LOW LEVEL ASSEMBLING OF AUXILIARY FRAMING

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1. GENERAL

1.1 Scope of Section

1.11 This section covers methods for low level assembling. It covers only the particular operations affected by low level assembly technique. Common operations such as laying out and drilling floors, auxiliary framing and cable rack assembly and support, requirements, etc., are covered in this installation handbook and shall be referred to in conjunction with low level assembly technique.

1.12 Cabling technique pertaining to low level assembly is covered in Handbook 8.

1.13 This section specifies the materials to be obtained and the procedures to be used in installing walkways alongside the cable racks in order to perform cabling operation while walking next to the cable racks.

1.131 Cabling walkways are to be used with low level assembly technique ONLY.

1.132 Personnel protective strips must be installed over the cable rack horns.

1.2 Arrangement of Tools

1.21 Prior to starting the operations covered by this section, the tools and other items required should be arranged at the work location so as to minimize fatigure and inconvenience while handling.

1.3 Description of Low Level Assembly Technique

1.31 Low level assembly is an installation technique performed on new jobs and (if economically justified) additions; whereby operations that are normally performed at a level requiring the use of ladders and scaffolding (the installation of auxiliary framing cable rack, ladder track, ladders, lighting, cabling, etc.) are now performed at the low level of approximately 6'-0" from the floor.

1.32 This technique is accomplished by means of floor-supported vertical telescoping stanchions, which in turn support the network at the 6'-0" level from the floor.

1.33 After all operations that can be performed at the 6'-0" level from the floor are completed, the entire network is raised via a hydraulic jack mechanism to the standard height of that particular office.

1.34 As the equipment frames come in and are fastened to the auxiliary framing, the low level facilities are removed from the premises.

1.4 Application

1.41 Low level assembly technique is applicable to any system involving more than 3 building bays in size, (be it addition or new job), and which is installed with low type auxiliary framing.

1.42 Low level assembly technique is applicable to jobs involving more than one floor of auxiliary framing.

1.5 Precaution

1.51 R-3257 Safety Helmets shall be worn by all employees during the low level assembly operations.

1.52 Inspect the R-4324 Wire Rope Hoist for broken wire strands or any other visual damage.

1.53 Inspect the R-4330 Hydraulic Jack for oil leakage or broken welds.

1.54 All stanchions and braces shall have no missing parts, and shall be free from visual defects such as bent, worn, or cracked parts.

1.55 The general precautions are covered in the general sections of the handbooks and in Handbook 0. The precautions should be observed at all times, as they apply to the particular operation being performed.

1.56 The specific precautions to be taken against personal injury and to prevent damage to equipment and service interruptions are covered in this section or in other sections of this handbook with the associated operations.

2. INSTALLATION TOOLS

2.1 Tools

2.11 In addition to the tools contained in the general tool kits, the following specific tools are required:

R-4328	Stanchion Low Level Framing
R-4329	Brace, Low Level Framing
R-4330	Jack, Low Level Framing

2.12 Use suitable material to protect the building columns from damage by column braces during the low level assembly and raising operations.

2.2 Interchangeability

2.21 The low level hoisting facility (composed of R-4322 Stanchion, R-4323 Brace, and R-4324 Wire Rope Hoist) is superseded by R-4328 Stanchion, R-4329 Brace, and R-4330 Hydraulic Jack.

NOTE: Where conditions permit, use the "New" rather than the superseded low level hoisting facility.

2.22 The superseded low level hoisting facility can be used on the same job with the Standard Hoisting Facility (see Paragraph 2.11), however, they are not interchangeable in the same line-up! (In the direction of office sweep.)

2.3 Determining Quantity of Tools Required on Job

2.31 General

2.311 The R-4328 Stanchion and the R-4329 Brace are required on the job from the job starting date to the time the equipment frames are installed.

2.312 The R-4330 Jacks are required only during the actual raising operations, with several remaining on the job during installation of equipment frames.

