

## University of Houston Master Specification

<Insert Project Name>

<Insert U of H Proj #>

<Insert Issue Name>

<Insert Issue Date>

### SECTION 26 0536 ELECTRICAL CABLE TRAY

Maintain Section format, including the UH master spec designation and version date in bold in the center columns of the header and footer. Complete the header and footer with Project information.

Edit and finalize this Section, where prompted by Editor's notes, to suit Project specific requirements. Make selections for the Project at text identified in bold.

This Section uses the term "Engineer." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Delete hidden text after this Section has been edited for the Project.

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
  - 1. The current version of the *Uniform General Conditions for Construction Contracts*, State of Texas, available on the web site of the Texas Facilities Commission.
  - 2. The University of Houston's *Supplemental General Conditions and Special Conditions for Construction*.

##### 1.2 DESCRIPTION OF WORK

- A. Work Included: Provide electrical cable tray as shown, scheduled, indicated, and as specified.
- B. Types: The types of electrical cable tray required for the project include, but are not limited to, the following:
  - 1. Ladder type cable tray [**general purpose**].
  - 2. Trough type cable tray [**for smaller cables**].
  - 3. Solid bottom cable tray [**and for sensitive communications cables**].
  - 4. Channel type tray [**branch runs for one to two cables**].
  - 5. Center supported rung type tray.

##### 1.3 STANDARDS

- A. Products shall be designed, manufactured, tested, and installed in compliance with the following standards:
  - 1. NEC Article 392 - Cable Tray.
  - 2. NEMA Publication VE1.
  - 3. NEMA Publication VE2.
  - 4. All cable tray systems should be UL classified as an Equipment Grounding Conductor (EGC).

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1.4 QUALITY ASSURANCE

- A. Manufacturers: Provide products complying with these specifications and produced by one of the following:
  - 1. Eaton B-Line Series
  - 2. Chalfant, Inc.
  - 3. T. J. Cope, Inc.
  - 4. Mono-Systems, Inc.
- B. NEMA Compliance: All cable tray components shall comply with NEMA Standard VE1.

1.5 SUBMITTALS

- A. The submittal shall include, but is not limited to, the following:
  - 1. Manufacturer's cutsheets clearly indicating all products which will be used on the project.
  - 2. 1/8 inch scale floor plan layouts tray components, accessories, elevations, offsets, supports, and anchors.
  - 3. Additional information as required in Section 26 0001 "Electrical General Provisions".

1.6 STORAGE AND HANDLING

- A. Handle cable trays and appurtenances to avoid damage, breaking, denting, and scoring. Damaged equipment shall not be installed.
- B. Store cable trays in a clean dry space and protect from weather.

PART 2 - PRODUCTS

2.1 ELECTRICAL CABLE TRAY

- A. General: Provide electrical cable trays in the types and sizes indicated, constructed in compliance with the applicable standards, and with additional features as indicated or required.
- B. Class Designation: Provide NEMA Class 12C cable tray for use on this Project. Mounting supports shall be spaced consistent with the class designation.

<u>CLASS</u>	<u>SUPPORT SPAN</u>	<u>WORKING LOAD (LBS./L.F.)</u>
8A	8 feet	50
8B	8 feet	75
8C	8 feet	100
12A	12 feet	50
12B	12 feet	75
12C	12 feet	100
16A	16 feet	50
16B	16 feet	75
16C	16 feet	100
20A	20 feet	50
20B	20 feet	75
20C	20 feet	100

- C. Material: Cable trays and accessories shall be constructed of aluminum alloy 6063-T6.

