

SECTION 260000
ELECTRICAL

PART 1 - PRIME

1.1 PRIME REQUIREMENTS

- A. Work shall be inclusive but not limited to the removal of the existing electrical interior humidification unit and roof top air conditioning unit currently supporting the building then extending the branch circuit feeds to the new humidification unit and roof top location as shown on the electrical plans.
- B. The Owner reserves the right to request references from this contractor and the right of final selection of the contractor.

1.2 FILED SUB-BIDS - TIME, MANNER AND REQUIREMENTS FOR SUBMITTING SUB-BIDS

- A. ELECTRICAL is stipulated as a Filed Sub-Bid under Part D, Item 2 of the Form for General Bid.
- B. All sub-bids shall be submitted on the Form for Sub-Bid furnished by the Awarding Authority, as required by section 44F of Chapter 149 of the Massachusetts General Laws, as amended.
- C. Sub-bidders must be DCAM Certified in the listed trade and shall include a current DCAM Sub-bidder Certificate of Eligibility and a signed DCAM Sub-bidder's Update Statement with the bid.
- D. Sub-Bids must be filed with the Awarding Authority in a sealed envelope, before time, on the date stipulated in the Advertisement part of the front-end specifications.
- E. Specific information relating to the sub-bidders is set forth in the Contract Documents, under the heading "Notice to All Bidders, Including Sub-Bidders" and the attention of sub-bidders is directed thereto.
- F. Work to be done under this SECTION is shown on Contract Drawings numbered ED.1, E1.1, E1.2. The remaining Contract Documents shall include the plumbing, mechanical and architectural plans.
- G. Sub-Sub-Bid Requirements:
 - 1. Sub bidder's attention is directed to Massachusetts G.L. Chapter 149 Section 44F, as amended, which provides in part as follows:

a. Each sub bidder shall list in Paragraph E of the "Form of Sub bid" the name and bid price of each person, firm or corporation performing each class of work or part thereof for which the Section of the Specifications for that sub trade requires such listing, provided that, in the absence of a contrary provision in the Specifications, any sub bidder may, without listing any bid price, list his own name or part thereof and perform that work with persons on his own payroll, if such sub bidders, after sub bid openings, shows to the satisfaction of the Awarding Authority that he does customarily perform such class of work with persons on his own payroll and is qualified to do so. This Section of the Specifications requires that the following classes of work shall be listed in Paragraph E under the conditions indicated herein.

1.3 RELATED DOCUMENTS

- A. Drawings and Prime provisions of Contract, including Prime and Supplementary Conditions, Section 23 00 00 HVAC and Division 1 Specification Sections, are hereby made a part of this Section.
- B. Division 23 00 00 Contractor shall be considered as the prime contractor for this project. Coordinate with the Division 23 00 00 contractor pertaining to the submission of all necessary electrical costs associated with this project.

1.4 REFERENCES

- A. The PRIME DOCUMENTS, as listed in the Table of Contents, and applicable parts of Division 1, PRIME REQUIREMENTS, are hereby made a part of this Section.
- B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Trade. Refer to the HVAC plans and Division 23 00 00.

1.5 SCOPE

- A. Labor, supervision, materials, tools, scaffolding, equipment, supplies, transportation and services for a complete and operational electrical system as specified shall be provided.
- B. Materials and equipment shall be installed in accordance with standards of the National Electrical Code, local codes, safety codes and ordinances.
- C. Work under this Section shall include, but not be limited to:

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1.5 EXAMINATION OF SITE

- A. Before submitting a Bid, this Contractor must visit the job site to determine the conditions under which the work is to be done.

1.6 DRAWINGS AND SPECIFICATIONS

- A. Drawings and specifications are complementary to each other. Any labor and material which is called for by either, whether or not by both, or which is

necessary for the successful operation of all systems, shall be furnished and installed. Discrepancies should be brought immediately to the attention of the Architect.

- B. Plans and specifications for this project should be examined to determine the scope and character of the work, the building design and function, and the required coordination with the Prime Contractor and other Trades before and during construction.
- C. Any questions regarding the plans and specifications shall be addressed in writing to the Architect five (5) days before Bids close; otherwise, after the closing of the Bids, the Architect's interpretation of the meaning and intent of the plans and specifications shall be final.
- D. This Contractor shall prepare an electrical set of coordination drawings to overlay with all other Trades. Drawings shall be prepared on translucent drawings to properly coordinate all of the other equipment to be installed. Prior to any installations the Electrical Contractor must receive approval of drawings from the Architect.

