SECTION 27 05 36 – CABLE TRAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes metallic cable trays. Types of cable trays in this section include the following:

1. Ladder cable tray

B. Cable tray support devices are specified herein.

C. Cable trays for installation of low voltage systems 24V and below, not including life safety (fire alarm) or power systems.

1.2 DEFINITIONS

A. Refer to NEMA Standard VE 1 for definitions of cable tray terminology used in this section.

1.3 REFERENCES

A. ASTM B 633 – Electrodeposited Coatings of Zinc on Iron and Steel.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division-1 Specification Sections:

1. Product Data for cable tray products.
2. Shop Drawings: Layout floor plans and elevations showing coordination of cable tray system. Designate components and accessories including clamps, brackets, hanger rods, splice plates, connectors, expansion joint assemblies, straight lengths, and fittings. Show accurately scaled components and spatial relationships to adjacent equipment. Show tray types, dimensions, and finishes. Coordinate and route tray around all mechanical ductwork, piping, electrical conduits and lighting fixtures.
3. The Contractor shall be responsible to provide layout drawings which show cable tray layout, routing and elevation through each space within the building. This Contractor shall be responsible to have all other trade Contractors sign off on the drawings to show the drawings have been coordinated with each trade. This Contractor shall bare all costs related to moving or relocating cable should a conflict arise between contractors if layout drawings are not submitted and signed off by all other prime trade contractors.
4. Factory Test Reports: Certified copies of factory test reports performed in conformance with NEMA Standard VE 1 on cable trays of types and size specified for this project.

1.5 QUALITY ASSURANCE

A. UL and NEMA Compliance: Cable trays and components shall be classified by UL and comply with NEMA Standard VE 1, "Cable Tray Systems."

B. Nationally Recognized Testing Laboratory and NEMA Compliance (NRTL): Cable trays and components shall be listed and labeled by a NRTL and comply with NEMA Standard VE 1, "Cable Tray Systems." The term "NRTL" shall be as defined in OSHA Regulation 1910.7.

C. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

D. Single-Source Responsibility: All cable tray components shall be the product of a single manufacturer.

PART 2 - PRODUCTS

2.1 LADDER CABLE TRAY

A. Manufacturers

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Eaton
    b. Legrand
    c. Cope
    d. Chalfant Manufacturing Company
    e. Mono-Systems
    f. ABB

B. General Requirements

1. Configuration: Two longitudinal side rails with transverse rungs swaged or welded to side rails, complying with NEMA VE 1.
2. Width: 18 inches unless otherwise indicated on Drawings.
3. Minimum Usable Load Depth: 4 inches unless otherwise indicated on Drawings.
4. Straight Section Lengths: 10 feet, except where shorter lengths are required to facilitate tray assembly.
5. Rung Spacing: 9 inches o.c.
6. Radius-Fitting Rung Spacing: 9 inches (225 mm) at center of tray's width.
7. Minimum Cable-Bearing Surface for Rungs: 7/8-inch (22-mm) width with radius edges.
8. No portion of the rungs shall protrude below the bottom plane of side rails.
9. Structural Performance of Each Rung: Capable of supporting a maximum cable load, with a safety factor of 1.5, plus a 200-lb (90-kg) concentrated load, when tested according to NEMA VE 1.
10. Fitting Minimum Radius: 12 inches.
11. Class Designation: Comply with NEMA VE 1, Class 12B.
12. Splicing Assemblies: Bolted type using serrated flange locknuts.
13. Splice-Plate Capacity: Splices located within support span shall not diminish rated loading capacity of cable tray.

C. Materials and Finishes:

1. Steel: Provide hot-dip galvanized finish, with galvanized, ASTM B633 hardware.
2. Aluminum: Provide aluminum tray with stainless steel hardware (to avoid electrolysis).

2.2 SUPPORTS AND CONNECTORS

A. Cable tray supports and connectors, including bonding jumpers shall be as recommended by cable tray manufacturer.

B. Cable tray shall be trapeze or wall supported. Center hung cable trays shall not be acceptable.

2.3 FASTENERS FOR SUPPORTS

A. Fasteners to connect cable tray supports to the building structure shall be as follows:

1. Trapeze Hangers.
2. Brackets and Support Kits.
3. Expansion Anchors.
4. Electro-Galvanized Zinc All Thread Rods.

2.4 ACCESSORIES

A. Provide drop-outs when cable tray is installed over data racks to protect cables as they drop to data racks.

B. Wherever the tray is exposed, and visible from below, provide a solid bottom plate. Tray and plate to be painted as directed by the architect.

