CABLE RACKS - TUBULAR CHANNEL OR SOLID STRINGER CONSTRUCTION

GENERAL

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1. GENERAL

1.1 Scope

1.11 This section covers methods and requirements for the fabrication of cable rack - BSP 800-614-157 Figures 1 through 1J.

1.12 The requirements covered in this section shall be followed except as modified by specifications and drawings furnished the job.

1.13 The tubular or channel stringer cable racks are identical in outside dimensions to the solid stringer ladder type cable rack, and are directly interchangeable. See Figure 1A.

1.2 Associated Information

1.21 Refer to the "Associated Handbook Information Reference Chart" for the location of information to which reference may be necessary when performing operations covered by this section.

1.22 Reference should also be made to specifications and cabling, cable rack and auxiliary framing drawings furnished the job.

1.3 Precautions Against Personal Injury, Service Interruptions and Equipment Damage

1.31 The precautions to be taken against personal injury and to prevent damage to equipment and service interruptions are covered in the 13 series of sections. General precautions are covered in Handbook 0 and are to be observed at all times, as they apply to the particular operation being performed.

1.4 Arrangement of Tools

1.41 Prior to starting operations covered in the 13 series of sections, the tools and other items required should be arranged at the work location so as to minimize fatigue and inconvenience when handling.

1.5 Arrangement of Figures

1.51 The figures in BSP 800-614-157 are frequently referred to in job specifications and drawings. For this reason, where figures from BSP 800-614-157 are reproduced in this section, they are numbered to agree with the corresponding figures in the BSP as far as possible. (Where a duplication of figure numbers would result from this procedure, the numbers are followed by a letter for purposes of differentiation.) Such figures are identified by a note beneath each figure title.

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NOTICE - NOT FOR USE OR DISCLOSURE OUTSIDE THE BELL SYSTEM EXCEPT UNDER WRITTEN AGREEMENT

1.52 Figure 1L shows the double line conventions used on cable plan drawings for most of the fabrication figures in this section. Typical double and and single line cabling plans and their associated charts and notes are shown in Handbook 1.

1.6 Piece Part Information

1.61 The list of parts shown in Figure 1K will facilitate the identification of piece parts frequently used in the installation of cable rack. While it is intended that the list include all parts which otherwise might be difficult to identify, it will be impracticable to keep the list up-to-date at all times.

1.62 The R-2903 Piece Part Chart is a large reproduction, similar to Figure 1K which may be located near piece part bins on the job for ready identification of some of the more common piece parts.

1.63 All fabrication materials, (clips, splices, J-bolts, etc.) are compatible with the tubular cable rack.

2. INSTALLING EQUIPMENT

2.1 Tools

2.11 In addition to the tools supplied in the General Kits and the Ironworkers Kit No. 4, one or more of the power cutting tools listed below may be required for operations covered by this section. (See associated section in Handbook 28).

	Tool
R-4102	Mobile Band Saw
R-2557	Power Hack Saw
R-3030	Power Hack Saw
R-3031	Power Hack Saw
R-3103	Hydraulic Shear
R-3148	Reciprocating Saw
R-3623	Portable Band Saw

2.12 In addition to Paragraph 2.11, obtain rubber and steel tipped hammers (R-4041) in quantities as required to equip personnel erecting wide cable rack.

2.13 The majority of the nuts used in the fabrication of cable rack are 841064777 3/8" - 16 Hex. Nuts, which are 9/16" across the flats and 841064793 1/2" - 13 Hex. Nuts, which are 3/4" across the flats. The R-3057A 9/16"- 3/4" Hex. Pivoted Socket Wrench, provided for use in tightening these nuts is illustrated in Figure 1P.

2.14 All installation tools with the exception of shears are compatible with the tubular cable rack.

NOTE: Cutting the tubular stringer with the R-3103 or R-4276 Shears will distort its geometric configuration. When it is necessary to cut the tubular rack, use the R-3623 or R-4102 Band Saw.

2.2 Supplies

2.21 Extra framing bars or channels, threaded rods, nuts, etc., which are required for the installing operations such as the temporary support of regular auxiliary framing and cable racks, and which will not become a part of the Telephone Plant, shall be requisitioned as "supplies" from Installation Stockkeeping. Such material should not be confused with material required temporarily for transition purposes which should be requisitioned after obtaining the Telephone Company's approval as outlined in the CI.

3. DESCRIPTION AND SIZES

3.1 Common Information

3.11 The piece part numbers and sizes of straight sections of cable rack are shown in Figure 1 (Ladder-Type), Figure 1D (Over-Aisle Bar-Type), Figure 1E (Cross-Aisle Bar-Type), Figure 1B (Power Cable Rack), Figure 1H (Narrow Bar-Type), Figure 2C (Modified 1-3 Ladder Frame Aisle Cable Rack) and Figure 2G (Modified 2-1 Ladder Cross Aisle Cable Rack).

3.12 Short sections of cable rack (Bar-Type or Ladder-Type) should be used whenever practical in preference to cutting the longer stock lengths such as for short cable runs, or at the end of a cable run, or for extensions of cable runs to service the equivalent of two relay rack bays and other places where the standard cable rack section would be too long. When the standard short lengths of cable rack are not suitable, it may then be necessary to cut a section to the size required. Short sections of cable rack are covered in the tables associated with Figures 1 and 1E.

3.13 Whether cable rack is used in stock lengths or has to be cut in the field, the following caution should be observed.

> CAUTION: ANY BURRS ON END OF STRINGERS IN LOCATIONS WHERE THERE IS POSSIBILITY OF PERSONAL INJURY SHALL BE FILED OFF AT TIME RACK IS INSTALLED.

3.2 Ladder-Type and Modified Ladder-Type Cable Racks

3.21 Ladder type cable racks are furnished in full lengths 9'-8-1/2" long or in half-lengths 4'-5-1/2" long and in various widths as shown in Figure 1. The stringers are 1-1/2" x 3/8" bars for 5", 10" and 12" wide racks and 2" x 3/8" bars for racks 15" or more in width as shown in Figure 1. The straps are 1" x 1/2" channel, spaced on 9" centers and welded to the stringers. The first, last and each alternate strap of the 2'-1" and 2'-6" wide cable racks are reinforced with a 1" x 1/4" bar.

3.22 Modified ladder-type cable racks with straight side bars and thin metal plates, shown in Figure 1J, are provided for heavy leads of unsecured cabling on extended runs between separated equipment areas.

3.23 Modified 1'-3" ladder-type cable racks with straight side bars welded to one stringer, as shown in Figure 2C, are provided for the wide cable rack concept to permit unsecured cabling for #4 Cross Bar System. Refer to Paragraph 8 of this section for the wide cable rack.

3.3 "Snap-On" L- and U- Shaped Brackets

3.31 "Snap-on" L- and U- shaped brackets P-449907, P-449908, and P-449909, shown in Figure 1F, are used with ladder-type cable racks to separate high-level from low-level transmission leads. They are also used in small offices where concentration of cables is small.

> CAUTION: "SNAP-ON" BRACKETS ARE NOT DESIGNED TO WITHSTAND MUCH IMPACT LOADING AND SHALL NOT BE USED TO FORM TROUGHS IN WHICH CABLES ARE PULLED OR DRAGGED.

3.32 "Snap-on" brackets, when used, shall normally be located on alternate straps of the cable racks. At crossing points and other points where cables drop off the racks, it may be desirable or necessary to locate the brackets elsewhere.

3.33 Single brackets P-449908 and P-449909, 5 and 7 inches high respectively, are used on cross straps as shown in Figure 1F, View A; or they are used to separate runs of cable on a wide rack as shown in Figure 1F, View C.

3.34 Double bracket P-449907, shown in Figure 1F, View B is provided for use on 5-in. racks and on larger racks, as specified, where only a few cables are to be secured, such as at the end of frame lineups.

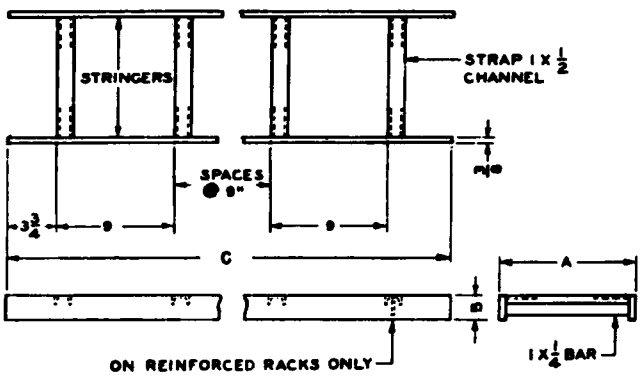

TABLE OF DIMENSIONS			PIECE PART NUMBER
STANDARD WIDTHS DIM A	SIZE OF STRINGER DIM B	DIM C	
5	1 1/2	9-8 1/2	P-401700
10	1 1/2	9-8 1/2	P-401701
1 - 0	1 1/2	9-8 1/2	P- 420634
1 - 0	1 1/2	4-5 1/2	P- 416322
1 - 3	2	9-8 1/2	P-401702
1 - 3	2	4-5 1/2	P- 416323
1 - 8	2	9-8 1/2	P- 401703
1 - 8	2	4-5 1/2	P- 416324
2 - 1 REINFORCED	2	9-8 1/2	P- 401704
2 - 6 REINFORCED	2	9-8 1/2	P- 401705

RP-16273

FIG. 1 LADDER-TYPE CABLE RACK (PARS. 3.11, 3.21, 4.4) (BSP 800-614-157, Fig. 1)

RP-0994M

FIG. 1A THE TUBULAR, CHANNEL OR SOLID STRINGER CONSTRUCTION CABLE RACK

3.4 Bar-Type Cable Racks

3.41 Bar-type cable racks, shown in Figures 1D, 1E, 1G and 1H are used as standard units of over-aisle, cross-aisle over-frame and miscellaneous cable racks respectively. Bar-type cable racks are made of 1" by 3/16" bent steel cross straps on 9-1/2" centers welded to 1-1/2" by 3/8" bar stringers. Thin metal plates are provided for covering the entire length of the bottom of the racks.

