



Installation Manual TITAN™ Code Compliant Modular Access System

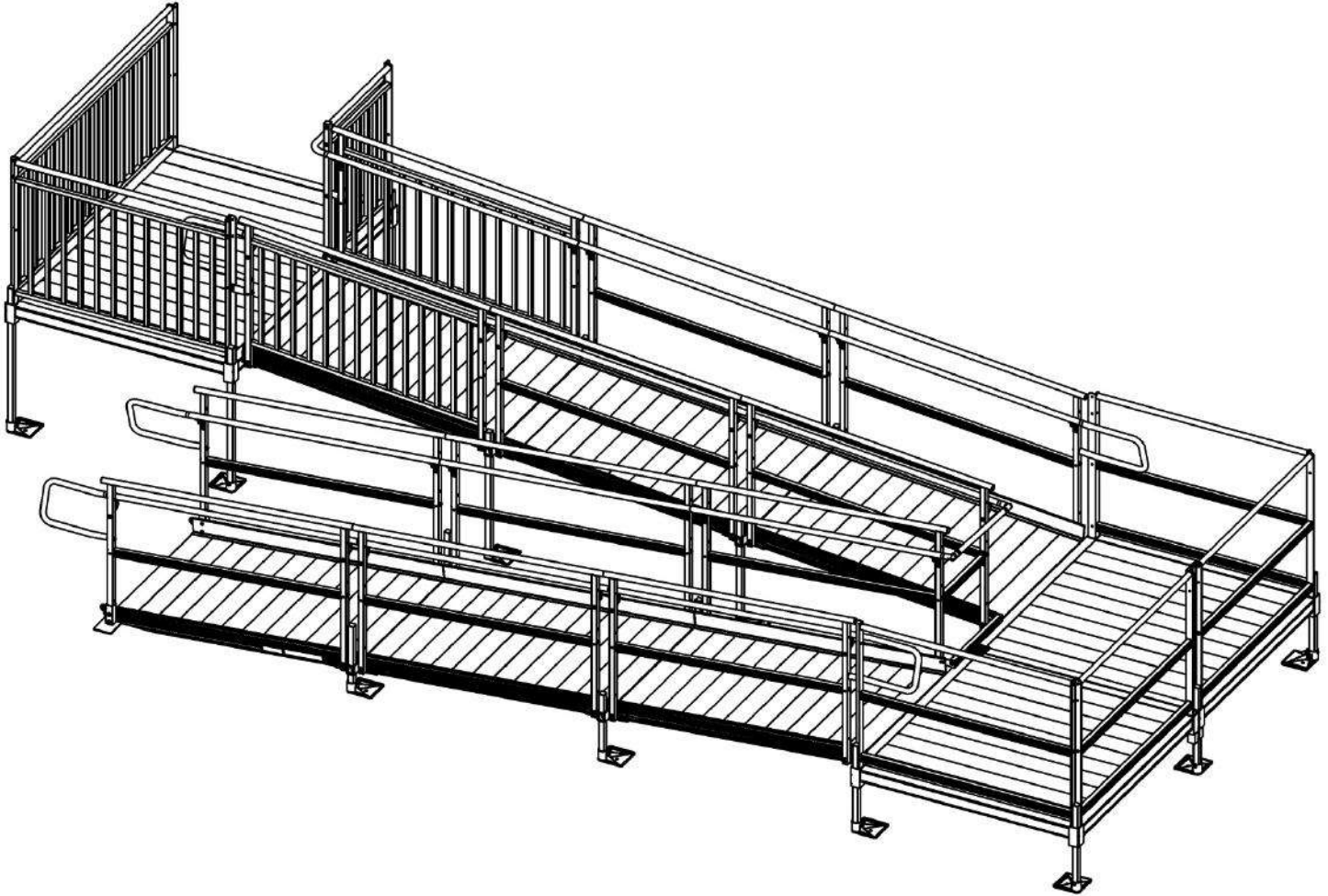


Image shown with multiple ramp and platform rail options.

3-YEAR WARRANTY. Please register at www.ezaccess.com/warranty-satisfaction.
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Manufactured in the USA





17845 02-28-2020

















INTRODUCTION

“System” refers to the entire TITAN™ Code Compliant Modular Access System, including any gates, stairs, ramps, platforms, risers, handrails, supports, transition plates, transition bridges, landing pads, and any/all hardware and components which are intended to be assembled on the TITAN™ Code Compliant Modular Access System.












SYMBOL MEANINGS, WARNINGS, AND NOTES

-  The **WARNING** symbol indicates a potentially hazardous condition/situation. The safety warnings throughout this manual, and on your equipment, if any, are for the protection of people and property. Failure by any operator to abide by safety warnings will result in a waiver of all liabilities, loss of your warranty, and could result in equipment damage and or failure, property damage, risk of serious bodily injury, and or death. The symbol may appear in various colors and in conjunction with other symbols and with or without the written word “WARNING”.
-  The **NOTE** symbol indicates important information. Failure to obey all notes could result in improper operation, less-than-optimum equipment performance, and at the sole discretion of the equipment manufacturer, may void your warranty. The symbol may appear in various colors and in conjunction with other symbols and with or without the written word “NOTE”.




WARNINGS

-  Rated Load: 100 lbs. psf live load, 300 lbs. concentrated. Do not exceed Rated Load.
-  Read, understand, and follow the Installation Manual, Supplements, and Addendums, if any, in their entirety. Learn and understand the location and function of all features, Rated Load, safety devices, and labels before use. If you do not understand which manuals apply, or their content, do not use the system and call 1-800-258-8503 for further information.
-  Always follow all warnings and safety directives.
-  Maintaining all labels and manuals in legible condition is required by the system owner and is essential for safe operation. Do not remove product safety labels. If any labels are missing, damaged, or become illegible, they must be replaced. An illegible label will fail to alert individuals on or around the system of a procedure or hazardous operating conditions. To obtain replacement copies of instructions, warnings, and labels, call 1-800-258-8503.
-  Professional installation, by an EZ-ACCESS approved technician, is required.
-  This system is made from aluminum. Aluminum is electrically conductive. Do not lay power cords on or across electrically conductive materials, such as this system. Do not use system near exposed wiring or hang lights or extension cords from system.
-  Only use components supplied or approved by manufacturer with system.
-  Never place on, under, or attach to the system anything the manufacturer did not supply. Do not use any part of the system to support, attach, or hang planters, baskets, lights, ropes, cords, decoration, fabrics, or other ornaments or furnishings.
-  System surfaces may become slippery when wet; use extra caution when system surfaces are wet.
-  Use system only with a qualified helper.
-  Always use your mobility device’s lap belt.
-  It is important that you refer to your mobility equipment’s owner guide for the proper degree of incline/decline and chair direction before using ramp. Never exceed your mobility equipment manufacturer’s recommendations.
-  This product must be installed and maintained as specified in this manual and per your applicable local codes. Ask your local contractor or your Authority Having Jurisdiction (AHJ) for information.
-  Use caution at all times. Proper maintenance and upkeep to the system is vital. Call 1-800-258-8503 to inquire about inspections and service.
-  Always use handrails for added stability.
-  Before each use, visually inspect the system to ensure that all parts are in good condition and that the system is free of any damage. If any part of the system appears damaged, loose, or missing, do not use until repaired by an EZ ACCESS approved technician.



WARNINGS, CONT'D.

-  Annually (more frequent in harsher environments) inspect all fasteners and verify all nuts, bolts, screws, and other fasteners are undamaged and secure. If any part of the system appears damaged, loose, or missing, do not use until repaired by an EZ ACCESS approved technician.
-  Do not tamper with, attempt to repair, or modify any portion of the system. Only EZ-ACCESS approved technicians may provide service.
-  Do not lean on, walk on, or otherwise bear weight on the system until installation is complete.
-  Consult local building codes for information on securing system for environmental loads.
-  Do not use if surfaces are cluttered, obstructed, or unsafe.
-  At all times, keep the system clear of dirt, leaves, and other debris that may accumulate on the surface. Simply sweeping the system or using a garden hose will usually suffice, but, if needed, a damp cloth or soft brush with mild dish soap and water can be used (avoid alkaline solutions). Rinse well and use extra caution when system surface is wet.
-  If snow and or ice is present on the system, remove accumulations before use. Please refer to 'DEICING' section for more information.
-  Before each use, confirm the system is level and positioned securely. Periodically check for ground shifts and make any necessary adjustments.
-  Do not sit, stand, or climb on guards, gates, or handrails. Do not play on or around system, including, but not limited to, running, jumping, bicycles, scooters, skateboards, etc.
-  Properly support and restrain system in transit or storage.
-  If you have any questions, or would like additional care, usage, or general safety information, please call 1-800-258-8503.

ATTENTION INSTALLER and END USER

-  Prior to use, read and understand this manual and all other applicable manuals, including supplements and addendums, if any, and warning labels, in their entirety. Learn and understand the location and function of all features, Rated Loads, safety devices, and labels before use. If you do not understand which manuals apply, or their content, do not use the TITAN™ Code Compliant Modular Access System and call 1-800-451-1903 for further information.
-  Leave this Installation Manual with the end user.
-  Fill out online warranty registration.

IMPORTANT SHIPPING INFORMATION

-  The shipment contains a packing list. Confirm all items are present before starting installation. Open shipping boxes and inspect for damage or missing parts. If damaged or missing parts are noted, DO NOT INSTALL OR USE.
-  Check for shipping damage immediately upon receipt and note any freight damage on freight bill while driver is still present. Contact shipper right away with any freight damage concerns. In most cases, freight damage claims will not be allowed unless noted on the freight bill. Pictures of damage before the unit is unpacked can be very helpful.

