

## SECTION 27-05-36 CABLE TRAYS FOR COMMUNICATIONS SYSTEMS

### PART 1 – GENERAL

#### 1.01 DESCRIPTION

- A. The work covered by this section of the Specifications includes all labor necessary to perform and complete such construction, all materials and equipment incorporated or to be incorporated in such construction and all services, facilities, tools and equipment necessary or used to perform and complete such construction. The work of this section shall include, but is not limited to, the following:
  - 1. Telecommunications cable trays and accessories in accordance with the strictest manufacturer written recommendation, per code or the best industry practice.

#### 1.02 QUALITY ASSURANCE

- A. Refer to Section 27-00-00 for general details.

#### 1.03 CODES, STANDARDS, AND GUIDELINES

- A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations in Section 27-00-00.
- B. NEMA VE-1 (Standard for Metal Cable Tray Systems)
- C. NUSIG (National Uniform Seismic Installation Guidelines)
- D. The Cal Poly ITS Telecomm group, Telecommunications Standards Document and the Labeling, Design and Syntax Standards in Appendix B.

#### 1.04 SUBMITTALS

- A. Refer to Section 27-00-00 for general details.
- B. Shop Drawings
  - 1. Coordinated cable tray layout drawings, 1/8 inch scale, at minimum. Show routing of all telecommunications cable tray.
  - 2. Show locations of related fire stops, expansion joints and connections to conduits or other pathways of similar size.
- C. Submit Manufacturer's Cut Sheets for the following:
  - 3. Any products not specifically listed in the PRODUCTS section shall require submittal of the manufacturer's cut sheets and the system/product design approval of the Cal Poly ITS Telecomm group.
- D. Seismic restraint calculations for the cable tray and its supports shall be submitted and meet the criteria for Seismic Zone 4 installation.

#### 1.05 IDENTIFICATION

- A. None Required

## 1.06 DEFINITIONS

- A. All pathways are to be continuous, accessible, viable and useable upon completion of construction.

## 1.07 WARRANTY

- A. Refer to Section 27-00-00 for general details.

## PART 2 – PRODUCTS

### 2.01 PRODUCT CONSISTENCY

- A. Product Consistency: Any given item of equipment or material shall be the product of one manufacturer throughout the facility. Multiple manufacturers of any one item will not be permitted.

### 2.02 RIGID CABLE TRAY

- A. Cable tray shall be aluminum with solid corrugated flooring.
- B. The cable trays shall be NEMA Class Designation 12B (75 lbs. per linear foot) with a safety factor of 1.5.
- C. Cable tray systems shall consist of straight sections, fittings, and accessories as defined in NEMA VE-1, VE-2 and UL classified as equipment grounding conductors. Provide radiused elbows, tees, crosses, splice plates, wall and overhead supports, and other fittings necessary for a complete, continuously grounded system.
- D. Aluminum: Straight sections and fitting side rails and rungs shall be extruded from Aluminum Association Alloy 6063. Fabricated parts shall be made from Aluminum Association Alloy 5052. Splice plates shall be of wedge lock design, using four square neck carriage bolts and serrated flange locknuts.
- E. ***The cable trays shall be a minimum of eighteen inches (18") wide by a minimum of 3" deep, unless otherwise noted on the drawings.***
- F. The tray shall be equipped with elbows, tees, and other attachments as required to complete the installation following a single manufacturer's guidelines.
- G. Approved Manufacturer: Cope Trof or Cal Poly ITS Telecomm group approved equal

### 2.03 CABLE TRAY ACCESSORIES

- A. Fittings: Tees, crosses, risers, elbows, and other fittings shall be of the same materials and finishes as cable tray, and from the same manufacturer.
- B. Provide cable tray trapeze supports and connectors including bonding jumpers, as required by cable tray manufacturer.
- C. Cable tray fittings that are used for changing of direction or elevation shall be factory made expressly for that purpose. No field improvised fittings are to be used.

## Cal Poly ITS Telecomm Group CABLE TRAY OPTIONS IN ORDER OF ACCEPTABILITY

When proposing cable tray options to fit a specific limited space installation need, the following is the order of product type acceptability:

1. The most desirable cable tray product for Cal Poly ITS Telecomm use is 18" wide, 3" high (sides), solid bottom, corrugated, aluminum cable tray as offered by Cope Trof or approved Cal Poly ITS Telecomm group equal. The information can be found using the following link.  
<http://www.copecabletray.com>
2. In locations where traditional solid channel style cable tray will not work due to limitations of the space needed to be worked in, this "whale bone" style tray is the second choice of the Cal Poly ITS Telecomm group. Information regarding one acceptable manufacturer's product can be found at the following link. Submit data sheets for all products for approval by the Cal Poly ITS Telecomm group.  
[http://www.cooperindustries.com/content/dam/public/bline/Resources/Library/catalogs/cable\\_tray\\_systems/all\\_products/Cent-R-Rail.pdf](http://www.cooperindustries.com/content/dam/public/bline/Resources/Library/catalogs/cable_tray_systems/all_products/Cent-R-Rail.pdf)
3. Snake Tray, or a Cal Poly ITS Telecomm approved equal is to be considered for use in situations where there is limited vertical space and restricted or random tray access. For information regarding Snake Tray, Mega Snake, Snake Canyon, Snake Race Ways and MC Snake Tray use the following link. <http://www.snaketray.com/cable-management/>

