

**SECTION 26 05 36 - CABLE TRAYS FOR ELECTRICAL SYSTEMS**

**SECTION 27 05 28 36 - CABLE TRAYS FOR COMMUNICATION SYSTEMS**

**SECTION 28 05 28 36 - CABLE TRAYS FOR ELECTRICAL SAFETY AND SECURITY**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Work covered under this section consists of the furnishing of all necessary labor, supervision, material, equipment, tests and services to completely execute a complete wire basket cable tray system (Product) as described in this specification and as shown on the drawings.
- B. Wire basket cable tray systems are defined to include, but are not limited to straight sections of continuous wire mesh, factory built horizontal and vertical fittings for changes in direction or elevation, tees, drop outs, supports and accessories.
- C. 2004 Edition:
  - 1. Division 05 – Metals
    - a. 05 45 16 Electrical Metal Supports
    - b. 05 45 19 Communications Metal Supports
  - 2. Division 26 - Electrical
    - a. 26 05 13 Medium Voltage Cables
    - b. 26 05 19 Low Voltage Electrical Power Conductors and Cables
    - c. 26 05 29 Hangers & Supports for Electrical Systems
    - d. 26 05 33 Raceway and Boxes for Electrical Systems
    - e. 26 05 36 Cable Trays for Electrical Systems
  - 3. Division 27 – Communications
    - a. 27 05 28 29 Hangers & Supports for Communication Systems
    - b. 27 05 28 36 Cable Trays for Communication Systems
    - c. 27 10 00 Structured Cabling
    - d. 27 11 23 Communication Cable Management & Ladder Racks
  - 4. Division 28 - Electronic Safety and Security
    - a. 28 05 28 29 Hangers & Supports for Electronic Safety & Security
    - b. 28 05 28 36 Cable Trays for Electronic Safety & Security

**1.2 REFERENCES**

- 1. NFPA 70: National Electrical Code (2008)
- 2. UL CYNW GuideInfo Cable Trays
- 3. NEMA VE 1 - Metal Cable Tray Systems.
- 4. NEMA VE 2 - Cable Tray Installation Guidelines.
- 5. ANSI/TIA-568-C.0 – Generic Telecommunications Cabling for Customer Premises
- 6. ANSI/TIA-569-B – Commercial Building Standard for Telecommunications Pathways and Spaces
- 7. TIA 942 – Telecommunications Infrastructure Standard for Data Centers
- 8. CSA C22.1-09 12-2200

9. [CSA C22.2 NO. 126.1-09](#)
10. IEC 61537 (2001) Cable Tray Systems and Cable Ladder Systems for Cable Management
11. ASTM A510 - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
12. ASTM A1011 - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
13. ASTM A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
14. ASTM A513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
15. ASTM A580 – Standard Specification for Stainless Steel Wire
16. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
17. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Hot-Dip Galvanized) Iron and Steel
18. ASTM A641 - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

### **1.3 DRAWINGS**

- A. The drawings, which constitute a part of these specifications, indicate the general route of the wire basket cable tray systems. Data presented on these drawings is as accurate as preliminary surveys and planning can determine until final equipment selection is made. Accuracy is not guaranteed and field verification of all dimensions, routing, etc., is required.
- B. Specifications and drawings are for assistance and guidance, but exact routing, locations, distances and levels will be governed by actual field conditions. Contractor is directed to make field surveys as part of his work prior to submitting system layout drawings.

### **1.4 SUBMITTALS**

- A. Comply with requirements of Section 01330 – Submittal Procedures.
- B. Product Data: Submit manufacturer's product data sheets for cable tray indicating dimensions, materials, and finishes, including UL Classification and cUL/NEMA/CSA Classification.
- C. Shop Drawings: Submit shop drawings indicating materials, finish, dimensions, accessories, layout, supports, splices, and installation details.
- D. Design Calculations: Verify loading capacities for supports.
- E. Coordination Drawings: Include floor plans and sections drawn to scale. Include scaled cable tray layout and relationships between components and adjacent structural and mechanical elements. Data presented on these drawings are as accurate as preliminary surveys and planning can determine. Field verification of all dimensions, routing, etc., is directed.
- F. Submit training procedure for certifying cable tray installers.

### **1.5 QUALITY ASSURANCE**

- A. Source Limitations – All cable tray components shall be sourced from a single manufacturer.