3.411 Bar-type over-aisle cable racks shown in Figure 1D, are 1'-8" wide with a 1'-3" wide depressed center and are 12'-0" long. If practicable, it is desirable that the metal plates overlap at a cross strap as shown. For a normal run of frame-aisle cable rack it will be possible to overlap the plates at a cross strap in the middle of a 12'-0" section of cable rack, while at the ends, where cable rack splices are assembled it will normally not be possible to overlap at a cross strap.

3.412 Bar-type cross-aisle cable racks are 1'-10" wide and vary in length to suit aisle widths and cable rack levels listed in Figure 1E.

3.413 Bar-type over-frame cable racks, shown in Figure 1G, are 1'-3" wide and 12'-0" long.

3.414 Narrow bar-type cable racks shown in Figure 1H are 5" wide and 12'-0" long.

3.42 Turns, offsets, spirals and vertical runs used in connection with horizontal bar-type cable racks should be fabricated with ladder-type cable racks, except offsets greater than 9" which are fabricated with bar-type cable rack.

3.5 Spiral Cable Rack, Double Turns and Offsets in Vertical Cable Rack

3.51 Spiral cable racks and double turns consist of channel straps fastened at each end with eyebolts to 5/8" bent rod stringers. They are assembled by the installer in accordance with the standard drawing ED-90843-01 for spirals and double turns.

3.52 Offsets in vertical cable rack when specified are installed as shown in the job specifications and drawings.

3.6 Power Cable Racks

3.61 Power cable racks of the type shown in Figure 1B are used for supporting power distribution cables when main- or end- aisle cable racks are omitted or where intermediate frames are omitted in a frame lineup and the gap exceeds 3'. They are furnished in full lengths 9'-8-1/2" long and in two widths as shown in Figure 1B.

3.62 Power cable rack turns are similar in general construction to ladder-type cable racks, except that the stringers are forged to 7" and 14" outside radii of 90-degree turns, with the straps on the outside of the turn. Power cable rack turns are available in 10", 12" and 15" widths.

3.63 The permissible pile-up of vertical power cable runs shall not exceed an ultimate pile-up of 7 inches (approximately equivalent to five layers of 750,000 CM cables).

3.64 The maximum width of cable racks for vertical power cable runs shall be limited to 1'-8".

4. LOCATION

4.1 Cable rack should be located in accordance with information contained on the cabling, cable rack and auxiliary framing plan drawing furnished the job. There should be no deviation from the cable rack information on this drawing unless approval is obtained from the equipment engineers.

NOTE: The above procedure is very important on carrier jobs because of the initial length and/or the separation of the cables.

4.2 The location of cable racks should be such that the clearance required for the proper installation and maintenance of the ultimate equipment will be maintained as specified for the particular equipment. Cable racks should be located so as not to interfere with future equipment.

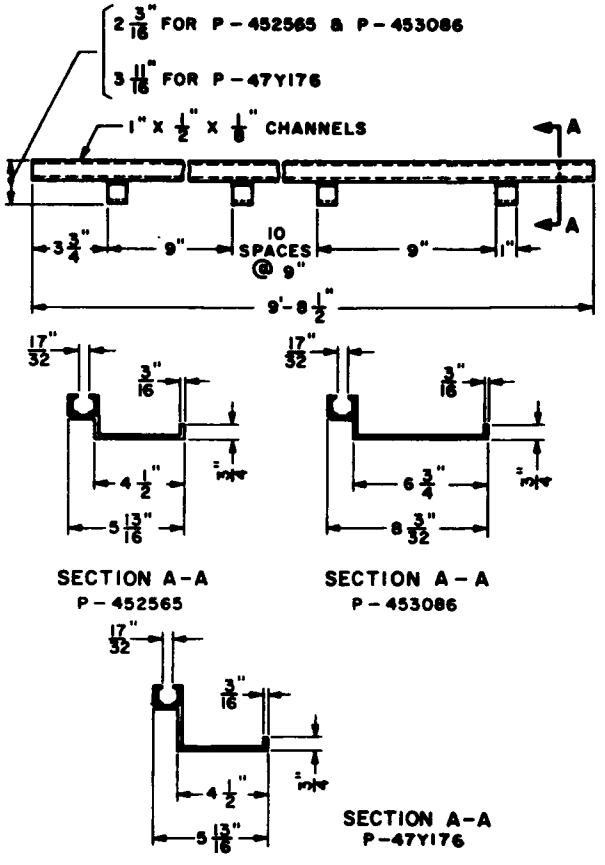

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FIG. 1B CABLE RACK FOR POWER CABLES WITH MAIN- OR END- AISLE CABLE RACKS ARE OMITTED (PARS. 3.11, 3.61) (BSP 800-614-157, Fig.1B) A & M Only.

4.3 Cable racks should not be located close to pipes, radiators, windows, doors, or any other equipment which may subject the cabling to possible damage by exposure or other detrimental conditions.

4.4 For horizontal cable runs, the ladder-type cable racks are usually placed with the cross straps upwards. Cable racks for inverted cable runs and for the so called "basket" runs are placed with the cross straps downward. (In a basket run, the cables rest horizontally but the cable rack is inverted to gain cabling space.) Reinforced cable rack, shown in Figure 1, should not be used for basket runs.

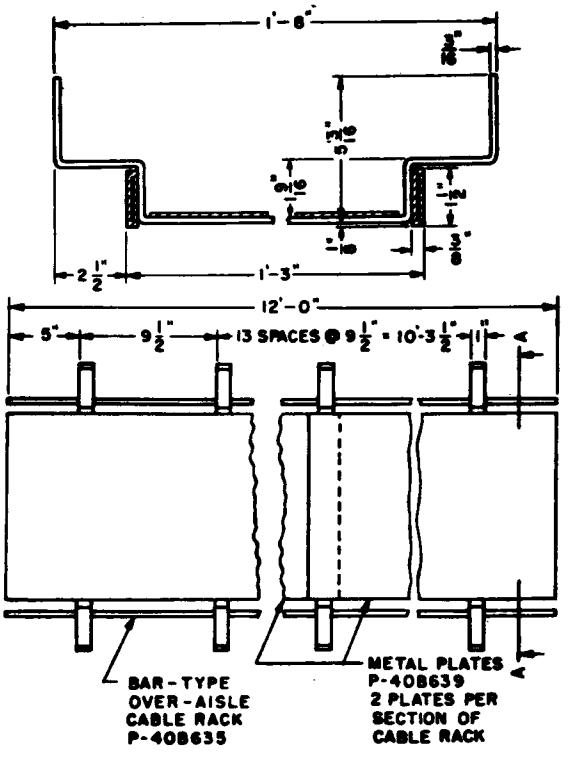

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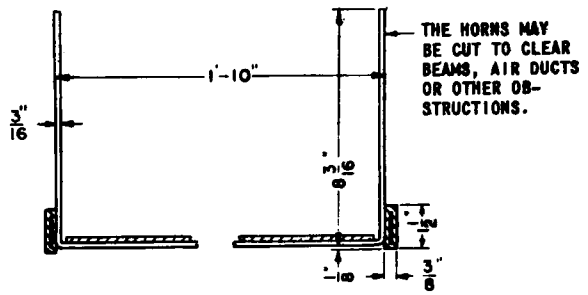
FIG. 1D BAR-TYPE OVER-AISLE CABLE RACKS (PARS. 3.11, 3.41, 3.4111) (BSP 800-614-157, Fig. 1D)

4.5 Runs of the cable rack should conform throughout to the "height above floor" shown on the cable plan drawing. They should be approximately level and in proper alignment as gauged by eye.

