ERECTING FRAMES
JOB ASSEMBLED
UNIVERSAL (EQUAL FLANGE) CABLE DUCT-TYPE BAYS

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2. GENERAL

2.1 Scope

2.1.1 This section covers the requirements and installation procedures for erecting and aligning universal cable duct-type frames and associated assemblies.

2.1.2 The universal cable duct-type frameworks covered by this section applies to the auxiliary framing supported 11'-6", 10'-6" and 9'-0" high bays per ED-63409-50, ED-65408-50, and ED-63460-50, respectively, and floor supported 7'-0" and 6'-0" high bays per ED-92712-70 and ED-92523-50, respectively.

2.1.3 To facilitate the installation of the various assemblies used in the fabrication of universal cable duct-type frameworks, a number of sketches of the bays and associated equipment together with "exploded" views of several of the assemblies are included in this section. Not all of the different assemblies are shown and, due to subsequent changes that may be made in the manufacturing drawings, the information on the figures may not be exactly the same as covered by the drawings furnished with the job. The illustrations shown in this section should, therefore, be considered as typical and are intended to serve only as a guide for interpreting the drawings and in assembling the frameworks on the job.

2.1.4 The information in this section is arranged in the approximate sequence in which the operations are normally performed.

2.1.5 The information in this section supplements that contained in other sections of this handbook or furnished the job as indicated below.

2.2 Associated Information

2.2.1 Section 9A covers installing and setting self-drilling anchors. ←

2.2.2 Sections 1A and 1B covering general safety precautions and general requirements and information.

2.2.3 Section 70 covering painting and retouching, and cleaning of finishes.

2.2.4 Specifications, floor plan, and framework drawings furnished to the job.

2.3 Verification Items

2.3.1 Items for the verification of the equipment installed by the operations covered in this section are listed in Section 19V.

3. INSTALLING EQUIPMENT

3.1 Tools

3.1.1 The tools listed below will be required for the operations listed in this section. Other tools, available in the general Tool Kits, may also be needed.

R-3764 Bolt "U" ←
R-1314 Bob, Plumb
R-2092 Chisel, Ripping
R-1285 Drill, Electric, 5/16"
R-3032 Drill, Electric, 1/2"
R-3033 Drill Stand, Motor
R-1471 Drill, Twist, No. 13 (.1850")
R-1482 File, Flat, 8"
R-9430 Hammer, Claw
R-1384 Line, Chalk
R-1652 Rule, 6' Folding
R-8550 Scale, 6"
R-2226 Screwdriver, Screw Holding
R-1324 Screwdriver, 8"
R-2443 Screwdriver, 3"
R-4300 Wrenches, Small Nut and Bolt ←
R-1526 Tap, No. 12 (.216"-24)
*R-2599 Truck, Dolly
R-1542 Wrench, Adj. O.E., 6"
R-1952 Wrench, Tap, 3/8"
*Required only for 9'-0", 10'-6" and 11'-6" shop equipped bays.

3.2 Supplies

**4655 Pencil, Red China Marking ←

**Stationery Supplies

4. DESCRIPTION

4.1 The flanges on the uprights of the universal cable duct-type bays are both 1" wide and punched and tapped alike for 1-3/4" wide, 19" long mounting plates. Removable guard rails, in 5", 6" and 8-3/8" widths, are provided for attaching to one or both sides of the bay. This arrangement is intended to provide flexibility in that the universal bays may be used for (1) single row lineups where the equipment is mounted on one side but maintained from both sides of the bay, (2) back-to-back lineups where two lines of single sided bays (9'-0", 10'-6" or 11'-6" bays only) are located back-to-back and each line is maintained from only one side of the bay, and (3) double-sided bays wherein the equipment is mounted on and maintained from both sides of the same bay. A typical universal cable duct-type bay is shown in Figure 9.

5. LAYING OUT FLOORS

5.1 Common Information

5.1.1 Lay out the floors in accordance with the floor plan drawings furnished the job.

5.1.2 The following points should be observed when laying out the floor.

5.1.2.1 First mark the overall dimensions followed by the shorter dimensions indicating the center of each of the bays. This will avoid cumulative errors and serve as a check for the overall layout.

5.1.2.2 Where locating dimensions on the floor plan drawings are to the front edge of the detachable guardrail, it will be necessary to add the width of the guardrail to the floor plan dimension when establishing the lines indicating the front edges of the sheet metal bases.

5.1.2.3 Dimensions shown in brackets on floor plan drawings are approximate and should not be used.

5.1.2.4 Bays shown in block on floor plan drawings have the same dimensions as shown for the first bay of the lineup unless otherwise indicated on the drawing.

5.1.2.5 Marking over the lines laid out on the floor with either a red or a black china pencil and applying a coat of shellac over them will prevent the lines from being worn off in the course of installation.

5.2 Floor Supported 6'-0" and 7'-0" Frames

5.2.1 From the information shown on the floor plan drawing, lay out lines on the floor corresponding to the front edges of the frame base plate. Mark a short line (about 3" long) perpendicular to the front base line at the center of each bay location. See Figure 1.

5.2.2 Use template for locating floor bolt holes.
See Figure 2.

5.3 9'-0", 10'-6" and 11'-6" Frames

5.3.1 Locate the front edges of the sheet metal bases of the bays at both ends of each lineup by measuring from the reference line, wall, or adjacent lineup, using the dimensions shown on the floor plan drawings. Extend these lines approximately 6" beyond the frame bases at both ends of the lineups to later serve for checking the location and horizontal alignment.

NOTE: Floor plan conventions and details of equipment for a typical back-to-back lineup of universal cable duct-type bays are illustrated in Figure 3 as an aid in interpreting the floor plan drawings furnished to the job.

5.3.2 If other than cone pointed leveling screws (P-428403) are to be used, it will be necessary to cut out the linoleum around each leveling screw to insure that the requirements of paragraph 12.1.1.4 are met. Locating dimensions for the level screws are shown in Figure 3.

6. LOCATION OF EQUIPMENT

6.1 The location of the equipment shall conform to that shown on the associated floor plan. Equipment drawings are specified in the job specifications for each installation.

6.2 Where limiting dimensions are not specified, the equipment shall be located to within such limits of the specified dimensions as will insure satisfactory functioning and workmanlike appearance of the equipment.

7. IDENTIFYING SIDES "A," "B" and "C" ON 9'-0", 10'-6" and 11'-6" FRAMES

7.1 Designations "A," "B" and "C" for sides of the bays and lineups are used throughout this section and on the framework assembly drawings. The designations are for illustrative purposes and as substitutes for "FRONT" (equipment side of frame) and "REAR" (wiring side of frame) since equipment may be mounted on either or both sides of universal cable duct-type frames.

7.1.1 Floor plan drawings formerly used "A," "B" and "C" designations for locating the correct sides of bays. The drawings now, however, have a note which indicates that unless otherwise specified duct-type bays with top tangles should be located with the top angle facing front. The front of each lineup of frames is clearly marked on the drawing. Any exceptions to this arrangement are listed in a table on the floor plan drawing.

7.1.2 Side "A" is always the side with the top angle and side "B" is the opposite side for single sided bays in single lineups, for bays in initial lines of back-to-back lineups and for double sided bays.

7.1.3 For bays in the second line of back-to-back lineups, side "B" is the side butted against side "B" of bays in the initial lineup and side "C" is that which faces the second aisle.

7.1.4 The arrangement at the tops of the bays illustrating the application of the three different basic bays identifying sides "A," "B" and "C" is shown on Figure 4.

8. NUMBER AND LOCATION OF FLOOR BOLTS

8.1 Floor supported 6'-0" and 7'-0" duct-type frames should be provided with four hold-down bolts; one for each hole in the base plate, unless otherwise specified on the framework assembly drawing.

8.1.1 Where the framework assembly drawings indicate that 2 floor bolts are to be used, they should be located in diagonally opposite corners of the base plate.

8.2 One bolt, located approximately in the center of each bay, shall be used for fastening 9'-0", 10'-6" and 11'-6" universal cable duct-type bays to the floor. (See Figures 3, 6A, and 9.)

→ NOTE: Method information for drilling self-drilling anchors in concrete, brick, etc., is contained in Section 9A.

8.2.1 Cable duct-type frames having integral guardrails to floors, that are adjacent in a lineup, should be treated as a unit and bolted to the floor as shown in Figure 7, using one bolt as near each end as practicable and intermediate bolts not to exceed 10'-0" centers. Two floor bolts should be used to fasten each isolated bay. Duct-type frames arranged back-to-back shall, for this purpose, be considered as two separate lineups.

→ 8.3 When self-drilling anchors are installed any length of time prior to the erection of the frames, precautions must be taken to prevent their filling up with dust or dirt. For this reason give consideration to installing the self-drilling anchors just prior to the erection of the frames or cover the openings in the floor with a piece of R-4572 Polyester Adhesive Backed Tape.

8.4 Where wooden floors are encountered, 3/8" lag screws should be used for securing the frames to the floor. The .272" (I) drill, R-1474, may be used for making the lead holes for the lag screws.

9. JUNCTIONING FRAMES

9.1 6'-0" and 7'-0" Floor Supported Frames

9.1.1 Floor supported 6'-0" duct-type frames are not ordinarily junctioned together. If junctioning is specified, it is special and should be assembled in accordance with the

drawings furnished to the job.

9.1.2 Floor supported 7'-0" frames are junctioned together at the top by means of top angles located on the front side of the frames. These top angles, which are assembled on the job, are provided when duct covers are used. Top angles are furnished for both the front and rear side of the frame lineup only when cable troughs are provided.

9.2 9'-0", 10'-6" and 11'-6" Frames

9.2.1 As stated herein, 9'-0", 10'-6' and 11'-6" duct-type frames with detachable guardrails, when aligned in a single row, are rigidly fastened and properly spaced at the top by means of a junction pipe, but are not rigidly joined together at the uprights.

9.2.2 Cable duct-type frames shall be junctioned by means of a pipe clamped to the inside of the frame top angle and the auxiliary framing where it appears. The pipe is run continuously throughout the length of the lineup.

9.2.3 The full or partial length pipe shall be installed where any portion of it is to be used initially to support the frames. The unused portion required for ultimate capacity of the lineup shall be secured to the auxiliary framing for future use as shown in Figures 6F or 6L.

9.2.4 The pipe shall be cut as required to meet the following conditions:

9.2.4.1 The pipes shall be junctioned at the middle of any bay either in the initial or ultimate lineup. (See Figure 6J.)

9.2.4.2 The pipe shall not extend in a cross aisle beyond the ultimate ends of the lineup of the bays.

9.2.4.3 The pipe shall not extend beyond the ultimate ends of groups of bays which are interrupted by a building column.

9.2.4.4 In lineups where all frame top angles are not on the same side of the lineup or for any reason the frame top angles are not in alignment as in the case of cable duct frames junctioned to other types of frames, the junction pipes for each group of frames should be extended beyond the frame top angles to the next auxiliary framing cross channels or bars and secured thereto, see Figures 6F and 6L; or the two pipes at the junction of dissimilar types of frames should be braced in the manner shown on the framework drawing for that particular type of junction.

9.2.5 Cable duct-type frames for single lineups and for the first lines of back-to-back lineups are equipped with top angles for fastening to the auxiliary framing in the standard manner. However, for exceptional applications, frames without top angles are used, as in the case of frames for TD radio equipment where wave guides necessitate omission of the top angles. See Handbook 226A. In such cases, junctioning of the frames and fastening to the auxiliary framing should be made in accordance with specific arrangements.

9.2.6 In cases where additional space is provided between cable duct-type frames for cabling or where cable duct-type frames are junctioned to channel, or bulb angle relay racks, additional details are provided for junctioning guardrails, uprights, etc., as shown on the framework drawings.

9.2.7 When cable duct-type bays are installed in a No. 5 Crossbar office having 11'-9-1/2" auxiliary framing, they should be fastened as shown in Figures 6L, 6P, 6Q and 6R, respectively.

9.2.8 Where the 1" frame junction pipe extends beyond the end of cable duct-type frames, the end of the pipe shall be capped with a P-15D383 Finishing Cap, as shown in Figure 6L.

10. FASTENING FRAMES

10.1 The distance between the end of the lineup and the last point of auxiliary framing support should not exceed 2'-6". Frames located at the ends of lineups shall have at least one point of auxiliary framing top support, unless the pipe is extended, and supported beyond the frame top, to the next auxiliary framing bars. ←

10.2 In general, high-type auxiliary framing should be used for the support of isolated frames. Where practicable to do so, isolated frames may be fastened to suitably supported cable racks by low-type auxiliary framing, as shown in Figures 62N, 62P, 62S, 62T, 62U, 62V and 62W, provided the bars or channels are extended and fastened to the cable rack of an adjacent lineup of frames. An isolated frame should be supported at least at two points. ←

10.3 When short pieces of framing bars or channels are used for the support of frames, the bars or channels should be cut so that the ends projecting to the outside of the cable rack stringers approximately ± 1/4 from the ends of the supporting saddle clips.

10.4 In offices where the auxiliary framing is at the 11'-6" level, cable duct-type frames or the 1" junction pipe at locations of future frames should be supported directly from the auxiliary framing as shown in Figure 6J. The 1" junction pipe extending beyond the end of cable duct-type frames should be attached to the auxiliary framing, as shown in Figure 6F.

10.4.1 When the 1" junction pipe extends beyond the end of the cable duct-type frames, the end of the pipe shall be capped with a P-15D383 Finishing Cap, as shown in Figure 6F.

10.5 Where cable duct-type frames are installed in an office having 11'-8" auxiliary framing such as a combined Step-by-Step and Toll office, the cable duct-type frames should be attached to the auxiliary framing as shown in Figures 6L and 6M.

10.6 Information for securing the bays to the overhead framing or to the initial line of bays in back-to-back lineups is shown on Figure 6J.

10.6.1 Where equipment such as a filter inductor per ED-63632-71 mounted directly on top of the bay prevent use of grounding set screws, due to the location of the "V" bolt, a No. 6 ground wire should be run between two KS-5517 L-1 Terminal Lugs; one mounted on the affected end of the frame top angle and the other on the junction pipe.