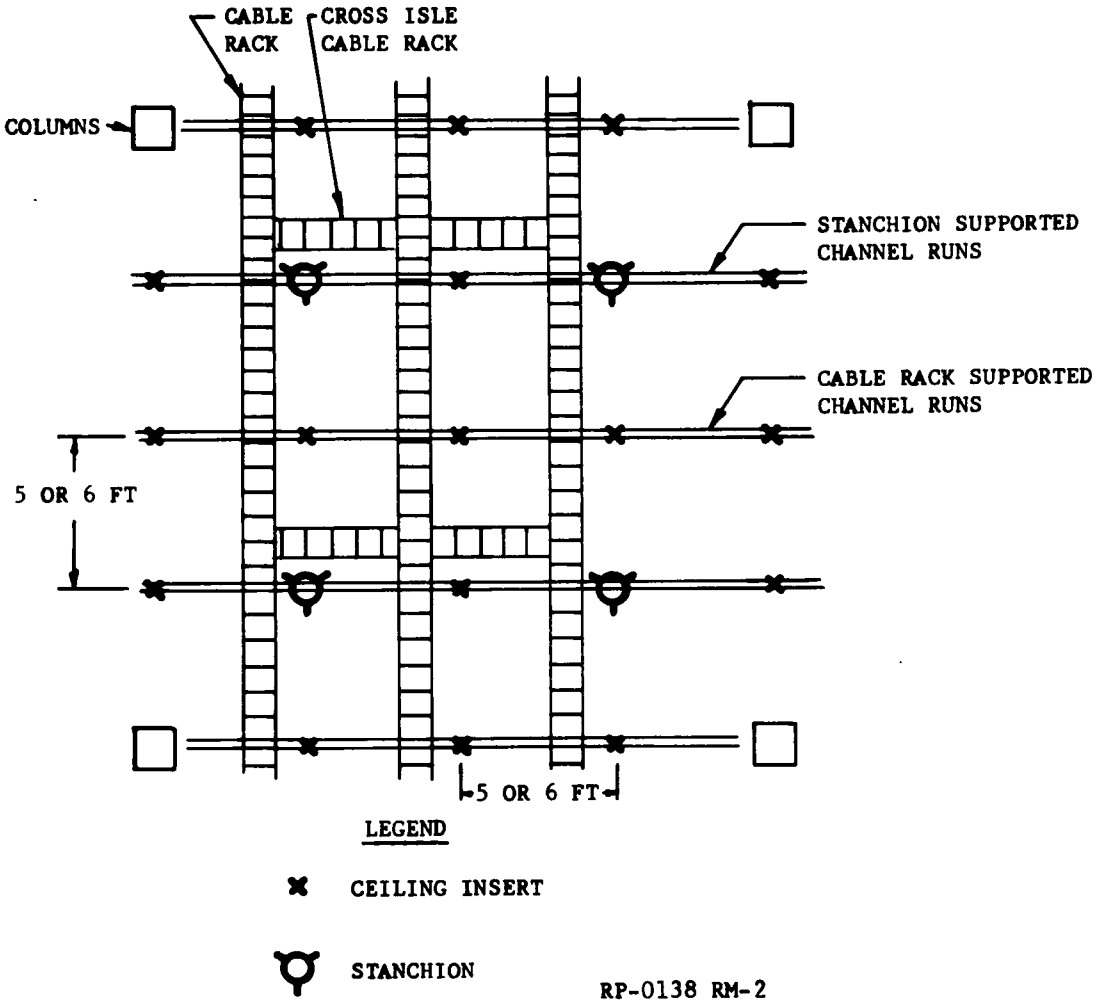


FIG. 1 TYPICAL BUILDING BAY
(PAR. 3.11)

2.32 Specific

2.321 Order R-4328 Stanchion - Approximately four (4) per building bay plus 20% for interspersion during cabling and raising operations.

