FLOOR STANCHION SUPPORTED CABLE RACK SYSTEM REQUIREMENTS

1. GENERAL

1.01 This section provides guidelines and requirements for engineering and installing a floor secured assembly to support overhead cable rack in network equipment environments. The floor stanchion system shall be applied when ceiling suspended auxiliary framing is not possible or not available. Typical applications are in buildings with inadequate ceiling load carrying capacity for auxiliary frame installations. The guidelines shall be applied for new central offices, growth to an existing central office or to replace overloaded auxiliary framing system.

1.02 Reserved.

1.03 This section shall be used in conjunction with BSP 800-003-150MP, BSP 800-006-151MP and BSP 800-068-150MP, documents providing the provisioning of miscellaneous cable and equipment support apparatus, as well as office cable rack arrangements. The floor stanchion system described in this section will be compatible to traditional auxiliary framing and permit use of many existing installation details for cable rack and equipment support. In some cases, different details may be necessary.

1.04 Floor stanchions as used under this section shall not be substituted with iron pipe stands described in BSP 800-006-150MP, Fig. 6. Pipe stands as applied in other sections are not compatible in performance or dimension to floor stanchions specified within this document.

1.05 The floor stanchion system shall be used for the 7 feet equipment environment only where freestanding equipment framework is installed. Taller equipment frames, 9’-0”, 11’-6”, that require overhead securing to auxiliary framing cannot be supported by the floor stanchion system.

2. STANCHION SYSTEM

A. System Description

2.01 The floor stanchion system provides a method to support ladder type cable rack on tubular crossmembers spanned across floor anchored columns. The system is a free standing structure that requires no attachment to ceiling or walls in most cases. The tubular floor columns shall be installed within the equipment lineups at intervals where they will not limit access to equipment, aisle traffic or maintenance requirements.

2.02 The floor stanchion system is assembled of steel floor stanchion columns, square tube sections connected between stanchions and corner hardware that attach square tube sections to the columns. Intermediate crossmembers are provided between main crossmembers to provide cablerack support at spans within the six feet limit.

2.03 The span length of the crossmembers shall not exceed 10 feet center to center distance between floor stanchions. Longer span lengths may result in crossmember deflections or bending that may not be tolerable when the crossmember is heavily loaded. Floor stanchion placement should be determined for distances to permit greatest number of equipment frames between stanchions, within 10 feet limits.

B. Floor Stanchion Arrangement

2.04 Floor stanchion locations and crossmember lengths may vary between crossmembers running parallel to equipment as opposed to crossmembers running perpendicular to equipment. The stanchion distance varies to accommodate equipment framework dimension, aisle spacing, continuity of equipment as illustrated in switch installation example of **Fig. 1**. For specific jobs consult with the Equipment Engineer or Detail Engineer for required aisle spacing and data on the depth of all equipment in affected area.

2.05 Floor stanchions are constructed of steel 5” x 5” square tube welded to a 12” x 12” steel base and secured to building floor with embedded floor anchors. The stanchion base will occupy 1 square foot of floor space at each stanchion location. The base may lie within equipment lineup or placed in aisles as equipment permits.

2.06 Stanchions are configured in rectangular grids to support crossmembers in a rectangular Pattern as shown in **Fig. 2**. A minimum of four stanchions are required to establish a free standing support system for cableracks. Additional pairs of stanchions may be added to initial group of four stanchions to expand support grid across room.

2.07 Stanchions are available in 7-0” feet and 9-0” feet nominal heights as shown in **Fig 3** and **Fig. 4**. Tapped holes drilled for supporting crossmembers are located at appropriate height above equipment frameworks, (i.e. 7’ 3-1/2” or 9’ 3-1/2”).

2.08 Stanchions placed near a building wall will be limited by the stanchion base width which will provide crossmember no less than 9 inches from the wall. Where support for cablerack is required closer than 9 inches from wall, cantilevered crossmembers from stanchion or crossmember attachment to wall may be utilized as shown **Fig. 5** and **Fig. 9**. Refer to appropriate paragraphs in this document for application restrictions.

C. Crossmember Configuration

2.09 The crossmembers may be provided with low type and high type layer of crossmembers when the 9 feet version stanchion is used as in **Fig. 6**. This arrangement permits two levels of framing to accommodate equipment areas with cableracks located at several heights.

2.10 The 9 feet stanchion may be used to place cableracks at the 9'-3" feet height in place of 9'-0" framework that may have been used in the past for supporting cableracks as in Community Dial Offices (CDO) sites and customer premise locations.

2.11 Seven feet version of floor stanchions places crossmembers at the 7'-3 1/2" height for seven feet tall equipment environment.

2.12 All floor stanchions are predrilled for crossmember installation at 3-1/2" height above the nominal equipment height, i.e. 7', 9' to conform with auxiliary framing clearance height above equipment.

2.13 Crossmembers are configured for primary and secondary runs on the same vertical plane. Crossmembers junction with tee or cross joints intersecting at the same vertical height, unlike auxiliary framing that may stack secondary framing channel on primary framing channel.

2.14 Main crossmembers are sections that span between floor stanchions either parallel (primary) to equipment lineup or perpendicular (secondary) to equipment. The main crossmembers are typically are the longer spans between stanchions.

2.15 Intermediate crossmembers are shorter sections spanning across main crossmembers to provide support to cableracks at intermediate points of main crossmembers. The intermediate crossmember provides cablerack support in compliance to requirements for cablerack support at 5-6 feet intervals.

2.16 Crossmembers are assembled of Unistrut P9200T slotted square tubes of dimensions as shown in **Fig. 7** and standard Unistrut P1000T U-channel within the outer square tube. The telescoped sections are required to provide greater load carrying capacity.

2.17 The P1000T channel is dimensioned to fit into the P9200T tube with 1/32 inch overall clearance. Length of crossmembers shall be cut at site to fit between floor columns with the P9200T square tube cut shorter than the P1000T channels to clear angle brackets at both ends. Unistrut nuts and 1/2 inch capscrews are installed along the span of the crossmember to secure the channel and tube against sliding.

2.18 Crossmembers are supported at the floor columns by angle brackets, Unistrut P2484W, 90 Degree brackets. The bracket is secured with two 1/2 inch hex head capscrews to tapped holes in the column. Crossmembers shall attach to the bracket with two 1/2 inch capscrews to Unistrut nuts in the P1000T channel.

2.19 High type framing at 11 feet 6 inches height may be provided by extending vertical structure above the 9 feet 3-1/2 inches crossmembers to the 11 feet 6 inches level. The vertical structure shall be assembled of Unistrut P9200T tubes and P2484W corner brackets as used in crossmember assemblies as shown in Fig..