11. ERECTING UNEQUIPPED BAYS

11.1 The 11'-6" duct-type bays, which each weigh approximately 100 lbs., are the heaviest of the unequipped duct-type bays. These bays, as well as the 10'-6", 9'-0", and 7'-0" and 6'-0" bays, may be manually raised to the vertical position without the aid of rope or chain hoists. Place the bays in their final location in the lineup and loosely fasten them at the tops when necessary and to the floor following the procedures covered for shop equipped bays.

12. PLUMBING AND ALIGNING BAYS

12.1 Common Information

12.1.1 When the frames are in final alignment, the requirements outlined below shall be met.

12.1.1.1 The uprights shall be plumb within the limits indicated below. In this requirement, the deviation should be measured at the top of the bay. Any variation in straightness of the parts may be ignored.

Height of Structure	Maximum Allowable Deviation from Plumb
Over 4'-6" but less than 7'-0"	1/8"
7'-0" to 9'-0" inclusive	3/16"
Over 9'-0"	1/4"

12.1.1.2 Cable duct-type frames should be as level as the plumbing tolerances and squareness of the structure permit. The difference in level between adjacent bays, measured at the top edges of the sheet metal bases, should be as small as practicable (not over 1/16"). This is to insure that the top surfaces of the detachable guardrails of adjacent bays will be within 1/16" of the same level when installed later.

12.1.1.3 The front faces of the flanges on the uprights of adjacent bays should not be more than 1/16" out of line with each other; nor, should any bay be out of its normal position (in and out from a straight line extending the full length of the lineup) more than 1/8".

12.1.1.4 Where the floor covering has been laid prior to the installation of frames equipped with leveling screws, the leveling screws must cut through the floor covering to the concrete to prevent further settling of the frames.

12.1.1.4.1 Since cable duct-type frames are provided with adjustable floor mouldings, it is not necessary to fill the space under the frames bases.

12.2 6'-0" and 7'-0" Floor Supported Frames

12.2.1 A lineup of floor supported duct-type bays may in general follow the contour of the floor; that is within the limits permitted by the plumbing and aligning requirements.

12.2.2 Stretch a tight line, R-1313, across the front of the frame uprights at the top mounting holes in the uprights. Place a wood block between the upright and the tight line at each end of the lineup to hold the line away from the faces of the uprights. The wood blocks must be of equal thickness.

12.2.2.1 On some shop equipped bays, it will be necessary to remove the end guard and duct covers from the outside of each end bay before starting the aligning operations.

12.2.3 Suspend a plumb line and plumb bob over the back edge of the frame top channel at each end of the lineup. The plumb bob should be suspended just above the rear base angle.

12.2.4 Plumb the lineups by placing one or more washers, P-284172 or P-284166, under the base plate and adjacent to the bolt holes in the end bays. Bring the vertical alignment of the end bays within 3/16" of the plumb for 7'-0" bays and 1/8" of plumb for 6'-0" bays. See paragraph 12.1.1.1. Tighten the floor bolts using 9/16" Wrench Socket, R-2819 Det. 3, and the reversible Ratchet Wrench, R-2806.

12.2.5 Shift the intermediate bays as required to bring the legs of all top angles approximately within an equal distance of the tight line.

CAUTION: USE THE R-2384 PINCH BAR FOR SHIFTING THE BAYS. A HAMMER SHOULD NOT BE USED FOR THIS PURPOSE WHEN INSTALLING SHOP-EQUIPPED BAYS AS THIS MAY DAMAGE SOME OF THE SENSITIVE SHOP MOUNTED APPARATUS.

12.2.6 Recheck the front edges and indentation at center of the bay base plates to see that they are still on the lines marked on the floor. Securely tighten all floor bolts and junction straps when provided. Reassemble the end guard and duct covers on the bays at each end of the lineup if they were previously removed.

12.3 9'-0", 10'-6" and 11'-6" Frames

12.3.1 After the bays, either shop or job equipped, have been placed in their approximate position in the lineup and loosely fastened at the top and to the floor, proceed to plumb, and align the bays as outlined below.

12.3.1.1 A lineup of universal duct-type bays may in general follow the contour of the floor, that is within the limits permitted by the plumbing and aligning requirements.

NOTE: The guardrails, end guards, and duct closing details are assembled in position after the bays have been plumbed and aligned.

12.3.2 If necessary, shift the bases of the bays so that the outer surfaces of the front base members coincide with the line previously placed on the floor. The indentations on the front and rear base members should intersect the associated lines placed on the floor for that purpose. Be sure that the leveling screws are loose before shifting the bays.

CAUTION: USE THE R-2384 PINCH BAR FOR SHIFTING THE BAYS. A HAMMER SHOULD NOT BE USED FOR THIS PURPOSE WHEN INSTALLING SHOP-EQUIPPED BAYS AS THIS MAY DAMAGE SOME OF THE SENSITIVE SHOP MOUNTED APPARATUS.

12.3.2.1 After the bases of the bays have been accurately located, turn the leveling screws down into the linoleum, if previously laid, to prevent accidental shifting of the bays during the subsequent aligning operations.

12.3.3 Place plumb lines and the tight lines in position as shown in Figure 8. Adjust the height of the bays by means of the leveling screws so that the top edges of the sheet metal bases on the front sides of all of the bays are as near as practicable, at the same level as judged by comparison with the tight line. The "V" bolt assemblies securing the top angles to the junctioning pipe and auxiliary framing, or the fastenings between top channels in the case of back-to-back lineups, must be loose enough to permit a bay to follow the movement of its leveling screws with the least effect upon the adjacent bays.

12.3.4 Next adjust the top positions of the bays at each end of the lineup, as necessary to meet the plumbing requirements and tighten the fastenings at the tops of the bays just enough to prevent the bays from shifting. See Figure 8. In the case of new lineups, this will require shifting of the junctioning pipe over the full length of the lineup and, if the pipe is straight, will automatically provide for the correct "front-to-rear" plumbing of all the intermediate bays.

12.3.5 Presuming that the bases of the bays are properly located with respect to the lines on the floor and that the end bays are plumb and the junctioning pipe straight, the only operation necessary for the proper alignment for the intermediate bays is to obtain the correct spacing between the tops of adjacent bays. Do this as follows:

12.3.5.1 Make sure that the indentations on the frame bases coincide with the associated lines marked on the floor. See Figure 3.

12.3.5.2 Using the R-1652 6' Folding Rule, measure the distance between the flanges on the uprights of adjacent bays at a point even with the top edges of the bays so that the distance between the flanges on uprights of adjacent bays agrees with the measurement at the frame bases. Loosely tighten the fastenings at the tops of the bays.

12.3.6 After making sure that the parts have not shifted and that the top edges of the sheet metal bases of adjacent bays are on the same level, proceed to tighten the floor fastenings and the fastenings at the tops of the bays.

12.3.7 Where a difference in level of adjacent top angles of cable duct-type frames exists, a spacer shown in Figures 1A, 6J and 6M should be inserted as required between the junction pipe and the under side of the top angle before the "V" bolt is securely fastened.

NOTE: Frames vary slightly in height due to permissible variations in manufacture. The top angle junction pipe, when clamped tight, tends to hold the tops of the frames at the same level. If clamped too tight before the floor bolts are tightened, it will cause the shorter bays to be raised off the floor thus destroying the horizontal alignment at the top edges of the sheet metal bases previously established. For this reason, P-266174 spaces furnished with the bays are placed between the top angles of the taller bays and the junction pipe to make up such variations. See Figures 1A, 6J and 6M.

13. FRAMEWORK FABRICATION

13.1 Basic Bay Assembly

13.1.1 Because the duct-type bay is a universal one and applicable for use in various equipment installations, a sequence of operations is listed for use as a guide when erecting and mounting the associated piece parts. ED-63409-50 is the standard equipment framework drawing for a 11'-6" frame. See Figure 11 for a typical Group 1 bay.

13.2 Installing Rear Skirts

13.2.1 Rear Skirts (ED-63418-51, G-1)

13.2.1.1 Information for installing the rear skirt assemblies on 9'-0", 10'-6" and 11'-6" duct-type bays is shown in Figure 10. Floor supported 6'-0" and 7'-0" bays are not provided with rear skirt assemblies.

13.2.1.2 Adjust the height of the floor mouldings to fit as snugly as possible against the floor.

NOTE: Unless otherwise specified the skirt assemblies, previously installed on the rear side of the initial line of back-to-back bays, may be left on the bays when installing the associated second line of bays.

13.3 Duct Closing Details

13.3.1 Junction Plates (ED-63409-52 - Group 5 or 6, as required and ED-63409-53 - Group 1 or 2, as required.)

13.3.2 The details used for covering the closed sides of the cable ducts between adjacent bays and at the ends of the lineups are of two types:

(a) Those which fasten from the outside of the ducts and are used where access can be had to the closed side, such as single row lineups in the open and the initial lineup of back-to-back bays. See Figures 11 and 12.

NOTE: If end guard is required on bay mount ED-63409-51, Group 1 or 2, or ED-63409-52, Group 3 or 4. Before these steps mount all end guard details, ED-63418-51, Group 2, 3, 5, 6.

(b) Those which fasten from inside of the ducts and are used where access cannot be had to the closed side of single row lineups against a wall and the second row of bays in back-to-back lineups. See Figures 13 and 14.

13.3.2.1 The later arrangement should normally be used in both the initial and the second row of bays in back-to-back lineups when both rows are being installed at the same time.

13.3.2.2 Where no separation of wiring is required and frames are installed back-to-back, the duct closing details may be omitted from the second row of frames. When both rows are installed at the same time the closing details may be omitted from both rows of frames. Junction plates are not required for N carrier bays placed against a wall.

13.3.3 Some groups include subassemblies covered by "P" drawings. Assembly screws and washers, furnished as part of the "P" assembly, may be used for fastening the subassembly on the bay. Although shown on the framework assembly drawings, these screws and washers are not listed in the stock lists since they are part of and furnished with the "P" subassembly.

13.4 Wire Protection Shield

13.4.1 Place the wire protection shield per ED-63409-53, Group 14, over the uprights after the coverplate is secured. See Figure 15.

13.5 Guardrail Supports

13.5.1 The following is a table of the guardrail supports provided for the various duct-type bays.

Height of Frame	Drawing	Groups
6'-0"	ED-92523-51	3
7'-0"	ED-92712-70	6
9'-0"	ED-63460-50	4, 5, 6
10'-6"	ED-63408-50	4, 5
11'-6"	ED-63409-50	4, 5

13.5.2 Information for installing the supports for the detachable guardrails is shown in Figure 16.

13.6 Detachable Guardrails

13.6.1 Guardrails are provided as assemblies per drawing ED-63418-50 and Figure 17.

13.6.1.1 The guardrail assemblies are mounted in position on the bay be means of the spring clips, attached to underside of the top surfaces, which fit under the associated support angles on the bay. Attach the quick acting "DZUS" Fasteners, on the front side of the guardrails, to the screw sockets in the front of the guardrail supports.

13.6.1.2 After the guardrails have been mounted in position, adjust the height of the floor mouldings to fit snugly as possible against the floor.

13.7 Damper Plates

13.7.1 Single or Double Sided Equipped Bays

13.7.1.1 Group 9 of ED-63409-53, Damper Plate, is not used when equipment is mounted on both sides of the bay. Group 10 Damper Plate Assemblies are used in the latter case.

13.7.1.2 Damper plates are not required when blower equipment is mounted in the bay.

13.8 Cable Fasteners

13.8.1 Common Information

13.8.1.1 Cable fasteners per ED-63409-53, Group 11, must be installed before equipment is mounted on the bay; otherwise, apparatus between uprights may block their assembly.

13.8.1.2 Cable fasteners should always be inserted in the vertical row of holes nearest the wiring side of the bay. This would be either side "A" for single sided mounting, side "C" for double sided mountings, or side "B" for Patching Bays. Figure 9 illustrates the location of cable fasteners for bays other than Patching Bays.

13.9 Installing End Guards and Duct Closing Details

13.9.1 Detailed information for installing several of the end guard and duct closing assemblies are illustrated in Figures 11, 12, 13 and 14.

13.9.1.1 The use of R-2226 Screw Holding Screwdriver will greatly facilitate the fabrication and installation of the assemblies where access to the mounting screw holes is through the ducts.

→ Indicates new or changed information.

Vertical lines at side of paragraphs indicate requirements.

