

SECTION 26 01 00 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All drawings and general provisions of Contract, including all General and Supplementary Conditions, Division 1 Specification Sections, and Instructions to Bidders apply to this section and all other sections of Division 26 and Division 27

1.2 REGULATIONS AND CODE COMPLIANCE

- A. All work and materials shall conform to and be installed, inspected and tested in accordance with the 2017 National Electric Code and with the governing rules and regulations of federal, state and local governmental agencies.
- B. The following is a list of codes and standards that will apply to this project:
 - 1. Fire Code of New York State.
 - 2. Energy Conservation Construction Code of New York State.
 - 3. Building Code of New York State
 - 4. New York State Department of Labor Rules and Regulations.
 - 5. New York State Department of Health.
 - 6. Federal Occupational Safety and Health Act - OSHA.
 - 7. Life Safety Codes, NFPA 101.
 - 8. National Electrical Code, NFPA 70.
 - 9. Local Codes and Ordinances for Town of Greece, County of Monroe
 - 10. NEMA Standards.
 - 11. Underwriters Laboratory.
 - 12. Factory Mutual or other Insurance Carrier.

1.3 LICENSING & PERMITS

- A. The Contractor shall hold a license to perform the work as issued by the town of Greece
 - 1. Apply for and obtain all required permits and inspections, include costs for all fees and charges.
- B. Provide certificate of inspection from locally approved inspection agency for all electrical work prior to acceptance of each phase.
- C. Refer to General Conditions of the Contract for additional requirements.

1.4 GLOSSARY

ACI	American Concrete Institute
ADA	American Disabilities Act
AGCA	Associated General Contractors of America, Inc.
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute

ASTM American Society for Testing Materials
AWSC American Welding Society Code
FM Factory Mutual Insurance Company
IEEE Institute of Electrical and Electronics Engineers
NYBFU New York Board of Fire Underwriters
NEC National Electrical Code
NEMA National Electrical Manufacturers' Association
NESC National Electrical Safety Code
NFPA National Fire Protection Association
NYS/DEC New York State Department of Environmental Conservation
UFPO Underground Facilities Protective Organization
UL Underwriter's Laboratories, Inc.
OSHA Occupational Safety and Health Administration
NYS/UFBC New York State Uniform Fire Prevention and Building Code
ISO International Standards Organization

1.5 DEFINITIONS

As Called For	Materials, equipment including the execution specified/shown in the contract documents.
Code Requirements	Minimum requirements.
Concealed	Work installed in pipe and duct shafts, chases or recesses, inside walls, above ceilings, in slabs or below grade.
Design Equipment	Refer to the article, BASIS OF DESIGN.
Design Make	Refer to the article, BASIS OF DESIGN.
Exposed	Work not identified as concealed.
Acceptance	Owner acceptance of the project from Contractor upon certification by Owner's Representative.
Furnished by Others	Receive delivery at job site or where called for and install.
Inspection	Visual observations by Owner's site Representative.
Labeled	Refers to classification by a standards agency.
Make	Refer to the article, BASIS OF DESIGN.
Relocate	Disassemble, disconnect, and transport equipment to new locations, then clean, test, and install ready for use.
Replace	Remove and provide new item.
Review	A general contractual conformance check of specified products.
Roughing	Pipe, duct, conduit, equipment layout and installation.

Satisfactory As specified in contract documents.

Site Representative Construction Manager or Owner's Inspector at the work site.

Refer to General Conditions of the Contract for additional definitions.

1.6 BASIS OF DESIGN

- A. The contract documents are prepared on basis of one manufacturer as "design equipment," even though other manufacturers' names are listed as acceptable makes. If Contractor elects to use one of the listed makes other than "design equipment," submit detailed drawings, indicating proposed installation of equipment. Show maintenance clearances, service removal space required, and other pertinent revisions to the design arrangement. Make required changes in the work of other trades, at no increase in any contract. Provide larger electrical feeders, circuit breakers, equipment, additional control devices and other miscellaneous equipment required for proper operation, and assume responsibility for proper location of roughing and connections by other trades. Remove and replace door frames, access doors, walls ceilings or floors required to install other than design make equipment. If revised arrangement submittal is rejected, revise and resubmit specified "design equipment" item which conforms to contract documents.

1.7 INTENT OF DRAWINGS

- A. The drawings are diagrammatic, unless detailed dimensioned drawings are included. Drawings show approximate locations of equipment, fixtures, panelboards, conduits, and wiring devices. Exact locations are subject to the approval of the Owner's Representative. The general run of electrical feeders, branch circuits, and conduits, indicated on the drawings, is not intended to be the exact routing. Circuit designations, in the form of "Home Runs" on branches, indicate the designation of the branch circuit, the size and the quantity of branch circuit conductors, and the panelboard or interconnection box from which the branch circuit is served.

