

SECTION 26 05 36 {16133}

CABLE TRAYS FOR ELECTRICAL SYSTEMS

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PART 1 GENERAL

1.1 SUMMARY

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, tests and services to install complete cable tray systems as shown on the drawings.
- B. Cable tray systems are defined to include, but are not limited to straight sections of cable trays, fittings, drop-outs, supports and accessories.
- C. Related Sections:
 - 1. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
 - 2. Section 26 05 29 - Hangers and Supports for Electrical Systems
- D. Related Sections:
 - 1. Section 16060 - Grounding and Bonding for Electrical Systems.
 - 2. Section 16070 - Hangers and Supports for Electrical Systems

1.2 REFERENCES

List reference standards included within text of this section. Edit the following for Project conditions.

- A. ASTM International:
 - 1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. National Electrical Manufacturers Association:
 - 1. NEMA VE 1-2009 - Metal Cable Tray Systems.
 - 2. NEMA VE 2-2013 - Cable Tray Installation Guidelines.
- C. ANSI/NFPA 70 – National Electrical Code

1.3 DRAWINGS

- A. The drawings, which constitute a part of these specifications, indicate the general route of the cable runway systems. Data presented on these drawings is as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification of all dimensions, routing, etc., is required.

- B. Specifications and drawings are for assistance and guidance, but exact routing, locations, distances and levels will be governed by actual field conditions. Contractor is directed to make field surveys as part of his work prior to submitting system layout drawings.

1.4 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of cable trays and fittings of types and capacities required, whose products have been in satisfactory use in similar service for not less than 10 years.
- B. NEMA Compliance: Comply with NEMA Standards Publication Number VE1, "Cable Tray Systems".
- C. NEC Compliance: Comply with NEC, as applicable to construction and installation of cable tray and cable channel systems (Article 392, NEC).
- D. UL Compliance: Provide products that are UL-classified and labeled.
- E. NFPA Compliance: Comply with NFPA 70B, "Recommended Practice for Electrical Equipment Maintenance" pertaining to installation of cable tray systems.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver cable tray systems and components carefully to avoid breakage, denting and scoring finishes. Do not install damaged equipment.
- B. Store cable trays and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials should be unpacked and dried before storage.

1.6 SUBMITTALS

[Click here](#) to visit the Cooper B Line design center for CAD drawings, submittals, test results, etc.

- A. Section **01 33 00 - Submittal Procedures** {01330 - Submittal Procedures}: Submittal procedures.
- B. Shop Drawings: Indicate tray type, dimensions, support points, and finishes.
- C. Product Data: Submit fittings and accessories.
- D. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.7 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements {01700 - Execution Requirements}: Closeout procedures.
- B. Project Record Documents: Record actual routing of cable tray and locations of supports.

1.8 QUALIFICATIONS

Include the following paragraph when manufacturer's list is not included or when substitutions are allowed and the following requirements apply.

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum ten years [documented] experience [,and with service facilities within [500] [_____] miles of Project].

1.9 PRE-INSTALLATION MEETINGS

- A. Section 01 30 00 - Administrative Requirements {01300 - Administrative Requirements}: Pre-installation meeting.
- B. Convene minimum [one] [_____] week prior to commencing work of this section.

PART 2 PRODUCTS

NEMA VE 1 Class designation, indicated in the following specifications for metal cable tray, is support span in feet (meters) plus working load designation.

Available Support Spans: 8, 12, 16, and 20 feet (2440, 3660, 4870, and 6090 mm).

Working Load Designation:

- A - 50 pounds per foot (74.4 kg/m).
- B - 75 pounds per foot (111.6 kg/m).
- C - 100 pounds per foot (148.8 kg/m).

For example, Class 12B applies to cable tray required to span 12 feet (3660 mm) between supports while supporting a minimum cable static weight of 75 pounds per foot (111.6 kg/m).

Consult NEMA VE 1 for additional information and safety factors.

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with these specifications, cable tray and cable channel systems shall be as manufactured by Eaton's B-Line Business (formerly Cooper B-Line, Inc.) [or engineer approved equal].

[Click here](#) for a complete listing of B-Line cable tray.

- B. Manufacturers:
1. Eaton's B-Line Business - Kwik Splice™ Series Cable Tray
 2. [_____] Model [_____].
 3. [_____] Model [_____].