Engineering Planning Manager
(Installation)

Attachment:
Figures

Reason for Reissue:
1. Update BSP references.
2. Remove expansion shield and replace with self-drilling anchor.
3. Add Figures 62S, 62T, 62U, 62V and 62W.
4. Update Paragraph 10.2 to include these figures.
5. Revise Paragraph 10.1
6. Remove Paragraph 5.1.2.6

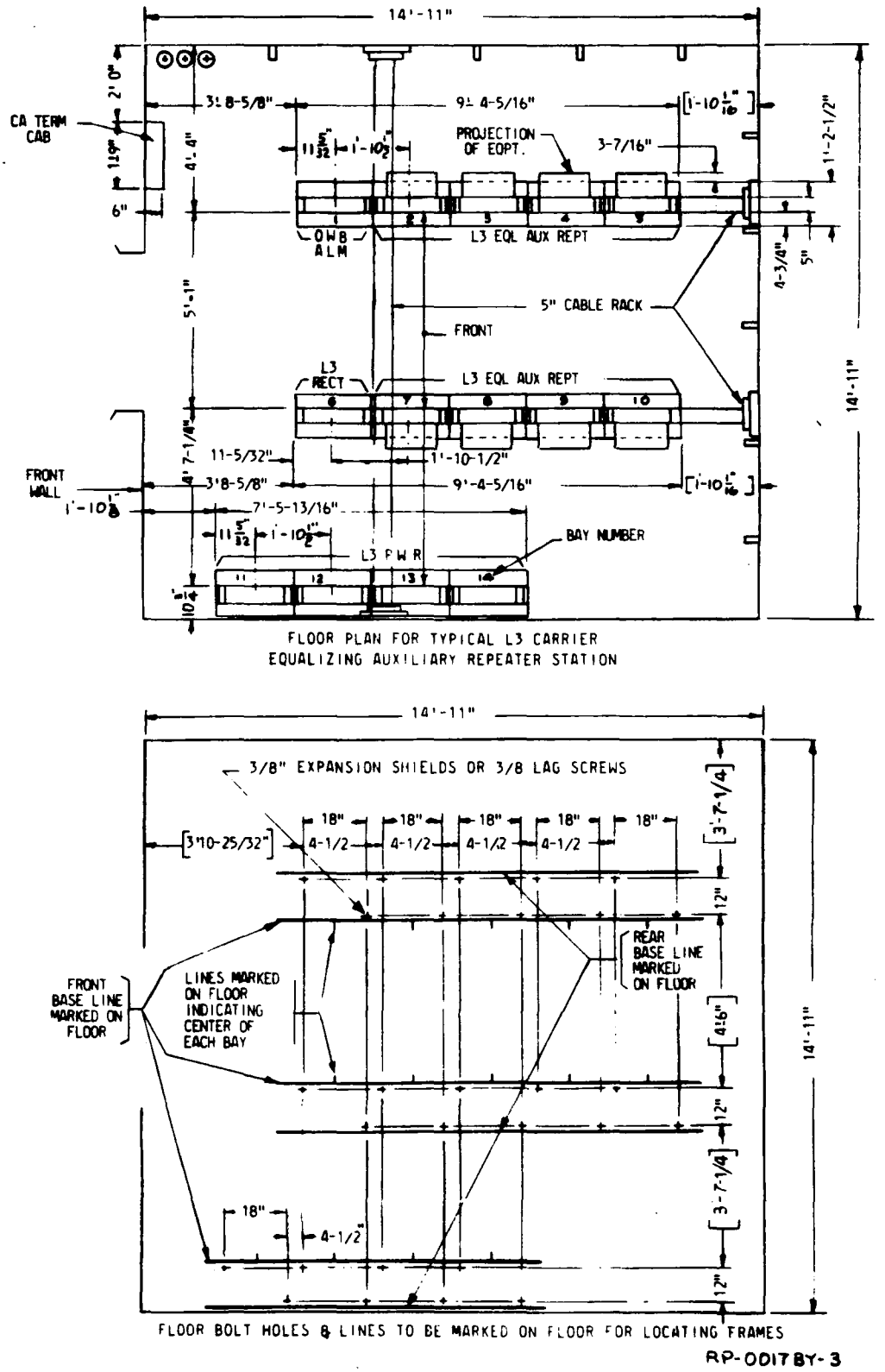


FIG. 1 FLOOR PLAN LAYOUT FOR FLOOR SUPPORTED CABLE DUCT-TYPE BAY - L3 CARRIER EQUALIZING AUXILIARY STATION SHOWN (PAR. 5.2.1)

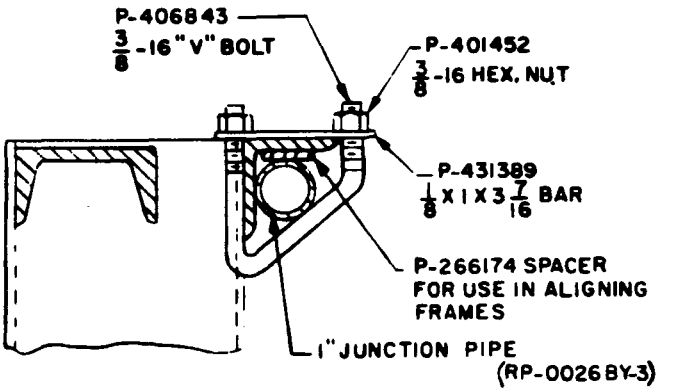


FIG. 1A SECURING TOP ANGLE ON CABLE DUCT-TYPE FRAMES TO JUNCTION PIPE (PARS. 12.3.7, 12.3.7 NOTE) (BSP 800-614-154, FIG. 1A)

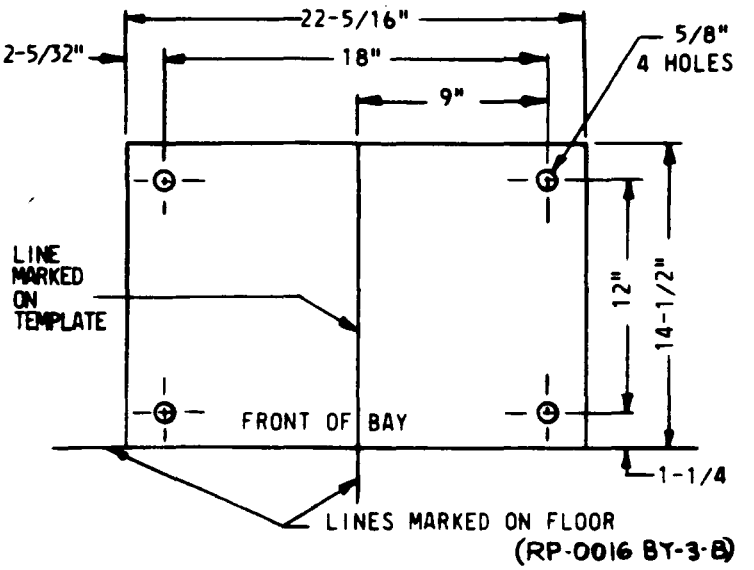
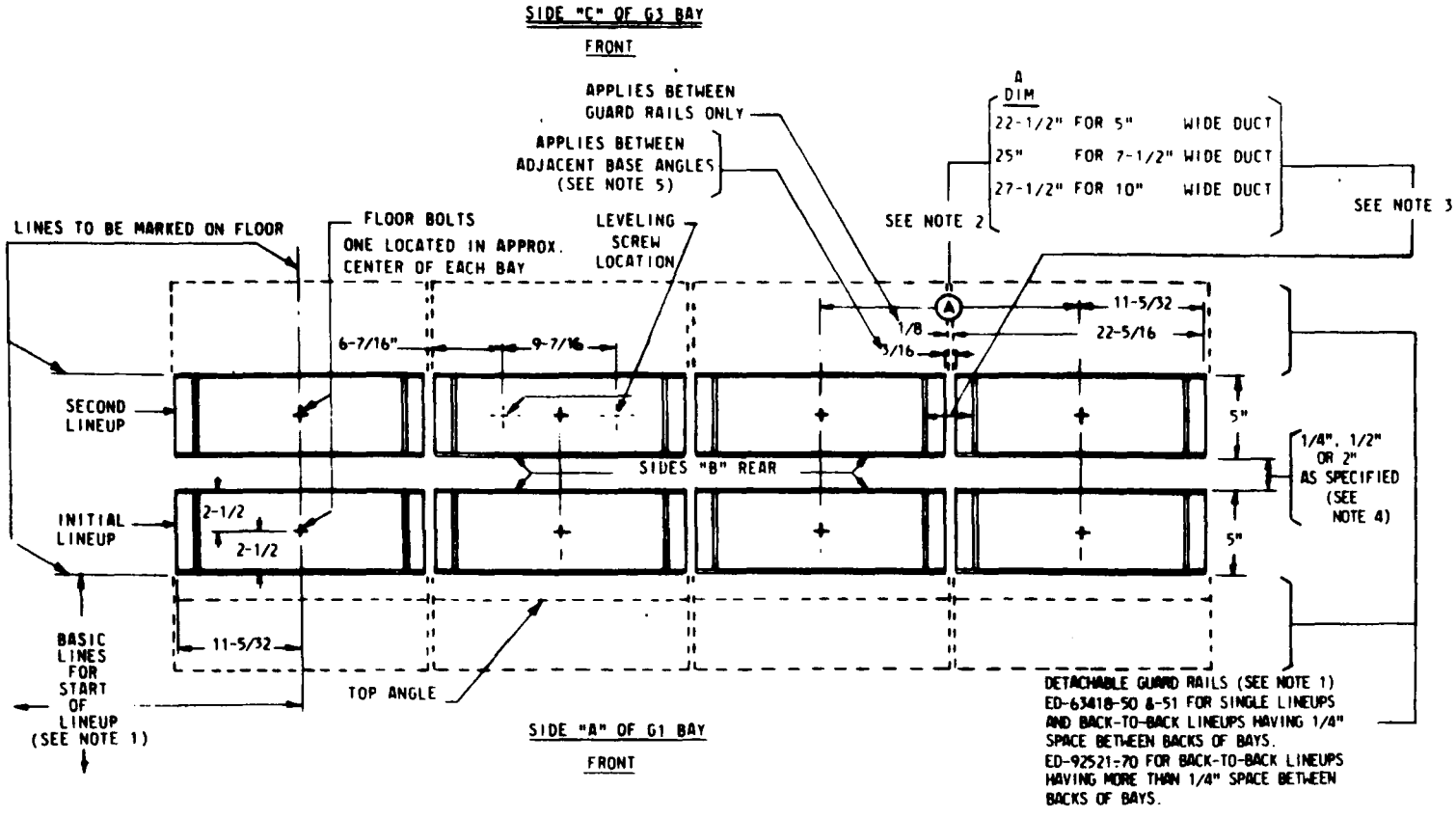


FIG. 2 TEMPLATE FOR LOCATING FLOOR BOLT HOLES FOR FLOOR SUPPORT DUCT-TYPE BAYS (PAR. 5.2.2)



NOTES: 1. DIMENSIONS FOR LOCATING BASIC LINES ARE OBTAINED FROM THE FLOOR PLAN DRAWING AND MAY BE TO THE FRONT SIDE OF THE SHEET METAL BASE OR TO THE OUTER EDGE OF THE GUARD RAIL ON THE FRONT SIDE. SINCE THE GUARD RAILS ARE NOT INSTALLED AT TIME THE BAYS ARE LOCATED AND ALIGNED IT WILL BE NECESSARY TO ADD THE WIDTH OF THE GUARD RAILS WHEN MARKING LOCATING LINES ON THE FLOOR IN THOSE CASES WHERE THE FLOOR PLAN DIMENSION IS TO FRONT EDGE OF GUARD RAIL.

2. INDENTATIONS ARE STAMPED IN THE CENTER NEAR THE BOTTOM OF BOTH THE FRONT AND REAR SIDES OF THE SHEET METAL BASE OF EACH BAY FOR POSITIONING THE BAY IN THE LINEUP. CORRESPONDING LINES FOR EACH BAY SHOULD BE MARKED ON THE FLOOR SO THAT INDENTATION ON BAYS MAY BE CENTERED WITH LINES ON FLOOR TO INSURE PROPER SPACING BETWEEN ADJACENT BAYS FOR ASSEMBLING CLOSING DETAILS.

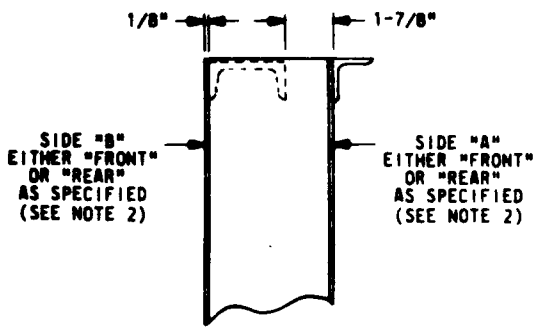
3. WITH FEW EXCEPTIONS THE 5" WIDE DUCT IS STANDARD FOR MOST EQUIPMENTS, INCLUDING N1 CARRIER. THE WIDER DUCTS ARE USED ONLY WHERE A LARGE AMOUNT OF CABLE IS TO BE RUN IN THE DUCT, SUCH AS FOR HIGH FREQUENCY PATCHING BAYS AND SEALED TEST BAYS ON J, K AND L CARRIER. THE FLOOR PLAN DRAWINGS MUST BE CONSULTED TO DETERMINE WHICH DIMENSIONS APPLY.

4. THE SPACING BETWEEN BACKS OF BAYS IN BACK-TO-BACK LINEUP IS MEASURED BETWEEN THE REAR FLANGES OF THE BAY UPRIGHTS AND NOT TO SPACING DETAILS ATTACHED TO UPRIGHTS. UNLESS OTHERWISE SPECIFIED THE DIMENSION IS 2" FOR N1 CARRIER, 1/2" FOR TD-2 TRANSMITTER-RECEIVER BAYS AND 1/4" FOR OTHER BACK-TO-BACK LINEUPS.

5. IT IS NOT NECESSARY TO MARK LINES ON THE FLOOR INDICATING THE ENDS OF THE FRAME BASES SINCE THE LINES THROUGH THE CENTER OF THE BASES ARE THOSE USED FOR LOCATING THE BAYS IN THE LINEUP.

(RP-0016 BY-3-E)

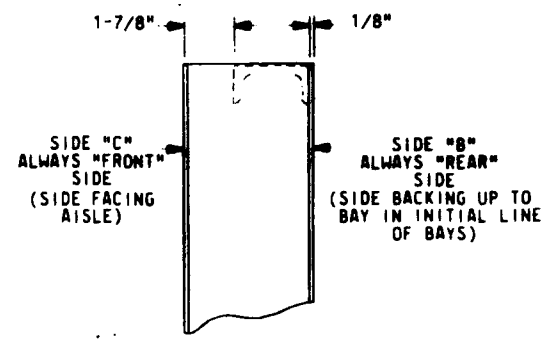
FIG. 3 FLOOR PLAN CONVENTIONS AND DETAILS OF EQUIPMENT FOR TYPICAL LINEUP OF 11'-6", 10'-6" OR 9'-0" UNIVERSAL CABLE DUCT-TYPE BAYS - BACK-TO-BACK LINEUP SHOWN (PARS. 5.3.1 NOTE, 5.3.2, 8.2, 13.3.5.1)



APPLICATION:
(A) INITIAL LINE OF BAYS IN BACK TO BACK LINEUP. EQUIPMENT MOUNTED ON SIDE "A" ONLY - MAY BE SHOP EQUIPPED.

(B) BAYS IN SINGLE ROW LINEUP. EQUIPMENT MOUNTED ON ONE OR BOTH SIDES - MAY BE SHOP EQUIPPED.

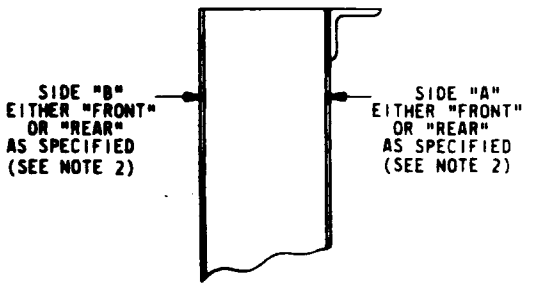
G 1



APPLICATION:
(A) SECOND LINE OF BAYS IN BACK TO BACK LINEUP. EQUIPMENT MOUNTED ON SIDE "C" ONLY - MAY BE SHOP EQUIPPED.

