TRANSIENT VOLTAGE SURGE SUPPRESSION SPECIFICATIONS SECTION16XXX

Part 1 -- GENERAL:

A. DESCRIPTION:

1. This section describes the materials and installation requirements for a Surge Protective Device (SPD) also known as a Transient Voltage Surge Suppressor (TVSS). Surge protective devices are used for the protection of all AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.

B. RELATED WORK SPECIFIED ELSEWHERE:

- 1. General electrical requirements
- 2. Raceways, boxes, and fittings
- **3.** Wire and cable
- 4. Low Voltage motor control
- **5.** Variable frequency drives
- **6.** Grounding
- 7. Lightning protection system

C. SUBMITTALS:

- 1. Submit product data and manufacturer's installation instructions.
- 2. The SPD submittals shall also include:
 - a. Dimensional drawing of each suppressor types indicating mounting arrangements.
 - **b.** UL 1449, Second Edition clamping voltage documentation.

D. TEST REPORTS

- 1. The SPD manufacturer shall provide test results, on request, for the models shipped.
- 2. The test conducted shall be per ANSI C62.41.2 2002 and ANSI C62.45- 2002. The units shall be tested in all modes listed in this specification for Category C.

E. WARRANTY

1. The surge suppressor manufacturer shall warrant the surge protective devices and supporting components against defects in material and workmanship for a period of ten years.

F. MANUFACTURER QUALIFICATIONS

- 1. Surge protective devices shall be manufactured in the USA, by a company normally engaged in the design and manufacture of such devices for at least five (5) years.
- 2. Both the service entrance and distribution panel SPDs shall be of the same manufacturer.

G. SAFETY AGENCY APPROVALS

1. Suppressors shall be listed in accordance with UL 1449, Second Edition standard for safety, transient voltage surge suppressors. They shall also be CSA or cUL approved.

Part 2 -- PRODUCTS:

A. <u>SERVICE ENTRANCE:</u>

- 1. Surge Protective Devices shall be installed at all service entrances of each building and/or as shown on the riser diagram.
- 2. Suppressors shall be tested with a Category C High exposure waveform of 10KA, 8/20 µsec.
- **3.** Wye systems shall have suppression elements between each phase conductor and the system neutral, between each phase conductor and the system ground and between the neutral conductor and ground.
- **4.** The surge suppressor shall have a Short Circuit Current Rating (SCCR) per NEC 2002, Article 285, up to a maximum of 200 kA.
- 5. Visible indication of proper suppressor connection and operation shall be provided.

- 6. The surge protective device shall be equipped with an audible alarm that shall actuate when any part of the surge circuitry has been damaged. A silence button shall be provided with the alarm.
- 7. Suppressors shall meet or exceed the following criteria:
 - **a.** Minimum current rating (L-N + L-G): 120,000 amperes per phase.
 - b. UL 1449, Second Edition Clamping voltage shall not exceed the following:

VOLTAGE	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>
120/208	400V	$\overline{400V}$	$\overline{400V}$
277/480	800V	800V	800V

- 8. Suppressors shall consist of solid-state components and shall operate bi-directionally.
- **9.** Maximum continuous operating voltage of the suppressor shall be greater than 115% of the nominal system voltage.
- **10.** The following equipment is approved per the above specifications:
 - **a.** Model # 500 MP, 400MP, 320MP, 250MP/xxx/xxx, 160P/xxx/xxx, and 200/120BPF/xxx/xxx. (xxx/xxx is voltage shown above)

B. SECONDARY SERVICE SUPPRESSORS FOR DISTRIBUTION PANELS:

- 1. Surge Protective Devices shall be installed at designated distribution panels as shown on the riser diagram.
- 2. The surge suppressor shall have a Short Circuit Current Rating (SCCR) per NEC 2002, Article 285.
- 3. Wye systems shall have suppression elements between each phase conductor and the system neutral, between each phase conductor and the system ground and between the neutral conductor and ground.
- 4. Visible indication of proper suppressor connection and operation shall be provided.
- 5. The surge protective device shall be equipped with an audible alarm (where available) that shall actuate when any part of the surge circuitry has been damaged.
- 6. Suppressors shall meet or exceed the following criteria:
 - **a.** Minimum current rating (L-N + L-G): 80,000 amperes per phase.
 - **b.** UL 1449, Second Edition Clamping voltage shall not exceed the following:

VOLTAGE	<u>L-N</u>	<u>L-G</u>	<u>N-G</u>
120/208	$\overline{400V}$	$\overline{400V}$	400V
277/480	800V	800V	800V

- 7. Suppressors shall consist of solid-state components and operate bi-directionally.
- 8. Maximum continuous operating voltage of the suppressor shall be greater than 115% of the nominal system voltage.
- 9. The following equipment is approved per the above specifications:
 - **a.** Model #'s 160P/xxx/xxx, 200/120BP(F)/xxx/xxx, 100W(F)/xxx/xxx, 80W/E/xxx/xxx, OSW/E/xxx/xxx (xxx/xxx is voltage shown above)

Part 3 -- EXECUTION:

A. SERVICE ENTRANCE

- 1. Install one primary suppressor at each utility service entrance or as indicated on the riser diagram. Follow manufacturer's installation instructions.
- 2. Suppressor shall be installed on the load side of the service entrance.
- **3.** Conductors between suppressor and point of attachment shall be at least #6 AWG stranded copper conductor or larger. The conductors shall be kept as short and straight as possible.
- 4. Suppressor's ground shall be connected to the service entrance ground.

B. SECONDARY DISTRIBUTION PANELS

- 1. Install one secondary suppressor at each distribution panel location or as indicated on the riser diagram. Follow manufacturer's installation instructions.
- 2. Suppressor shall be installed on the distribution panel, per the manufacturer's installation instructions. Contractor shall install a circuit breaker in the distribution panel, matched to the connecting wire size to the Surge Protective Device, per National and Local codes.
- **3.** Conductors between the Surge Protective Device and point of attachment shall be at least #10 AWG stranded copper conductor or larger. The conductors shall be kept as short and straight as possible.

End of Section