

SECTION 26 0510
GENERAL ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Definitions
- B. Quality Assurance Requirements and Installer Qualifications.
- C. Submittal Procedures
- D. Execution Requirements common to Division 26 systems

1.02 DEFINITIONS

- A. Manufacturers' Representatives: Wherever MANUFACTURER'S REPRESENTATIVE is referred to in this division, said representative shall be regularly employed by the manufacturer to perform similar activities to those called for herein, which indicates his competence in that field of work.
- B. Concealed: Where the word concealed is used in this Division, it shall mean items above ceilings, in attics, in crawl spaces, in chases, in tunnels, in cabinet work, and under counters or equipment so as to be not visible from an elevation of 5 feet at a horizontal distance of 10 feet.
- C. Finished Spaces or Areas: Where finished spaces or areas are referred to in this Division, it shall mean all spaces except concealed spaces, mechanical rooms, or boiler rooms unless otherwise noted.
- D. Provide: Where the word provide is used, it shall mean to furnish and install the item(s) in accordance with plans, specifications or manufacturer's instructions.
- E. Control and Interlock Wiring: All wiring, both line voltage and low voltage, other than power wiring from an electrical distribution panel, through the primary control device, to the equipment.
- F. Primary Control Device: That ONE device for any item of equipment which interrupts power flow during normal operation. Where magnetic starters are provided, they are the primary control. For items not switched by starters, the primary control device will be the ONE thermostat, manual switch, aquastat, P.E. switch, or relay performing the primary switching.
- G. Diagrammatic: A drawing that shows arrangement and relations (as of parts).i.e.: A diagrammatic drawing uses symbols rather than pictorial representation of pipes, ducts, conduit and other items shown and is not necessarily to scale. Arrangement, location, and sizes shown are firm.
- H. Readily Accessible: Equipment, valves and other items requiring service shall be installed to be readily accessible. These items shall be available for maintenance or use in a space, through an access door from floor elevation, or above a lay-in ceiling by maintenance staff standing on a ladder no taller than the ceiling.
- I. Noted, Indicated or Shown: Where the terms "Noted", "Indicated" or "Shown" are used in these specifications, the words "in the specifications or on the plans" shall be inferred.
- J. Detail: Details referenced shall pertain to plans unless otherwise noted.
- K. Specifications: Where reference is made to these specifications, it shall be inferred in this Division of specifications.
- L. Notification by Contractor, and Instructions to Contractor: Where reference is made in these specifications to notification by or instructions given to Contractor, it shall be inferred that Architect shall be the notifier or the instructor as the case exists.
- M. Submittal Data, Equipment Cuts, Shop Drawings: Wherever these terms are used in the plans or specifications, the information is to be submitted for review as part of the packaged submittal specified under "SUBMITTALS".
- N. Conduit of Duct Bank: Two or more, 2-inch or larger conduits with a common point of origin and a common point of termination routed parallel, and as specifically designated on plans.

- O. Division or Section Reference: Where reference is made to another Division or Section within this Division, refer to specifications table of contents for Division, Section, or Page Number.
- P. Diagrammatic: A drawing that shows arrangement and relations (as of parts). A diagrammatic drawing uses symbols rather than pictorial representation of pipes, ducts, conduit and other items shown and are not necessarily to scale. Arrangement, location and sizes shown are firm.
- Q. Horizontal Cabling: A data cabling term indicating the cable from the work area back to the patch panel. Commonly used in the description "conduit for horizontal cabling shall be 1" minimum in size".

