

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all materials and labor for the installation of a device boxes for inside plant communications circuits. This section includes requirements for device boxes specific to communications circuits (cabling) for voice, data, video, and other low-voltage applications.

1.2 SYSTEM DESCRIPTION

- A. Furnish, install, and place into satisfactory and successful operation all materials, devices, and necessary appurtenances to provide a complete device box system as hereinafter specified and/or shown on the Contract Documents. The device box system shall support an ANSI/TIA/EIA and ISO/IEC compliant communications Structured Cabling System (SCS) as specified in Division 27 - Communications Horizontal Cabling. These requirements supersede any Division 26 device box requirements.
- B. The work shall include materials, equipment and apparatus not specifically mentioned herein or noted on the Contract Documents but which are necessary to make a complete working device box system.

1.3 QUALITY ASSURANCE

- A. Listing and Labeling: Provide boxes specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in NEC, Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
 - 3. Intertek ETL - <http://www.intertek.com/>
- B. Comply with NECA's "Standard of Installation" and with NEC Quality assurance.

1.4 COORDINATION

- A. Coordinate layout and installation of boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials shall consist of device boxes, fittings, enclosures, and other raceway incidentals and accessories as required for inside plant communications circuits.

2.2 MATERIALS

- A. Device boxes:
 - 1. All 5 Square® Telecommunications Boxes shall have the following characteristics:
 - a. Outside Dimensions:
 - 1) 5 in (127 mm) Width
 - 2) 5 in (127 mm) Height
 - 3) 2 7/8 in (73.025 mm) Depth
 - 4) Bracket length 7 7/8 in (200.025 mm)
 - b. Materials:

- 1) Steel, 0.0625 in (1.59 mm) thickness (minimum)
 - 2) Galvanized zinc coating, 0.0005 in (0.013 mm) (minimum) thickness on the exterior surface of box and 0.00015 in (0.0038 mm) (minimum) thickness on the interior surface of box.
 - c. Construction:
 - 1) Cleanly punched knockouts
 - 2) Welded at 8 points (minimum)
 - 3) Softened edges (no sharp edges)
 - d. Grounding:
 - 1) 2 threaded holes for grounding screws, arranged such that at least one hole is usable regardless of box orientation.
 - e. Mounting/Attachment Features:
 - 1) For Cut-in Mounting: 4 holes (0.1875 in (4.76 mm) diameter) on one side
 - 2) For Concrete Form Mounting: 1 mounting hole knockout and 2 anti-rotation holes (0.25 in (6.35 mm) diameter) on back for use with Concrete Box Holder
 - 3) For Back Support Mounting: 2 holes (0.25 in (6.35 mm) diameter) on back
 - 4) For Box Support Bracket Installation: 4 tabs with tapped holes (8-32) on front of box
 - 5) For Integrated Bracket Mounting: Offsets to match conduit bending. Includes a tab for guiding box recess depth to account for screw heads behind gypsum board.
 - f. Testing / Listing:
 - 1) Intertek ETL Listed
2. Knockout Configurations
- a. Boxes with an integrated stud-mount bracket shall have similar knockout configurations on 3 sides. Otherwise, boxes shall have similar knockout configurations on all 4 sides.
 - b. Boxes with a 1-inch trade size (27 mm) knockout and a 1¼-inch trade size (35 mm) knockout per side:
 - 1) STEEL CITY 5 Square® Telecommunications Boxes, 82181T-1-114 (without bracket)
 - 2) STEEL CITY 5 Square® Telecommunications Bracket Boxes, 82181T-1-114-CV (with bracket for attaching to stud)
 - c. Boxes with a 1-inch trade size (27 mm) knockout, a ¾-inch trade size (21 mm) knockout and a ½-inch trade size (16 mm) knockout per side:
 - 1) STEEL CITY 5 Square® Telecommunications Boxes, 82181T-1234-1 (without bracket)
 - 2) STEEL CITY 5 Square® Telecommunications Bracket Boxes, 82181T-1234-1CV (with bracket for attaching to stud)
 - d. Boxes with two 1-inch trade size (27 mm) knockouts knockout per side:
 - 1) STEEL CITY 5 Square® Telecommunications Boxes, 82181T-1 (without bracket)
 - 2) STEEL CITY 5 Square® Telecommunications Bracket Boxes, 82181T-1-CV (with bracket for attaching to stud)
- B. Box Support Brackets: Rough-in brackets for mounting multiple device boxes in a single stud space.
1. Brackets shall have the following characteristics:
 - a. Materials:
 - 1) Steel, 0.6858mm thickness (minimum)
 - 2) Galvanized zinc coating, 0.013mm) (minimum) thickness on both sides of bracket.
 - b. Construction:
 - 1) Cleanly punched knockouts
 - 2) Softened edges (no sharp edges)
 - c. Mounting/Attachment Features:
 - 1) Centerline and mid-line markings for device box installation
 - 2) Offset mounting wings allowing recessed mounting to account for screw heads behind gypsum board.
 - 3) Support 5 Square® device boxes, 4 11/16 device boxes and 4 square device boxes.