(B) BOTH INITIAL AND SECOND ROW BAYS IN BACK TO BACK LINEUP OF TRANSMITTER-RECEIVER BAYS ON TD-2 RADIO-RELAY INSTALLATIONS - MAY BE SHOP EQUIPPED.

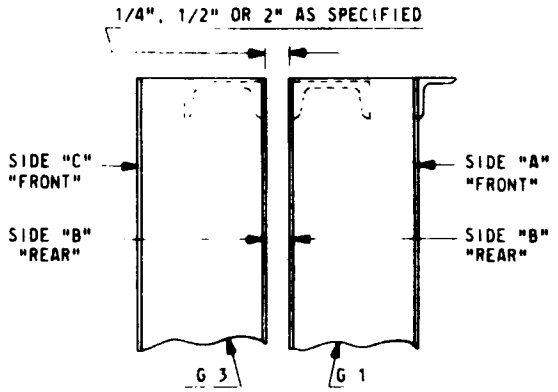
G 3



APPLICATION:
(A) BAYS IN SINGLE ROW LINEUP EQUIPMENT MOUNTED ON ONE OR BOTH SIDES - NEVER SHOP EQUIPPED.

NOTE: USED ONLY WHERE CABLES OR WIRING ENTERS BETWEEN UPRIGHTS OF SAME BAY - EXAMPLE IS THE SEALED TEST TERMINAL BAY FOR "K" CARRIER.

G 2



BACK TO BACK LINEUP FOR OTHER THAN TRANSMITTER-RECEIVE BAYS ON TD-2 RADIO-RELAY INSTALLATIONS

NOTES:
1. GROUP NUMBERS SHOWN APPLY TO THE 9'-0", 10'-6" AND 11'-6" BAYS PER ED-63460-50, ED-63408-50 AND ED-63409-50 RESPECTIVELY.
2. SIDES OF BAYS ARE SHOWN ON FRAMEWORK DRAWINGS AS "A", "B" AND "C" RATHER THAN "FRONT" OR "REAR" SINCE EITHER SIDE OF THE UNIVERSAL DUCT TYPE BAYS MAY BE THE "FRONT" OR THE "REAR" SIDE. BAYS WITH TOP ANGLES (GR.1 AND GR.2) ARE GENERALLY LOCATED WITH THE TOP ANGLE (SIDE "A") TOWARDS THE FRONT. THERE ARE, HOWEVER, SOME EXCEPTIONS. THE FLOOR PLAN DRAWINGS WILL INDICATE WHETHER THE TOP ANGLE IS ON THE "FRONT" OR THE "REAR" SIDE.
3. ONLY BAYS WITH TOP CHANNELS (GR.1 AND GR.3) MAY BE SHOP EQUIPPED. (RP-16529)

FIG. 4 ARRANGEMENT AT TOPS OF 9'-0", 10'-6", 11'-6" BAYS ILLUSTRATING APPLICATION OF G1, G2 AND G3 BAYS AND IDENTIFYING SIDES "A," "B" AND "C" (PAR. 7.1.4)

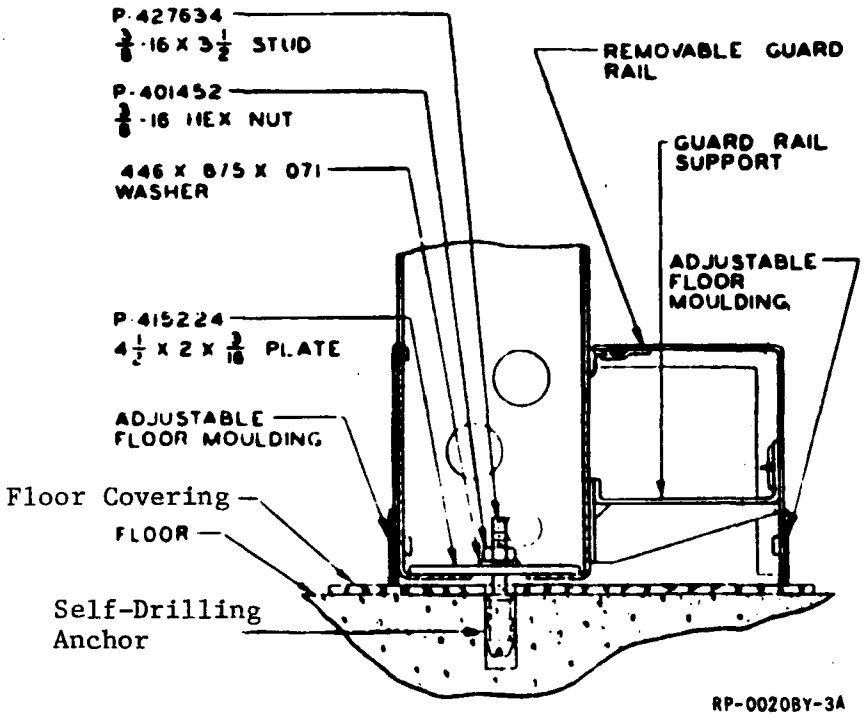


FIG. 6A FASTENING CABLE DUCT-FRAME HAVING DETACHABLE GUARDRAILS TO FLOORS (PAR. 8.2) (BSP 800-614-154, FIG. 6A)

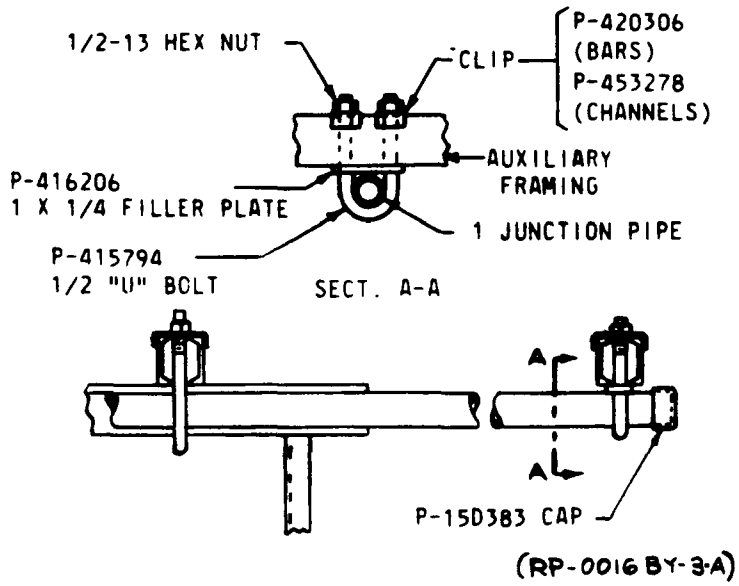
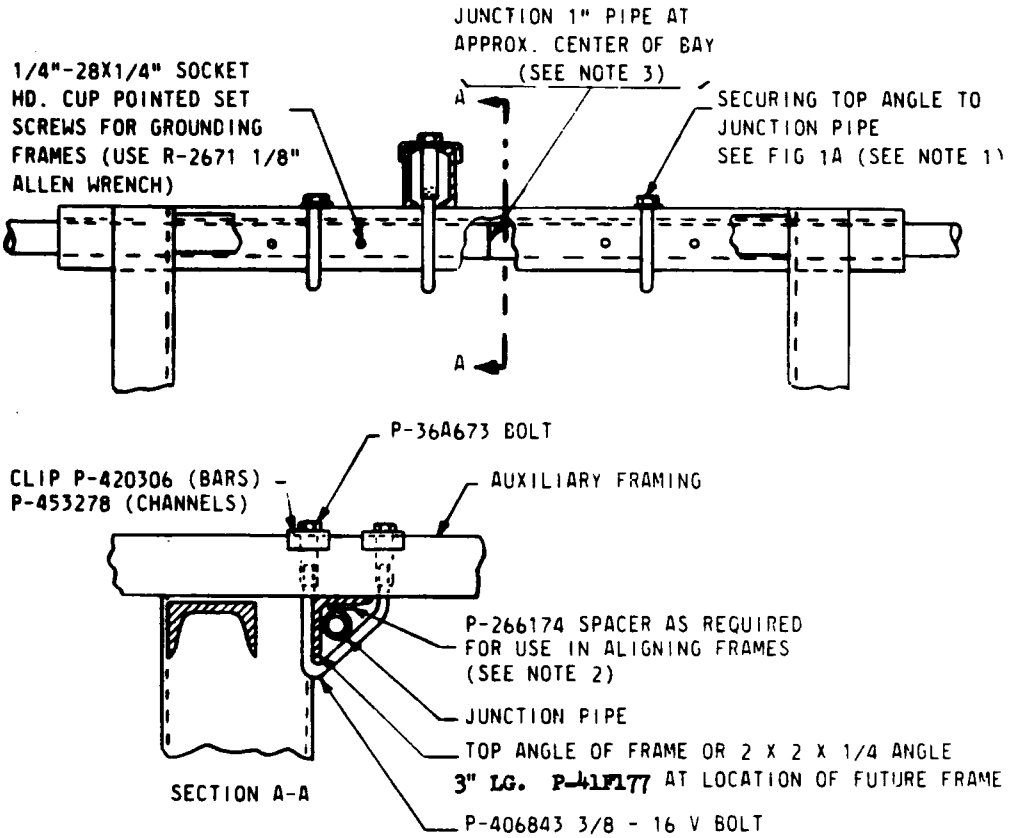


FIG. 6F ONE INCH JUNCTION PIPE EXTENDED BEYOND THE END OF CABLE DUCT-TYPE FRAME AND FASTENED TO 11'-6" AUXILIARY FRAMING (PARS. 9.2.3, 9.2.4.4, 10.4 and 10.4.1) (BSP 800-614-155, FIG. 6F)



NOTES:

1. A P-406843 "V" BOLT SHALL BE PLACED BETWEEN EACH PAIR OF TAPPED HOLES PROVIDED FOR SET SCREWS. HOWEVER, WHERE REGULAR AUXILIARY FRAMING "V" BOLTS ARE LOCATED ANYWHERE BETWEEN THE GROUNDING SET SCREWS AND PREVENT PLACING P-406843 "V" BOLT IN POSITION BETWEEN GROUNDING SCREWS, THE LATTER "V" BOLT AND, IF NECESSARY, ONE GROUNDING SCREW MAY BE OMITTED.
2. FRAMES VARY SLIGHTLY IN HEIGHT DUE TO PERMISSIBLE VARIATIONS IN MANUFACTURE. THE TOP ANGLE JUNCTION PIPE, WHEN CLAMPED TIGHT, TENDS TO HOLD THE TOPS OF ADJACENT BAYS AT THE SAME LEVEL. HOWEVER, WHEN IN FINAL ALIGNMENT THE TOP SURFACES OF THE GUARD RAILS OF ADJACENT BAYS (AND NOT THE TOP ANGLES) MUST BE WITHIN 1/16" OF SAME LEVEL. FOR THIS REASON DO NOT TIGHTEN "V" BOLT FASTENINGS UNTIL BAYS ARE IN FINAL ALIGNMENT AT WHICH TIME INSERT P-266174 SPACERS AS REQUIRED TO FILL ANY GASP BETWEEN JUNCTION PIPE AND TOP ANGLE OF THE HIGHER BAYS.
3. REQUIREMENT PERTAINING TO JUNCTIONING OF 1" PIPE AT APPROXIMATE CENTER OF FRAME.

(RP-0016 BY-3-D)

FIG. 6J CABLE DUCT-TYPE FRAME SUPPORTED FROM AUXILIARY FRAMING OR JUNCTION PIPE ATTACHED TO AUXILIARY FRAMING AT LOCATION OF FUTURE FRAMES - 11'-6". AUXILIARY FRAMING (PARS. 9.2.4.1, 10.4, 10.6, 12.3.7, 12.3.7 NOTE) (BSP 800-614-155, FIG. 6J)