TOOLS TYPICALLY REQUIRED

- | | |
|--|--|
| ✓ 1/2" SOCKET OR 1/2" WRENCH | ✓ 5/32" ALLEN WRENCH |
| ✓ 9/16" SOCKET OR 9/16" WRENCH | ✓ 3/16" ALLEN WRENCH |
| ✓ 5/16" SOCKET OR 5/16" WRENCH | ✓ BOX KNIFE |
| ✓ LEVEL | ✓ HAMMER |
| ✓ FILE | ✓ 1/4" MASONRY DRILL BIT (IF INSTALLING TO CONCRETE PORCH, STEP, ETC.) |
| ✓ RUBBER Mallet | ✓ DIGGING TOOLS (FOR SURFACE OBSTACLE REMOVAL) |
| ✓ POWER DRILL | ✓ HACKSAW (IF OPTIONAL HANDRAIL KITS ARE USED) |
| ✓ 25' TAPE MEASURE | ✓ PLIERS |
| ✓ #2 PHILLIPS HEAD SCREWDRIVER | ✓ CLAMP |
| ✓ 5/16" DRILL BIT (IF BRACE ASSEMBLIES ARE USED) | |

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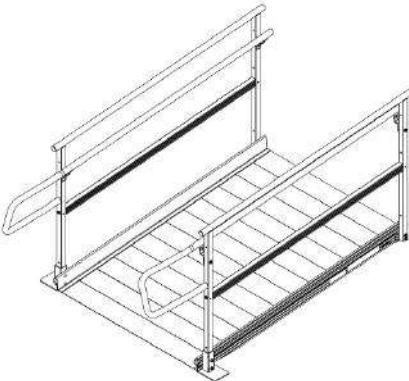
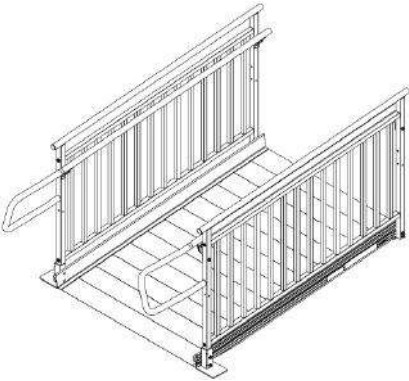
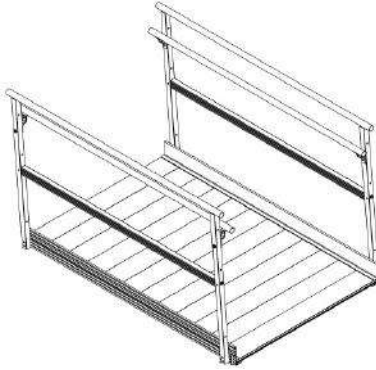
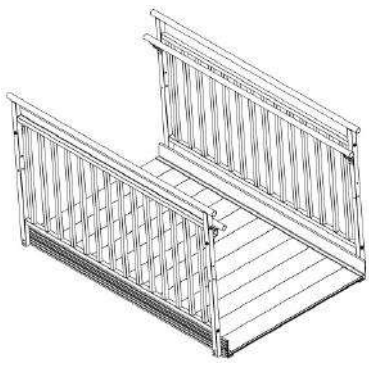
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1. **BASIC SYSTEM COMPONENTS**

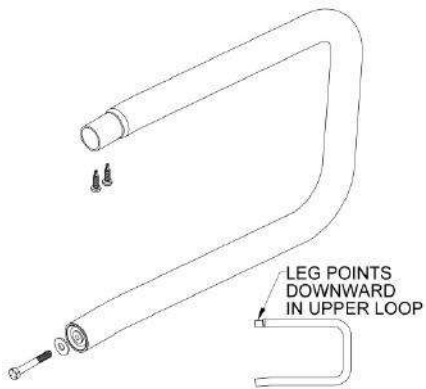
Because configurations will differ from one another, your system may or may not contain all of these basic components. The system may also include custom items or items not shown in this section. Identify your system components before you begin.

RAMPS AND RAMP HANDRAIL OPTIONS	
STARTER RAMP WITH TWO-LINE HANDRAILS*	STARTER RAMP WITH PICKETED GUARDS*
	
RAMP WITH TWO-LINE HANDRAIL	RAMP WITH PICKETED GUARDS
	

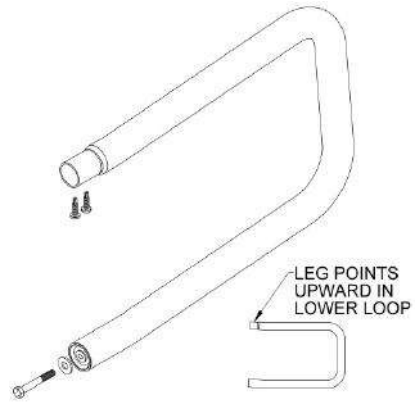
***END LOOPS SHOWN FOR CONTINUITY (ORDERED SEPARATELY)**

KEY RAMP COMPONENTS

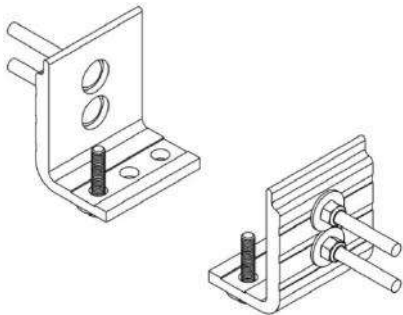
T3GRHRLU – HANDRAIL END LOOP UPPER



T3GRHRL – HANDRAIL END LOOP LOWER

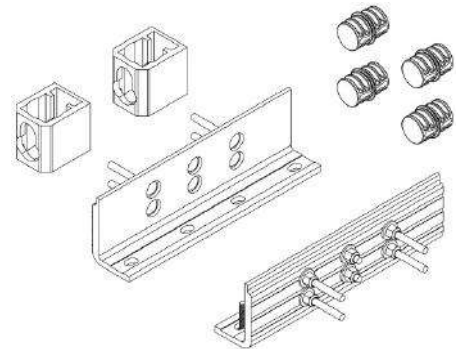


T3GRHBPR – RAMP HANDRAIL END BRACKET (PAIR)



