Field Advisor Data	F/O,D				
233300			DUCTWORK ACCESSORIES					
233300		PD	Damper Actuators	F/O,D				
233300		PD	Flexible Connections - Fabric	F/O,D				
233300		PD	Duct Access Doors	F/O,D				
234100			AIR FILTERS					
234100		PD	Pleated Air Filters	F/O,D				
234100		CCS	Extra Materials: One spare set of air filters for each air handling unit	F				
236419			AIR-COOLED WATER CHILLER					
236419		PD	Air-cooled water chiller	F/O,D	X			
236419		CCS	Operation and Maintenance Data - 2 copies	F				
237313			AIR HANDLING UNITS					
237313		SD	Field assembly drawings for each size of factory fabricated cabinet section	F/O,D				
237313		SD	Specials tools necessary for field re-assembly	F/O,D				
237313		PD	Air Handling Unit	F/O,D	X			

SCHEDULE OF SUBMITTALS

PROJECT NO.: 44947-H

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 3 weeks for Approval		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
237313		CCS	Operation and Maintenance Data - 2 copies	F				
237313		CCS	Field Test results - casing leakage less than 1% at 8 in. wg after unit field assembly	F/O,D				
237313		CCS	Extra Materials: one spare set of air filters	F				
260221			MOTORS AND MOTOR CONTROLLERS					
260221		PACK	Submit the product data, and quality control submittals specified below at the same time as a package	F/O,D				
260221		PD	Motor Controllers - Identify each controller for use with corresponding motor	F/O,D	X			
260221		PD	Motor Controllers - Describe overload devices	F/O,D				
260221		PD	Motor Controllers - Enumerate and describe all accessories	F/O,D				
260221		PD	All Motors - Catalog sheets, specifications and installation instructions	F/O,D				
260221		PD	All Motors - Data proving that voltage rating of each motor is in accordance with specified NEMA standard motor voltage	F/O,D				
260221		PD	All Motors - Data proving that the service factor and temperature rise for the motor's insulation system conforms to NEMA standards for each motor's specific application.	F/O,D				
260221		PD	All Motors - Data proving that the motor efficiency rating conforms to NEMA testing and marking standards MG1-12.54 and 12.55.	F/O,D				
260221		PD	Additional Data for Motors Controlled by Solid State or Adjustable Speed Motor Controllers - Data proving that the motor has been designed for use with associated controller	F/O,D				
260221		QCS	Harmonic analysis report	F/O,D				
260221		QCS	Company Field Advisor Data	F				
260221		CCS	System acceptance test report	F/O,D				
260221		CCS	Certificate: Affidavit, signed by the Company Field Advisor and notarized	F/O,D				
260221		CCS	Operation and Maintenance Data - 2 copies	F				
260221		CCS	Service Availability: A fully equipped service organization shall be available to service the completed Work	F				
260523			WIRING FOR MOTORS AND MOTOR CONTROLLERS					
260523		SD	Complete wiring diagrams of all power and control connections (Standard diagrams will not be accepted)	F/O,D				
260523		PD	Raceways, Fittings and Accessories	F/O,D				
260523		PD	Outlet/Device, Junction and Pull Boxes	F/O,D				
260523		PD	Conductors and Accessories	F/O,D				
260523		PD	"C" Beam Clamps	F/O,D				
260523		PD	Pipe Straps	F/O,D				
260523		PD	Pipe Clamps	F/O,D				
260523		PD	Supporting Fastener (Metal Stud Construction)	F/O,D				