

SECTION 260533 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

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.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. This Section specifies the raceway, conduit, boxes, fittings, multioutlet assemblies, etc. for buildings and structures electrical systems.
 - 2. Provide all labor, materials, and equipment as necessary to complete all work as indicated on the drawings, and as specified herein.
- B. Related Sections include the following:
 - 1. Applicable sections of Division 26 - Electrical

1.3 SUBMITTALS

- A. Shop Drawings
 - 1. Surface raceway.
 - 2. Multioutlet assemblies.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70, “National Electrical Code”

PART 2 - PRODUCTS

2.1 GENERAL INFORMATION

- A. All boxes, brackets, bolts, clamps, etc., shall be galvanized, electro-galvanized, metalized, or sherardized.
- B. All hardware used outdoors shall be hot dipped galvanized.
- C. Pull boxes, junctions boxes, and outlet boxes installed outdoors shall be heavy duty die cast aluminum construction powder coat finished with gasketed cover plate.

2.2 CONDUIT

- A. Rigid galvanized conduit shall be installed in poured concrete slabs, walls and partitions. Rigid or I.M.C. shall be installed in damp locations and inaccessible places.
- B. All rigid conduit, I.M.C. and E.M.T. shall be hot dipped galvanized, sherardized, metalized or electro-galvanized.
- C. In locations where rigid or IMC conduit cannot be turned and a fitting is required, three piece malleable iron/steel rain-tight fittings shall be used.
- D. E.M.T. may only be installed exposed, above suspended ceilings, or in partitions.
- E. Flexible metal conduit may be used for short runs, up to a length of six feet, to individual pieces of equipment.
- F. Flexible metal conduit and flexible metallic tubing may be used for light fixture whips up to a length of six feet.
- G. Liquidtight flexible metal conduit shall be used for short runs, up to a length of six feet, to individual pieces of equipment in mechanical rooms, penthouses, on roofs, water softener areas and other similar locations.
- H. MC (metal clad) 2 conductor with ground cable can be used for lighting fixture whips.
- I. All conduit 2-1/2 inches and larger shall be rigid or I.M.C.
- J. No E.M.T. or aluminum conduit shall be used in concrete or direct burial, nor in water softener areas or similar corrosive locations.
- K. Aluminum conduit may only be used in sizes 1-1/2 inch and larger. No aluminum conduit will be permitted in concrete. When aluminum conduit is used, all bends shall be galvanized steel.
- L. Size and type of conduit shall comply with the National Electric Code. Where conduits are indicated on the drawing to be larger than required by Code, the larger conduit shall be used.

- M. All conduit used for fire alarm system wiring shall have a red topcoat to identify it as fire alarm system.
- N. All conduit used for life safety systems such as emergency lighting, shall have a green topcoat to identify as life safety.
- O. Minimum conduit size shall be 3/4 inch for all feeder and branch circuit conduits to all panels, junction boxes, pull boxes, and outlets.
- P. Short runs of exposed conduit to individual pieces of equipment may be one-half inch.
- Q. Minimum conduit size shall be one-half inch for low-voltage control wiring.
- R. Where metal conduit is buried underground outside the building walls, to signs, exterior lights, etc., it shall be not less than 1 inch regardless of wire size.

2.3 PULL AND JUNCTION BOXES

- A. All pull boxes shall be galvanized sheet steel, sized as required, with thickness not less than no. 14 gauge.
- B. All pull and junction boxes used for fire alarm system wiring shall have a red cover plate.

2.4 OUTLET BOXES

- A. All outlets, except as otherwise specified, shall consist of approved galvanized steel boxes of pattern adapted to the special requirements of each outlet, securely fastened in place in an approved manner.

Underfloor Ducts

Floor duct shall be used only in large open areas where electric and telephone outlets are required, and wall outlets are impractical.

When underfloor duct is required, it shall be capable of handling power and communications.

The floor duct should either be flush duct with pre-cut holes on 2 foot centers, or standard duct with inserts on 2 foot centers. Use a sealing compound to make the entire system watertight.

The top of duct inserts shall be 1/8 inch below the finished cement floor.

Markers shall be placed in the last insert of all duct runs, in inserts on each side of partitions, and in the first insert adjacent to the junction boxes to indicate electrical and telephone ducts.

Underfloor ducts shall be as manufactured by Walker, Parkersburg, Square D, or General Electric.

2.5 SURFACE RACEWAY

If finished surfaces are not to be cut and patched use surface raceway.

- A. Where necessary to run exposed on existing walls and/or ceilings in finished areas, use surface raceway series type, as required for each individual circuit, or as shown on drawing. Paint the new surface raceway to match the existing surface.
- B. Surface raceway shall be Wiremold, Mono-Systems, or Hubbell.

2.6 MULTI-OUTLET ASSEMBLIES

Note information to be shown on drawing.

