



## Forsyth County Procurement

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June 29, 2020

### ADDENDUM #3

### Bid 20-78-1620

**For: Providing all labor, equipment and materials for the construction of a new Juvenile Justice Center at 875 Lanier 400 Parkway, Cumming, GA 30040. Project includes a multi-phased site development, demolition of existing motel structures and construction of new 62,000 square foot Juvenile Court building.**

This addendum supersedes and supplements all portions of the bidding documents and becomes part of the contract documents for the above-referenced project.

Where any item called for in the specifications or indicated on the drawings is supplemented hereby, the original requirements shall remain in effect.

Where any original item is amended, voided or superseded hereby, the provision of such item not so specifically amended, voided or superseded shall remain in effect.

#### **PART 1 - Prebid Questions Received** (response in *bold italics*)

1. Bridge Communications LLC have been asked by (9) general contractors to provide a bid for the structured cabling, fire alarm, intrusion alarm and the access control for the new Juvenile Justice Center project. We do not have an RCDD on stall and our highly trained technicians do not have BICSI installer certifications. We do have an extensive satisfied customer list that can vouch for our professionalism and our telecommunications installation skills. If we were to bid this project and have winning numbers, could the RCDD and BICSI installer certifications be waived in lieu of a satisfied customer references list?
  - a. **RESPONSE: Yes, BICSi and an RCCD will be required and can't be waived.**
2. I have a RFI for the above mentioned project concerning the low voltage; Is there a detailed layout drawing of the telecom rooms?
  - a. **RESPONSE: Layout and one line diagram risers have been provided in contract documents.**
3. Since bid proposals on certain scopes of work are customarily received from subcontractors/vendors very close to the time of bid, please advise if the bidding Contractors may make last minutes adjustments to the bid price on the outside of the proposal package envelope with the signature or initial of a company officer.
  - a. **RESPONSE: No, the county does not accept "envelope cuts/changes" - and as a reminder this is a Request for Proposal**



## Forsyth County Procurement

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4. Referencing 20-78-1620RFP\_Doc.pdf, page 10, Proposal Content, item 3: Please verify if the information regarding the bidding “firm’s financial strength (last audited year)” is to be included in the “Key Personnel” tab of the Proposal – or is it to be a separate tab.
  - a. **RESPONSE: *Place under a separate tab.***
5. Referencing 20-78-1620RFP\_Doc.pdf, page 2, GENERAL INFORMATION: Does “un-bound original” mean loose sheets in a 3-ring binder or loose sheets with just a binder clip. Please clarify.
  - a. **RESPONSE: *Either is acceptable.***
6. Referencing 20-78-1620RFP\_Doc.pdf, page 10, Proposal Content, item 2: Since bid proposals from the lowest responsive subcontractors are customarily received from subcontractors/vendors very close to the time of bid, could deadline for the request for list of subcontractors be amended to 24 hours after the bid?
  - a. **RESPONSE: *List of subcontracts is to be included, though it is understood that this could change and we would permit a revised list be provided for our review.***
7. Is the detail SF-3 below on sheet A 7.12 calling for tempered glass (“T” designation) on all panes - and would this type of notation be typical for the other similarly tagged elevations? Please clarify.
  - a. **RESPONSE: *Tempered panels are identified as "T" on door and window elevations.***
8. I see there is an AV Spec Section and there is the "AV Performance Matrix" shown in the drawings, however I'm not seeing much else in the way of detail. Will AV drawings be released for this project, or is this scope being handled by the Owner?
  - a. **RESPONSE: *AV drawings have been issue to the extent required for a performance based AVOIP design. (see AV Legend T0.01, Floor Plans, T1..01, T1..02 and T1.03. Also, AV one line diagrams on T7.01, AV performance matrix T8.01. and Court AV Zone Plan on T8.03. The intent for this to be a performance based design is given in Specifications 274100 1.2.D, and in drawing notes 1 on T7.01 and notes 3, 4 on T8.01.***
9. Would you please clarify the intent of the PROJECT COLLABORATION SOFTWARE section in the specifications? Specifically, Sections 1-4 basically outline what the goals and abilities the Owner-Insite software need be capable of. Item 5. Procedures, in my reading, seems to indicate specifically what the Architect and Contractor are responsible for during the course of construction utilizing the software. scheduling, emails, etc.. Is this the intent? A broader reading of items 1-4, one could infer that accounting, Also, the specification stations that all costs related to Owner Insite will be covered by the license holding organization. Who is this organization? Finally, what is the cost for this system with Unlimited Licenses? I would suspect that Owner Insite licenses its product on a per year basis.
  - a. **RESPONSE: *“OWNER INSITE PROJECT MANAGEMENT COLLABORATION SOFTWARE SPECIFICATION” simply provides an outline of the web based***