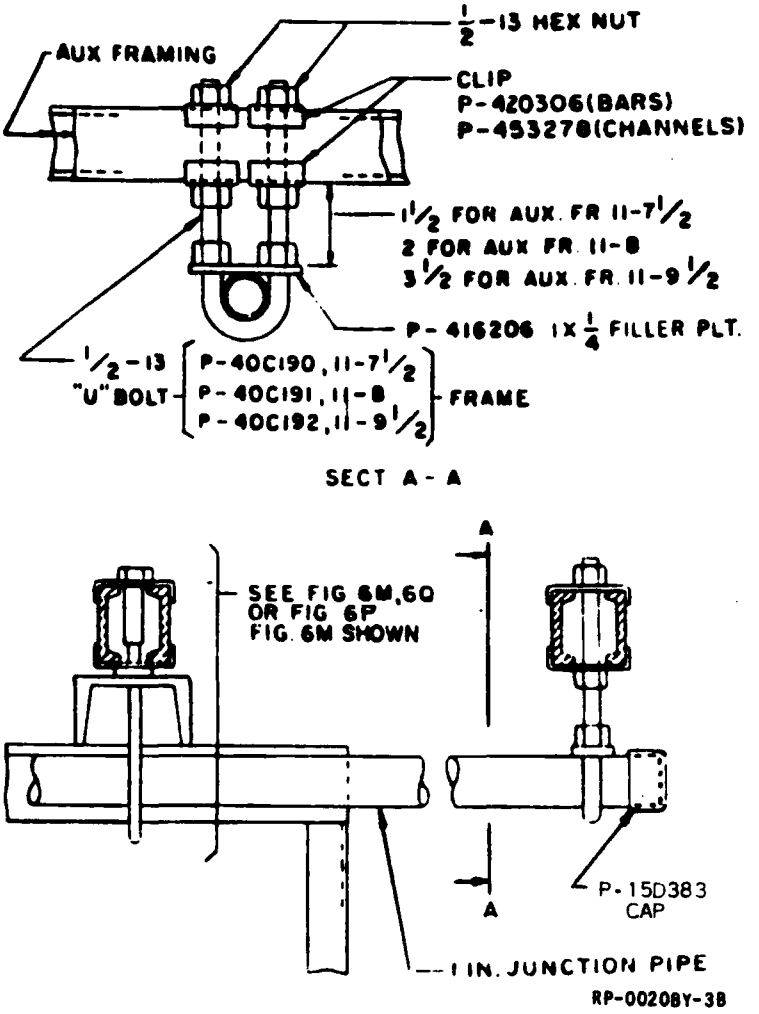
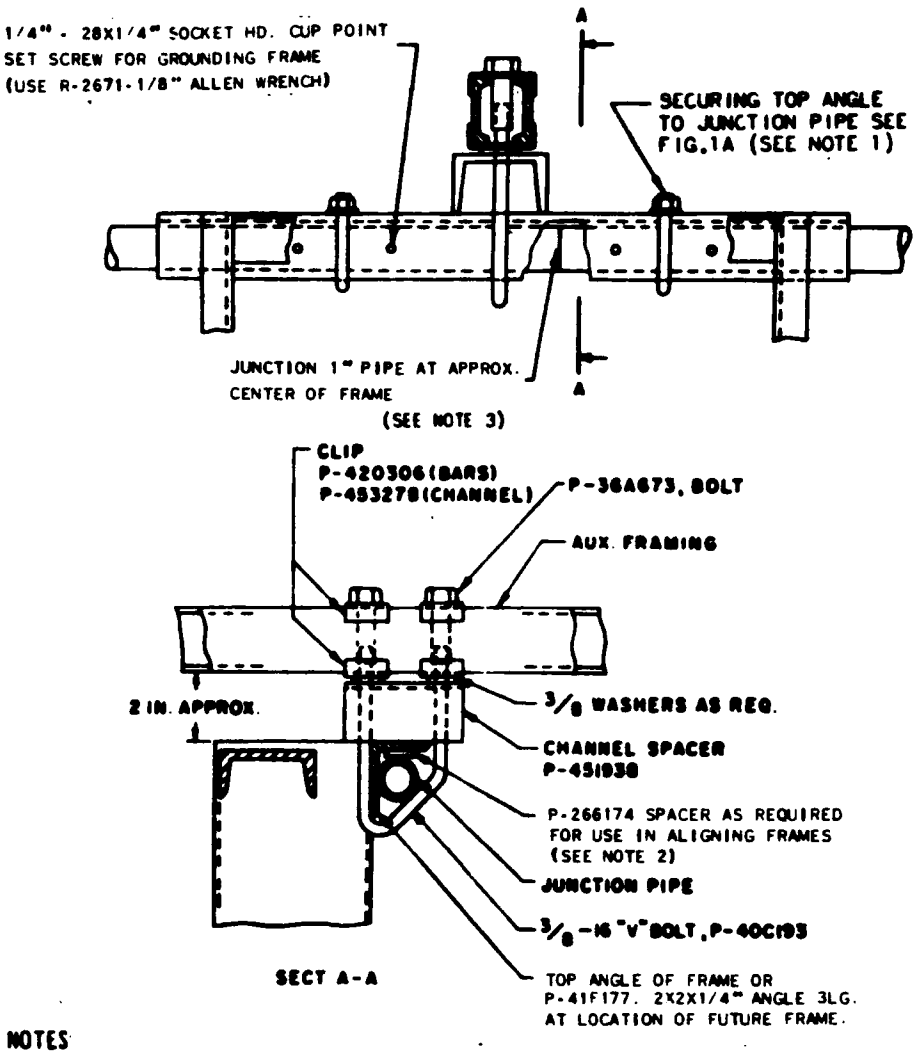


FIG. 6L SUPPORT FOR FRAME JUNCTION PIPE EXTENDING BEYOND END OF CABLE DUCT-TYPE FRAME - 11'-7-1/2", 11'-8", 11'-9-1/2" AUXILIARY FRAMING (PARS. 9.2.3, 9.2.8, 9.2.4.4, 10.5)
(BSP 800-614-155, FIG. 6L)



NOTES

1. A P-406843 "V" BOLT SHALL BE PLACED BETWEEN EACH PAIR OF TAPPED HOLES PROVIDED FOR SET SCREWS HOWEVER, WHERE REGULAR AUXILIARY FRAMING "V" BOLTS ARE LOCATED ANYWHERE BETWEEN THE GROUNDING SET SCREWS AND PREVENT PLACING P-406843 "V" BOLT IN POSITION BETWEEN GROUNDING SCREWS, THE LATTER "V" BOLT AND, IF NECESSARY, ONE GROUNDING SCREW MAY BE OMITTED.
2. FRAMES VARY SLIGHTLY IN HEIGHT DUE TO PERMISSIBLE VARIATIONS IN MANUFACTURE. THE TOP ANGLE JUNCTION PIPE, WHEN CLAMPED TIGHT, TENDS TO HOLD THE TOPS OF ADJACENT BAYS AT THE SAME LEVEL HOWEVER, WHEN IN FINAL ALIGNMENT THE TOP SURFACES OF THE GUARD RAILS OF ADJACENT BAYS (AND NOT THE TOP ANGLES) MUST BE WITHIN 1 16" OF SAME LEVEL. FOR THIS REASON DO NOT TIGHTEN "V" BOLT FASTENINGS UNTIL BAYS ARE IN FINAL ALIGNMENT AT WHICH TIME INSERT P-266174 SPACERS AS REQUIRED TO FILL ANY GAPS BETWEEN JUNCTION PIPE AND TOP ANGLE OF THE HIGHER BAYS.
3. REQUIREMENT PERTAINING TO JUNCTIONING OF 1" PIPE AT APPROXIMATE CENTER OF FRAME.

(RP-0014)

FIG. 6M CABLE DUCT-TYPE FRAME SUPPORTED FROM AUXILIARY FRAMING OR JUNCTION PIPE ATTACHED TO AUXILIARY FRAMING AT LOCATION OF FUTURE FRAMES - 11'-8" AUXILIARY FRAMING (PARS. 10.5, 12.3.7, 12.3.7 NOTE) (BSP 800-614-155, FIG. 6M)

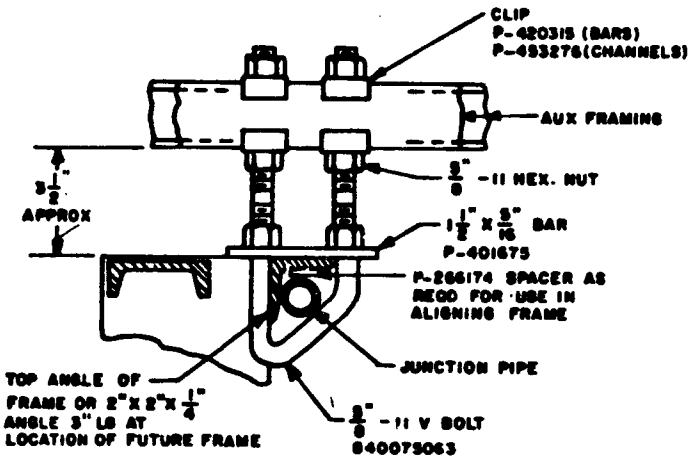


FIG. 6R AUXILIARY FRAMING FASTENED TO CABLE DUCT-TYPE FRAME OR TO JUNCTION PIPE AT LOCATION OF FUTURE FRAME, 11' 9-1/2" AUXILIARY FRAMING (PAR. 9.2.7) (BSP 800-614-155, FIG. 6R)

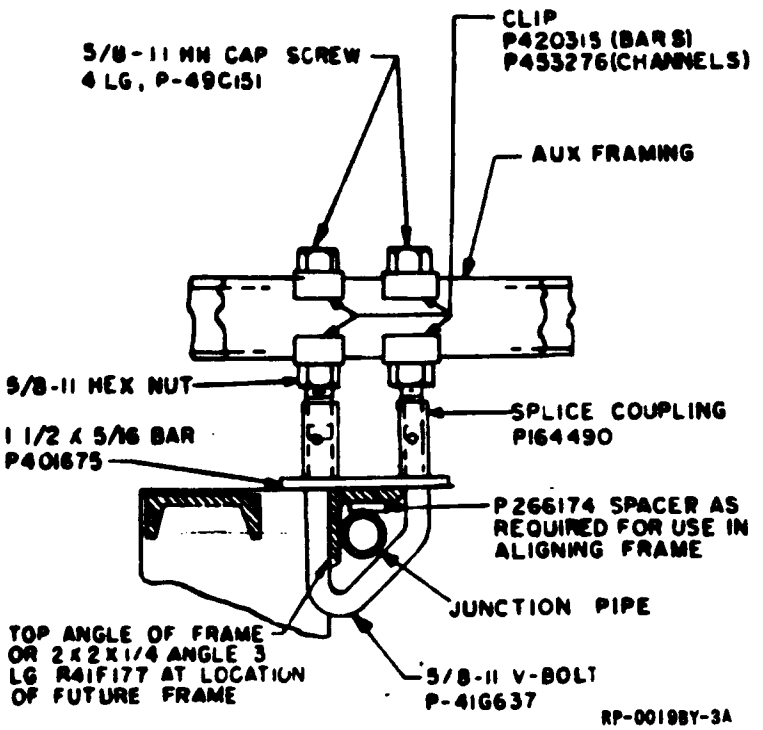


FIG. 6P NO. 5 CROSSBAR-TYPE AUXILIARY FRAMING ATTACHED TO CABLE DUCT-TYPE FRAME OR TO JUNCTION PIPE AT LOCATION OF FUTURE FRAME - 11' - 9-1/2" AUXILIARY FRAMING (PAR. 9.2.7) (BSP 800-614-155, FIG. 6P)

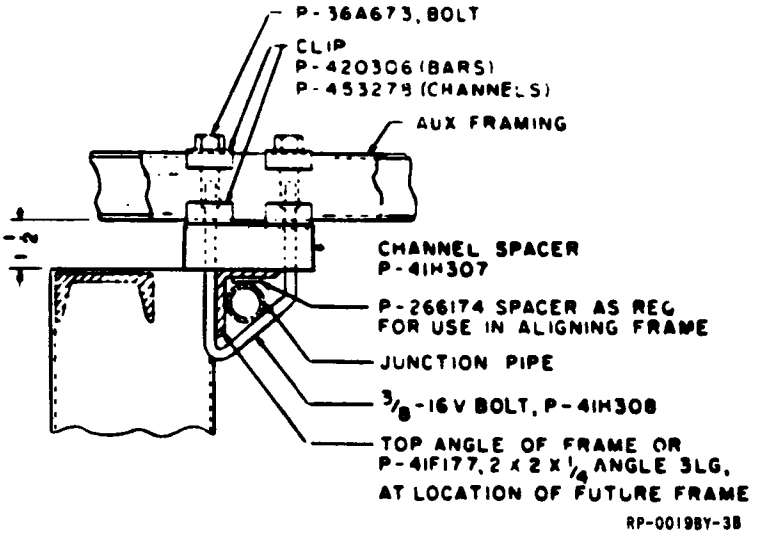


FIG. 6Q AUXILIARY FRAMING ATTACHED TO CABLE DUCT-TYPE FRAME OR TO JUNCTION PIPE AT LOCATION OF FUTURE FRAME - 11'-7-1/2" FRAMING (PAR. 9.2.7) (BSP 800-614-155, FIG. 6Q)

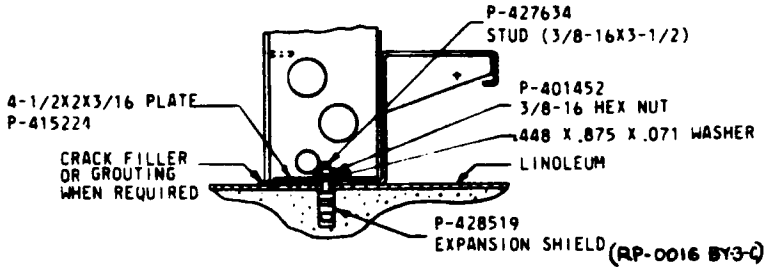
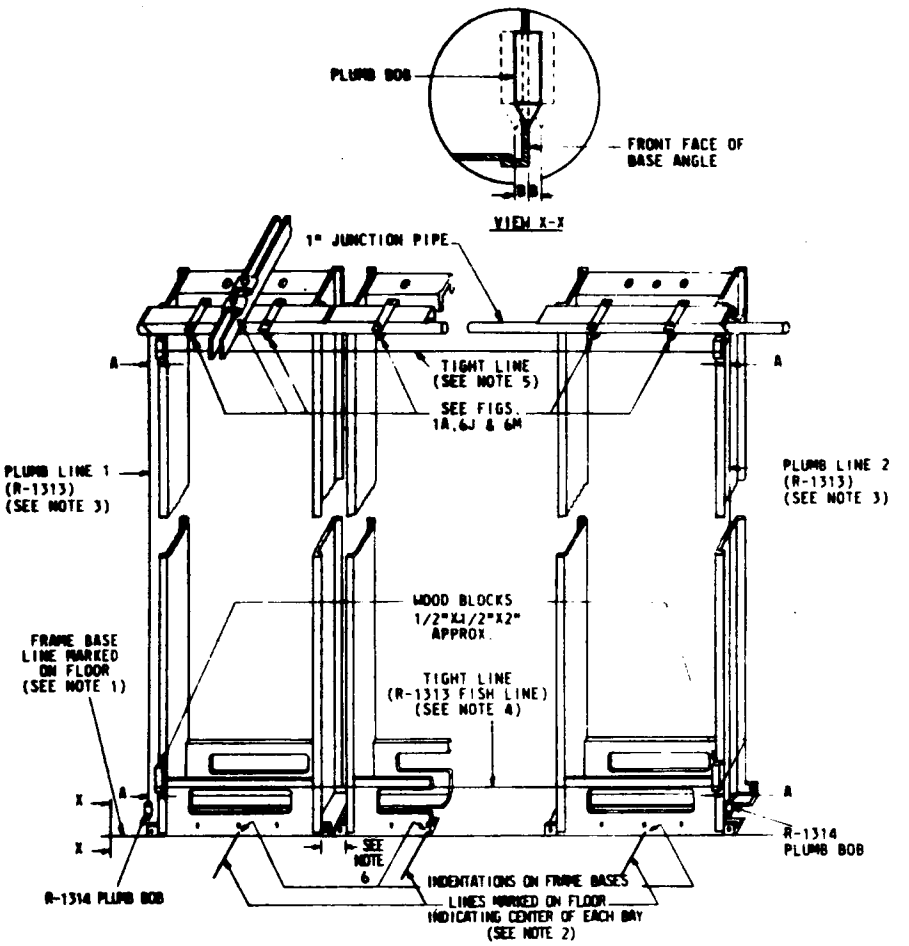