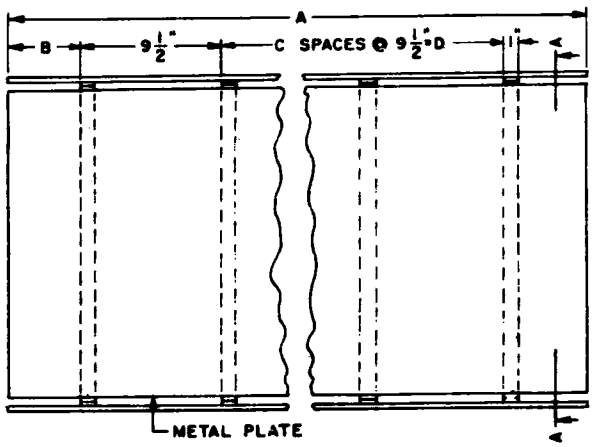
4.6 Locate racks supported without auxiliary framing in operating rooms, hallways, etc., so as to utilize a row of beam clamps or ceiling inserts. This will reduce the number of expansion shields necessary. However, racks must be kept within the locating limits shown on cable plan drawings.

4.7 Adhere rigidly to the dimensions given on drawings for cable rack at distributing frames, cable holes, fans in cable turning sections, etc., to prevent difficulty in running and fanning cables.

4.8 A method for locating cable rack where the auxiliary framing is assembled before the frames are in place and lines have been marked on the floor is shown in Section 6A of this handbook which covers method for marking cable rack location lines on the floor.



SECT. A-A



	WIRING AISLE C TO C	PIECE PARTS		DIMENSIONS			
		RACK	PLATE	A	B	C	D
CR. & OVER AISLE CA.RKS. AT SAME LEVEL	6'-8"	P-40D629	P-31A109	5-4 7/8	3 7/16	5	3-11 1/2
	6'-2"	P-40D630	P-40B276	4-10 7/8	5 3/16		
	6'-0"	P-40D631	P-40D603	4-8 3/4	4 1/8		
CR. AISLE CA. RACK 2" ABOVE OVER AISLE CA. RK.	6'-8"	P-40D632	P-40D602	4-11 3/4	5 5/8	4	3-2
	6'-2"	P-40D633	P-40D601	4-5 3/4	2 5/8		
	6'-0"	P-40D634	P-40D600	4-3 3/4	1 5/8		
CR. AISLE CA. RACK 2" ABOVE OVER FRAME CA. RACK	6'-2"	P-32B916	P-32B918	1-5 1/8	3 5/16	0	0
	6'-2"	P-32B917	P-32B919	2-3 7/8	3 11/16	1	9½
USED WHERE LINE OF FRS. ARE OMITTED OR PRECUT LENGTHS NOT FURNISHED CR AISLE USE ONLY		P-40D628	2, P-31A112	12-0	5	13	10-3 1/2

RP-19896

FIG. 1E BAR-TYPE CROSS-AISLE CABLE RACKS (PARS. 3.11, 3.41, 3.412) (BSP-800-614-157, Fig. 1E)

5. ASSEMBLY OF CABLE RACK CLAMPING DETAILS

5.1 The clamping details commonly used on both ladder and bar type cable rack are illustrated in Section 13B of this handbook. Figures 2 thru 12 inclusive.

5.2 Clamping details should not be altered in any way, except that where necessary to avoid interference with cable rack straps or other details, the clamping details may be modified slightly, provided a secure fastening is obtained. Where straps interfere with the proper placing of the clamping details, the rack should be cut back to such a point that the straps will not interfere with the clamping details.

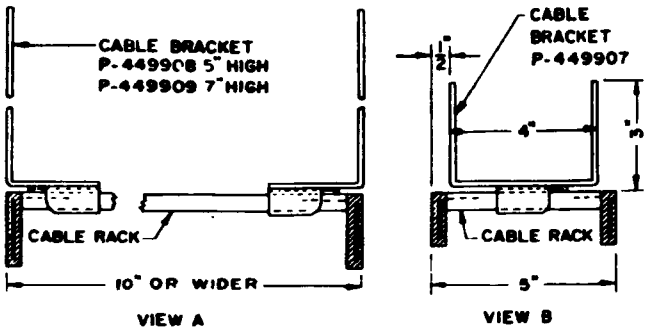
5.21 Interference of cross straps with clamps can usually be avoided by cutting the rack at both ends. Where this method is not feasible, the straight junction clamps, P-403472 may be modified to avoid interference by cutting away a portion of the inside flange as shown in Figure 1Q.

5.3 Corner clamps may be assembled in positions opposite to those shown where necessary to avoid interference with other clamps or with cable rack stringers or straps.

6. CABLE RACK STRAPS

6.1 Sections of ladder-type cable rack should be assembled so that support for the cabling is provided at approximately every 9". At turns or junctions in vertical or inverted horizontal cable runs, where the turn of the cables is such that the proper support is not provided for the cables, 1/2" x 1" channels should be placed diagonally across the rack in a manner to provide the proper support for the cables. These channel straps should be secured by bolts at the corner clamps.

6.11 Sections of bar type cable rack should be assembled so that cross strap support for cabling does not exceed 11-5/8".



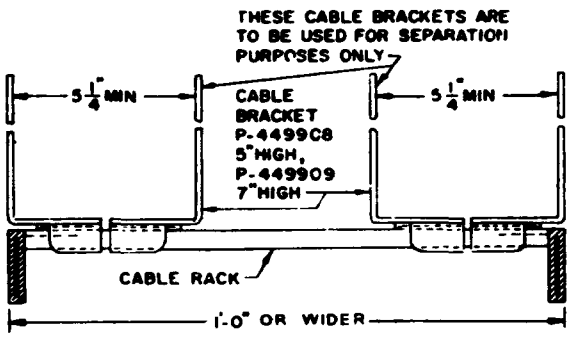


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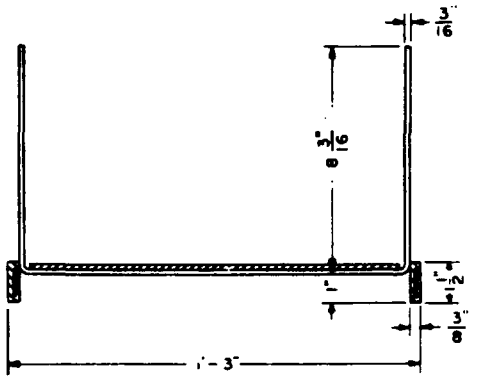
FIG. 1F MOUNTING CABLE BRACKETS ON LADDER-TYPE CABLE RACKS
(PARS. 3.31, 3.33, 3.331, 3.34)
(BSP 800-614-157, Fig. 1F

6.2 Diagonal channel straps for additional cable support at turns or offsets of vertical or underhung runs, may be fastened as shown in Figure 1R.

6.3 The addition or replacement of a strap will be facilitated by the use of supports as shown in Figure 1U. A loose end may be cut back and drilled, and supported in a like manner.

6.4 When necessary to remove a cable rack cross strap use the R-3148 Power Reciprocating Saw or as a second choice the R-3623 Portable Band Saw.

6.41 If neither of these saws are readily available on a job, the use of the R-2281 Hand Hack Saw or the R-1543 12" Adjustable Wrench, as illustrated in Figure 1W will be found effective.



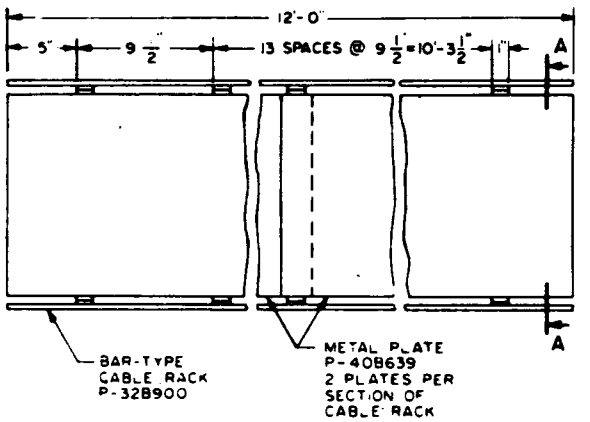


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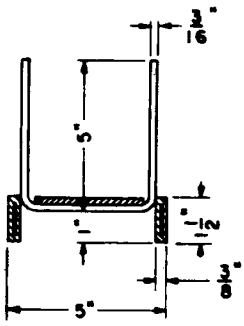
FIG. 1G BAR-TYPE OVER-FRAME CABLE RACKS
(PAR. 3.413)
(BSP 800-614-157, Fig. 1G)

7. CABLE RACK SCREENS

7.1 Cable rack screens, which are installed underneath ladder type cable rack are furnished for conspicuous cable runs and should not be confused with cable rack plates which rest on the cross straps of bar-type cable rack. Where cable rack screens per ED-91689-30 are to be installed the cable retaining ("snap-on") brackets should be placed prior to the installation of the cable rack screens. This should eliminate any interference with the installation of the cable retaining ("snap-on") brackets as covered in Handbook 8.



