

SECTION 16130 – OUTLET BOXES, JUNCTION BOXES AND GUTTERS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK:

- A. Outlet, junction boxes, conduit bodies, wiring gutters and their installation.

PART 2 – PRODUCTS

2.1 OUTLET AND JUNCTION BOXES:

- A. Provide wiring devices, fixtures and special system outlets with outlet box. Use galvanized steel for concealed boxes and exposed boxes in dry locations. Use cast iron conduit fittings similar to “Condulets” or “Unilets” with threaded hubs for exposed boxes outside and exposed to moisture.
- B. Concealed outlets and exposed outlets in unfinished spaces for lights, switches, wall receptacles, etc.; consist of standard galvanized steel outlet boxes and plaster rings.
 - 1. Provide 1/16” thick boxes and covers of form and dimension adapted to its specific use and location, kind of fixture to be used and number, size and arrangement of connecting conduits.
 - 2. Provide 3/8” fixture studs where required.
 - 3. Ceiling Outlet Boxes: 4” octagonal or 4-11/16” square as required, due to number of wires, and 2” deep minimum. Ceiling boxes in slabs concrete type. Plaster rings not required for ceiling outlet unless needed for device.
 - 4. Paint junction boxes provided with blank covers to match surroundings, except use blank device plates in finished areas.
 - 5. Switch and receptacle outlet boxes: 4” square with plaster rings as necessary. Provide multigang boxes where shown or required. Provide metal barriers to separate emergency and normal service wiring per N.E.C.
 - 6. Steel City, Appleton, Raco, Bowers or approved equivalent.
- C. Use galvanized cast iron boxes, approved equivalent to Crouse-Hinds type “FS” or Appleton condulets, with appropriate covers for wall outlets in exposed conduit work and exposed to moisture.
- D. Use galvanized cast iron boxes equivalent to Crouse-Hinds type GRF for ceiling outlets in exposed conduit work exposed to moisture.

- E. Use square cut steel outlet boxes for outlets exposed in finished locations. Use round or square to adapt to device installed. Wiremold, Hoffman or approved equivalent.

2.2 LARGE JUNCTION BOXES:

- A. Furnish pull, tap and cable support boxes required by NEC for excessive number of 90 degree conduit bends, conductor taps and cable supports.
 - 1. Box construction per NEC and manufactured with galvanized sheet steel 12 gage minimum, with angle iron frame where required for rigidity; welded or bolted construction. Install bolts to prevent damage to cables in box.
 - 2. Boxes with removable screw type covers and plated screws. Provide split covers where necessary for access. Maximum single piece cover – 36" x 36".
 - 3. Provide separate junction boxes for each feeder. If conduit is installed so separate junction boxes are not practical, one large pull-box may be used with each set of feeder conductors separated by 12 gage steel barriers. Furnish junction box or each compartment in junction box with ground lug for connection of ground wire.

2.3 CONDUIT BODIES:

- A. Conduit bodies shall be installed to provide ease of pulling conductors and to provide neat appearance of conduit installation, and as shown on drawings. Conduit bodies constructed of malleable iron or copper free aluminum castings. Bodies shall be finished with standard durable exterior coatings of manufacturer specified. Provide rollers in type "C" and type "LB" bodies, 1-1/4" size and larger. Provide gasketed plated steel or malleable iron covers.
- B. Conduit bodies shall be manufactured by Crouse-Hinds, Pyle National, Killark, Appleton or approved equivalent.

2.4 GUTTERS (WIREWAYS):

- A. 8" x 8" and smaller – use standard assembly manufactured by Square "D", Walker Electric, B&C Stamping Co., and General Electric. Make special and larger gutters of code grade galvanized sheet steel with hinged covers and approved fastening device.