### PART 3 – EXECUTION

#### 3.01 GENERAL

- A. Coordinate location of cable trays with other trades to avoid conflicts and maintain accessibility.  
***Where installed above an accessible ceiling, cable trays shall be not less than 12 inches above the bottom of the finished ceiling. Vertical clearance above the tray shall be a minimum of 12 inches; clearance to at least one side of the cable tray shall not be less than 3 feet.***
- B. Conduit entries and all other transition points shall only occur in accessible locations.

#### 3.02 QUANTITIES

- A. Quantities of cable trays and associated accessories shown on the drawings are illustrative only and shall be meant to indicate the general configuration of the work. The Contractor shall be responsible for providing the correct quantities of materials to construct a system that meets the intent of these Specifications and the relevant codes.

#### 3.03 INSTALLATION

- A. Cable tray shall be one continuous structure, and installed level.
- B. All transitions shall use radiused fittings.
- C. Install cable tray so that it is accessible: Installation in open ceiling areas and above lay-in accessible ceilings shall generally be acceptable. Installation above "hard" ceilings, within a chase, behind a wall or where obstructed by ducts, pipes, etc. shall not be acceptable.
- D. ***Where the cable tray crosses an inaccessible area, place a minimum of four 4" conduits to connect the accessible segments together. The 4" conduits must extend a minimum of 12" beyond the edge of the inaccessible area on both sides.***

1. Exception: Relatively short (10 foot maximum) straight sections (no transitions) of cable tray may be routed over hard ceilings or through similar inaccessible areas provided that good access to the cable tray is maintained at both ends of the short inaccessible run.
- E. Where conduits are used in lieu of a section of cable tray, they shall join the cable tray from the end at an equal height, not from the side or above. Transitions of this type shall require the use of a "Straight Reducer Fitting".
- F. Install expansion joints and related fittings where required to accommodate the expected environmental ambient temperature range of 50 to 80 degrees F.
- G. Each end of the tray shall be equipped with a finished lip and drop off to reduce damage to cables.
- H. Manufactured offsets shall be used to change height or direction of rigid cable trays. Cable tray vertical transitions or transitions from a cable tray to other pathways must be designed such that unsupported cable does not exceed 2 feet.
- I. Cable tray offsets shall utilize 30 degree angles, and distance between transitions shall be no less than two times the offset distance.
- J. Cable trays are to be clean and debris free before the placement of cable.
- K. Firestop System
  1. Where cable tray encounters a fire rated assembly (wall, floor, shaft, etc.), install a listed Firestop system to maintain the fire rating of the assembly. Firestop systems must be of a re-enterable type and equal in area/capacity.
  2. All Firestop systems must be accessible for future maintenance.
  3. See Section 27-05-37 for further detail.
- L. Support
  1. Rigid cable tray shall be supported at distances not to exceed the maximum required for the specified NEMA Load/Span Designation(s) and at each bend, tee, cross, and elbow fitting.
  2. Supports shall be 3/8" threaded rod trapeze style hangers, threaded rods with rail clips as recommended by the cable tray manufacturer and as suitable for the specified cable tray NEMA Load/Span Designation.
  3. Side rails shall bear on the supports; rungs shall not bear on the supports.
  4. Cable tray supports shall not be used to mount any other structures.
  5. Provide seismic restraints/supports as required. (Seismic Zone 4)

### 3.04 GROUNDING & BONDING

- A. ***Cable tray shall be electrically continuous. Where a cable tray run is interrupted at a fire rated assembly, an expansion joint or is otherwise rendered electrically discontinuous, provide bonding jumpers.***
- B. ***Where cable tray enters a telecommunications closet or equipment room, bond the cable tray to the TGB in that room.***
- C. Where conduits or other conductive raceways connect to a cable tray system, bond them together with connection suitable for the purpose.
- D. Refer to Section 27-05-26 for additional details.

**3.05 TESTING**

None Required

**3.06 ACCEPTANCE**

- A. Once the installation and testing has been completed and the Cal Poly ITS Telecomm group representative is satisfied that all work is in accordance with the Contract Documents, the ITS Telecomm representative will notify the Contractor and/or Cal Poly Project Manager in writing or via email.

**3.07 RECORD (AS-BUILT) DRAWINGS**

- A. The Project Record Drawings shall show the types and locations of all cable tray.

END OF SECTION

DOCUMENT VERSION CONTROL

REVISION	DATE	AUTHOR	REASON
1	02/20/2014	R. Volk	INITIAL DOCUMENT DEVELOPMENT
	02/20/2014	DW & MH	PRIMARY REVIEW COMPLETE