- 4) Fixed mount for 5 Square® device boxes permitting the box to be installed in any orientation.
 - 5) Adjustable mount for 4 square device boxes and 4 11/16 device boxes permitting the boxes to adjust their mounting distance from other boxes.
 - d. Reversible: Bracket shall be capable of being mounted with the 5 Square® opening on the left or right side.
 - e. Testing / Listing:
 - 1) Intertek ETL Listed
2. Box Support Brackets shall be:
- a. STEEL CITY 5 Square® Box Support Bracket for 16" stud spacing, H16S-82-3
 - 1) Outside Dimensions:
 - a) 16 in (406 mm) Width
 - b) 5.3 in (134.62 mm) Height
 - c) 0.19 in (4.83 mm) Depth
 - 2) Three box windows total:
 - a) 5 Square® boxes (two maximum)
 - b) 4 11/16 boxes (three maximum)
 - c) 4 square boxes (three maximum)
 - b. STEEL CITY 5 Square® Box Support Bracket for 24" stud spacing, H24S-82-4
 - 1) Outside Dimensions:
 - a) 24 in (610 mm) Width
 - b) 5.3 in (134.62 mm) Height
 - c) 0.19 in (4.83 mm) Depth
 - 2) Four box windows total:
 - a) 5 Square® boxes (two maximum)
 - b) 4 11/16 boxes (four maximum)
 - c) 4 square boxes (four maximum)
- C. Extension Rings: Box covers, suitable to reduce front opening of box for faceplate mounting. Also called "mud rings" or "plaster rings".
1. All extension rings shall have the following characteristics:
 - a. Materials:
 - 1) Steel, 0.0625 in (1.59 mm) thickness (minimum)
 - 2) Galvanized zinc coating, 0.0005 in (0.013 mm) (minimum) thickness on both sides of extension ring.
 - 3) Outside Dimensions:
 - a) 5 in (127 mm) Width
 - b) 5 in (127 mm) Height
 - b. Construction:
 - 1) Cleanly punched knockouts
 - 2) Softened edges (no sharp edges)
 - 3) Stamped/Drawn fabrication
 - c. Mounting/Attachment Features:
 - 1) Attachable directly to Device Box or to Box Support Bracket
 - 2) Centerline and mid-line markings for device box installation
 - 3) 4 screw slots (2 straight and at least 2 angled), suitable to mount on screws that are already in place.
 - 4) At least 2 faceplate mounting tabs, with tapped holes (6-32) to receive faceplate screws. For 4 Square Extension ring, the tapped holes shall be 8-32.
 - 5) Precision screw-hole positioning for reliable device mounting within +/- 5 thousandths.
 - d. Reversible: Extension Rings shall be capable of being mounted in multiple orientations.
 - e. Testing / Listing:
 - 1) Intertek ETL Listed
 2. 5 Square® by 4 Square Extension Rings

- a. Opening (Interior) Dimensions:
 - 1) 3.85 in (97.8 mm) Width
 - 2) 3.85 in (97.8 mm) Height
- b. 5 Square® by 4 Square Extension Rings shall be:
 - 1) STEEL CITY 82-52E-0 (flat)
 - 2) STEEL CITY 82-52E-1/4 (0.25 in (6.4 mm) depth)
 - 3) STEEL CITY 82-52E-1/2 (0.5 in (12.7 mm) depth)
 - 4) STEEL CITY 82-52E-5/8 (5/8 in (15.9 mm) depth)
 - 5) STEEL CITY 82-52E-3/4 (3/4 in (19.1 mm) depth)
 - 6) STEEL CITY 82-52E-1 (1.0 in (25.4 mm) depth)
 - 7) STEEL CITY 82-52E-1-1/4 (1.25 in (31.8 mm) depth)
 - 8) STEEL CITY 82-52E-1-1/2 (1.5 in (38.1 mm) depth)
3. 5 Square® by 1-gang Extension Rings
 - a. Oversized Opening (Interior) Dimensions:
 - 1) 2.0 in (50.8 mm) Width
 - 2) 3.03 in (77.0 mm) Height
 - b. 5 Square® by 1-gang Extension Rings shall be:
 - 1) STEEL CITY 82C-1G-0 (flat)
 - 2) STEEL CITY 82C-1G-1/4 (0.25 in (6.4 mm) depth)
 - 3) STEEL CITY 82C-1G-1/2 (0.5 in (12.7 mm) depth)
 - 4) STEEL CITY 82C-1G-5/8 (5/8 in (15.9 mm) depth)
 - 5) STEEL CITY 82C-1G-3/4 (3/4 in (19.1 mm) depth)
 - 6) STEEL CITY 82C-1G-1 (1.0 in (25.4 mm) depth)
 - 7) STEEL CITY 82C-1G-1-1/4 (1.25 in (31.8 mm) depth)
 - 8) STEEL CITY 82C-1G-1-1/2 (1.5 in (38.1 mm) depth)
 - 9) STEEL CITY 82C-1G-2 (2.0 in (50.8 mm) depth)
4. 5 Square® by 2-gang Extension Rings
 - a. Oversized Opening (Interior) Dimensions:
 - 1) 3.665 in (93.1 mm) Width
 - 2) 3.03 in (77.0 mm) Height
 - b. 5 Square® by 2-gang Extension Rings shall be:
 - 1) STEEL CITY 82C-2G-0 (flat)
 - 2) STEEL CITY 82C-2G-1/4 (0.25 in (6.4 mm) depth)
 - 3) STEEL CITY 82C-2G-1/2 (0.5 in (12.7 mm) depth)
 - 4) STEEL CITY 82C-2G-5/8 (5/8 in (15.9 mm) depth)
 - 5) STEEL CITY 82C-2G-3/4 (3/4 in (19.1 mm) depth)
 - 6) STEEL CITY 82C-2G-1 (1.0 in (25.4 mm) depth)
 - 7) STEEL CITY 82C-2G-1-1/4 (1.25 in (31.8 mm) depth)
 - 8) STEEL CITY 82C-2G-1-1/2 (1.5 in (38.1 mm) depth)
 - 9) STEEL CITY 82C-2G-2 (2.0 in (50.8 mm) depth)
5. 5 Square® Blank Cover
 - a. STEEL CITY 82C-1