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- D. Finish: Aluminum cable tray shall be supplied in a natural finish state.
- E. Inside Width and Depth: Cable tray shall have a usable depth of **[3 inch] [4 inch] [5 inch] [6 inch]** and width of **[6 inch inches] [9 inch] [12 inch] [18 inch] [24 inch] [30 inch] [36 inch]** or as shown on the Drawings and required by the cable sizes.
- F. Elbows and Fittings: The bending radii of cable tray elbows and fittings shall be **[12 inch] [24 inch] [36 inch]** or as required by the cable bending limitations and construction details. All fittings to have 3 inch tangents.
- G. **[Ladder Type Cable Tray: Cable tray shall consist of two longitudinal side rails connected by individual cross members or rings. Rung spacing shall be [9 inch] on center.]**
- H. **[Trough Type Cable Tray: Cable tray shall consist of two longitudinal side rails with closely spaced rungs or ventilated bottoms with a maximum 4 inch opening between transverse elements.]**
- I. **[Solid Bottom Cable Tray: Cable tray shall consist of two longitudinal side rails connected with a corrugated or reinforced solid bottom.]**
- J. **[Channel Type Cable Tray: Cable tray shall consist of one piece construction and may be ventilated or solid bottom design. Cable tray shall be [3 inches] [4 inches] [6 inches] wide.]**
- K. **[Center Supported Tray: Cable tray shall be constructed of a center rectangular aluminum support which forms a spine to which cross rungs are attached. Cross rungs shall be bent up at their ends to form a center supported, open sided, ladder-like assembly. Rungs shall emanate from the top of the spine [to maximize usable area] [so that the spine divides the tray into two halves and the overall tray depth is minimized].]**
- L. Accessories: Provide barrier strips, hold down clips, box connectors, covers, and endplates where shown or required. Provide all necessary hangers and splice pieces as required to install the cable tray where shown or specified and as recommended by the manufacturer.
- M. All components shall be of the same manufacturer as the cable tray.
- N. Fire Stopping: Provide a permanent, reusable fire stop system which utilizes dustless heat expanding pillows or bags and is FM-approved and UL-classified for a minimum 2-hour fire rating. The system shall be fully removable and reusable without damage to the integrity of the seal and shall have been tested by UL for use with aluminum cable tray. The fire stopping system shall be KBS Seal bags as distributed by P-W Industries, Inc., Bio Fireshield/Metatalk, or an approved equal.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. General: Install cable trays where shown, in accordance with the manufacturer's written instructions, NEC, NEMA Standard VE2, and with recognized industry practices to ensure that the cable trays comply with the specified requirements and serve the intended purposes. Coordinate installation with field conditions and all other trades. Install cable tray level. Minimum clear access space above top of cable tray shall be 12 inch, or as indicated; minimum clear access space in front of cable tray shall be 18 inches, or as indicated.
- B. Finishing: Remove burrs and sharp edges of cable trays wherever these could possibly cause damage to wiring insulation or jacket.
- C. Support: Cable tray shall be supported from the building slab using 1/2 inch threaded rod or a similar support on minimum 5 foot centers and at bends, cable drops, elbows, tees, reducers, and offsets, per NEMA VE2 or manufacturer recommendations.

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- D. Anchors: Rigidly anchor the cable tray system to the building structure at each change in direction and tray fitting to prevent movement during cable installation.
- E. Grounding: A copper ground wire sized per NEC shall be installed the length of the cable tray system and shall be connection to the ground grid as indicated on the drawings. Cable trays shall be bonded to the ground bus or ground rods as shown on the drawings. External bonding is not required unless the tray is not inherently bonded to steel support structures.
- F. Cable tray splices shall be made with an approved manufacturers splice plate.
- G. The cable tray system design has been made to allow separation between power and cables operating at voltages less than 120V AC.
- H. Cable tray dividers, where specified, shall be furnished of the same material, finish, height as inside dimension of the tray.
- I. Cable trays shall not be used as conduit supports except for the following where conduits that terminate at the cable tray or conduits routed inside the cable tray.
- J. If cable tray covers are required, the covers shall be of the same material that is compatible with the tray. Also, the electrical power cables shall be de-rated per NEC.
- K. All electrical power cables installed in a cable tray shall be attached to the ladder rungs using high strength UV resistant plastic cable ties, ABB Thomas Betts or equivalent, per NEC 392.
- L. Cutting: Where field cutting is required, cable trays shall be cut square with a cable tray saw and sharp edges filed where in contact with cable insulation.
- M. Cables:
  - 1. Complete cable tray installation before starting the installation of cables.
  - 2. Provide sufficient space to permit access for installing, splicing, and maintaining the cables.
- N. Cable Tray Wall Penetrations: Provide a sheet metal window where the cable tray penetrates partitions, as detailed on the Drawings. Seal penetrations through rated partitions, after cabling is installed, using fire protection seal bags installed in accordance with the manufacturer's UL-listed installation instructions. Conduit shall only run to bottom of cable tray and shall be clamped to tray.

END OF SECTION 26 0536

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