

## SECTION 27 05 29

### COMMON WORK - HANGERS AND SUPPORTS

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. This Section includes specific requirements for hangers and supports within the Communications Pathway System.

##### 1.02 RELATED SECTIONS

- A. The requirements of Division 27 Specification Section *Electrical Technology - General Requirements* shall serve as the basis for the requirements of this Section, and are incorporated by reference into this Section.

##### 1.03 SUBMITTALS

- A. Provide the following per the criteria set forth in Submittals in Division 27 Specification Section *Basic Communications Requirements*:
  - 1. Product Data.

##### 1.04 DEFINITIONS

- A. Hanger/Support System: All equipment, materials, and incidentals required to support the raceway/pathway and cabling systems, including but not limited to metallic hangers and supports, conduit, cable tray, conduit, pull boxes, device boxes, u-channels, threaded rods, clamps, concrete inserts, anchor bolts, cables, backing boards, etc. Bridal rings not allowed.

#### PART 2 - MATERIALS

##### 2.01 GENERAL

- A. Part Numbers: Refer to the Equipment Schedule(s) for specific manufacturers and part numbers. If no part number is provided, then any part meeting the manufacturer and requirements specified is acceptable.

##### 2.02 HANGERS AND SUPPORTS

- A. A complete Hanger/Support System shall be provided to support all components of the raceway/pathway and cabling systems.
- B. The Contractor shall provide all materials, labor and incidentals as required for a complete Hanger/Support System.
- C. The Hanger/Support System shall be of corrosion resistant or galvanized steel, shall be of an approved standard design, and shall be constructed to maintain the supported load in proper position and alignment under all operating conditions. Manufacturer shall be:
  - 1. B-line
  - 2. Caddy/Erico
  - 3. Panduit
  - 4. Or equal.

##### 2.03 CABLE SUPPORTS (J-HOOKS, STRAPS)

- A. Cable supports:
  - 1. Provide cable supports suitable for the quantity of cables to be supported. Cable supports shall be complete with all incidental materials and assemblies required, including but not limited to mounting accessories to independently support supports from structure, extender brackets for mounting multiple hooks on a single support, clamps and fasteners, dedicated support wires, purlins and cable retainers as required. Supports, incidental materials, cable ties and cable retainers shall be plenum or non-plenum rated to match that of associated cable, and shall be listed to UL Standard 2239. Supports shall be:

- a. Wide Base Cable Supports (J-Hooks): Supports shall be wide-based (minimum 1-inch) with flared edges. Provide larger sizes and multiple supports as required by cable quantities.
2. Straps/Slings: Straps/slings shall be wide-based (minimum) 2-inch and adjustable. Provide sizes, quantities and universal mounting equipment as required.

## **PART 3 - EXECUTION**

### **3.01 HANGERS AND SUPPORTS**

- A. Hanger/Support system shall be installed in such a manner as to prevent any strain being imposed on the equipment supported.
- B. Coordinate with the building structure and the work of other trades.
- C. Install individual and multiple trapeze raceway hangers and riser clamps as necessary to support raceways. Provide all incidental materials as necessary for hanger assembly and for securing hanger rods and conduits. Use 3/8 inch diameter or larger all-thread rods for support.
- D. NEC requirements:
  1. Hangers and supports shall be installed at required intervals.
  2. Conduit, hangers and supports, cable, or infrastructure related to Communications Systems, shall not be secured to, or supported by, the ceiling assembly, including the ceiling support wires. An independent (dedicated) means of secure support shall be provided.
  3. Wires provided as dedicated hangers for supports shall be secured at both ends, such as the structural ceiling at one end and the suspended ceiling grid at the other end, and shall be distinguishable from wire used to support the suspended ceiling assembly by color, tagging, or other effective means.
- E. In exposed structural ceiling spaces, where no suspended ceiling assembly is indicated, wire shall not be used as a hanger for supports.
- F. Strength of each support shall be adequate to support a minimum of five times the present and future load. A minimum of 200 pound safety allowance for each support is required.
- G. Cut threaded rods such that the bottoms have a maximum length of thread below the bottom nut equal to that of the rod diameter (i.e. a 3/8 inch rod would have a maximum length of 3/8 inches below the bottom nut).
- H. Conduit and box support installation shall prevent displacement of conduit and box in any direction.
- I. Provide plastic or rubber end caps for all Hanger/Support System components which are readily accessible and exposed to personnel.
- J. Anchor Methods:
  1. Verify all allowable Anchor Methods with the General Contractor, Owner, Structural Engineer, and Structural Construction Documents prior to performing any work. Not all methods listed below may be allowed depending on the Structural Design / Elements.
    - a. Hollow Masonry: Toggle bolts or spider type expansion anchors.
    - b. Solid Masonry (excluding concrete): Steel expansion bolts.
    - c. New Concrete: Preset inserts with machine screws and bolts.
    - d. Existing Concrete: Steel expansion bolts or explosive powder driven inserts.
    - e. Wood surfaces: Wood screws.
    - f. Steel: Welded threaded studs or galvanized steel clamps.
    - g. Light Steel: Sheet metal screws.
- K. Firestopping devices shall not act as supports.