## Forsyth County Procurement

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**software program capabilities. The SPECIAL CONDITIONS EXHIBIT, PROJECT MANAGEMENT, items 31 through 35 specifically address its use and all of the questions noted above.**

10. Qualification Station for SWC attached for Division 28 0000, 1.4 D. South Western Communications, Inc.
  - a. **RESPONSE: SWC is qualified to be an approved Division 28 systems integrator based upon their qualification statement.**
11. What are the correct deadlines to submit Requests for Substitution and Requests for Information for RFP NO. 20-78-1620 Construction of a new Juvenile Justice Center?
  - a. **RESPONSE: Last day for questions July 14, 2020.**
12. Qualification Barrier One – Porosity Inhibiting Admixture.
  - a. **RESPONSE: Barrier One is qualified to be an approved product based upon their qualification statement and product information submittal.**
13. Qualification Meridian Brick Company.
  - a. **RESPONSE: Meridian Brick is qualified to be an approved manufacturer based upon their qualification statement and product information submittal.**

### **PART 2 – Changes to Drawings**

#### **2-1 Sheet CS-1.01 COVERSHEET:**

1. Added the following paragraph to coversheet:

#### **SECURITY PROCEDURES**

Prior to getting the Forsyth County Sheriff's Office background check, all contractors are required to receive authorization by the Procurement Department for the background check.

All contractors' personnel, subcontractors and/or vendors working in the building must complete a GCIC background check at the Forsyth County Annex Building (100 W Courthouse Square, Cumming, GA 30040) prior to entering the secured work area, (\$20 each). Forsyth County reserves the right to refuse entry into secured areas at any time, for any reason, what-so-ever. All contractor to sign in and out (each time) when entering or exiting the building and secured areas. Contractor must schedule access a minimum of 72 hours prior and include on the detailed project schedule.

#### **2-2 Sheet C 000 COVERSHEET:**

1. Added the following paragraph to coversheet:



## Forsyth County Procurement

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*“Any need for switch-overs or outages of any utility supporting the existing building/s during construction require a minimum 72 hours, 3 (three) business days’ notice in writing prior approval by the owner, are strictly limited to and subject to specific hours listed in written owner approval. Actual outage and switch overs of any utility shall only be allowable after Owner’s business hours of operation. Any unplanned and/or unapproved power outages to the Juvenile court building during daily operations are not allowed.”*

### 2-3 Sheet E-0.02 ELECTRICAL SITE PLAN – PHASE ONE:

1. Revised key note #1 to read: Contractor to coordinate scheduling of work with Georgia Power to provide design and installation of parking lot lightings in this area.
2. Revised key note #2 to read: *“Coordinate with Georgia Power for existing transformer and feeder removal and re-routing of temporary services to existing one-story brick and frame building and two-story brick apartments. Any need for switch-overs or outages of any utility supporting the existing building/s during construction require a minimum 72 hours, 3 (three) business days’ notice in writing prior approval by the owner, are strictly limited to and subject to specific hours listed in written owner approval. Actual outage and switch overs of any utility shall only be allowable after Owner’s business hours of operation. Any unplanned and/or unapproved power outages to the Juvenile court building during daily operations are not allowed.”*
3. Reference sheet E-0.02 ELECTRICAL SITE PLAN – PHASE ONE revised under addendum #03 dated 06/29/2020.

### 2.4 Sheet E-0.03 ELECTRICAL SITE PLAN – PHASE TWO:

1. Revised key note #1 to read: Contractor to coordinate scheduling of work with Georgia Power to provide design and installation of parking lot lightings in this area.
2. Revised key note #2 to read: *“Coordinate with Georgia Power for existing transformer and feeder removal and re-routing of temporary services to existing one-story brick and frame building and two-story brick apartments. Any need for switch-overs or outages of any utility supporting the existing building/s during construction require a minimum 72 hours, 3 (three) business days’ notice in writing prior approval by the owner, are strictly limited to and subject to specific hours listed in written owner approval. Actual outage and switch overs of any utility shall only be allowable after Owner’s business hours of operation. Any unplanned and/or unapproved power outages to the Juvenile court building during daily operations are not allowed.”*
3. Reference sheet E-0.03 ELECTRICAL SITE PLAN – PHASE TWO revised under addendum #03 dated 06/29/2020.



