ORIGINATION FORM
Proposed Revisions to the Specifications

(Please provide all information - incomplete forms will be returned)

Date: November 4, 2020

Office: Traffic Engineering and Ope

Originator: Derek Vollmer

Specification Section: 620

Telephone: 850-921-7361

Article/Subarticle: 620-2.7,620-2.7.1 through 620-2.7

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****Will the proposed revision require changes to:**

Publication	Yes	No	Office Staff Contacted and date contacted
Standard Plans Index	○	◉	Rick Jenkins/Cheryl Hudsor
Traffic Engineering Manual	○	◉	Javier Ponce 10/19/20
FDOT Design Manual	○	◉	Bobby Bull 10/19/20
Construction Project Administration Manual	○	◉	Scott Arnold 10/19/20
Basis of Estimate/Pay Items	○	◉	Melissa Hollis 10/19/20
Structures Design Guidelines	○	◉	Ben Goldsberry 10/19/20
Approved Product List	○	◉	Karen Byram 10/19/20
Materials Manual	○	◉	Tim Counts 10/19/20

**This section must be completed prior to processing proposed revisions.

Will this revision necessitate any of the following:

Design Bulletin ☐ **Construction Bulletin** ☐ **Estimates Bulletin** ☐ **Materials Bulletin** ☐

Are all references to external publications current? **Yes** ◉ **No** ○

If not, what references need to be updated? (Please include changes in the redline document.)

Why does the existing language need to be changed?

The materials subarticles (620-2.7, 620-2.7.1, 620-2.7.2, 620-2.7.3, 620-2.7.4, 620-2.7.5) have been moved Section 996 in Division III.

Summary of the changes:

The materials article in this section has been moved from Section 620 in Division II to Section 996 in Division III.

Are these changes applicable to all Department jobs? **Yes** ◉ **No** ○

If not, what are the restrictions?

Contact the State Specifications Office for assistance in completing this form.

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M E M O R A N D U M

DATE: December 17, 2020

TO: Specification Review Distribution List

FROM: Daniel Strickland, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **6200207 Grounding and Lightning Protection**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Derek Vollmer from the Traffic Engineering and Operations Office to move the materials section to Section 996 in Division III.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or online at http://fdotewp1.dot.state.fl.us/programmanagement/development/industryreview.aspx . Comments received after **January 14, 2021,** may not be considered. Your input is encouraged.

DS/rf

Attachment

GROUNDING AND LIGHTNING PROTECTION
(REV 11-5-20)

SUBARTICLE 620-2.7 is deleted and the following substituted:

620-2.7 Surge Protective Devices (SPDs): ~~Provide SPDs to protect electronics from lightning, transient voltage surges, and induced current.~~

Install SPDs on all power, data, video and any other conductive circuit. SPD requirements for lighting must meet the minimum requirements of Section 992 and the Standard Plans. Use SPDs that are listed on the Department's Approved Product List (APL).~~SPDs for traffic control devices, including intelligent transportation system (ITS) equipment, must be listed on the Department's Approved Product List (APL).~~

Provide primary and secondary surge protection on AC power at traffic control device field sites.

SUBARTICLE 620-2.7.1 is deleted and the following substituted:

620-2.7.1 SPD for 120 Volt or 120/240 Volt Power: Install a SPD at the utility disconnect to the cabinet. ~~Ensure that the SPD at the utility disconnect includes L-N, L-G, and N-G protection and has a maximum surge current rating of 50 kA per phase or greater. The SPD must meet the requirements of UL 1449, Third Edition and be listed by a NRTL.~~

Ensure an SPD is provided where the supply circuit enters the cabinet. Locate the SPD on the load side of the main disconnect and ahead of any and all electronic devices and connected in parallel with the AC supply. ~~Ensure that the SPD in the cabinet includes L-N, L-G, and N-G protection and has a maximum surge current rating of 50 kA per phase or greater. The SPD must meet the requirements of UL 1449, Third Edition and be listed by a NRTL.~~

~~Ensure that the SPD has a visual indication system that monitors the weakest link in each mode and shows normal operation or failure status and also provides one set of normally open (NO)/normally closed (NC) Form C contacts for remote alarm monitoring. The enclosure for a SPD shall have a NEMA 4 rating.~~