C. Corner Brackets

2.20 Corner brackets secure main crossmembers to the stanchions and provide lateral stiffness to the system. Corner brackets are available from commercial suppliers under Unistrut Part Number P2484 or equivalent.

2.21 Secure corner brackets to stanchions with ½-13 Grade 5 capscrew, washer and lockwasher. Capscrews shall be tightened to minimum 25 ft.lbs.

3. INSTALLATION REQUIREMENTS

A. Floor Stanchion Installation

3.01 Floor stanchions are secured to building floor with four Hilti 12mm HSL floor anchors in "High Risk" (Zones 3,4) seismic areas or four Hilti ½ inch HDI floor anchors in "Low Risk" (Zones 0,1,2) seismic zones. Anchor holes in stanchion base are offset to minimize rebar interference. If rebar interference is encountered, the affected anchor may be deleted if required. Greater number of anchor interference may require stanchion to be moved. Other options may be provided by discussions with company seismic protection engineer.

3.02 Building floors appropriate for floor load of network equipment will provide adequate support for stanchions. Equipment floors shall be normal weight aggregate concrete of 5 inch nominal depth, minimum 3000 psi compressive strength. Installation of floor stanchions in customer premise locations, administrative buildings may require inspection of floor construction to assure adequate floor thickness and load carrying capacity.

3.03 Prior to installation of stanchions, roughly layout stanchions in the equipment area. The Equipment Engineers and DEC Resident Engineers shall determine location based on equipment type and aisle space requirements. Stanchions to be positioned in aisles shall not block equipment doors, front or rear equipment access and minimum aisle widths must be maintained. See Fig 1 as example of stanchion placement for switch installation.

3.04 Shims shall be used for leveling stanchion bases where necessary. Shim stock shall be non compressive, non flammable material with shim surface area at least equal to 1/4 of stanchion base area. Column shall be plumb within 1/4 inch from vertical measured with a bubble level on one side of stanchion tube.

B. Crossmember Installation

3.05 The main crossmembers run between the floor stanchions to form the support grid for cableracks and other overhead equipment as shown in **Fig. 8**. The main crossmembers may be 10 feet length or shorter of the Unistrut P9200T square tubes and P1000 U-channels. The square tubes and channels arrive at the jobsite in lengths up to 20 feet long and require field cutting to appropriate lengths. A bandsaw or cutoff saw onsite will reduce amount of time necessary to cut materials. Cut ends shall be filed free of burrs, sharp edges and painted.

3.06 Main crossmembers are assembled with a length of Unistrut P1000 U-channel inserted into a shorter length of P9200T Square Tube. Both materials shall be cut to full length required with no splices permitted. The P9200T is shorter to permit clearance of stanchion corner bracket at both ends. The P1000T is fastened to the corner brackets at each stanchion. P9200T square shall be cut to length where each end of tube is no more than ½ inch from nearest edge of corner bracket.

C. Stanchion Angle Brackets

3.07 Main crossmembers are secured to floor stanchions by angle brackets, Unistrut P2484W, 90 Degree brackets. The angle brackets are secured to floor stanchions, to predrilled ½-13 tapped holes provided for the brackets. Each bracket requires two ½ -13 capscrews for securing to stanchion.

3.08 Crossmembers are secured to top leg of angle bracket P2484W using ½-13 capscrew and Unistrut nuts, Unistrut nuts are installed on inside of P1000T channel.

D. Intermediate Crossmember Installation

3.09 Intermediate crossmembers run between main crossmembers to provide support to cableracks. The intermediate crossmembers are secured to main crossmembers with junctioning hardware Unistrut P1950M or P1726M as shown in **Fig. 8**. The P1950 plate is used at crossing tee junctions

3.10 For crossmember span lengths longer than 6 feet, intermediate crossmembers are required so cablerack may be supported at distance no greater than every 6 feet. The intermediate crossmembers shall be assembled from equal length sections of P9200T tubes. The intermediate crossmembers are secured to main crossmembers with Unistrut P1726M brackets for tee connections and Unistrut P1950M brackets for cross connections. Both brackets shall be fastened to tubes with ½-13 hex head capscrew and nut. Nut shall be placed on bottom side of tube.

3.11 Attaching crossmembers to building walls is only permitted when cablerack is placed within 12 inches of a wall and locating stanchions up against wall is not possible and as shown in **Fig. 9**. Crossmembers attached to building walls must be secured to a structural load bearing wall only. Crossmembers shall never be attached to partitioning walls. The crossmember shall attach to a wood batten with Unistrut P1130 90 degree angle bracket attached by two 1/2 inch wood lag screws. The crossmember is secured to the wall bracket with ½-13 hex head capscrew, washer, nut assembly. Assure wood batten is securely attached to building wall with at minimum a fastener or anchor at every 18 inches.

E. Bracing

3.12 For normal cablerack loads, the floor stanchion system does not require supplemental bracing for “High Risk” earthquake areas. Stanchions provide adequate strength for lateral loads. The stanchion system should not be secured building walls to avoid exceeding stanchion capabilities.

3.13 Crossmembers cantilevered from stanchion, member extended from stanchion with a free unsupported end, may require additional diagonal bracing if cantilevered section exceeds 12 inches or load to be supported by cantilevered section is greater than 150 pounds. Brace the cantilevered section with Unistrut P/N P2458-18. Brace attachment to the stanchion will require a ½ inch diameter hole be drilled and tapped into stanchion tube. Cantilevered crossmember shall not extend more than 3 feet from stanchion, even when braced. Free end of crossmember shall be protected with rubber cap.

3.14 Network equipment framework shall not be attached to the floor stanchion system crossmembers. Network equipment framework loads may exceed stanchion load capabilities. The stanchion system is intended for cablerack and network incidental equipment loads only.

4. EQUIPMENT ATTACHMENT

A. Cablerack

4.01 The primary application of the floor stanchion system is to support cable racks from the crossmember sections as shown in **Fig. 10**. Cable rack stringers shall be placed onto crossmembers and secured with traditional J-Bolt detail to the crossmembers as illustrated in **Fig. 11**. Locate cable rack where J-Bolts are centered over slotted holes of crossmembers. J-Bolt shall pass through slots to underside of crossmember and fastened with framing clip and nut.

4.02 Cable racks that cannot be placed with J-Bolt in line with slots of crossmembers require J-Bolt kit (B-Line SB-1003-K, Newton Fig. 2038 or equal) with flat plate straddling crossmember as shown in **Fig. 12**. The line J-Bolt kit does not require bolt to pass through crossmember slots.