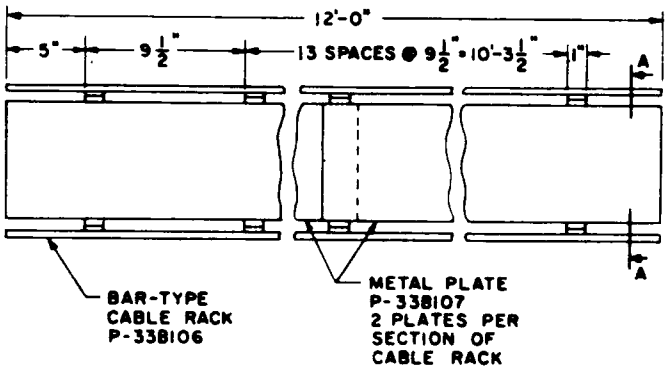


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FIG. 1H NARROW BAR-TYPE CABLE RACK (PARS. 3.11, 3.41, 3.414) (BSP 800-614-157, Fig. 1H)

7.11 Where cable rack is terminated by means of rubber finishing caps, the cable rack screen should be cut back so that it is under the last cross strap of the cable rack in order to eliminate the safety hazard presented by protruding edges and corners of the screen.

7.12 For cable rack which carries ANI primary and secondary cable attach P-43D111 and P-43D112 Identification Plates at the intervals specified in the job information. Where possible these plates shall be bent to clip onto the cable rack strap. If, however, a screen is installed under the rack, the identification plates shall be attached to the screen by means of the P-423561 Self-Trapping Screw provided. A No. 28 drill may be used to drill the holes in the screen. If practical, this operation should be performed before the screens are installed.

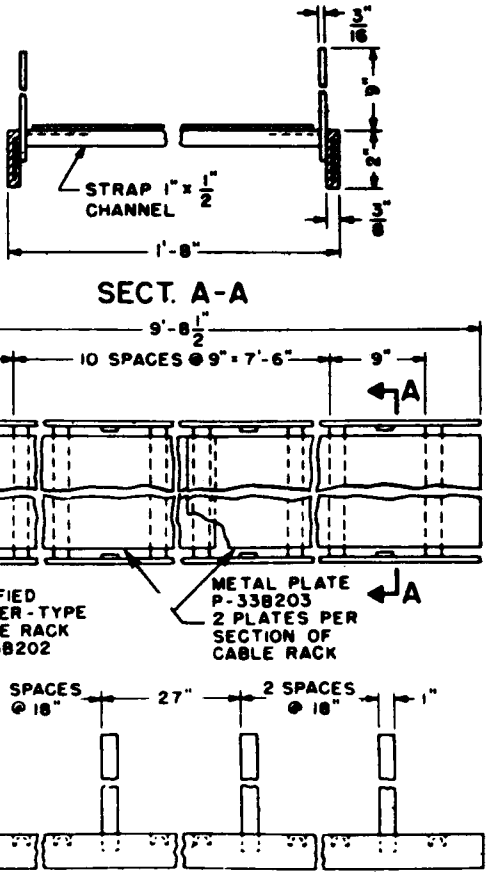

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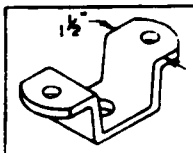
FIG. 1J MODIFIED LADDER-TYPE CABLE RACK - FOR UNSECURED CABLING (PAR. 3.22) (BSP 800-614-157, Fig. 1J)

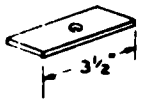
8. WIDE CABLE RACK

8.1 The wide cable rack (841210065) is composed of two modified 1'-3" ladder type cable racks (Figure 2C) bridged together with bars to provide various cable rack configurations and widths from 42 to 56 inches. (Figures 2D, 2E and 2F.)

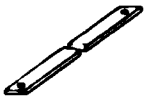
8.11 The modified 1'-3" ladder cable rack is installed in the standard manner above frame lineups. The stringer of the modified 1'-3" ladder cable rack having the welded side bar shall be located at the rear of the frame lineups. (Figures 2D, 2E and 2F) Refer to typical building bay for application (Figure 2).



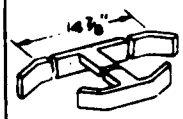
CLIP
P-69115 3/16" THICK
P-400298 1/4" THICK



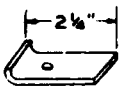
DETAIL (BAR)
P-401980



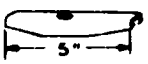
HANGER BAR
P-401760 FOR 10" RACK
P-411735 FOR 12" RACK
P-401761 FOR 15" RACK OR TOP ANGLE ASSEM
P-401762 FOR 20" RACK
P-401763 FOR 25" RACK



CORNER BRACKET
P-401758

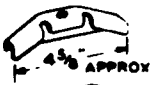


CLAMP
P-401465



STRAIGHT CLAMP
P-403472

90° EDGE CLAMP
P-403475



45° EDGE CLAMP
P-403476

INSIDE EDGE CLAMP
P-403477

CORNER CLAMP
P-403473

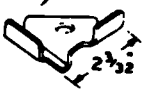
R H MACH SCREW
P-210239 1/4"-20 x 1"
P-160392 3/8"-16 x 1 1/8"
P-160388 3/8"-16 x 2 1/2"
P-160387 3/8"-16 2 3/4"

HEX HD CAP SCREW
P-147284 3/8"-16 x 1 1/4"
P-125775 3/8"-16 x 7/8"
P-423924 1/2"-13 x 3"

RD HD BOLT 3/8"-16
P-403466 2 13/16"
P-403467 2 9/16"
P-403468 2 5/16"
P-403469 2 1/16"
P-403470 1 11/16"
P-403471 1 3/16"

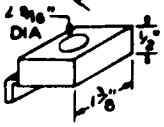
COTTER PIN
P-210292 3/32" x 3/4"

JUNC CORNER CLAMP
P-403474



CORNER CLAMP (LEFT)
P-401456

CORNER CLAMP (RT)
P-401457

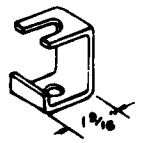


CLIP ASSEMBLY
P-432127

CLIP

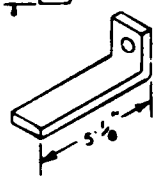
	A	B
P-420306	1½"	17/32"
P-453278	1⅜"	17/32"
P-420315	1½"	21/32"
P-453276	1⅜"	21/32"

CLIP
P-422566 A = 25/64"
P-423302 A = 33/64"



HANGER CLIP
P-406395 FOR 1½" STRG
P-406396 FOR 2" STRG

"S" CLIP
P-401480



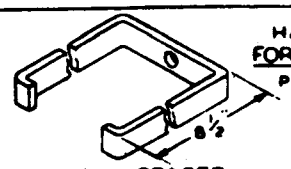
FOOT
P-401750 FOR 1½" STRINGER
P-401751 FOR 2" STRINGER

THREADED ROD 5/8"-11

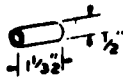
P-69106	A = 0' 7"
P-400663	A = 0' - 9"
P-68227	A = 1' - 0"
P-400664	A = 1' - 6"
P-68228	A = 2' - 0"
P-402572	A = 2' - 6"
P-68229	A = 3' - 0"
P-68230	A = 4' - 0"
P-69107	A = 5' - 0"

"J" BOLT ½"
P-49D706 A = 4¼"
P-49D707 A = 4¾"
P-49D705 A = 3⅜"

"J" BOLT ½"
P-420915 A = 4¼"
P-420916 A = 4¾"

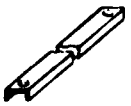


HANGER FOR 5" RACK
P-401759

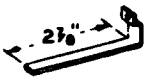


SPACER
P-401460

SPLICE COUPLING
P-164490

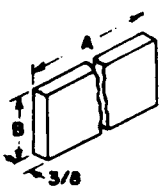


CHANNEL STRAP
P-401752 FOR 5" RACK
P-401753 FOR 10" RACK
P-411736 FOR 12" RACK
P-401754 FOR 15" RACK
P-401755 FOR 20" RACK
P-401756 FOR 25" RACK
P-401757 FOR 30" RACK



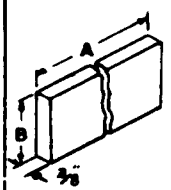
CA RK STRAP SUPPT
P-401766
EXPENSE SUPPLIES

CABLE RACK BARS

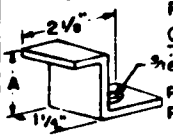


	A	B
P-418221	6 1/8	1 1/2
P-418222	11 1/8	1 1/2
P-418223	13 1/8	1 1/2
P-418224	16 1/8	2
P-418225	21 1/8	2
P-418226	26 1/8	2

CABLE RACK ENDS



	A	B
P-413511	5"	1½"
P-413512	1'-0"	1½"
P-417929	1'-3"	2"
P-417930	1'-8"	2"
P-417931	2'-1"	2"
P-408640	1'-3"	1 1/2"
P-408827	1'-10 3/4"	1 1/2"



CLAMP

	A
P-430508	1 9/16"
P-451906	2 1/16"

90° TURN-DOWN ASSEM

P-409945	10" WIDE	7" RAD.
P-411664	12" WIDE	
P-409946	15" WIDE	
P-407798	10" WIDE	14" RAD
P-411681	12" WIDE	
P-407799	15" WIDE	