## **Forsyth County Procurement**

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### **2-5 Sheet E-0.04 ELECTRICAL SITE PLAN – PHASE THREE:**

1. Revised key note #1 to read: Contractor to coordinate scheduling of work with Georgia Power to provide design and installation of parking lot lightings in this area. Poles indicated with a “GP” indicate proposed locations of lighting poles and is for information purposes only.
2. Reference sheet E-0.04 ELECTRICAL SITE PLAN – PHASE THREE revised under addendum #03 dated 06/29/2020.

### **PART 3 – Changes to Specifications (changes are in *bold and italicized*)**

#### **3-1 Specification Section 23 0000 MECHANICAL GENERAL**

1. Added section 3.9, Part A and B.
2. Reference Specification Section 23 0000 MECHANICAL GENERAL revised under addendum #03 dated 06/29/2020.

#### **3-2 Specification Section 26 0500 COMMON WORK RESULTS FOR ELECTRICAL**

1. Added section 3.8.
2. Reference Specification Section 26 0500 COMMON WORK RESULTS FOR ELECTRICAL revised under addendum #03 dated 06/29/2020.

**END OF ADDENDUM NO 3**

SECTION 230000  
MECHANICAL GENERAL

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CODES AND STANDARDS

- A. The mechanical scope of work shall comply with the following codes and standards:
1. The International Energy Conservation Code, 2015 Edition, with Georgia Amendments.
  2. The International Mechanical Code, 2018 Edition, with Georgia Amendments.
  3. The National Electrical Code, 2017 Edition.
  4. The International Plumbing Code, 2018 Edition, with Georgia Amendments.
  5. The International Fuel Gas Code, 2018 Edition, with Georgia Amendments.
  6. The International Fire Code, 2018 Edition.
  7. Air-Conditioning and Refrigeration Institute Standards (ARI).
  8. American National Standards Institute, Inc. Standards (ANSI).
  9. American Society for Testing and Materials Publications (ASTM).
  10. American Gas Association, Inc. Laboratories (AGA).
  11. American Society of Mechanical Engineers Code (ASME).
  12. Factory Mutual Underwriters (FM).
  13. National Fire Protection Association Standards (NFPA).
  14. Sheet Metal and Air-Conditioning Contractors' National Association, Inc. (SMACNA).
  15. Underwriters Laboratories, Inc. (UL).

1.3 REGULATIONS

- A. Obtain all permits, inspections and approvals as required by all authorities having jurisdiction and deliver certificates of approval to the Architect. Assume and pay all fees and costs of any nature whatsoever incidental to these permits.

2.0 PRODUCTS:

2.1 COORDINATION

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- A. If the products and equipment used as the basis of design are modified, coordinate with all other trades prior to purchasing any material or equipment.

- B. Such coordination shall occur before purchasing and delivering equipment from the manufacturer and shall clearly indicate on the shop drawings. Perform all related modifications without incurring cost to the Contract.
- D. All products shall be new and shall bear the Underwriter's Laboratories, Inc. (UL) label unless specifically indicated otherwise.

### 3.0 EXECUTION

#### 3.1 GENERAL:

- A. The mechanical, plumbing, and fire protection drawings do not give exact elevations or location of lines, nor do they show all the offsets, control lines or installation details. Carefully lay out the work at the site to conform to the structural conditions, to provide proper grading of lines, to avoid all obstructions.
- B. Properly locate and size of all slots and openings in the building structure pertaining to the work and correctly locate sleeves, inserts and cores.
- C. Offset valves in piping systems down to within one foot of the access point. Group runs of piping whenever it is feasible to do so.
- D. Do not install piping, equipment or ductwork in electrical rooms, elevator machine rooms or electronic data rooms except as serving only those rooms. Do not run piping or ductwork or locate equipment with respect to switchboards, panelboards, power panels, motor control centers or dry type transformers. Clearances apply vertically from floor to structure:
  - 1. Within 42" in front of electrical equipment.
  - 2. Within 36" of sides of electrical equipment.
- G. Provide access to equipment and valves requiring operation, service or maintenance within the life of the system. Equipment located above lay-in type ceilings is considered accessible.
- H. Valves and dampers for Terminal Units shall be located in areas accessible for maintenance.

