

SECTION 16170

GROUNDING AND BONDING

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Grounding Electrodes and Conductors.
- B. Equipment Grounding Conductors.
- C. Bonding.

1.2 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.3 GROUNDING ELECTRODE SYSTEM

- A. Concrete-encased Electrode.
- B. Rod Electrode.

1.4 PERFORMANCE REQUIREMENTS

- A. Grounding System Resistance: 5 ohms or less.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Test Reports: Indicate overall resistance to ground.
- C. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation and installation of exothermic connectors.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700 – Contract Closeout.
- B. Accurately record actual locations of grounding electrodes.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

1.8 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.

- B. Furnish products listed and classified by Underwriters Laboratories, Inc., or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

2. PART 2 PRODUCTS

2.1 ROD ELECTRODE

- A. Material: Copper or Copper-clad steel.
- B. Diameter: 3/4 inch.
- C. Length: 10 feet.

2.2 MECHANICAL CONNECTORS

- A. Material: Bronze.

2.3 EXOTHERMIC CONNECTIONS

- A. Manufacturers:
 - 1. Cadweld.
 - 2. Substitutions: Under provisions of Section 01600 – Material and Equipment.

2.4 WIRE

- A. Material: Stranded copper.
- B. Foundation Electrodes: 2/0 AWG.
- C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 INSTALLATION

- A. Install Products in accordance with manufacturer's instructions.
- B. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.
- C. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Coordinate with structural contractor to arrange for conductor attachment to reinforcing steel.
- D. Provide isolated grounding conductor for circuits supplying instrumentation system.

3.3 INTERFACE WITH OTHER PRODUCTS

- A. Interface with transient voltage surge protection system installed under Section 16675 – Transient Voltage Surge Suppression.

3.4 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
- B. Use suitable test instrument to measure resistance to ground of system. Submit report to Engineer stating resistance measured and methods used to measure. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method. Engineer shall be present for testing. Inform Engineer one week prior to test date.

END OF SECTION