# AUXILIARY FRAMING - LOW TYPE

## DESCRIPTION, INSTALLATION AND ASSEMBLY

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## 1. GENERAL

### 1.1 Scope

1.11 This section covers descriptive information for the high level assembly of low type auxiliary framing, including the general installation procedures and the assembly of splices and junctions for all types of systems, including power, where applicable.

NOTE: The term "high level assembly" is defined as: The assembly of ironwork at or slightly higher than the permanent height prescribed for a given office.

1.12 Where auxiliary framing fastenings to cable racks and frames are involved, reference should be made to the 13 series and the 20 series of sections in this handbook.

### 1.2 Associated Information

1.21 "Cabling, Cable Rack and Auxiliary Framing Plan" Drawings and the "Ironwork" Specification furnished for the job. Samples of these drawings are shown in Handbook 1.

1.22 Sections of Handbook 3 covering Scaffolding, Ladders and Stools.

1.23 Where an office is to be pre-cabled, reference should be made to Handbook 10 for special auxiliary framing information and requirements.

1.231 Where an office is to be assembled and pre-cabled at a 6'-0" height from the floor (low level assembly) and supported by vertical floor cranes, reference should be made to Section 11LL of this handbook.

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

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1.24 The requirements contained in Section 10 of this handbook which covers high type auxiliary framing should be followed in low-type framing installations, as far as they apply. Where threaded rods are used for support and bracing of framing, the requirements covered in high type auxiliary framing regarding the use of threaded rods, ceiling inserts, beam clamps, etc., also apply.

1.25 The 13 series of sections in this handbook covering Cable Rack.

1.26 The 20 series of sections in this handbook covering Erecting, Placing, and Fastening of Frames.

1.27 The 40 series of sections in this handbook covering Ladder Track.

1.28 The "General" section of this handbook covering general requirements and information.

1.29 Section 11B of this handbook.

1.3 Precautions

1.31 General safety precautions against personal injury and equipment damage are outlined in the "General" sections of this handbook. Pre-cautions applying to specific operations are listed with the associated paragraphs.

1.32 When using the tools listed below for cutting auxiliary framing be sure they are properly lubricated and maintained in accordance with the information in the Sections of Handbook 28 associated with the tool.

1.4 Tools and Materials

1.41 In addition to the tools supplied in the general kits, the tools and materials listed below may be required for the operations covered by this section.

Tools

R-2557 Portable Power Hack Saw
R-3030 Portable Power Hack Saw
R-3031 Portable Power Hack Saw
R-3103 Portable Hydraulic Shear
R-3623 Portable Band Saw
R-3148 Reciprocating Saw
R-4276 Alligator Shear
R-4328 Framing Stanchions
R-4329 Stanchion Braces
R-4330 Framing Jack

Materials

| | |
|---|---|
| Rent Locally | Adjustable Steel Post Shores |
| Purchase Locally | 2"x4" or 4"x4" Timber |
| Purchase Locally | Asbestos Tile (Note under Par. 3.412(b) |

1.5 Arrangement of Figures

1.51 The figures in BSP 800-614-155 are frequently referred to in job specifications and drawings. For this reason, where figures from 800-614-155 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 in the sections by a note beneath each figure title.

1.6 Verification

1.61 Items for the verification of the equipment installed by the operations covered in this section are listed in paragraph 5 in this section.

1.62 The items in paragraph 5 may also be used as a self check quide when performing operations covered by this section.

## 2. DESCRIPTION OF AUXILIARY FRAMING

2.1 Types of Framing Members

2.11 Standard low type auxiliary framing may consist of either bars or channels. The details used in either case are shown on the figures in this section and Section 11B.

2.2 Piece Part Information

2.21 The list of parts shown in Figure 1 will facilitate the identification of piece parts frequently used in the installation of low type auxiliary framing. While it is intended that the list include all parts which otherwise might be difficult to identify, it will be impractical to keep the list up-to-date at all times.

2.22 The R-2905 Piece Part Chart is a large reproduction similar to Figure 1 which may be ordered from Installation Stockkeeping. The Chart can be located near the piece part bins on the job for easy identification of some of the more common piece parts.

NOTE: Extra framing bars or channels threaded rods, etc., which are required for the installer's convenience only in connection with installing operations, such as hoisting centers, temporary transition set-ups, and temporary support of regular auxiliary framing and cable rack such as that required for pre-cabling operations, shall be considered the same as installation tools and shall not become a part of the telephone plant. These items shall be requisitioned as "Supplies" from Installation Stockkeeping. It is recommended that this material be transferred from job to job within an Area, where possible, instead of being returned to Service Center.

## 3. GENERAL INSTALLATION PROCEDURE

### 3.1 General

3.11 The installation of auxiliary framing is an integrated operation involving cable racks, auxiliary framing, ladder track, and frames. Where necessary, reference should be made to those respective sections of this handbook covering their installation.

3.12 The method used to install auxiliary framing depends to a great extent on the type and size of job and the job conditions encountered. In general, the following procedures have been found to be most satisfactory.

### 3.2 Installation of Auxiliary Framing Prior to Erection of Frames

3.21 This procedure is advantageous on all installations where the framing may be temporarily supported in a manner which is independent of the frames.

3.22 The most efficient method of installing auxiliary framing prior to the erection of frames is the Low Level Assembly Technique. This method is covered in Section 11LL of this handbook.

3.23 Where job conditions do not permit the use of low level assembly methods, installation may be effected at a high level as follows:

(a) Install the auxiliary framing (including cable racks and ladder track) at a level which is slightly higher (approximately 1/2") than the permanent height specified in the job information. This will facilitate the installation of the frames and the top members and fastening details.

(b) Support the auxiliary framing using one of the methods of support covered in paragraph 3.4 of this section.

(c) Lower the auxiliary framing to the permanent height after installation of the frames and fasten in accordance with the 20 series of sections in this handbook.

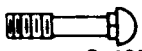
(d) On additions to existing central offices, after the installation and fastening of the equipment frames, all threaded rods which were used for the support of existing auxiliary framing and cable racks prior to the start of the addition are already considered as equipment, and shall not be removed unless individual threaded rods interfere with other operations.