#### 3.2 PAINTING:

- A. Repaint factory painted equipment that has been scratched or marred to match original factory color.
- B. Clean and paint all un-insulated black ferrous metal items exposed to sight inside the building such as gas piping, and fire sprinkler standpipes and exposed sprinkler piping, equipment hangers and supports with one coat of zinc chromate primer. In addition, paint such items in finished spaces with two coats of finish paint in a color to match adjacent surfaces or as otherwise directed by the Architect.

- C. Clean and paint black ferrous metal items exposed outside the building such as gas piping, un-insulated pipe and pipe supports with one coat of rust inhibiting primer and two coats of an asphaltic base aluminum paint. Clean and paint all piping installed outside the building that is to be insulated with one coat of rust inhibiting primer before installing insulation.
- D. Do not paint nameplates on equipment.
- E. Re-coat galvanizing broken during construction with cold galvanizing compound.
- F. Paint all ductwork, piping, insulation, conduit, structural members or other appurtenances visible through ceiling grilles flat black.

3.3 CLEANING:

- G. Remove all stickers, rust, stains, labels and temporary covers before final acceptance.
- H. Clean the interior of all ducts, plenums and casings of all debris and blow free all particles of rubbish and dust before installing outlet faces.
- I. Lubricate bearings that require lubrication in accordance with the manufacturer's recommendations. Provide two copies of certification of lubrication.
- J. Leave equipment rooms clean.
- K. Provide temporary filters for any fans operated during construction. Change temporary filters regularly to prevent contamination of the equipment and duct systems. Install new and unused permanent filters one week prior to final inspection.
- L. Cover ends of open ducts and pipes during construction except when working on such end prohibits covering. Cover with minimum 4 mil thick polyethylene taped, tied or wired in place.

3.4 SLEEVES AND FRAMES:

- A. Install in concrete, carpentry or masonry construction, all necessary sleeves, frames, hangers, expansion bolts, inserts and other fixtures and appurtenances necessary for the support of all pipe, duct, equipment and devices furnished under this Division.
- B. Cut openings and install sleeves or frames through walls and surfaces in a neat workmanlike manner. Cut openings only as large as required for the installation. Install sleeves and/or frames flush with finished surfaces and grout in place unless otherwise indicated. Leave surfaces around openings smooth and finish to match surrounding surface.
- C. Where pipes pass through floor slabs, sleeves shall be standard weight black steel pipe with top of sleeve 3" above finished floor. Where pipes pass through walls, sleeves shall be standard weight black steel pipe or 20-gauge galvanized sheet metal with ends flush with both surfaces.



- D. Provide each pipe or duct passing through walls, floors, ceilings or partitions with sleeves having an internal diameter 1 inch larger than the outside dimensions of the insulated pipe or duct.
- E. Build all pipe sleeves through floors, roofs and masonry walls in place as the affected walls, floors and roofs are built.
- F. Pack all penetrations through rated walls and floors with mineral wool and cap off with a silicon caulk. As an alternate use an approved, fire rated sealant as manufactured by Hilti, 3M or Dow. Materials shall meet or exceed UL 1479 or ASTM E814 requirements.
- G. Sleeves through exterior walls shall be steel pipe, cast iron pipe or Schedule 40 PVC flush with both wall surfaces, and with the space between the pipe and the sleeve caulked watertight in an approved manner.
- H. Inserts shall be individual type galvanized steel with accommodations for removable nuts and threaded rods up to 3/4 inch diameter and permitting lateral adjustment.

### 3.5 ESCUTCHEONS:

- A. Install escutcheons on all pipes where they pass through floors, ceilings, walls or partitions in finished and exposed construction areas.
- B. Escutcheons shall be split, hinged, stamped brass type designed to fit the pipe and to cover the terminating pipe sleeve. Escutcheons shall be chrome plated finish unless otherwise specified with a securing device to hold them tight to the pipe.
- C. Allow sufficient spacing between parallel pipe runs to ensure installation of escutcheons without modification. Do not alter the escutcheons in any manner to allow for installation.

### 3.6 WARRANTY:

- A. The installation and mechanical equipment and components shall be provided with a one year warranty from the date of final acceptance by the owner unless otherwise noted in the contract documents. The warranty shall cover all materials and workmanship. During this warranty period correct all defects in materials and workmanship by repair or replacement without incurring any additional cost to the owner.
- B. Warrant all air conditioning compressors for an additional four years beyond the initial one year warranty. This additional warranty shall include parts only.