- B. Listing and Labeling: Provide cable trays and accessories specified in this Section that are listed and labeled.
  - 1. The Terms “Classified” pertaining to cable trays (rather than “Listed”) and "Labeled": As defined in NFPA 70, Article 100.
  - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
  - 3. “Classified” products shall not be modified in the field without express and advance written approval from “Listing and Labeling” Agency, Authority Having Jurisdiction (AHJ), and owner.
- C. Comply with NFPA 70, *National Electrical Code, Article 392: Cable Trays*; provide UL Classification and labels.
- D. All cable and equipment shall be installed in a neat and workmanlike manner. All methods of construction that are not specifically described or indicated in the contract documents shall be subject to the control and approval of the owner or owner’s representative.
- E. Supply all equipment and accessories new and free from defects.
- F. Supply all equipment and accessories in compliance with the applicable standards listed in Part 1.2 of this section and with all applicable national, state and local codes.
- G. All cable tray shall be Classified by Underwriters Laboratories (UL) as to their suitability for use as an equipment grounding conductor in accordance with Sections 392.3(C) and 392.7(B) of the NEC.
- H. Wire basket cable tray shall be of uniform quality and appearance.
- I. Comply with the NFPA 70, National Electrical Code (NEC) 2008 Edition, as applicable, relating to construction and installation of cable tray and cable channel systems (Article 392, Cable Trays).
- J. Comply with NFPA 70B, “Recommended Practice for Electrical Equipment Maintenance” pertaining to installation of cable tray systems.

## **1.6 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum 50 years of documented experience manufacturing products from the same or similar materials, and with fabrication and service facilities within the borders of the Continental United States of America.

## **1.7 COORDINATION**

- A. Coordinate layout and installation of cable tray with other installations.
- B. Revise locations and elevations from those indicated as required to suit field conditions and as approved by the Architect.
- C. Storage and Handling: Avoid breakage, denting and scoring finishes. Damaged products will not be installed. Store cable trays and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials will be unpacked and dried before storage.

## 1.8 CLOSEOUT SUBMITTALS

- A. Submit under provision of section 01 78 00
- B. Project Record Documents: Record actual routing of cable tray and locations of supports.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with these specifications, only manufacturers of complete prefabricated cable tray system shall be acceptable. No field modification of factory prefabricated parts shall be allowed except as expressly approved beforehand in writing by the owner or owner's representative. All cable tray and fittings shall be UL Classified and said Classification shall not be compromised by field modification.
- B. Wire basket cable tray systems shall be as manufactured by the following:
  - 1. Wiremaid Products Division, 11711 W Sample Road, Coral Springs, Florida 33065. Phone (954) 545-9000 Facsimile (954) 545-9011. Website: [www.wiremaidcabletray.com](http://www.wiremaidcabletray.com) Email: [info@cablemgr.com](mailto:info@cablemgr.com)
  - 2. Engineer approved equivalent

### 2.2 WIRE BASKET CABLE TRAY SECTIONS AND COMPONENTS

- A. Provide wire basket cable tray of types and sizes indicated with support assemblies and accessories.
- B. All straight section longitudinal wires shall be constructed with a straight and rigid top wire. In no case shall the top wire be bent or kinked either before or after installation.
- C. All fittings for changes in direction and/or elevation shall be factory complete parts and shall be "Listed and Labeled" ("Classified") in the same manner and by the same Agency as the straight sections. In no case shall a straight section be modified in the field to change direction or elevation.
- D. Wire basket cable tray shall be made of high strength steel wires and formed into a minimum 2 inch by 4 inch wire mesh pattern with intersecting wires welded together. All mesh sections must have at least one bottom longitudinal wire along entire length of straight section.
- E. Wire basket cable tray sizes shall conform to the following nominal criteria:
  - 1. Straight sections shall be furnished in standard lengths of 120", 96", 60", 24", or 12".
  - 2. Wire diameter shall be 0.187" (3/16") minimum on all mesh sections.
  - 3. Wire tray shall have a minimum 2" usable loading depth by 6", 8", 12", 18", 24" or 36" wide.
  - 4. Wire basket cable tray shall have a 4" usable loading depth by 4", 6", 8", 12", 18", 24" or 36" wide.
  - 5. Wire basket cable tray shall have a 6" usable loading depth by 4", 6", 8", 12", 18", 24" or 36" wide.
- F. Material and Finishes: Material and finish specifications are as follows:
  - 1. Electro-Plated Zinc Galvanizing: Due to well-documented risks associated with electroplated metals, there shall be no electroplated material allowed except for that minimum necessary for purposes of bonding and grounding. All tray, fittings, supports,

