SECTION 16060
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION
A. Provide conduits, wires, ground rods, and other miscellaneous materials as specified and as required for a complete electrical grounding system per Article 250 of the latest applicable California Electrical Code.

1.2 QUALITY ASSURANCE
A. All materials shall be U.L. listing.

1.3 REFERENCES
A. ES-07/Ground Detail for Padmount H.V. Transformer in the Facility Design Guide.
C. IEEE-142-2007

PART 2 - PRODUCTS

2.1 GROUND RODS
A. Solid copper or copper clad steel rod. Rod shall be 5/8” minimum diameter 10’ in length.

2.2 BARE COPPER GROUND WIRE
A. Medium hard drawn solid copper conductor, stranded, sizes as shown on drawings.

2.3 HARDWARE
A. Bolts, nuts and washers shall be bronze, cadmium plated steel, or other non-corrosive material, approved for the purpose.

2.4 INSULATED GROUND WIRE
A. Soft drawn stranded copper rated for 600V.
PART 3 - EXECUTION

3.1 GROUNDING ELECTRODE SYSTEM

A. Grounding electrode system shall bond all of the following electrodes where they exist:
   1. Metal water pipe.
   2. Building structural metal columns.
   3. Concrete-encased electrodes (Ufer Ground).
   4. Ground rods.

B. The above grounding electrodes are bonded together to form a grounding electrode system. The bonding conductor shall be sized per the CEC tables.

3.2 CIRCUIT AND SYSTEM GROUNDING

A. Separately derived systems shall be grounded in accordance with Article 250-5 (d) in the latest applicable California Electrical Code.

B. Grounding conductors shall be copper.

3.3 ELECTRICAL EQUIPMENT GROUNDING

A. Ground non-current carrying metal parts of electrical equipment enclosures, frames, conductor raceways or cable trays to provide a low impedance path for line-to-ground fault current and to bond all non-current carrying metal parts together. Install a ground conductor in each raceway system where shown or where required by code. Equipment ground conductors shall be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per latest applicable California Electrical Code.

B. Grounding Conductors: Green for 6 AWG and smaller. For 4 AWG and larger, identify with green tape at both ends and all visible points including in all junction boxes.

C. Install metal raceway couplings, fittings and terminations secure and tight to insure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure and at concentric knock-outs.

D. Motors shall be connected to equipment ground conductors with a conduit grounding bushing and with a bolted solderless lug connection on the metal frame.

3.4 BONDING

A. Bonding shall be provided to assure electrical continuity and the capacity to conduct safely any fault current likely to be imposed.
B. Bonding shall be in accordance with the latest applicable California Electrical Code.

3.5 INTERCONNECTION OF GROUNDING SYSTEMS

A. Bond lightning protection grounding system to building grounding system electrode system.

B. Bond all wall mounted ground busses to building grounding electrode system.

3.6 GROUND RESISTANCE TEST

A. Three point fall-of-potential ground resistance measurements for the grounding electrode system shall be taken and submitted to the Stanford Project Manager.

B. Test results shall be in writing and shall show temperature and humidity. The ground resistance shall not exceed 0.5 ohms at 60 Hz.

END OF SECTION