

SECTION 27 05 36
CABLE TRAY FOR COMMUNICATIONS SYSTEMS

Part 1 General

1.1 SUMMARY

1.1.1 This section shall govern the products and installation of hangers and supports for communications systems.

1.2 RELATED DOCUMENTS

1.2.1 The latest versions of the following codes, standards, and guidelines shall be followed. Bring to the immediate attention of CCS if construction documents or conditions differ from requirements in codes, standards, guidelines and specifications.

1.2.2 The following codes, as required by law:

Ontario Electrical Safety Code (OESC)

Ontario Building Code (OBC)

1.2.3 The following standards:

ASTM A 510 - Specifications for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel

ASTM B 633 - Specifications for Electrodepositing Coatings of Zinc on Iron and Steel, Sections SC2 and SC3.

ASTM A653 - Specifications for Steel Sheet, Zinc-Coated (Galvanized) by Hot Dip Process

ASTM A123 - Specifications for Zinc (Hot Galvanized) Coatings on Iron and Steel.

ASTM A276-06 - Standard Specification for Stainless Steel Bars and Shapes

ASTM A580/A580M-06 Standard Specification for Stainless Steel Wire

NECA/BICSI-568-2006, Standard for Installing Commercial Building Telecommunications Cabling

TIA-569-C Commercial Building Standard for Telecommunications Pathways and Spaces

ANSI/TIA--607-B - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

1.2.4 The following guidelines:

NEMA-VE2, Metal Cable Tray Installation Guidelines

NFPA 70B, Recommended Practice for Electrical Equipment Maintenance

1.2.5 The following best practices:

BICSI, Telecommunications Distribution Methods Manual (TDMM)

BICSI, Information Transport Systems Installation Methods Manual (ITSIMM)

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Part 2 Product

2.1 General

- 2.1.1 The cable tray system shall be Listed for its location and intended purpose.
- 2.1.2 The cable tray system shall be Listed to allow for continuous grounding. Refer to execution section for additional grounding requirements.
- 2.1.3 Manufacturer shall be:
 - 1. Flextray
 - 2. WBT
 - 3. Or approved equivalent

Part 3 Execution

3.1 General

- 3.1.1 Follow all manufacturers' instructions.
- 3.1.2 Coordinate with all other trades prior to installation.
- 3.1.3 All telecommunications cabling not routed through conduit or cable tray shall be supported every 60" or less.
- 3.1.4 Telecommunications cables shall not be supported by any other trades, and shall be fully-supported by independent methods.

3.2 Wire Mesh Cable Tray

- 3.2.1 Cable trays shall be sized (including 10% growth) as per the drawings and will accommodate all horizontal and/or backbone cabling within the Telecommunications Room as well as entering/existing the Telecommunications Room.
- 3.2.2 All material to properly install the cable tray shall be provided. The cable tray system shall accommodate the weight of the horizontal and/or backbone cabling. The rung spacing shall be between 6" (in) 152 mm to 8" (in) 203 mm.
- 3.2.3 Provide horizontal elbows, end plates, vertical risers and drops, tees, wyes, expansion joints and reducers where required.
- 3.2.4 Wire mesh cable tray shall be manufactured from round steel wire that is a minimum of .196" (5mm) in diameter. Wires shall be welded at intersections to form a 2" x 4" (50.8mm x 101.6mm) grid pattern. The tray shall be U-shaped with equal height sidewalls.
- 3.2.5 Individual tray sections will be 10' (3048mm) or 5' (1524mm) long and 4" (101.6mm), 6" (152.4mm), 8" (203.2mm), 12" (304.8mm), 16" (406.4mm), 18" (457.2mm), 20" (508mm), or 24" (609.6mm) wide. Sidewalls will be 2" (50.8mm), 4" (101.6mm) or 6" (152.4mm) high.
- 3.2.6 Tray ends will be formed downward at 90° to allow easy drop-in installation with approved supports.
- 3.2.7 Wire mesh cable tray will be hot dipped galvanized after fabrication.

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- 3.2.8 Wire mesh cable tray will be UL Classified for grounding purposes.
 - 3.2.9 Provide all components of the tray system (tray, supports, splices, fasteners, waterfalls, and accessories) from a single manufacturer.
 - 3.2.10 Wire mesh cable tray should be secured to the structural ceiling, building truss system, wall or floor using manufacturer's recommended supports and appropriate hardware as defined by local code or the authority having jurisdiction (AHJ).
 - 3.2.11 When the pathway is overhead, wire mesh cable tray should be installed with a minimum clearance of 12" above and below (between tray and top of rack/cabinet) the tray. Leave 12" in between the tray and ceiling/building truss structure. Multiple tiers of wire mesh cable tray should be installed with a minimum clearance of 12" in between the trays. When located above an acoustical drop ceiling, wire mesh cable tray should be installed a minimum of 3" above the drop ceiling tiles.
 - 3.2.12 When installed under a raised floor, wire mesh cable tray should be installed with a minimum 1" clearance between the top of the tray and the bottom of the floor tiles or floor system stringers, whichever are lower in elevation. Maintain a 3" clearance between trays wherever trays cross over.
 - 3.2.13 Wire mesh cable tray should be supported every 5' or less in accordance with ANSI/EIA/TIA-569-C. Supports may be located directly under splices or intersections if recommended by the manufacturer's installation instructions. If supports are not located under splices or intersections, wire mesh cable tray should be supported within 2' on both sides of every splice or intersection. Support wire mesh cable tray on both sides of every change in elevation.
 - 3.2.14 Secure wire mesh cable tray to each support with a minimum of one fastener. Follow the manufacturers' recommended assembly, splice and intersection-forming practices.
 - 3.2.15 Use installation tools recommended by the manufacturer to field fabricate wire mesh cable tray intersections and changes in elevation. Use side-action bolt cutters with an offset head to cut wire mesh cable tray. Use a bending tool to form the ends of cut sections downward at 90° to allow easy drop-in installation with approved supports.
 - 3.2.16 Wire mesh cable tray should be bonded to the Telecommunications Grounding Busbar (TGB) using an approved ground lug on the wire basket tray and a minimum #6 grounding wire or as recommended by the AHJ. Verify bonds at splices and intersections between individual cable tray sections and supports. Cable pathway should be electrically continuous through bonding and attached to the TGB.
 - 3.2.17 The quantity of cables within the tray will not exceed a whole number value equal to 50% of the interior area of the tray divided by the cross-sectional area of the cable. Cable fill will not exceed the depth of the cable tray's side rail (2", 4" or 6").
 - 3.2.18 The combined weight of cables within the tray will not exceed stated load capacity in manufacturer's specifications.
 - 3.2.19 Separate different media type within the tray. Treat each type of media separately when determining cable fill limits.
- 3.3 Wire Mesh Cable Tray Supports
- 3.3.1 Supports will be sized at minimum to match the width of the wire mesh cable tray that is supported. The support may be wider than wire mesh cable tray.
 - 3.3.2 Support design will allow the support to be placed under a wire mesh cable tray at any point mid-span or directly under a pathway splice or intersection.

