

SECTION 27 05 33

CONDUITS AND BACKBOXES FOR COMMUNICATIONS

PART 1 – GENERAL

1.1 SUMMARY

- A. This section governs the products and installation of conduits, backboxes, and additional accessories, connections, fittings, and equipment required for in-building communications systems, otherwise known as “Electrical Rough-In”.

1.2 RELATED DOCUMENTS

- A. The latest versions of the following codes, standards, and guidelines shall be followed. Bring to ITS’ immediate attention where construction documents or conditions differ from requirements in codes, standards, guidelines and specifications.
- B. The following codes, as required by law:
 - 1. National Electric Code (NEC)
- C. The following standards:
 - 1. TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces
 - 2. NECA/BICSI-568-2006, Standard for Installing Commercial Building Telecommunications Cabling
- D. The following guidelines:
 - 1. BICSI, Telecommunications Distribution Methods Manual (TDMM)
 - 2. BICSI, Information Transport Systems Installation Methods Manual (ITSIMM)
- E. The following project specifications:
 - 1. 27 05 26 Grounding and Bonding for Communications
 - 2. 27 05 53 Identification for Communications Systems

1.3 DEFINITIONS AND ACRONYMS

- A. Conveniently Accessible - being capable of being reached from floor or use of 8’ step ladder without climbing or crawling under or over obstacles such as motors, pumps, belt guards, transformers, piping and duct work.
- B. IMC – Intermediate Metal Conduit
- C. Listed Communications Cable – A cable Listed by a Nationally Recognized Testing Laboratory (NRTL) and acceptable to the local authority having jurisdiction (AHJ) as having met appropriate designated standards or has been tested and found suitable for installation in specific spaces. Refer to NEC Articles 725, 770 and 800 for listing types and additional requirements. **Assume Outside Plant (OSP) Cables being supplied to the building by ITS are not Listed.**
- D. Plenum – A compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system.
- E. Plenum-rated – A product that is Listed by a NRTL as being suitable for installation into a plenum space. Communications cabling shall be Listed and identified as type CMP.

- F. Point of Entrance (Building Entrance): The point within a building at which the Outside Plant (OSP) communications wire or cable emerges from an external wall, from a concrete floor slab, or from a rigid metal conduit (Type RMC) or an intermediate metal conduit (Type IMC) connected by a grounding conductor to an electrode in accordance with the NEC.
- G. RMC – Rigid Metal Conduit
- H. UL – Underwriters Laboratory

1.4 SUBMITTALS

- A. The following submittals are due at the Pre-Construction Phase, in accordance with submittal requirements in Section 27 00 00 Communications:
 - 1. Product Information
 - a) Provide manufacturer's product information cutsheet or specifications sheet with the specific product number identified or filled out.
 - 2. Shop Drawings
 - a) Provide scaled drawings (not less than 1/8" = 1'-0") indicating routing of conduits and locations of all pull points (to include pullboxes, communications LB, etc.). *These locations are to be fully coordinated with all other trades.*
- B. The following submittals are due Post-Construction, in accordance with the submittal requirements in Section 27 00 00 Communications:
 - 1. Record Drawings
 - a) Provide scaled drawings (not less than 1/8" = 1'-0") indicating actual installed routing of conduits and locations of all pull points. Design or shop drawings modified in the field will not be accepted.
 - 2. Manufacturer and Maintenance Manuals for all installed equipment
 - 3. Keys for any pullboxes (if applicable)

PART 2 – PRODUCTS

2.1 GENERAL

- A. Refer to Electrical specifications for additional information.

2.2 CONDUIT

- A. Refer to execution section for sizing and installation requirements.
- B. Refer to Electrical specifications for list of approved manufacturers.

2.3 BACKBOXES

- A. Typical communications backbox shall have the following minimum dimensions: 4-11/16" x 4-11/16" x 2-1/2"
 - 1. Refer to drawings for plaster ring size/opening
 - 2. For outlets in stud wall, Manufacturer shall be:
 - a) RACO 259 with a minimum of 3/8" deep raised cover or plaster ring
 - b) Randl T-55017 with appropriate extension or plaster ring

- c) Or approved equivalent
- 3. For outlets in CMU wall, submit appropriate backbox for application.

2.4 PULLBOXES

- A. Material shall be aluminum or steel.
- B. The following manufacturers are conditionally-approved:
 - 1. Hoffman
 - 2. Or approved equivalent
- C. Refer to execution section for sizing and installation requirements.