1.8 QUALITY ASSURANCE

- A. Manufactures of equipment shall be firms regularly engaged in the production of factory fabricated systems and equipment whose products have been in satisfactory use in similar service for not less than three (3) years.
- B. Suppliers of equipment must have factory trained and authorized personnel for the service of all equipment provided.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. The Materials, products and equipment described in the Bidding Documents establish a standard of required quality, functions, dimensions and appearance that must be met by any proposed substitution.

- B. Proposed substitutions must be submitted to the Architect/Engineer a minimum of ten (10) days prior to the date for receipt of Bids. Each request shall include the name of the proposed material equipment being substituted, cut sheets, installation drawings, performance and test data and warranties. At that time the equipment or will be evaluated and if determined to be acceptable an Addendum will be issued to all bidders.
- C. Requests for substitution shall be made only by a Bidder. Requests for substitution from sales representatives, vendors or suppliers are not acceptable.

2.2 SHOP DRAWINGS/PRODUCT DATA

- A. Submit Shop Drawings on all items of equipment and materials to be furnished and installed. Submission of Shop Drawings and samples shall be accompanied by a transmittal letter, stating name of project and contractor, number of drawings, titles, and other pertinent data called for in individual sections. Shop Drawings Shall Be Dated and Contain: Name of project; name of prime professional; name of prime contractor; description or names of equipment, materials and items; and complete identification of locations at which materials or equipment are to be installed. Incomplete submittals will not be accepted. All products specified in an individual Division 26 section shall be submitted at the same time. Number each submittal. Indicate deviations from contract requirements on Letter of Transmittal. Corrections or comments made on the Shop Drawings during the review do not relieve Contractor from compliance with requirements of the drawings and specifications. The Contractor is responsible for confirming and correcting all quantities; checking electrical characteristics and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

PART 3 - EXECUTION

3.1 COORDINATION DRAWINGS

- A. Before construction work commences, Contractors for all trades shall submit Coordination Drawings in the form of reproducible transparencies drawn at not less than 1/4" = 1'-0" scale. Coordination Drawings are required throughout all areas for all trades. These drawings shall identify and show resolutions of trade conflicts. Mechanical Equipment Rooms shall be drawn early in the Coordination Drawing process, simultaneous with all other congested areas. Prepare Coordination Drawings As Follows:
 - 1. HVAC Contract will prepare the base plan Coordination Drawings showing all ductwork and all pertinent piping and equipment. The drawings shall be coordinated with cable tray, lighting fixtures, sprinklers, air diffusers, other ceiling mounted items, ceiling heights, structural work, maintenance clearances, electric code clearance, reflected ceiling plans, and other contract requirements. Reposition proposed locations of work after coordination drawing review by the Construction Manager and the Architect. Provide adjustments to exact size, location and offsets of

ducts, pipes, conduit, etc., to achieve reasonable appearance objectives. Provide these adjustments as part of Base Bid Contracts. Minor revisions need not be redrawn.

2. HVAC Contract will provide prints and/or digital files and submit the base plan to all major trades' Contractors.
3. Electrical, Plumbing and Fire Protection Contracts will draft location of piping and equipment on the base plan, indicating areas of conflict and suggested resolutions.

3.2 ROUGH-IN

- A. Due to small scale of Drawings, it is not possible to indicate all offsets, fittings, changes in elevation, etc. Verify final locations for rough-ins with field measurements and with the equipment being connected. Verify exact location and elevations at work site prior to any rough in work. **DO NOT SCALE PLANS.** If field conditions, details, changes in equipment or shop drawing information require a significant change to the original documents, contact the owners representative for approval before proceeding.
- B. Provide easy, safe, and code mandated clearances at controllers, motor starters, valve access, and other equipment requiring maintenance and operation. Contractor shall relocate existing work in the way of new construction. VISIT SITE BEFORE BIDDING TO DETERMINE SCOPE OF WORK. Provide new materials, including new piping and insulation for relocated work.

3.3 EXISTING SYSTEMS AND CONDITIONS

- A. Prior to beginning work inspect and test all existing electrical systems that will be affected by the work in this contract. Provide a report to the Owner indicating any problems or defects found. If no problems or system defects are submitted, the contractor shall be responsible for correcting problems found at the completion of the project that are determined to be caused by the work of this contract.
- B. Inspect the entire work area for defects in the existing construction such as scratches, holes etc. Submit a complete list and photographs of existing damage, to the owner prior to beginning work. If existing damage is not documented the contractor shall repair all damage to like new condition, that is determined to have been caused by the work in this contract.

3.4 ELECTRICAL INSTALLATIONS

- A. All installations shall comply with the following requirements:
 1. Coordinate electrical systems, equipment, and materials installation with other building components. Be responsible for any changes in openings and locations necessitated by the equipment installed.
 2. The architect shall control the placement of all wall and ceiling mounted electrical equipment and devices in all rooms with the exception of

mechanical and electrical equipment rooms. When drawing details are not available, consult with the Architects representative for actual location.

