SECTION 260536 - CABLE TRAYS FOR ELECTRICAL SYSTEMS

Latest Update 5-6-2017 See underlined text for Edits.

(Engineer shall edit specifications and blue text in header to meet project requirements. This includes but is not limited to updating Equipment and/or Material Model Numbers indicated in the specifications and adding any additional specifications that may be required by the project. Also turn off all "Underlines".)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section and all other sections of Division 26.

1.2 SUMMARY

A. This Section includes aluminum cable trays and accessories.

1.3 SUBMITTALS

A. Product Data: Include data indicating dimensions and finishes for each type of cable tray indicated.

B. Shop Drawings: For each type of cable tray.

1. Show fabrication and installation details of cable tray, including plans, elevations, and sections of components and attachments to other construction elements. Designate components and accessories, including clamps, brackets, hanger rods, splice-plate connectors, expansion-joint assemblies, straight lengths, and fittings.

C. Coordination Drawings: Floor plans and sections, drawn to scale. Include scaled cable tray layout and relationships between components and adjacent structural, electrical, and mechanical elements. Show the following:

1. Vertical and horizontal offsets and transitions.
2. Clearances for access above and to side of cable trays.
3. Vertical elevation of cable trays above the floor or bottom of ceiling structure.

D. Field quality-control reports.

E. Operation and Maintenance Data: For cable trays to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain cable tray components through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store indoors to prevent water or other foreign materials from staining or adhering to cable tray. Unpack and dry wet materials before storage.

1.6 WARRANTY/GUARANTEE

A. See Division 26 Specification Section "Basic Electrical Requirements' for warranty and guarantee requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Cooper B-Line, Inc.
2. Cope, T. J., Inc.; a subsidiary of Allied Tube & Conduit.
3. GS Metals Corp.; GLOBETRAY Products.
4. MONO-SYSTEMS, Inc.
5. MPHusky.
6. PW Industries.

2.2 MATERIALS AND FINISHES

A. Cable Trays, Fittings, and Accessories: Steel, complying with NEMA VE 1.

1. Hot-dip galvanized after fabrication, complying with ASTM A 123/A 123M, Class B2; with chromium-zinc, ASTM F 1136, hardware.

B. Sizes and Configurations:

1. Ladder Type (Vertical Risers Only): Ladder type transverse rungs welded to side rails shall be [6] [9] [12] inches on center. Rungs shall have a minimum bearing surface of 3/4 inch radius edges.

2. Ventilated Trough Type: Corrugated trough bottoms shall be welded to the side rails and have a minimum cable bearing surface of 2-3/4 inches on [6[[9] inch centers. Ventilation holes (2-1/4 inch x 4 inch) shall be punched along the width of the valleys.

3. Dimensions:

   a. Tray width shall be [6] [9] [12] [18] [24] as shown on drawings.
   b. Side rails height inches/cable fill depth shall be [4/3] [5/4] [6/5] [7/6] inches.

2.3 CABLE TRAY ACCESSORIES

A. Fittings: Tees, crosses, risers, elbows, and other fittings as indicated, of same materials and finishes as cable tray.

1. Horizontal and vertical pivot splice blocks, connectors, as required.

2. Manufacturer's stiffener bars installed on all eighteen (18) inch wide sections to stabilize tray when loaded unevenly.

B. Barrier Strips: Same materials and finishes as cable tray.

C. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.

2.4 WARNING SIGNS

A. Lettering: 1-1/2-inch- 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."

2.5 SOURCE QUALITY CONTROL

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

PART 3 - EXECUTION

3.1 CABLE TRAY INSTALLATION

A. 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.

B. Remove burrs and sharp edges from cable trays.

C. Fasten cable tray supports to building structure.

1. Place supports so that spans do not exceed manufacturer's maximum spans.
2. 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.
3. Support bus assembly to prevent twisting from eccentric loading.
4. Manufacture center-hung support, designed for 60% versus 40% eccentric loading condition, with a safety factor of three (3).
5. Locate, design and install supports according to NEMA FG 1 NEMA VE 1, or the calculated load multiplied by a safety factor of four (4), or the calculated load plus two hundred (200) lbs (90 kg) whichever is the greater.

D. Retain paragraph below if cable tray connects to equipment. Make connections to equipment with flanged fittings fastened to cable tray and to equipment. Support cable tray independent of fittings. Do not carry weight of cable tray on equipment enclosure.

E. Retain first paragraph below if expansion fittings are required. Install expansion connectors where cable tray crosses building expansion joint and in cable tray runs that exceed dimensions recommended in NEMA FG 1 NEMA VE 1. Space connectors and set gaps according to applicable standard.

F. Make changes in direction and elevation using standard fittings.

G. Make cable tray connections using standard fittings.

H. Seal penetrations through fire and smoke barriers according to Division 07 Section "Penetration Firestopping."

I. Sleeves for Future Cables: Install capped sleeves for (25% growth) future cables through firestop-sealed cable tray penetrations of fire and smoke barriers.

J. Workspace: Install cable trays with minimum eighteen (18) inches above tray to permit access for installing cables.

K. Install barriers to separate cables of different systems, such as power, communications, and data processing. Mixing 600, 5,000 and 15,000 systems in the same cable tray is not permitted.

L. After installation of cable trays is completed, install warning signs in visible locations on or near cable trays.

3.2 CABLE INSTALLATION

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

B. Fasten cables on horizontal runs with cable clamps or cable ties as recommended by NEMA VE 2. Tighten clamps only enough to secure the cable, without indenting the cable jacket. Install cable ties with a tool that includes an automatic pressure-limiting device.

C. On vertical runs, fasten cables to tray every eighteen (18) inches. Install intermediate supports when cable weight exceeds the load-carrying capacity of the tray rungs.

D. In existing construction, remove inactive or dead cables from cable tray.

E. Install covers after installation of cable is completed. Delete this

3.3 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. Install insulated bonding jumper cable, sized per NEC, between bolted connections.

3.4 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 retorque 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.

3.5 PROTECTION

A. Protect installed cable trays.

1. Repair damage finishes with methods and products as recommended by cable tray manufacturer.
2. Install temporary protection for cables in open trays to protect exposed cables from falling objects or debris during construction. Temporary protection for cables and cable tray can be constructed of wood or metal materials until the risk of damage is over.

END OF SECTION 260536