### 3.7 FLAME SPREAD AND SMOKE DEVELOPED RATINGS OF MATERIALS:

- A. Materials and adhesives used throughout the mechanical systems for any system shall have a flame spread rating not over 25, and a smoke developed rating not to exceed 50. If such materials are to be applied with adhesives, test them as applied with such

adhesives, or the adhesives used shall have a flame spread rating not over 25 and a smoke developed rating not to exceed 50.

- B. Determine flame spread rating and smoke developed rating by the Method of Testing of Surface Burning Characteristics of Building Materials, NFPA 255, ASTM E84, and Underwriters' Laboratories, Inc. standards.

### 3.8 TRAINING

- A. Schedule training for the major mechanical equipment at the end of construction. The training shall include operation and maintenance of all air conditioning units, air handling units, Variable Frequency Drives, exhaust fans, building automation system, and terminal units. Training shall be minimum 16 hours, divided into 4 4-hour sessions. Training shall be provided by a manufacturer representative once the equipment is working properly.

### 3.9 FUNCTIONAL PERFORMANCE TESTING

- A. ***The contractor shall demonstrate, in presence of the Architect and Owner representative, all modes of the sequence of operation, automatic back up mode, all alarms, and mode of operation upon loss of power and restoring of power.***
- B. ***Contractor shall schedule the Functional Performance Testing five (5) days in advance of the test.***

END OF SECTION 230000

SECTION 26 0500  
COMMON WORK RESULTS FOR ELECTRICAL

1.0 PART 1 GENERAL

1.1 DESCRIPTION AND DEFINITIONS:

A. This division of the Specifications covers the complete electrical systems as indicated on the drawings or as specified herein. Provide all equipment, materials, labor, and supervision to install electrical systems. The requirements of this Section apply to all electrical work hereinafter described. The General and Special Conditions are considered a part of this Division of the Specifications and all provisions contained therein which affect this work are as binding as though incorporated herein.

B. The following words and phrases shall be interpreted as indicated:

1. "approved": approved or accepted by Governing Officials or Authorities Having jurisdiction
2. "materials": equipment and/or materials
3. "or equal/or equivalent": an equivalent with respect to appearance or function as determined by the Architect/Engineer; submittal approval may be required - refer to individual specification sections
4. "provide": furnish, install, connect, and test the operation thereof
5. "work": materials provided - see above definitions
6. "wiring": conductors/cablings and raceway system, including fittings, boxes, connectors, supports, hardware, labeling, and related accessories

1.2 QUALITY ASSURANCE:

A. All electrical work shall be in accordance with the latest locally adopted edition of the following codes and agency standards:

1. The National Electrical Code, 2017 Edition.
2. The Life Safety Code (NFPA 101), 2015 Edition.
3. Occupation Safety and Health Administration (OSHA) regulations.
4. Regulations of the local serving utility company regarding metering and service entrance.
5. Accessibility Codes: Americans with Disabilities Act Guidelines (ADA), ANSI A117.1, and 2010 ADA Standards for Accessibility Design.
6. Georgia State Minimum Standard Building Code (International Building Code 2018 with Georgia Amendments).
7. International Energy Conservation Code, 2015 Edition, with Georgia Amendments.
8. Georgia State Minimum Standard Fire Code (International Fire Code, 2018 Edition, with Georgia State Amendments).
9. Municipal or other locally enforced ordinances governing electrical work.

B. Material Standards: All material shall conform to the standards where such standards have been established for the particular material indicated. Publications and standards of the organizations listed below are applicable to materials specified herein.

1. American National Standards Institute (ANSI)
2. Insulated Cable Engineers Association (ICEA)
3. Institute of Electrical and Electronic Engineers (IEEE)
4. National Electrical Manufacturers Association (NEMA)
5. National Fire Protection Association (NFPA)
6. Underwriters' Laboratories, Inc. (UL)

C. Listing and Labeling: Provide equipment assemblies that are listed and labeled.

1. The terms "listed" and "labeled": As defined in the National Electrical Code, Article 100.
2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

### 1.3 PERMITS:

A. Obtain all permits and inspections for the installation of this work and pay all charges incident thereto. Deliver to the Owner all certificates of said inspection issued by authorities having jurisdiction.

### 1.4 WARRANTY:

A. The Contractor warrants to the Owner and Architect that materials and equipment furnished under this Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Refer to Division 1 for other warranty requirements.

### 1.5 PROJECT DOCUMENTS:

A. Keep on hand at the project site a complete set of all project drawings and specifications, including, but not limited to, all architectural and engineering drawings. Refer to these documents as necessary; coordinate and install all work accordingly so that all electrical equipment will be properly located and accessible.