3. Verify all dimensions with field measurements.
4. Arrange for all chases, slots and openings in other building components, that are not indicated on drawings, to allow for electrical installations.
5. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
6. Coordinate ordering and installation of all equipment with long lead times or having a major impact on work by other trades so as not to delay the job or impact the construction schedule. Pay close attention to equipment that must be installed prior to building enclosure.
7. Where mounting heights are not detailed or dimensioned, install systems, materials and equipment to provide the maximum headroom possible.
8. Install systems, materials and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer the conflict to the Architect.
9. Store Materials on dry base, at least 6" above-ground or floor. Store so as not to interfere with other work or obstruct access to buildings or facilities. Provide waterproof/windproof covering. Remove and provide special storage for items subject to moisture damage. Protect against theft or damage from any cause. Replace items stolen or damaged, at no cost to Owner.
10. Set all equipment to accurate line and grade, level all equipment and align all equipment components.
11. All tolerances in alignment and leveling, and the quality of workmanship for each stage of work shall be as required by the manufacturer and subject to approval by the owners representative.
12. All finished equipment surfaces damaged during construction shall be brought to "as new" condition by touch up or repainting. Any rust shall be removed and primed prior to repainting.
13. Workmanship shall be as called for in the "Standard of Installation" published by the National Electrical Contractors Association (NECA).
14. Provide all scaffolding, rigging, hoisting and services necessary for erection and delivery of equipment and apparatus furnished into the premises. These items shall be removed from premises when no longer required.

15. No electrical equipment shall be hidden or covered up prior to inspection by the owners representative. All work that is determined to be unsatisfactory shall be corrected immediately.
16. All electrical work shall be installed level and plumb, parallel and perpendicular to other building systems and components.
17. Conceal all contract work above ceilings and in walls, below slabs, and elsewhere throughout building. If concealment is impossible or impractical, notify Owner's Representative before starting that part of the work and install only after his approval. In areas with no ceilings, install only after Owner's Representative reviews and comments on arrangement and appearance.
18. Install access panel or door where units are concealed behind finished surfaces.

3.5 UTILITY COMPANY SERVICES

- A. Make arrangements with RGE for electric service to the Owner's distribution equipment. Provide underground electric service as called for and transformers, meter sockets or meter compartments as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the electric service shall comply with the published Utility Company standards. PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.
- B. Make arrangements for telephone service to the Owner's distribution system. Provide services to the buildings as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the telephone service shall comply with the published Utility Company standards. PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.
- C. Make arrangements with **Spectrum and/or other ISP** for cable and internet service to the Owner's distribution system. Provide services to the buildings as required by the Utility Company. Coordinate all activities between the Owner and Utility Company. The installation of the internet and CATV service shall comply with the published Utility Company standards. PAY ALL UTILITY COMPANY CHARGES; INCLUDE CHARGES IN THE BASE BID.

3.6 ELECTRICAL EQUIPMENT CONNECTIONS

- A. Provide complete power connections to all electrical equipment. Provide control connections to equipment where indicated on the drawings. Ground all equipment in accordance with the 2017 NEC.
- B. Provide all power wiring, electric equipment, control wiring, switches, lights, receptacles, and connections as required for proper equipment operation of Owner-Furnished Equipment and Equipment furnished by other contracts,
- C. Refer to Manufacturer's drawings/specifications for requirements of special equipment. Verify connection requirements before bidding and confirm prior to

roughing.

3.7 CLEANING

- A. After all tests are made and installations completed satisfactorily:
- B. Thoroughly clean entire installation, both exposed surfaces and interiors.
- C. Remove all debris caused by work.
- D. Remove tools, surplus, materials, when work is finally accepted.

3.8 TEMPORARY FACILITIES

- A. Refer to General Contract Sections 015000 for additional temporary facility requirements of this contract.
- B. Provide construction lighting and power requirements as deemed necessary by each trade. Coordinate with general contractor as required. Provide all temporary facility requirements of this contract.
- C. Contractor shall remove temporary construction light and power provisions at end of project or when transference is made to the permanent service/distribution system.
- D. Supplemental special construction power provisions for welding, temporary heat, crane(s), etc., shall be made available upon request and as required to meet the project requirements.
- E. All utility company fixed temporary service charges, including intermediate poles, connect/disconnect costs, metering, etc., shall be paid by the Contractor.
- F. Install the power distribution system and the construction lighting and receptacle branch circuits within the building as required to facilitate the project construction schedules.
- G. Furnish, install and maintain lighting and receptacle outlets as required to facilitate construction demands and shall extend and/or add circuits and equipment as required during the course of construction.
- H. Apportion the lighting and receptacle outlets throughout each floor or area in an arrangement acceptable to the Architect/Engineer and to the other trades.
- I. Lighting outlet spacing shall not exceed 25 feet on center, and shall have maximum 1800 watt loading per 20 ampere circuit.
- J. Receptacle outlet spacing shall not exceed 50 feet on center, and shall have a maximum of 6 receptacles per 20 ampere circuit.
- K. Within the completed building areas, new lighting and receptacles may be used in lieu of a temporary system, and shall be supplemented where required to maintain minimum outlet spacing specified above or as required for work.