1.03 REGULATORY REQUIREMENTS

- A. General: Where requirements of these specifications exceed specified codes and ordinances, conform to these specifications.
- B. Materials and equipment included in Underwriters Label Service shall bear that label. Electrical equipment shall be U.L. approved as installed.
- C. Jurisdiction: Where codes or guides refer jurisdiction to local governing code officials, such official in this procedure shall be the State Fire Marshal.
- D. Permits: Permits and licenses of a temporary nature necessary for the prosecution of the work shall be obtained and paid for by Contractor. Neither Contractor nor any sub-contractor will be required to pay Municipal or County building permit fees. The Contractor and/or any subcontractor will be required to pay any Municipal and/or County building license taxes or fees, if any.
- E. Energy: Conform to the International Energy Conservation Code, 2009 Edition with all Georgia State Amendments.
- F. Fire Prevention: Conform to Georgia State Minimum Standard Fire Prevention Code (International Fire Code), 2018 Edition.
- G. Building Code: Conform to the Georgia State Minimum Standard Building Code (International Building Code), 2018 with all Georgia Amendments.
- H. Electrical: Conform to the 2020 National Electrical Code (NEC), NFPA and the National Electrical Safety Code.
- I. Life Safety: Conform to the 2018 Edition of NFPA 101 - Life Safety Code, with Georgia State Amendments.
- J. Fire Alarm: Conform to the 2018 Edition of NFPA 72 - National Fire Alarm Code and Signaling Code, with Georgia State Amendments.

1.04 SUBMITTALS

- A. In general, the design professional is allocated 14 calendar days to review a submittal. On large items such as gear, panel, and lighting submittals, our office will require this same amount of time, and should receive copies of these submittals at the same time as the design professional. Special circumstances may require faster turnaround times, and may be discussed at the onset of the submittal process.
- B. Supplementing Division 1 requirements; Contractor shall:
 - 1. Review the submittal data and check to ensure compliance with specifications prior to submitting.
 - a. The Contractor agrees that submittals of equipment and material and shop drawings of equipment and material layouts required under provisions of these specifications and processed by the are not Change Orders.
 - b. The purpose of submittals is to demonstrate that Contractor understands the design concept of the project by indicating the equipment and materials he intends to furnish and install, and by detailing the installation he intends to achieve. The review by Architect shall NOT be construed to be for the purpose of "approving" equipment or drawings. The plans and specifications alone are the contract document. The

- contractor has agreed to follow the contract document, regardless of the results of the submittal submission.
- c. The Contractor shall conform to the requirements of the Contract Documents unless a change order or a specific letter of clarification is issued. The Contractor shall identify on each submittal and in letter form to Architect any and all deviations from the Contract Documents.
 - d. Any submittal or shop drawing not conforming to the Contract Documents without this identification and notification shall be assumed to be marked "Revise and Resubmit" (Contractor acknowledges this by the submission), and Contractor shall promptly resubmit said submittal so as to be in full compliance with the Contract Documents.
 - e. Failure of Contractor to provide this information during the shop drawing phase shall make Contractor responsible for all changes to achieve compliance with the Contract Documents without additional compensation.
2. Identify all submittals by a cover sheet showing project name, specification sections, drawing or detail number, room number, date, revision date, Contractor and subcontractor's organization and project manager with phone number, the model, style and size of item being submitted with manufacturers' representative, salesman (or a preparer who can answer questions), and preparer's phone number.
 3. Manufacturers' standard drawings shall be modified by deletions or additions to show only items applicable to this project.
 4. **Prepare a master list of submittals proposed to be submitted on the project.** This list shall be updated for each submission and shall be the first sheet(s) of the submission in the quantity that is submitted for review. The information and general format shall contain an Tab number, Item Description, Item Status and any comment. Items that require quicker submittal review because of material lead times should be indicated in this list.
 5. Provide a Letter stating that all submittals have been checked for compliance with specifications.
- C. Power Wiring Requirements: The Contractor shall submit a letter acknowledging receipt and review of the Tabulated List of Power Wiring Requirements of all Mechanical Equipment specified in Division 23 of the Specifications. Failure to submit this letter will require Contractor to assume responsibility for any required changes to the electrical design attributed to mechanical equipment. Include a copy of the Tabulated List of Power Wiring Requirements with the letter. The electrical requirements for the mechanical equipment is based on the best information available at the time of design. The Contractor is responsible for coordinating with the purchased equipment. Power Wiring letters are required for the following equipment:
1. Mechanical
 2. Fume Hood
- D. Certificates:
1. For Lighting Systems, Fire Alarm System: Start-up, testing and placing into operation shall be performed by the field representatives of the manufacturers.
 2. Certificates of the manufacturers shall be provided on the letter heads of the manufacturers in which the manufacturer certifies that the equipment has been installed in strict compliance with the manufacturers recommendations and is operating properly.
 3. The manufacturers shall list in the certificate the item or items furnished to the job.
 4. The Contractor shall coordinate performance of the aforesaid services and shall, in all cases where the equipment of two or more manufacturers tie in and function together, require the field representatives to perform simultaneously the initial start-up, the testing, and the placing of their equipment into operation. Start-up is defined as putting the equipment into action. Testing is defined as performing such testing as is stipulated in the contract documents to be performed. Placing into operation is defined as operating the equipment for a sufficient period of time for the determination to be made that it is performing properly.
 5. Notification shall be given at least 48 hours in advance of start-up. The Contractor shall give each system supplier the advance notice time he requests for his work on his system.