(e) On additions and initial installations, all auxiliary framing, threaded rods, etc., which have been added on the respective job solely for the installer's convenience and which are not a part of the installation at completion shall be removed. Refer to note under paragraph 2.22.

### 3.3 Installation of Auxiliary Framing and Frames Together

3.31 This procedure is of advantage on additions to existing offices where the framing cannot be temporarily supported in a manner which is independent of the frames.

(a) Initially support the framing by using existing framework, if possible, or "starting" bars or "additional" auxiliary framing as covered in Paragraph 3.411(b) and (c) of this section.



RD. HD. M BOLT

P-403470 3/8"-16X1-11/16"
P-403467 3/8"-16X2-9/16"

H. H. CAP SCREW

P-210224 3/8"-16X5/8"
P-108511 3/8"-16X3/4"
P-228678 3/8"-16X1-1/8"
P-147284 3/8"-16X1-1/4"
P-147285 3/8"-16X1-1/2"
P-210834 1/2"-13X3/4"
P-210317 1/2"-13X7/8"
P-160381 1/2"-13X1-1/8"
P-210805 1/2"-13X2-3/4"
P-423926 1/2"-13X3-3/4"
P-423925 1/2"-13X3-1/4"
P-423933 5/8'-11X3"

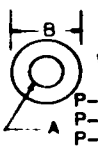
P-40X985 5/8"-11X3-1/4"
P160842 5/8"-11X3-1/2"
P210599 5/8"-11X4"
P423935 5/8"-11X5"

HEXAGONAL NUT

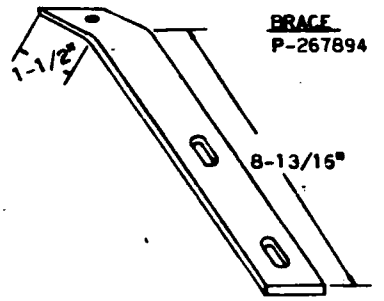
P-401452 3/8"-16 SPL
A-5/8" B=21/64"
P-125614 1/2"-13
A-7/8" B=1/2"
P-210263 1/2"-13 SPL
A=13/16" B=5/16"
P-205261 5/8"-11
A=1-1/16"B=5/8"

THREADED ROD 5/8"

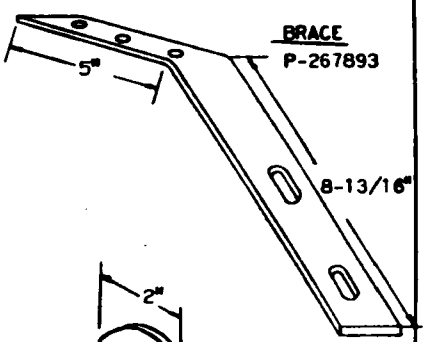
| | |
|---|---|
| P-420303 | 0'-4-1/2" |
| P-69106 | 0'-7" |
| P-400663 | 0'-9" |
| P-68227 | 1'-0" |
| P-400664 | 1'-6" |
| P-68228 | 2'-0" |
| P-402572 | 2'-6" |
| P-68229 | 3'-0" |
| P-68230 | 4'-0" |
| P-69107 | 5'-0" |
| P-407733 | 6'-6" |



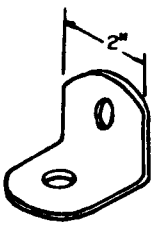
| WASHER | A | B |
|---|---|---|
| P-284166 | 7/16" | 1" |
| P-284172 | 9/16" | 1-1/8" |
| P-160834 | 11/16" | 1-3/4" |



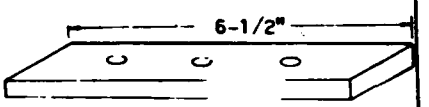
BRACE
P-267894



BRACE
P-267893

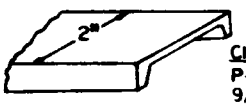


BRACKET
P-402989



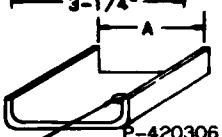
BAR
P-69108
1-1/2"X3/8"X6-1/2"

FRAMING BAR
P-421291
3/8"X2"X20'-0"



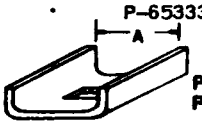
CHANNEL
P-453281
9/16"X2"X20'-0"

CLIP
P-401699

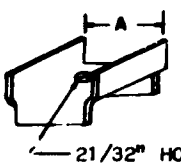


CLIP

| | A | B |
|---|---|---|
| P-420306 | 1-1/2" | 17/32" |
| P-453278 | 1-7/8" | 17/32" |
| P-420315 | 1-1/2" | 21/32" |
| P-453276 | 1-7/8" | 21/32" |
| P-420317 | 1-1/2" | 5/16" |
| P-65333 | 1-1/2" | 21/32" |

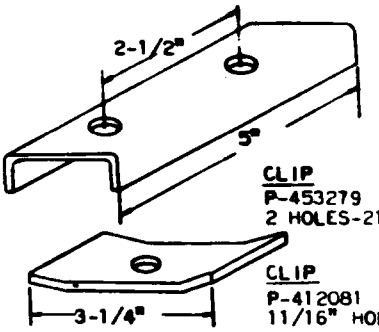


| CLIP | A |
|---|---|
| P-258449 | 1-7/8" |
| P-374668 | 1-1/2" |



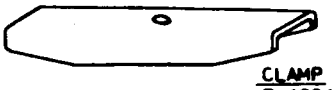
| CLIP | A |
|---|---|
| P-420316 | 1-1/2" |
| P-453277 | 1-7/8" |

