

## Technical Specification 030.01

### Grounding and Bonding

#### 1.0 General

- a) This specification provides general guidance on the grounding and bonding requirements for electrical systems and equipment.
- b) The electrical contractor shall furnish all labor, materials, tools, equipment and related items required to furnish and install all required electrical grounding and bonding as required by the National Electric Code (NEC).

#### 2.0 Reference Standards

- a) All electrical grounding and bonding shall comply with these reference standards and also with all local codes and ordinances:
  - 1) NEC – National Electrical Code
  - 2) OSHA – Occupational Safety and Health Administration
  - 3) ANSI – American National Standards Institute
  - 4) IEEE – Institute of Electrical and Electronics Engineers
  - 5) NEMA – National Electric Manufacturers Association
  - 6) Brunswick County Standard Details
  - 7) Brunswick County Technical Specification TS 028.01: General Electrical Information
  - 8) Brunswick County Technical Specification TS 029.01: Electrical Services
  - 9) Brunswick County Technical Specification TS 031.01: Surge Protection

#### 3.0 Submittals

- a) The electrical contractor shall submit shop drawings and other submittals to the Engineer for review and approval prior to beginning work.

#### 4.0 Grounding and Bonding Conductors

- a) Install all grounding and bonding in accordance with the National Electrical Code Article 250: Grounding and Bonding.
- b) All grounding electrode conductors at County sewer pump stations shall be exothermically welded to the pump station grounding electrodes per County pump station Standard Details.

- c) Comply with any other special instructions in the approved drawings or as directed by the Engineer or Brunswick County staff.

## **5.0 Field Quality Control**

- a) If a maximum ground-resistance level has been specified in the Contract Documents the electrical contractor shall test the completed grounding system at each location where a ground-resistance level is specified, at the service disconnect enclosure grounding terminal, at all ground test wells, and / or as directed by the Engineer.
  - 1) NEC Article 250 requires a single electrode consisting of a rod, pipe, or plate to have a resistance to ground of twenty-five (25) ohms or less, or an additional electrode must be installed.
- b) The electrical contractor shall measure ground resistance not less than two (2) full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage, and without chemical treatment or other artificial means of reducing the natural ground resistance.
- c) Perform the ground resistance tests in accordance with IEEE – 81: *Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System*
- d) Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, and identify each by letter in alphabetical order, and keyed to the record of tests and observations. Include the number of ground rods driven and their depth at each location and include observations of weather and other phenomena that may affect the test results. Describe any measures taken to improve test results.
- e) If resistance to ground exceeds the specified values the electrical contractor shall notify the Engineer and include any recommendations to reduce the ground resistance to meet the specified requirements.

## **6.0 Payment**

- a) No separate payment will be made for Grounding and Bonding. All costs incurred by the electrical contractor for this work should be included in the unit price or lump sum price for the item of work to which it pertains.