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USACE / NAVFAC / AFCEC / NASA **UFGS-27 05 28.36 40 (May 2017)**

Preparing Activity: NASA **Superseding UFGS-27 05 28.36 40 (August 2014)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2021
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DIVISION 27 - COMMUNICATIONS

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CABLE TRAYS FOR COMMUNICATIONS SYSTEMS

05/17

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SECTION 27 05 28.36 40

CABLE TRAYS FOR COMMUNICATIONS SYSTEMS
05/17

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NOTE: This guide specification covers the requirements for materials and installation of communication cable tray systems.

Contract drawings should indicate the extent and general arrangement of the cables, equipment, and distribution systems and should indicate cable tray supports.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of

the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A1008/A1008M	(2020) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA VE 1	(2017) Metal Cable Tray Systems
NEMA VE 2	(2018; ERTA 1-2 2018) Cable Tray Installation Guidelines

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2020; ERTA 20-1 2020; ERTA 20-2 2020; TIA 20-1; TIA 20-2; TIA 20-3; TIA 20-4) National Electrical Code

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Pre-Installation Meetings

The Contracting Officer will schedule a pre-installation meeting within [30] [_____] days of contract award. Submit fabrication drawings for review and approval.

Submit manufacturer's product data for the following items:

a. Cable Trays

b. Supports

1.3 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit

the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; G[, [____]]

Installation Drawings; G[, [____]]

SD-03 Product Data

Cable Trays; G[, [____]]

Supports; G[, [____]]

SD-08 Manufacturer's Instructions

Manufacturer's Instructions

1.4 QUALITY CONTROL

Comply with NEMA VE 1.

Comply with NEC, requirements that apply to the construction and installation of cable tray and cable channel systems (Article 392 NEC).

Provide products that are UL-classified and labeled with the UL classification mark.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

[Provide ladder cable trays consisting of two longitudinal side members connected by individual transverse members.

][Provide trough cable trays consisting of continuous one-piece ventilated-bottom sections contained within longitudinal side members.

][Provide channel cable trays consisting of one-piece ventilated channel sections.

][Provide solid bottom trays consisting of two longitudinal side members connected by a one-piece bottom section.

]## 2.2 FABRICATION

Submit fabrication drawings for cable trays. Ensure the drawings contain details showing the fabrication and assembly details performed in the factory.

Before assembly, use an antioxidant compound to coat the contact surfaces of trays. Ensure that the finishes of edges, fittings, and hardware are free from burrs and sharp edges. Include splice and end plates, dropouts, and miscellaneous hardware.

2.3 COMPONENTS

2.3.1 Supports

Permit both vertical and horizontal adjustment, where possible on supports and hangers. Provide an adequate bearing surface for the tray on the horizontal and vertical tray supports, and ensure that the surface can accommodate holddown clamps or fasteners. Provide a means, other than friction, for securely fastening cable trays to supports.

Provide support for cable trays at intervals of no more than [1800] [_____] millimeter [6] [_____]-foot. Place supports for horizontal-elbow tray fittings within [600] [_____] millimeter [2] [_____]-feet of each fitting extremity and as recommended by the cable tray manufacturer.

Ensure that the cable trays can carry at least [150] [_____] pounds per linear foot when supported at [1800] [_____] millimeter [6] [_____]-foot intervals. Ensure that the tray fittings have a load-carrying capacity that is equal to or greater than that of straight tray sections. Ensure that the radius of tray fittings is based on the minimum bending radius of the cables, as specified by the cable manufacturer.

2.4 MATERIALS

Provide cable trays constructed of [high-strength corrosion-resistant aluminum Alloy No. 5052-H32] [steel in accordance with ASTM A1008/A1008M and that has a zinc coating which was applied after fabrication].

[Provide hot-dipped galvanized steel trays with a finish in accordance with ASTM A123/A123M.

][Provide a stainless steel tray with a straight section and fitting side rails and rungs made of AISI Type 304 or Type 316 stainless steel. Weld transverse members (rungs) or corrugated bottoms to the side rails with Type 316 stainless steel welding wire.

]# PART 3 EXECUTION

Comply with NEMA VE 2 for cable tray installation.

3.1 INSTALLATION

3.1.1 Manufacturer's Instructions

Submit the manufacturer's instructions for cable trays, including special provisions required to install equipment components and system packages. Ensure that the instructions specify impedances, hazards and safety precautions.

3.1.2 Installation Drawings

No later than [30] [_____] calendar days before shipment, submit installation drawings to the Contracting Officer for approval. Coordinate drawings with those being used for all other work in the immediate area to ensure that this other work does not conflict with the installation. Include the layout of the cable tray work and details on both horizontal and vertical supports as specified in the paragraph SUPPORTS.

3.1.3 Grounding

Provide properly grounded cable trays by means that has a low-resistance conductor of sufficient capacity, and that is no smaller than [No. 1/0 AWG copper][No. 3/0 AWG aluminum][_____]. Bond the grounding conductor to cable tray sections and fittings by compatible bolted connections. Consider cable tray sections in tandem assembly as having electrical continuity when these sections are bonded with appropriate high-strength bolts. Provide permanent and continuous effective grounding with an impedance that is low enough to limit the potential above ground and to facilitate operation of overcurrent devices in the circuit. Provide grounding and bonding for cable trays in accordance with NFPA 70.

-- End of Section --