21/32" HOLE

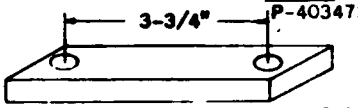


CLIP
P-453279
2 HOLES-21/32

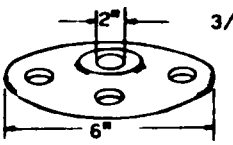
CLIP
P-412081
11/16" HOLE



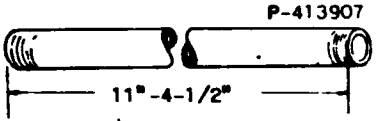
CLAMP
P-403472



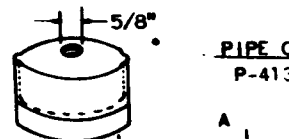
CLAMP BAR
P-420305
3/8"X1-1/4"X4-3/4"



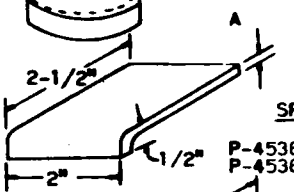
FLOOR FLANGE
P-413795



PIPE, 2"
P-413907

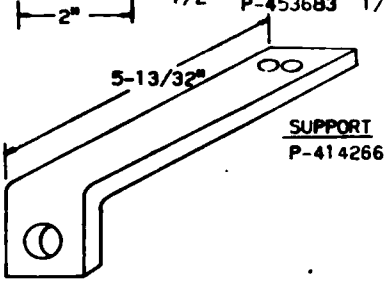


PIPE CAP, 2"
P-413908

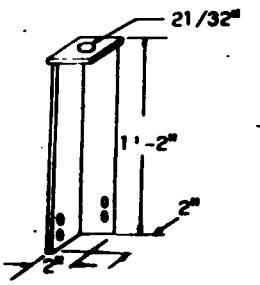


SPACER

| | A |
|---|---|
| P-453682 | 3/16" |
| P-453683 | 1/16" |



SUPPORT
P-414266



SUPPORT
P-412083

RP-0235

FIG. 1 PIECE PARTS FREQUENTLY USED IN THE INSTALLATION OF LOW TYPE AUXILIARY FRAMING (PAR. 2.21, 2.22)

(b) Approximately 15 feet away from the initial supports erect a lineup of frames and associated details for fastening the auxiliary framing to the lineup. Erecting, placing and fastening frames is covered in the 19 and 20 series of sections of this handbook.

(c) Install the framing between the initial supports and the fastening locations of the frame lineup (uprights, cable rack, etc.). The framing should be provided with the desired overhang so that adjacent splices do not occur in the same aisle. See Section 11B, for spacing of splices in the same aisle.

(d) Erect and fasten the frames between the initial supports and the lineup approximately 15 feet away.

(e) Continue the installation using the foregoing procedure.

(f) Remove all temporary bracing or framing when it is no longer required.

3.4 Support of Auxiliary Framing

3.41 The auxiliary framing may be supported by the following means.

3.411 From the Floor

(a) Where the frames and framing are installed simultaneously, the frames are considered temporary support until the installation is completed. Reference should be made to the 20 series of sections in this handbook for fastening to frames and associated details.

(b) The best method of temporary support from the floor is by means of the R-4328 Stanchions and R-4329 Braces. Although the original intent was for low level assembly, the stanchion provides a most efficient means of high level support. See Section 11LL of this handbook for proper set-up and use instructions. One R-4330 Jack is required for transferring the load from the stanchions to the frames.

NOTE: It is recommended that this method of support be considered above all other methods for installations of one or more building bays of equipment frames. In the event that this method does not apply, or job conditions do not permit its use, one of the following methods may be substituted.

(c) R-4099 Adjustable Stanchions may be used. This stanchion can be varied in height from 7' to 12'-6" and is capable of supporting 4000 pounds.

(d) Adjustable steel post shores may be used as shown in Figure 2, Method A. These shores may be rented locally from suppliers dealing in building scaffolding or, in some cases, lumber yards.

NOTE: If the flange of the post shore tends to "bite" into the floor covering, place factory seconds or a low grade of asbestos tile under them. These tiles can usually be obtained locally at little cost.

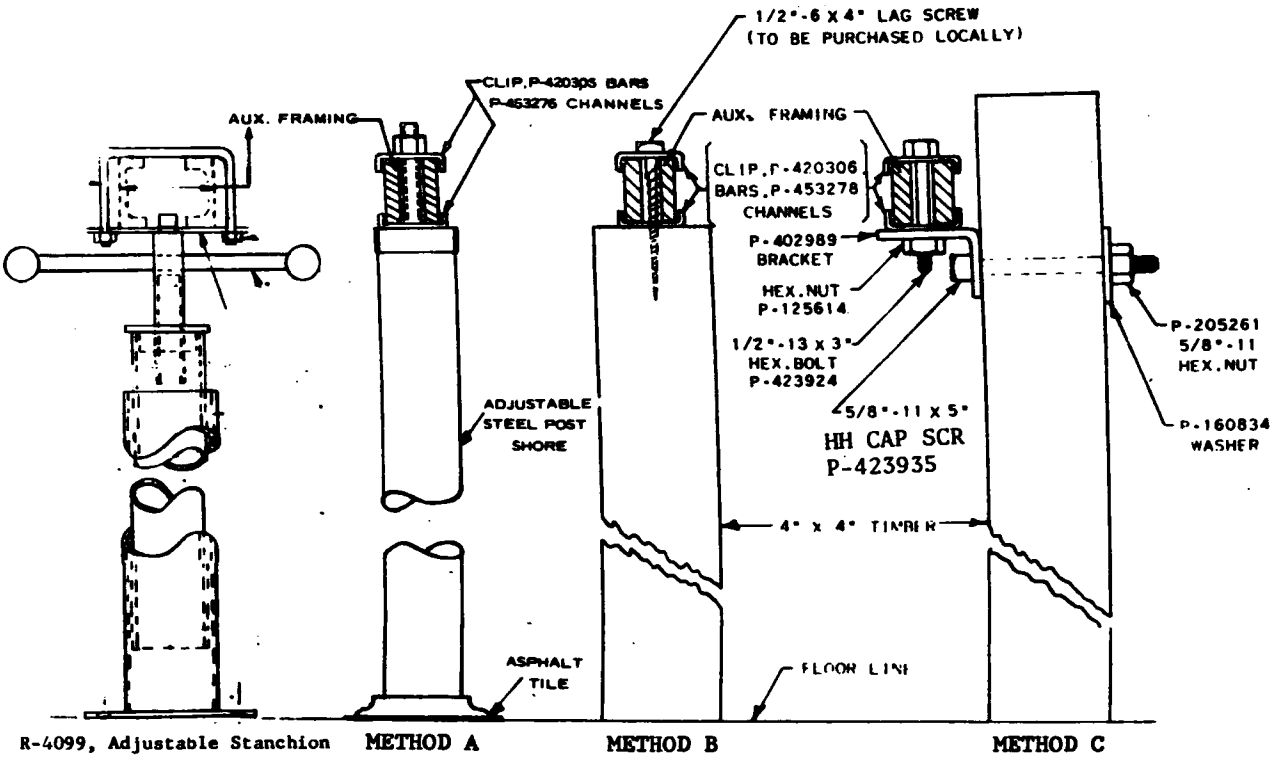
(e) Two (2) inch conduit or pipe of sufficient length may also be used, if available.

