SECTION 260534 - CONDUITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. This section is a Division 26 Basic Electrical Materials and Methods section and is part of each Division 26 section making reference to electrical conduits specified herein.

1.02 SCOPE OF WORK

A. The work shall include all labor and material for feeder and branch circuit conduits required by Division 26 of the Contract Documents.

B. Types of conduits specified in this section include the following:

1. Electrical metallic tubing (EMT)

2. Flexible metal conduit (FMC)

3. Liquid-tight flexible metal conduit

4. Heavy wall rigid steel conduit

5. Heavy wall rigid aluminum conduit

6. Heavy wall PVC conduit

PART 2 - PRODUCTS

2.01 METAL CONDUIT AND TUBING

A. Rigid aluminum conduit shall be 6063 alloy, T41 temper, conforming to FS WWC 540, ANSI C80.5 and UL 6. Fittings shall be threaded type of aluminum construction.

B. Rigid steel conduit shall be hot dip galvanized conforming to FS WWC 581, ANSI C80.1 and UL 6. Fittings shall be threaded type of galvanized malleable iron construction.

C. Flexible metal conduit shall be formed from continuous length of spirally wound, interlocked zinc-coated strip steel conforming to FS WWC 566 and UL 1. Fittings shall be of the threadless, hinged clamp type.

D. Liquid-tight flexible metal conduit shall be constructed of single strip, flexible, continuous, interlocked and double-wrapped steel, galvanized inside and outside and coated with liquid-tight jacket of flexible polyvinyl chloride (PVC). Fittings shall be liquid-tight compression type.

E. Electrical metallic tubing (EMT) shall be galvanized steel in accordance with FS WWC 563, ANSI C80.3 and UL 797. Fittings 1-1/4-inch and smaller shall be compression type and 1-1/2-inch and larger shall be set screw type. All fittings shall be of wrought steel construction.

2.02 NON-METALLIC CONDUIT

A. Heavy wall PVC conduit shall be Schedule 40, 90 degrees C, U.L. rated, constructed of polyvinyl chloride and conforming to NEMA TC-2 for direct burial or normal above ground use. Fitting shall be of the solvent weld type. Conduits shall be supported with non-metallic devices.

PART 3 - EXECUTION

3.01 INSTALLATION OF CONDUITS

A. Conduit shall be installed, generally as shown on plans, in an approved workmanlike manner. Hangers and fasteners shall be of the type appropriate in design and in dimension for the particular application and shall be securely fastened in place. All joints shall be securely and tightly made. Elbows, offsets and bends shall be uniform and symmetrical. Conduit shall be run parallel to or at right angles to the building lines.

1. Install exposed conduits parallel with, or at right angles to wall of building. Conduits shall not interfere with ceiling inserts, lights or ventilation ducts or outlets.

2. Support exposed conduits by use of hangers, clamps or clips. Support conduits on each side of bends and on spacing not to exceed following: up to 1-inch: 6'-0"; 1-1/4-inch: 8'-0".

3. Horizontal runs for conduit shall be supported from overhead construction at intervals not exceeding 10-feet (5-feet for flexible), using clevis type hangers and round steel rods. Perforated strap iron hangers will not be permitted.

4. Where three or more conduits are run parallel in a group, trapeze hangers of steel angles or channels and steel hanger rods shall be used.

B. Field bends shall be made with an approved bending machine and shall be free from dents or flattening. Not more than the equivalent of three 90 degree bends will be permitted in any conduit run. Straight runs shall not exceed 100-feet in length without a junction or pull box.

C. Each conduit system shall be installed complete and swabbed out from end to end to remove all foreign matter before any conductors are drawn in. All conduits which are to remain empty shall be provided with a nylon pull line.

D. Conduits shall be independently supported from the building structure and shall not be attached to the support systems provided by other trades unless specifically indicated.

E. Provide sleeves for all conduits passing through hollow walls. Sleeves shall be installed in circular openings made by core drill or hole saw and shall be securely fastened to the wall. The annular space between the wall and the sleeve shall be kept to a minimum and filled with a fire retardant caulking compound. Sleeves shall be nominally 1-inch trade size larger and constructed of the same material as the conduit being installed.

F. Provide expansion joints in all conduits which cross building expansion joints.

G. Manufactured PVC 90 degree conduit ells shall be as follows:

1. Through 1-1/2-inch trade size - l8-inch radius.

2. Two to three-inch trade size - 36-inch radius.

3. Three and one-half (3-1/2) inch and larger - 60-inch radius.

H. Where conduit runs are in close proximity to heating piping or domestic hot water piping, the minimum space between pipes and conduits shall be 6-inches.

3.02 CONDUIT USAGE

A. Install all wire and cables in electrical metallic tubing, unless otherwise specified or indicated on the drawings. Minimum size conduit, unless otherwise indicated, shall be 3/4-inch trade size.

1. Rigid aluminum conduit with threaded fittings shall be used for all conduit installations exposed to the weather.

2. Liquid-tight flexible metallic conduit shall be used for connection to motors and other equipment which produces or transmits vibration or noise, unless the motors or equipment are mounted above suspended ceiling. Provide suitable bonding jumper for all connections.

3. Flexible metallic conduit (min. 1/2-inch trade size) shall be used for connection from a junction box to lighting fixtures, motors and other similar equipment mounted in a suspended ceiling, as well as for connection to transformers.

4. Rigid steel conduit shall be used where conduit is encased in the building's poured concrete construction, and PECO metering equipment.

5. Heavy wall PVC conduit shall be used for all grounding conductors and other specific uses as indicated by the drawings.

3.03 LOCKNUTS AND BUSHINGS

A. Provide locknuts on both sides of rigid conduit terminations in all junction boxes, panelboards and similar sheet metal enclosures.

B. Provide nylon insulated metallic bushings for terminating all rigid conduits. Bushings shall be installed before cables are pulled.

C. Connector for EMT, liquid tight and flexible metallic conduit shall be nylon insulated steel fittings with lock nuts.

3.04 CONDUIT IDENTIFICATION

A. Each feeder conduit shall be identified as specified in Section 16195.

3.05 FIRESTOPS

A. Provide firestops around all conduits passing through sleeves and those passing through core drilled holes in floors or walls. The annular space between the conduit and the sleeve or core drilled opening shall be filled as follows:

1. Fire retardant caulking compound shall be packed tight to a depth of two-inches in the annular space at the underside of the slab (or at one side of wall).

2. Firestop material shall be packed tight into annular space to within 1-1/2-inches of top of slab (other side of wall).

3. Fire retardant caulking compound shall be packed into remaining annular space.

B. Fire retardant caulking compound shall be 3M Brand Fire Protection Products.

C. Firestop material shall be 3M Brand or Alvatech, Inc. Fire Protection Products.

END OF SECTION 260534