HEXAGONAL NUT

		A	B
844064751	1/4-20	7/16	3/16
841064777	3/8-16	9/16	7/32
841064793	1/2-13	3/4	7/16
841063670	5/8-11	15/16	9/16

ALIGNMENT CLIP
P-404159

WASHER

	A	B
P-284172	9/16	1-1/8
P-160834	11/16	1-3/4
P-284166	7/16	1

R-2903 PIECE PART CHART ISSUE 4

RP-12766
RP-12765

FIG. 1K PIECE PARTS USED IN CABLE RACK FABRICATION
(PARS. 1.61, 1.62)

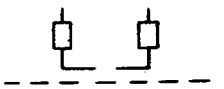
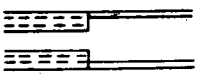
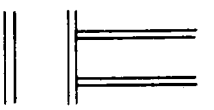
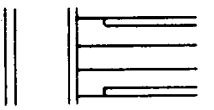
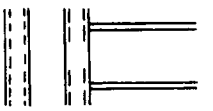
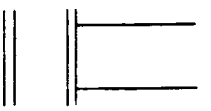
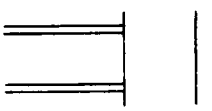
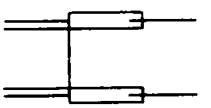
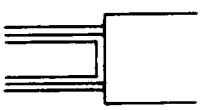
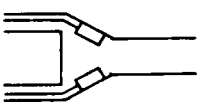
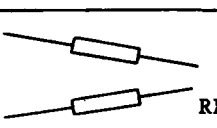
FIGURE # AA 614 007	TITLE	CONVENTION
13	FASTENING VERTICAL RACK TO FLOOR, SWITCHBOARD OR DESK.	
16 A	EXTENSIONS FOR CHANNEL ANGLE OR BAR-TYPE CA. RK.	
16 D	SPLICING BAR-TYPE OVER-AISLE TO CHANNEL TYPE OVER-AISLE CABLE RACKS	
17 C	"T" INTERSECTION BAR-TYPE OVER-AISLE TO BAR-TYPE CROSS-AISLE CABLE RACK.	
17 D	"T" INTERSECTION BAR-TYPE OVER-AISLE TO ANGLE-TYPE CROSS-AISLE CABLE RACK.	
17 E	"T" INTERSECTION CHANNEL-TYPE OVER-AISLE TO BAR-TYPE AND LADDER-TYPE CROSS-AISLE CABLE RACK.	
17F	"T" INTERSECTION BAR-TYPE OVER-AISLE TO BAR OR LADDER TYPE CROSS AISLE CABLE RACK. CROSS AISLE CABLE RACK RAISED 2 INCHES.	
17G		
18 A	1 1/2 STRG 2 STRG — "T" INTERSECTION BAR-TYPE OVER AISLE TO LADDER-TYPE CA. RK.	
19 A	1 1/2 STRG 2 STRG — "T" INTERSECTION LADDER-TYPE TO BAR-TYPE OVER-AISLE OR CROSS-AISLE CABLE RACK	
20 A	JOINING BAR-TYPE TO LADDER-TYPE CABLE RACK OF THE SAME WIDTH	
21 A	JOINING BAR-TYPE TO WIDER LADDER TYPE CABLE RACK	
22 A	JOINING BAR-TYPE OVER-AISLE TO NARROWER LADDER-TYPE CABLE RACK.	
23 24	JOINING 10" TO 1'-0" OR 1'-0" TO 1'-3" CABLE RACKS IN THE SAME PLANE USING STRAIGHT CLAMPS-SMALLER RACK IN CENTER (FIG. 23) OR AT ONE SIDE (FIG. 24)	 RP-8442

FIG. 1L CONVENTIONS USED ON CABLING, CABLE RACK AND AUXILIARY FRAMING PLAN DRAWINGS FOR FABRICATION FIGURES IN BSP 800-614-157, (CONTINUED ON NEXT PAGE) (PAR. 1.52)

FIGURE IN AA 614.007	TITLE	CONVENTION
25 25C	CLOSING END OF RACK	
26	90° TURN IN SAME PLANE	
27	"T" INTERSECTION	
28	SMALL OFFSET LESS THAN WIDTH OF RACK AND IN SAME PLANE	
29	OFFSET SAME AS WIDTH OF RACK AND IN SAME PLANE	
30	LARGE OFFSET LESS THAN WIDTH OF RACK AND IN SAME PLANE	
31	JOINING RACKS OF DIFFERENT WIDTHS IN SAME PLANE, SMALLER RACK APPROX. IN CENTER	
32	JOINING RACKS OF DIFFERENT WIDTHS IN SAME PLANE, SMALLER RACK AT ONE SIDE	
33	JOINING THREE RACKS OF DIFFERENT WIDTHS IN SAME PLANE	
34	CORNER BRACKET AT TURN OR INTERSECTION	
35	90° OUTSIDE TURN FOR RADIUS MORE THAN 6"	R.=
36	90° INSIDE TURN FOR RADIUS MORE THAN 6"	R.=
37	90° INSIDE TURN FOR RADIUS 6" OR LESS	R.=
38 38H	90° OUTSIDE TURN FOR RADIUS 6" OR LESS	
39	SMALL VERTICAL OFFSET IN HORIZONTAL RACK	VIEW A VIEW B VIEW C VIEW D VIEW E
40 40C	OFFSET GREATER THAN 9" IN PARALLEL PLANES USING 45° EDGE CLAMPS	
41	ACUTE ANGLE TURN IN SAME PLANE	
42	OBTUSE ANGLE TURN IN SAME PLANE	
43	ACUTE OR OBTUSE ANGLE INTERSECTION	
	CABLE SUPPORT AT END OF TOP ANGLE ASSEMBLY OF DIAL SYSTEMS FRAMES	
52	OFFSET IN VERTICAL CABLE RACK	
54	NON-CONTINUOUS CROSS AISLE CABLE RACK	CROSS AISLE RACK — FRAME AISLE RACK
54F	CONTINUOUS CROSS AISLE CABLE RACK	CROSS AISLE RACK — FRAME AISLE RACK
COVERED ON DRAWING ED - 90843-01	90° SPIRAL	RT. TO LT. — LT. TO RT.
	90° DOUBLE INSIDE TURN	LT. TO RT. — RT. TO LT.
	180° SPIRAL	
	90° HORIZONTAL SPIRAL	
	90° DOUBLE OUTSIDE TURN	LT. TO RT. — RT. TO LT.

RP-8442

FIG. 1L CONVENTIONS USED ON CABLING, CABLE RACK AND AUXILIARY FRAMING PLAN DRAWINGS FOR FABRICATION FIGURES IN BSP 800-614-157, (CONTINUED FROM PREVIOUS PAGE) (PAR. 1.52)

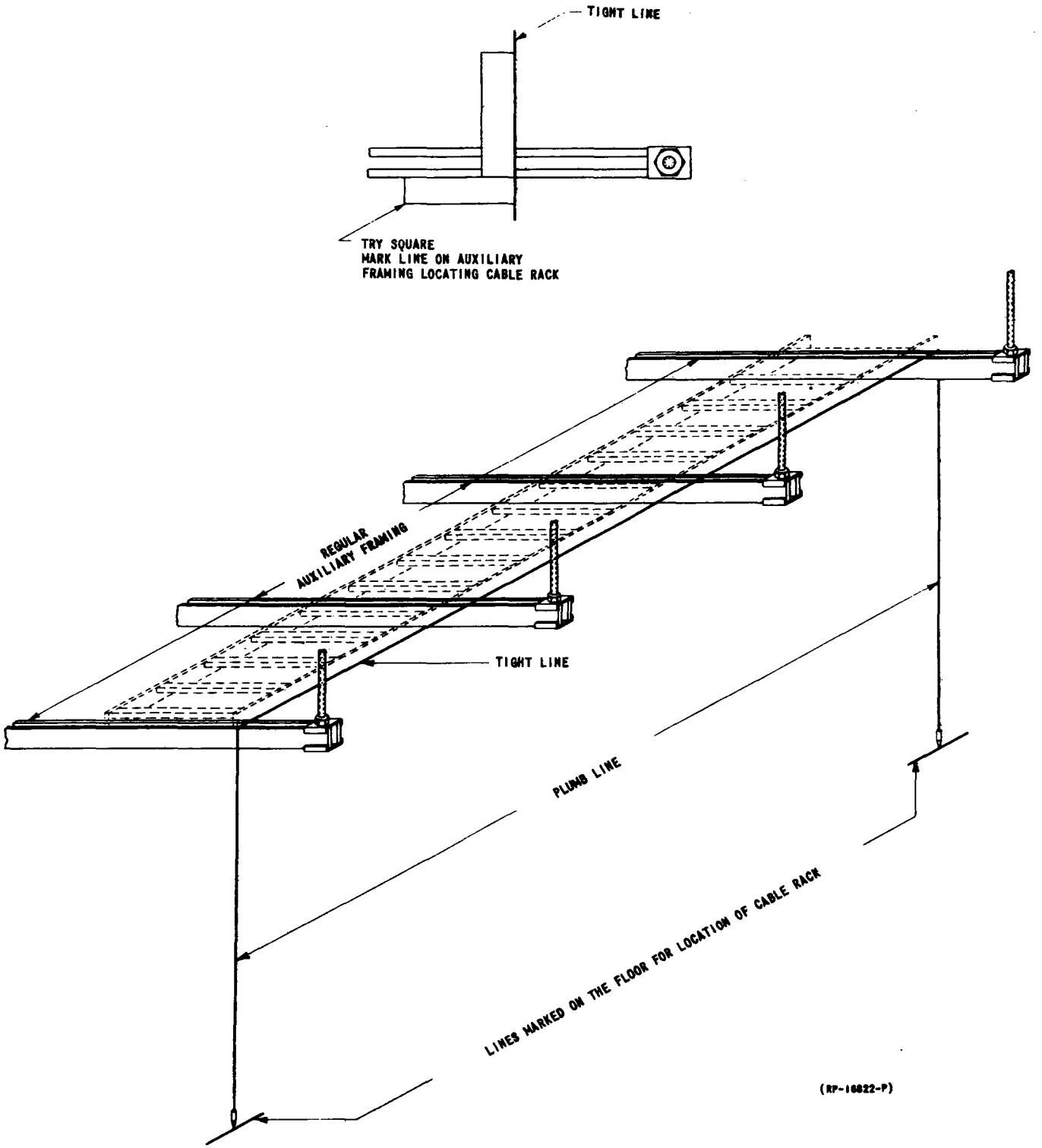


FIG. 1M A METHOD OF LOCATING CABLE RACK
(PAR. 4.8)

