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)

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, 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:
   1. Any products not specifically listed in the PRODUCTS section shall require a submittal of the manufacturer’s cut sheets.
D. Seismic restraint calculations for the cable tray and its supports.

1.05 IDENTIFICATION
A. None Required
1.06 DEFINITIONS

A. N/A

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 should 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 factory made 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 siderails 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 singular manufacturer’s guidelines.

G. Manufacturer/Product: Cope Trof Part# 1B54-18SL-12-S or Approved Equal

2.03 CABLE TRAY ACCESSORIES

A. Fittings: Tees, crosses, risers, elbows, and other fittings should be of the same materials and finishes as cable tray, and from the same manufacturer.

B. Cable tray 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.
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 should be not less than 3 foot.

B. Where multiple conduits serve a cable tray, they shall enter a straight reducer to transition the conduit array to the cable tray width.

C. Where multiple conduits serve a cable tray, conduits shall not enter at a right angle to the cable tray.

D. Conduits entries and all other transition points must only occur in accessible locations.

E. All conduits shall be bonded to the cable tray.

3.02 QUANTITIES

A. Quantities of cable trays and associated accessories shown on the drawings are illustrative only and are meant to indicate the general configuration of the work. The Contractor is 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 is generally acceptable. Installation above "hard" ceilings, within a chase, behind a wall or where obstructed by ducts, pipes, etc. is not 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 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 must join the cable tray from the end at an equal height, not from the side or above. Transitions of this type 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 1 foot.

I. Cable tray offsets shall utilize no more than 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. Firestopping
   1. Where cable tray encounters a fire rated assembly (wall, floor, shaft, etc.), install a listed fire stop system to maintain the fire rating of the assembly. Firestop systems must be of a reenterable type.
   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.

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 of suitable size and type to maintain the UL listing as an equipment grounding conductor.

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

A. None Required

3.06 ACCEPTANCE
A. Once the installation and testing has been completed and the campus telecommunications representative is satisfied that all work is in accordance with the Contract Documents, the representative will notify the Contractor and/or campus project manager in writing or via email.

3.07 RECORD (ASBUILT) DRAWINGS

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

END OF SECTION
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