2.2 CABLE TRAY SECTIONS AND COMPONENTS

- A. General: Except as otherwise indicated, provide metal cable trays, of types, classes, and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features. Cable tray shall be installed according to the latest revision of NEMA VE-2.
- B. Material and Finish: Straight section, fitting side rails, rungs and splice plates shall be extruded from Aluminum Association Alloy 6063. All fabricated parts shall be made from Aluminum Association Alloy 5052.

2.3 TYPE OF TRAY SYSTEM

- A. Ladder Cable Trays shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to both side rails. Both side rails and rungs shall be I-beam configuration. Side rails shall have a splice retention groove to accept a splice plate. Rungs shall be spaced [4] [6] [9] [12] inches on center. Rung spacing in radiused fittings shall be industry standard 9" and measured at the center of the tray's width. **Each rung must be capable of supporting a 200 lb. concentrated load on top of the catalogued design load at the center of a 18" wide cable tray (with a safety factor of 1.5) .**
- B. Ventilated Bottom Cable Trays shall consist of two longitudinal members (side rails) with rungs spaced 4" on center.
- C. Solid Bottom Cable Trays shall consist of two longitudinal members (side rails) with a solid sheet over rungs spaced on 12" centers.
- D. Cable tray loading depth shall be [3] [4] [5] inches per NEMA VE-1.
- E. Straight sections shall be supplied in standard [10 foot (3.05m)] [12 foot (3.65m)] lengths.

- F. Cable tray widths shall be [6] [9] [12] [18] [24] [30] [36] inches or as shown on drawings.
- G. Splice plates shall have a maximum of (2) two nuts and bolts per plate. The resistance of fixed splice connections between adjacent sections of tray shall not exceed 0.00033 ohms. Splice plates shall be furnished with straight sections and fittings.

All horizontal fittings (horizontal bend, horizontal tee, horizontal cross) to be installed utilizing B-Line Kwik Splice™ Universal Fitting. All vertical fittings must have a minimum radius of [12] [24] inches.

***** [OR] *****

All fittings must have a minimum radius of [12] [24] inches.

2.4 LOADING CAPACITIES

- A. Cable trays shall meet NEMA class designation:
{NEMA 12A: [50 lbs./ft. on a 12 ft. span]} OR {NEMA 12B: [75 lbs./ft. on a 12 ft. span]}.

***** [OR] *****

- B. Cable tray shall be capable of carrying a uniformly distributed load of _____ lbs./ft on a _____ foot support span with a safety factor of 1.5 when supported as a simple span and tested per NEMA VE 1 Section 5.2.

2.5 ACCESSORIES

- A. Covers:
 - 1. Furnish only where indicated on the Drawings.
 - 2. Solid or ventilated as indicated.
 - 3. Same manufacturer and material as the tray.
 - 4. Secure covers with manufacturer's approved clamps.
 - 5. Clamp spacing per manufacturer's recommendations.
- B. Dividers:
 - 1. Manufactured by the cable tray manufacturer of the same material as the tray.
- C. Mounting hardware:
 - 1. Zinc coated tray bolts, nuts, and fasteners: quantity not to exceed two each per splice plate.
- D. Trapeze Supports
 - 1. Manufactured by the cable tray manufacturer of the same material as the tray.
- E. Cable Exit Options

1. Radiused drop outs must be utilized for cables exiting the cable tray through the rungs or over either side rail

***** [OR] *****

2. Conduit connectors must be utilized to securely connect the conduit runs to the cable tray when a cable exits through the rungs or over either side rail.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install cable trays as indicated: Installation shall be in accordance with equipment manufacturer's instructions, and with recognized industry practices to ensure that cable tray equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA-VE2 for general cable tray installation guidelines.
- B. Coordinate cable tray with other electrical work as necessary to properly integrate installation of cable tray work with other work.
- C. Provide sufficient space encompassing cable trays to permit access for installing and maintaining cables.
- D. Cable tray fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports per NEMA VE-2 guidelines, or in accordance with manufacturer's instructions.

3.2 TESTING

- A. Test cable trays to ensure electrical continuity of bonding and grounding connections, and to demonstrate compliance with specified maximum grounding resistance. See NFPA 70B, Chapter 18, for testing and test methods.
- B. Manufacturer shall provide test reports witnessed by an independent testing laboratory of the "worst case" loading conditions outlined in this specification and performed in accordance with the latest revision of NEMA VE-1/CSA C22.2 No. 126. 1-09.

END OF SECTION