(f) It is also possible to support the framing with either 2"x4" or 4"x4" timbers as shown in Figure 2, Method B or C. However, when timber is used, it must be painted with a fire retardant paint.

3.412 From Above

(a) The auxiliary framing may be supported directly from threaded rods where ceiling insert arrangement permits. Where the auxiliary framing and cable rack structure is installed prior to the erection of frames, it is advantageous to place alternate pairs of bars or channels directly under the ceiling inserts and use threaded rods for support.

NOTE: When the assembly of 5/8"-11 Hex Nuts onto threaded rods is required, the R-4453 Manual Nut Runner shall be used to drive a small quantity of 15/16" new industry size nuts. For large quantities of hex Nuts (New Jobs or building additions) the R-4454 Pneumatic Nut Runner shall be used.




RP-17711-L

FIG. 2 TEMPORARY SUPPORT OF AUXILIARY FRAMING FROM FLOOR (PARS. 3.411 (c), (d) and (f)

NOTE: Where temporary threaded rods, such as hoisting center, etc., are installed, omit the P-160834 Washer which is normally used at the ceiling when installing permanent rods. This is done for easier identification of temporary rods.

(b) Auxiliary framing placed at right angles to the permanent auxiliary framing and suspended from threaded rods may be used. This type of support can be used as "starting" bars or channels for permanent auxiliary framing in step-by-step and manual offices. Temporary bracing should be provided to aid in maintaining alignment.

(c) "Additional" auxiliary framing which is used in unequipped areas where the adjacent rows of frames are more than 8'-0" apart, as covered in Section 11B, support may be utilized in a manner similar to that for starting bars.

CAUTION: ENDS OF THREADED RODS USED FOR THE TEMPORARY SUPPORT OF AUXILIARY FRAMING, WHICH EXTEND SUFFICIENTLY BELOW THE FRAMING BARS AS TO PRESENT AN ACCIDENT HAZARD SHOULD BE COVERED WITH SEVERAL LAYERS OF CANVAS TIED IN PLACE WITH SUITABLE CORD.

3.413 A spacing of 12 to 15 feet between these temporary supports may be found satisfactory under ordinary conditions. It may be found necessary, however, to install additional supports in some cases to prevent excessive sagging of the framing.

## 4. ASSEMBLY

### 4.1 General

4.11 To facilitate assembling auxiliary framing, the upper P-420315 or P-453276 Clip may be held at a point above the lower clip by a P-404159 Alignment Clip while the framing bars or channels are being put in place. See Figure 3. The alignment clip is removed, when the bars or channels are in place, permitting the upper auxiliary framing clips to fall into place. Extra P-404159 Clips may be ordered at the same time as the extra framing, etc., required for installing operations.

4.12 The R-2923 and R-3472 Mobile Aluminum Scaffolds have been used to advantage in expediting installing operations. Using a two man team, one man on the floor hands the framing bars or channels and the necessary threaded rods, bolts, clips, etc., to the other man on the scaffold. Then the two men, working from the scaffold, install the threaded rod supports and secure the framing to the threaded rods. Handbook 3 contains information concerning the procurement and assembly of all types of scaffolds.

### 4.2 Splice Assemblies

4.21 Splices in auxiliary framing bars and channels are assembled as follows:

(a) 2" x 3/8" Bars to 2" x 3/8" Bars - Refer to Figure 9.

(b) Channels to Channels Using P-453279 Clips (2-Hole Splice) - Refer to Figure 9A. A spacing between ends of the spliced pairs of channels is permitted to allow for the variation in length of standard channels provided a 2" minimum overlap between the clips and channels is maintained as shown in Figure 9A.

(c) Channels to Bars Using P-453279 Clips (2-Hole Splice) - Refer to Figure 9B.

(d) Channels to Channels Using P-390391 3-Hole Splice Plates - Refer to Figure 9J for general requirements. The channel ends must be within the points of engagement, which are marked on the splice plates, and have a

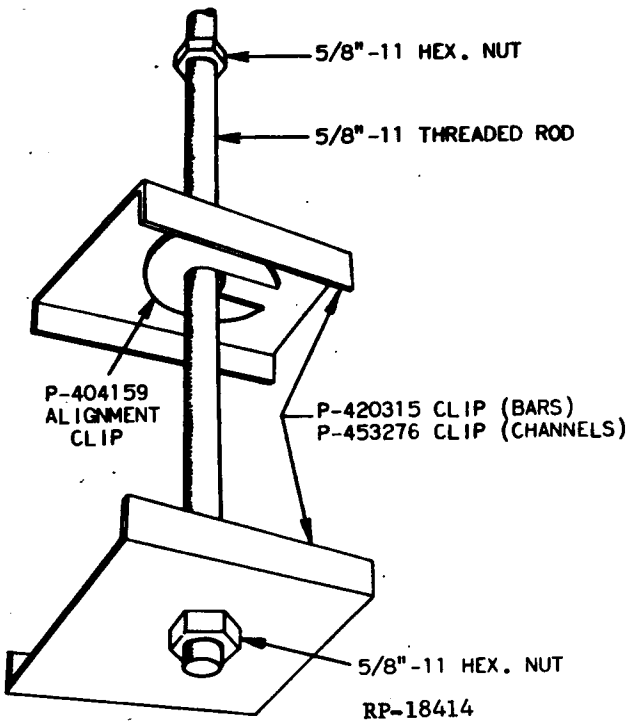



FIG. 3 USE OF P-404159 ALIGNMENT CLIP FOR HOLDING THE TOP AUXILIARY FRAMING CLIP DURING THE INSTALLATION OF THE AUXILIARY FRAMING (PAR. 4.11)

