Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

OFFCE OF THE
SECRETARY

February 15, 2011

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

Re: Office of Design, Specifications
Section 785
Proposed Specification: 7850204 Intelligent Transportation Systems – Infrastructure - REVISED

Dear Ms. Gourdine:

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

These changes were proposed by Gene Glotzbach to clarify requirements for the use of surge protective devices (SPD).

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

RPft/
Attachment
cc: Gregory Jones, Chief Civil Litigation
Florida Transportation Builders' Assoc.
State Construction Engineer

INTELLIGENT TRANSPORTATION SYSTEMS - INFRASTRUCTURE.

(REV ~~11-10-10~~*1-31-11*) ~~(FA 1-5-11) (7-11)~~

SUBARTICLE 785-2.4 (of the Supplemental Specifications) is deleted and the following substituted:

785-2.4 Surge Protective Devices:

785-2.4.1 General: Provide all ITS field installation sites with both primary and secondary surge protection on the AC power. Connect the primary surge protection at the service entrance or main disconnect. Connect the secondary surge protection on the power distribution to the equipment.

785-2.4.2 ~~Type 1~~ SPD at Power Entry Point: Install a SPD at the closest termination/disconnection point where the supply circuit enters the ITS device cabinet. Locate the SPD on the load side of the main disconnect and ahead of any and all ITS electronic devices. Configure the SPD to operate at 120 volt single phase (i.e., line, neutral and ground) or 120/240 volt single phase (line 1, line 2, neutral and ground) as required to match the supply circuit configuration. *Ensure that the SPD maximum surge current rating is 80kA per phase or greater.* Verify that the SPD has been labeled to indicate that the unit is UL listed and meets the requirements of UL 1449, Third Edition.

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.

785-2.4.3 SPD at Point of Use: Install a SPD at the point the ITS devices receive 120 volt power. Ensure that the units are rated at 15 or 20 amps load and a minimum of 20kA of surge current capacity and configured with receptacles.

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

785-2.4.4 SPD 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 functional requirements shown in Table 785-1 for all available modes (i.e. power L-N, N-G; data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

Table 785-1

SPD Minimum Requirements

Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
12 VDC	15-20 V	N/A	5kA per mode (8x20 µs)	<150 Vpk

Table 785-1				
SPD Minimum Requirements				
Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
24 VAC	30-55 V	N/A	5kA per mode (8x20 µs)	<175 Vpk
48 VDC	60-85 V	N/A	5kA per mode (8x20 µs)	<200 Vpk
120 VAC at POU	150-200 V	N/A	20kA per mode (8x20 µs)	<550 Vpk
Coaxial Composite Video	4-8 V	N/A	10kA per mode (8x20 µs)	<30 Vpk
RS422/RS485	8-15 V	Up to 10 Mbps	10kA per mode (8x20 µs)	<30 Vpk
T1	13-30 V	Up to 10 Mbps	10kA per mode (8x20 µs)	<30 Vpk
Ethernet Data	7-12 V	Up to 1 Gbps	1kA per mode (10x1000 µs)	<30 Vpk

Install a SPD that has an operating voltage matching the characteristics of the circuit. Ensure that these specialized SPDs are UL 497B or UL 497C listed, as applicable.

INTELLIGENT TRANSPORTATION SYSTEMS - INFRASTRUCTURE.
(REV 1-31-11)

SUBARTICLE 785-2.4 (of the Supplemental Specifications) is deleted and the following substituted:

785-2.4 Surge Protective Devices:

785-2.4.1 General: Provide all ITS field installation sites with both primary and secondary surge protection on the AC power. Connect the primary surge protection at the service entrance or main disconnect. Connect the secondary surge protection on the power distribution to the equipment.

785-2.4.2 SPD at Power Entry Point: Install a SPD at the closest termination/disconnection point where the supply circuit enters the ITS device cabinet. Locate the SPD on the load side of the main disconnect and ahead of any and all ITS electronic devices. Configure the SPD to operate at 120 volt single phase (i.e., line, neutral and ground) or 120/240 volt single phase (line 1, line 2, neutral and ground) as required to match the supply circuit configuration. Ensure that the SPD maximum surge current rating is 80kA per phase or greater. Verify that the SPD has been labeled to indicate that the unit is UL listed and meets the requirements of UL 1449, Third Edition.

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.

785-2.4.3 SPD at Point of Use: Install a SPD at the point the ITS devices receive 120 volt power. Ensure that the units are rated at 15 or 20 amps load and a minimum of 20kA of surge current capacity and configured with receptacles.

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

785-2.4.4 SPD 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 functional requirements shown in Table 785-1 for all available modes (i.e. power L-N, N-G; data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

Table 785-1

SPD Minimum Requirements

Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
12 VDC	15-20 V	N/A	5kA per mode (8x20 µs)	<150 Vpk

Table 785-1				
SPD Minimum Requirements				
Circuit Description	Clamping Voltage	Data Rate	Surge Capacity	Maximum Let-Through Voltage
24 VAC	30-55 V	N/A	5kA per mode (8x20 µs)	<175 Vpk
48 VDC	60-85 V	N/A	5kA per mode (8x20 µs)	<200 Vpk
120 VAC at POU	150-200 V	N/A	20kA per mode (8x20 µs)	<550 Vpk
Coaxial Composite Video	4-8 V	N/A	10kA per mode (8x20 µs)	<30 Vpk
RS422/RS485	8-15 V	Up to 10 Mbps	10kA per mode (8x20 µs)	<30 Vpk
T1	13-30 V	Up to 10 Mbps	10kA per mode (8x20 µs)	<30 Vpk
Ethernet Data	7-12 V	Up to 1 Gbps	1kA per mode (10x1000 µs)	<30 Vpk

Install a SPD that has an operating voltage matching the characteristics of the circuit. Ensure that these specialized SPDs are UL 497B or UL 497C listed, as applicable.