B. The drawings are diagrammatic and are intended to indicate the arrangements of electrical equipment. Do not scale drawings. Obtain dimensions for layout of equipment from drawings of other trades unless indicated on Electrical plans. Review drawings of

other trades for door swings, cabinets, counters, and built-in equipment; conditions indicated on Architectural plans shall govern. Coordinate installation of electrical equipment with structural system and mechanical equipment and access thereto. Coordinate installation of electrical equipment with ductwork and piping, and wall thickness. Verify construction dimensions at the site and make changes necessary to conform to the building as constructed. Work improperly installed due to lack of construction verification shall be corrected at no additional cost to the Owner.

C. Equipment layout is based on one manufacturer's product. Where equipment selected by the Contractor for use on the project differs from layout indicated, the Contractor shall be responsible for coordinating space requirements and connection arrangements.

D. Bring all discrepancies shown on different drawings, between drawings and specifications or between documents and field conditions to the immediate attention of the Architect.

#### 1.6 SUBMITTALS:

##### A. Shop Drawings and Product Data:

1. Submit for review by the Architect data for materials and equipment to be used on the project. Submittals shall be supported by descriptive material, catalog cuts, diagrams, and performance charts published by the manufacturer to show conformance to specification and drawing requirements. Model numbers alone will not be acceptable. Provide documentation of complete electrical characteristics for all equipment.

2. Provide equipment layout plans, drawn to  $\frac{1}{4}''=1'-0''$ , showing the space arrangement of electrical spaces such as main service equipment area, electrical closets, and each area where electrical distribution equipment is to be installed. Base layout on dimensions of the equipment submitted for use on the project. Submit plans for review with shop drawings.

3. Refer to the individual sections for indication of equipment for which submittals are required.

4. Refer to Division 1 for additional information on submittal requirements.

B. Record Documents: Refer to Division 1 for requirements for record documents, as-built drawings, and related submittals.

#### 1.7 EQUIPMENT REQUIRING ELECTRICAL SERVICE:

A. Review all specification sections and drawings for equipment requiring electrical service. Provide service to and make connections to all equipment requiring electrical service.

B. Drawings indicate equipment with loads, horsepower ratings, voltages, and corresponding control equipment, feeders, and overcurrent devices which were used as a basis for design. If equipment actually furnished have loads other than those indicated on the drawings or specified herein, control equipment, feeders, and overcurrent devices shall be adjusted in size accordingly at no additional cost to the Owner. Such adjustment shall be subject to the review of the Architect.

C. Incidental items not indicated on the drawings or mentioned in the specifications but that can legitimately and reasonably be inferred to belong to the work or be necessary in good practice to provide a complete system, shall be furnished and installed as though itemized here in detail.

#### 1.8 MECHANICAL SYSTEMS INTERFACE:

A. All control wiring and associated raceway systems for mechanical systems shall be provided under Divisions 21, 22, 23, 27, and 28, unless otherwise shown on the Electrical drawings. Review other division specifications, project drawings, and shop drawings for control systems to assure compatibility between equipment furnished under Division 26 and wiring furnished under Division 21, 22, 23, 27, and 28.

B. Unless otherwise indicated, motor controllers (starters) shall be provided under Division 21, 22, 23, and 28 or as an integral component of Division 21, 22, 23, and 28 equipment.

C. Power wiring to all motors and controllers and between motors and controllers shall be provided under Division 26.

D. All electric heating equipment shall be provided and installed under Division 23. Power wiring to all electric heating equipment shall be provided under Division 26.

#### 1.9 SITE INVESTIGATION:

A. Prior to submitting bids for the project, visit the site of the work to become aware of existing conditions which may affect the cost of the project.

#### 2.0 PART 2 PRODUCTS

##### 2.1 MATERIALS:

A. Furnish all materials specified herein or indicated on the drawings. All materials shall be new, unless otherwise indicated.

B. Where Underwriters' Laboratories (UL) testing standards and listings exist for an item of material or equipment, the listed material shall bear the UL label.

### 3.0 PART 3 EXECUTION

#### 3.1 PRODUCT DELIVERY, STORAGE, HANDLING, AND PROTECTION:

A. Inspect materials upon arrival at site and verify conformance with project requirements. Prevent unloading of unsatisfactory material. Handle materials in accordance with applicable standards and recommendations, and in a manner to prevent damage to materials. Store packaged materials in original undamaged condition with manufacturer's labels and seals intact. Containers which are broken, opened, damaged, or watermarked are unacceptable and shall be removed from the premises and replaced.

