SECTION 27 11 13

COMMUNICATIONS PROTECTION

BASED ON DFD MASTER SPECIFICATION DATED 09/03/24

Notes to A/E:

This section has been written to cover most (but not all) project requirements that you will encounter. Depending on the project, you may need to add material, delete items, or modify what is currently written.

Edit all areas as applicable to meet the requirements of the project. Common options or features recognized by the DFD, or items where A/E input is needed are enclosed in [brackets] and/or <less-greater brackets>.

Editing instructions are included throughout the document (italic text; red if viewed/printed in color). Delete these instructions for final printing.

The document is structured to automatically update the Table of Contents when printed or in response to an “Update Field” command (right mouse click on TOC opens menu) in MS-Word. Confirm that changes to the document outline are reflected in the TOC. TOC entries are Hyperlinks and can be used to navigate the document.

Revision History:

In the on-line “DFD Document Library” Under “Master Specifications/Design Guidelines / Division 27 – Communications” see “Div. 27 Revision History”.

1. GENERAL

Scope

This Section describes the general, product and execution requirements relating to equipment required in for the protection of cables entering a building. Included are the following topics:

[PART 1 - GENERAL](#_Toc175826086)

[Scope](#_Toc175826087)

[Related Work](#_Toc175826088)

[References](#_Toc175826089)

[Submittals](#_Toc175826090)

[PART 2 - PRODUCTS](#_Toc175826091)

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[PART 3 - EXECUTION](#_Toc175826094)

[General](#_Toc175826095)

[Identification and Labeling](#_Toc175826096)

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Related Work

Applicable provisions of Division 1 govern work under this Section.

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 26 05 00 – Common Work Results for Electrical

Section 26 05 26 – Grounding and Bonding for Electrical Systems

Section 27 05 53 – Identification for Communications Systems

Section 27 08 00 – Commissioning of Communications

Section 27 10 00 – Structured Cabling

References

All work and materials shall conform in every detail to the rules and requirements of the National Fire Protection Association, the Wisconsin Electrical Code and present manufacturing standards.

All materials shall be listed by UL and shall bear the UL label. If UL has no published standards for a particular item, then other national independent testing standards shall apply and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.

Applicable standards include the following:

* ANSI/IEEE C2 - National Electrical Safety Code
* SPS Chapter 316 – Wisconsin Dept. of Safety and Professional Services Electrical Code
* TIA-568-C.0, -568-C.1, -568-C.2, -569-C, -606-B and standards referenced therein
* IEEE/ANSI 142-1982 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
* TIA-607-C - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
* UL 497 - Protectors for Paired-Conductor Communications Circuits
* UL 497B - Protectors for Data Communications and Fire-Alarm Circuits
* Telcordia GR-1089-CORE - Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment

Submittals

Refer to Section 27 10 00 – Structured Cabling.

1. PRODUCTS

Building Entrance Terminal / Protector

Legacy Voice Application

Building Entrance Terminal (BET) shall incorporate Gas Tube type devices containing a two element, wide-gap gas tube providing a 265-425 VDC breakdown for lightning/over voltage protection and have a fail-safe design to protect personnel and equipment from exposure to sustained high voltages or currents. BET shall be equipped with such devices for all pairs terminated on the BET.

BET and Protector Modules shall meet or be better than the requirements of UL 497 ‑ Standard for Protectors for Paired-Conductor Communications Circuits.

Construction:

* Interface: Input - Termination Block; Output - Termination Block

Block type on the BET shall be the same type as used for termination of new cabling in the Communications Main Equipment Room.

Unit shall incorporate a grounding lug that will accept a #6 AWG ground wire.

Surge Protection Device

Network Application

Intended for use on network connection to outdoor-mounted devices (Wireless Access Point, Security Camera).

Protects high-performance 4-pair cables. All pairs protected.

Construction:

* [Individual (single cable) Unit] [Rack-mounted, multi-cable Unit; <##>-ports]
* Solid-State design.
* Interface: Input - [Termination Block] [8P8C Modular Jack]; Output - [Termination Block] [8P8C Modular Jack]
* Supports [Shielded (F/UTP) Cable] [Unshielded (UTP) Cable]
* Incorporates a grounding lug that will accept a #6 AWG ground wire.