- and accessories not required to be bare metal for bonding and grounding shall be powder coated carbon steel or stainless steel.
2. Stainless Steel: Straight sections and accessories shall be made from AISI Type [CHOOSE 304L OR 316L] stainless steel meeting the minimum mechanical properties of ASTM A580.
  3. Black Powder Coat: Straight sections, fittings, supports, and accessories shall be powder coated [CHOOSE Black, White, Chrome, Red, Blue, Orange, or Yellow] with an average paint thickness of 1.2mils (30microns) to 3.0mils (75microns).
  4. Pre-Galvanized Zinc: Due to well-documented risks associated with electroplated metals, there shall be no electroplated material allowed except for that minimum necessary for purposes of bonding and grounding. All tray, fittings, supports, and accessories not required to be bare metal for bonding and grounding shall be powder coated carbon steel or stainless steel.
  5. Hot Dipped Galvanizing: Straight sections shall be made from steel meeting the minimum mechanical properties of ASTM A510, Grade 1008 and shall be hot-dipped galvanized after fabrication in accordance with ASTM A123.
- G. Special accessories shall be furnished as required to protect, support and install a wire basket cable tray system:
1. Divider Strips shall be installed by the manufacturer, welded into the cable tray and powder coated (or manufactured of stainless steel or hot-dipped galvanized) and shall be of the same height as the usable height specified for the cable tray.
  2. Covers shall be no longer than 5' for handling safety and shall be finished in the same manner as the cable tray, fittings, supports, and other accessories. Covers shall "snap on" to cable tray and shall provide holes for imposition of "lock-out tag-out" security.
  3. Dropouts shall be manufactured of the same material and finish as the cable tray and fittings.
  4. Supports shall be manufactured of .25" (1/4") diameter wire or other material as supplied by manufacturer of cable tray. Supports shall be finished in the same manner as cable tray, fittings, and accessories with powder coat, hot-dipped galvanizing, or stainless steel.

### **2.3 EQUIPMENT GROUNDING CONDUCTOR PERFORMANCE**

- A. Under UL CYNW Cable Tray program cable tray must be *capable of* performance as an equipment grounding conductor.
1. Use only UL Classified and Labeled complete factory tray straight sections and,
  2. Use only UL Classified and Labeled complete factory tray fittings for changes in direction and elevation
  3. Ensure that all bonding/grounding points on tray and fittings are securely *bolted* in accordance with manufacturer's instructions
- B. Test cable tray system per NFPA 70B, Chapter 18 to verify specified maximum grounding resistance.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION:**

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of cable tray supports. Do not proceed with installation until unsatisfactory conditions have been corrected.

## **3.2 INSTALLATION**

- A. Install cable tray level and plumb according to drawings, original design, and referenced standards.
- B. Install wire basket cable tray in accordance with NEMA VE 2 to ensure that the cable tray equipment complies with the requirements of the NEC, applicable portions of NFPA 70B, and the National Electrical Contractors Association's (NECA) 'Guide to Quality Electrical Installations' pertaining to general electrical installations practices.
- C. All trays should be supported using a minimum of 1/4" All Threaded Rod (ATR) or Gripple No 3 Y-Fit Cable Support. Verify Rod or Cable support capacity is adequate for cable tray, supports, cabling, and future growth.
- D. Special accessories shall be furnished as required to protect, support and install a wire basket cable tray system.
- E. Coordinate wire basket cable tray with other electrical work as necessary to properly interface installation of wire basket cable tray with other work.
- F. Support trays and fasten to structure. Install supports at each connection point, at end of each run, and at other points to maintain spacing between supports of 6' maximum.
- G. Install expansion connectors where recommended by manufacturer as indicated on drawings.
- H. Install firestopping in accordance with local and NFPA regulations to sustain ratings when passing wire basket cable tray through fire-rated elements.
- I. Bond and ground metal cable tray in accordance with NFPA 70, National Electrical Code, Article 392: Cable Trays.
  - 1. Provide continuity between wire basket cable tray components.
  - 2. Make connections to tray using bonding loops built into tray and carriage bolt/nut assembly supplied by cable tray manufacturer.
  - 3. Ground cable trays using grounding lug attached to open bonding loop on last section of tray or fitting.
- J. If required, install warning signs along wire basket cable tray, located to be visible.
- K. Provide sufficient space encompassing wire basket cable tray to permit access for installing and maintaining cables.

## **3.3 TESTING**

- A. Test wire basket cable tray systems to ensure electrical continuity of bonding and grounding connections, and to demonstrate compliance with specified maximum grounding resistance. See NFPA 70B, Chapter 18, for testing and test methods.

**END OF SECTION**