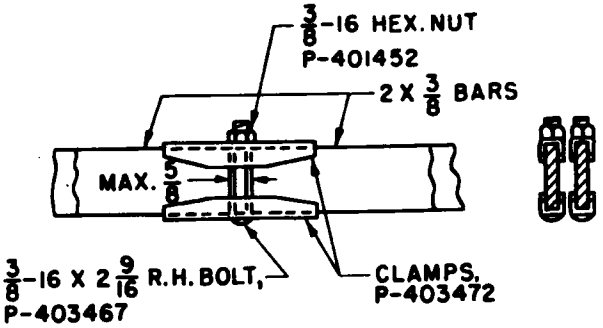



FIG. 9 SPLICING PAIRS OF 2" x 3/8" BARS TO 2" x 3/8" BARS (PAR. 4.21 (a)) (BSP 800-614-155, Fig. 9)

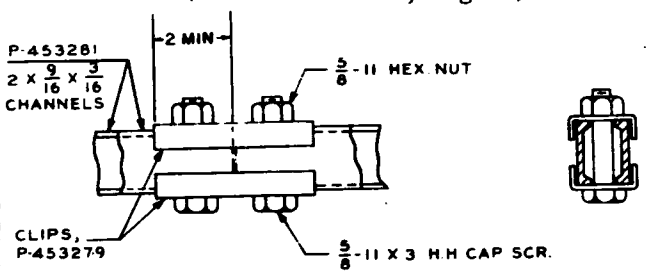



FIG. 9A SPLICING AUXILIARY FRAMING - CHANNELS TO CHANNELS (PAR. 4.21 (b)) (BSP 800-614-155, Fig. 9A)

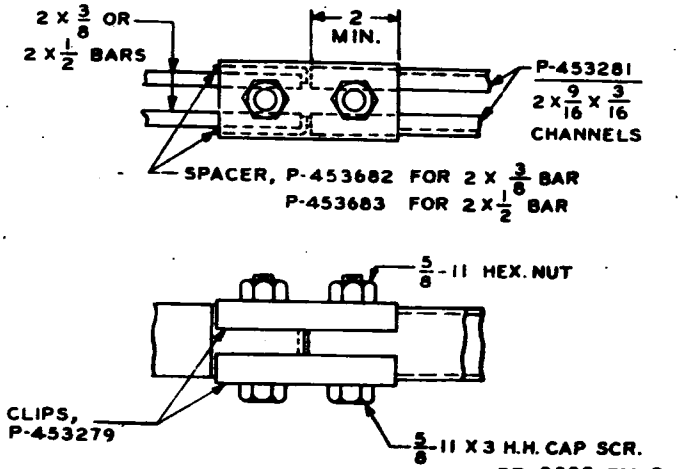



FIG. **9B** SPLICING AUXILIARY FRAMING - CHANNELS TO BARS (PAR. 4.21 (c)) (BSP 800-614-155, Fig. 9B)

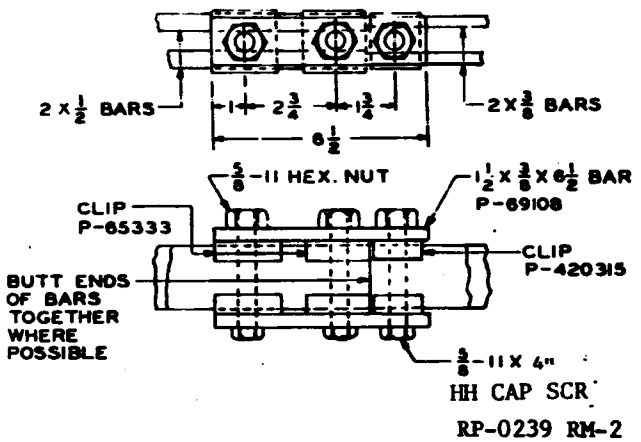



FIG. **9C** SPLICING PAIRS OF 2" x 1/2" BARS TO 2" x 3/8" BARS (PAR. 4.21 (f)) (BSP 800-614-155, Fig. 9C)

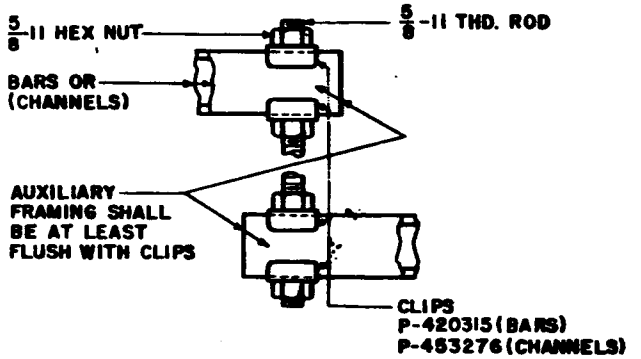



FIG. **9E** JUNCTIONING LOW TO HIGH LEVEL FRAMING (PAR. 4.31) (BSP 800-614-155, Fig. 9E)