4.03 Threaded rods used for suspending equipment or cable rack from crossmembers shall be sized for appropriate loads of suspended equipment and installed as shown in **Fig. 13**. Heavier loads require larger diameter rods for vertical strength and lateral resistance. Guidelines specified in BSP 800-006-151MP for cable rack support shall be applied.

A. Lighting Fixtures

4.05 Loads such as light fixtures or fiber optic racks may be suspended from crossmembers with ½ inch diameter threaded rods. Attach threaded rod to crossmember with 1/2 inch framing clips and 1/2 inch hex nuts through crossmember slots. Maximium length of rod shall not exceed 12 inches.

4.06 Heavy loads such as cable racks shall be suspended from crossmembers with 5/8 inch diameter threaded rods. Attach threaded rod to crossmember with B-Line SB-2215-B Hanger Brace kit or equal as shown in **Fig. 14**. The bracket shall attach to the crossmember with two 3/8 inch capscrews and nuts through crossmember slots, The threaded rod is secured to the bracket with 5/8 inch nuts and lock washer. Maximum length of hanger rod shall not exceed 12 inches.

C. Power Cables

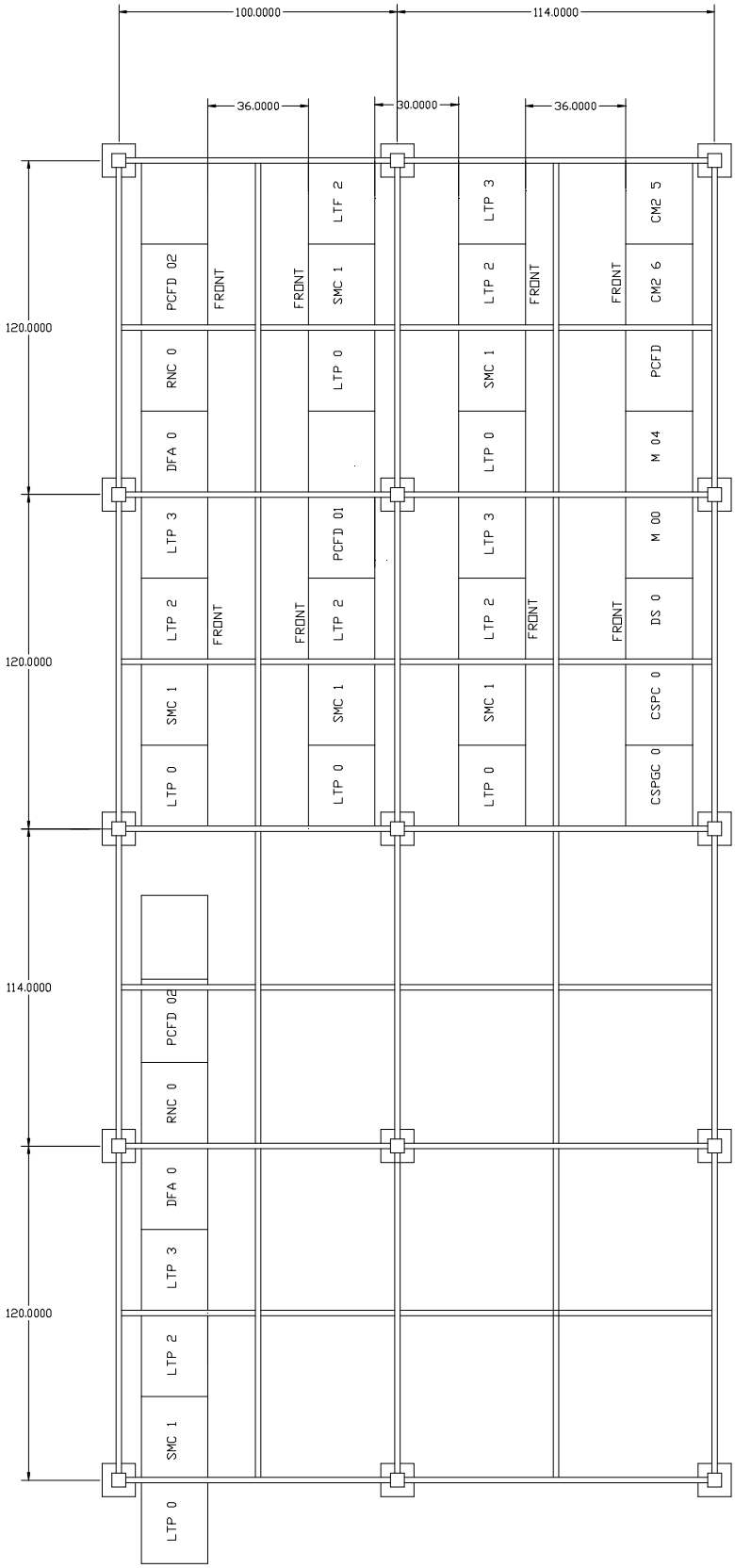
4.07 Crossmembers may be used for routing AC conduit runs with appropriate hardware. Reference Unistrut engineering catalog for hardware to secure conduit and junction boxes to crossmembers. Conduit shall only be placed along sides of crossmember away from existing and future cablerack runs. All applicable electrical code requirements and telephone company installation requirements shall be adhered to.

4.08 Ground cables for network equipment shall be routed and installed in accordance to requirements outlined in BSP-800-068-180MP.

