

SECTION 27 05 33
CONDUITS AND BOXES FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
1. This section includes requirements pertaining to pathways for communications systems.

1.02 SUBMITTALS

- A. Contractor shall submit all the product data in Division 27 at the same time. Piecemeal submittals will be rejected as incomplete.
1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
 2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 270533.H01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
 3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.
- B. Product Data.
1. Pursuant to Section 01300 Submittal Procedures.
 2. Manufacturer's data including materials of construction, equipment weight and related information for each item specified in PART 2 PRODUCTS.
 3. Seismic calculations and drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **EMT Conduit (270533.C01)**
1. Reference Specification Section 260533 for requirements for EMT conduit.
 2. Provide bushings at all conduit terminations.
 3. Conduits for concealed wiring of the following Division 27 systems in walls shall be 1" minimum. Conduit shall originate at the wiring device backbox and terminate in the ceiling space of in locations with accessible ceilings. Conduit shall originate at the wiring device backbox and terminate at the respective cable tray in locations without accessible ceilings.
 4. Conduit that terminates at a cable tray shall be provided with a bushing and shall be bonded and secured to the cable tray using a Manufacturer approved clamp or clip. Bond conduit to the cable tray using #6 AWG minimum.
- B. **Galvanized Sheet Metal Boxes (270533.B01).**
1. Reference Specification Section 260533 for requirements for boxes.
 2. Sheet metal boxes for the following Division 27 wiring devices shall be 4-11/16" x 4-11/16" x 2-1/8".
- C. **Sleeves (270533.S01)**

1. Provide conduit sleeves through floors as shown on the Drawings.
2. Provide conduit bushing on each end.

2.02 FIRESTOPPING

- A. Firestopping products shall be provided in all fire and smoke rated partition penetrations per Specification Section 078400 Firestopping.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General.
 1. No section of conduit shall exceed two 90 degree bends.
 2. Sections of conduit shall not exceed 100 feet without a pull point.
 3. Condulets shall not be used for bends unless approved by the ENGINEER. Utilize field or factory bends only.
 4. Where specific pathways are not shown on the Drawings, the design of the pathway shall be CONTRACTOR's choice.
 5. CONTRACTOR shall be responsible for coordination the installation of conduits and boxes with other trades.
 6. Conduits shall be reamed.
 7. Metallic threads shall all be coated with conduit thread lubricant before assembly. Failure to install the lubricant will result in removal of all conduit and reassembly with the conduit lubricant.
 8. Exposed conduits shall be installed parallel or perpendicular to the structural members and surfaces and shall be level and or plumb.
 9. When two or more conduits are routed in the same general direction their routing shall be parallel with symmetrical bends.
 10. Conduits shall be bent with equipment specifically designed for this purpose and for the specific size and type of conduit.
 11. Conduits that are creased or crushed shall be replaced.
 12. Install conduits such that they do not interfere with the proper and safe operation of equipment and do not block or otherwise interfere with the ingress and egress and installation of removable hatches and covers.
 13. Install expansion joints as needed across expansion joints in the structure and at other locations where necessary to compensate for thermal or mechanical expansion or contraction.
 14. Conduits shall be routed at least six (6) inches from high temperature piping, ducts and flues
 15. Conduits over 10 feet in length shall be provided with a pull string.
 16. Raceways shall be electrically and mechanically complete before the conductors are installed.
 17. Routing of conduits may be adjusted to avoid obstructions. Coordinate with other trades prior to installation of raceways. Lack of such coordination shall not be justification for extra compensation and removal and reinstallation to resolve conflicts shall be at the CONTRACTOR's expense.

END OF SECTION

SECTION 27 05 36
CABLE TRAY FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes.
1. The section includes requirements for cable tray, ladder tray, and cable runway for communications systems.