1.7 INSURANCE

- A. Insurance is to conform to the provisions and requirements as set forth in Division 1.

1.8 CHANGES AND REVISIONS

- A. Costs for changes and/or revisions shall be submitted to the Prime Contractor with material and labor breakdown of charges and credits clearly itemized.
- B. Work shall not be executed until approval has been received in writing from the Architect.

1.9 WORKMANSHIP

- A. Materials shall be new and shall conform to the standards of UL, Inc., in every case where such a standard has been established for the particular type of material in question. Work shall be executed in a workmanlike manner and a competent Foreman shall be provided for the entire project.
- B. After wires are pulled in and fixtures and equipment are installed, this Contractor shall make tests for performance, grounds, etc., and shall immediately remedy any defects. Equipment for tests shall be provided by this Contractor.
- C. Work under this Contract must be so performed that the progress of the entire project, including work of all Trades, shall not cause delays or interference. Materials and apparatus shall be installed as fast as the condition of the building will permit.

- D. It will be the responsibility of the Electrical Foreman to instruct the Owner in the function, operation and maintenance of electrical systems and equipment. This is to be done upon completion of the installation, before leaving the job site and to the satisfaction of the Owner, Engineer, and Architect.

1.10 MANUFACTURERS' NAMES AND TRADE NAMES

- A. Throughout the specification types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of performance and quality, and not to limit competition.

1.11 MATERIAL STORAGE AND OFFICE SPACE

- A. This Contractor shall maintain at his own expense, where directed on the premises, neat-covered storage for material and equipment, and office space where drawings and specifications shall be kept for records.
- B. Equipment or material damaged during the construction period shall be replaced at this Contractor's expense.

1.12 GUARANTEE

- A. Materials and labor incorporated in the work are to be guaranteed against defects for a period of one (1) year from date of substantial completion. This Contractor shall correct such defects that occur within the guarantee period and to the satisfaction of the Architect without cost to the Owner, within a twenty-four (24) hour period.
- B. This Contractor shall not be responsible for failures through normal usage, nor for those caused by neglect or abuse on the part of the Owner or his employees.

1.13 RELATED WORK

- A. Following related work is not included in this Section and will be performed under designated Sections.
 - 1. Major cutting and patching.
 - 2. Fire stopping of all penetrations in rated walls and ceilings: see FIRESTOPPING Section for acceptable material to be used on the exterior of the sleeve and around wires to be used by this Contractor. The Electrical Contractor shall be responsible for all firestopping of the interior and exterior of raceways installed through walls and floors.

1.14 CUTTING AND PATCHING

- A. This Contractor as part of his work, and without extra charge, shall do fitting

and minor cutting required for conduit four (4) inches and under. Cutting over four (4) inches and patching will be by the Prime Contractor. Costs for openings required due to lack of coordination shall be the responsibility of this Contractor.

1.15 OPERATING INSTRUCTIONS

- A. This Contractor shall furnish electronic PDF copies for the Operating and Maintenance Manuals outlining in detail the operational features of the following systems:
1. NEMA 1 and 3 heavy duty disconnect switches
 2. Circuit Breakers for existing main switchboard and sub-panels.
 2. Cable, junction boxes and conduit.

1.16 PERMITS

- A. This Contractor shall obtain and pay for permits for the electrical systems on this project.

1.17 RECORD DRAWINGS

- A. A set of record drawings shall be maintained at the job site for reference by the Engineer and Architect. Weekly, the Electrical Foreman will note changes and review drawings periodically with the Engineer. Changes, including feeders, lighting, power, panel schedules and other schedules shall be recorded on the drawings. At the conclusion of the construction this Contractor shall order from the Prime Contractor a compact disc with all drawing files. All changes shall be made on the disc and shall be compatible to that of AutoCad 2020.

1.18 DEFINITIONS

- A. The terms "This Contractor", "Electrical Contractor", "Electrical Subcontractor", or "This Section" all refer to the work of this Section 26.00.00.