Where a weatherproof unit is required:

* Heavy-duty, weatherproof ABS or cast metal enclosure.
* Incorporates weatherproof cable gland at cable entry points. Gland opening is large enough to pass 8P8C Modular jack so pre-terminated cables can be used.

Performance:

* Meets [TIA Category 5e] [TIA Category 6] [TIA Category 6A]
* Protects 10/100/1000[/10G] Base-T Ethernet networks.
* Provides protection for both common- and differential-mode surges.
* Supports Modes A and B of 802.11af (PoE) and 802.11at (PoE+) standards.
* Meets UL Primary (497) and Isolated Loop (497B)
Complies with Telcordia GR-1089-CORE (Intra-Building).

Environmental:

* Operating Temperature: -40°F – 158°F (-40°C – 70°C)
* Maximum Humidity: 90% non-condensing

The following is to be included only where a DAS supporting Cellular services is included in the project. This is unusual.

Protection-related content for Emergency Responder Radio Coverage Systems is covered in specification Section 28 05 37.

Where both are included, coordinate with Division 28 designer to integrate design and specification content as applicable.

Cellular DAS Application - Donor Antenna Down-lead

Intended for placement on downlead between donor antenna and BDA.

Bi-Directional Operation.

Suitable for intended operating frequencies.

Construction:

* Listed rating meets or exceeds requirements of installation environment
* Threaded (Male) interface both ends matching downlead connector type.
* Weatherproof when installed.
* Incorporates a grounding lug or other means that will accept a #6 AWG ground wire.
1. EXECUTION

General

Refer to Project Drawings which indicate device and termination location(s).

Provide hardware and equipment as shown on drawings and as specified herein.

Comply with manufacturers recommendations for use and installation of the product.

Position Protection as close to building entrance as practicable or as noted on drawings. Document location on record documents.

If a special tool is required to open the BET housing or Protector Enclosure, provide (1) tool for each BET location. Turn over as “miscellaneous materials” to DFD Construction Representative at completion of the work.

Building Entrance Terminal

Provide a listed primary protector on all inter-building backbone copper pairs.

Surge Protection Devices

Provide a Surge Protector on horizontal copper cabling for all exterior network devices (e.g. security camera, wireless access point) as noted on project drawings. Position Surge Protector between the Equipment Outlet (or device if cabling is terminated in a modular plug) and the Network Switch serving the device.

Where a mid-span PoE Injector is used, position Surge Protector between the Equipment Outlet (or device) and the PoE Injector.

## Grounding & Bonding

Bond Building Entrance Terminals (BET) and/or Surge Protector to an approved ground using a #6 AWG (minimum) solid copper conductor (green jacket) or per manufacturer’s installation instructions. Confirm grounding plan with DFD prior to construction. Unless noted otherwise on drawings, assume the following grounding plan for each application:

* Building Entrance Terminal – Bond to Telecommunications Grounding System.
* Surge Protector (Network application)
* Protector at Telecom Room – Bond to Telecommunications Grounding System.
* Protector at Building Perimeter – Bond to Telecommunications Grounding System.
* Surge Protector (DAS application) – Bond to bus bar positioned in enclosure at Donor Antenna location. [Add reference to applicable “DAS” specification section.]

Identification and Labeling

Refer to Section 27 05 53 “Identification for Communications Systems” for General Identification and Labeling guidelines for this Project.

Building Entrance Terminal

Where 110-type Termination Blocks are the physical interface, Designation Strip color shall be BROWN (Inter-Building Backbone).

Label Designation Strips with:

* Cable Origin & Destination.
* Pair Number to match plan for Voice Field.

Surge Protection Devices

Label Surge Protectors for network or DAS applications to indicate function.

Testing and Acceptance

See specification Section 27 10 00 - Structured Cabling.

Documentation

Refer to specification Section 27 10 00 – Structured Cabling for format and distribution requirements.

Identify protective device locations and grounding plan on as-built drawings.

Warranty

See Division 1, GENERAL CONDITIONS, and GENERAL REQUIREMENTS - Guarantee Documents for general requirements.

Building Entrance Terminal – 2 years

Surge Protector – 10-years

END OF SECTION