2.5 FIRE STOPPING

A. General: Materials shall be UL listed and labeled and FM approved for fire ratings consistent with penetrated barriers. The Contractor shall be responsible to provide fire rated sleeves for where cable tray penetrates fire rated floors or walls. Sleeve capacity, at 40% fill shall match cable tray capacity. Contractor may install 4” conduits sleeves or rectangular sleeve with fire pillow at their discretion.

B. Refer to Division 26 “Common Requirements – Electrical,” for additional fire stopping requirements.

2.6 WARNING SIGNS

A. Lettering: Provide the following factory label for all cable tray sections: "WARNING! NOT TO BE USED AS WALKWAY."

B. Materials and Fastening: Conform to Section "Electrical Identification."

PART 3 - EXECUTION

3.1 INSTALLATION OF CABLE TRAY SYSTEMS

A. Install cable trays in accordance with equipment manufacturer's written instructions.

B. Install cable trays as a complete system, including fasteners, hold-down clips, support systems, barrier strips, adjustable horizontal and vertical splice plates, elbows, reducers, tees, crosses, cable dropouts, adapters, covers, and bonding.

C. Install cable trays so that the tray is accessible for cable installation and all splices are accessible for inspection and adjustment.

D. Remove burrs and sharp edges of cable trays.

E. Support cable tray independently from the building structural components. Support cable tray per manufacturer requirements.

F. Conform to manufacturer's recommendations for selection and installation of supports.

G. Strength of each support including fastenings to the structure shall be adequate to carry present and future load multiplied by a safety factor of at least four or 200 lbs., whichever is greater.

H. Support Locations: Locate supports in accordance with the recommendations of NEMA Standard VE 1 and VE 2.

I. Installation of supports shall be in accordance with cable tray manufacturer's written instructions and the recommendations of NEMA Standard VE 1 and VE 2.

J. Fastening Supports: Unless otherwise indicated, fasten cable tray supports securely to the building structure as specified in Division-26 Section "Supporting Devices."

K. Support at Connections to Equipment: Where cable trays connect to equipment, provide flanged fittings fastened to the tray and to the equipment. Support the tray separately. Do not carry the weight of the tray on the equipment enclosure.

L. Provide expansion fittings where cable tray crosses building expansion joints.

M. Direction Changes: Make changes in direction of cable tray with standard cable tray fittings.

N. Locate cable tray as required to route cables across data closets and in corridors as needed and as otherwise indicated.

O. Firestopping: Where cable trays penetrate fire and smoke barriers including walls, partitions, floors, and ceilings, install fire- stopping at penetrations after cables are installed.

1. At fire and smoke barriers, the contractor shall provide a quantity of 4” conduits with a 40% fill capacity that matches the rated fill capacity of the cable tray to penetrate the barriers. All fire and smoke barriers are indicated on the architectural drawings and specifications.

P. Sleeves for Future Cables: Install capped sleeves for future cables through fire stopped cable tray penetrations of fire/smoke barriers.

Q. Working Space: Install cable trays with sufficient space to permit access for installing cables.

3.2 GROUNDING

A. Electrically ground cable trays and ensure continuous electrical conductivity of cable tray system. Use tray as an equipment ground conductor for itself only, not for connected equipment. Grounding connection shall be minimum #6 AWG.

3.3 SYSTEMS INSTALLED IN CABLE TRAY

A. Cable tray may be used for data, building intercom, security, BAS, and other non-life safety low voltage systems.

B. Under no circumstances may fire alarm and other life safety equipment be installed in cable trays.

C. Under no circumstances may any power lines (over 24VAC) be installed in cable tray. Power conduits shall be kept minimum 12” from cable tray wherever possible.

3.4 FIELD TESTING

A. Grounding: Test cable trays to ensure electrical continuity of bonding and grounding connections.

3.5 CLEANING AND FINISH REPAIR

A. Upon completion of installation of cable trays, inspect trays, fittings, and accessories. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

END OF SECTION 27 05 36