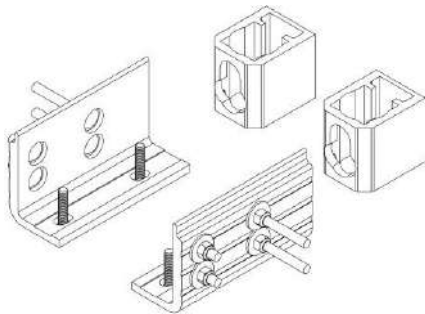
T3GRRC – CONNECTOR RAMP TO RAMP

INCLUDES COMPONENTS TO CONNECT RAMPS AND RAMP HANDRAILS

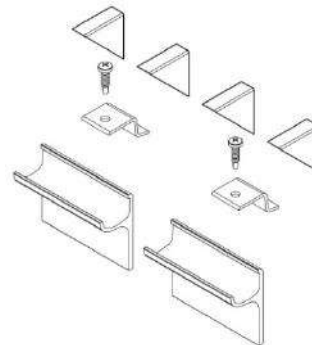


T3GRST – RAMP SUPPORT TOP

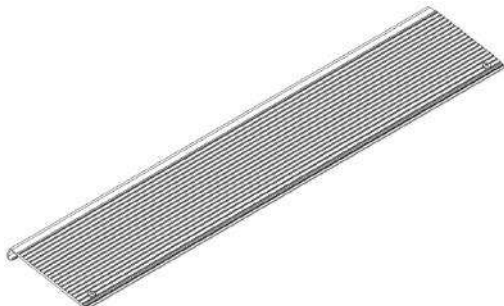
USED WHEN LEGS SUPPORT UPPER OR LOWER END OF RAMP ONLY



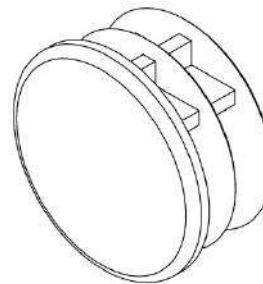
T3GRHP – RAMP HANGER PAIR



TTP48, TTP54 & TTP60 – RAMP TRANSITION PLATE

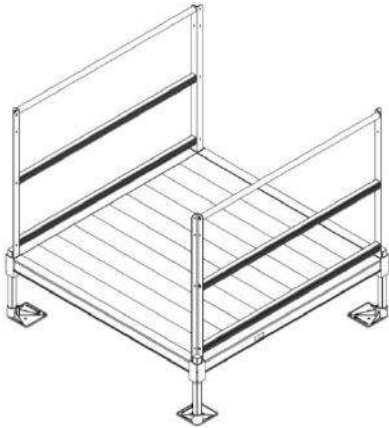


T3GHREP – HANDRAIL END PLUG

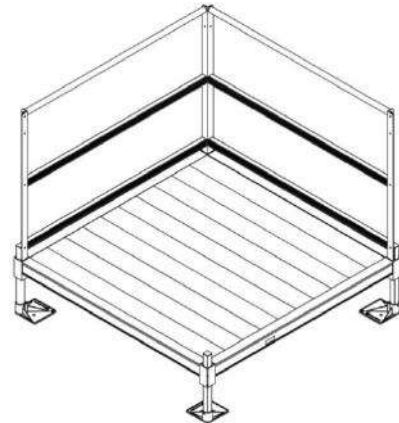


PLATFORMS AND PLATFORM HANDRAIL OPTIONS

**PLATFORM WITH TWO-LINE
(STRAIGHT CONFIGURATION)***



**PLATFORM WITH TWO-LINE
(TURN CONFIGURATION)***



**PLATFORM WITH PICKETED GUARDS
(STRAIGHT CONFIGURATION)***

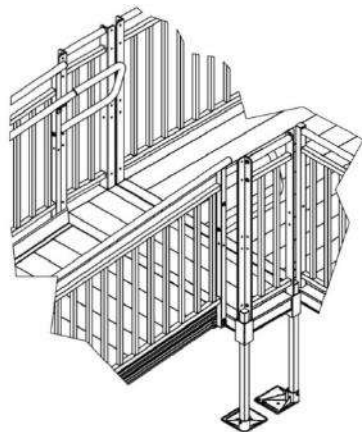


**PLATFORM WITH PICKETED GUARDS
(TURN CONFIGURATION)***



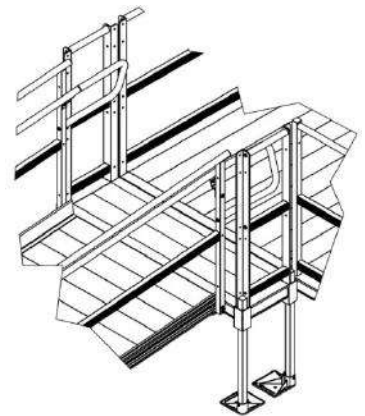
PLATFORM EXTENDER WITH PICKETED GUARDS*

END LOOPS
SHOWN FOR
CONTINUITY;
ORDERED
SEPARATELY



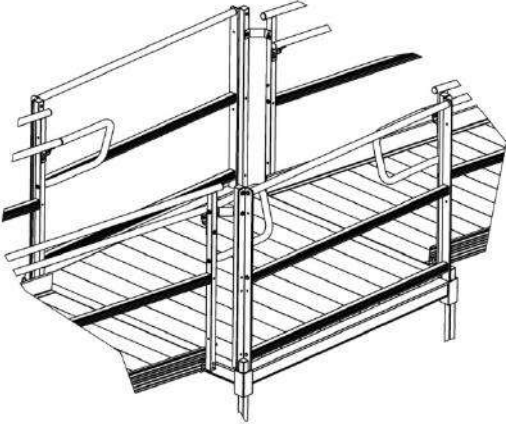
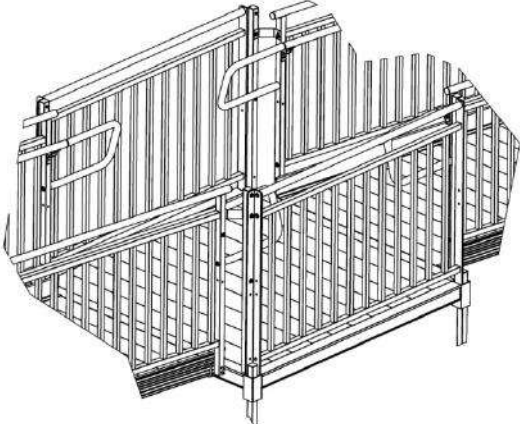
PLATFORM EXTENDER WITH PICKETED TWO-LINE*

END LOOPS
SHOWN FOR
CONTINUITY;
ORDERED
SEPARATELY





***FEET & LEGS SHOWN FOR CONTINUITY (ORDERED SEPARATELY)**

PLATFORMS AND PLATFORM HANDRAIL OPTIONS, CONT'D.

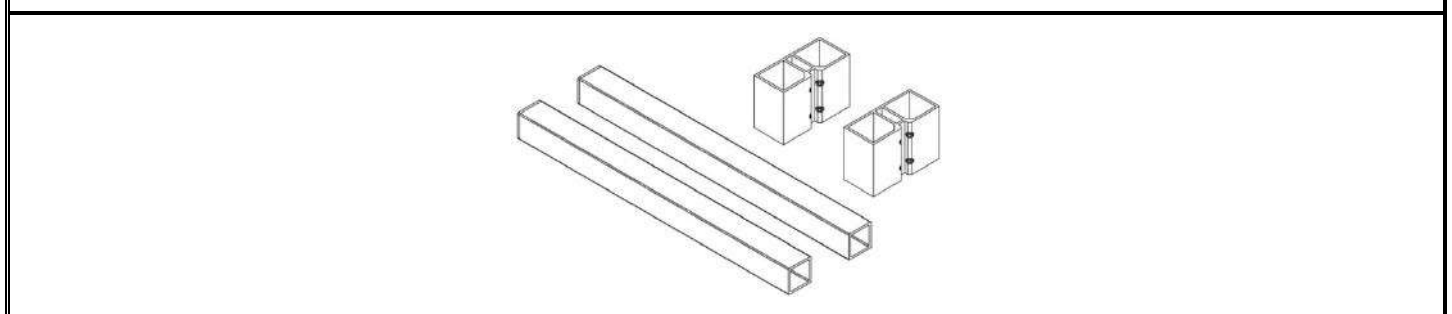
RESTING PLATFORM WITH TWO-LINE*	PLATFORM WITH PICKETED GUARDS*
 <p>NOTE: END LOOPS ARE INCLUDED WITH RESTING PLATFORMS</p>	 <p>NOTE: END LOOPS ARE INCLUDED WITH RESTING PLATFORMS</p>

*FEET & LEGS SHOWN FOR CONTINUITY (ORDERED SEPARATELY)

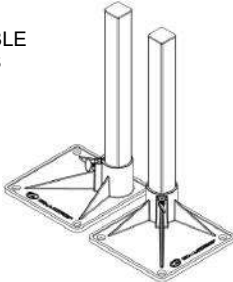

KEY PLATFORM COMPONENTS

T3GCPCR – CORNER POCKET COVER PAIR	T3GCPD – CORNER POCKET COVER, DOUBLE, 1 EA.
	

T3GPPC – CONNECTOR PLATFORM TO PLATFORM

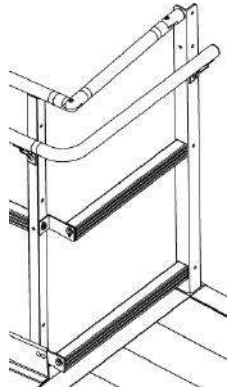


ADDITIONAL COMPONENTS FOR RAMPS & PLATFORMS

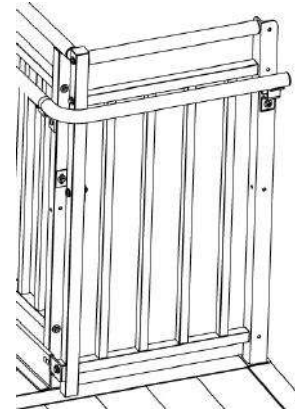
T3GSLxxPR – SUPPORT LEGS WITH FEET (PAIR)	TXB36 & TXB736 – CROSS BRACE
<p>XX DENOTES USABLE LENGTH (LENGTHS AVAILABLE 10" THROUGH 112")</p> 	<ul style="list-style-type: none"> • TXB36 USED ON 5' & 6' PLATFORM SIDES & RAMPS • TXB736 USED ON 7' PLATFORM SIDE 

CLOSURE OPTIONS

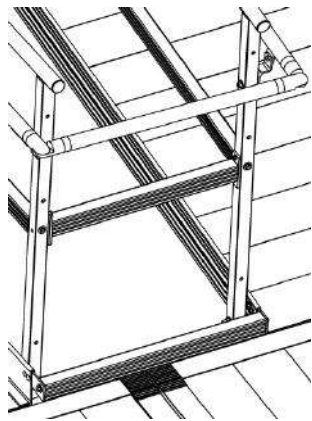
**T3GCTL5, T3GCTL6, T3GCTL7
TWO-LINE RAIL CLOSURE**



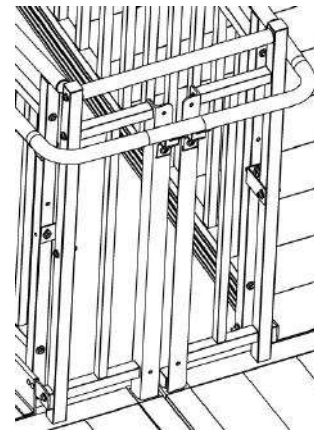
**T3GCG5, T3GCG6, T3GCG7, T3GCG654, T3GCG754
PICKETED GUARD CLOSURE**



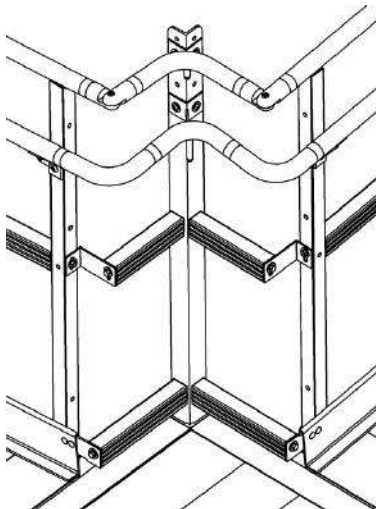
**T3GTBCTL5, T3GTBCTL6
TURN BACK CLOSURE TWO-LINE RAIL**



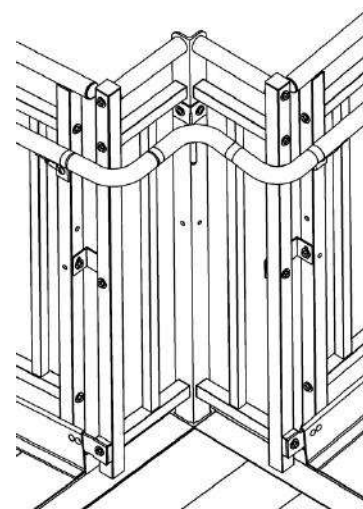
**T3GTBCG5, T3GTBCG6, T3GTBCG554, T3GTBCG654
TURN BACK CLOSURE PICKETED GUARD**



**T3GCTCTL5, T3GCTCTL6
CORNER TURN CLOSURE TWO-LINE RAIL**



**T3GCTCG5, T3GCTCG6, T3GCTCG554, T3GCTCG654
CORNER TURN CLOSURE PICKETED GUARD**



2. PLATFORMS

2.1. INSTALL PLATFORMS



If your system does not include a platform, skip to 'CONNECT RAMP SECTIONS'.