2.5 SURFACE METAL RACEWAYS:

- A. Where indicated on the drawings, wiring shall be run in exposed metal raceways, metal molding or wiremold complete with outlet boxes and fittings. All circuits run in surface metal raceways shall have a ground conductor with green insulation sized per the NEC, but not smaller than No. 12 AWG screw connected to each outlet box. All wiring in surface metal raceways shall be type “THWN” conductors.

PART 3 – EXECUTION

3.1 INSTALLATION OF OUTLET BOXES:

- A. Fasten outlet boxes securely to structure.
- B. Set all flush outlet boxes so edge of device flange is flush with finished surface.
- C. Open no more knockouts in outlet box than required.
- D. Seal boxes during construction.
- E. Stagger back to back boxes 3” minimum. In rated walls use appropriate U.L. spacing.
- F. Coordinate and verify rough-in location and mounting height of all boxes with drawings and other trades prior to installation.
- G. Support All Boxes:
 - 1. Outlet boxes – with ¼” diameter galvanized rods or bolts anchored to structure.
 - 2. Outlet boxes for surface mounted luminaires on furred ceilings with ¾” channel iron fastened to ceiling channels. See Section covering “Luminaires”.
 - 3. Pull, junction and cable boxes with 3/8” diameter galvanized rods or bolts (4 minimum).
 - 4. Support outlet boxes in steel stud partitions with Caddy “BHA” bar hangers or approved equivalent.
- H. Install adjacent outlets at different levels in one vertical line where possible.
- I. Provide green covered bonding jumper, screw connected to outlet box in all receptacle boxes.

- J. Paint wiring connections in ground mounted outlets or floor outlets in wet locations with "Scotchkote" and fill box with "Duxseal".
- K. Mark outlet box covers with permanent ink markers to indicate circuit number(s) and panel of origination. Use black markers for normal service circuits and orange for emergency service.
- L. Use 4" octagonal boxes with blank covers for master outlets, installed to permit installation of collars by others.
- M. Where outlet boxes installed in unfinished concrete walls or columns, provide 1" deep plaster ring with box and ring set in position before the concrete is poured so concrete will fill around the ring and cover plate can be installed flush with the unfinished surface. In case of brick walls, follow same procedure with mason filling around the plaster ring with mortar.
- N. Install all outlets located on columns on centerline of column and bend or shift reinforcing so that the outlet box will be flush with the finished concrete. Provide plaster rings as required so that the plate is flush with the finished plaster or exterior concrete surface.
- O. Where outlets installed in waterproofed columns or walls, provide 6" x 6" x 3" deep wood box placed in the forms before concrete is poured. Box will be removed before waterproofing is applied. General Contractor will waterproof wall and opening, after which Electrical Contractor will install outlet box. General Contractor will grout around box. Set boxes carefully so that cover plates will be flush.
- P. Install conduit bodies where shown or where required for sharp bends and/or aesthetics in raceway system. Do not use in lieu of pullboxes except in limited space or as directed by *[Architect (or) Engineer].

3.2 INSTALLATION OF JUNCTION BOXES:

- A. All junction boxes shall be accessible.
- B. Securely fastened to structure.
- C. Exterior below grade boxes shall be embedded 6" of concrete on sides and bottom. Top shall be level with finished grade unless shown otherwise.
- D. There shall be no more knockouts opened in any box than are actually required.
- E. Protection during construction.

3.3 INSTALLATION OF GUTTERS:

- A. Mount gutters on ¾" thick BC plywood backboard, sized for devices to be mounted, paint 2 coats of Albi No. 107A fire retardant paint (install label on board), and mount all equipment thereon.
- B. Run conductors in gutter without reduction in size, entire length of gutter.
- C. Connect individual taps from conductor to tapped device with ILSCO insulated tap devices sized for conductors used.
- D. Gutter Tops: for copper conductors shall be ILSCO type GTA or PTA with GTC or PTC insulating covers or by "TEE" compression lugs as manufactured by Anderson or Burndy, wrapped with Scotch #33 electrical tape to a thickness which equals insulation level of wire.

END OF SECTION 16130