2.322 Order R-4329 Brace - Approximately 80% of the R-4328 Stanchion quantity.

2.323 Order R-4330 Jack - Approximately 10% of the R-4328 Stanchion quantity.

NOTE: The R-4330 Jacks are shipped three (3) per shipping case.

3. PRELIMINARY OPERATIONS

3.1 Location of Stanchions

3.11 Place four (4) stanchions per building bay on 10 to 12 foot centers as shown in Figure 1.

3.12 Place stanchions around the periphery of the office so that the overhang of the auxiliary framing shall not exceed more than one foot.

3.13 Additional stanchions may be interspersed as required during cabling and raising operations. (These are usually areas of heavy cable concentration.)

3.2 Set-Up and Leveling of Stanchions

3.21 Place the stanchion and brace assembly into vertical position, loosen two (2) set screws in the brace collar, position brace for solid stanchion support and then tighten setscrews in the brace collar.

3.22 For additional leveling requirement of the stanchion, loosen the 1/2-13 nut and bolt in the leg joint of the brace. Level facility and tighten all bolts for firm support of the stanchion.

4. ASSEMBLING IRONWORK AT 6'-0" LEVEL FROM THE FLOOR

4.1 Specific Information

4.11 Install high type framing and any other material that will not be accessible once the low level ironwork is assembled.

4.12 Install threaded rods over unequipped areas and the periphery.

4.13 Place support channels on the stanchions, insert a 5/8-11 x 3-1/4 Sq. H.M. Bolt as shown in Figure 2. Move the stanchions if necessary to miss the support channel splices P-390390, 390391 and 125614.

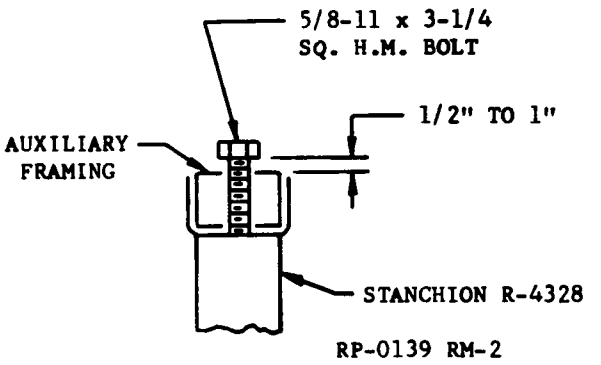
NOTE: Support channels are defined as those channel runs supported by the stanchions.

4.14 Install cable racks in the standard manner, only do not tighten to final torque.

4.15 Install a temporary ground to low level assembly, to avoid the possibility of hazardous voltage.

4.2 Installation of Vertical Cable Rack

4.21 Determine the vertical cable rack length as measured from the cable hole termination to the horizontal cable rack at its permanent length.



NOTE: DO NOT DRAW THE BOLTS TIGHT.

FIG. 2 TYPICAL ATTACHMENT OF AUXILIARY FRAMING TO STANCHIONS (PAR. 4.13)

4.22 Attach vertical cable rack to the horizontal cable rack in the standard manner. (See Figure 3.)

4.23 After the network is raised to the permanent height of the office, attach the vertical cable rack to the cable hole termination in the standard manner.

4.24 Such method provides a flexibility in the vertical cable run between floor during raising operations.

4.3 General Information

4.31 Install the remaining channel runs in the standard manner.

4.32 Assembly column braces on regular framing, do not tighten to final torque. Leave about one inch between the column and brace. Protect the column with suitable material.

4.33 Install ladder track, lighting, switchboard cable, power cable, cabling, etc. Do everything you can at the low level.

4.34 Install rolling ladders, only leave the 5/8-11 hex nuts located between the yoke and the metal hanger step loose until the assembly is raised. This will permit the required slantings of the ladder at various stages of the operation.

