

SECTION 26 05 37
CABLE TROUGH FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

- A. Cable Tray shall be manufactured and tested per one or more of the following: Underwriter's Laboratories, Inc, CSA, ETL, and NEMA.

1.2 DESCRIPTION

- A. Complete assembly of steel cable tray system and necessary accessories shall be provided as shown on plans. Install entire cable tray system in accordance with all local governing codes.

1.3 SUBMITTALS

- A. Submittal drawings, in the form of "8 ½ x 11" catalog cut sheets, shall be provided for the following items: cable trays, fittings, accessories and load data.
- B. Submit as required here in and under Section 26 00 10.
- C. Shop Drawings: Indicate tray type, material dimensions, support points, expansion splice plates, NEMA class, and finishes.
- D. Product Data: Provide data for fittings and accessories.
- E. Manufacturer's Instructions: Indicate 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.
- F. Submit cable each system capacity in pounds per linear foot. Submit deflection at stated capacity.

1.4 SUMMARY

- A. Section Includes:
 - 1. Manufacturers
 - 2. Materials and Finishes
 - 3. Wire Trough Accessories
 - 4. Warning Signs
 - 5. Source Quality Control
- B. Meet the following performance requirements:
 - 1. Seismic performance: In accordance with Section 26 00 10.
- C. System Description:
 - 1. Raceways to support electrical systems.
- D.

1.5 RELATED SECTIONS

- A. Section 26 00 10 – Basic electrical requirements, is an integral part of this section. Requirements and work indicated in 26 00 10 are not repeated in this Section.

1.6 COORDINATION

- A. Coordinate work under provisions indicated in Section 26 00 10.

1.7 QUALIFICATIONS / QUALITY ASSURANCE

- A. Conform to requirements indicated in Section 26 00 10.

1.8 REGULATORY REQUIREMENTS

- A. Conform to requirements indicated in Section 26 00 10.
- B. ASTM A-123: Hot Dip Galvanized After Fabrication.
- C. ASTM A-525: Hot-Dip Mill Galvanized Before Fabrication.
- D. NEMA VE 1: Metallic Trough Systems.ANSI/TIA/EIA - 568-B Commercial Building Telecommunications Cabling Standard.
- E. ANSI/TIA/EIA – 569-A Commercial Building Standard for Telecommunications Pathways and Spaces

1.9 EXTRA MATERIALS

- A. Furnish under provisions indicated in Section 26 00 10.

1.10 PROJECT RECORD DOCUMENTS

- A. Submit under provisions indicated in Section 26 00 10.

1.11 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions indicated in Section 26 00 10.

1.12 WARRANTY

- A. Provide under provisions indicated in Section 26 00 10.

1.13 LEED / SUSTAINABILITY

- A. Conform to requirements indicated in Section 26 00 10.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Trough Tray shall be manufactured from galvanized Steel, G90 or equal.

2.2 SOLID TROUGH TRAY

- A. Steel Trough Tray shall be constructed of a single formed sheet of material, incorporating internal flanges of 7/8"W x 1/2"H. Each tray length shall possess four holes per end for the connection of a splice connector or other accessories. The Trough Tray shall be 120" in length at widths and heights as shown on plans.

2.3 FITTINGS

- A. Splice Connectors - Steel Sections of Trough Tray and all other fittings shall be joined by using U-Splice connectors. The U-Splice connector shall be U-shaped, and shall nest around the exterior of the tray. Each U-Splice shall be attached utilizing eight 3/8" Hex Bolts and Flange nuts. U-Splices shall allow for thermal expansion of tray.
- B. Tray Covers - Steel, as well as other accessories shall be constructed of compatible material and design. Covers shall be field installed and rigidly secured by means of self tapping screws. Covers shall be solid.

2.4 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the manufacturer specified:
 - 1. Cooper B-Line, Inc.
 - 2. MONO-SYSTEMS, Inc.
 - 3. Substitutions: Under provisions of Section 26 00 10.

2.5 SUPPORTS

- A. A. Each Steel Trough Tray section shall be supported on maximum 10 foot centers, (3.0 meters) in Canada, by two .50 inch (12mm) pieces of threaded rod which attach to an appropriately sized trapeze system supporting the tray. All mounting and trapeze materials shall be furnished and installed by others.

2.6 OPTIONAL PAINTED FINISHES

- A. Optional powder coated painted finish to be applied to the outer surfaces of the cable tray and associated components. Prior to the application of the powder coat all surfaces shall be cleaned and have an iron phosphate film applied. The color shall be

2.7 MATERIALS AND FINISHES

- A. Cable Trays, Fittings, and Accessories:
 - 1. Steel, complying with NEMA VE 1 Hot-dip galvanized after fabrication, complying with ASTM A 123/A 123M, Class B2; with chromium-zinc, ASTM F 1136, or Type 316 stainless-steel hardware.
 - 2. Stainless steel, Type 304 or 316, complying with NEMA VE 1.