- A. Multi-outlet assemblies shall be Wiremold Plugmold series 2100 with receptacles, couplings, entrance and end fittings necessary for a complete installation, as shown on the drawing.
- B. Receptacles for plugmold shall be 15 ampere, 125 volt, 3 wire grounding type, Wiremold catalog no. 2127GA.
- C. 15 ampere, 250 volt, 3 wire grounding type receptacle shall be Wiremold catalog no. 2127GB.
- D. The length of plugmold, number of outlets, spacing of outlets on centers, and mounting height shall be as shown on the drawing.
- E. Mono-Systems and Hubbell are an approved equal to Wiremold.

2.7 TELE-POWER POLES

Note information to be shown on drawing.

- A. Tele-power poles shall be as manufactured by Wiremold Company, series and catalog no. as noted on drawing.
- B. Mono-Systems and Hubbell are an approved equal to Wiremold.

2.8 TWIN-DUCT

- A. Twin-duct shall be Wiremold series 4000 with divider strip and furnished with catalog no. G-4007 C-1 or C-2 device mounting plates, couplings, entrance and end fittings necessary for a complete installation, as shown on the drawing.

- B. Mono-Systems and Hubbell are an approved equal to Wiremold.

2.9 PANCAKE

Note information to be shown on drawing.

- A. Pancake shall be Wiremold series 1500 with receptacles, couplings, entrance and end fittings necessary for a complete installation, as shown on the drawing.
- B. Receptacles for pancake shall be 15 ampere, 125 volt, 3 wire grounding type, Wiremold catalog no. 1543GL.
- C. The length of pancake, number of outlets, spacing of outlets, and mounting shall be as shown on the drawing.
- D. Mono-Systems and Hubbell are an approved equal to Wiremold.

PART 3 - EXECUTION

Use approved conduit hangers and support conduit in a neat and orderly manner regardless of location.

Conduit installed in steam tunnels shall be anchored with "Hilti" type anchors. Plastic anchors shall not be used.

3.1 CONDUIT

- A. Conduit shall be concealed in all new walls and run above suspended ceilings.
- B. Channel existing plaster walls and/or ceilings to conceal conduit in finished areas.
- C. In lieu of channeling existing plaster walls and where lay-in ceilings are used, flexible metal conduit of minimum size 3/4" may be installed from a switch or receptacle outlet up to a junction box located above the lay-in ceiling. In this instance, the conduit length may exceed six feet.

Note information to be shown on drawing.

- D. Use Wiremold where necessary to run exposed on existing walls and/or ceilings in finished areas as shown on the drawings.

If finished surfaces are not to cut and patched use surface raceway.

- E. Use Wiremold where necessary to run exposed on existing walls and/or ceilings in finished areas.
- F. Provide one spare 1 inch conduit up and one down, to ceiling space, from each new flush panel.
- G. All conduits shall be fastened or suspended from structural members, slabs, or walls only. It shall not be run on or fastened to tee bars of suspended lay-in ceilings.
- H. All conduits shall be supported by approved hangers.
- I. Conduit shall be terminated with locknuts and bushings in all outlet boxes and panels. Insulated bushings shall be used on all rigid conduits 1-1/4 inch and larger. Use insulated bushings and connectors on all E.M.T. All conduit connectors and couplings shall be galvanized steel; cast connectors and couplings are not acceptable.
- J. Threaded couplings, connectors, and conduit bodies shall be used on rigid galvanized conduit and intermediate metal conduit; set screw or threadless types are not acceptable.

If Use the following paragraph for exposed conduit installation.

- K. All conduits run exposed shall be run parallel to the structural members of the building in a neat manner, securely fastened in place. Approved conduit type fittings or outlet boxes shall be used at all bends in a vertical plane or where breaking around beams or columns. Bends on ceilings in a horizontal plane shall be made with long sweep ells. Paint all exposed conduit in finished areas to match existing finishes.
- L. All conduits penetrating underground walls into basements, crawlspaces, vaults, etc. shall be sealed between the conduits and walls with Link-Seal Model "C" modular sealing system.

Use the following paragraphs for conduit under concrete slab.

- M. When metal conduit extends below the bottom of a slab on the ground, the slab shall be thickened in the area of the conduit so as to encase the conduit in concrete by at least 2 inches on all sides. The responsibility for and expense of this work shall be borne by the Contractor.
- N. Where high voltage conduit or fiber duct is laid beneath the floor slab of a building, there shall be a minimum of 6 inches of sand fill between the outside of the concrete envelope around the conduit and the underside of the floor slab.

3.2 PULL AND JUNCTION BOXES

- A. Pull boxes shall not be installed in inaccessible locations.

- B. In general, pull or junction boxes shall be used in conduit runs when the number of bends in the conduit run exceeds 360 degrees. When conduits are installed in a bank, conduit bodies may be utilized due to space limitations.

3.3 SURFACE RACEWAY AND MULTIOUTLET ASSEMBLIES

- A. All joints and corners shall be tight with no gaps or spaces.
- B. Raceway and assemblies shall be securely fastened to surface such that it cannot be moved.

3.4 MOUNTING UNDER ROOF DECKS

- A. Conduit and raceways systems shall not be mounted directly to the underside of roof decks or installed through the webbing, flutes, or ribs of the roof deck support system.
- B. Conduit and raceway systems shall be attached to the bottom of the structural elements supporting the roof deck.

END OF SECTION 260533