PART 1 - GENERAL

1.01 SECTION INCLUDES

1. Grounding Electrodes and Conductors
2. Equipment Grounding Conductors
3. Power System Grounding/Bonding
4. Communication System Grounding
5. Electrical Equipment and Raceway Grounding and Bonding
6. Building Grounding/Bonding Detail

1.02 RELATED SECTIONS

1. Section 26 21 16 Service Entrance.
2. Section 26 41 13 Lightning Protection Systems.
3. Section 26 43 00 Surge Protective Devices
4. Section 26 43 13 Surge Protective Devices for Data and Low Voltage Systems

1.03 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70 / NEC Article 250.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. (UL) or NRTL, as suitable for purpose specified and shown.

1.04 SYSTEM DESCRIPTION

A. Ground the electrical service system neutral and each separately-derived system (i.e., transformers and generators) neutral at service entrance equipment within five feet (5') of entrance to building to metallic water service, concrete encased rebar, to building steel, and to supplementary grounding electrodes.

B. All low voltage communication systems shall be bonded per the grounding detail.

1.05 SUBMITTALS

A. Submit shop drawings under provisions of Division 01.

B. Indicate location of system grounding electrode connections and routing of grounding electrode conductor.

1.06 PERFORMANCE REQUIREMENTS

The grounding system installed on permanent building and structures shall provide a maximum of 5 ohms resistance to ground. Grounding systems installed on relocatable structures and play courts shall provide a maximum of 10 ohms resistance to ground.

PART 2 - PRODUCTS

2.01 ROD ELECTRODE

1. Material: Copper-clad steel
2. Diameter: 3/4 inch for permanently installed buildings and structures; 5/8 inch for relocatables and play courts
3. Length: 20 feet minimum

2.02 MECHANICAL COUPLINGS (GROUND RODS)

Material: Bronze

2.03 WIRE

1. Material: Solid copper 4 AWG and smaller. Stranded copper larger than 4 AWG
2. Foundation Electrodes: 4 AWG copper
3. Grounding Electrode Conductor: Sized to meet National Electrical Code Table 250-66 requirements

2.04 GENERAL

All connections shall be exothermic welds to made electrodes (Erico CADWELD or equal). Access boxes shall be provided for inspections, whether in sidewalks, concrete, or landscape areas. Provide an Eritech T416B HDP inspection well for each driven ground rod.

PART 3 - EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

1. Install products in accordance with manufacturer's instructions.
2. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.
3. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Minimum twenty feet (20') continuous/unbroken per NEC.
4. Provide grounding and bonding at Utility Company's metering equipment and pad- mounted transformer.
5. Connect grounding electrode conductors to metal water pipe using a suitable ground clamp. Make connections to flanged piping at street side of flange. Provide bonding jumper around water meter.
6. Provide bonding to meet Regulatory Requirements.
7. Bond together metal siding not attached to grounded structure.
8. Bond together each metallic raceway, pipe, and other metal objects.
9. Provide minimum #12 equipment grounding conductors in all raceways including FAS/Intercom or Paging/CATV/Data/Telecommunications/Power/Lighting/etc. per NEC.
10. Provide a separate, insulated equipment grounding conductor in feeder and branch circuits. Terminate each end on a grounding lug, bus, or ground bar.
11. Provide a system bonding jumper from each separately derived system to connect the equipment grounding conductors of the separately derived system to the grounded conductor. The grounded conductor of the separately derived system shall be bonded to the equipment grounding conductors at the transformer of origin.
12. The following systems and/or equipment shall be bonded in strict accordance with the NEC as minimum requirements:
13. Fire alarm systems
14. Intercommunication/Paging systems
15. Building power/lighting systems
16. Raceway and conduit systems
17. Telecommunication systems
18. Lightning protection systems/SPD
19. Non-current carrying metal parts of all motors, panels, and other electrically operated equipment
20. CATV Systems
21. Use minimum 4 AWG copper conductor for communications service bonding conductor.
22. All connections to ground rods, footer steel and ground rings shall be made by exothermic welds. Also see Electrical Distribution Grounding System detail and ground buss on contract drawings.
23. All ground rod installations shall be a minimum 20' in total length.

3.03 FIELD QUALITY CONTROL

1. Inspect grounding and bonding system conductors and connections for tightness and proper installation.
2. Prior to energizing, measure ground resistance from system neutral connection at service entrance to convenient ground reference point using suitable ground testing equipment. Resistance shall not exceed 5 ohms for permanent buildings and structures and 10 ohms for relocatables and play courts.
3. Use suitable test instrument to measure resistance to ground of system. Perform testing in accordance with test instrument manufacturer's recommendations using the fall-of-potential method. Submit test results to Engineer for review and approval.

3.04 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 01

B. Accurately record actual locations of grounding electrodes

C. Test Reports: Indicate overall resistance to ground and resistance of each electrode

Appendix Reference: Electrical Distribution Grounding System Detail (2 pages)

**END OF SECTION**