2.8 TROUGH TRAYS

- A. Refer to drawings for sizes

2.9 CABLE TRAY ACCESSORIES

- A. Fittings: Tees, crosses, risers, elbows, and other fittings as indicated, of same materials and finishes as cable tray.
- B. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.
- C. Turns, elbows, tees, crosses etc shall be large radius.
- D. Waterfalls shall be provided at each location cable drop out of tray without conduit.

- E. Barrier Strips: Same materials and finishes as cable tray.

2.10 WARNING SIGNS

- A. Lettering: 1-1/2-inch- (40-mm-) high, black letters on yellow background with legend "WARNING! NOT TO BE USED AS WALKWAY, LADDER, OR SUPPORT FOR LADDERS OR PERSONNEL."
- B. Materials and fastening are specified in Division 26 Section "Identification for Electrical Systems."

2.11 SOURCE QUALITY CONTROL

- A. Perform design and production tests according to NEMA FG 1 and NEMA VE 1.

PART 3 - EXECUTION

3.1 MANUFACTURERS

- A. Company specializing in manufacturing products specified in this section must have a minimum of ten years documented experience.

3.2 CABLE TRAY INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Comply with recommendations in NEMA VE 2. Install as a complete system, including all necessary fasteners, hold-down clips, splice-plate support systems, barrier strips, hinged horizontal and vertical splice plates, elbows, reducers, tees, and crosses.
- C. Remove burrs and sharp edges from troughs.
- D. Fasten cable tray supports to building structure and install seismic restraints.
 - 1. Design each fastener and support to carry load indicated by seismic requirements and to comply with seismic-restraint details according to Division 26 Section "Vibration and Seismic Controls for Electrical Systems."
 - 2. Place supports so that spans do not exceed maximum spans on schedules.
 - 3. Construct supports from channel members, threaded rods, and other appurtenances furnished by cable tray manufacturer. Arrange supports in trapeze or wall-bracket form as required by application.
 - 4. Support bus assembly to prevent twisting from eccentric loading.
 - 5. Manufacture center-hung support, designed for 60 percent versus 40 percent eccentric loading condition, with a safety factor of 3.
 - 6. Locate and install supports according to NEMA FG 1 and NEMA VE 1.
- E. Support trays in accordance with Section 260529. Provide supports at each connection point, at the end of each run of each side of expansion connectors, within 2 feet, and at other points to maintain spacing between supports of 4 feet maximum for runway and basket tray and 10 maximum for ladder cable tray.
- F. Provide sway supports that will support a 200 lb sideward thrust from either direction at least on each end of cable rack but not more than 40 feet apart.
- G. Install expansion connectors where trough crosses building expansion joints and in cable tray runs that exceed dimensions recommended in NEMA FG 1 and NEMA VE 1. Space connectors and set gaps according to applicable standard.

- H. Make changes in direction and elevation using standard fittings.
- I. Make trough connections using standard fittings.
- J. Seal penetrations through fire and smoke barriers according to Division 07 Section "Penetration Firestopping" and Section 26 05 00 "Common Work Results for Electrical."
- K. Sleeves for Future Cables: Install capped sleeves for future cables through firestop-sealed cable tray penetrations of fire and smoke barriers.
- L. Workspace: Install trough trays with enough space to permit access for installing cables.
- M. After installation of troughs is completed, install warning signs in visible locations on or near cable trays.

3.3 CABLE INSTALLATION

- A. Install cables only when cable tray installation has been completed and inspected.

3.4 CONNECTIONS

- A. Ground cable trays according to manufacturer's written instructions.
- B. Install an insulated equipment grounding conductor with cable tray, in addition to those required by NFPA 70.
- C. Ground and bond cable tray under provisions of Section 260526 and as detailed on the Drawings.
 - 1. Provide continuity between tray components. Provide bonding conductor or fitting between sections
 - 2. Provide copper equipment grounding conductor through entire length of tray; bond to each component.
 - 3. Connections to tray may be made using mechanical or exothermic connectors.

3.5 FIELD QUALITY CONTROL

- A. After installing cable trays and after electrical circuitry has been energized, survey for compliance with requirements. Perform the following field quality-control survey:
 - 1. Visually inspect cable insulation for damage. Correct sharp corners, protuberances in cable tray, vibration, and thermal expansion and contraction conditions, which may cause or have caused damage.
 - 2. Verify that the number, size, and voltage of cables in cable tray do not exceed that permitted by NFPA 70. Verify that communication or data-processing circuits are separated from power circuits by barriers.
 - 3. Verify that there is no intrusion of such items as pipe, hangers, or other equipment that could damage cables.
 - 4. Remove deposits of dust, industrial process materials, trash of any description, and any blockage of tray ventilation.
 - 5. Visually inspect each cable tray joint and each ground connection for mechanical continuity. Check bolted connections between sections for corrosion. Clean and retorqued in suspect areas.
 - 6. Check for missing or damaged bolts, bolt heads, or nuts. When found, replace with specified hardware.
 - 7. Perform visual and mechanical checks for adequacy of cable tray grounding; verify that all takeoff raceways are bonded to cable tray.
- B. Report results in writing.

END OF SECTION