FIG. 7 FASTENING CABLE DUCT FRAMES HAVING INTEGRAL GUARDRAILS TO FLOORS (PAR. 8.2.1) (BSP 800-614-154, FIG. 7)



NOTES:

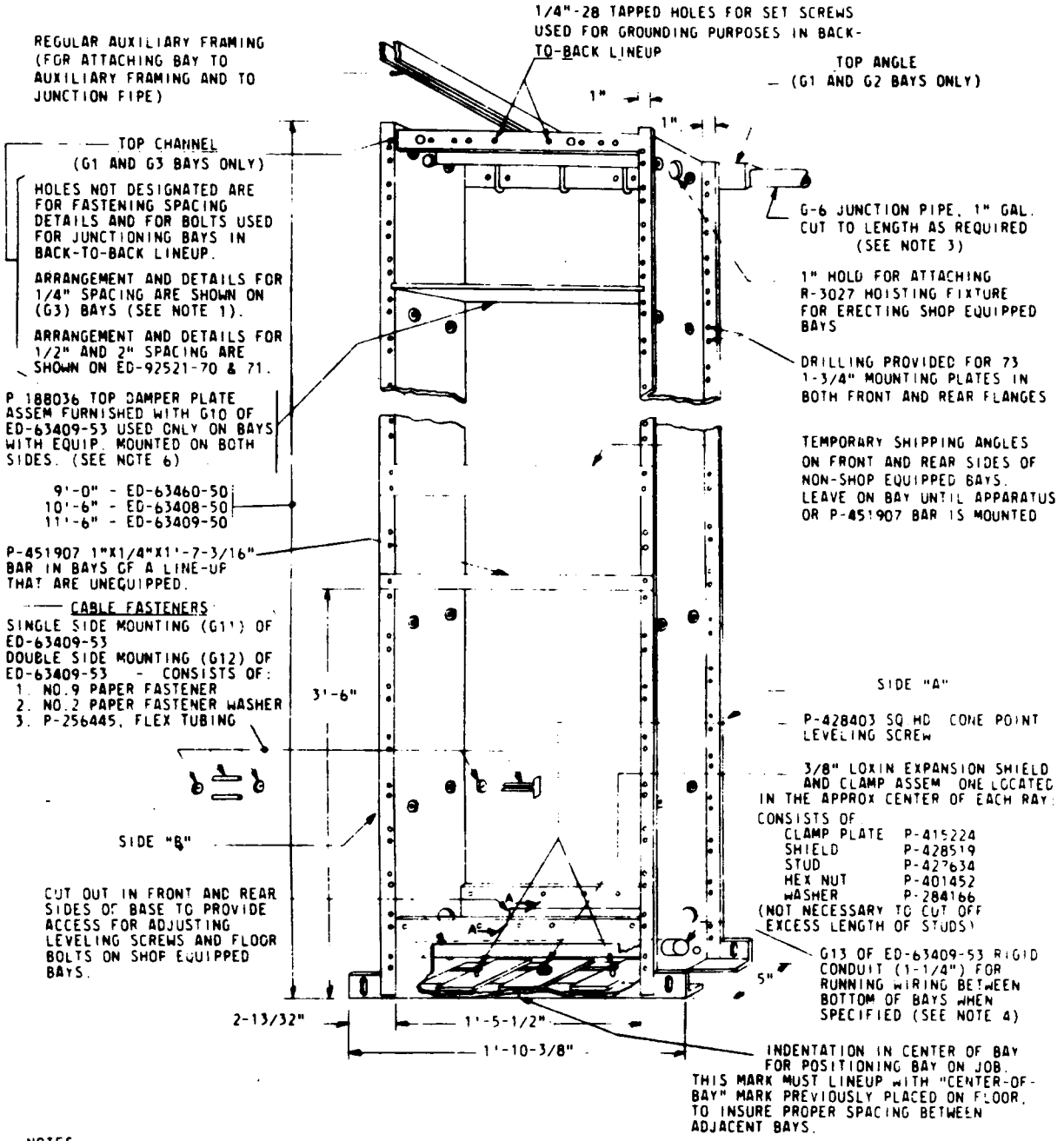
1. FRONT SURFACES OF SHEET METAL BASES OF BAYS SHOULD COINCIDE WITH LINE PREVIOUSLY MARKED ON FLOOR.
2. THE INDENTATION STAMPED BY THE SHOP IN LOWER EDGE OF SHEET METAL BASE OF EACH BAY SHOULD COINCIDE WITH ASSOCIATED LINES PREVIOUSLY MARKED ON THE FLOOR.
3. PLUMB LINES 1 AND 2 SHOULD BE HUNG FROM THE INNER EDGE OF THE BAY TOP ANGLES AT BOTH ENDS OF THE LINEUP APPROXIMATELY 1" FROM THE FLANGE OF THE UPRIGHTS, AS SHOWN. THE DISTANCE BETWEEN THE PLUMB LINE AND THE FLANGE OF THE UPRIGHT (DIM.A) SHOULD BE APPROXIMATELY THE SAME AT THE TOP AND BOTTOM OF THE BAYS. THE POINT OF THE PLUMB BOB SHOULD LINE UP APPROXIMATELY WITH THE FRONT EDGE OF THE BASE ANGLE (DIM.B IN VIEW X-X) IN NO CASE SHOULD THE VARIATION IN DIMENSIONS A AND B EXCEED THE LIMITS INDICATED BELOW.

HEIGHT OF BAY	MAXIMUM ALLOWABLE DEVIATION FROM PLUMB
OVER 4'-6" BUT LESS THAN 7'-0"	1/8"
7'-0" TO 9'-0" INCL.	3/16"
OVER 9'-0"	1/4"

4. THE TOP EDGES OF THE SHEET METAL BASES SHOULD BE AT APPROXIMATELY THE SAME LEVEL AS JUDGED FROM COMPARISON WITH A TIGHT LINE EXTENDING THE FULL LENGTH OF THE LINEUP. ANY VARIATION BETWEEN THE LEVEL OF ADJACENT BAYS SHOULD BE AS SMALL AS PRACTICABLE. THIS IS TO INSURE THAT THE LEVEL OF THE TOP SURFACES OF ADJACENT GUARD RAILS, WHEN INSTALLED, WILL NOT EXCEED 1/16".
5. THE DISTANCE BETWEEN THE FRONT FACES OF THE FLANGES ON THE BAY UPRIGHTS AND A HORIZONTAL TIGHT LINE, LOCATED NEAR THE TOPS OF THE BAYS AND EXTENDING THE FULL LENGTH OF THE LINEUP, SHOULD BE APPROXIMATELY THE SAME ON ALL UPRIGHTS. THIS AUTOMATICALLY PROVIDES FOR "FRONT-TO-REAR" PLUMBING OF INTERMEDIATE BAYS TO AGREE WITH THAT PREVIOUSLY ESTABLISHED ON END UPRIGHTS.
6. SPACING BETWEEN FLANGES OF UPRIGHTS OF ADJACENT BAYS SHOULD BE APPROXIMATELY SAME AT THE TOP AND BOTTOM OF THE BAYS.

(BY-10590)

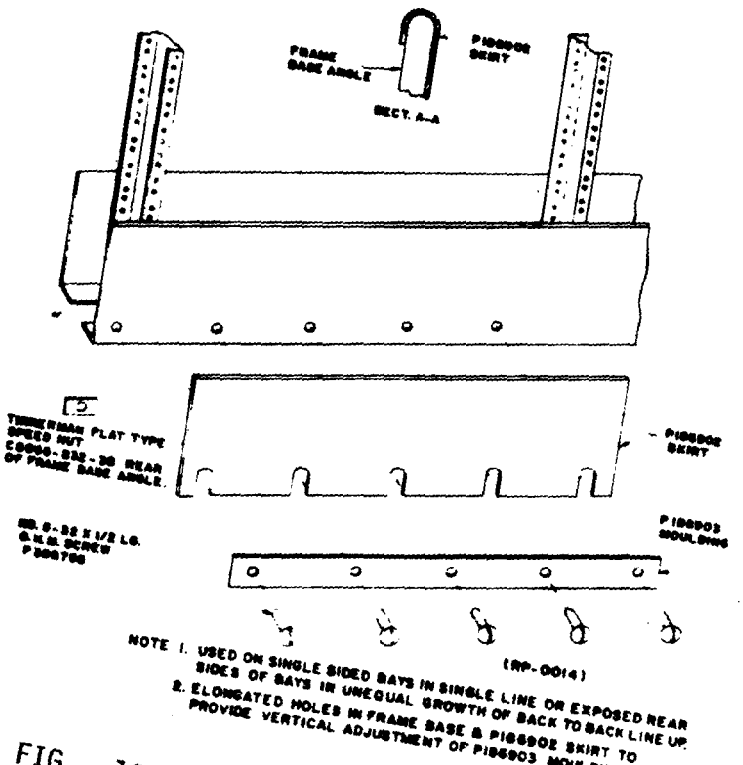
FIG. 8 PLUMBING AND ALIGNING UNIVERSAL CABLE DUCT-TYPE BAYS (PAR. 12.3.3)



NOTES:
1. GROUP NUMBERS SHOWN UNLESS OTHERWISE SPECIFIED ARE FOR 11'-6" BAYS PER ED-63409-50. THE GROUP NUMBERS MAY BE DIFFERENT FOR THE 9'-0" BAY PER ED-63460-50 AND 10'-6" BAY PER ED-63408-50. HOWEVER, THE GENERAL ARRANGEMENT WILL BE THE SAME.
2. JUNCTIONS IN PIPE SHOULD BE MADE AT THE APPROXIMATE CENTER OF A BAY WITH AT LEAST ONE "V" BOLT FASTENING AT ENDS OF ADJOINING LENGTHS OF PIPE.
3. WHEN ONLY ONE G13 OF ED-63409-53 IS SPECIFIED MOUNT IN LARGE HOLES NEAREST BOTTOM OF BAY.
4. P-188036 PLATE RESTS ON MOUNTING PLATES OF TWO TOP UNITS, WHERE LEVELS OF EQUIPMENT ARE UNEVEN DUMMY MOUNTING PLATE MUST BE USED.

(RP-16530)

FIG. 9 TYPICAL UNIVERSAL CABLE DUCT-TYPE BAY (G1 BAY SHOWN) (PARS. 4.1, 8.2, and 13.8.1.2)



NOTE 1. USED ON SINGLE SIDED BAYS IN SINGLE LINE OR EXPOSED REAR SIDES OF BAYS IN UNEQUAL GROWTH OF BACK TO BACK LINE UP.
2. ELONGATED HOLES IN FRAME BASE & P186902 SKIRT TO PROVIDE VERTICAL ADJUSTMENT OF P186903 MOULDING.

FIG. 10 SKIRT ASSEMBLY FOR SIDE OF BAY OPPOSITE GUARDRAIL (PAR. 13.2.1.1)

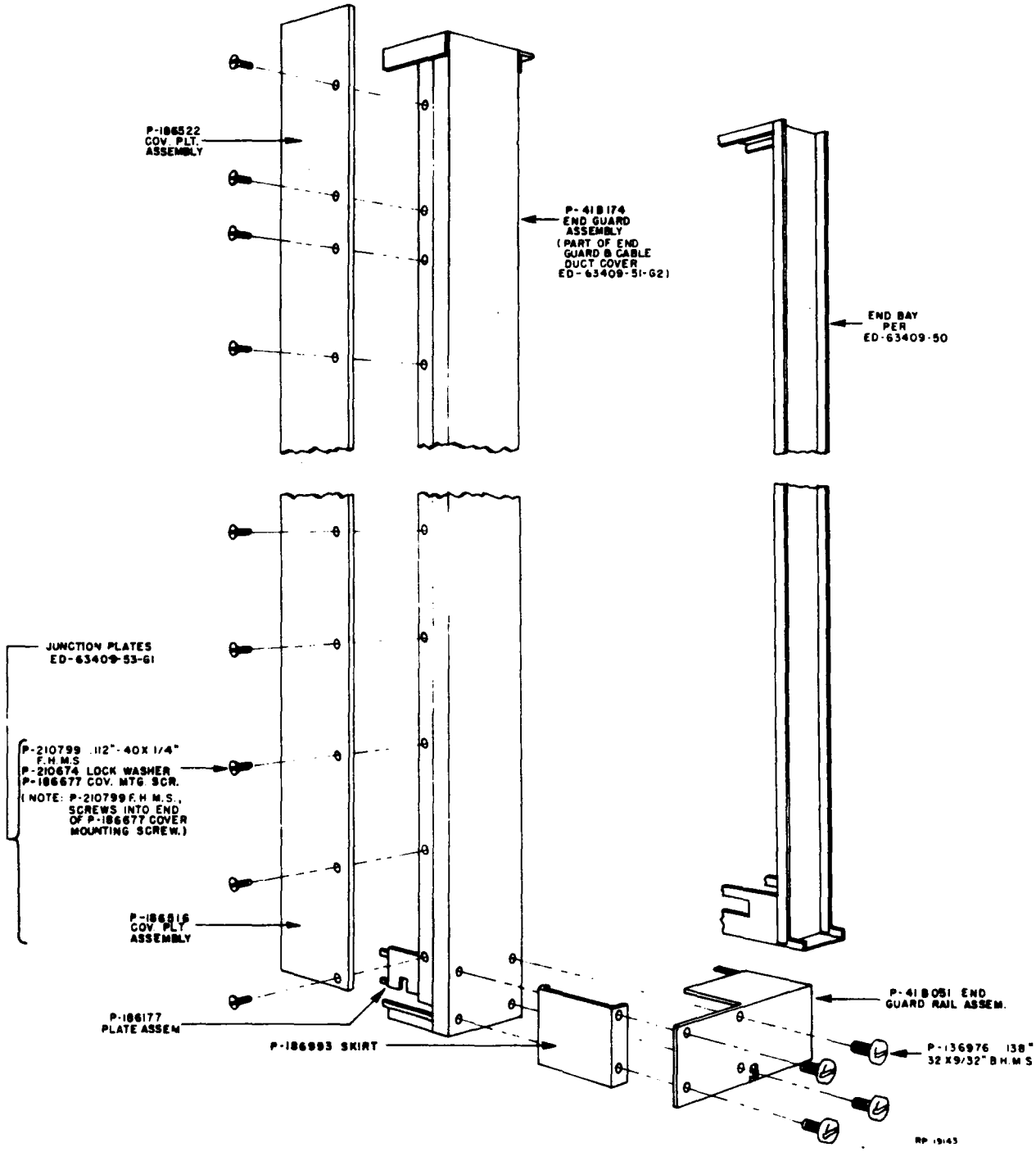


FIG. 11 ASSEMBLY OF END GUARD, END GUARDRAIL AND CABLE DUCT COVER FOR LEFT OR RIGHT END OF LINEUP TO PROVIDE 5-3/4" WIDE DUCT - LEFT END SHOWN (PARS. 13.3.2(a), 13.9.1)