SUBARTICLE 620-2.7.2 is deleted and the following substituted:

620-2.7.2 SPD at Point of Use: Install a SPD at the point the ITS devices receive 120 volt power and connected in series with the circuits. ~~Ensure that these devices comply with the minimum functional requirements shown in Table 620-1. Ensure that the units are rated at 15 or 20 amps load and are configured with receptacles.~~

~~Ensure that these units have internal fuse protection and provide common mode (L+N-G) protection.~~

SUBARTICLE 620-2.7.3 is deleted and the following substituted:

620-2.7.3 SPDs for Low-Voltage Power, Control, Data and Signal Systems: Install a specialized SPD on all conductive circuits including, but not limited to, data communication cables, coaxial video cables, and low-voltage power cables. ~~Ensure that these devices comply with the minimum functional requirements shown in Table 620-1 for all available modes (i.e. power L-N, N-G; L-G, data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).~~

~~Table 620-1~~				
~~SPD Minimum Requirements~~				
~~Circuit Description~~	~~Clamping Voltage~~	~~Data Rate~~	~~Surge Capacity~~	~~Maximum Let-Through Voltage~~
~~12 V_{DC}~~	~~15-20 volts~~	~~N/A~~	~~5kA per mode (8x20 µs)~~	~~<150 Vpk~~
~~24 V_{AC}~~	~~30-55 volts~~	~~N/A~~	~~5kA per mode (8x20 µs)~~	~~<175 Vpk~~
~~48 V_{DC}~~	~~60-85 volts~~	~~N/A~~	~~5kA per mode (8x20 µs)~~	~~<200 Vpk~~
~~120 V_{AC} at POU~~	~~150-200 volts~~	~~N/A~~	~~20kA per mode (8x20 µs)~~	~~<550 Vpk~~
~~Coaxial Composite Video~~	~~4-8 volts~~	~~N/A~~	~~10kA per mode (8x20 µs)~~	~~<65 Vpk (8x20 µs/1.2x50µs; 6kV, 3kA)~~
~~RS422/RS485~~	~~8-15 volts~~	~~Up to 10 Mbps~~	~~10kA per mode (8x20 µs)~~	~~<30 Vpk~~
~~T1~~	~~13-30 volts~~	~~Up to 10 Mbps~~	~~10kA per mode (8x20 µs)~~	~~<30 Vpk~~
~~Ethernet Data~~	~~7-12 volts~~	~~Up to 1 Gbps~~	~~1kA per mode (10x1000 µs)~~	~~<30 Vpk~~
~~POE~~	~~60-70 volts~~	~~Up to 1 Gbps~~	~~5kA per mode (8x20 µs~~	~~<200Vpk (100kHz 0.5µs; 6kV, 500A)~~

~~Ensure that SPDs meet the requirements of UL 497B or UL 497C, as applicable, and are listed by a NRTL.~~

SUBARTICLE 620-2.7.4 is deleted:

~~**620-2.7.4 Mechanical Specifications:** Ensure equipment is permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number. All parts must be made of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal.~~

SUBARTICLE 620-2.7.5 is deleted:

~~**620-2.7.5 Environmental Specifications:** Ensure that SPDs operate properly during and after being subjected to the temperature and humidity test described in NEMA TS 2, Section 2.2.7, and the vibration and shock tests described in NEMA TS 2, Sections 2.2.8., and 2.2.9.~~

SUBARTICLE 620-2.7.6 is deleted and the following substituted:

620-2.7.~~6~~ 4 Manufacturer's Warranty: Ensure that the SPD has a manufacturer's warranty covering failures for a minimum of 10 years from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608.

The term "failure" for warranty replacement is defined as follows:

Parallel-connected, power-rated SPD units are considered in failure mode when any of the visual indicators shows failure mode when power is applied to the terminals at the unit's rated voltage, or the properly functioning over-current protective device will not reset after tripping.

Series-connected, low-voltage power, data, or signal units are considered in the failure mode when an open circuit condition is created and no data/signal will pass through the SPD device or a signal lead is permanently connected to ground.

In the event that the SPD, including any component of the unit, should fail during the warranty period, the entire SPD shall be replaced by the manufacturer at no cost to the Department or maintaining agency.