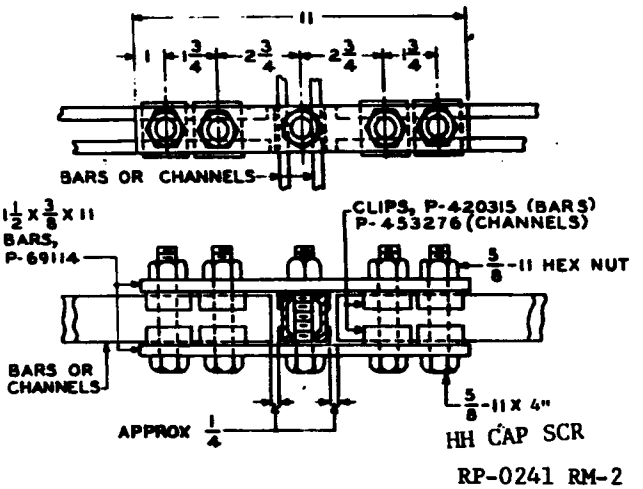



FIG. **9F** SINGLE-LEVEL AUXILIARY FRAMING INTERSECTION OF PRIMARY AND SECONDARY BARS OR CHANNELS (PAR. 4.32) (BSP 800-614-155, Fig. 9F)

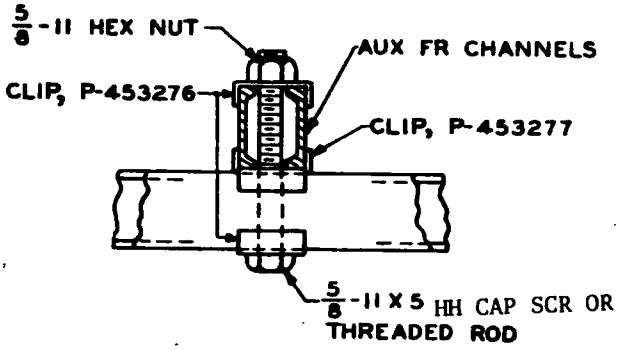
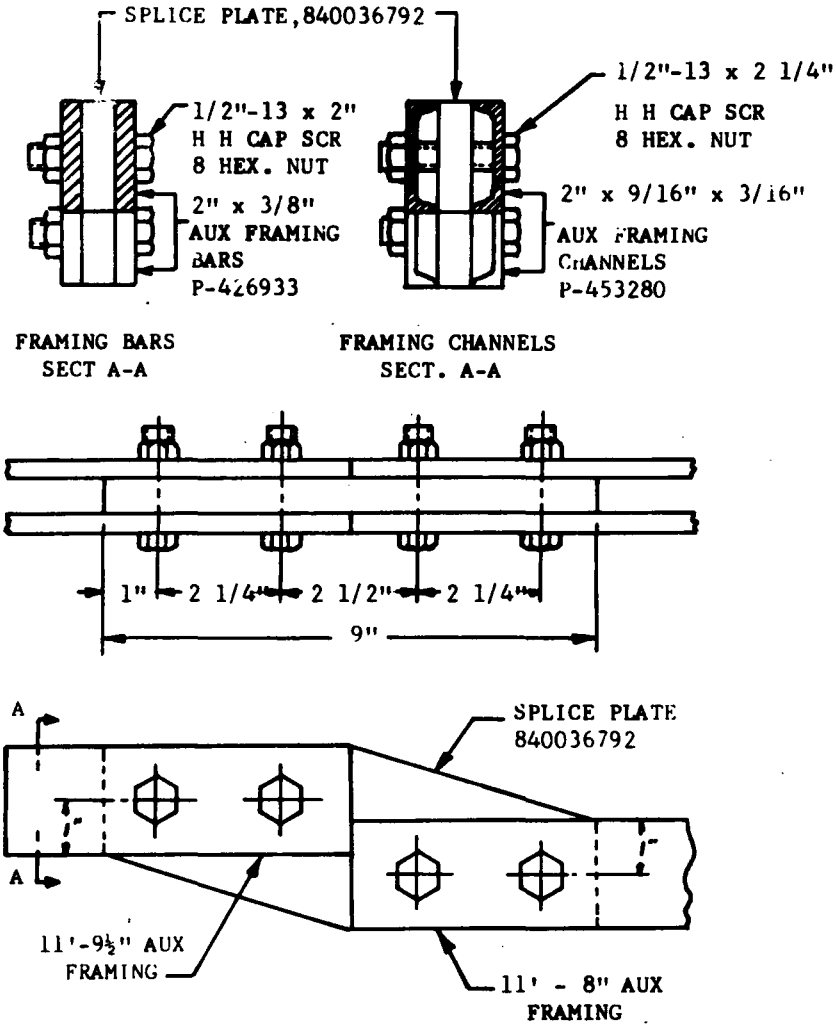
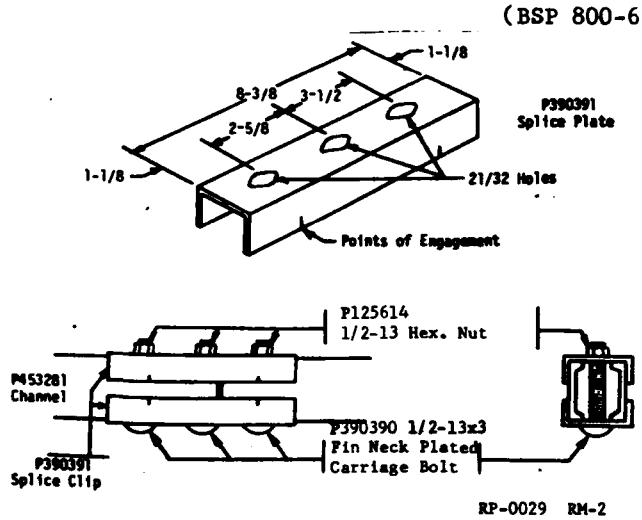



FIG 11J DOUBLE-LEVEL AUXILIARY FRAMING BARS OVER BARS OR CHANNELS OVER CHANNELS (PAR 4.33) (BSP 800-614-155, FIG 11J)



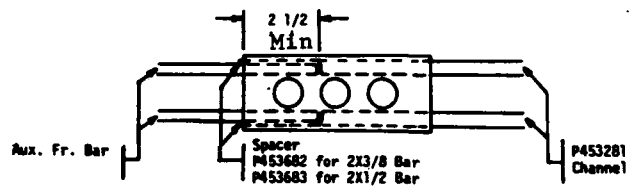

RP-0228 RM-2

FIG. **9H** INTERIM ARRANGEMENT FOR SPLICING 11'8" TO 11'9-1/2" AUXILIARY FRAMING (PAR. 4.22) (BSP 800-614-155, Fig. 9H)