PART 3 - EXECUTION

3.1 GENERAL

- A. Install the device box system in a manner ensuring that communications circuits, when installed, are able to fully comply with ANSI/TIA/EIA Standards.

3.2 EXAMINATION

- A. Examine surfaces and spaces to receive device boxes for compliance with installation tolerances and other conditions affecting performance of device box installation. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Notify the Engineer/Owner of conditions that may adversely affect the installation or to not comply with ANSI/TIA/EIA standards.

3.3 INSTALLATION

- A. Install device boxes as indicated, according to manufacturer's written instructions. Provide a device box for each circuit indicated. Do not gang raceways device boxes, without specific approval from the Engineer. Do not group home runs or circuits without approval from the Engineer.
- B. Device Boxes:
 - 1. Provide device boxes and covers as shown on the Contract Documents and as needed. Verify that the appropriate cover type and depth is provided for each type of wall and finish.
 - 2. Paint device boxes as required to meet Code or Owner's requirements.
 - 3. Coordinate box locations with building surfaces and finishes to avoid bridging wainscots, joints, finish changes, etc.
 - 4. Install boxes in dry locations (not wet, corrosive, or hazardous).
 - 5. Attach boxes securely to building structure with a minimum of two fasteners. Provide attachments to withstand a force of 22.6 kg minimum, applied vertically or horizontally.
 - 6. Install boxes at heights indicated on the drawings.
 - 7. Recessed mounted outlet boxes:
 - a. Recess boxes in wall and ceiling surfaces in finished areas. Set boxes plumb, level, square and flush with finished building surfaces to within one-sixteenth inch for each condition. Set boxes so that box openings in building surfaces are within one-eighth inch of edge of material cut-out and fill tight to box with building materials. Openings shall extend at least to the finished wall surface and extend not more than 1/8 inch beyond the finished wall surface. Provide backing for boxes using structural material to prevent rotation on studs or joists.
 - b. Install floor boxes level and adjust to finished floor surface.
- C. Box Support Brackets:
 - 1. Provide box support brackets as required.
 - 2. Mount brackets level and square with finished building surfaces to within one-sixteenth inch for each condition. Align device boxes and extension rings using centerline and mid-line markings.
 - 3. Securely fasten brackets to studs. Securely fasten device boxes and extension rings to brackets.
- D. Extension Rings:
 - 1. Provide extension rings as required.
 - 2. Align extension rings to boxes and brackets using centerline and mid-line markings.
 - 3. Securely fasten extension rings to device boxes and box support brackets.

3.4 GROUNDING/BONDING:

- A. Grounding and bonding work shall comply with the Uniform Building Code, Uniform Fire Code, WAC, National Electrical Code, and UL 467, ANSI/TIA/EIA standards and the references listed in PART 1 – REFERENCES above, as well as local codes which may specify additional grounding and/or bonding requirements.

1. Bond metallic raceway together and to the nearest TGB (as provided under Division 27 Section — “Grounding and Bonding for Communications Systems”). Ensure that bonding breaks through paint to bare metallic surface of painted metallic hardware.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and in accordance with accepted industry practice, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.
 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.6 CLEANING

1. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION