

# ENHANCED LIGHTNING PROTECTION SYSTEM SPECIFICATION

## SECTION 16670

### PART 1 – INSTALLATION

#### 1.01 SUMMARY

A. The lightning protection system shall be of the Controlled Leader Triggering type. The system shall be of the type to attract lightning from a predetermined collection volume and to safely conduct the lightning current to earth through a known and preferred route.

#### 1.02 STANDARDS OF QUALITY

- A. The CLT system equipment, contractor and installer shall be certified with the manufacturer.
- B. All components of the CLT system except the air terminal/mast assembly shall be NRTL listed where applicable and the certified installers shall be listed with the manufacturer of the CLT equipment.
- C. The CLT system certification and manufacturer's guarantees and warranties shall be submitted to the owner or owner's representative within thirty days of completion of the CLT system installation.

#### 1.03 SERVICE AND TESTING

- A. Installation of equipment shall be done under the direct supervision of a manufacturer certified installer.
- B. The complete lightning protection system shall be fully tested for ground resistance and continuity with the results to be recorded. The results of this ground test shall be forwarded to the manufacturer for final certification and for the issuance of the performance guarantee. All certification documents shall be forwarded to the Owner and/or the Owner's representative for evaluation, certification, archiving, and documentation.
- C. The ground resistance of the completed system shall be measured using IEEE "Fall of Potential Method" and shall be so noted on the Certified Ground Test Document. Ground resistance shall be ten (10) ohms or less.

#### 1.04 SUBMITTALS

- A. Product data for air terminal, down conductors, and grounding components shall be provided.
- B. Air terminal UL certification certificate.
- C. Manufacturer's generated drawing containing plan view and a minimum of two elevations. The drawings shall include the locations of all Enhanced air terminals and the competing points of the structure.

## **PART 2 – PRODUCTS**

### **2.01 CLT AIR TERMINAL**

- A. The complete CLT air terminal shall consist of a hybrid assembly consisting of either: a stainless steel hybrid air terminal, with the CLT initiator, spark gap triggering mechanism, and be completely assembled with a threaded base for connection to mast. The CLT air terminal shall not be radioactive nor require batteries or external power sources for the operation. The entire assembly shall bear a manufacturer's serial number with each completed air terminal assembly. The DYNASPHERE Enhanced Air Terminal by ERICO, Inc. is acceptable.

### **2.02 CONDUCTORS**

- A. Copper conductors shall be 28 strands of 14-gauge wire rope lay, with a net weight of 375 pounds per 1,000 feet, minimum, or copper strip of equivalent capacity or approved equal conductor material.
- B. All conductors shall be secured every 3'0" maximum. Fasteners and clips utilized shall be of equal corrosion resistance as the material being secured.
- C. Bonding of all conductive material within six (6) feet of the conductor shall be accomplished via secondary conductor no smaller than #6 copper.
- D. Conductors shall be installed so that all wire runs shall always have a horizontal or downward path, free of "U" or "V" pockets, with the exception that an eight (8) inch maximum rise or a rise of three (3) inches maximum from every twelve (12) inches of conductor length shall be permitted in a main conductor run.
- E. Each CLT terminal shall have two (2) paths to ground from the base plate of the mast, with the exception of an elevated mast that may have a single conductor run for a maximum of sixteen (16) feet before two (2) down conductors shall be initiated.
- F. The electrical contractor shall furnish and install all necessary PVC conduits (1") for concealed down conductors.
- G. No bend of a conductor shall be less than ninety (90) degrees and shall not have a radius of bend of less than eight (8) inches. Exceptions are through roof and wall assemblies and "T" connections using manufacturer approved hardware.
- H. All PVC and Fiberglass conduits for each down conductor shall comply with the National Electric Code.
- I. All PVC and Fiberglass conduits shall provide a junction/pull box at 200' intervals (maximum spacing) for wire rope installation. All PVC conduits shall have no more than 360 degrees of turns from base of CLT mast to grade with no more than (4)- 90 degree turns maximum per down conductor.

### **2.03 LIGHTNING EVENT COUNTER**

- A. The lightning event counter shall be coupled to the down conductor through a current transformer and shall measure any discharge of greater than 1500 amperes when exposed to a 8/20 uSEC peak current. The counter shall be self powered.

## 2.04 MAST & GROUNDING

- A. Mast height to be determined by the area of protection, with threaded connections for the CLT air terminal and manufacturer's approved bonding hardware for cable to mast connection.
- B. Ground rods shall be a 3/4" x 10' long and consist of a delta configuration. They shall be installed a minimum of one foot below grade and a minimum of two feet from the foundation. All connections shall be exothermically welded.
- C. A minimum of one (1) inspection and test well, rated for the traffic of the installation area, shall be installed for each completed system.
- D. Bonding of grounded systems shall be via main size conductors. The bonding shall be accomplished to achieve equal potential of all grounds. All underground connections shall be via exothermic welding, CADWELD by ERICO or other approved equal manufacturer.

## 2.05 CONNECTORS, FITTINGS, FASTENERS, AND HARDWARE

- A. All conductor mast to ground path connections to be exothermically welded.
- B. Provide all connectors, fittings, fasteners, clamps, lugs crimps, and miscellaneous hardware as required to connect the install on all parts of the system.
- C. All equipment shall be fabricated from copper and/or bronze, aluminum or stainless steel.

## 2.05 CERTIFIED INSTALLER

- A. Equipment shall be manufactured by ERICO, Inc. and shall be furnished and installed by a certified installer, such as BONDED LIGHTNING PROTECTION SYSTEMS, INC. (561)746-4336

## **PART 3 - EXECUTION**

### 3.01 INSTALLATION – GENERAL

- A. Installation shall be accomplished in a professional manner by a certified installer of verifiable CLT systems. Installations shall be certified by the manufacturer.
- B. All work installed in accessible locations shall be properly guarded and protected.
- C. All material shall be installed in a manner to prevent electrolytic action under presence of moisture. All below grade connections shall be exothermic.
- D. All wall or other building penetrations shall be made in a manner to prevent the ingress of water or moisture.
- E. PVC sleeves shall be provided where conductors pass through all floors furnished and installed by Electrical Contractor.
- F. The completed system shall be digitally recorded and documented during installation. Documentation is to be returned to manufacturer for certification and issuance of the manufacturer's certification.