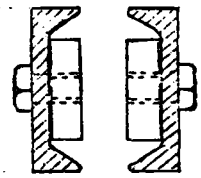

RP-0029 RM-2

FIG. **9J** SPLICING AUXILIARY FRAMING USING P-390391 3-HOLE SPLICE PLATES - CHANNELS TO CHANNELS (PAR. 4.21 (d) and (e)) (BSP 800-614-155, Fig. 9J)




RP-0230 RM-2

FIG. **9K** SPLICING AUXILIARY FRAMING USING P-390391 3-HOLE SPLICE PLATES - CHANNELS TO BARS (PAR. 4.21 (e)) (BSP 800-614-155, Fig. 9K)



SECT. A-A

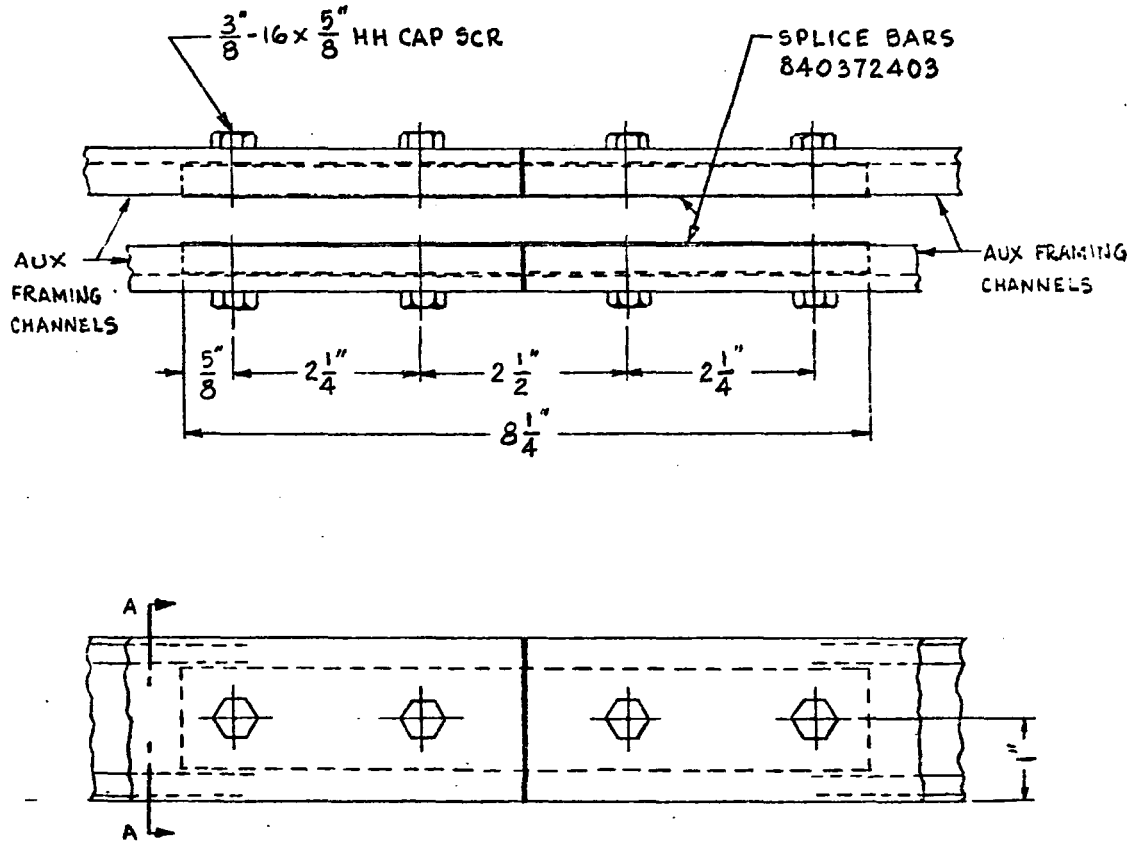
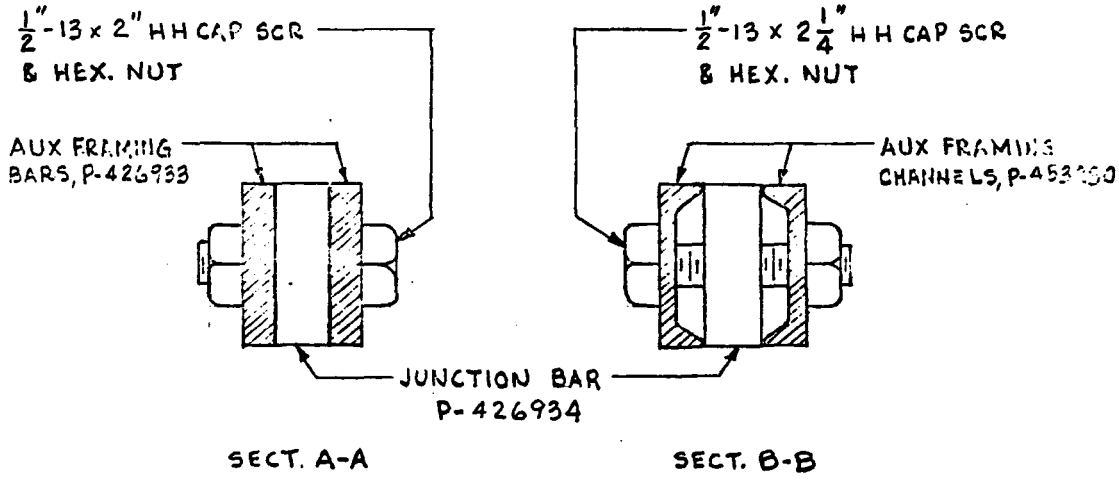



FIG. 9N- SPLICING AUXILIARY FRAMING - CHANNELS TO CHANNELS - USING EARTHQUAKE SPLICE
(BSP 800-614-155 FIG. 9N)