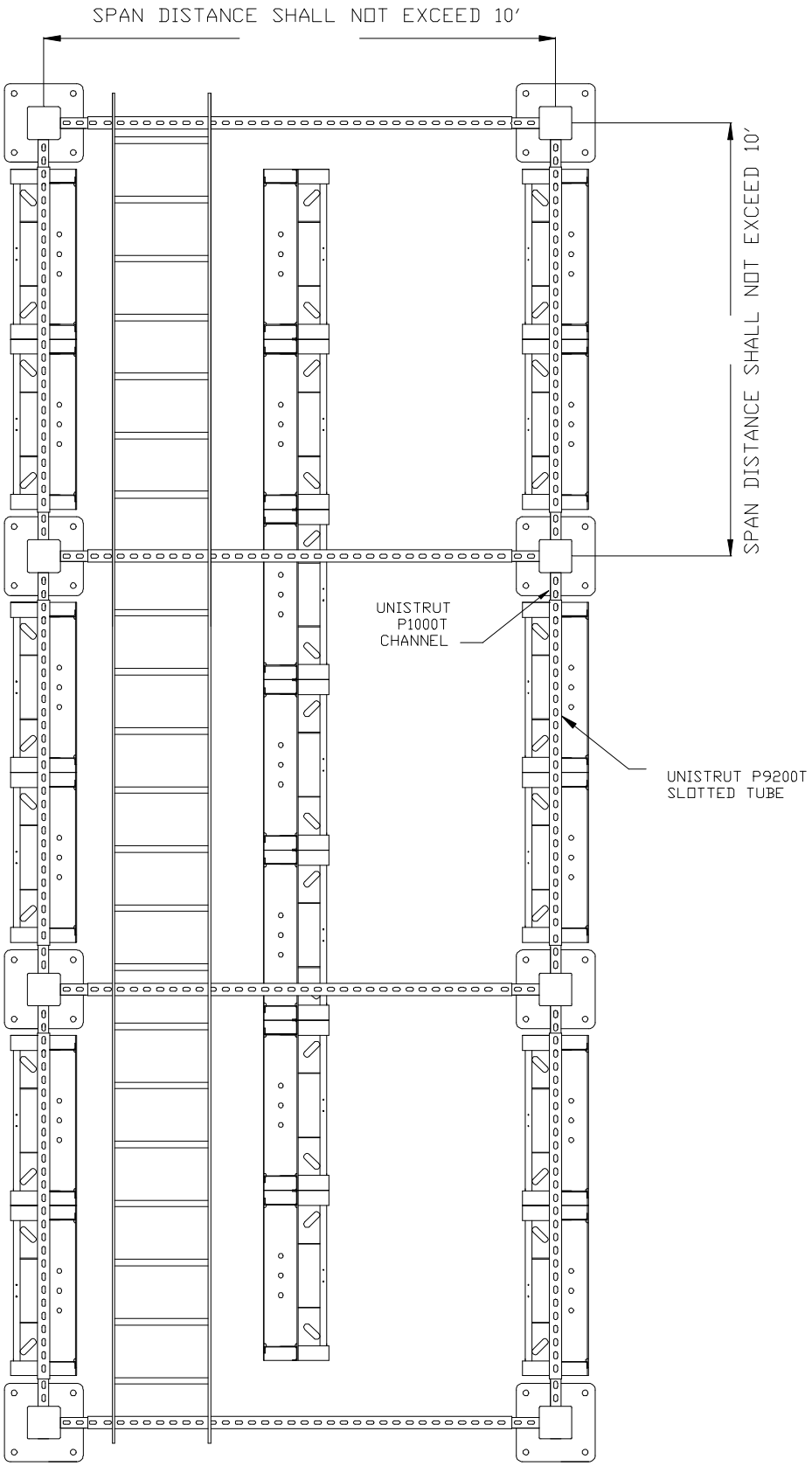
5. ASSISTANCE

5.01 Consult with the Telephone Company Equipment Engineer or DEC Resident Engineer on equipment location, cable rack location and other spatial requirements.

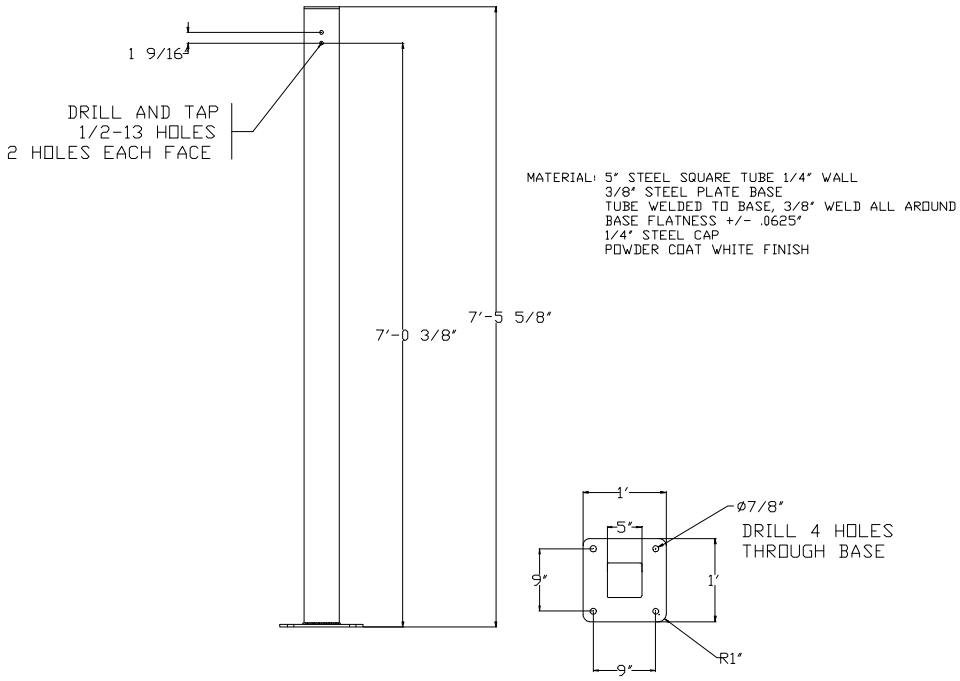
5.02 Questions concerning design and assembly of the floor stanchion system may be directed to Pacific Bell's Seismic Protection Engineer, 925 823-4544.