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- 3.3.3 Each support will be punched with an alternating round hole-pattern that accepts wire mesh cable tray ends which are formed downward at 90° and self-threading splice plate attachment hardware.
 - 3.3.4 When placed directly under a splice or intersection, the support will allow drop-in attachment of cable tray. Splice hardware will simultaneously splice cable trays and secure wire mesh cable trays to the support.
 - 3.3.5 Supports will be manufactured from steel extrusion and/or sheet.
 - 3.3.6 Wire Mesh Cable Tray Supports will be hot dipped galvanized after fabrication.
- 3.4 Wire Mesh Cable Tray Splices and Fasteners
- 3.4.1 Provide a method of simultaneously splicing, bonding and securing intersecting wire mesh cable tray sections to supports when supports are placed directly under a wire mesh cable tray pathway at a splice point, intersection point, or at the beginning or end of a change in elevation.
 - 3.4.2 Provide a method of splicing and bonding wire mesh cable tray sections together at a splice point or an intersection point that is not located directly over a support.
 - 3.4.3 Provide a method for bonding and securing wire mesh cable tray to supports when supports are placed mid-span (in between a splice or intersection point) along a wire mesh cable tray pathway.
 - 3.4.4 Provide a method for attaching wire mesh cable tray directly to the top of racks and cabinets.
 - 3.4.5 Provide a method for attaching wire mesh cable tray supports to raised floor pedestals.
 - 3.4.6 Provide a method for attaching a bonding conductor to the wire mesh cable tray.
- 3.5 Wire Mesh Cable Tray Accessories
- 3.5.1 Provide a divider to separate cable tray into multiple pathways where required. The divider shall be the same height as the sidewalls of the cable tray.
 - 3.5.2 Provide a bend radius to connect the sidewalls of adjoining wire mesh cable tray wherever a splice or an intersection in the cable tray pathway results in a 4" or wider gap between the sidewalls. The bend radius shall be the same height as the sidewalls of the wire mesh cable tray.
 - 3.5.3 Provide a radius drop to form cable over a smooth curve wherever cable exits or enters the side, bottom or end of wire mesh cable tray.
 - 3.5.4 Wire mesh cable tray accessories will be manufactured from steel extrusion and/or sheet.
 - 3.5.5 Wire mesh cable tray accessories will be pre-galvanized before fabrication.
- 3.6 Wire Mesh Cable Tray Installation Tools
- 3.6.1 Provide specialized cutting and forming tools required for field fabrication of wire mesh cable tray pathways.
 - 3.6.2 Provide specialized tools required for pulling cable around turns, bends or intersections in wire mesh cable tray pathway.

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3.6.3 Wire Mesh Cable Tray Support – Installation Hardware:

Provide installation hardware to attach wire mesh cable tray supports to building structure.

3.5 Execution

3.5.1 Identify to site supervisor, and resolve issues with any location where cable pathways fail to meet separation clearances as detailed in this document, prior to start of cable path installation.

3.5.2 Maintain the following clearances from electrical and heat sources when installing Cable Tray for data/telephone cables.

Item	Minimum Separation Distances		
	(<2kVA)	(2-5kVA)	(>5kVA)
Unshielded power lines or electrical equipment in proximity to open or non-metallic pathway.	127 mm (5"(in))	305 mm (12"(in))	610 mm (24"(in))
Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway.	64 mm (2.5"(in))	152 mm (6"(in))	305 mm (12"(in))
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway.	---	76 mm (3"(in))	152 mm (6"(in))
Motors	1.2 m (4'-0")		
Transformers	1.2 m (4'-0")		
Conduit and cables used for electrical distribution less than 1kV	0.3 m (1'-0")		
Conduit and cables used for electrical distribution greater than 1kV	1.0 m (3'-0")		
Fluorescent Luminaires	300 mm (12")		
Pipes (gas, oil, water, etc.)	120 mm (5")		
HVAC (equipment, ducts, etc.)	150 mm (6")		
Coax (CATV/CCTV)	Separate conduits or metallic divider in cable tray (do not run Cat6A and coax in same pathways)		

End of Section 27 05 36