

SECTION 16111

CONDUIT

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal Conduit.
- B. Liquid-tight Flexible Metal Conduit.
- C. Nonmetal Conduit.
- D. Fittings and Conduit Bodies.

1.2 RELATED SECTIONS

- A. Section 16130 - Boxes.
- B. Section 16170 - Grounding and Bonding.
- C. Section 16190 - Supporting Devices.
- D. Section 16195 - Electrical Identification.

1.3 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. ANSI C80.5 - Rigid Aluminum Conduit.
- D. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- E. ANSI/NFPA 70 - National Electrical Code.
- F. NECA "Standard of Installation."
- G. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- H. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC--80).
- I. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.4 DESIGN REQUIREMENTS

- A. Conduit Size: ANSI/NSPA 70.

- 1.5 PROJECT RECORD DOCUMENTS
 - A. Submit under provisions of Section 01700 – Contract Closeout.
 - B. Accurately record actual routing of all conduits.
- 1.6 REGULATORY REQUIREMENTS
 - A. Conform to requirements of ANSI/NFPA 70.
 - B. Furnish products listed. Classified list by Underwriters Laboratories, Inc., or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver, store, protect, and handle products to Site under provisions of Section 01600 – Material and Equipment.
 - B. Accept conduit on Site. Inspect for damage.
 - C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
 - D. Protect PVC conduit from sunlight.
- 1.8 PROJECT CONDITIONS
 - A. Verify that field measurements are as shown on plans.
 - B. Verify routing and termination locations of conduit prior to rough-in.
 - C. Conduit routing is shown on plans in approximate locations unless dimensioned. Route as required to complete wiring system.
2. PART 2 PRODUCTS
 - 2.1 CONDUIT REQUIREMENTS
 - A. Minimum Size: 1 inch unless otherwise specified.
 - B. All conduit shall be new schedule 80 PVC. If susceptible to mechanical damage, conduit will be rigid steel. PVC shall be installed underground, in concrete, and in damp or wet locations.
 - C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel fittings with external PVC coating to match conduit.
3. PART 3 EXECUTION
 - 3.1 INSTALLATION
 - A. Sample concrete penetrations are shown on plans. Contractor shall determine proper size and number of conduits needed and shall coordinate with earth moving and concrete work Contractors.

- B. Install conduit in accordance with NECA "Standard of Installation" in locations shown on plans and other areas where required.
- C. Arrange supports to prevent misalignment during wiring installation.
- D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- E. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
- F. Fasten conduit supports to building structure and surfaces under provisions of Section 16190 – Supporting Devices.
- G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
- H. Arrange conduit to maintain headroom and present neat appearance.
- I. Route exposed conduit parallel and perpendicular to cabinets, walls, etc.
- J. Route conduit in and under slab from point-to-point.
- K. Do not cross conduits in slab.
- L. Maintain adequate clearance between conduit and piping.
- M. Cut conduit square using saw or pipecutter; de-burr cut ends.
- N. Bring conduit to shoulder of fittings; fasten securely.
- O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- P. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in all locations.
- Q. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate or factory elbows for bends in metal conduit larger than 2 inch (50 mm) size. All conduits for optical fiber shall use long sweeps with 3 feet minimum radius turns.
- R. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- S. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.
- T. Provide suitable pull wire, #12 galvanized, in each empty conduit except sleeves and nipples.
 - 1. Label each end of pull wire as to its purpose and termination point.

- U. Use suitable caps to protect all installed conduit against entrance of dirt and moisture including all empty conduits.
- V. Ground and bond conduit under provisions of Section 16170 – Grounding and Bonding.
- W. Identify conduit under provisions of Section 16195 – Electrical Identification.

END OF SECTION