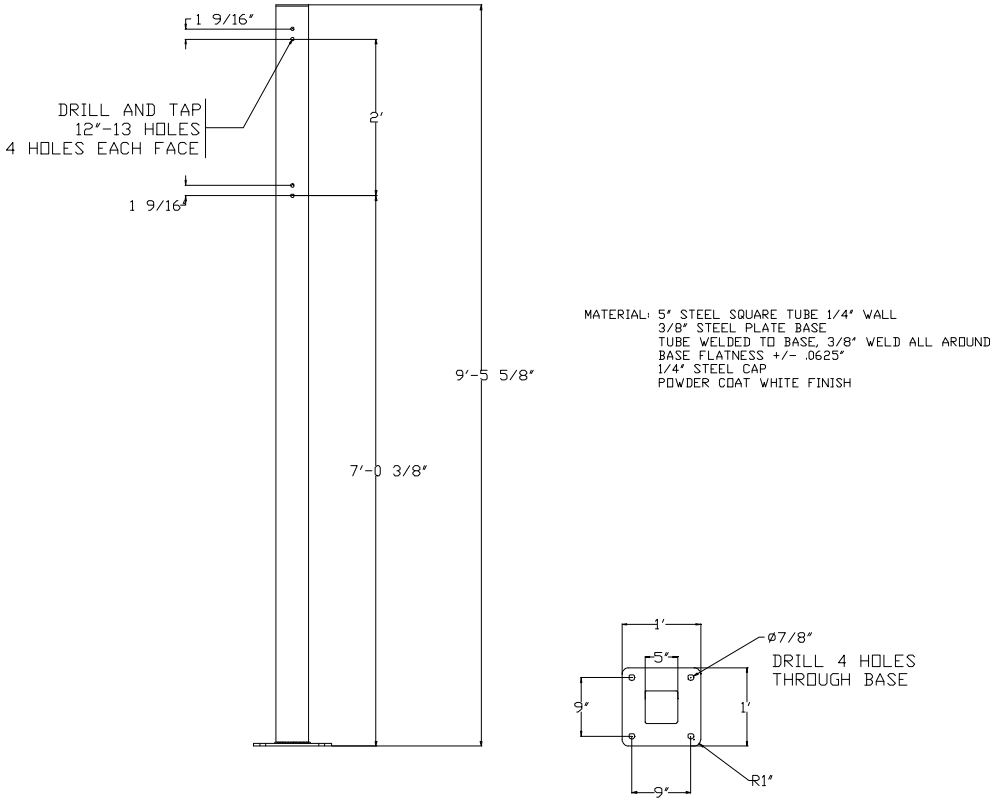
Typical Floor Stanchion Layout
Fig. 1



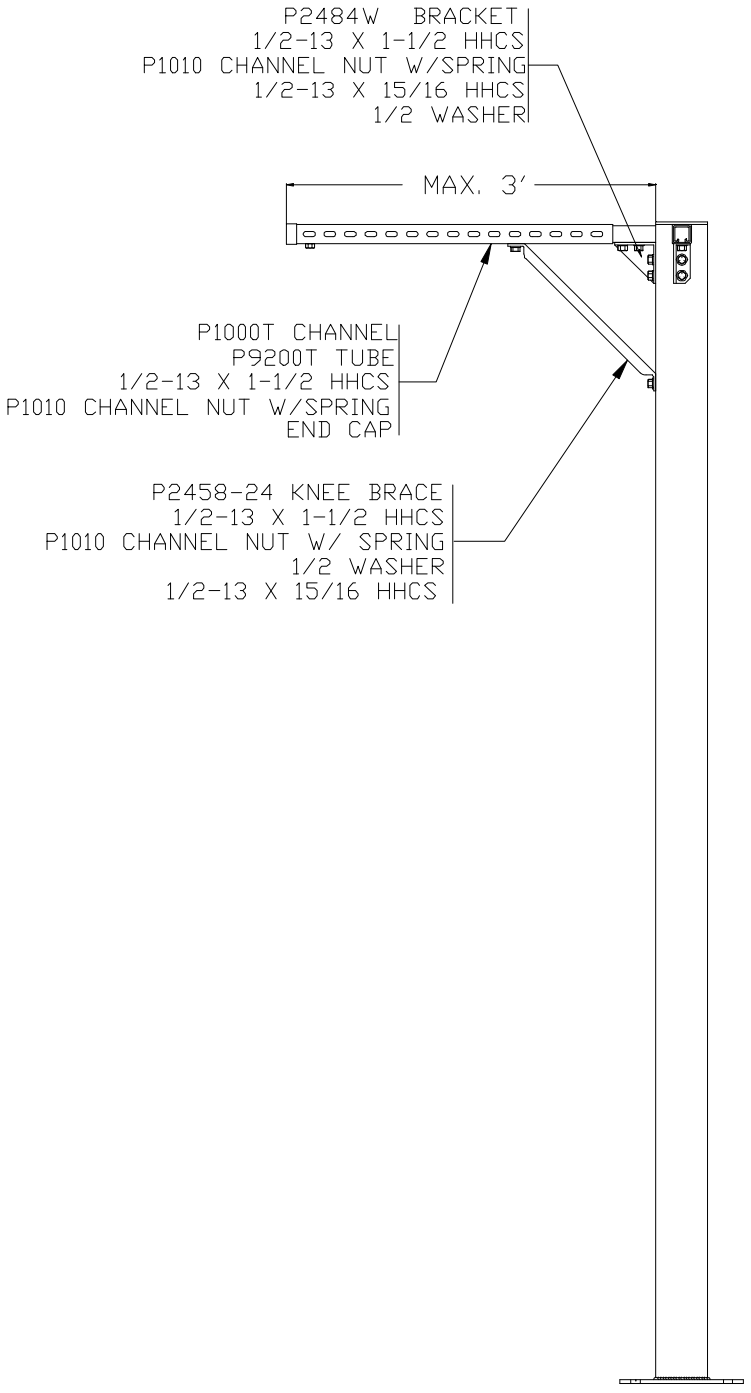
Floor Stanchion Assembly
Fig. 2



