SECTION 26 41 13 – LIGHTNING PROTECTION FOR STRUCTURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes lightning protection system for ordinary structures and pole-mounted lighting.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include layouts of lightning protection system, with details of components to be used in installation.
2. Include raceway locations needed for installation of conductors.
3. Details of air terminals, ground rods, ground rings, conductor supports, splices, and terminations, including concealment requirements.
4. Include roof attachment details, coordinated with roof installation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of roof adhesive for attaching roof-mounted air terminal assemblies, approved by roofing-material manufacturer.

C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For lightning protection system to include in maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include following:
    a. Dimensioned site plan showing dimensioned route of ground loop conductor and ground rod locations. Comply with requirements of Section 017839 "Project Record Documents."
    b. A system testing and inspection record, listing results of inspections and ground resistance tests, as recommended by NFPA 780, Annex D.

B. Completion Certificate: UL Master Label Certificate.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: UL-listed installer, category OWAY.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. UL Lightning Protection Standard: Comply with UL 96A requirements for Class I buildings.

B. Lightning Protection Components, Devices, and Accessories: Listed and labeled by qualified testing agency as complying with UL 96, and marked for intended location and application.

2.2 MATERIALS

A. Air Terminals:

1. Copper or Aluminum unless otherwise indicated.
2. Aluminum: 1/2-inch diameter by 12 or 18 inches long.
3. Copper: 3/8-inch diameter by 18 inches long.
4. Rounded tip.
5. Integral base support.

B. Class 1 Main Conductors:

1. Stranded Copper: 57,400 circular mils in diameter.
2. Aluminum: 98,600 circular mils in diameter.

C. Secondary Conductors:

1. Stranded Copper: 26,240 circular mils in diameter.
2. Aluminum: 41,400 circular mils in diameter.

D. Ground Loop Conductor: Stranded, tinned copper.

E. Ground Rods:

1. Material: Stainless steel.
2. Diameter: 3/4 inch.
3. Rods shall be not less than 120 inches long.

F. Conductor Splices and Connectors: Compression fittings that are installed with hydraulically operated tools, or exothermic welds, approved for use with class type.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install lightning protection components and systems per UL 96A.

B. Install conductors with direct paths from air terminals to ground connections. Avoid bends less than 90 degrees and 8 inches in radius and narrow loops.

C. Conceal conductors within normal view from exterior locations at grade within 200 feet of building. Comply with requirements for concealed installations in UL 96A.

1. Roof penetrations required for down conductors and connections to structural-steel framework shall be made using listed through-roof fitting and connector assemblies with solid rods and appropriate roof flashings. Use materials approved by roofing manufacturer for purpose. Conform to methods and materials required at roofing penetrations of lightning protection components to ensure compatibility with roofing specifications and warranty.
2. Install conduit where necessary to comply with conductor concealment requirements.
3. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's written instructions.

D. Ground Ring Electrode: Conductor shall be not less than main-size lightning conductor.

3.2 CONNECTIONS

A. Aboveground concealed connections, and connections in earth or concrete, shall be done by exothermic welds or by high-compression fittings listed for purpose.

B. Aboveground exposed connections shall be done using following types of connectors, listed and labeled for purpose: bolted connectors or exothermic weld.

C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3.3 CORROSION PROTECTION

A. Do not combine materials that can form electrolytic couple that will accelerate corrosion in 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.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Engage qualified special inspector to perform inspections as required to obtain UL Master Label for system.

B. Prepare test and inspection reports and certificates.

END OF SECTION