1.19 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. The Prime Contractor shall provide and pay for all dumpster services during the entire construction period. Suppliers and Sub-Contractors shall bring all rubbish and debris to the dumpster location daily. No costs are to be assessed to the suppliers or Sub-Contractors by the Prime Contractor for this service.
- B. The Prime Contractor, Sub-Contractors and suppliers, individually, shall furnish their own staging, scaffolding, and hoisting equipment to get workers, material and equipment from the point of delivery at the project site to the point of use or installation within the building and project site.

1.20 WORK CONDITIONS/SEQUENCE

- A. If Sub-Contractors find that conditions are not appropriate for them to begin the work of their trade or if they are directed to perform their work out of sequence by the Prime Contractor, or if the Prime Contractor directs Sub-Contractors to start and continue regardless of job conditions, the Sub-Contractor shall notify the Architect in writing by certified mail immediately.

PART 2 - PRODUCTS

BASIC MATERIALS AND METHODS

2.1 RACEWAYS AND FITTINGS

- A. Minimum size of conduit used shall be 3/4" with no more than 9-#12 conductors. All circuits shall have separate neutrals and grounds.
- B. Electrical Metallic Tubing (EMT) shall be PVC coated, mild steel, electrically welded, galvanized, Midland-Ross, Wheatland or Republic.
- C. Conduit shall be kept at least six (6) inches away from adjacent copper piping or other copper work on the project. Keep a minimum of 18" away from the natural gas line.
- D. During construction, ends of conduit shall be kept tightly plugged to exclude plaster, dirt, dust, moisture and debris.
- E. Ends of conduit entering boxes shall be equipped with galvanized locknuts or bushings. Cut ends of conduit shall be reamed free of burrs and sharp edges.

2.2 FIREPROOFING AND CONDUIT SEAL

- A. The Electrical Contractor is responsible for all fireproofing of raceways through floors and walls.
- B. The material to be used for fire-stopping shall be 3M moldable fire rated putty or 3M #CP25WB caulk to fire-stop penetrations in fire rated areas of walls and floors.

2.3 WIRING SYSTEM

- A. Wiring shall be installed concealed in the construction. Wiring exposed shall be installed in heavy wall or rigid conduit.
- B. Joints in wiring shall be made with approved type solderless connectors of the self-insulating type with an insulation equal to that of the conductors being joined. They shall be Minnesota Mining & Manufacturing Co., Type "Y", "R" or "B" Scotchlok, T&B Twist-on-Piggy or TUB one-piece, pressure type, self-insulating wire joint.

- C. All branch circuits shall have separate grounds and neutrals.

2.4 WIRE

- A. Unless otherwise specified, conductors installed in conduit shall be Type THW or THHN, 600V, 90 degree C. – Rome Cable. Conductors shall be copper.
- B. MC fire-rated shall be Type THHN #12 copper conductors or as noted on the drawings.
- C. Covering of wires and cables designed to meet the above specifications shall have distinctive markings as required by the latest standards of UL, Inc., making them readily identifiable in the field.

2.5 GROUNDING

- A. The entire system shall be grounded in accordance with the National Board of Fire Underwriters', State and local requirements.
- B. Heavy duty circuit breaker disconnect switch shall be equipped with an equipment ground connection and internal ground wire.
- E. This Contractor shall furnish and install an equipment ground wire in feeder runs to meet requirements of the National Electrical Code.
- F. All branch circuits shall have separate neutrals and grounds.

2.6 OUTLET BOXES

- A. Outlet boxes shall be Steel City, Appleton, or Raco, galvanized of a type best adaptable to their respective use and in Prime four (4) square or octagon. Boxes in plaster areas shall be equipped with plaster rings or trim. Studs of suitable size for proper support shall be provided in boxes from which fixtures are to be hung. Exposed junction boxes are to be NEMA 3R type fully gasketed.
- B. Boxes installed in tile, block or similar finished walls shall be solid flush type, square cornered, without ears, 1-2-3 and 4-gang as required - Raco, Steel City or Appleton.
- C. Outlet boxes shall be provided with only the holes necessary to accommodate conduit connected. Boxes shall be furnished with lugs, ears, covers and/or outlet devices for attachment.
- D. Plastic boxes are NOT acceptable.