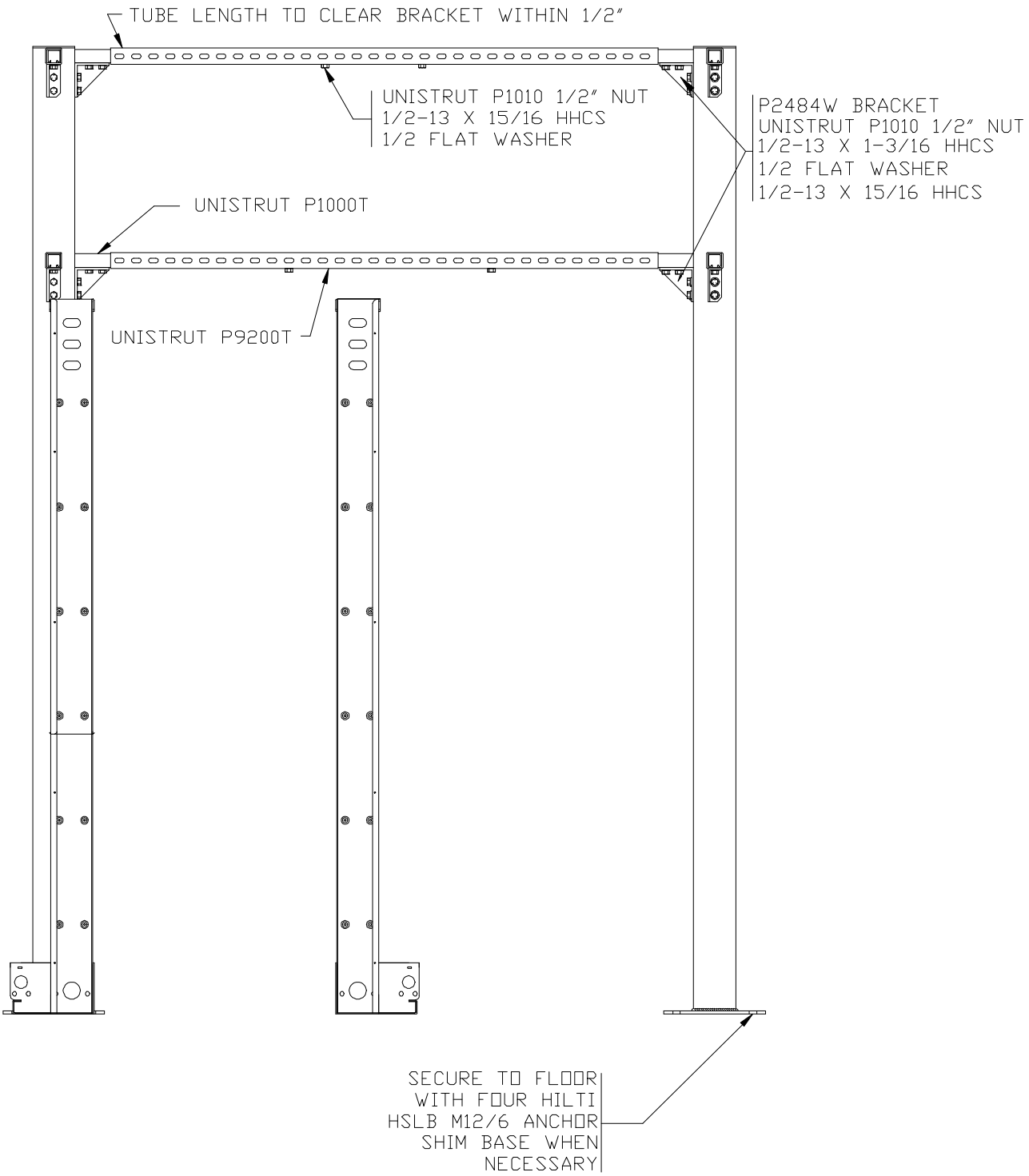
7' - 0" Stanchion
Fig. 3



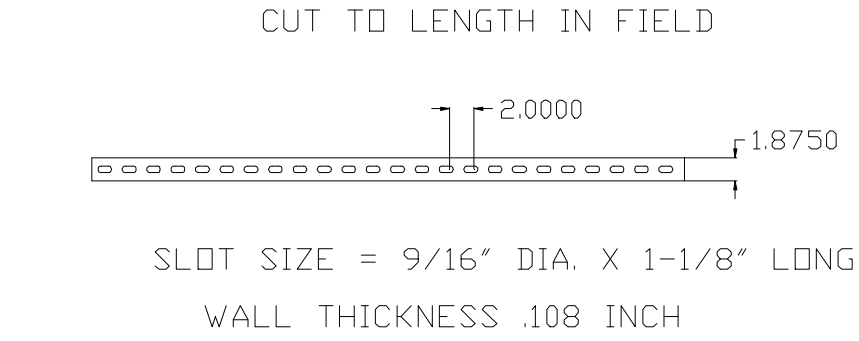
9' - 0" Stanchion
Fig. 4



