

SECTION 27 05 36  
CABLE TRAYS FOR COMMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Wire-mesh cable tray.
  2. Cable tray accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of product.
1. Show fabrication and installation details of cable trays, 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. Delegated-Design Submittal: For seismic restraints.
1. Seismic-Restraint Details: Signed and sealed by a qualified professional engineer, licensed in the state where Project is located, responsible for their preparation.
  2. Design Calculations: Calculate requirements for selecting seismic restraints.
  3. Detail fabrication, including anchorages and attachments to structure and to supported cable trays.
- D. INFORMATIONAL SUBMITTALS
- E. Coordination Drawings: Floor plans and sections, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Include scaled cable tray layout and relationships between components and adjacent structural, electrical, and mechanical elements.
  2. Vertical and horizontal offsets and transitions.
  3. Clearances for access above and to side of cable trays.
  4. Vertical elevation of cable trays above the floor or below bottom of ceiling structure.
- F. Field quality-control reports.

## 2.1 GENERAL REQUIREMENTS FOR CABLE TRAYS

- A. Cable Trays and Accessories: Identified as defined in NFPA 70 and marked for intended location, application, and grounding.
  - 1. Source Limitations: Obtain cable trays and components from single manufacturer.
- B. Sizes and Configurations: See the Cable Tray Schedule on Drawings for specific requirements for types, materials, sizes, and configurations.
- C. Structural Performance: See articles on individual cable tray types for specific values for uniform load distribution, concentrated load, and load and safety factor parameters.
  - 1. Uniform Load Distribution: Capable of supporting a uniformly distributed load on the indicated support span when supported as a simple span and tested according to NEMA VE 1.
  - 2. Concentrated Load: A load applied at midpoint of span and centerline of tray.
  - 3. Load and Safety Factors: Applicable to both side rails and rung capacities.
- D. Seismic Criteria: Comply with seismic criteria defined in Section 260548 "Vibration and Seismic Controls for Electrical Systems."

## 2.2 WIRE-MESH CABLE TRAY

- A. Description:
  - 1. Configuration: Galvanized steel wire mesh, complying with NEMA VE 1.
  - 2. Width: As specified on drawings.
  - 3. Minimum Usable Load Depth: As specified on drawings.
  - 4. Straight Section Lengths: 10-feet except where shorter lengths are required to facilitate tray assembly.
  - 5. Structural Performance: Capable of supporting a maximum cable load, with a safety factor of 1.5, plus a 200-lb (90-kg) concentrated load, when tested according to NEMA VE 1.
  - 6. Class Designation: Comply with NEMA VE 1.
  - 7. Splicing Assemblies: Bolted type using serrated flange locknuts.
  - 8. Splice-Plate Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.
- B. Materials and Finishes:
  - 1. Steel:
    - a. Straight Sections and Fittings: Steel complies with the minimum mechanical properties of ASTM A1011.
    - b. Fasteners: Steel complies with the minimum mechanical properties of ASTM A510.
    - c. Finish: Powder-coat enamel paint.
      - 1) Powder-Coat Enamel: Cable tray manufacturer's recommended primer and corrosion-inhibiting treatment, with factory-applied powder-coat paint.
      - 2) COLOR: Electro zinc plated

### 2.3 WIRE-MESH CABLE TRAY ACCESSORIES

- A. Fittings: Tees, crosses, risers, elbows, and other fittings as indicated, of same materials and finishes as cable tray.
- B. Covers: Provide covered/ secured tray where indicated on drawings.
- C. Barrier Strips: Same materials and finishes as for cable tray.
- D. Cable tray supports and connectors, including bonding jumpers, as recommended by cable tray manufacturer.

### 2.4 SOURCE QUALITY CONTROL

- A. Testing: Test and inspect cable trays according to NEMA VE 1.