Platform handrails are shown (FIGs. 2.1, 2.2, and 2.3) for clarity of how to orient platforms in various configurations. For installation ease, install all platforms and ramps before installing handrails (see 'HANDRAILS' section).

- 2.1.1. There are three basic platform arrangements, though one or more of these arrangements may be used. All three require the same procedure for installation except for FIG. 2.3, which requires an additional CONNECTOR PLATFORM TO PLATFORM.

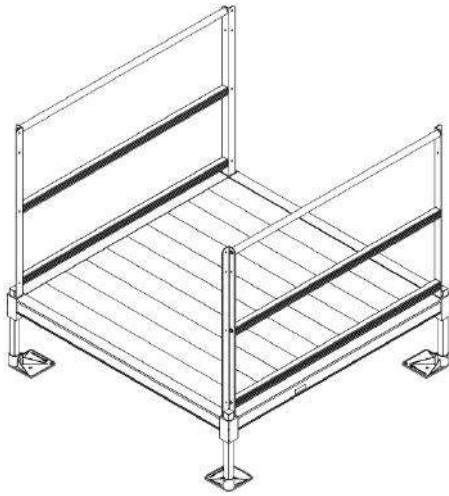


FIG. 2.1

Platform in straight configuration

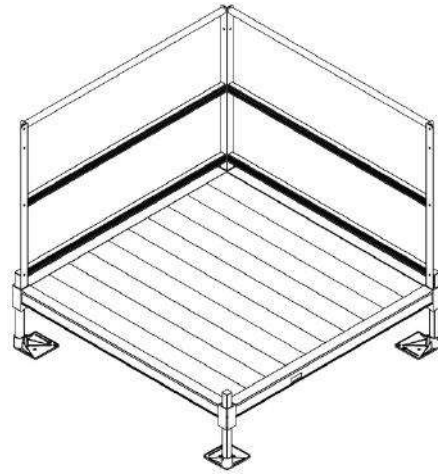


FIG. 2.2

Platform in turn configuration

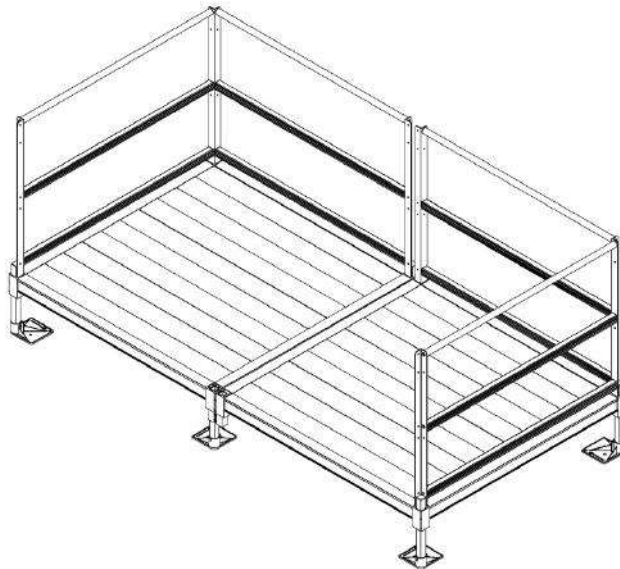


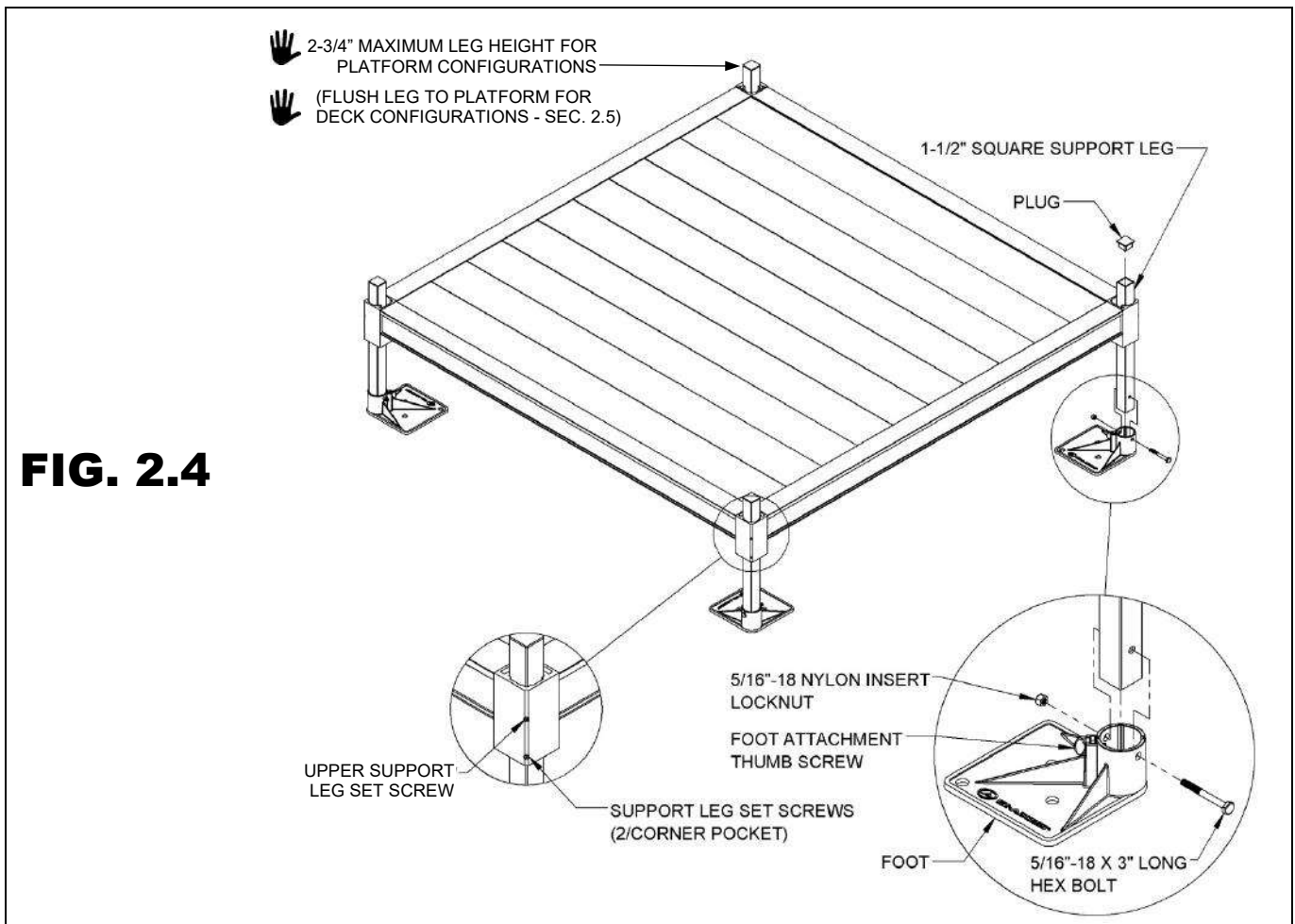
FIG. 2.3

Two platforms in turn back configuration




(In a turn back configuration, connect any two platforms with equal length sides together)

2.2. INSTALL SUPPORT LEGS AND FEET AND ADJUST PLATFORM HEIGHT



- 2.2.1. Support legs, plugs, and feet come in pairs. Support legs come in lengths corresponding to the layout.
- 2.2.2. Loosen all set screws in the platform corner pocket and the foot's thumb screw, if needed, to fully engage the support leg in the foot (FIG. 2.4). Repeat for all support legs.
 - 2.2.2.1 Set screws on the outside of the platform are for the platform support legs.
 - 2.2.2.2 Set screws on the inside of the platform are for the platform angle posts.
- 2.2.3. Tip the platform on its side, then slide the support legs into the four platform corner pockets. Adjust the support legs to the approximate platform height needed (FIG. 2.4).
 - 👉 Platform Configurations: The platform support legs must be no shorter than flush with the top of the corner pocket and extend no more than 2-3/4" above.
 - 👉 Deck Configurations: When creating decks from platforms (see 'CREATING DECKS FROM PLATFORMS' section) where corner pocket covers will be used, legs cannot extend above the top of the platform corner pocket.

