SECTION 260000 (16130)

ELECTRICAL BOXES (Rev. Jun 2011)

PART 1 GENERAL

1.00 SECTION INCLUDES

A. Provide boxes for electrical equipment and wiring devices as follows:

1. Wall and ceiling outlet boxes.
2. Floor Boxes.
4. Pull and junction boxes.
5. Access doors.

1.01 RELATED DOCUMENTS


C. Drawings and general provisions of the Contract, including General and Supplemental Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 RELATED SECTIONS

A. Refer to the following sections for additional requirements for the Communications Distribution System (CDS):

1. Standards Section 078413 (07841) – Through-Penetration Fire Stop System
2. Standards Section 101000 (10019) – Space Identification-Standard
3. Standards Section 260000 (16111) – Raceway System
4. Standards Section 260000 (16130) – Boxes (Sizes, Styles and Types)
5. Standards Section 260000 (16650) – Electrical System-CDS
6. Standards Section 132100 (16652) – Requirements for Communication Rooms
7. Standards Section 271000 (16651) – Communications Distribution System
8. Standards Section 271000 (16651) – APPENDIX-A CDS Approved Products
9. Standards Section 271000 (16651) – APPENDIX-B CDS Glossary of Terms
10. Standards Section 271000 (16651) – APPENDIX-C CDS Building Acronyms
11. Standards Section 271000 (16651) – APPENDIX-D CDS Station Cable Record
12. Standards Section 271000 (16651) – APPENDIX-E CDS Typical Rack Layout For Equipment
13. Standards Section 271000 (16651) – APPENDIX-F CDS Typical Rack Layout For Data Patch Panels
14. Standards Section 273226 (16630) – Rescue Assistance Telephone System
15. Standards Section 275316 (16680) – Clock System
16. Standards Section 275319 – Distributed Antenna System
17. Standards Section 274100 (16710) – Audio-Video (Multi-Media) Systems
18. Standards Section 281300 – Electronic Access Control and Intrusion Detection System
19. Standards Section 282300 (16710) – Video Surveillance System

1.03 REFERENCES

A. NECA – Standard of Installation.
B. NEMA FB 1 – Fittings and Supports for Conduit and Cable Assemblies.
C. NEMA OS 1 – Sheet-steel Outlet Boxes, Device Boxes, Covers and Box Supports.
D. NEMA OS 2 – Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
F. NEMA 70 – National Electrical Code.

1.04 SUBMITTALS

A. Product Data: Provide data for wall and ceiling outlet boxes, floor boxes, pull and junction boxes.
B. Record actual locations and mounting heights of outlet, pull and junction boxes on project record documents.

1.05 REGULATORY REQUIREMENTS

A. Provide Products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 OUTLET BOXES

A. Acceptable Manufacturers: Appleton, Crouse Hinds, Killark, O Z Gedney, Raco/Bell, Steel City or approved equivalent.
B. Outlet boxes shall accommodate the devices to be installed and shall be sized as required by the applicable codes for number and size of conduits and conductors entering and leaving. Round or octagon boxes will not be permitted unless specifically called for. Boxes shall have galvanized finish.

C. Outlet boxes shall be of code gauge, galvanized steel and provided with plaster rings in non-masonry walls, tile rings in masonry walls or other appropriate device rings and provided with knockouts.

D. Outlet boxes and device boxes mounted in non-masonry walls shall be minimum 4” square by 2 1/8” deep minimum size exclusive of rings and shall be provided with covers or device rings as specified. Boxes for wall switches and data/telephone outlets shall be minimum 2-1/8” deep exclusive of rings.

E. All Boxes for data/telephone pathway use shall be a minimum 4-11/16” square by 2-1/8” deep exclusive of rings.

F. Outlet boxes, telephone/data boxes and device boxes mounted in masonry walls shall be double gang masonry boxes with a minimum depth of 2½” for 4” masonry walls and 3½” for 6” or 8” masonry walls (exclusive of rings).

G. Multi-gang boxes shall be one-piece. Do not use built-up boxes.

H. Weatherproof boxes shall be non-rusting cast metal with threaded hubs. Boxes shall have screw mounted, gasketed covers. Plugs shall be installed in all unused holes.