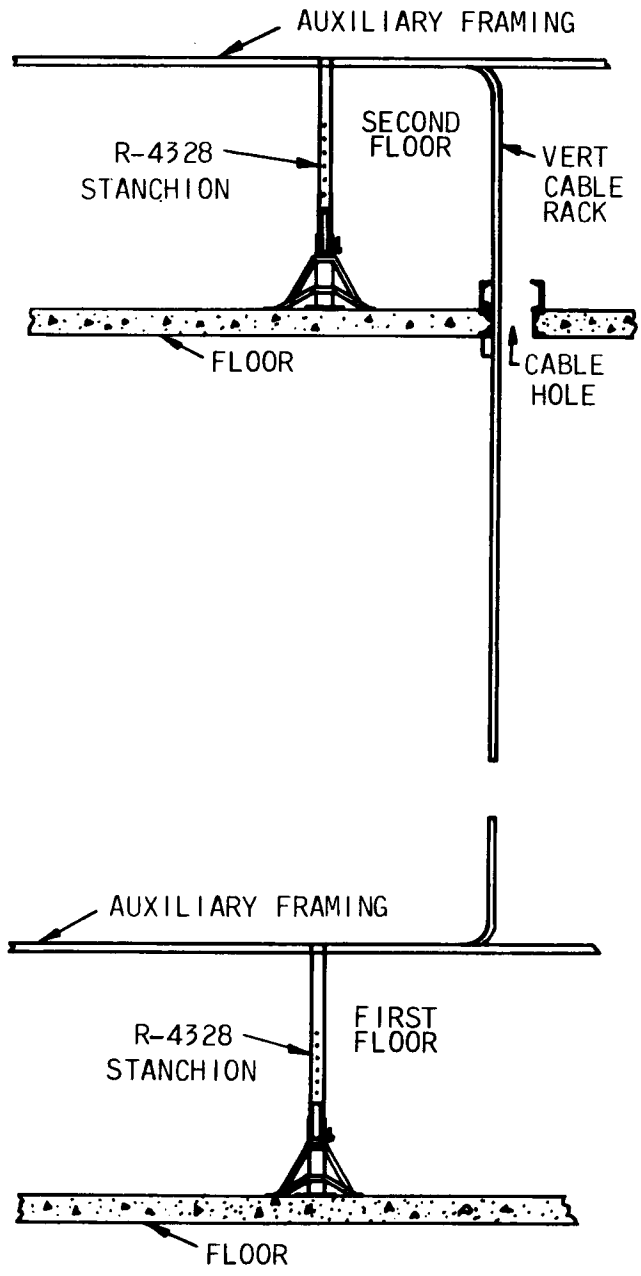


FIG. 3 VERTICAL CABLE RACK ASSEMBLY (PAR. 4.22)

5. RAISING LOW LEVEL NETWORK

5.1 Procedure

5.11 Raising the low level network shall be accomplished using the R-4330 Hydraulic Jack. Position these hydraulic jacks, one per stanchion, parallel to and along the first run of channels. (Reference from the front of the office.)

NOTE: Reference will be made to the front and rear of the office, however, whichever is chosen as the front or the rear shall be used throughout this procedure.

5.12 Remove all lift pins from the stanchions which are held in position by hair clips.

5.13 Place the R-4330 Hydraulic Jack on the outer tubing of the R-4328 Stanchion as shown in Figure 4, Insert one (1) lift pin into the inner tubing immediately above the jack.

5.14 Move the lift pin (and the inner tubing respectively) by the engagement of the R-4330 Hydraulic Jack, a distance of 2 inches for heavily cabled systems such as #4 Cross Bar at a distance of 4 inches for lightly cabled systems such as #5 Cross Bar. Place a second lift pin into the inner tubing so that it rests in the notch of the center tubing.

CAUTION: DO NOT GO PAST THE RED BAND IN THE INNER TUBING.