1.05 OPERATING AND MAINTENANCE MANUALS

- A. Each Manual shall be compiled as follows:
 - 1. Data shall be bound in smooth surface hard back commercial quality three-ring notebooks with project identification shown on the front cover and binding back. Identification labels shall be typed and adhered with waterproof glue.
 - 2. Notebooks shall have 9-1/2-inch by 11-1/2-inch covers with back width to permit the covers to lie parallel or to converge, and have not less than 1-1/2-inch back width.
 - 3. Index divider sheets of heavy Manila paper shall be inserted between each section of the Manual with a 2-inch x 1/3-inch ready-cut shield tab attached to each sheet for identification of sections.
 - 4. Data sheets and diagrams shall be 8-1/2-inch x 11-inch or be mounted on 8-1/2-inch x 11-inch sheets of 16-pound paper if smaller, with reinforced 11-inch mechanically perforated edges. Drawings and diagrams larger than 8-1/2-inch by 11-inch shall be folded up from the bottom to form a height of 11-inches and folded to the left to form a width of 8-1/2-inches.
 - 5. Table of Contents(Index) sheets shall be provided in the order listed with identifications typed in capital letters.
- B. Each Manual shall contain the following information, data and drawings:
 - 1. Copies of approved submittals (with Design Professional's review comments and stamp), equipment and materials.
 - 2. Manufacturer's installation, operating and maintenance instructions for each item of equipment.
 - 3. Manufacturer's list of renewal parts for each item of equipment with recommended stock items and quantities indicated.
 - 4. Control diagrams.
 - 5. Wiring diagrams and color codes for fire alarm system. Refer to fire alarm specifications.
 - 6. Copies of shop drawings showing layouts and construction details. Shop drawings are required for the following systems:
 - a. Lighting control (occupancy sensor and relay panels)
 - b. Fire Alarm system
 - c. Low voltage system (voice/data/catv)
 - 7. Provide a copy of the riser diagram, no smaller than printed on 11X17, with lengths of feeders shown (handwritten is acceptable).
 - 8. Maintenance schedules.
 - 9. Warranty Information.
 - 10. Sign in sheets for all owner training sessions.

1.06 WARRANTY

- A. See General Conditions.
- B. Where extended warranties beyond Contractor's one (1) year warranty are specified, the additional warranty time shall start at the end of Contractor's warranty.
- C. All equipment warranty periods shall begin the day of building turnover, not the delivery or startup date.
- D. Correct defective Work within a one year period after Date of Material Completion.

1.07 NOTIFICATION TO THE OWNER WHEN THE CONTRACTOR VISITS SITE AFTER FINAL INSPECTION

- A. When Contractor's representative visits the job after the final inspection to perform specific work such as maintenance service, seasonal balance, or to correct a deficiency, Contractor shall notify Owner not less than 48 hours prior to the date on which they will visit the site, except under an emergency condition.
- B. The Contractor shall visit the designated office of Owner to notify Owner that Contractor is on the site prior to visiting the site, thereby enabling Owner's representative to accompany Contractor, should they so desire while Contractor is on the project site.

- C. A carbon copy of the notification shall be provided to Architect with the intent of the site visit. After Contractor has completed the site visit, Contractor shall give a written report of the action taken and any incomplete work yet to be performed to Architect, within five (5) days.