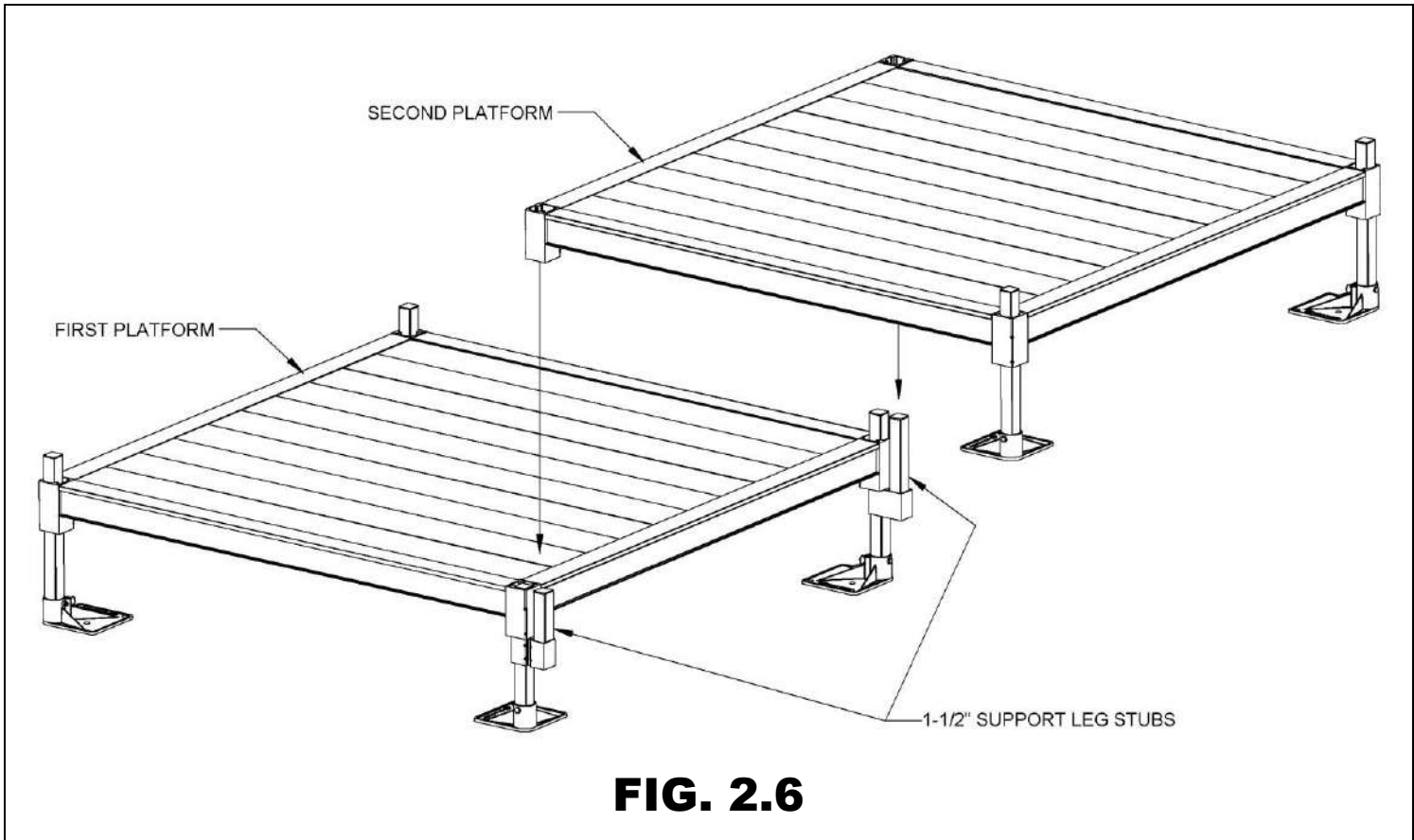
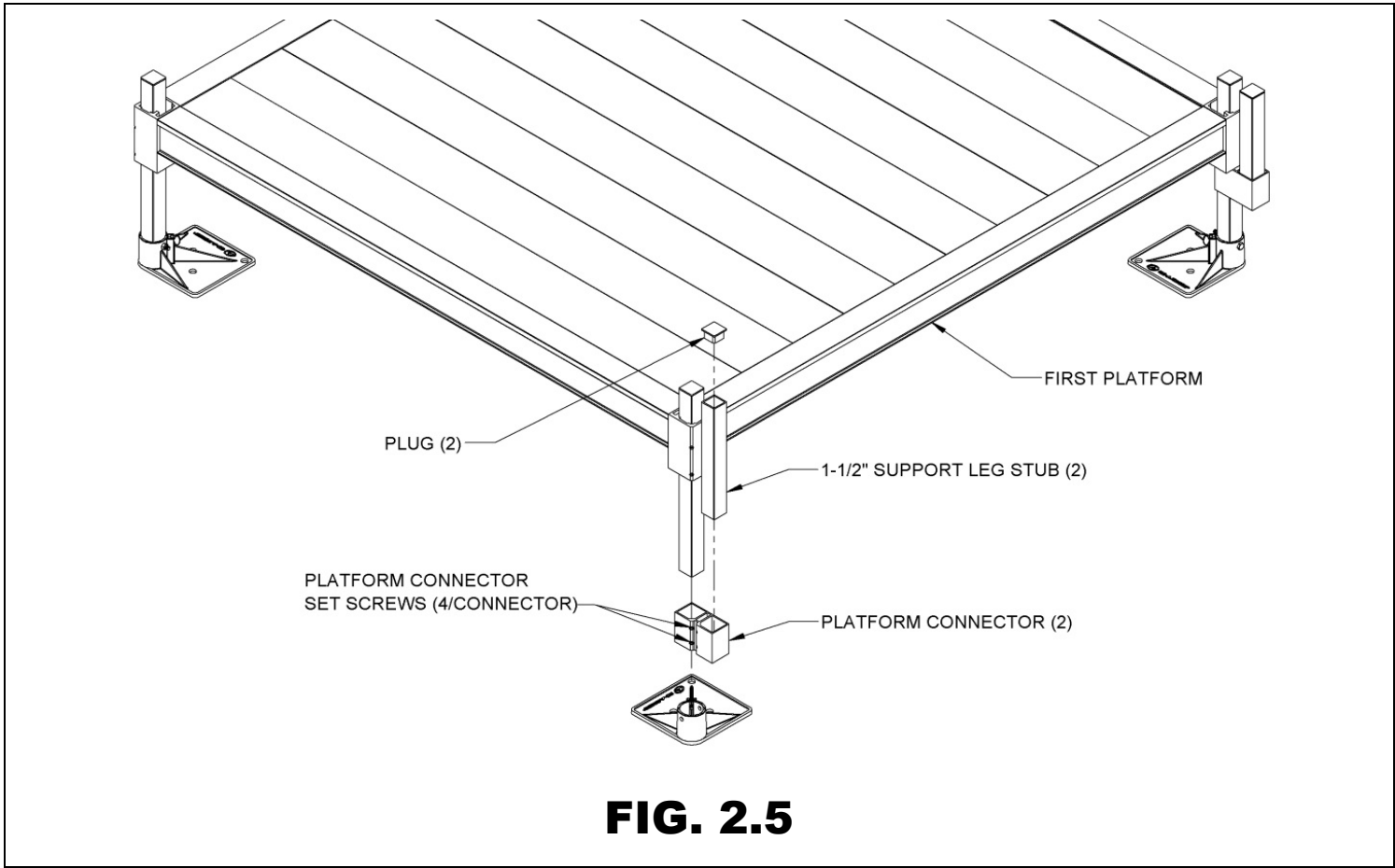


- 2.2.4. Use 3/16" Allen wrench to tighten the upper (FIG. 2.4) platform corner pocket set screws just enough to hold the support legs in place but do not over tighten (second set screw will be tightened after final height adjustments).
 - 👉 Platforms configured as a turn back platform (FIG. 2.3) will have six legs to adjust.
 - ⚠ Do not attempt to walk on the platform until platform has been fully installed.
- 2.2.5. Place the platform with support legs attached into the upright position.
 - ⚠ Do not let the weight of the platform bear on the support legs while tipping the platform upright, as system damage and injury could result.

- 2.2.6. Lift each corner of the platform and install a foot on each support leg, oriented so that the foot extends under the platform (FIG. 2.4).
 -  If necessary due to site conditions, the feet can be oriented in other directions but may present a tripping hazard if not oriented under the platform.
 -  It is the installer's responsibility to install the system in a manner which is safe for the persons on and around the system and clearly mark any hazards created by the installation.
- 2.2.7. Make sure the feet are fully engaged on the legs and tighten the thumb screw on each foot securely (FIG. 2.4).
 -  If installing on soft soil it may be necessary to set the foot on a concrete pad or make other arrangements. Talk with your local contractor for additional information.
- 2.2.8. Use hole in the foot as a template to drill an 11/32" or 3/8" hole through each support leg (FIG. 2.4).
- 2.2.9. Insert a 5/16"-18 x 3" long hex bolt through the support leg and foot, then secure with the 5/16"-18 nylon insert locknut.
- 2.2.10. Adjust the final height of the platform by adjusting legs, one at a time, by loosening the outer set screws in the platform corner pockets. Using a level, adjust the platform height and re-tighten.
- 2.2.11. Once the final height has been adjusted, tighten the second, outer lower set screw in each platform corner pocket.
- 2.2.12. Insert a plug and fully seat into the top of each support leg (FIG. 2.4). Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.
- 2.2.13. Tighten all set screws and fasteners securely.