B. All material, except items specifically designed to be installed outdoors, shall be stored in an enclosed, dry building or trailer. Areas for general storage shall be provided. Provide temperature and/or humidity control where necessary. All material for interior installation, including conductors, shall be stored in an enclosed weathertight structure and shall be protected from water, direct sunlight, cold or heat. Equipment stored other than as specified above shall be removed from the premises and replaced.

C. Equipment and materials shall not be installed until such time as the environmental conditions of the job site are suitable to protect the equipment or materials. Conditions shall be those for which the equipment or materials are designed to be installed.

#### 3.2 CLEANING, PAINTING, AND IDENTIFICATION:

A. Remove oil, dirt, grease and foreign materials from all raceways, boxes, panelboard trims and cabinets to provide a clean surface for painting. Touch-up scratched or marred surfaces of lighting fixtures, panelboard and cabinet trims, or other equipment enclosures with paint furnished by the equipment manufacturer specifically for that purpose.

B. Where painting of trim covers for flush mounted panelboards, communication equipment cabinets, pull boxes, junction boxes, and control cabinets is required under this or any other Division of these specifications, remove trim covers before painting. Do not paint locks, latches, hinges, or exposed trim clamps.

C. Where plywood backboards are used to mount equipment provided under Divisions 26, 27, or 28, paint backboards with two coats of light gray paint. Provide fire-retardant plywood, 3/4" thick minimum.

D. Identify electrical components where required in the individual specification sections.

1. Equipment connected to utility power shall have black faced nameplates. Equipment connected to emergency power shall have red faced nameplates.

2. Nameplates shall be constructed from laminated phenolic engraved plastic three-ply with a white interior core at least 1/16 inch thick.

3. Plastic strips shall be stamped, pressure-sensitive adhesive type labels, with white letters.
4. Stencils shall be machine cut with 1/4-inch high minimum size letters. Paint shall be enamel or lacquer type. Unless otherwise indicated, labeling shall use condensed gothic letters and Arabic numerals properly spaced for easy and legible reading.
5. Nameplates for surface mounted equipment shall be installed on the exterior, and for flush or recessed mounted equipment shall be installed on the inside of the door or cover with epoxy cement adhesive, unless otherwise indicated.

### 3.3 EXCAVATION, TRENCHING AND BACKFILLING:

- A. Perform all excavation to install underground circuiting and raceway systems indicated on the drawings or specified herein. During excavation, pile material for backfilling back from the banks of the trench to avoid overloading and to prevent cave-ins. Provide shoring as required by OSHA Standards. Remove and dispose of all excavated materials not to be used for backfill. Grade to prevent surface water from flowing into trenches and excavation. Remove any water accumulating therein by pumping.
- B. Grade the bottom of trenches to provide uniform bearing and support for underground circuiting and raceway systems on undisturbed soil at every point along entire length. Tamp over depths with loose, granular, moist earth. Remove unstable soil that is not capable of supporting equipment or installation and replace with specified material for a minimum of 12" below invert of equipment or installation.
- C. Backfill the trenches with excavated materials approved for backfilling, consisting of earth, loam, sandy clay, or sand and gravel, free from large clods of earth and stones, deposited in 6" layers and tamped until the installation has a cover of not less than the adjacent ground but not greater than 2" above existing ground. Backfill simultaneously on both sides of the trench. Compaction of the filled trench shall be at least equal to that of the surrounding undisturbed material. Do not settle backfill with water. Reopen any trenches not meeting compaction requirements or where settlement occurs, refill, compact, and restore surface, mounded over and smoothed off.

### 3.4 COORDINATION AND COOPERATION:

- A. Schedule the work, coordinate, and cooperate with all trades to avoid interferences, delays, and unnecessary work. If any conflicts occur which, in the installer's opinion, necessitate departures from the drawings and specifications, details of departures and reasons therefore shall be submitted in writing for the Architect's consideration.
- B. Notify other trades of dedicated electrical space to ensure those spaces stay clear of pipes, duct work and other foreign systems.

### 3.5 OPERATION AND MAINTENANCE MANUALS AND INSTRUCTIONS:



A. Provide printed material for binding in operation and maintenance manuals. Include electrical equipment shop drawings as a minimum, and other information as necessary. Refer to Division 1 for additional information on submittal requirements.