5.15 Remove the jack and the lift pin from the first row of stanchions and move to the second row of stanchions. Interspersed stanchions shall be raised in unison with the nearest row of stanchions.

5.16 Repeat the above procedure, working your way to the rear of the office. When you have completed this first sweep, the network of ironwork and cabling will be 2 or 4 inches higher, depending on the raising increment used, than at the outset.

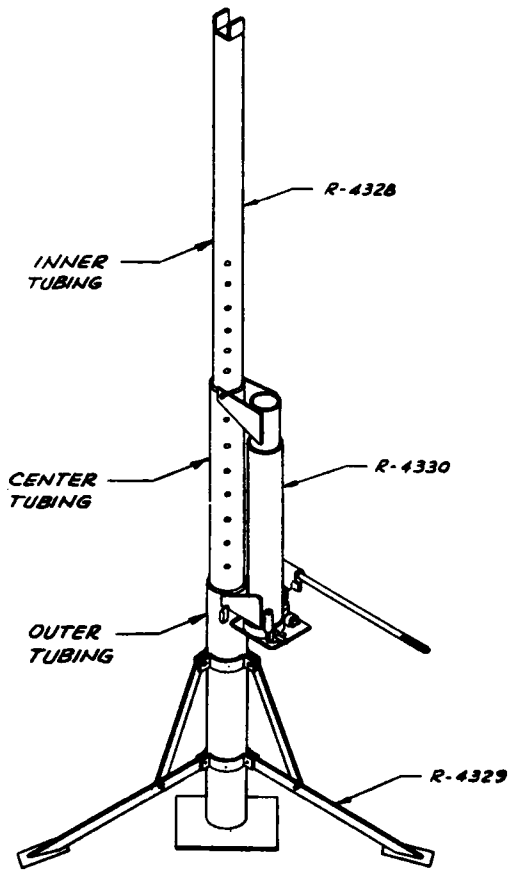


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FIG. 4 LOW LEVEL HOISTING FACILITY (PAR. 5.13, 6.21)

5.17 Continue this sweeping procedure to raise the network until it approaches approximately the permanent height of the office. At this point, raise the network an additional increment (as allowed by the hole location in the stanchion) in order to provide clearance for the installation of equipment frames.

5.2 Multi Floor Raising

5.21 When two (2) or more floors of ironwork and cabling are raised simultaneously, first slacker the vertical cable runs by raising the lower floor an increment (2 or 4 inches) prior to the commencement of raising all floors in unison.

5.3 Stanchion Loading Verification

5.31 Prior to raising the low level network, erify that the stanchions are not subjected to loads (primarily under areas of heavy cable concentration and distributing frames), greater than 2000 lbs. If loads exceed 2000 lbs. per stanchion, intersperse additional stanchions as required.

5.32 Use R-4377 Test Tool for load verifications. This tool consists of a suitable adapter for the hydraulic jack and a torque wrench.

5.33 Insert adapter into the lever socket of the jack and attach torque wrench to adapter. Apply pressure to the torque wrench, to insure proper load engagement.

5.34 To obtain weight in lbs., multiply the torque reading by 50.

6. FINALIZING LOW LEVEL ASSEMBLY

6.1 General

6.11 Finalizing the low level assembly will include the following:

(a) Lowering or raising of auxiliary framing in order to facilitate the installation of equipment frames.

(b) Securing the auxiliary framing in the standard manner.

(c) Remove protective material from the columns and adjust the column braces to their final position.

(d) Run interfloor and/or different level cabling, which was not done at low level.

(e) Install any ironwork you could not put up at low level, secure framing brace, etc.

6.2 Procedure

6.21 Place the R-4330 Hydraulic Jack on the stanchion in much the same manner as for raising operations (Paragraph 5.11 and Figure 4). Lift network enough to release the support pin.

Remove pin and place it in the hole above. Release hydraulic pressure in the jack very slowly, this will cause the network to descend onto the equipment frames.

