Ground Rod Requirments

SECTION 700.04(a) Ground Rods is replaced with the following:

(a) Grounding Electrodes: Grounding electrodes (rods) shall be installed in accordance with the requirements of the NEC or by any other methods approved by the Engineer. Grounding electrodes shall be installed utilizing a hydraulic/pneumatic/electric hammer drill driving device with an electrode drive bit to minimize damage to the electrode tip. Electrode drive bit shall be designed for ¾" electrodes. Grounding electrodes shall include a grounding electrode conductor & grounding electrode clamp.

The following procedures shall apply for Electrical Service Grounding Electrode installations only:

- Grounding electrodes & grounding electrode conductors shall be installed in the presence of the Engineer at a date & time mutually agreed.

- Grounding electrode & grounding electrode conductors shall be connected utilizing exothermic welds. Exothermic welds shall be deigned for the size conductor & grounding electrodes, and shall be installed in accordance with the manufacturer's instructions. Grounding electrode conductors & grounding electrodes shall be cleaned to remove oxidation & any other foreign material from the surface before performing the exothermic welds.

- Primary grounding electrode(s) shall not have a resistance to ground of more than 25 Ohms. A 10-foot section of grounding electrode shall have a minimum of eight (8) foot contact with soil. Grounding electrodes shall be spaced a minimum of 10 feet between all electrodes.

- Primary grounding electrode(s) shall be installed vertically to a depth of 40 feet or until refusal. If the vertical grounding electrode cannot be installed to a minimum of eight (8) foot contact with soil, the contractor shall install a grounding electrode at an angle of no more than 45 degrees to a depth of 40 feet or until refusal. If refusal

occurs prior to installing the electrode to a minimum of eight (8) foot contact with soil, the contractor shall remove the electrode or cut the electrode off six (6) inches below grade & abandon.

. Primary grounding electrode(s) meeting the above requirements shall be augmented with an additional grounding electrode & connected in parallel to the primary grounding electrode to form a system. The augmented electrode shall be a single electrode driven to a depth of four (4) inches below the finished grade. If refusal occurs prior to installing the electrode to a minimum of eight (8) foot contact with soil, the contractor shall remove the electrode or cut the electrode off six (6) inches below grade & abandon.

. Grounding electrodes shall be coupled at each section with couplers or exothermic welded splices. The grounding electrode conductor shall be installed to a depth of 18" below grade when connecting the primary electrode & augmented grounding electrodes.

. The contractor shall install a JB-2C junction box at the primary grounding electrode location for access to the electrode, for connection & testing. Grounding electrode conductor(s) shall be installed under the bottom flange of the JB-2C. The grounding electrode shall be centered in the bottom of the JB-2C with a minimum of six (6) inches exposed. The JB-2C cover shall have the letters "VDOT ELEC" cast in the depression on top.

. The contractor shall notify the Engineer of those location(s) where primary grounding electrodes do not conform to the following:

- Resistance does not measure 25 Ohms or less;
- Grounding electrode does not have eight (8) foot contact with soil.

For those conditions indicated above, the Engineer will advise the contractor how to proceed

Grounding Electrode Testing: Primary grounding

electrodes shall be tested after each 10-foot grounding electrode and/or section thereof is installed utilizing the Fall of Potential (3-point measurement) method. After the primary grounding electrode is installed & tested, the contractor shall connect to the augmented electrode(s) to conduct a system test. The contractor shall disconnect the grounding electrode conductor from the service equipment ground bus & bonding bushing before testing the grounding electrodes/ system. The contractor shall test the grounding electrode as required by the manufacturer's instructions for the type of earth testing equipment. The contractor shall record the readings on a form provided by the City Traffic Engineer. The completed form shall be signed & submitted to the Engineer after installation of the electrical service grounding.