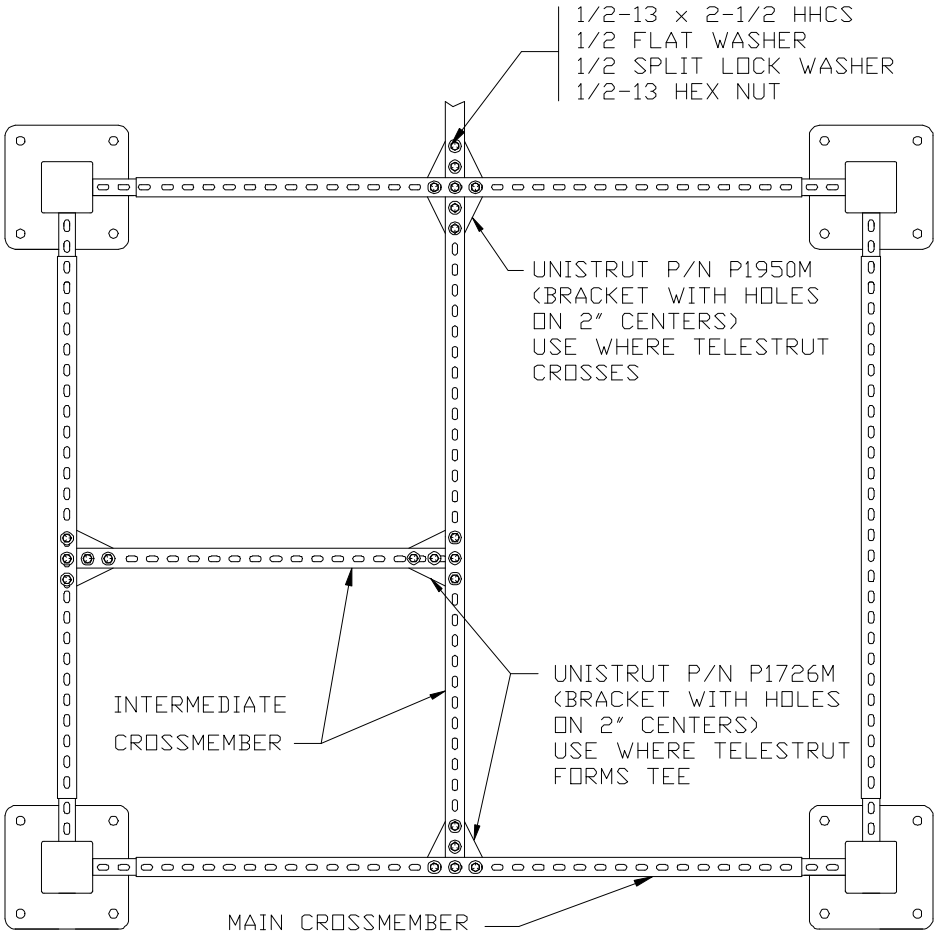
Cantilevered Crossmember
Fig. 5



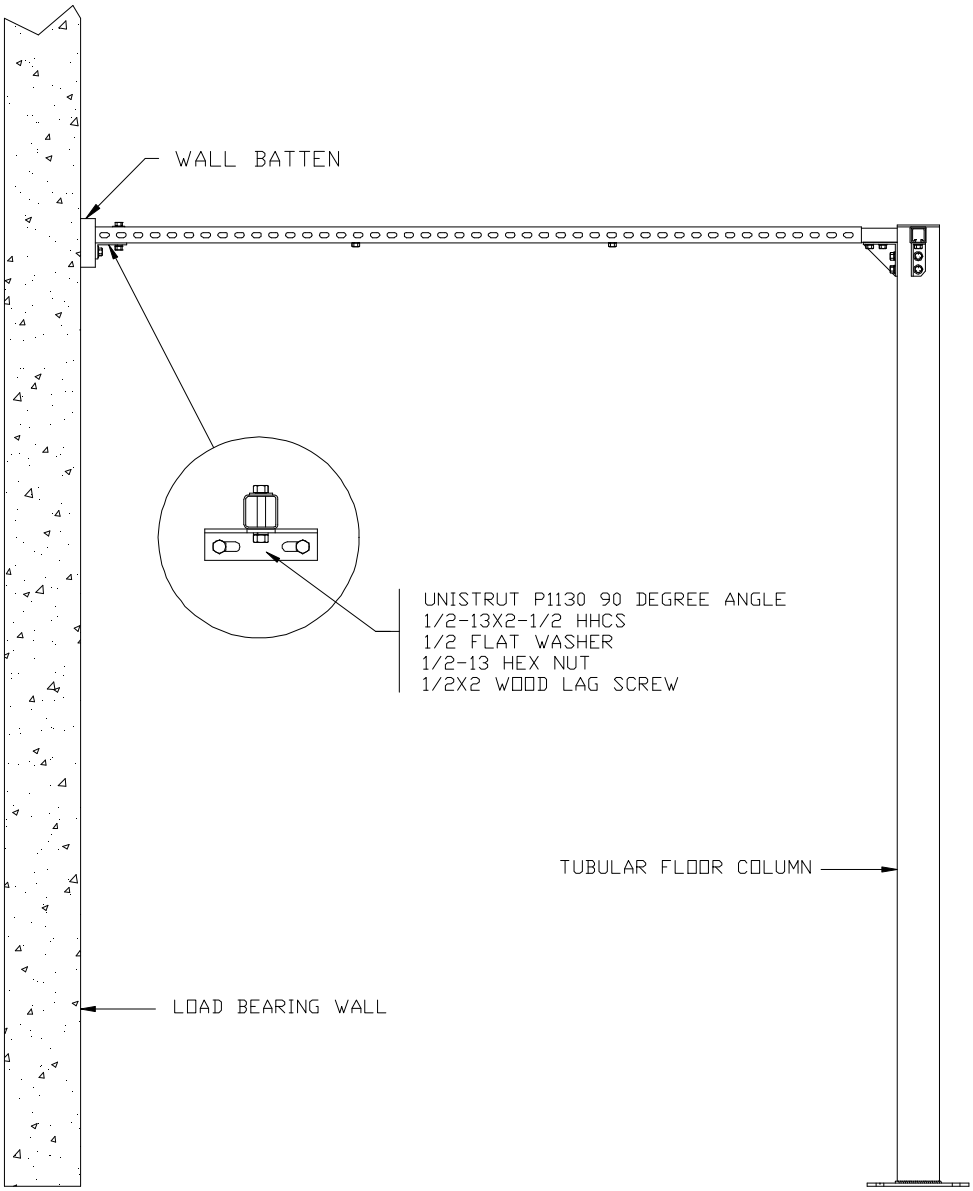
Floor Stanchion Crossmember Vertical Height
Fig. 6



