

SECTION 33 72 33.36 – CABLE TRAY AND WIREWAY FOR UTILITY SUBSTATIONS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes furnishing and installing of wireway, cable tray, cable rack, and supports included in this Contract.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 RELATED REQUIREMENTS:

- A. Section 13 34 23.23 - Fabricated Substation Control Enclosures
- B. Section 23 75 00 – Substation Enclosure HVAC Equipment
- C. Section 26 24 16 - Panelboards
- D. Section 26 51 23 - Substation Interior Lighting and Receptacles
- E. Section 26 36 00 – Power Switching and Control Devices
- F. Section 33 72 33 43 – Raceway and Boxes for Utility Substations
- G. Section 33 72 33 33 – Raceway and Boxes for Utility Substations
- H. Section 33 72 33.16 - Relay Switchboards
- I. Section 33 72 43 11 - Substation Wire, Cable and Accessories

1.03 REFERENCE STANDARDS:

- A. All Materials, Equipment, and labor supplied shall be in strict compliance with the statutes, codes, and standards listed herein. Where conflicts exist between statutes, codes, and standards, the more stringent requirement shall prevail. Applicable statutes, codes, and standards are as listed below:
 - 1. ASTM International (ASTM):
 - a. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 2. National Electrical Manufacturers Association (NEMA):
 - a. NEMA VE 1 - Metal Cable Tray Systems.
 - b. NEMA VE 2 - Cable Tray Installation Guidelines

1.04 SUBMITTALS:

- A. Construction details of all straight sections and fittings showing cross-sectional dimensions.
- B. Catalog cuts of installation and mounting materials used.
- C. Details of special support arrangements that are not indicated in Contract Drawings.

1.05 QUALITY ASSURANCE:

- A. The Contractor shall furnish equipment and materials meeting the specified ratings and performance at the altitude and ambient temperatures specified.

PART 2 - PRODUCTS

2.01 WIREWAY:

- A. Lay-in type with full-length matching width surface covers for full channel access.
- B. Coordinated covers and fittings for a completely enclosed raceway.
- C. Satin gray enamel finish inside and out over phosphatized surfaces, or electrogalvanized steel.
- D. Conform to NEMA 1 type enclosure for all indoor nonhazardous areas where oil, dust, or water is not a problem.
- E. Acceptable Manufacturers:
 - 1. General Electric Company.

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2. Hoffman Engineering Company.
3. Square D Company.

2.02 CABLE TRAY (LADDER TYPE):

- A. Prefabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs) which provide the cable supporting means.
- B. Cable tray system components including straight sections, fittings, splice plates, divider strips, covers, hardware, etc., shall be constructed of aluminum alloys with natural finish or steel hot-dip galvanized after fabrication. (All system components to be of same material and finish.)
- C. Side rail height of 6 inches, unless otherwise indicated.
- D. Width of tray shall be 24 inches.
- E. Transverse member (rung) spacing of nine inches center-to-center.
- F. Transverse members (rungs) to have a minimum cable bearing surface of 3/4 inch.
- G. Continuously smooth interior after field assembly with no sharp corners or burrs.
- H. Bolts or rivets with round heads to the inside.
- I. Furnish all vertical and horizontal fittings as indicated.
- J. Fittings designed to provide the same load capacity as straight sections and with 12-inch radii of bends unless otherwise indicated.
- K. Fittings cross-sectional dimensions compatible with straight sections.
- L. Furnish flanged tray covers of minimum 18-gage electrogalvanized steel or 0.040-inch thick aluminum. Use peaked covers in areas where accumulation of liquids is likely. Tray covers to be of same material and finish as tray. Furnish covers with cover clamps designated for the installation environment.
- M. Dead-end cover plates.
- N. Divider strips for separating various classes of cables in tray.
- O. Acceptable Manufacturers:
 1. B-Line Systems, by Eaton.
 2. Chalfant Manufacturing Company.
 3. T. J. Cope, Incorporated.
 4. P-W Industries, Incorporated.
 5. MP Husky Corporation.

2.03 SUPPORTS:

- A. General types as indicated on Contract Drawings or required for the specific installation.
- B. Adequate design strength to support tray without noticeable deflection of support members. Provide additional bracing where necessary.
- C. Supply all necessary rods, anchors, inserts, clamps, tie-down clips, spacers, shims, bolts, brackets, framing channel inserts, and miscellaneous steel. All material shall be electrogalvanized, cadmium-plated, or otherwise suitably corrosion protected.
- D. Fabricated of structural steel or manufactured framing member equal to "Unistrut" P-3000 series as manufactured by Unistrut Corporation, unless otherwise indicated.
- E. Acceptable Manufacturers:
 1. B-Line Systems Incorporated.
 2. GS Metals Corporation.
 3. Power-Strut Division, Allied Tube and Conduit Corporation.
 4. Super Strut, Inc.
 5. Unistrut Products Corporation.

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2.04 ACCEPTABLE MANUFACTURERS:

- A. Fireproof Coatings:
 - 1. Carboline Company - Intumastic 285.
 - 2. Flamemaster Corporation - Flamaster 77.
- B. Penetration Sealers:
 - 1. Dow Corning Corporation - Firestop Foam 2001.
 - 2. Fireproof coatings listed above when applied as specified.
- C. Damming Materials:
 - 1. Boards: Thermal Ceramics - Firemaster Board.
 - 2. Fiber: Thermal Ceramics - Firemaster Blanket or Fiber.

PART 3 - EXECUTION

3.01 CABLE TRAY:

- A. Install as indicated using tray with the NEMA classification as follows:

NEMA Classifications			
	Outside Tray Depth (in)		
Tray Width (inches)	4	5	6
12	8C	12A	12B
18	12B	12B	12B
24	12B	12B	12C
36	16A	16A	16B

- B. Support at intervals as indicated on Contract Drawings and as necessary for rigid support and neat alignment, suitably braced to prevent movement in any direction and adequate to support working loads as dictated by the NEMA classification.
- C. Provide all openings in floors and walls necessary for passage of cable tray unless indicated as being provided by others.
- D. Install a cable tray to box connector at point of tray entrance into each electrical enclosure, including switchgear, motor control centers, pull boxes, and similar equipment.
- E. Install covers on all solid bottom tray, outdoor tray, tray carrying cables rated 2 kV and above, all vertical tray sections, vertical risers from panelboards, switchgear, and similar equipment; also at all locations where accumulation of debris in tray is possible such as under floor openings, stairs, open grating, etc.
- F. Install special fittings such as expansion joint splice plates where necessary.
- G. Install divider strips in all tray used, either installed by this Contract or by others, placed to separate proportionately to their areas instrumentation, control, and power cables where they are run in the same tray section and fittings.
- H. Clean out all cable trays after completion of cable installation and just prior to installation of tray covers.
- I. Coat all field cuts, scars, or abrasions in galvanized tray with an approved organic, zinc-rich primer equivalent to Subox Galvanox Type 1.

3.02 SUPPORTS:

- A. Furnish general types of supports as indicated, specified, or required.
- B. Coat all field cuts, scars, or abrasions on galvanized supports with an approved organic, zinc-rich primer equivalent to Subox Galvanox Type 1.

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END OF SECTION 33 72 33.36