

SECTION 16135

OUTLET, JUNCTION, AND PULL BOXES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Section includes requirements for outlet boxes for use with wiring devices and lighting fixture outlets.

1.02 REFERENCE STANDARDS

- A. California Code of Regulations (CCR):
 - 1. Title 24, Part 3, California Electrical Code
- B. National Electrical Manufacturers Association (NEMA):
 - 1. NEMA FB-1 Fittings, Cast Metal Boxes, Conduit Bodies for conduit, Electrical Metallic Tubing (EMT) and Cable
 - 2. NEMA OS-1 Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
 - 3. NEMA 250 Enclosures for Electrical Equipment (1000 Volts max)
- C. National Fire Protection Association (NFPA):
 - 1. NFPA 70 National Electrical Code (NEC)
- D. Underwriters Laboratories, Inc. (UL):
 - 1. UL 514A Metallic Outlet Boxes

1.03 SUBMITTALS

- A. Refer to Section 16000, Basic Electrical Requirements, for additional submittals and submittal requirements.
- B. Submit manufacturer's product data on outlet boxes to be used.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Furnish electrical boxes of material, finish, type and size indicated and required for location, kind of service, number of wires, and function.
- B. Boxes shall have appropriate means to secure covers. Provide boxes complete with accessible covers designed for quick removal and suitable for purpose used;

- equip boxes, in which or on which no devices or fixtures are to be installed with flat or raised blank covers as required.
- C. Provide neoprene gaskets 1/8 inch thick for boxes subjected to weather.
 - D. Provide fire resistant gaskets 1/8 inch thick for boxes in tunnels and cross-passages.
 - E. Furnish necessary adapter plate for mounting devices on light fixtures, brackets, supports, hangers, fittings, bonding jumpers and other accessories required.
 - F. Concealed and Embedded Junction Boxes: Zinc-coated inside and out.

2.02 STANDARD SHEET METAL BOXES

- A. Standard Sheet Metal Boxes: Conform to NEMA OS-1 standard, hot dipped galvanized, one piece drawn steel.
- B. Outlet Boxes shall be 4 inch minimum true size and 1-1/2 inches minimum depth unless otherwise specified for the installation. For 1-inch conduit, use boxes 4-11/16-inch minimum trade size. Sectional boxes assembled by means of screws are not acceptable.
- C. Use standard galvanized covers, rings and fittings of appropriate type for box or device to be installed. Same thickness as sheet steel boxes.
- D. Provide products of commercial quality best suited for purpose indicated or specified.
- E. Luminaire and equipment supporting boxes shall be rated for weight of equipment supported.
- F. Manufacturer: Appleton, Bowers, Raco, Steel City, or Engineer approved equal.

2.03 CAST BOXES

- A. Cast Boxes: Conform to NEMA FB-1. Boxes for exposed switches and receptacles: Cast metal, FS and FD Types.
- B. Boxes shall be cast metal type with threaded hubs. Steel or ferrous alloy, with compatible conduit fittings.
- C. Use cast metal boxes in moist locations where surface mounted rigid conduit system is used (e.g. storm water lift station sump, above ground prefabricated service booth on interior and exterior surfaces, and for surface mounted weatherproof outlets or devices, regardless of location)
- D. Surface Mounted Cast Metal Box: NEMA 250, Type 4, 4X or 6, flat flanged, galvanized cast iron. Furnish cover with ground flange, neoprene gasket, and stainless steel cover screws.
- E. Recessed Mounted Cast Metal Box: NEMA 250, Type 3S, heavy duty, galvanized cast iron, recessed cover with neoprene gasket suitable for concrete wall

embedment. Cover shall be provided with stainless steel tamper proof screws. Box shall be drilled and tapped for the number and size of conduits indicated on the Contract Drawings. Use box in tunnels and pedestrian underpasses.

- E. In-Ground Cast Metal Box: NEMA 250, Type 6, inside flanged, recessed cover for flush mounting. Galvanized cast iron. Non-skid cover with neoprene gasket and stainless steel screws.
- F. Cover Legend: "ELECTRIC"
- G. Manufacturer: Appleton, Crouse-Hinds, or Engineer approved equal.

PART 3 - EXECUTION

3.01 OUTLET BOXES

- A. Outlet boxes
 - 1. Securely fasten outlet boxes in position and support independent of the conduit system.
 - 2. Install boxes true to the building lines and at equal heights in conformity with mounting heights per NEC and as indicated in the Contract Documents.
 - 3. Boxes shall have only the holes necessary to accommodate the conduits at point of installation.
 - 4. Rigidly secure boxes in position. Set boxes so that the front edge of the box is flush with the finished wall or ceiling line, or not more than 1/8 inch back of same.
 - 5. Offset back-to-back outlets so that a minimum of 6 inches separation.
 - 6. All boxes shall be accessible. Mount boxes with long axis of devices vertical unless otherwise indicated.
 - 7. Locate boxes and box knockouts without interference with reinforcing steel.
- B. Lighting Outlet Boxes
 - 1. Exposed installation: Cast metal, not smaller than 4 inches round or square by 2 1/8 inches deep.
 - 2. Embedded and concealed installation: Standard sheet steel boxes approved for intended purpose.
 - 3. Locate outlet boxes to allow luminaries positioned as shown on reflected ceiling plan.

- C Support fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels, directly from the structure above, wherever pendent mounted lighting fixtures are installed on the box. Mount boxes independent of ceiling suspension system.
- D. Install necessary adapter plate for mounting devices on light fixtures, brackets, supports, hangers, fittings, bonding jumpers and other accessories.
- E. Install specified gaskets.
- F. Grounding: As specified in Section 16060, Grounding and Bonding. Install grounding jumpers.

3.02 JUNCTION AND PULL BOXES

- A. Junction and pull boxes less than 100 cubic inches in size: Cast metal for exposed installation and sheet steel for embedded installation.
- B. Junction and pull boxes more than 100 cubic inches in size: Conform to requirements for cabinets, except use recessed cast metal boxes with gasketed covers in tunnels; interface pull boxes at ends of tunnels.
- C. Support boxes independently of conduit.
- D Use gang boxes where more than one device is mounted together. Do not use sectional box.
- E. Install covers readily accessible after completion of installation.
- F. Outlet boxes used as junction boxes: Not smaller than four inches square by 1 1/2 inches deep. Provide flat blank covers.
- G. Covers:
 - 1. Same thickness as sheet steel boxes; secured in position by No. 10-24 stainless steel machine screws. Arrange covers to be vandal resistant.
 - 2. Cover for four-inch square box: Provide opening at one side for switch or receptacle; blank at other side.
- H. Concealed and Embedded Junction Boxes:
 - 1. Concealed or embedded switch or receptacle boxes: Sheet steel, four inches by 1 1/2 inches deep minimum size.
 - 2. Boxes Set in Concrete:
 - a. Support boxes to prevent movement during placement of concrete.
 - b. Plug and mask unused nailing holes and other holes in side or bottom of boxes.

3.03 CLEAN UP

- A. After installation, clean boxes placed in concrete.

END OF SECTION