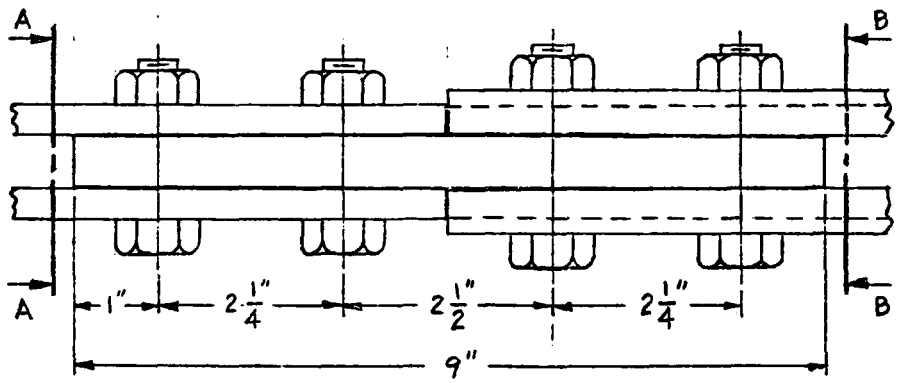




FIG. 9P - SPLICING AUXILIARY FRAMING - CHANNELS TO BARS - USING EARTHQUAKE SPLICE
(BSP 800-614-155 FIG. 9P)

maximum separation of 1/4". These new splice plates are designed such that ladder track, lighting, cable rack, top of frames, etc., can be supported at the splice location thereby considerably reducing amount of channel layout effort. Drawing H-555-123 covers the requirements and methods of attachment for various conditions. (Conditions not covered can be accommodated by applying them to those illustrations they most closely resemble.)

(e) Channels to Bars Using P-390391 3-Hole Splice Plates
The requirements contained in Paragraph 4.21(d) and Figure 9J apply to this arrangement in addition to the specific requirement contained in Figure 9K.

(f) 2" x 3/8" Bars to 2" x 1/2" Bars
Refer to Figure 9C

(g) Channels to Channels using Earthquake Splice 840372403
Refer to Figure 9N

(h) Channels to Bars using Earthquake Splice P-426934
Refer to Figure 9P.

4.22 Splicing 11'-8" High to 11'9-1/2" High Auxiliary Framing on Additions

Where 11'-8" and 11'-9-1/2" high auxiliary framing is junctioned, a 840036792 Splice Plate shall be used to bolt the two levels of framing together as shown in Figure 9H.

4.3 Juntion Assemblies

4.31 Low level framing should be junctioned to high level framing as shown in Figure 9E.

4.32 Where pairs of auxiliary framing bars or channels, ruuning at right angles at the same level are to be junctioned, the fastenings should be made as shown in Figure 9G.

4.33 Pairs of auxiliary framing bars or channels running at right angles with one pair directly above the other would be junctioned as shown in Figure 11J.

## 5. VERIFICATION ITEMS

### 5.1 General

5.11 The following contains the verification items for the equipment installed by operations covered in this section.

5.12 Where practical, the essentials of the requirements are included in the verification item. Where this is not practical, a brief statement of the requirement appears as one or more subparagraphs of the verification item. In each case, reference is made to each requirement.

5.13 Verification items which are followed by the symbol (D) may be checked by the installer on the "Cabling, Cable Rack and Auxiliary Framing Plan" drawings furnished for the job.

5.14 Verification items marked (P) are so designated to denote that the equipment should be verified before a portion of the work becomes indescernible due to additional installation operations. If this requirement does not apply, verify in the regular manner.

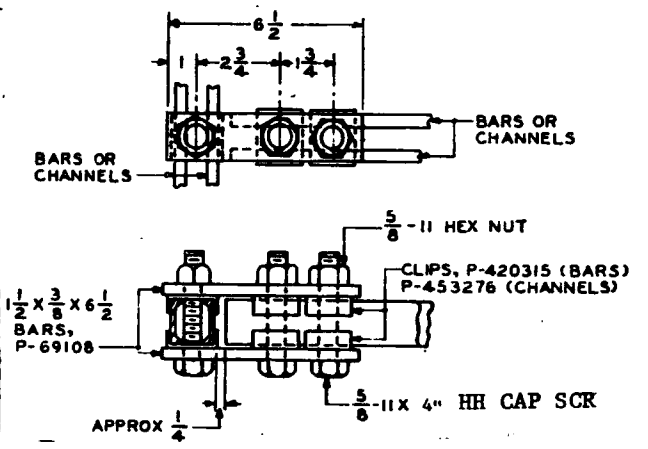



FIG 9G SINGLE-LEVEL AUXILIARY FRAMING JUNCTION OF PRIMARY AND SECONDARY BARS OF CHANNELS (PAR 4.32)
(BSP 800-614-155, FIG 9G)

5.2 Verification Items - Auxiliary Framing

| | VERIFICATION ITEMS AND BRIEF STATEMENT OF REQUIREMENTS | REFERENCE PAR.NO. | REFERENCE FIG.NO. |
|---|---|---|---|
| 5.21 | Supports | | |
| 5.211 | Proper type of clamps used where framing on the same level is junctioned at right angle. | 4.32 | 9G |
| 5.212 | Low type framing junctioned to high type framing as shown in Figure 9E. | 4.31 | 9E |
| 5.213 | Bars to bars, or channels to channels junctioned one above the other as shown in Figure 11J. | 4.33 | 11J |
| 5.214 | All temporary supports used for installation convenience removed (D). | 2.22 note<br>3.23(e) | |
| 5.22 | Splices | | |
| 5.221 | Type of splice correct | 4.21<br>4.22 | 9, 9A, 9B, 9K, 9J<br>9C, 9H, |

→ Arrowed Lines Indicate New or Changed Information

[ Vertical line at side of paragraphs indicates requirements.

Assistant Manager
Common Installation Engineering

Reason for Reissue:
**Correct FIG. 9G and 11J.**
**Add FIG. 9N and 9P.**
**Remove T1 11A dated 6-14-74**
**Application is coverec in**
**HB 30 Series 40**