7. FINISHING OPERATIONS

7.1 General

7.11 Remove the R-4328 Stanchions, R-4329 Braces and R-4330 Hydraulic Jacks.

7.2 Verification

7.21 Verify and tighten all connections that might have loosened during the raising procedure.

7.3 Packaging

7.31 R-4328 Stanchion with R-4329 Brace

7.311 Insert one lift pin and secure it with a hair pin through a hole in the outer tubing, which is also common to all three sections. Insert the remaining two lift pins and secure them with hair pins. Fold and secure brace onto stanchion. Steel band together four stanchions with braces for shipment.

NOTE: Avoid where possible, the shipment of braces not attached to stanchions.

7.32 R-4330 Hydraulic Jack

7.321 Hydraulic jacks shall be shipped in the R-4330 Det. 20 Shipping Case, which is provided with the jacks.

7.34 R-4377 Test Tool

7.341 The R-4377 Test Tool shall be shipped in the R-4377 Det. 10 Shipping Case, which is provided with the test tool.

8. WALKWAY INSTALLATION

8.1

8.11 Install the planking alongside the cable rack as illustrated in Figures 5, 6, 8 and 9. Obtain all lumber locally. Nominal thickness of plank shall be at least two inches (1-1/2 actual). Nominal width shall be at least nine inches (8-1/4 actual). A sufficient number of planks shall be placed side by side to cover the area between cable racks except for a 2-3 inch clearance on each side as shown in Figure 1. If it is necessary to use a combination of narrower planks in order to allow for the clearance next to the cable rack, the planks shall be joined to each other at the midpoint between supports with 2" x 4" nominal lumber and 1/4 inch bolts, nuts and washers; or supported from beneath such that the actual span between supports is no more than three feet. In no case shall a plank less than nine inches wide (nominal) be used singly.

8.111 See Figure 8 for plank splicing.

8.12 After noting the distance between supports on which planking is to be laid, and giving due consideration to any obstructions which may affect removal of the planking, procure the most convenient standard lengths of lumber. Procure sound lumber, dressed on four sides, preferably of a Select Grade, but not less than No. 1 Common. Obtain the most economical of the following varieties: Sitka spruce, Douglas fir, Norway pine, Southern yellow pin, West Coast hemlock, or other woods of equivalent strength which are available locally.

8.13 Planking shall pass above the auxiliary framing when the cross-aisle cable rack is raised, Figure 5, and it shall be suspended under the auxiliary framing when all cable racks are at the same height, Figure 6.

8.14 Install protective strips of lumber over the cable rack horns as shown in Figure 7. The lumber for these 2" x 4" (nominal dimensions) strips may be of an economical grade. Other designs, such as split fiber tubing, providing equivalent protection from the horns may be used.

8.141 Obtain 1" wood drill bit locally and drill approximately 1" deep holes into the 2" x 4" wood on centers similar to the cable rack horns.

8.15 Handholds shall be installed along the periphery and any other areas not planked as shown in Figure 9.

8.16 Perform all cabling operations from the walkways.

8.17 Remove the handholds, protective strips, and the walkways after all the cabling has been performed.

8.18 Install the rolling ladders, raise the low level network and perform the final operations as specified in Section 11LL, Paragraphs 4.34 through 7.34.