PART 3 - EXECUTION

3.1 GENERAL

- A. Follow all manufacturers' instructions.
- B. Coordinate with all other trades prior to installation.
- C. The contractor's Project RCDD shall perform weekly inspections during construction to verify the conduits, backboxes, and other electrical rough-in meet these specifications and referenced documents. Each week of rough-in installation, the contractor's Project RCDD shall invite the Design Engineer and ITS Representative to weekly inspections.
 - 1. Should any disparity between construction and these specifications be discovered by the contractor's Project RCDD, Design Engineer, or ITS Representative at any point during the course of construction, contractor shall make necessary corrections without cost or schedule change to the project.
- D. Elevator Equipment Rooms:
 - 1. See Elevator specifications for demark CCTV box information
 - a) Provide 2" conduit from CCTV box to nearest communications room (providing appropriate pullboxes to meet length and bend restrictions).
 - 1) Label 2" conduit "ELEVATOR PHONE/DATA" at both ends of conduit and on cover of pullboxes.

3.2 CONDUIT

- A. Conduit size to telecommunications outlet shall be trade size 1-1/4" UON.
- B. Conduits which enter Communications Entrance Facilities shall extend:
 - 1. 4" AFF, or;
 - 2. 3" below finished ceiling.
 - 3. 3" through wall.
- C. Conduits shall be reamed and bushed.
- D. Communications Building Entrance Conduits entering a building shall be RMC or IMC construction, and shall extend to within 50' cable length from the wall reserved for Building Entrance Protection in the Communications Entrance Facility.
- E. Minimum Bend Radius

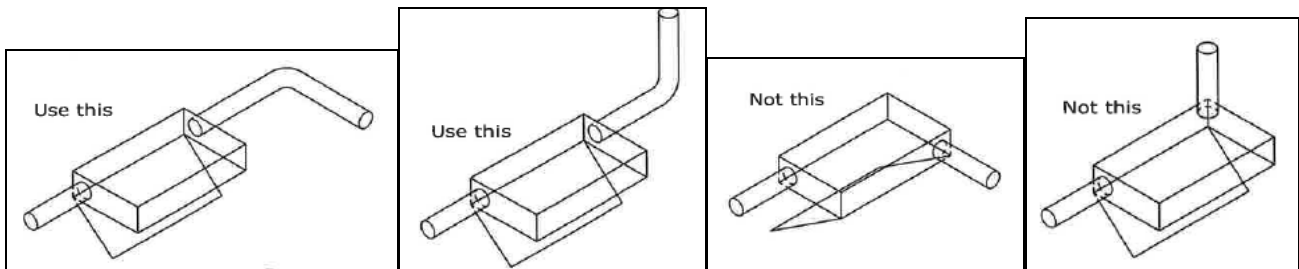
1. For trade size conduits 2" or less, maintain a minimum bend radius of (6) times the actual inside diameter of the conduit.
 2. For trade conduits greater than 2", maintain a minimum bend radius of (10) times the actual inside diameter of the conduit.
- F. No continuous section of conduit may exceed 100 feet. Utilize pullboxes as necessary.
- G. No continuous section of conduit may include more than (2) 90 degree bends (or equivalent).
1. An offset is considered a 90 degree bend.
 2. A pullbox is required wherever a reverse (180 degree) bend is installed.
- H. Conduit to Floor Boxes in Slab-on-Grade
1. Slab-on-grade conduits shall not be installed.
- I. Flexible Conduit
1. As defined by the NEC.
 2. To be utilized only at specific locations identified on the drawings.
 3. Sections are to be limited to a maximum of 20 feet in length and the trade size shall be increased by one.

3.3 BACKBOXES

- A. Backboxes installed into fire-rated walls shall include appropriate firestopping system (See Division 7).
- B. Where back-to-back with outlet on opposite side of wall, off-set one of the backboxes and conduits to adjacent stud cavity or masonry block.

3.4 PULLBOXES

- A. Directional changes within a pullbox shall not be allowed. Refer to the following diagrams:



- B. Size pullboxes according to the following chart:

Conduit Trade Size	Width	Length	Depth	Width Increase for Additional Conduit
1"	4"	16"	3"	2"
1-1/4"	6"	20"	3"	3"
1-1/2"	8"	28"	4"	4"
2"	8"	36"	4"	5"
2-1/2"	10"	42"	5"	6"

3"	12"	48"	5"	6"
4"	16"	60"	8"	6"

- C. Install pullboxes in conveniently accessible locations.
- D. Where identified on drawings as lockable, key all pullboxes the same.
- E. Identify pullboxes according to Section 27 05 53.

END OF SECTION