1.08 ABBREVIATIONS - ELECTRICAL

AICAVAILABLE INTERRUPTING CAPACITY
A.F.F.ABOVE FINISHED FLOOR
ALALUMINUM
ANTANTENNA
AWGAMERICAN WIRE GAUGE
B.E.BOTTOM ELEVATION
B.G.BELOW FINISHED GRADE
BRKRBREAKER
CCONDUIT
CAT.CATALOG
C.H.CEILING HEIGHT
CLGCEILING
C.O.CONVENIENCE OUTLET
COND.CONDUCTOR(S)
CRCONTROL RELAY
CUCOPPER
D.DIAMETER
EMEREMERGENCY
EMTELECTRICAL METALLIC TUBING
F.O.FIBER OPTIC
FAPFIRE ALARM PANEL
FUTFUTURE
GNDGROUND
H-O-AHAND-OFF-AUTO
HPSHIGH PRESSURE SODIUM
HTRHEATER
I.A.W.IN ACCORDANCE WITH
I.C.INTERCOM MASTER STATION
IMCINTERMEDIATE METALLIC CONDUIT
MBMAIN BREAKER
M.C.MASTER CLOCK
MFGRMANUFACTURER
MLOMAIN LUGS ONLY
MTDMOUNTED
MTGMOUNTING
MVMERCURY VAPOR
N.E.C.NATIONAL ELECTRICAL CODE (2002)
NFDSNON FUSED DISCONNECT SWITCH

N.I.C.NOT IN CONTRACT
NMCNON METALLIC CONDUIT
NO.NUMBER
PBPUSHBUTTON
PLCSPLACES
PVCPOLYVINYL CHLORIDE
R. RADIUS
R.G.S.RIGID STEEL CONDUIT
SCHED.SCHEDULE
SEC.SECTION
SMRSURFACE METAL RACEWAY
SURF.SURFACE
SYMSYMMETRICAL
TEL.TELEPHONE
TRTIME RELAY
TYP.TYPICAL
W/WITH
WPWEATHERPROOF
XFMRTRANSFORMER
20A/3P20 AMP / 3 POLE TYPICAL

PART 3 EXECUTION

2.01 EXAMINATION

- A. Hazardous Materials:
1. A/E's Responsibility: Plans and specifications have been prepared by the A/E for Owner without the A/E having conducted investigation as to the presence of asbestos or hazardous waste on the project. Not being a part of this contract, the A/E has not charged any fees and has not and will not advise Owner with regard to the detection and/or removal of asbestos or hazardous waste. The Owner is aware that asbestos or hazardous waste could be present and will make all decisions with regard to its removal. The removal of all hazardous materials and encapsulation of remaining surfaces is the sole responsibility of Owner.
 2. If Contractor observes the existence of a friable material which must be disturbed during the course of his work, Contractor shall promptly notify Owner and Architect. The Owner shall make all arrangements regarding testing and removal or encapsulation of asbestos material if present. The Contractor shall not perform any work pertinent to the friable material prior to receipt of special instructions from Owner through Architect.
 3. "Friable Material" is any material which can be crumbled, pulverized or reduced to a powder by hand pressure when dry.

2.02 PREPARATION

- A. Drawings are diagrammatic and show the general location of the equipment, raceway, and equipment, but are not to be scaled. All dimensions shall be verified at the building site, and with Architectural plans. Prefabrication and/or installation of work from drawings shall be at Contractor's risk. Refer to Architectural plans for exact building dimensions and details.
- B. Space Conditions:
1. All apparatus shall fit into the available spaces in the building and must be introduced into the building so as not to cause damage to the structure. Equipment larger than access to equipment spaces shall be disassembled into sub-assemblies for installation.

2. Where deviations from the plans are required in order to conform to the space limitations, such changes shall be made at no additional cost to Owner and shall be subject to approval.
 3. All equipment requiring service shall be made accessible.
- C. Where new work is specified or shown connected to old work and materials are different from existing, Contractor shall request a clarification from Architect prior to performing the work.
- D. The demolition plan has been prepared to assist Contractor in determining the scope of demolition work and should not be construed to be all of the demolition required. The Contractor shall visit job site (after carefully reviewing the contract documents) and determine exact areas and quantities of existing materials to be removed to accomplish new construction.