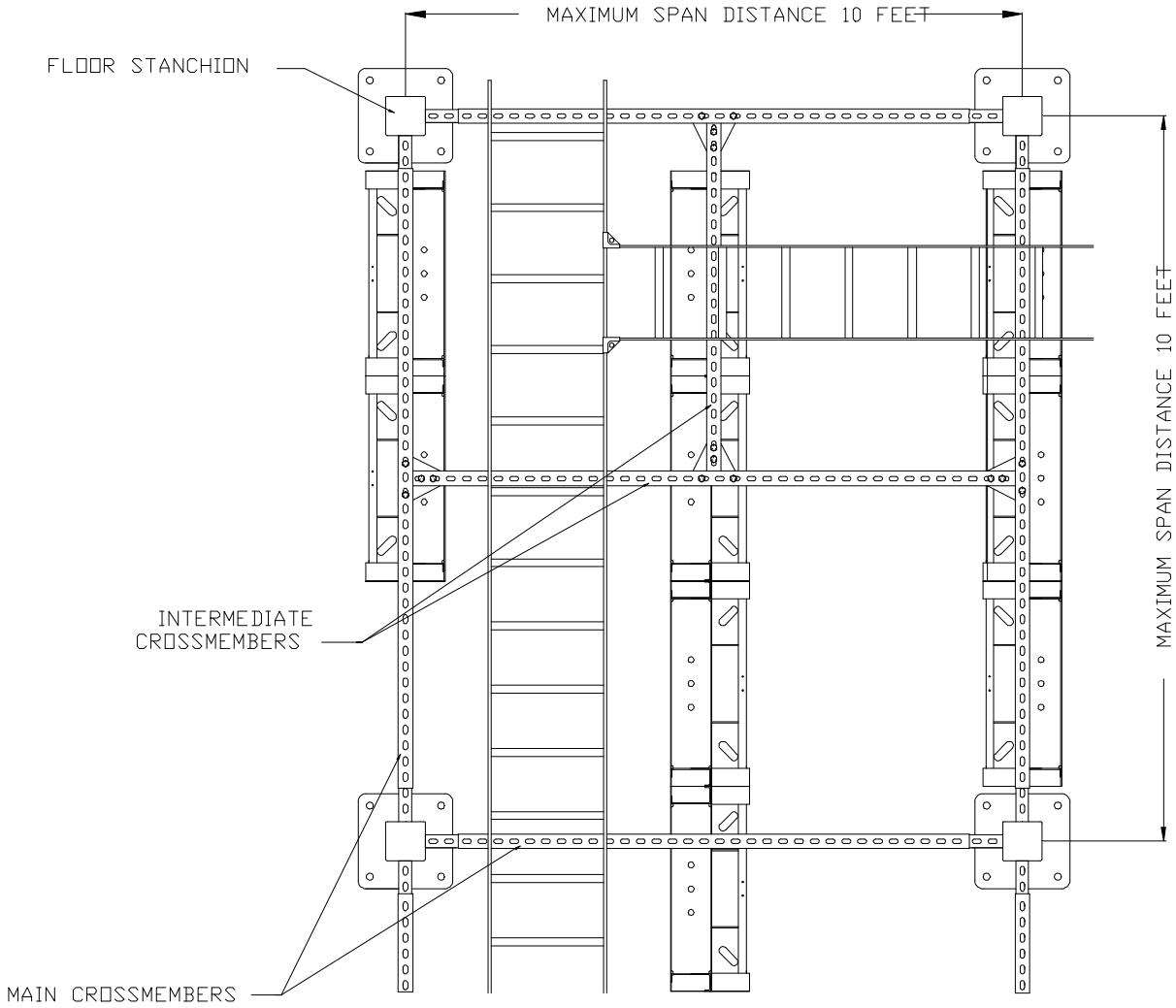
Telestrut Tube
Fig. 7



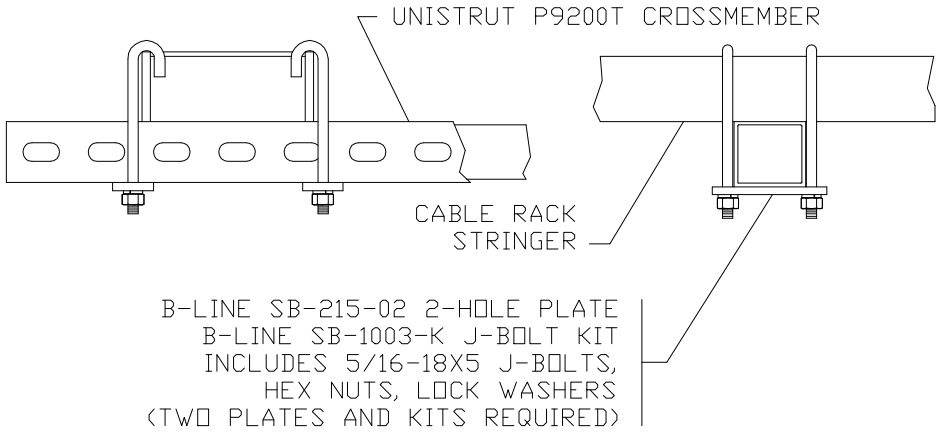
Crossmember Assembly
Fig. 8



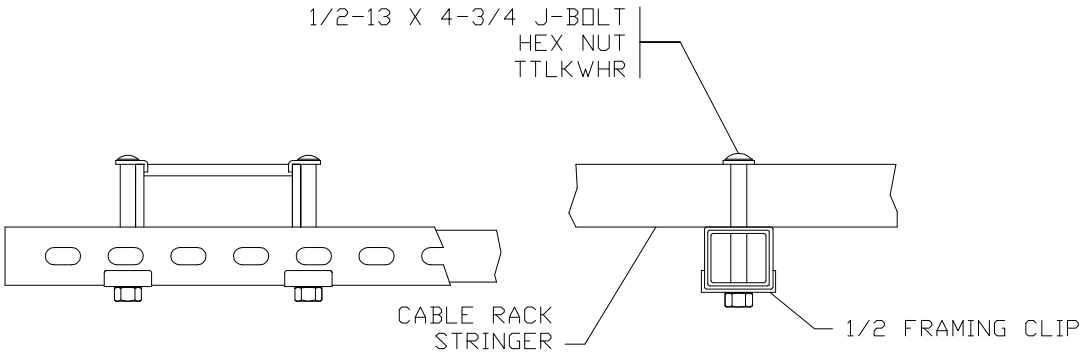
Wall Attachment of Crossmember
Fig. 9



Cablerack Installation
Fig. 10



Fastening Detail J-Bolt
Cablerack to Crossmember
Fig. 11



Fastening Detail Clip
Cablerack to Crossmember
Fig. 12

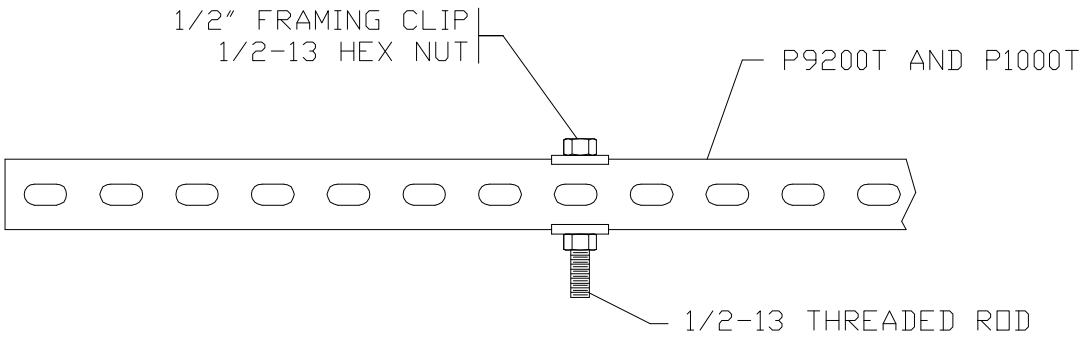


Figure 13
½ Inch Hanger Rod

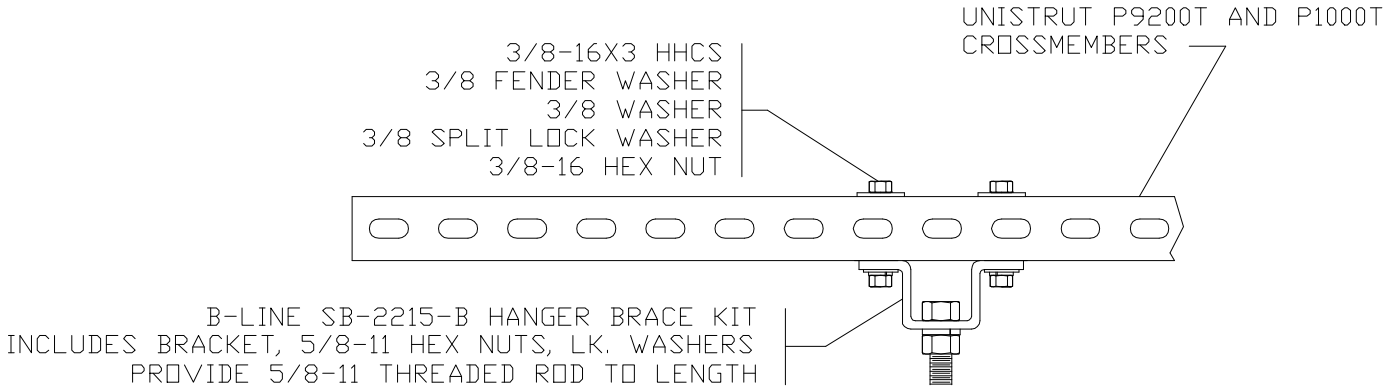


Figure 14
5/8 Inch Hanger Rod