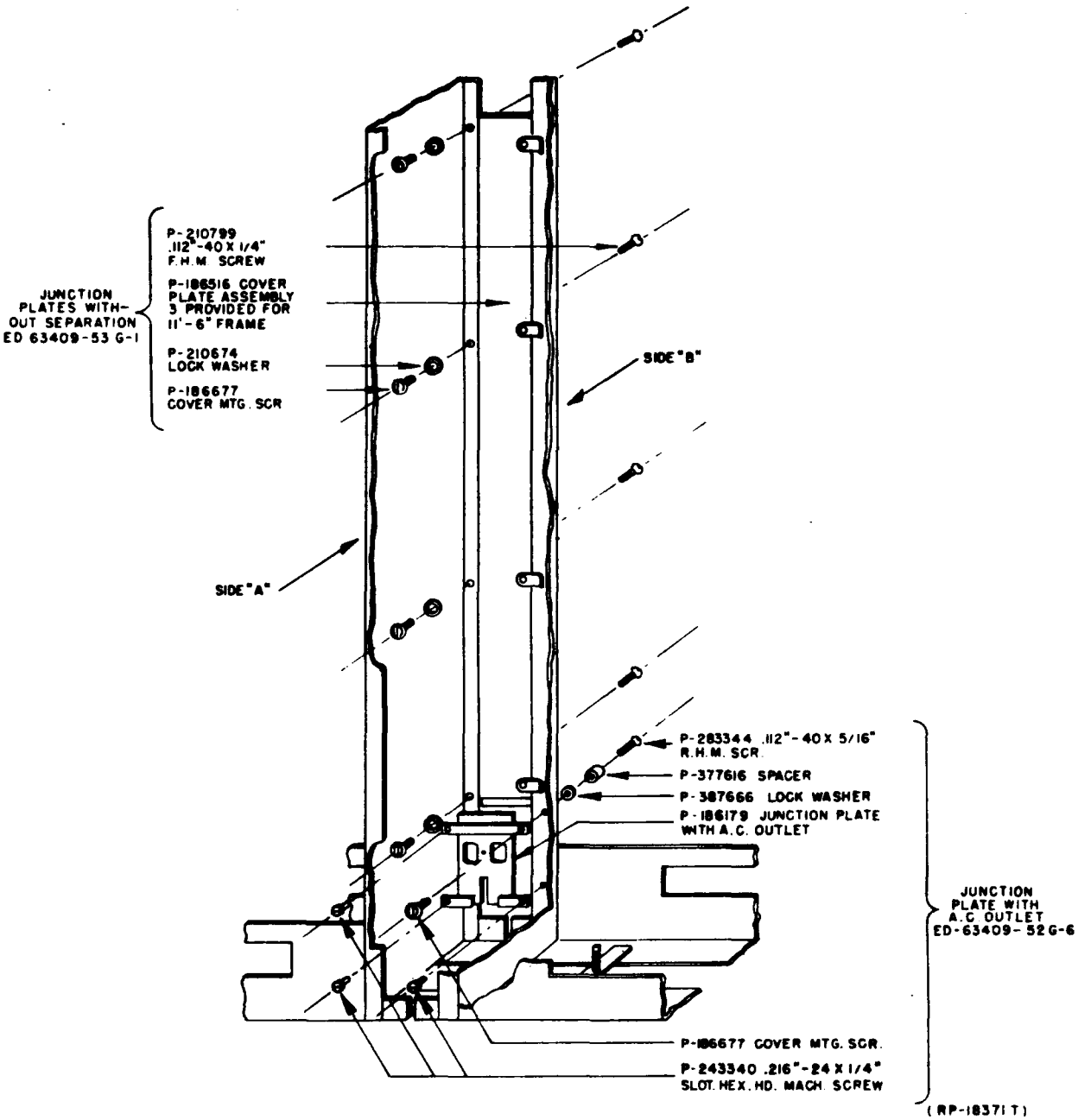


FIG. 12 ASSEMBLY OF JUNCTION PLATES FOR 5" DUCT - WHERE FRAMES ARE ACCESSIBLE FROM THE CLOSED SIDE (PARS. 13.3.2(a), 13.9.1)

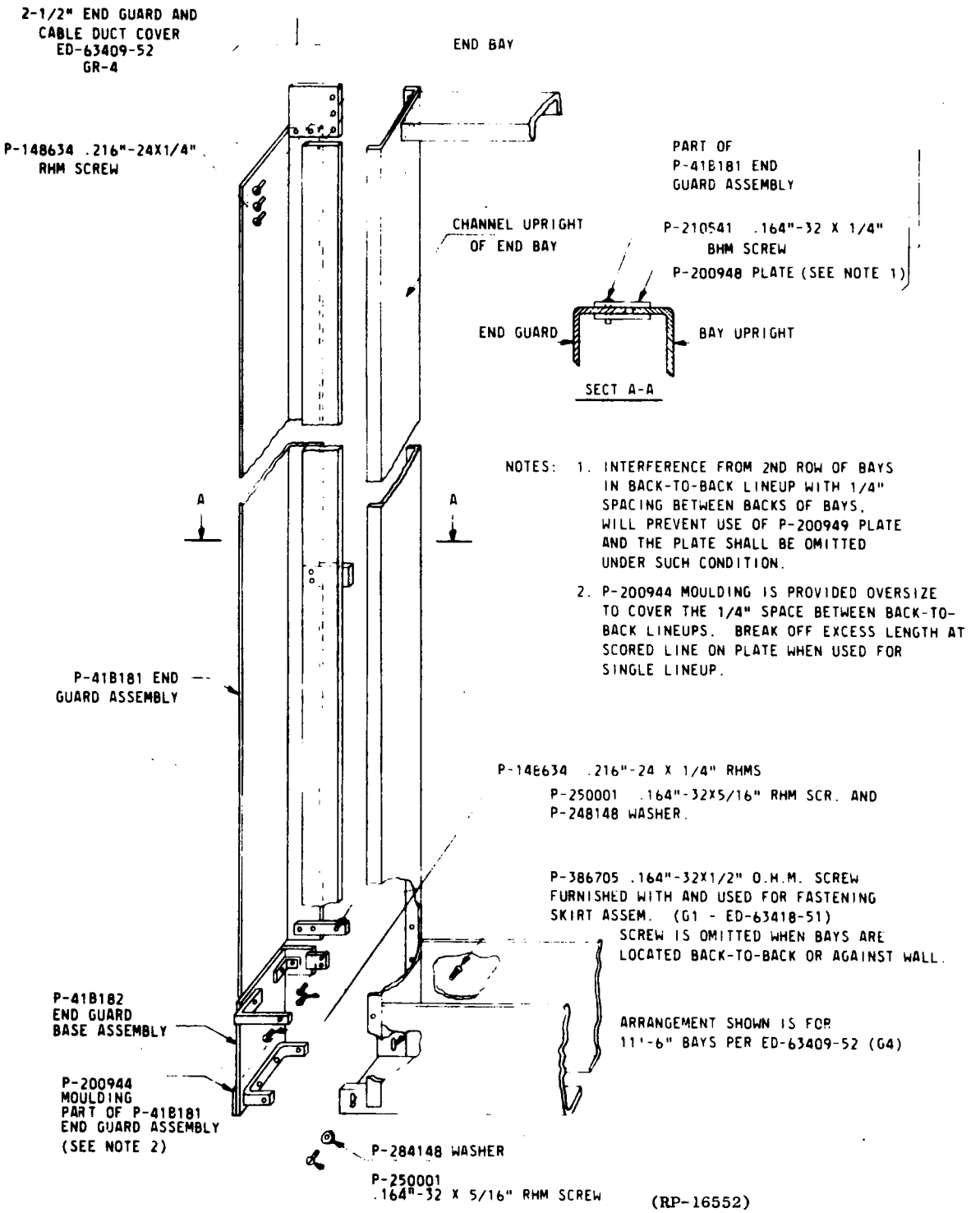
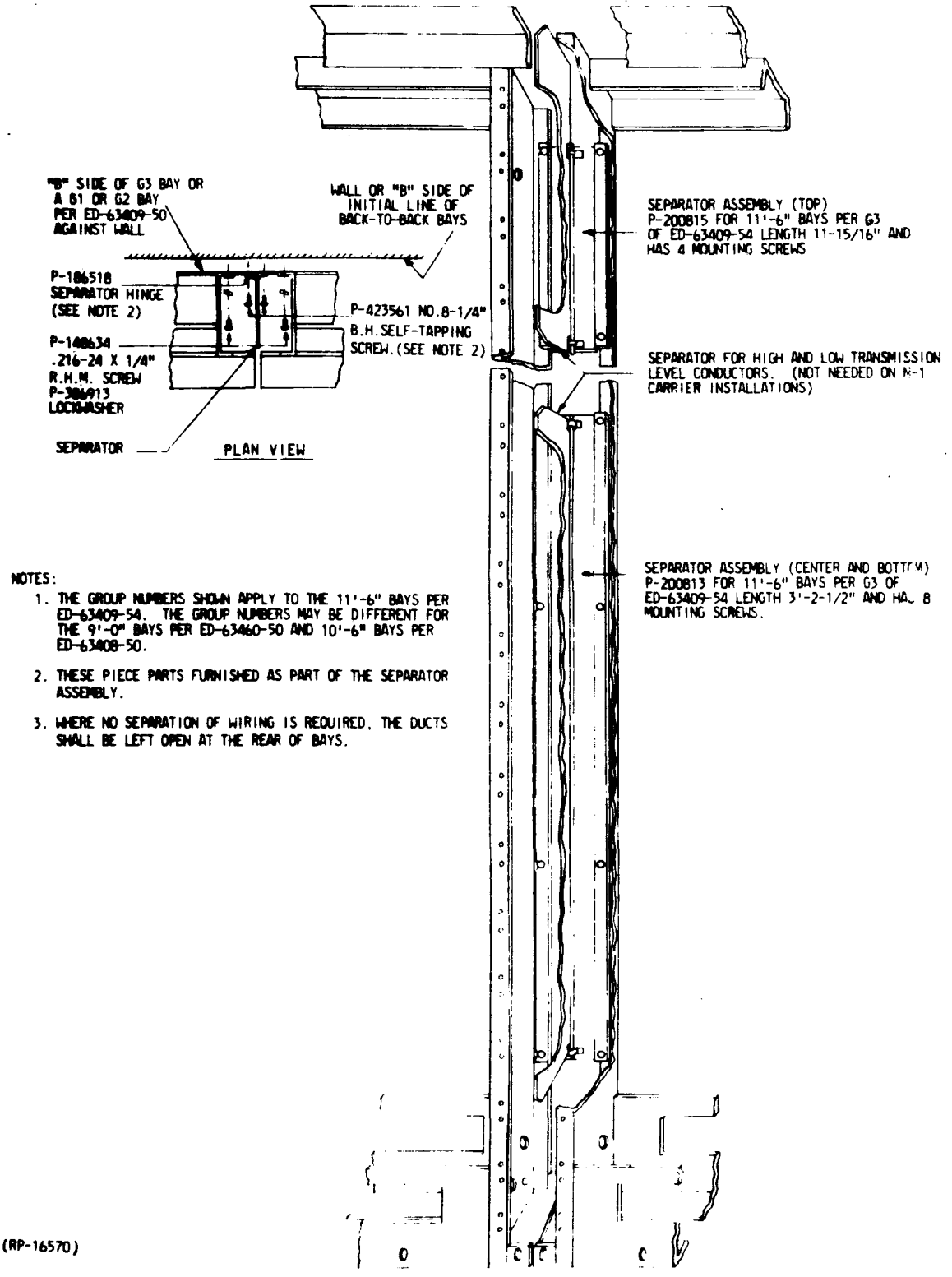


FIG. 13 ASSEMBLY OF END GUARD AND CABLE DUCT COVER FOR LEFT OR RIGHT END OF LINEUP TO PROVIDE 2-1/2" WIDE DUCT (PARS. 13.3.2(b), 13.9.1)



NOTES:

1. THE GROUP NUMBERS SHOWN APPLY TO THE 11'-6" BAYS PER ED-63409-54. THE GROUP NUMBERS MAY BE DIFFERENT FOR THE 9'-0" BAYS PER ED-63460-50 AND 10'-6" BAYS PER ED-63408-50.
2. THESE PIECE PARTS FURNISHED AS PART OF THE SEPARATOR ASSEMBLY.
3. WHERE NO SEPARATION OF WIRING IS REQUIRED, THE DUCTS SHALL BE LEFT OPEN AT THE REAR OF BAYS.