2.7 PULL AND JUNCTION BOXES

- A. Pull and junction boxes shall conform to requirements of the National Electrical Code. They shall be galvanized code gauge steel construction with removable

cover plate secured by 1/4" brass machine screws. Junction boxes shall be supported to the building structure. Exposed junction boxes installed on the exterior of the building are to be NEMA 3R type fully gasketed.

2.8 SLEEVES

- A. It shall be the responsibility of this Contractor to furnish and install sleeves through floors, walls, rated assemblies, etc., where necessary.
- B. Sleeves shall be sealed with UL, Inc., approved fire rated material after wires have been installed. Refer to FIRESTOPPING Section.

2.9 SYSTEM OF POWER

- A. Secondary distribution system is 277/480V and 120/208V, 3 phase, 4 wire, 60 HZ AC.

2.10 SAFETY DISCONNECT SWITCHES

- A. Safety type disconnect switches shall be circuit breaker style EATON Co., Siemens Co., Square D or Prime Electric. Boxes exposed to rain or wet conditions shall be rain-tight.

PART 3 - EXECUTION

3.1 INSPECTION AND COORDINATION

- A. This Contractor shall inspect surfaces and areas that will receive his material and the job conditions as they exist and report any conditions that may adversely affect his work. Notify Architect or Prime Contractor of unsuitable conditions.
- B. Coordinate work with construction schedule and job progress.
- C. This Contractor shall confer with the Prime Contractor and other Trades to coordinate his work and to properly locate systems to avoid conflict and interference.
- D. Any interference with the work of other Trades or with architectural or structural details shall be brought to the attention of the Architect for decision before installation. Contractor's failure to so coordinate his work will not relieve him of the responsibility to correct work to suit building conditions.

3.2 INSTALLATION

- A. Installation shall be by skilled workmen using proper equipment. Commencement of work shall be deemed as acceptance of existing conditions by installer.
- B. Entire application shall be in strict accordance with manufacturer's

recommendations and the standards of the National Electrical Code, local codes and ordinances, OSHA safety codes and regulations.

- C. After wires are pulled in and the equipment is installed, this Contractor shall make tests for performance, grounds, etc., and shall immediately remedy defects. Equipment for tests shall be borne by this Contractor.
- D. Work under this Contract must be so performed that the progress of the entire project, including work of all Trades shall not cause delays or interference. Material and apparatus shall be installed as fast as condition of the building will permit.

3.3 RACEWAYS AND FITTINGS

- A. Conduit and wiring shall be installed concealed in the construction where possible. Conduit shall be installed in a neat, workmanlike manner and run parallel to building walls. Conduit size shall be minimum 3/4".
- B. During building construction ends of conduit shall be tightly plugged to exclude plaster, dirt, dust and moisture.
- C. Ends of conduit entering boxes shall be equipped with galvanized locknuts and bushings. Cut ends of conduit shall be reamed free of burrs and sharp edges.
- D. Electrical metallic tubing couplings and terminations in outlet boxes, junction boxes, panelboard cabinets, etc., shall be secured thereto for grounding by means of raintight and concrete-tight fittings of the interlocking compression ring or stainless steel, multiple joint locking type. Set screws or indentations will not be acceptable as a method of attachment of fittings to conduit or EMT.

3.4 WIRE

- A. Wire #8 and larger shall be stranded and no wire less than #12 shall be used, unless otherwise noted.

3.5 OUTLET BOXES

- A. Ceiling boxes shall be supported to carry the weight of the equipment which are to be hung.
- B. Outlet boxes shall be provided with only the holes necessary to accommodate the conduits being connected. Boxes shall be furnished with lugs or ears for attachment of covers and/or outlet devices.

3.6 INSTRUCTIONS TO OWNER

- A. It shall be the responsibility of the Electrical Foreman to instruct the Owner in the function, operation and maintenance of electrical systems and equipment.

- B. Coordinate all building shutdowns with the owner. All shutdowns are to be completed after hours.

3.7 CLEANUP

- A. Stains and/or damage to the finish of the building caused by faulty workmanship and/or improper handling of material in regard to installation shall be cleaned or removed and replaced at no cost to the Owner.

3.8 FIRESTOPPING

- A. The Electrical Contractor shall be responsible to fire stop all the raceways and the interior and exterior of all sleeves through which wires penetrate walls, floors or any other penetrations requiring firestopping material under this Section.

END OF SECTION