2.3. CONNECT TWO PLATFORMS TOGETHER

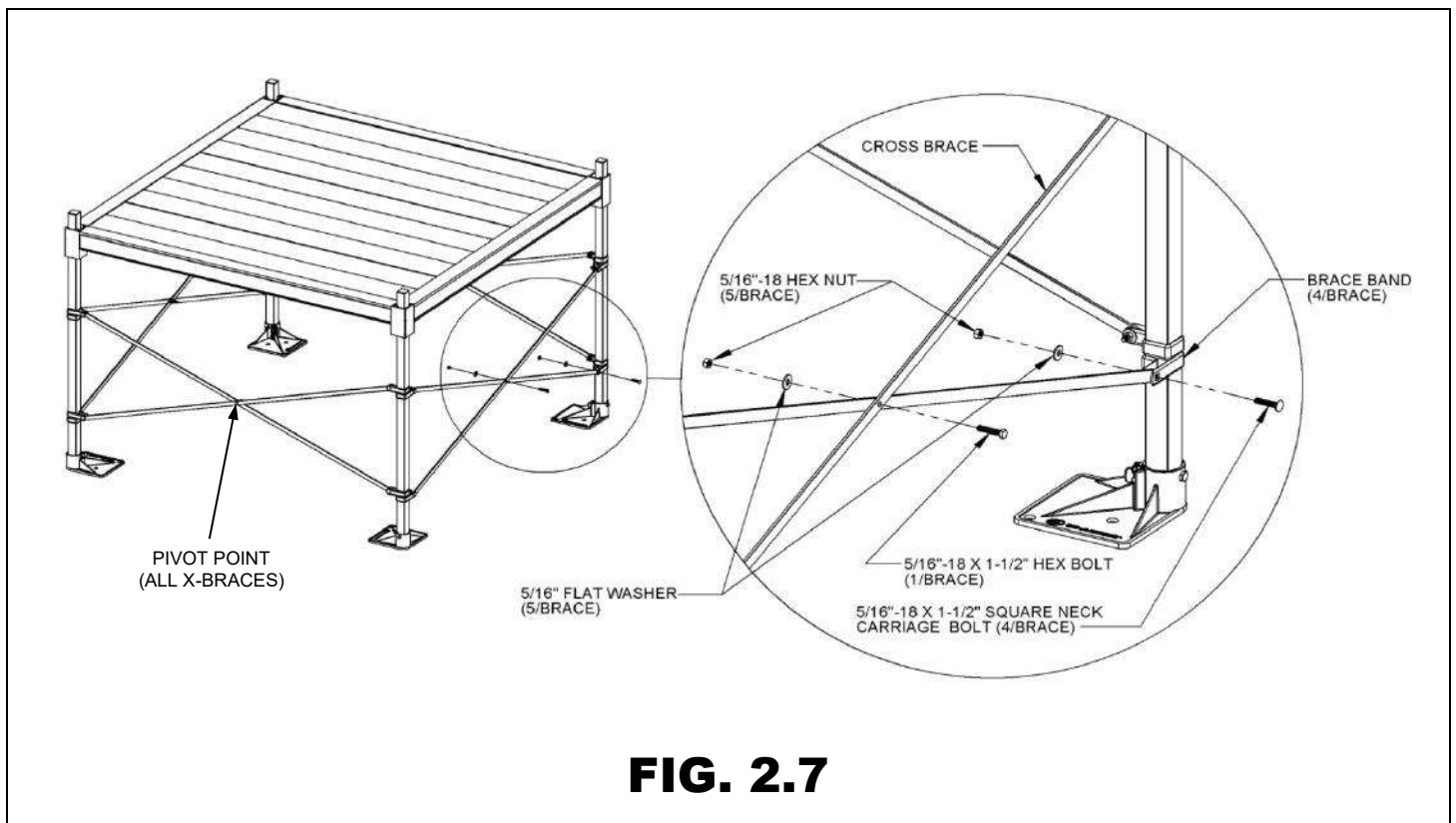
- 2.3.1. Install the first platform as described in the previous steps except on the side where the second platform will connect, install two CONNECTOR – PLATFORM TO PLATFORM before installing feet onto the support legs.
 -  Make sure the platform connector set screws are oriented outward so they will be accessible.
 -  Any two platforms of the same width can be connected. For example, two 5' x 5' or 5' x 6' platforms are often connected to make a turn back platform.
- 2.3.2. Slide platform connectors up until they contact the bottom of the platform (FIG. 2.5), and then tighten set screws securely.
- 2.3.3. Install a support leg stub into the open pocket in each connector until the bottom of the stub is flush with the bottom of the connector, and then tighten set screws securely.
- 2.3.4. Insert a plug and fully seat into the top of each support leg stub. Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.
- 2.3.5. Install the second platform as described in the previous section except only install support legs, plugs, and feet on the opposite side of where the platforms will connect (FIG. 2.6).
- 2.3.6. Lift the second platform and slide the open corner pockets over the support leg stubs extending up from the platform connectors.
- 2.3.7. Tighten the set screws in the platform corner pockets securely.
- 2.3.8. Adjust the platform heights and level as needed.
- 2.3.9. Tighten all setscrews securely.



2.4. INSTALL CROSS BRACE – PLATFORMS

For added stability, platforms with walking surfaces over 36" high require bracing (certain configurations and site conditions may require bracing under 36"). The TXB36 CROSS BRACE is used for 5' and 6' platform sides and ramps. The TXB736 CROSS BRACE is used for 7' platform sides.

- 2.4.1. Use four braces per platform or six braces when two platforms are connected.
- 2.4.2. Separate ends of brace bands until they fit around the 1-1/2" support leg.
- 2.4.3. Install four bands on each leg with the part containing bolt holes at 90-degrees from each other and in line with the outer edge of the foot (FIG. 2.7).
- 2.4.4. The cross brace should be placed approximately in the middle of the platform legs on all four sides with the top brace bands a minimum of two feet from the bottom brace bands.
- 2.4.5. Install the cross brace by installing the 5/16"-18 x 1-1/2" hex bolt, 5/16"-18 hex nut, and 5/16" flat washer through the center hole in the braces. Tighten enough to hold the brace together but still allow it to pivot around the bolt (FIG. 2.7).
- 2.4.6. If needed for the location, trim the ends of the cross brace to fit.
- 2.4.7. Drill one 11/32" or 3/8" diameter hole on center approximately 1/2" from both ends of each brace.
- 2.4.8. Install the assembled cross brace between the legs of the brace bands using the four 5/16"-18 x 1-1/2" long square neck carriage bolts, 5/16"-18 hex nuts, and 5/16" washers provided (FIG. 2.7).
- 2.4.9. Tighten all fasteners securely.



2.5. CREATING DECKS FROM PLATFORMS

Decks can be created by combining platforms and joining them with platform connectors (refer to 'CONNECT TWO PLATFORMS TOGETHER' section).

- ⚠ Never use two leg stubs at a platform connector; there must always be at least one leg with a foot reaching the ground in the connector.
- ⚠ Regardless of the location of the platforms and the platform connectors in the deck, use a minimum of two legs per platform.

- 2.5.1. Whenever possible, alternate the direction of the platform connectors from one side of the platform to the other as the deck is being created.
- 2.5.2. At locations where four platform corners meet, install the platform legs in opposite diagonal corners (whenever possible), and alternate the direction of the opposite diagonal corners at the next connection.
- 2.5.3. Trim all legs and leg stubs on the interior of the deck at or below the top of the platform corner pockets as the deck is being created (the outer perimeter, where two-line rails or picketed guards will be installed, should not be trimmed).
- 2.5.4. Locate the PLATFORM CORNER POCKET COVER PAIR and/or PLATFORM CORNER POCKET COVER DOUBLE.
- 2.5.5. Insert the 2" x 2" angled edges into the pockets where the post would normally be installed. Use either two pairs of the single pocket covers, two of the double pocket covers, or any combination needed for the specific platform deck layout (FIG. 2.8).
- 2.5.6. Tighten the inside set screws in corner pocket to hold the covers in place (FIG. 2.9).

FIG. 2.8

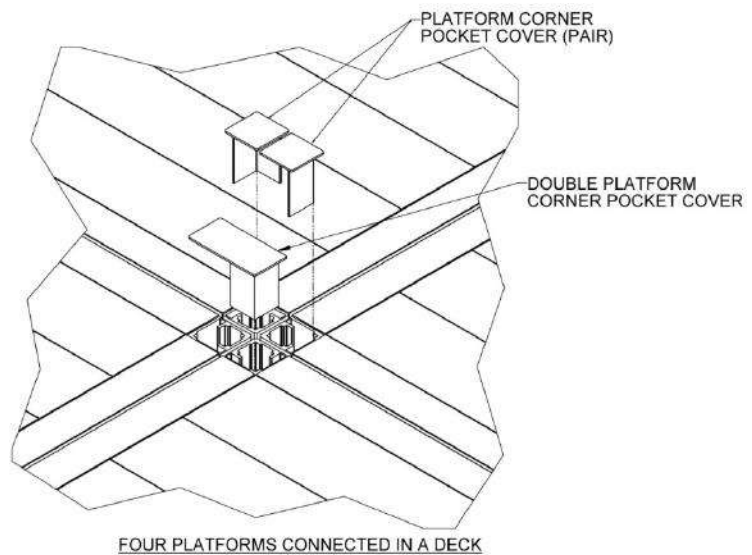
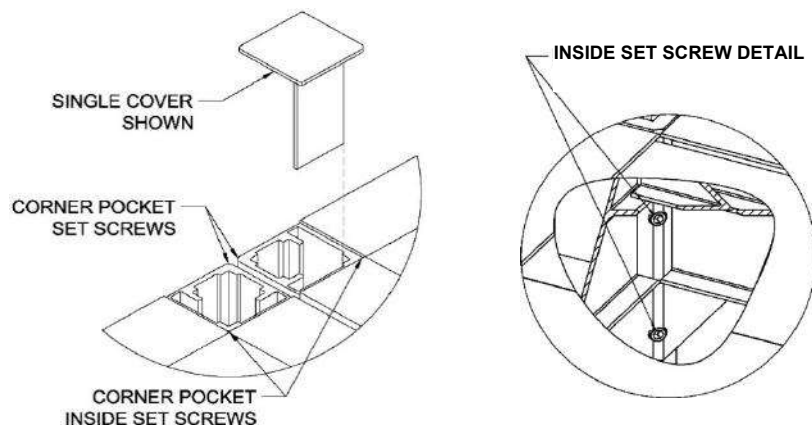


