



Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

January 18, 2012

Monica Gourdine
Program Operations Engineer
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section **620**
Proposed Specification: **6200000 Traffic Control Signal and Device Installation
Grounding.**

Dear Ms. Gourdine:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

These changes were proposed by the Traffic Operations, Product Evaluation, and Specifications Offices as part of an ongoing effort to consolidate the Minimum Specifications for Traffic Control Signals and Devices (MSTCSD) and Standard Specifications for Road and Bridge Construction. The material requirements for grounding have been moved from Section A620 to Section 620. Only editorial changes have been made to the material requirements.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4280.

Sincerely,

Signature on file

Rudy Powell, Jr., P.E.
State Specifications Engineer

RP/dt

Attachment

cc: Calvin Johnson, Chief Civil Litigation
Florida Transportation Builders' Assoc.
State Construction Engineer

TRAFFIC CONTROL SIGNAL AND DEVICE INSTALLATION GROUNDING.(REV ~~11/2-1-30~~12/17-11)

SECTION 620 (Pages 736 – 738) is deleted and the following substituted:

SECTION 620
TRAFFIC CONTROL SIGNAL AND DEVICE
INSTALLATION GROUNDING

620-1 Description.

Install grounding for traffic signal *and device* installations to provide personnel and equipment protection against faults, surge currents and lightning transients.

620-2 Materials.

~~Use materials meeting the requirements of Section A620 of the current Minimum Specifications for Traffic Control Signal Devices (MSTCSD), except as provided in 603-2.2.~~

620-2.1 Ground Rods: *Use ground rods made of copper-clad steel with a minimum diameter of 5/8 inches. Ground rod sections must be a minimum of 8 feet in length and manufactured for the sole purpose of providing electrical grounding.*

620-2.2 Grounding Conductors: *Use solid No. 6 AWG copper insulated (green) conductor for electrical or lightning protection ground from the system ground bus or barrier plates to the grounding electrode assembly ~~and from ground rod to ground rod~~. Use either solid or stranded No. 6 AWG copper insulated (green) conductor for all ground connections ~~other applications~~.*

620-2.3 Exothermic Grounding Bond: *Use materials from the same source, meeting the requirements of the Institute of Electrical and Electronics Engineers Standards- 80 and 837.*

620-2.4 Ground Rod Coupling Devices: *Use a coupling device for grounding electrode to grounding electrode connections approved by the Engineer.*

620-3 Requirements for Grounding.

620-3.1 General: Meet all local electrical codes which exceed these Specifications. Install all grounding conductors, which bond grounding electrode assemblies, 18 inches below finished grade. Accomplish grounding for any element of a traffic *control* signal *and device* installation by installing either a grounding electrode assembly or a grounding electrode array, unless otherwise specified in the Contract Documents.

~~Use solid No. 6 AWG copper insulated (green) conductor for electrical or lightning protection ground from the system ground bus or barrier plate(s) to the grounding electrodes and from grounding electrode to grounding electrode. Use either solid or stranded No. 6 AWG copper insulated (green) conductor for all other applications.~~

Bond all grounding electrode assemblies and arrays together and place in a location that minimizes the length of the grounding conductor between the assembly or array and the element being grounded.

Install 40 feet of ground assembly or array for each of the following elements:

- (a) Electric power service
- (b) Pole with electrical power service installed

- (c) Pole mounted cabinet with electrical power service installed
- (d) Controller or detector cabinet

Install 20 feet of ground assembly or array for each of the following elements:

- (a) Pole
- (b) Pedestals for pedestrian signals
- (c) Metal cover used with pull boxes with AC power

Ensure that all separately grounded elements at an intersection are bonded together to form an intersection grounding network.

For span wire assemblies, use the span wire to connect the grounding electrode assemblies or arrays of the poles.

Do not install a grounding electrode assembly or array for a base mounted cabinet within 6 feet of a grounding electrode assembly or array installed for a pole.

Make all bonds between ground wires and grounding electrode assemblies or arrays with an exothermic bond with the following exception: do not exothermically bond grounding electrode to grounding electrode connections or the system ground bussbar or barrier plate connections located within a cabinet. ~~Use exothermic materials from the same source to make all the exothermic bonds at an intersection, meeting the requirements of the IEEE standards 80 and 837.~~

620-3.2 Grounding Electrode Assembly: Provide a grounding electrode assembly consisting of one or more grounding electrodes coupled together, such that the total length of the electrodes in the assembly is a minimum of 20 feet, driven into the earth at a single point, without disrupting the electrical continuity of the assembly.

~~Use a coupling device for grounding electrode to grounding electrode connections approved by the Engineer.~~

Install the grounding electrode assembly so that the final elevation at the top is 6 inches below finished earth grade. Mark the location of the assembly with a stake and keep uncovered until the Engineer performs a final inspection of the installation.

620-3.3 Grounding Electrode Array: Provide a grounding electrode array consisting of two or more grounding electrode assemblies, bonded together and spaced a minimum of 6 feet apart.

620-3.4 Grounding Poles: Ground all ~~metal~~ poles, including pedestals for pedestrian signals, in accordance with the details for grounding and connections shown in the Design Standards, ~~Index No. 17727~~.

For non-metallic *traffic signal* poles, including pedestals for pedestrian signals, accommodate the ground connection from signal heads and span wires to the ground electrode assembly or array located at the pole base in accordance with the details in the Design Standards, Index No. 17727.