### 3.02 CABLE SUPPORTS (J-HOOKS, STRAPS)

#### A. General:

1. Cable supports shall be used to support cables in open access environments. Supports shall be provided along the entire pathway. Multiple supports at hanger locations shall be provided as required by the quantity of cables to be supported (subject to the maximum load which can be supported by the hanger) as well as cable segregation requirements (see below).
2. Cable supports may be affixed to structural members or other supports, but shall not be attached to pipes, electrical conduit, mechanical items, existing cables, or the ceiling support system. Supports shall be hung from all thread rods, dedicated #8 galvanized wires, or from brackets connected directly to structure, and shall be installed above accessible ceilings.
3. Where cable pathways are shown on the Drawings, the Contractor shall follow the indicated pathways as closely as possible, subject to field conditions. Pathways, where not shown, including pathways for small cable counts, shall be designed and documented on the Record Drawings maintained by the Contractor. Supports shall be installed parallel and perpendicular to building lines.
4. Cable supports shall be mounted at varying intervals with each interval not to exceed 5 feet. Supports shall also be placed at all changes of direction. The Contractor shall ensure that intervals between cable supports shall vary along the pathway (i.e. a given interval should not be exactly the same length as the interval preceding or following it – “exact” intervals can degrade cable performance).
5. Cable supports shall not support more cables than for which they were designed and shall not exceed 50 percent of the manufacturer’s recommended fill. Multiple cable supports shall be provided where the total cable fill exceeds this amount.
6. Installation of supports shall be fully coordinated with other elements such as mechanical ductwork, piping/plumbing, electrical conduit, and other systems such that the supports remain fully accessible after installation.
7. A J-Hook cable support system or DPS approved equivalent shall be utilized to suspend the twisted pair workstation cables in the interstitial ceiling space from the cable tray to the access point in the ceiling above the workstation location.
8. These J-hooks shall have built-in 1 inch bend radius control. The system shall accommodate cable ties to retain bundles and have available a full assortment of mounting options.
9. J-hooks shall be installed at no more than five foot (5 ft.) intervals and be attached to the building structure independent of ceiling systems and supports. J-hook shall be independently mounted using hardware built to that purpose.
10. Hanger wire that is used to support the j-hooks will need to be attached to the ceiling grid. This is Denver City low volt code.
11. No cable shall touch, or appear to touch, any other facility, system, apparatus, etc. in the interstitial ceiling space (e.g. ducts, conduits, pipes, etc.). Improperly installed cable and/or supports shall be remedied at Contractor's expense.
12. Only approved mounting fasteners shall be permitted. In no case shall the Contractor use a low velocity fastening tool into a surface not listed for such purpose (e.g. no shooting into the roof deck of the top floor).
13. The contractor may use beam clamps, pound on clamps with J-Hook attached as accepted method for pathway. Bridle rings cannot be used in network cabling.

14. J-Hook fill rates:
- |       |         |                       |
|-------|---------|-----------------------|
| .75"  | J- Hook | 8 Category 6 cables   |
| 1.31" | J-Hook  | 25 Category 6 cables  |
| 2"    | J-Hook  | 46 Category 6 cables  |
| 4"    | J-Hook  | 180 Category 6 cables |
15. Black Velcro type cable ties shall be installed in TRs. Plenum cable ties will be installed in all other location including the ceiling space. Plenum Velcro (red) can be used in above ceiling in place of cable ties.
16. Plenum cable ties must be red in color to be easily identifiable upon inspection. All cable wraps shall be loosely installed with no deformation to the cable jackets.

**PART 4 - EQUIPMENT SCHEDULE**

**4.01 HANGERS AND SUPPORTS EQUIPMENT SCHEDULE**

<b>27 04 06 - HANGERS AND SUPPORTS (JS)</b>		
<b>DESCRIPTION</b>	<b>Manufacturer/Part Number</b>	
	<b>PANDUIT</b>	<b>Special Rqmt</b>
J-PRO CABLE SUIPPORT SYSTEM	J-HOOKS	
MAROON PLENUM RATED HOOK AND LOOP CABLE TIES 12" LENGTH	HLSP3S-X12	
MAROON PLENUM RATED HOOK AND LOOP CABLE TIES 18" LENGTH	HLSP5S-X12	
RED (MAROON) PLENUM CABLE TIES FOR USE IN CEILING SPACES - 4"	PLT1M-C702Y	
RED (MAROON) PLENUM CABLE TIES FOR USE IN CEILING SPACES - 7.4"	PLT2S-C702Y	
RED (MAROON) PLENUM CABLE TIES FOR USE IN CEILING SPACES - 11.6"	PLT3S-C702Y	
75' CONTINUOUS ROLL BLUE OR BLACK HOOK AND LOOP TIES	HLS-75R6	Used on cable bundles in the telecom room.

**END OF SECTION 27 05 29**