2.03 INSTALLATION

- A. Indoor Air Quality Environment: Portions of the existing building will be in use and occupied during construction. The Contractor shall schedule work and provide temporary ventilation and/or isolation to insure that fumes from welding, other construction tasks, and out-gassing from construction materials do not migrate to occupied areas.
- B. All equipment shall be installed in accordance with manufacturer's published installation instructions shipped with the equipment. In the event there is a discrepancy between these specifications or Drawings and the manufacturer's instructions, no work shall be performed until additional instructions are received.
- C. Cutting and patching in connection with the installation shall be done by the trade whose work is to be cut. The Contractor shall lay out and install his work ahead of the work of other trades wherever possible.
- D. Where penetrations are made in fire rated partitions, walls, floors or ceilings during the course of electrical installation, these penetrations shall be restored to their intended fire ratings by the use of fittings or materials as approved by Underwriter's Laboratories for this purpose.
- E. Fire Prevention Precautions in Cutting and Welding Areas: Conform to Article 2904 Fire Prevention Precautions, Georgia State Minimum Standard Fire Prevention Code (International Fire Code), 2006 Edition, with 2007 & 2010 Georgia State Amendments for all work involving cutting and welding.
- F. Seal sleeves and openings in exterior walls and mechanical room walls vaportight, watertight, or for smoke/fire protection as applicable. Refer to Section 07 8400 - Firestopping.
- G. Continuity of Building Services:
1. Schedule work so existing building systems will not be interrupted when they are required for normal usage of the existing building.
 2. Perform work to provide minimum inconvenience to Owner and as approved by Architect. No allowance will be made for lack of knowledge of existing conditions.
- H. Record Drawings:
1. After completion, any changes in the location of conduits, the connections of circuits, or any other changes from the contract documents shall be noted on a clean set of blue line white prints and delivered to Architect before final acceptance of work.

2.04 INTERFACE WITH OTHER WORK

- A. General: No roughing shall be done until roughing drawings and exact electrical demand of equipment is obtained. Notify Architect of any discrepancies.
- B. Mechanical:
1. Review Tabulated List of Power Wiring Requirements of all Mechanical Equipment specified in Division 23 of the specifications. Conduit, conductor and breaker sizes shown for mechanical equipment are based upon the best available information on the equipment specified. The Contractor shall be allowed to provide electrical circuits compatible with the proposed mechanical equipment where the mechanical equipment conforms to Division 23 of the specifications, but does not conform to the electrical criteria of these contract documents. The Contractor shall submit the proposed electrical modifications to Architect

- for review prior to roughing. No additional costs to the contract will be allowed for these modifications.
2. Provide control, program and interlock wiring as shown on Mechanical and/or Electrical drawings.
 3. Provide conduit, wiring, boxes, adaptors for equipment terminations and disconnect switches. Provide power wiring through primary control device.
 4. Starters, push-button stations, contactors, relays, limit and safety devices, and control items are specified in Division 23 of the specifications (except as shown in Motor Control Center). Unless otherwise noted, all starters shall be mounted between 24" and 80" above finished floor. Push-button stations shall be mounted at switch height except as noted.
 5. Owner Furnished Equipment: Provide conduit, wiring, boxes, adaptors for equipment terminations, and disconnect switches. Make all connections indicated.
 6. The information shown on the plans is based upon the best available information. Before performing any work on the site, Contractor shall contact the utility company(s) serving the facility and stake out all underground services. Notify Architect of any discrepancies.

2.05 CLEANING and PROTECTION

- A. All materials, equipment and electrical/telecommunications rooms shall be cleaned prior to Final Observation.
- B. Remove any stored materials. Vacuum interiors of all panelboards, switchboards, switchgear, transformers and any other electrical equipment.
- C. Paint equipment where finish has been damaged requiring retouching of finish to match factory finish. Equipment which has been damaged beyond the point of retouching or has been retouched not to match shall be repainted to match factory finish.
- D. Chipped or scraped paint shall be retouched to match original finish.
- E. All equipment shall be free of dust, rust and stains prior to material completion.
- F. During Construction: Conduit openings shall be closed with caps or plugs. All equipment shall be covered and protected against water, dirt and chemical or mechanical injury. All equipment and material shall be stored in accordance with manufacturer's recommendations.

END OF SECTION