When erecting new metal poles within 10 feet of existing metal poles or structures, bond the new and existing poles or structures together.

620-3.5 Grounding Electric Power Service: Ground all electric power services in accordance with the details for grounding and connections shown in the Design Standards, Index No. 17736.

620-3.6 Grounding Controller or Detector Cabinets: Ground controller or detector cabinets to the bussbar located in the cabinet. Place the grounding electrode assembly or array as close to the cabinet as possible.

620-3.7 Grounding Span Wire Mounted Signal Heads and Electrically Powered

Signs: Ground span wire mounted signal heads and electrically powered signs through the span wire assembly in accordance with the details shown in the Design Standards, Index No. 17727.

Do not use guy wires for grounding purposes, however bond any guy wire to the span wire as part of the intersection grounding network.

620-4 Basis of Payment.

The work specified in this Section will not be paid for directly, but will be considered as incidental work.

**TRAFFIC CONTROL SIGNAL AND DEVICE INSTALLATION GROUNDING.
(REV 1-17-11)**

SECTION 620 (Pages 736 – 738) is deleted and the following substituted:

**SECTION 620
TRAFFIC CONTROL SIGNAL AND DEVICE
INSTALLATION GROUNDING**

620-1 Description.

Install grounding for traffic signal and device installations to provide personnel and equipment protection against faults, surge currents and lightning transients.

620-2 Materials.

620-2.1 Ground Rods: Use ground rods made of copper-clad steel with a minimum diameter of 5/8 inches. Ground rod sections must be a minimum of 8 feet in length and manufactured for the sole purpose of providing electrical grounding.

620-2.2 Grounding Conductors: Use solid No. 6 AWG copper insulated (green) conductor for electrical or lightning protection ground from the system ground bus or barrier plates to the grounding electrode assembly. Use either solid or stranded No. 6 AWG copper insulated (green) conductor for all ground connections.

620-2.3 Exothermic Grounding Bond: Use materials from the same source, meeting the requirements of the Institute of Electrical and Electronics Engineers Standards 80 and 837.

620-2.4 Ground Rod Coupling Devices: Use a coupling device for grounding electrode to grounding electrode connections approved by the Engineer.

620-3 Requirements for Grounding.

620-3.1 General: Meet all local electrical codes which exceed these Specifications. Install all grounding conductors, which bond grounding electrode assemblies, 18 inches below finished grade. Accomplish grounding for any element of a traffic control signal and device installation by installing either a grounding electrode assembly or a grounding electrode array, unless otherwise specified in the Contract Documents.

Bond all grounding electrode assemblies and arrays together and place in a location that minimizes the length of the grounding conductor between the assembly or array and the element being grounded.

Install 40 feet of ground assembly or array for each of the following elements:

- (a) Electric power service
- (b) Pole with electrical power service installed
- (c) Pole mounted cabinet with electrical power service installed
- (d) Controller or detector cabinet

Install 20 feet of ground assembly or array for each of the following elements:

- (a) Pole
- (b) Pedestals for pedestrian signals
- (c) Metal cover used with pull boxes with AC power

Ensure that all separately grounded elements at an intersection are bonded together to form an intersection grounding network.

For span wire assemblies, use the span wire to connect the grounding electrode assemblies or arrays of the poles.

Do not install a grounding electrode assembly or array for a base mounted cabinet within 6 feet of a grounding electrode assembly or array installed for a pole.

Make all bonds between ground wires and grounding electrode assemblies or arrays with an exothermic bond with the following exception: do not exothermically bond grounding electrode to grounding electrode connections or the system ground bussbar or barrier plate connections located within a cabinet.

620-3.2 Grounding Electrode Assembly: Provide a grounding electrode assembly consisting of one or more grounding electrodes coupled together, such that the total length of the electrodes in the assembly is a minimum of 20 feet, driven into the earth at a single point, without disrupting the electrical continuity of the assembly.

Install the grounding electrode assembly so that the final elevation at the top is 6 inches below finished earth grade. Mark the location of the assembly with a stake and keep uncovered until the Engineer performs a final inspection of the installation.

620-3.3 Grounding Electrode Array: Provide a grounding electrode array consisting of two or more grounding electrode assemblies, bonded together and spaced a minimum of 6 feet apart.

620-3.4 Grounding Poles: Ground all poles, including pedestals for pedestrian signals, in accordance with the details for grounding and connections shown in the Design Standards.

For non-metallic traffic signal poles, including pedestals for pedestrian signals, accommodate the ground connection from signal heads and span wires to the ground electrode assembly or array located at the pole base in accordance with the details in the Design Standards, Index No. 17727.

When erecting new metal poles within 10 feet of existing metal poles or structures, bond the new and existing poles or structures together.

620-3.5 Grounding Electric Power Service: Ground all electric power services in accordance with the details for grounding and connections shown in the Design Standards, Index No. 17736.

620-3.6 Grounding Controller or Detector Cabinets: Ground controller or detector cabinets to the bussbar located in the cabinet. Place the grounding electrode assembly or array as close to the cabinet as possible.

620-3.7 Grounding Span Wire Mounted Signal Heads and Electrically Powered Signs: Ground span wire mounted signal heads and electrically powered signs through the span wire assembly in accordance with the details shown in the Design Standards, Index No. 17727.

Do not use guy wires for grounding purposes, however bond any guy wire to the span wire as part of the intersection grounding network.

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