2101 Commonwealth Blvd, Suite B
Ann Arbor, MI 48105-5759
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270536-H: COMMUNICATION CABLE TRAYS

Related Sections

Basis Guideline: N/A
260500-H – "Supplemental Common Work Results for Electrical"
260533-H – "Supplemental Electrical Materials and Methods"
260800-H – "Supplemental Electrical Acceptance Test"
272000-H – "Supplemental Voice and Data Communications"
5.4.1 – "Requirements for Telecommunication Rooms in UMHHC Facilities"
For an explanation of the use of these guidelines, see "Design Guidelines for UMHHC Facilities"

Applicability:

The information expressed herein is unique to UMHHC owned, operated, and leased facilities, and are intended to supplement the University of Michigan's Architecture, Engineering, and Construction (UMAEC), design guidelines 16050 dealing with cable trays for non-power uses.. Those UMAEC design guidelines are located on the website http://www.plantext.bf.umich.edu/for.archs/index.html. All information presented in the referenced UMAEC guideline applies to UMHHC facilities, unless explicitly stated otherwise below. Where differences and/or conflicts exist between the supplemental information noted below, and the information in the UMAEC guideline, this supplementary information shall take precedence.

The Design Professional (A/E) shall adhere to UMHHC Design Guidelines for all work at UMHHC facilities. Any requested deviations from these guidelines, shall be sent, in writing, to UMHHC's Facilities Planning and Development (FP&D). Address the correspondence to the assigned FP&D engineer for the given project. The deviation shall not be incorporated into the construction documents until written approval of the deviation is received by the Design Professional.

The Design Professional is fully responsible for the professional quality, technical accuracy, code compliance, and overall coordination of the contract documents. Compliance with these guidelines shall not be construed so as to relieve the Design Professional of any of that responsibility.

All major buildings shall be designed with cable tray systems for data/communication/ telephone/auxiliary system wiring. All such wiring must be for power-limited systems only, and in accordance with NEC Sections 725, 760, 800 and 820. All cables shall be rated for at least 150 volts and shall be listed as resistant to spread of fire. Do not install any non-power limited systems wiring in the cable trays.

The tray system will be routed through the corridors to the communication rooms. The overall tray system shall also comply with the specific requirements of NEC Section 318.

Standards:

Cable Tray Design Requirements

For additional details on most tray design requirements see Sections 272000-H Voice and Data Communication, and SBA-C-H. The items below supplement the information in 260533-H – "Supplemental Electrical Materials and Methods, and 272000-H – "Telecommunication/Data Systems"..

1. Provide access to and working clearance around all trays to allow later installation of additional cables when required.
    a. Twelve inch minimum above tray and 18" minimum on one side of tray is required.
    b. Route conduits from communication outlets into tray so working clearances are maximized (i.e., group conduits entering tray from working clearance side of tray.) ***Note:***

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To achieve this accessibility, trays shall normally be placed below all piping, duct work, VAV boxes, sprinkler mains and like systems. They shall however not inhibit the removal or replacement of ceiling tiles.

c. If HVAC ducts, VAV boxes, and like systems by necessity will violate the 12" vertical working clearance, these crossings shall only be at 90-degrees to path of tray; and that maximum width of said duct, VAV box (or like system) shall not exceed 3'-0".

2. Twelve inch minimum above tray and 18" minimum on one side of tray is required. Route conduits from communication outlets to tray so working clearances are maximized...i.e., group conduits entering tray from working clearance side of tray, . Make allowances for cover swing on enclosed trays. **Note**: To achieve this accessibility, trays shall normally be placed below all piping, duct work, VAV boxes, sprinkler mains and like systems.

3. Normally trays should be routed through all major corridors to the communication rooms.

4. When trays pass through fire/smoke walls, install three inch or four-inch conduit sleeves. The number of sleeves shall equal, or exceed, total cross-sectional area of tray. These sleeves shall be extended, offset, and braced as necessary to allow cable pulling through the sleeves without damage to cable, or excessive installation labor.

5. Cable tray sections shall be provided in Communication Rooms to allow routing of cables from backboard to backboard and from backboards to above relay racks, etc. If tray sections must cross, maintain a minimum of 12" from top of one tray to bottom of one above.

6. Cable tray size shall be selected so as to provide needed spare capacity, noted in Section 16020260500-H, and meet fill limits defined in NEC Section 39218, tables 39218-9. A/E should assume one 1/2" diameter cable equivalent per communication/data outlet plus all contractors supplied cabling. Minimum communication cable tray size shall be 12" wide.

7. Cable tray installations shall meet OSHA regulations 29 CFR 1910.305(a) (3) and 1910.399 and NEMA Publication VE 2-2000.

8. All cable tray penetrations through fire-rated walls shall be fire stopped. Installation shall be by certified firestop contractors.

Cable Splicing

No splices shall be made in the tray. If a splice must be made, install a junction box on the outer rail of the tray. Make splice in box and label box with system/cable designation. The patient TV antenna system and patient telemetry system are the only exception to this requirement. ***Note**: No splices of telecommunication cables (Type 5E and like) shall be made between outlet and backboards in telecommunication rooms.*

"Drops into Tray"

In general, all conduits routed to the tray shall be horizontal. No cables or conduits shall enter from below,below or from directly above. The only exception shall be the wiring in the communication room.

Proximity to Other Systems/Equipment

The side rails shall not be cut or modified to allow installation of other equipment, structural members, etc. Design ceiling space to allow full tray to be installed with needed working clearances.

Do not route any equipment vertically through the tray area. Also the tray should be spaced from other systems with high temperature, or high current equipment by at least a 12" spacing.

Support

Tray shall be supported independently from the finish ceiling system and any mechanical equipment. (See 16716 16740 for load carrying limits.)

Grounding

All raceways to tray shall be bonded to the tray using bonding bushings and #12 wire from bushing to tray. All tray sections shall be bonded together. ***Note**: If the raceway is not continuous to the outlet box, and/or the outlet box is not metallic, grounding of the raceway is not a requirement of these guidelines.*

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Fittings

All horizontal, vertical bends and offsets shall be factory fabricated with continuous side rails and consistent rung spacing on open trays.

Enclosed trays shall have hinged covers with captive-screw fasteners. Enclosed trays are normally only needed in buildings/areas with open plenum returns (i.e., Med Inn Building and the Medical Professional Building on the main hospital campus, have open-plenums).

Power Trays

If an A/E sees a need for a cable tray system, to route power wiring...either 600 volt or medium voltage, this shall be reviewed and approved in writing, by UMHS UMHHC Electrical Engineer. We have not used trays in this manner and need to review necessity before preparing any design documents. Any such applications shall include instruction to fire wrap cables.

Special Tray Clearances/Loading

Where clearances are tight or cable loadings are high, A/E shall investigate use of only tray systems that have integral support systems (i.e., do not require “UNISTRUT hangers”) and have capabilities for easy expansion. In these special applications only specify specific vendors, from Section 16995, that have these capabilities.