I. Outlet boxes installed on existing poured concrete or masonry walls in detention areas shall be triple coated, malleable iron cast boxes equal to Appleton FS/FD series. Where the conduit is surface mounted to the box, provide cast hubs, otherwise, provide a blank body capable of being drilled and tapped at back of box.

J. Boxes installed in masonry walls shall have tile covers.

2.02 PULL AND JUNCTION BOXES

A. Acceptable Manufacturers: Circle AW, Hoffman, Rittal or approved equal.

B. Special oversized outlet boxes and junction boxes shall be code gauge, galvanized steel and of the knockout type. Boxes shall have screw mounted covers for surface or flush mounting. Boxes shall be sized in accordance with applicable codes. Special outlet boxes shall accommodate the equipment served.

C. In damp or wet locations sheet metal pull boxes shall be hot dipped galvanized after fabrication then finished painted with two coats of rust-resistant paint. Use covers with neoprene gaskets affixed with stainless steel screws. Seal around conduit entries with silicone based sealant.
2.03 FLOOR BOXES

A. Acceptable Manufacturers: Steel City, Walker Box or approved equal.

B. Floor boxes shall be of cast metal, threaded conduit-entrance, waterproof type with means of adjusting cover plate to finish floor level both before and after pour. Cover plates shall be of heavy brass with permanent ring or flange and rubber gasket. Model numbers as indicated on the Contract Drawings. Floor outlets in carpeted areas shall be complete with polycarbonate carpet flanges.

C. Provide special depth floor boxes where installed in access floor systems. Verify box requirements with floor manufacturer.

2.04 POKE-THRUS

A. Acceptable Manufacturers: Walker Box or approved equal.

B. Poke-thrus shall be as indicated on the Contract Drawings and include polycarbonate finish rings and shall be Ul listed and classified for 2 hours. Poke-thrus shall include flush polycarbonate finish rings, have double duplex or data ports as shown and contain integral ¾” EMT conduit and junction box. Junction box shall be a minimum of 24 cu inch capacity. Model numbers shall be as indicated on the Contract Drawings.

2.05 COMBINATION DATA/POWER FLOOR BOXES

A. Acceptable Manufacturers: Steel City GAB-6 with AFM-6 floor inserts or approved equal.

B. Floor boxes shall be steel type for installation in concrete floors with means of adjusting cover plate to finish floor level both before and after the concrete pour. Cover plates shall be the hinged polymide type with retractable cable exits. Provide power/data plates as required for mounting the indicated devices. Floor outlets in carpeted areas shall be complete with polycarbonate carpet flanges.

C. Provide special depth floor boxes where installed in access floor systems. Verify box requirements with the floor manufacturer.

2.06 ACCESS DOORS

A. Material shall be in accordance with Specification Section 08305..

B. Minimum size of access doors shall be 12” x 12”.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify exact locations of floor boxes and outlets prior to rough-in.

3.02 GENERAL INSTALLATION

A. Install boxes in accordance with NECA “Standard of Installation.”

B. Install in locations as shown on Contract Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

C. Electrical boxes are shown on Contract Drawings in approximate locations unless dimensioned. Adjust box location up to 10 feet if required to accommodate intended purpose.

D. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Specification Section 07270.

E. Boxes shall be supported independently of the raceway or conduit system. Do not fasten boxes to ceiling support wires.

F. Where boxes occur in pre-cast concrete construction, the Contractor shall coordinate said installation with the contractor building the precast construction to produce shop drawings showing all box locations. Provisions shall be made for conduit entry from top or bottom of wall panels. All conduit and boxes shall be installed concealed and flush respectively. These requirements shall be met whether the precast work is done at the site or at a location remote from the site.

G. All boxes shall be plumb. Supports shall be noncombustible and corrosion resistant. In suspended ceilings, bar hangers shall be used to support the boxes from the ceiling channels. Refer to Contract Drawings for exact heights of outlets not specified herein or indicated on the Contract Drawings. Unused knockouts in boxes shall be left sealed.