## PART 3 - EXECUTION

### 3.1 WIRE-MESH CABLE TRAY INSTALLATION

- A. Install cable trays according to NEMA VE 2.
- B. Install cable trays as a complete system, including fasteners, hold-down clips, support systems, barrier strips, adjustable horizontal and vertical splice plates, elbows, reducers, tees, crosses, cable dropouts, adapters, covers, and bonding.
- C. Fasten cable tray supports to building structure.
- D. Design fasteners and supports to carry cable tray, the cables, and a concentrated load of 200 lb (90 kg). Comply with requirements in Section 270529 "Hangers and Supports for Communications Systems.
- E. Support wire-basket cable trays with 2-rod trapeze hangers and wall brackets as required. Single, center support methods are not acceptable.
- F. Make connections to equipment with flanged fittings fastened to cable trays and to equipment. Support cable trays independent of fittings. Do not carry weight of cable trays on equipment enclosure.
- G. Install expansion connectors where cable trays cross building expansion joints and in cable tray runs that exceed dimensions recommended in NEMA VE 2. Space connectors and set gaps according to applicable standard.
- H. Seal penetrations through fire and smoke barriers. Comply with all local and national code firestopping requirements.
- I. Contract must include the installation of provide solid non-metallic button covers with finish to match wire-mesh cable tray for all sections of the conveyance system.

### 3.2 WIRE-MESH CABLE TRAY GROUNDING

- A. Ground cable trays according to NFPA 70 unless additional grounding is specified. Comply with requirements in Section 270526 "Grounding and Bonding for Communications Systems."
- B. Cable trays shall be bonded together with splice plates listed for grounding purposes or with listed bonding jumpers.
- C. When using epoxy- or powder-coat painted cable trays as a grounding conductor, completely remove coating at all splice contact points or ground connector attachment. After completing splice-to-grounding bolt attachment, repair the coated surfaces with coating materials recommended by cable tray manufacturer.
- D. Bond cable trays to power source for cables contained within with bonding conductors sized according to NFPA 70, Article 250.122, "Size of Equipment Grounding Conductors."

### 3.3 CABLE INSTALLATION

- A. Install cables only when each cable tray run has been completed and inspected.
- B. Fasten cables on horizontal runs with velcro according to NEMA VE 2. Tighten clamps only enough to secure the cable, without indenting the cable jacket. Under no circumstances are plastic, one way, cable ties to be used, or are allowed.
- C. Fasten cables on vertical runs to cable trays every 18 inches.
- D. Fasten and support cables that pass from one cable tray to another or drop from cable trays to equipment enclosures. Fasten cables to the cable tray at the point of exit and support cables independent of the enclosure. The cable length between cable trays or between cable tray and enclosure shall be no more than 72 inches (1800 mm).
- E. Tie MI cables down every 36 inches where required to provide a 2-hour fire rating and every 72 inches (1800 mm) elsewhere.
- F. In existing construction, remove inactive or dead cables from cable trays.

### 3.4 CONNECTIONS

- A. Connect raceways to cable trays according to requirements in NEMA VE 2.

### 3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections [with the assistance of a factory-authorized service representative]:
  - 1. Visually inspect cable insulation for damage. Correct sharp corners, protuberances in cable trays, vibrations, 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 trays do not exceed that permitted by NFPA 70. Verify that communications or data-processing

circuits are separated from power circuits by barriers or are installed in separate cable trays.

3. Verify that there are no intruding items such as pipes, hangers, or other equipment in the cable tray.
4. Visually inspect each cable tray joint and each ground connection for mechanical continuity. Check bolted connections between sections for corrosion. Clean and retorquing in suspect areas.
5. Perform visual and mechanical checks for adequacy of cable tray grounding; verify that all takeoff raceways are bonded to cable trays.

B. Prepare test and inspection reports.

### 3.6 PROTECTION

A. Protect installed cable trays and cables.

1. Install temporary protection for cables in open trays to safeguard exposed cables against falling objects or debris during construction.
2. Temporary protection for cables and cable tray can be constructed of wood or metal materials and shall remain in place until the risk of damage is over.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by cable tray manufacturer.
4. Repair damage to paint finishes with matching touchup coating.

END OF SECTION 27 05 36