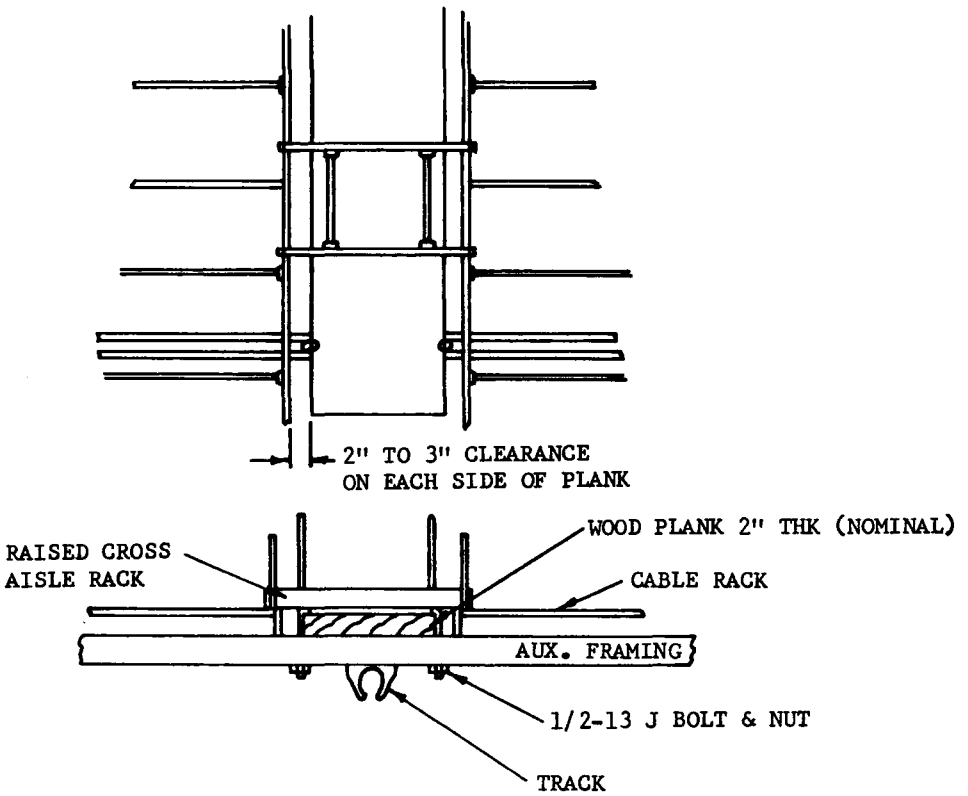

FIG. 5
(PAR. 8.11, 8.13)

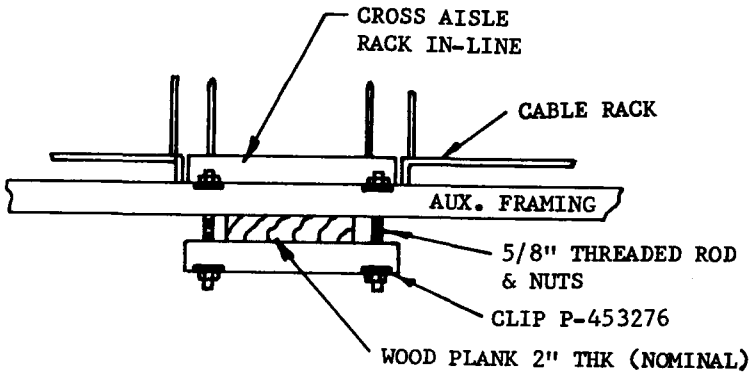

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FIG. 6
(PAR. 8.11, 8.13)