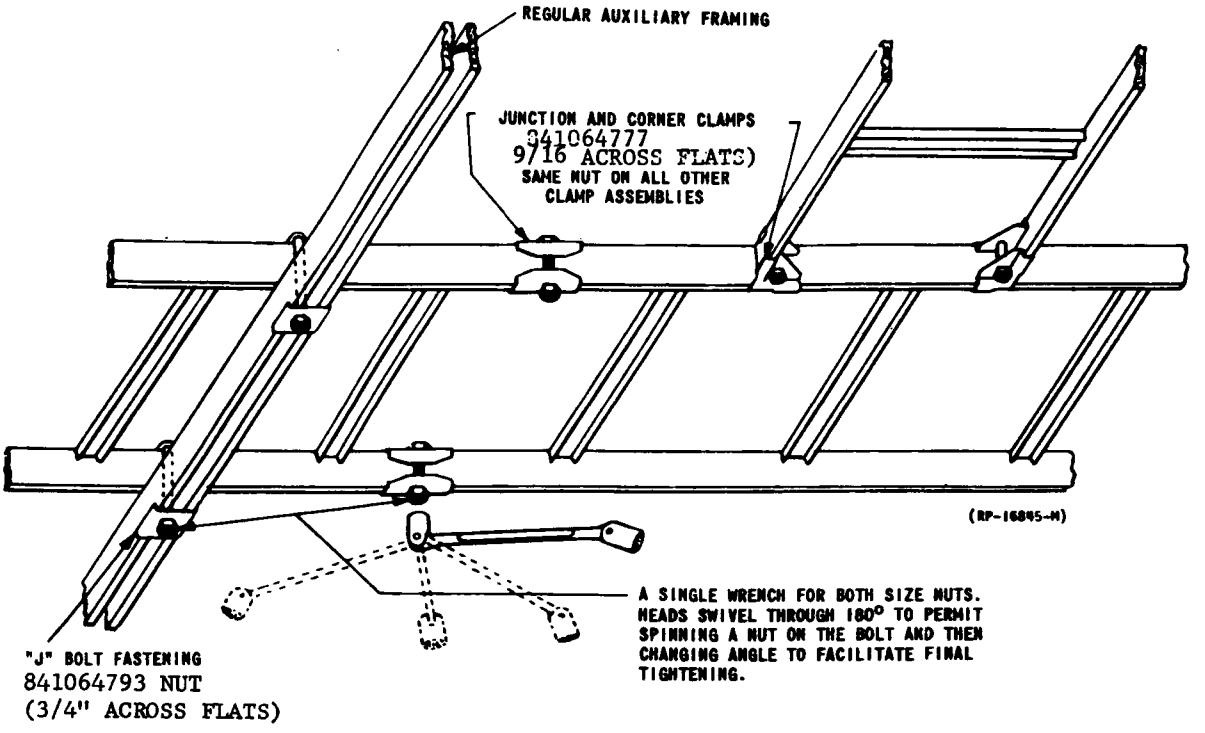


FIG. 1P USE OF THE R-3057A A WRENCH FOR FABRICATING CABLE RACK
(PAR. 2.13)

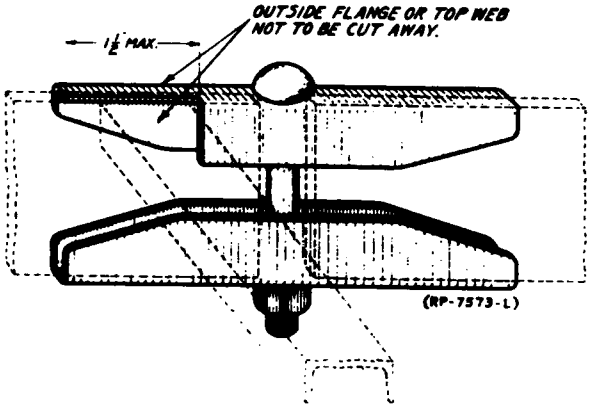


FIG. 1Q MODIFICATION OF STRAIGHT JUNCTION CLAMP
(PAR. 5.21)

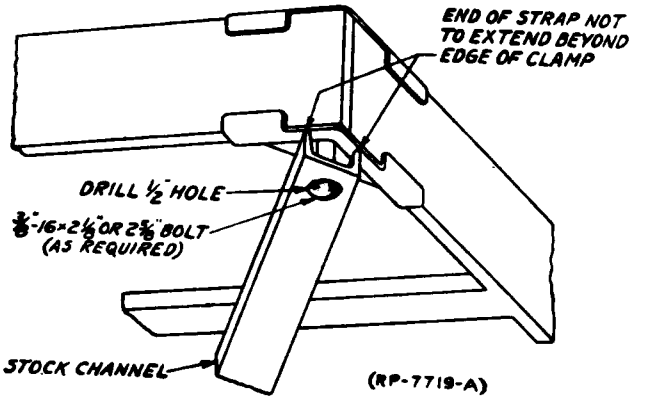
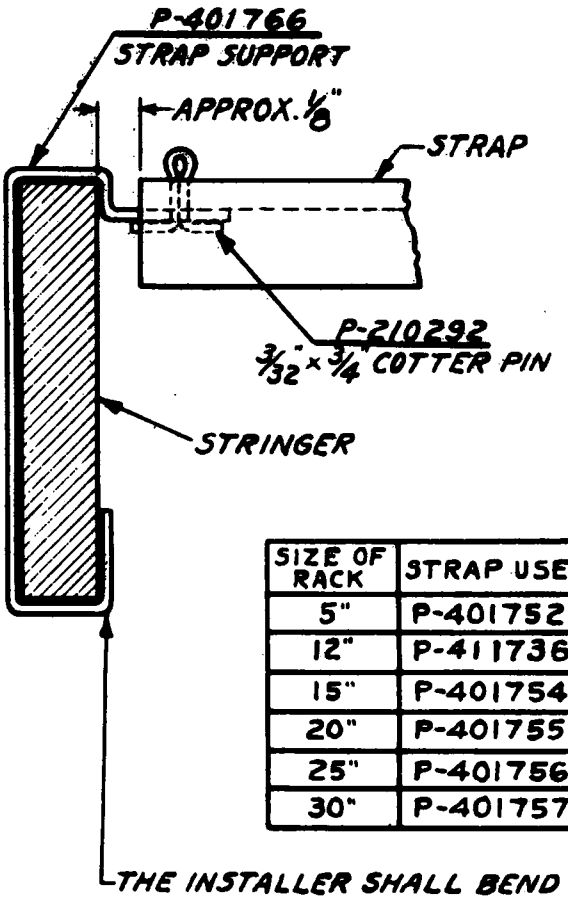


FIG. 1R METHOD OF FASTENING DIAGONAL CHANNEL STRAP
(PAR. 6.2)



SIZE OF RACK	STRAP USED
5"	P-401752
12"	P-411736
15"	P-401754
20"	P-401755
25"	P-401756
30"	P-401757

THE INSTALLER SHALL BEND THE SUPPORT ACROSS AND ALONG THE INSIDE OF THE CABLE RACK STRINGER, KEEPING IT SNUG AGAINST THE BAR. (RP-7539-L)

FIG. 1U CABLE RACK STRAP SUPPORT (PAR. 6.3)

8.111 The type of configuration will be in accordance with information contained on the cabling, cable rack and auxiliary framing plan drawing furnished to the job. There should be no deviation from the cable rack information on this drawing unless approval is obtained from the equipment engineers.