1.02 SUBMITTALS

- A. Contractor shall submit all the product data in Division 27 at the same time. Piecemeal submittals will be rejected as incomplete.
1. The product data shall be bound in a three ring binder with tabs for each Section. The tabs shall be numbered to match the specification Section numbers. Submittals not bound and labeled as specified will be rejected as incomplete.
 2. A submittal is required for each product specified. Each individual product submittal shall have the corresponding Reference Keynote Number (example - 270536.G01) typewritten in the upper right hand corner of the submittal. The submittals within each Section tab shall be in the same sequential order as they are listed in the specification Section. Submittals not containing the Reference Keynote Number will be rejected as incomplete.
 3. No typical submittals will be accepted. Each submittal shall be project specific and clearly identify specifically which components or parts are being submitted for approval. Any product submittals, such as a catalog sheet, which do not clearly identify which components or parts are being submitted for approval, will be rejected as incomplete.
- B. Product Data
1. Pursuant to Section 01300 Submittal Procedures.
 2. Manufacturer's data including materials of construction, methods of installation and related information for each item specified in PART 2 PRODUCTS.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **Wire Basket Cable Tray (270536.C01)**
1. Size shall be sized as shown on the Drawings.
 2. Shall be provided with bends, T's, connector assemblies, clamp assemblies, connector plates, splice plates, splice bars, and spillways required for a complete system. The CONTRACTOR shall be responsible for providing all accessories.
 3. Provide shelf brackets where cable tray is routed along a wall. The tray shall be securely screwed to the shelf bracket. Relying on friction clips shall not be acceptable.
 4. Material shall be electroplated zinc galvanized steel.
 5. UL Classified as an equipment grounding conductor.
 6. Cable tray segments shall be bonded together with listed splice plates or listed bonding jumpers.
 7. Shall be Cooper B-Line Flextray or approved equal.
- B. **Ladder Cable Tray (270536.C02)**
1. Provide cable tray, size and length as shown on the Drawings.
 2. Aluminum material.
 3. Rungs shall be 6" O.C.

4. Shall be provided with all bends, T's, connector assemblies, clamp assemblies, connector plates, splice plates, splice bars, and spillways required for a complete system. The CONTRACTOR shall be responsible for providing all accessories.
5. UL classified as an equipment grounding conductor.
6. Provide bonding jumpers on painted surfaces to maintain UL classification.
7. Finish shall aluminum.
8. Shall be Cooper Redi-Rail RS104A, or approved equal.

C. Firestopping Pillows (270536.F01)

1. Provide intumescent firestopping pillows in cable tray in all penetrations through rated partitions.
2. Color shall be red.
3. UL Listed for the fire rating of the assembly as shown on the Architectural Drawings.
4. 3M Fire Barrier Pillow, or approved equal.

2.02 SEISMIC BRACING

A. Seismic Anchoring and Bracing Products (270536.S01)

1. Provide seismic bracing for all vertical and lateral restraints of all cable trays required by the International Building Code and Oregon Structural Specialty Code.

2.03 INSTALLATION

A. General.

1. All identification labeling shall be in compliance with Section 260553 Electrical and Control Identification.
2. Bond all ladder rack, cable runway, and cable tray to the nearest TMGB/TGB with #6 AWG copper.
3. Cable tray shall be installed level and plumb.
4. Install all cable trays so that they are accessible from an 8' ladder. Cable tray shall be side accessible by 18" and top accessible by 12". Cable tray shall be installed a minimum of 3" above an accessible ceiling tile. Coordination with other trades to maintain cable tray accessibility shall be the responsibility of the CONTRACTOR.
5. Cable tray penetrations through fire and smoke rated partitions shall be sealed per the Specification Section 078400 Firestopping.
6. Neatly group cables together that terminate on the same patch panel in MDF and IDF rooms. Utilize velcro cable ties only. The use of plastic tie wraps is prohibited.
7. Cables shall be bundled in groups no larger than 24. Cable bundles shall be of a similar system only (i.e. IT, Nurse Call, Security). Bundling cables of different systems shall not be acceptable.

B. Seismic Anchoring and Bracing

1. The design of the seismic anchoring and bracing system shall be by a licensed Structural Engineer in the State of Oregon. The CONTRACTOR shall arrange and pay for the services of the licensed Engineer.
2. Wet stamped and signed calculations and drawing of the seismic anchoring and bracing system shall be submitted to the Architect and Engineer for review and approval.

END OF SECTION