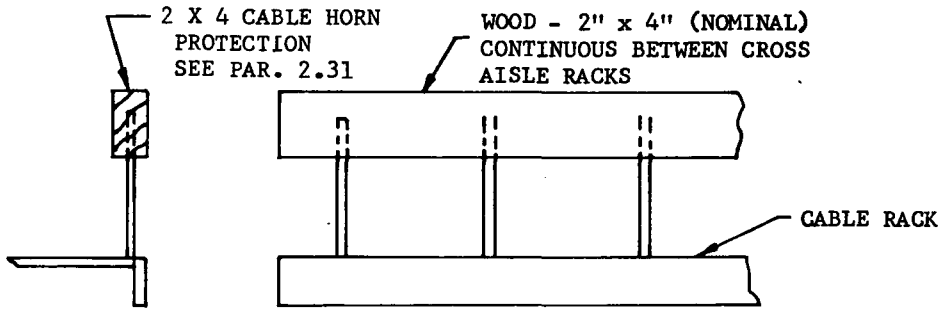

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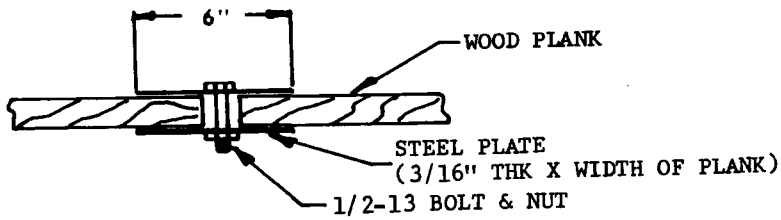
FIG. 7
(PAR. 8.14)



TYPICAL WALKWAY SPLICE

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FIG. 8
(PAR. 8.111)

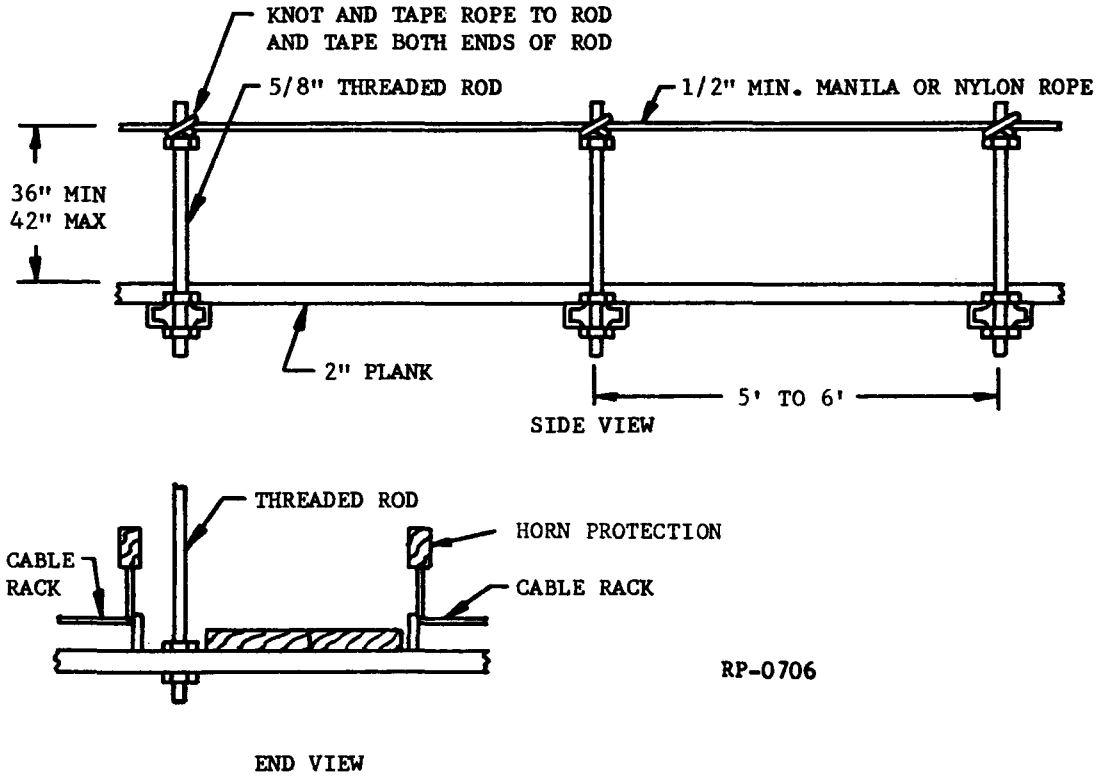

FIG. 9
(PAR. 8.11, 8.15)

➛ Indicates new or changed information.

Engineering Planning Manager
Common Installation Engineering

Reason for Reissue:

To include TI dated 4-30-73 on
Installation of Walkways.