B. Instructions of Owner Personnel:

1. Before final project review, as designated by the Architect, provide a competent representative to instruct Owner's designated personnel in systems indicated.

2. Use Operation and Maintenance Manuals as basis of instruction. Review contents with personnel in detail to explain all aspects of operation and maintenance.

3. Prepare and insert additional data in Operation and Maintenance Manuals when the need for such data becomes apparent during instruction.

### 3.6 ELECTRICAL ACCEPTANCE TESTS AND MANUFACTURERS CERTIFICATION:

A. Refer to the individual specification sections and the Electrical Acceptance Testing section for equipment or system test requirements. Testing documentation shall be provided for reference at the time of final project review.

B. Where specified under the individual system specification sections, the systems shall be reviewed for compliance with these specifications, installation in accordance with the manufacturer's recommendations, and system operation by a representative of the manufacturer.

### 3.7 CONSTRUCTION OBSERVATION ASSISTANCE:

A. Provide personnel to assist the Architect or his representative during all construction observation visits. Provide tools and equipment as required to demonstrate the system operation and provide access to equipment, including screwdrivers, wrenches, ladders, flashlights, circuit testing devices, meters, keys, etc.

B. Remove panelboard trims, motor control covers, device plates, junction box covers, etc. as directed for inspection of internal wiring. Turn over to the Owner one set of keys for all lockable electrical equipment on the project. Accessible ceilings shall be removed as directed for inspection of equipment installed above ceilings.

C. Energize and de-energize circuits and equipment as directed. Demonstrate operation of equipment and systems as directed.

### 3.8 **LIGHTING SYSTEM FUNCTIONAL TESTING:**

***A. Prior to passing final inspection, the registered design professional shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's instructions.***

**B. Where occupant sensor controls are provided, the following procedures shall be performed:**

- 1. Certify that the occupant sensor has been located and aimed in accordance with manufacturer recommendations.**
- 2. For projects with seven or fewer occupant sensors, each sensor shall be tested.**
- 3. For projects with more than seven occupant sensors, testing shall be done for each unique combination of sensor type and space geometry. Where multiples of each unique combination of sensor type and space geometry are provided, not less than 10 percent, but in no case less than one, of each combination shall be tested unless the code official or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested controls fail, all remaining identical combinations shall be tested. For occupant sensor controls to be tested, verify the following:**
  - 3.1. Where occupant sensor controls include status indicators, verify correct operation.**
  - 3.2. The controlled lights turn off or down to the permitted level within the required time.**
  - 3.3. For auto-on occupant sensor controls, the lights turn on to the permitted level when an occupant enters the space.**
  - 3.4. For manual-on occupant sensor controls, the lights turn on only when manually activated.**
  - 3.5. The lights are not incorrectly turned on by movement in adjacent areas or by HVAC operation.**

**C. Where time-switch controls are provided, the following procedures shall be performed:**

- 1. Confirm that the time-switch control is programmed with accurate weekday, weekend and holiday schedules.**
- 2. Provide documentation to the owner of time-switch controls programming including weekday, weekend, holiday schedules, and set-up and preference program settings.**
- 3. Verify the correct time and date in the time switch.**
- 4. Verify that any battery back-up is installed and energized.**
- 5. Verify that the override time limit is set to not more than 2 hours.**
- 6. Simulate occupied condition. Verify and document the following:**
  - 6.1. All lights can be turned on and off by their respective area control switch.**
  - 6.2. The switch only operates lighting in the enclosed space in which the switch is located.**
- 7. Simulate unoccupied condition. Verify and document the following:**
  - 7.1. Nonexempt lighting turns off.**
  - 7.2. Manual override switch allows only the lights in the enclosed space where the override switch is located to turn on or remain on until the next scheduled shutoff occurs.**
- 8. Additional testing as specified by the registered design professional.**

- D. Where daylight responsive controls are provided, the following shall be verified:***
- 1. Control devices have been properly located, field calibrated and set for accurate setpoints and threshold light levels.***
  - 2. Daylight controlled lighting loads adjust to light level set points in response to available daylight.***
  - 3. The locations of calibration adjustment equipment are readily accessible only to authorized personnel.***
- E. The construction documents shall specify that documents certifying that the installed lighting controls meet documented performance criteria are to be provided to the building owner within 90 days from the date of receipt of the certificate of occupancy.***

Provide authorized representatives of the manufacturers to demonstrate to the Architect compliance with the Contract Documents at a time designated by the Architect.