H. Do not mount control or disconnecting devices more than 6’-6” above finish floor.

I. Do not locate cabinets, outlets or other apertures larger than 16 square inches in rated fire walls.

J. Prior to installation, the Owner reserves the right to relocate any outlet or device within 6’-0” of the location indicated on the Contract Drawings at no additional cost to the Owner.

K. Where rigid conduit enters a box, fitting or device through a knockout, double locknuts and an insulated metallic bushing shall be used. EMT shall terminate at knockouts with an insulated throat fitting and one locknut. Connectors shall be made up tight to insure electrical continuity of the raceway system.
L. Provide all necessary supports and backing for all enclosures and equipment.

M. Attach boxes, outlets, straps, cabinets and equipment to wood with wood or lag screws, to metal with machine screws or bolts, and to concrete with expansion anchors or self-drilling metal anchors and machine screws or bolts. Use size and number of attachments as required to support equipment weight with a safety factor of 4 (minimum).

N. Provide access doors where boxes are not exposed or located within an accessible ceiling unless indicated to be provided under other Divisions. Access doors shall comply with Specification Section 08305.

3.03 OUTLET BOX INSTALLATION

A. Each lighting outlet, switch, receptacle and other miscellaneous device shall be provided with a suitable box.

B. Align adjacent wall mounted outlet boxes for receptacles, data/telephone outlets and similar devices.

C. Use flush mounting outlet box in finished areas.

D. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

E. Outlet boxes installed in masonry walls shall be set deep enough to allow a masonry facing over the plaster ring to frame the opening. Center outlet in a course of masonry. Masonry boxes shall be mounted as follows:

1. From floor to height of 6’-0”, mount so that bottom of box rests on block joint.
2. Above 6’-0”, mount so that top of box rests on block joint.

F. Do not install flush mounting box back-to-back in walls; provide minimum of 6 inches separation. Provide minimum or 24 inches separation in fire-rated assemblies and acoustic rated walls.

G. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

H. Use stamped steel bridges to fasten flush mounting outlet box between studs.

I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

J. Use adjustable steel channel fasteners for ceiling hung outlet box.

K. Use cast outlet box in exterior locations, where exposed to the weather and wet locations.
L. Where two or more of the same type devices occur adjacent to each other, they shall be in a gang type box with a gang type cover. Where different type devices occur adjacent to each other, space outlet boxes so that finish plates will be spaced 1” apart. Where receptacles or switches are shown side by side but at different heights, they shall be centered one above the other unless noted otherwise.

M. Unless otherwise indicated, switch boxes shall be mounted with top at 48”, over counter convenience outlet boxes shall be centered 8” above the counter top or higher as required to clear the backsplash, desk height outlet boxes shall be mounted with bottom at 32 inches above finished floor and other convenience outlets shall be mounted with bottom 16 inches above the finished floor. Coordinate outlet locations with owner and provide box extensions or other equipment as required where outlets occur in cabinet backs.

N. Outlets in acoustical ceilings are to be in the center of the acoustical tile or in the center of a joint in the acoustical tile.

O. Align all outlets horizontally or vertically for a uniform neat appearance.

3.04 PULL AND JUNCTION BOX INSTALLATION

A. Pull boxes and junction boxes shall be provided as indicated on the Contract Drawings and/or as required.

B. Boxes larger than 200 cubic inches or 18 inches in any dimension shall use a hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

C. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

D. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

3.05 FLOOR BOX INSTALLATION

A. Use cast floor boxes for installations in slab on grade; formed steel boxes for other installations. Set floor boxes level and flush and finish flooring material.

B. The exact location of floor outlets shall be verified with the A/E’s representative before installation is made. Floor outlet cover plates shall be compatible with finish floor as installed.

C. Provide special depth floor boxes to suit the specified access floor system. Provide trim to match floor tiles. Verify with A/E prior to ordering.

3.06 POKE-THRU INSTALLATION

A. Coordinate exact location with A/E prior to installation.

B. Core-drill floor as required for poke-thru installation.
3.07 ADJUSTING

A. Adjust floor box flush with finish flooring material.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused box openings.

END OF SECTION 260000 (16130)