8.112 The straps on the pair of adjacent cable racks shall be in alignment prior to securing cable rack permanently.

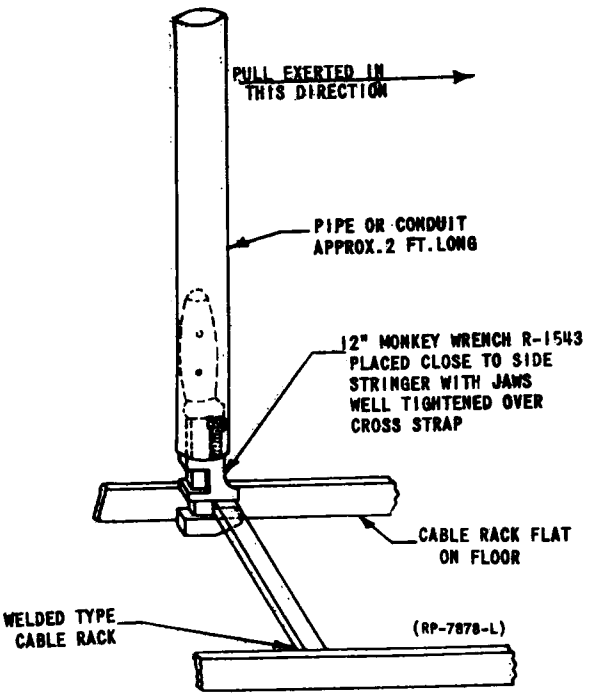


FIG. 1W REMOVING CABLE RACK CROSS STRAP (PAR. 6.41)

8.113 Where straps are not in alignment due to manufacturing tolerances, rotate clip on bridging bar to compensate this condition. This procedure will eliminate the need for cutting cable rack.

8.12 The modified 1'-8" ladder cable rack (Figure 2H) (P-33B202) is installed in the standard manner above frame lineups and when lineup is added adjacent to column line. Refer to typical building bay for its intended application.

8.13 At this interval, the ladder track and track-integrated fluorescent lighting fixtures shall be installed.

8.14 If air diffusers are to be employed within equipment area they must be placed on fluorescent lighting fixtures at this stage of the installation.

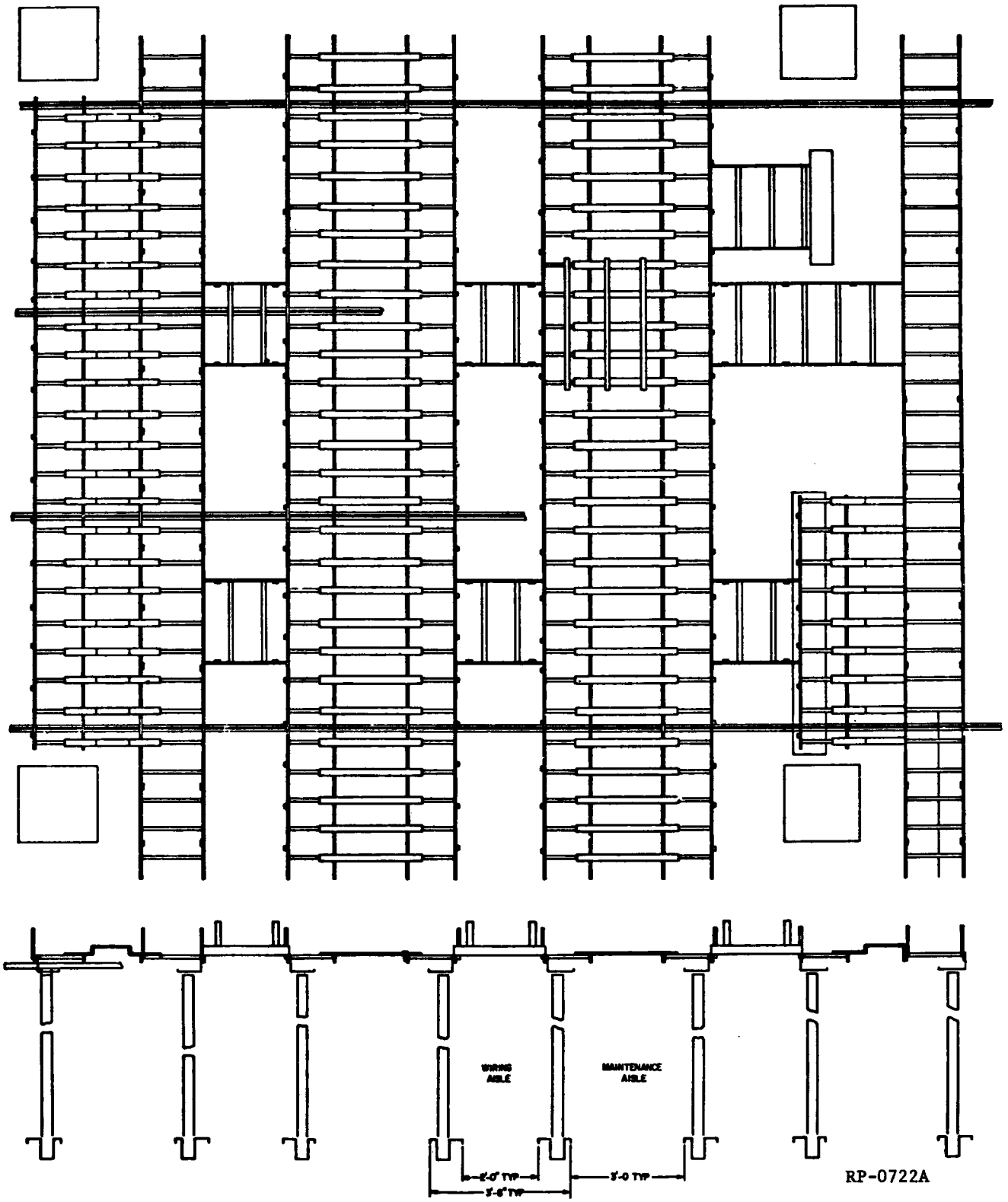


FIG. 2 TYPICAL PLAN VIEW OF WIDE CABLE RACK BUILDING BAY

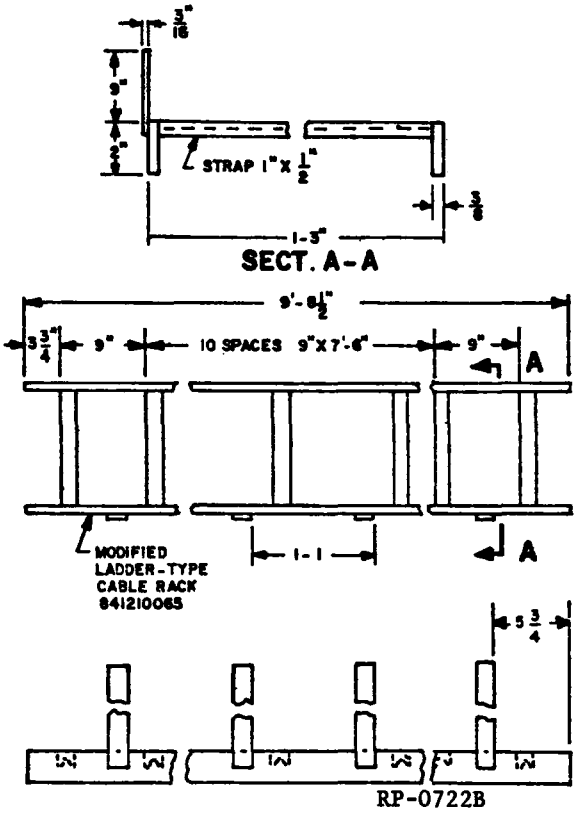


FIG. 2C MODIFIED LADDER-TYPE CABLE RACK FOR UNSECURED CABLING
(PAR. 3.23, 8.1)

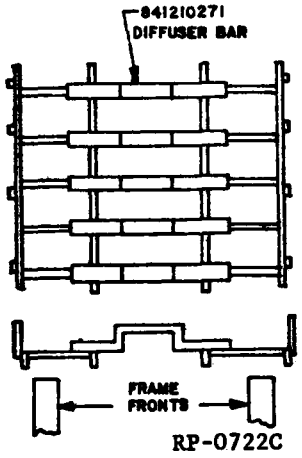


FIG. 2D
(PAR. 8.1, 8.11)

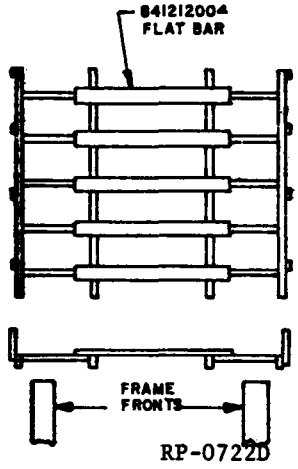


FIG. 2E
(PAR. 8.1, 8.11)

