16114-H: CABLE TRAYS

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. Those UMAEC design guidelines are located on 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 details on most tray design requirements see Section 16740 Communication System. The items below supplement the information in 16050-H, and 16740-H.

1. Provide access to and working clearance around, all trays to allow later installation of additional cables when required. 12 inches minimum above tray and 18 inches minimum on one side of tray is required. Route conduits from 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.
2. Normally trays should be routed through all major corridors to the communication rooms. 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.
3. Cable tray section shall be provided in Communication Rooms to allow routing of cables from backboard to backboard and from backboard to relay racks, etc.
4. Cable tray size shall be selected so as to provide needed spare capacity, noted in Section 16020, and meet fill limits defined in NEC Section 318, tables 318-9. A/E should assume one ½ inch diameter cable equivalent per communication/data outlet plus all contractors supplied cabling.
5. All cable tray penetrations through fire-rated walls shall be fire stopped. Installation shall be by certified fire stop contractors.
Cable Splicing

No splices shall be made in tray. If a splice must be made, install a junction box on outer rail of 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.

"Drops Into Tray"

In general all conduits routed to the tray shall be horizontal. No cables or conduits shall enter from below, or 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 tray area. Also 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 for load carrying limits.)

Grounding

All raceways to tray shall be bonded to tray using bonding bushings and #12 wire from bushing to tray. All tray sections shall be bonded together.

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 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.