(RP-16570)

FIG. 14 JUNCTION BETWEEN BAYS IN SECOND ROW OF BACK-TO-BACK LINEUP OR FOR BAYS IN LINEUP AGAINST-WALL TO PROVIDE 5" WIDE DUCT (PARS. 13.3.2(b), 13.9.1)

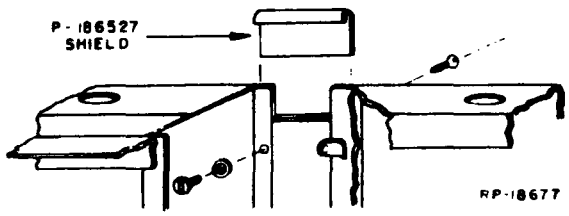
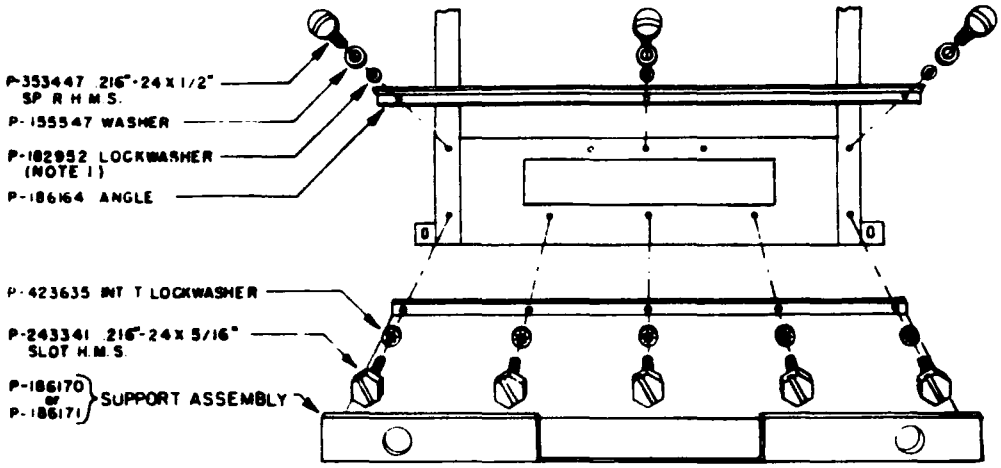


FIG. 15 WIRE PROTECTION SHIELD
(par. 13.41)



NOTES:

1. TO FACILITATE INSERTING THE P-243341 HEX. MTG SCREWS WITH THE R-1542 WRENCH ADJ. O.E., 6 INCHES, THE SUPPORT ASSEMBLY SHOULD BE MOUNTED PRIOR TO THE MOUNTING OF THE ANGLE.
2. TO FACILITATE ALIGNMENT WHEN ASSEMBLING THE GUARD RAIL SUPPORT, PLACE THE LEFT SCREW IN FIRST, ALIGNMENT OF THE REMAINING HOLES WILL FOLLOW WITHOUT DIFFICULTY.
3. WHEN CABLE BRACES PER ED-92822-10 ARE PROVIDED THE P-182952 LOCKWASHERS ARE DISCARDED AT POINTS WHERE CABLE BRACES ARE ASSEMBLED.

(RP-18676)

FIG. 16 WIRING AND GUARDRAIL SUPPORT
(ED-63409-50, G-4 and G-5) (Par. 13.52)

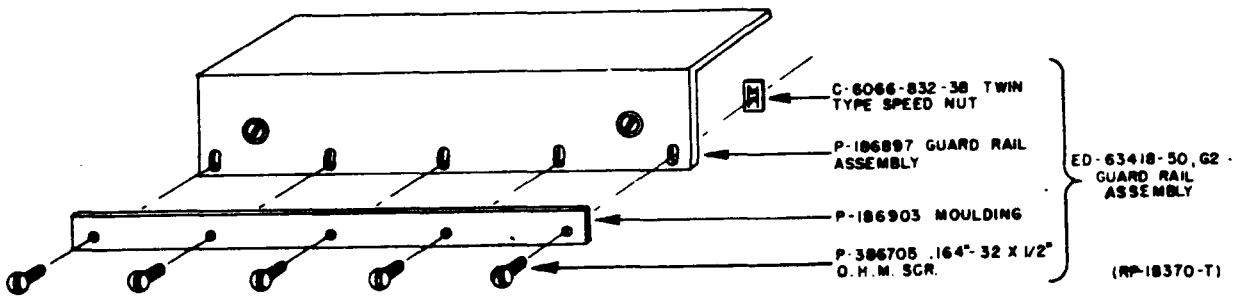


FIG. 17 DETACHABLE GUARDRAIL ASSEMBLY
(PAR. 13.6.1)

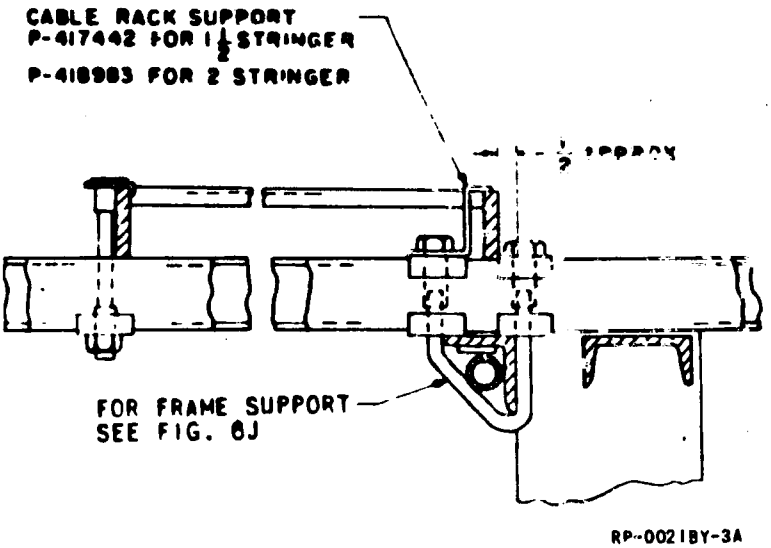


FIG. 62N CABLE DUCT-TYPE FRAME SUPPORTED FROM CABLE RACK - 11'-6" AUXILIARY FRAMING (PAR. 10.2)
(BSP 800-614-157, FIG. 62N)

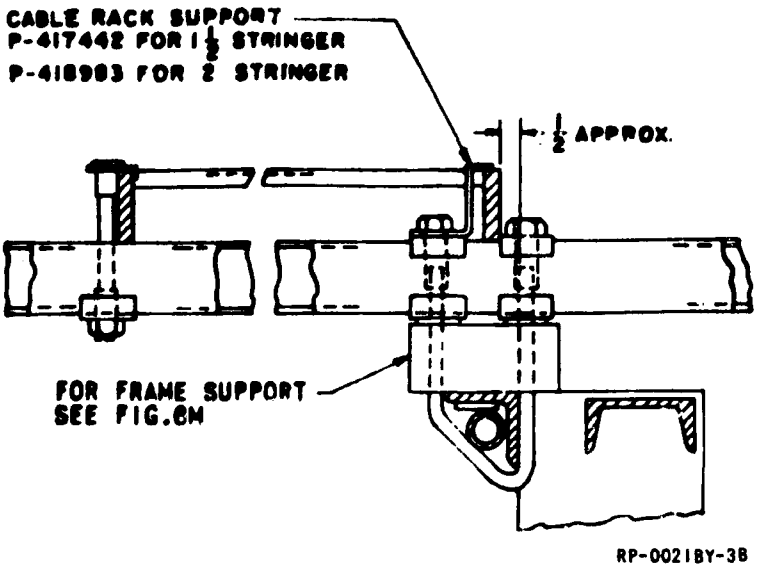


FIG. 62P CABLE DUCT-TYPE FRAME SUPPORTED FROM CABLE RACK - 11'-8" AUXILIARY FRAMING (PAR. 10.2)
(BSP 800-614-157, FIG 62P)

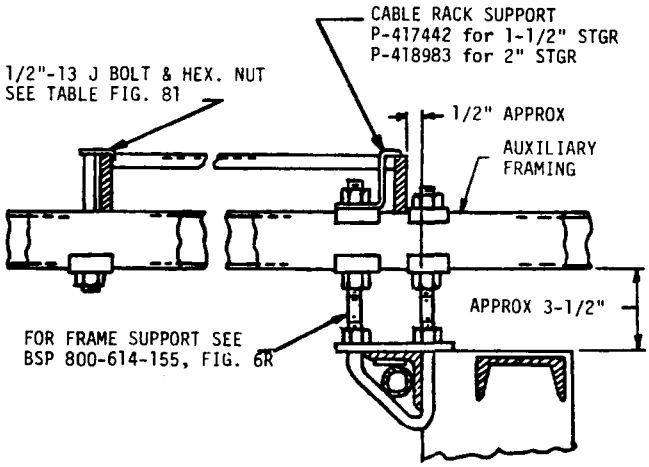


FIG. 62S LADDER-TYPE CABLE RACK OVER CABLE DUCT-TYPE FRAMES 11'-9-1/2" FRAMING (PAR. 10.2) (BSP 800-614-157, FIG. 62S)

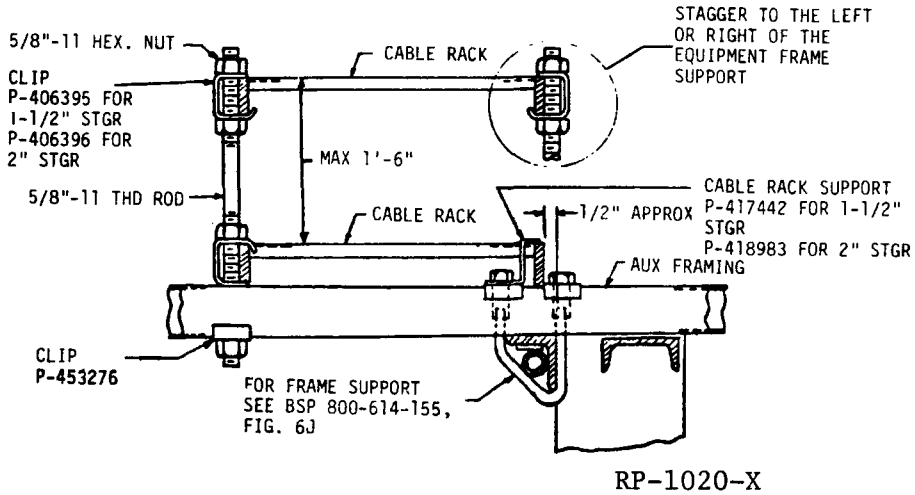


FIG. 62T MULTI-LEVEL CABLE RACK SUPPORT OVER DUCT-TYPE FRAMES - 11'-6" FRAMING (PAR. 10.2) (BSP 800-614-157, FIG. 62T)

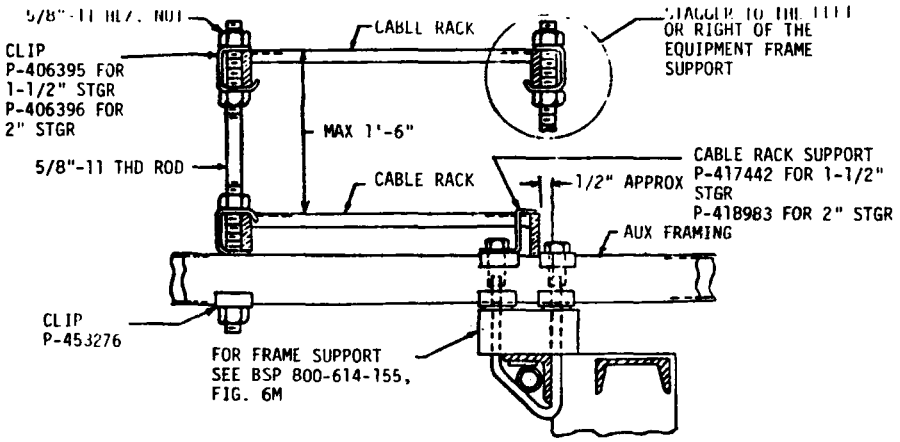


FIG. 62U MULTI-LEVEL CABLE RACK SUPPORT OVER DUCT-TYPE FRAMES - 11'-8" FRAMING (PAR. 10.2) (BSP 800-614-157, FIG. 62U)

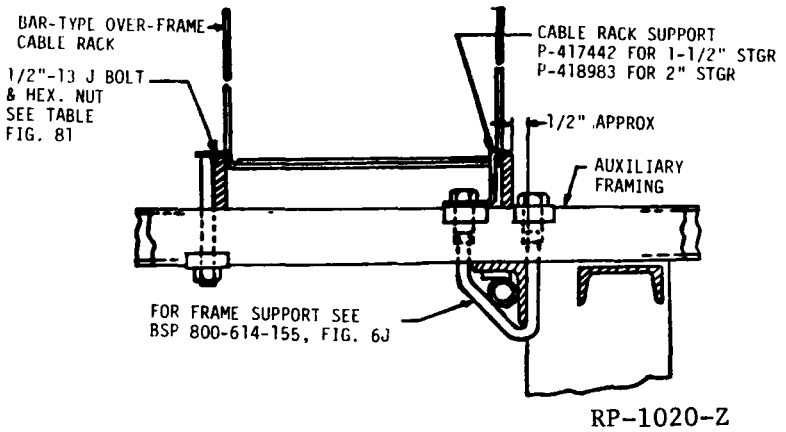


FIG. 62V BAR-TYPE OVER-FRAME CABLE RACK OVER CABLE DUCT-TYPE FRAMES - 11'-6" FRAMING (PAR. 10.2) (BSP 800-614-157, FIG. 62V)

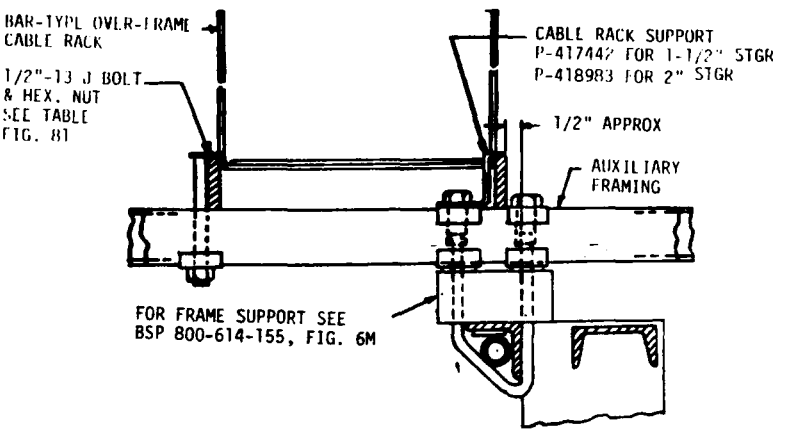


FIG. 62W BAR-TYPE OVER-FRAME CABLE RACK OVER CABLE DUCT-TYPE FRAMES - 11'-8" FRAMING (PAR. 10.2) (BSP 800-614-157, FIG. 62W)