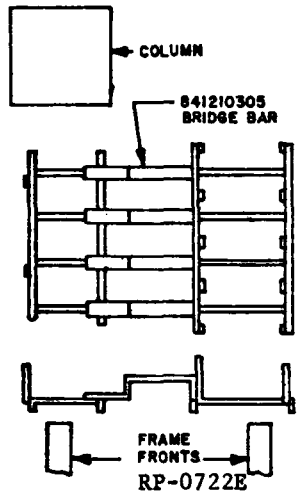
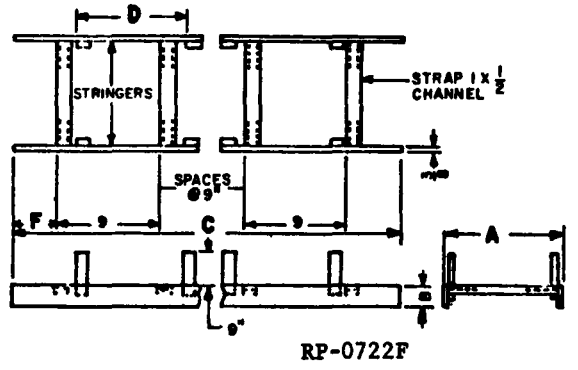


FIG. 2F
(PAR. 8.1, 8.11)

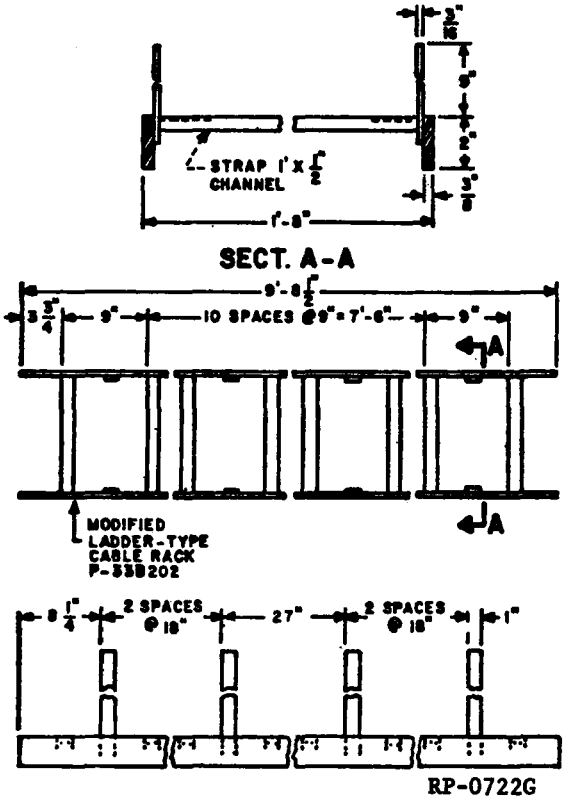
8.141 A strong emphasis on the installation of diffusers and fluorescent lights at this time is stressed. The erect-o-fitting of diffusers after cabling will create problems. This type of an operation should be avoided.

TABLE OF DIMENSIONS					
STANDARD WIDTHS DIM A	SIZE OF STRINGER DIM B	DIM C	PIECE PART NUMBER	BRACKET DIM D	DIM E
2-1	2	9-81/2	841211071	1-1	5 3/4
2-1	2	2-91/2	841210115	1-6	7 3/4
2-1	2	2-31/2	841210107	-6	4 3/4
2-1	2	2-11 3/4	841210081	-6	3 7/8
2-1	2	2-5 3/4	841210075	-6	5 7/8



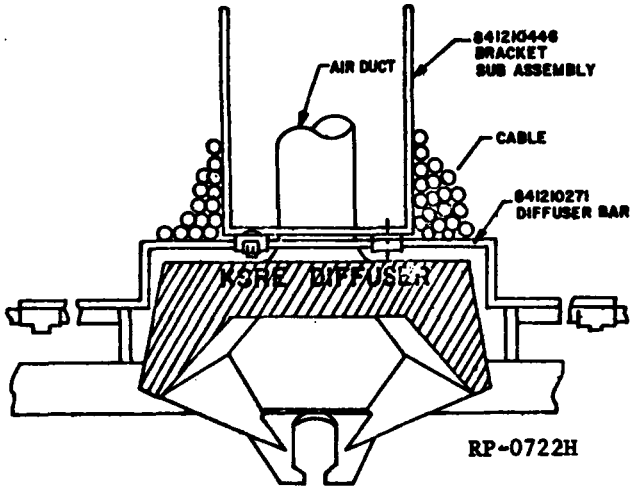
RP-0722F

FIG. 2G MODIFIED CROSS AISLE LADDER-TYPE CABLE RACK FOR UNSECURED CABLING (PAR. 8.17)



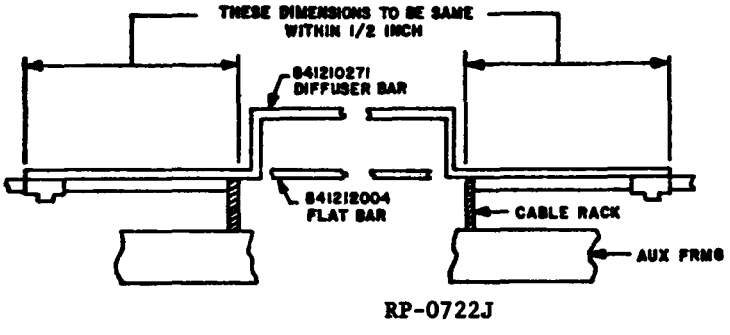
RP-0722G

FIG. 2H MODIFIED LADDER-TYPE CABLE RACK - FOR UNSECURED CABLING (PAR. 8.12)



RP-0722H

FIG. 2J AIR DIFFUSER (PARS. 8.14, 8.15)



RP-0722J

FIG. 2K POSITION OF FLAT BAR AND DIFFUSER BAR (PARS. 8.111, 8.16 and 8.161)

8.15 The air diffuser indicated in Figure 2J is a sheet metal enclosure so designed as to permit the circulation of air over the sides of the fluorescent lighting fixture and cool equipment on frames where there is a concentration of heat build-up.

8.151 The connection between the ventilating system and the air diffuser is made with an elephant trunk. The elephant trunk can be terminated to diffuser by installer or local contractor pending local operating labor relation policy.

8.16 After the final positioning of diffusers install the diffuser, bridging and flat bars as required. Each cable rack strap will be equipped with a bar to meet requirements of Paragraph 6.1. Figure 2K indicates position of bars before permanently securing bars to cable rack straps.

8.161 When the location of a bridging bar has been determined, it can be secured with the aid of the (R-4041) rubber and steel tipped hammer.

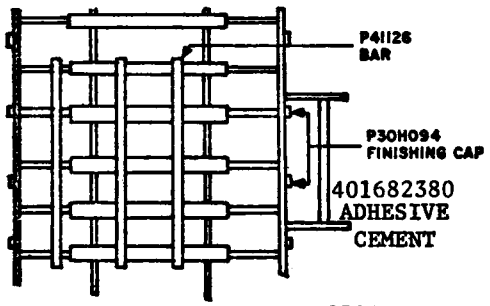


FIG. 2L INSTALLING MODIFIED CROSS AISLE CABLE RACK (PAR. 8.17)

8.17 At this stage of the installation the 2'-1" modified cross aisle cable racks can be installed (Figure 2G). They shall be supported in the standard manner as indicated in Handbook 30, Section 13C, Figure 54, Notes 1, 2 and 3. Refer to typical building bay for application (Figure 2).

8.18 Figure 2L indicates P-411266 Bar for supporting cables crossing wide frame cable racks. The P-411266 Bar is cut as required and tied to the wide cable rack straps with R-2916 Cord. This will prevent cables from sagging across the apparatus aisle and coming in contact with the lighting fixture. Refer to typical building bay for application (Figure 2).

8.19 At the over aisle racks, apply the finishing caps as illustrated in Figure 2L. Refer to typical building bay for application (Figure 2).

8.20 The sequence, on running cables on the wide cable rack is strongly recommended.

8.21 By using the cable running list as a guide and check list, the installer can readily determine a group of cables which will cover the greatest lengths and will result in a neat appearing bottom layer and form a foundation for the remaining layers. The installer should avoid the running of adjacent frame aisle runs at the very beginning of the cabling operation. An exception would be extreme opposite ends as long as cable is run perpendicular to cable rack straps.

8.211 At extreme opposite ends of frame lineups and building equipment perimeters where very little cabling is to be run, the possibility of cables being run parallel to cable straps becomes apparent. If this condition occurs the installer shall install P-411266 Bars, cut as required, tied to the wide cable rack straps. For general cable runs, refer to Handbook 8, Section 120.

9. VERIFICATION ITEMS

	VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENT	REFERENCE Par. No.	REFERENCE Fig. No.
9.1	Bar-Type Cable Racks		
9.11	Offsets greater than 9" be fabricated with bar type rack.	3.42	
9.2	Location		
9.21	Cable rack location and installation.	3.63,3.64, 4.1,4.3, 4.2,4.4, 4.5,4.6, 4.7,8.1, 8.11,8.12	1 2C 2D 2E 2F
9.3	Assembly of Cable Rack Clamping Details		
9.31	Clamping interference with cable rack straps.	5.2	
9.4	Cable Rack Straps		
9.41	Proper support of cabling at turns or junctions.	6.11,6.1 8.17	1R 2H

Indicates new or changed information.

Vertical lines at side of paragraphs indicate requirements.

Engineering Planning Manager
(Installation)

REASON FOR REISSUE
1. Add Figure 1A.
2. Figure 2L changed COMCODE number from 900229634 to 401682380.