

SECTION 16670 LIGHTNING PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section covers the designing fabrication and installation of the complete lightning protection system for this project.
- B. This Section includes lightning protection for buildings and building site components.
- C. Related Sections: The following sections contain requirements that relate to this section.
 - 1. Section 16450, "Grounding".

1.3 REFERENCES

- A. Lightning Protection Institute (LPI):
 - 1. LPI-175-87: Lightning Protection Installation Standard.
 - 2. LPI-177-83: Inspection Guide for LPI Certified Systems.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 780-97: Standard for Installation of Lightning Protection Systems.
- C. Underwriters Laboratories, Inc. (UL):
 - 1. UL 96-94: Lightning Protection Components.
 - 2. UL 96A-2001: Installation Requirements for Lightning Protection Systems.

1.4 SUBMITTALS

- A. Product Data: For air terminals and mounting accessories.
- B. Shop Drawings: Detail lightning protection system, including air-terminal locations, conductor routing and connections, and bonding and grounding provisions. Include indications for use of raceway and data on how concealment requirements will be met. Include table showing compatibility of system components with all building/mechanical materials that are used for mounting.
- C. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include data on listing or certification by nationally recognized testing laboratory (NRTL) or trade association and certified "Master Label" system installer.
- D. Field inspection reports indicating compliance with specified requirements.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is NRTL listed or who is certified by LPI as a Master Installer/Designer.

- B. Listing and Labeling: As defined in NFPA 780, Article 2-2, "Definitions."
- C. Provide UL Master Label.
- D. Provide LPI certification of system.
- E. Provide ETL Master Label indicating system complies with specified requirements.

1.6 COORDINATION

- A. Coordinate installation of lightning protection with installation of other systems and components, including electrical wiring, supporting structures and building materials, and metal bodies requiring bonding to lightning protection components.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Harger Lightning Protection, Inc.
 - 2. Heary Bros. Lightning Protection Co. Inc.
 - 3. Thompson Lightning Protection, Inc.

2.2 LIGHTNING PROTECTION SYSTEM COMPONENTS

- A. Comply with UL 96.
- B. Stack-Mounting Air Terminals: Solid copper.
- C. Ground Rods, Ground Loop Conductors, and Concrete-Encased Electrodes: Comply with Division 16 Section 16450, "Grounding" and standards referenced in this Section.
- D. All main conductors shall be copper, 28 strands, 14 gauge, 1/2" diameter, rope lay, 115 kcmil, 375 pounds/1,000 feet or aluminum, 37 strands, 12 ½ gauge, 211 kcmil, 204 pounds/1000 feet.
- E. Secondary bonding conductors (for connections to individual pieces of equipment) shall be aluminum, 10 strands, #14 gauge, smooth weave, 41.1 kcmil, 42 pounds/1000 feet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install lightning protection components and systems according to UL 96A, LPI-175, and NFPA 780.
- B. Install conductors with direct paths from air terminals to ground connections. Avoid sharp bends and narrow loops.
- C. Conceal the following conductors:
 - 1. System conductors.

2. Down conductors.
 3. Interior conductors.
 4. Conductors within normal view from exterior locations at grade within 200 feet (60 m) of building.
 5. Notify CM at least 48 hours in advance of inspection before concealing lightning protection components.
- D. Cable Connections: Use approved exothermic-welded connections for all conductor splices and connections between conductors and other components, for below grade and concealed locations, all exposed connections shall be bolted clamp type.
- E. Bond extremities of vertical metal bodies exceeding 60 feet (18 m) in length to lightning protection components.
- F. A counterpoise installation based on requirements in Section 16450, "Grounding", may be used as a ground loop required by NFPA 780, provided counterpoise conductor meets or exceeds minimum requirements in NFPA 780.
1. Bond ground terminals to counterpoise conductor.
- G. Use all copper components except where building or mounting surfaces require aluminum for materials compatibility reasons.

3.2 CORROSION PROTECTION

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
- B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.3 FIELD QUALITY CONTROL

- A. Periodic Inspections: Engage an LPI inspector to perform periodic inspections during construction and at its completion, according to LPI-177.
- B. UL Inspection: Apply for inspection by UL as required to obtain a UL Master Label for system.

END OF SECTION 16670