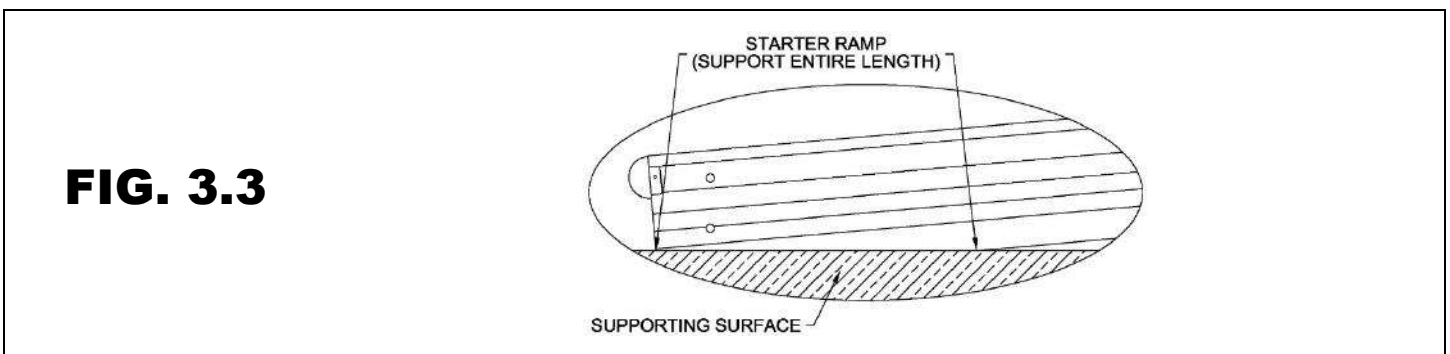
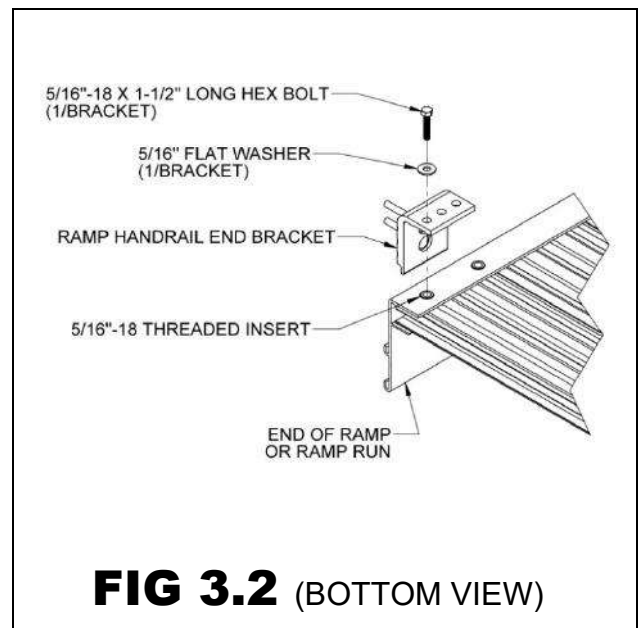
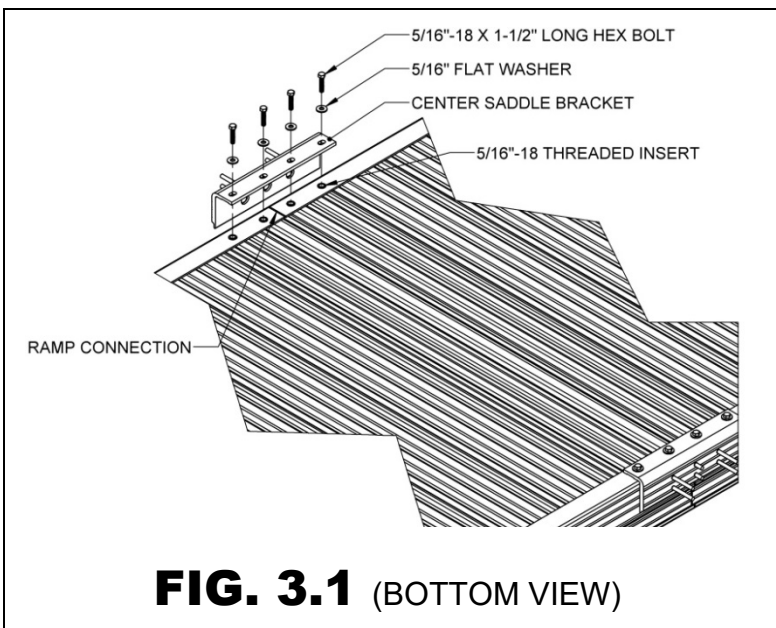
FIG. 2.9



3. RAMPS

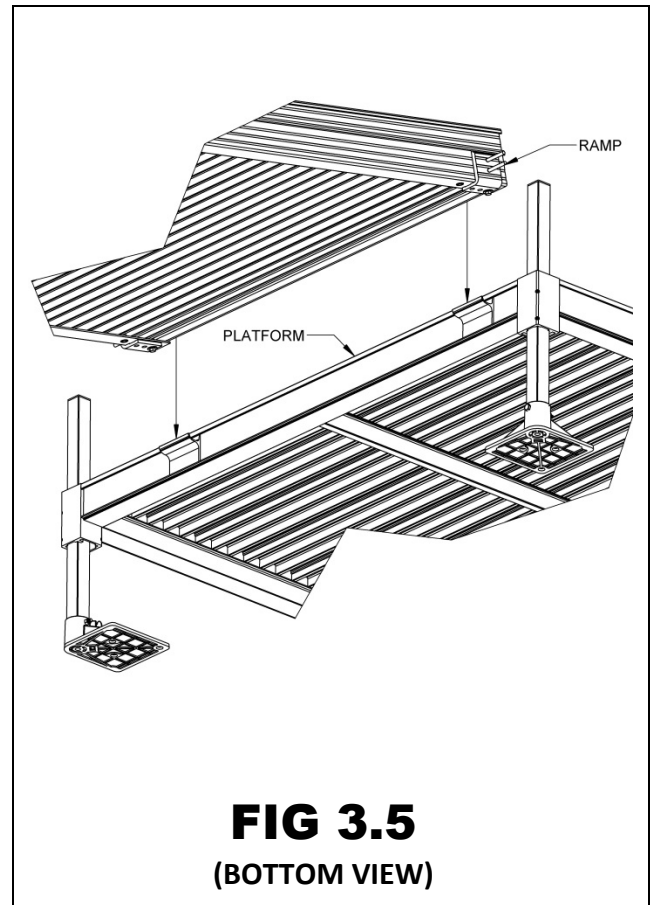
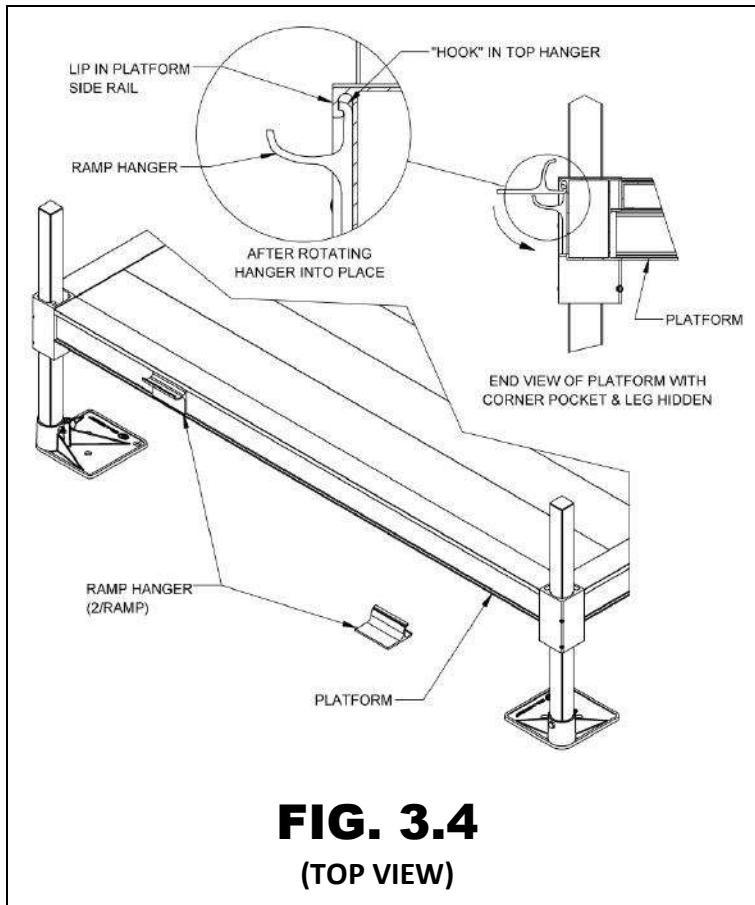
3.1. CONNECT RAMP SECTIONS