Permanent existing equipment, devices, etc. that are damaged while being utilized for temporary lighting or power shall be replaced.

L. Materials

1. Materials for the temporary construction light and power system need not be new and need not conform to the provisions found elsewhere in these specifications relating to materials for the permanent installation. However, materials shall be in good condition and of quality to assure adequate operation and safety of use and shall have the listed approval of Underwriter's Laboratories, Inc., where applicable.
2. Temporary receptacles except where noted otherwise, shall be 20 ampere, 120 volts, duplex grounding type and shall be installed in suitable outlet boxes with plates and protected by a ground fault interrupting device.
3. Temporary lights, except where noted otherwise, shall consist of medium base rubber pigtail type light sockets or porcelain lampholders on suitable outlet boxes. All sockets shall be provided with incandescent lamps and guards.
4. Temporary conductors, where open wiring is permitted, may be copper or aluminum and, except for grounding conductor, shall be insulated. Sizes of feeder wiring and/or conduit shall be as per load requirements. Sizes of branch circuit conductors shall be No. 12 AWG minimum size, except that where the branch circuit length exceeds 100 feet #10 AWG shall be installed to the first outlet. Splices of temporary conductors shall be soldered or shall utilize accepted types of mechanical connectors, and all splices shall be insulated by taping or other accepted methods.
5. Materials furnished by the Contractor for the preceding temporary system shall remain his property, and shall be removed when there is no longer any need for temporary light and power, or when so ordered by the Architect/Engineer.

M. Installation

1. Installation of the construction light and power system shall comply with requirements of applicable codes and ordinances as they relate to such temporary wiring.
2. Except as otherwise noted herein, completed portions of the permanent installation or materials for use in the permanent installation shall not be used in the temporary work without specific permission of the Architect/Engineer. If permanent fixtures are utilized for temporary lighting, all lamps shall be replaced with new at the time of completion.
3. Grounding shall comply with applicable codes relating to permanent work. Grounding terminals of receptacles and non-current-carrying metal parts of components of the construction light and power system shall be connected to the common grounding conductor at the service through metallic conduits or through grounding conductors installed with circuit conductors. The permanent grounding system may be utilized for the temporary system.

4. Overload protection for circuits and equipment of the construction light and power system shall comply with applicable codes relating to permanent work. Load protection centers and other protective equipment shall be furnished and installed as shown on the electrical drawings or as required by field conditions.

3.9 START UP AND OWNER INSTRUCTIONS

- A. Before acceptance of the work, furnish necessary skilled labor to operate all systems by seasons. Instruct the Owners designated personnel on the proper operation and maintenance of systems and equipment. Obtain written acknowledgment from person instructed prior to acceptance repeat the instructions if asked to do so. Contractor is fully responsible for systems until acceptance, even though operated by Owner's personnel, unless otherwise agreed in writing. Provide, operating, maintenance and starting precautions and procedures to be followed by the Owner for operating systems and equipment. Mount the instruction in clear plastic holder on or adjacent to the equipment.
- B. Where supervision by a manufacturer is called for, provide manufacturer's certified technician or engineer to supervise the startup, testing and adjustment of the equipment or system. Where two or more manufacturer's are involved (i.e., variable frequency drive and air handling unit) both manufacturer's shall be present at start up. The manufacturer shall provide a written report detailing the testing and start-up including problems that occurred and their method of resolution.

3.10 OPERATION AND MAINTENANCE MANUALS

- A. Provide Operation and Maintenance Manuals. Include one copy each of approved Shop Drawings, wiring diagrams, piping diagrams, spare parts lists, as-built drawings and manufacturer's instructions. Include typewritten instructions, describing equipment, starting/operating procedures, emergency operating instructions, seasonal changeover, freeze protection, precautions and recommended maintenance procedures. Include name, address, and telephone number of supplier manufacturer Representative and service agency for all major equipment items. Bind above items in a three ring binder with name of project on the cover. Deliver to Owner's Representative before request for acceptance.

3.11 RECORD DOCUMENTS

- A. Prepare record documents in accordance with front end specifications/ In addition to those requirements provide the following:
 1. Document the routing major raceway systems, location of control devices, branch circuit numbers for all devices and equipment and fuse and circuit breaker sizes for major equipment and branch circuit home runs.

END OF SECTION