- 3.1.1. Place the walking surface side of the ramp sections face down onto cardboard or lawn so that the ramp is not scratched, dented, or damaged.
- 3.1.2. Butt the two sections together end-to-end, ensuring there is no gap, and then position the two center saddle brackets, included in the CONNECTOR – RAMP TO RAMP, over the threaded inserts at the end of each ramp section (FIG. 3.1).
- 3.1.3. One edge of the center saddle bracket will slide into the lower hook of ramp side rail.
- 3.1.4. To create a run, ramp sections are connected using two center saddle brackets per joint. Handrails and ramp legs attach to the center saddle brackets.
- 3.1.5. Place the center saddle bracket where ramps connect and attach using four each 5/16"-18 x 1-1/2" bolts and 5/16" washers per bracket. Tighten all eight bolts.
👉 If you chose the RAMP SUPPORT TOP option, install as described in 'RAMP SUPPORT' section.
- 3.1.6. Install four end brackets (used to attach handrails in a later step). Use one end bracket at each outside corner of the ramp or ramp run using one 5/16" x 1-1/2" bolt and washer into the threaded insert closest to the end of the ramp (FIG. 3.2).
- 3.1.7. Turn the joined ramps over into their upright position.
👉 When turning ramps over, be careful not to damage the threaded studs.
- 3.1.8. The starter ramp (see image in SECTION 1) features a tapered section for transitioning to the ground. It is usually the first ramp in a system and connects to other ramps as described in this section.
⚠️ The starter ramp's tapered section must be completely supported by the ground; do not use starter ramp in an elevated position (FIG. 3.3).



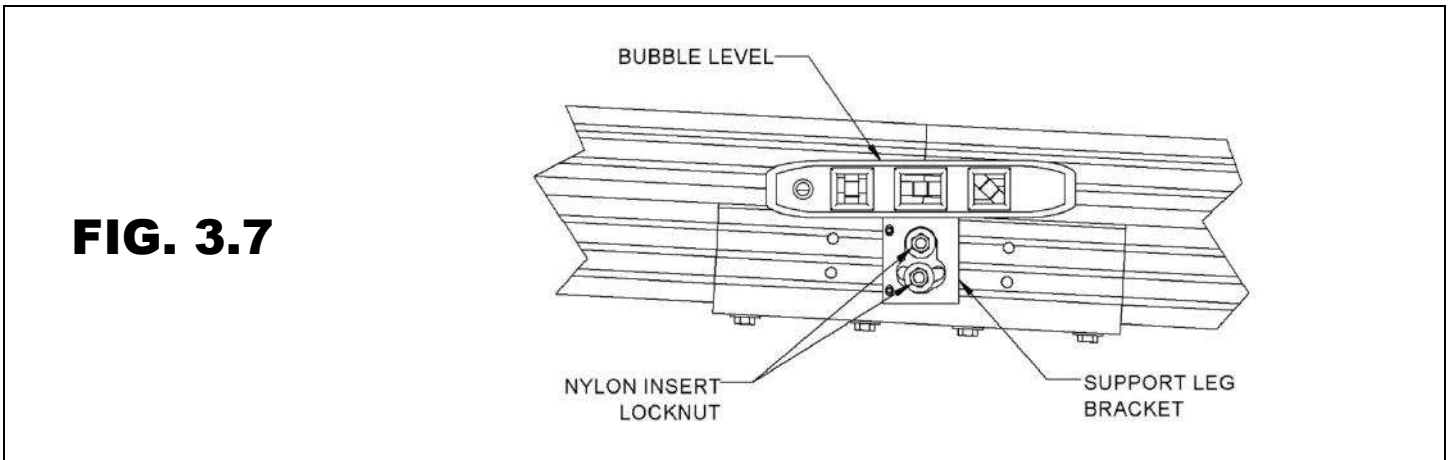
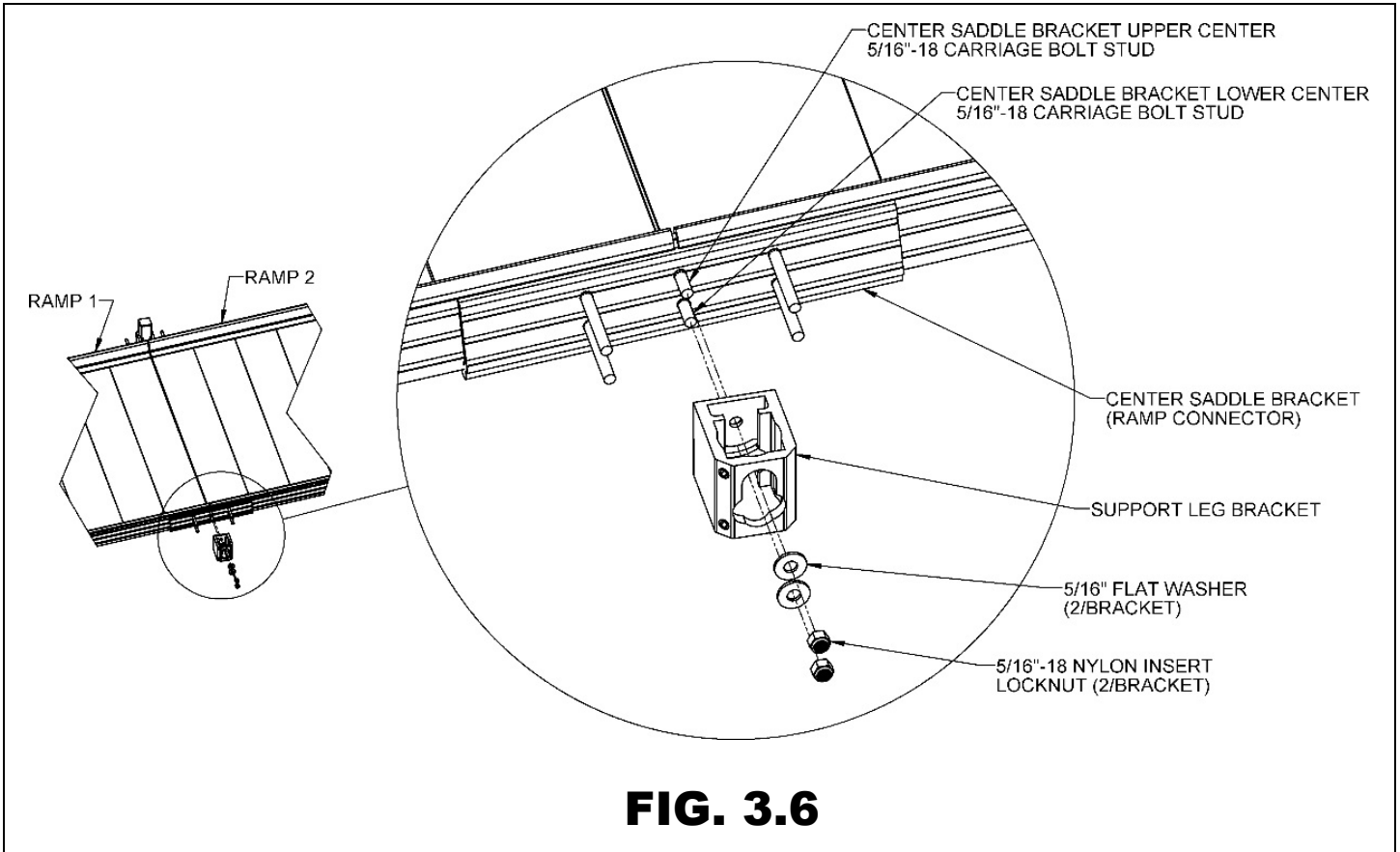
3.2. INSTALL RAMPS ON PLATFORMS

- 3.2.1. The following will address attaching a ramp or ramp run to a platform. If the ramp needs to be angled with respect to the platform or is going to be attached to an existing porch, skip to 'ANGLE RAMPS WITH RESPECT TO PLATFORMS, PORCHES OR DECKS' in this section.
- 3.2.2. Ramps are most commonly located toward either the left or right side of the platform. However, they can also be centered. When centered and using a 'TWO-LINE RAIL CLOSURE', a second closure must be ordered to connect the ramp and platform handrails.
 - 3.2.2.1. When the ramp is located toward the side of a platform, the outside of the frame post should be aligned with the inside of the platform angle post.
 - 👉 When placing a ramp in other locations on a guarded platform, custom components may be required.
- 3.2.3. Locate a RAMP HANGER PAIR and install both hangers in the platform side rail where the ramp will be attached.
- 3.2.4. Hold the hanger perpendicular (approximately) to the platform side rail, then bring the hanger upward until it is against the side rail lip. Rotate the hanger and continue pushing upward in such a manner that the "hook" at the top of the hanger goes behind and catches on the lip in the top of the platform side rail and the hanger sits on the ledge at the bottom (FIG. 3.4).
- 3.2.5. Set the ramp on the hangers. The hangers should be positioned as close as possible to the ramp side rails (FIG. 3.5). The procedure is the same at both the top and bottom of ramp runs which end at a platform unless a transition plate (installed in a later step) is used.
 - ⚠ Do not attempt to walk on system until installation is complete.

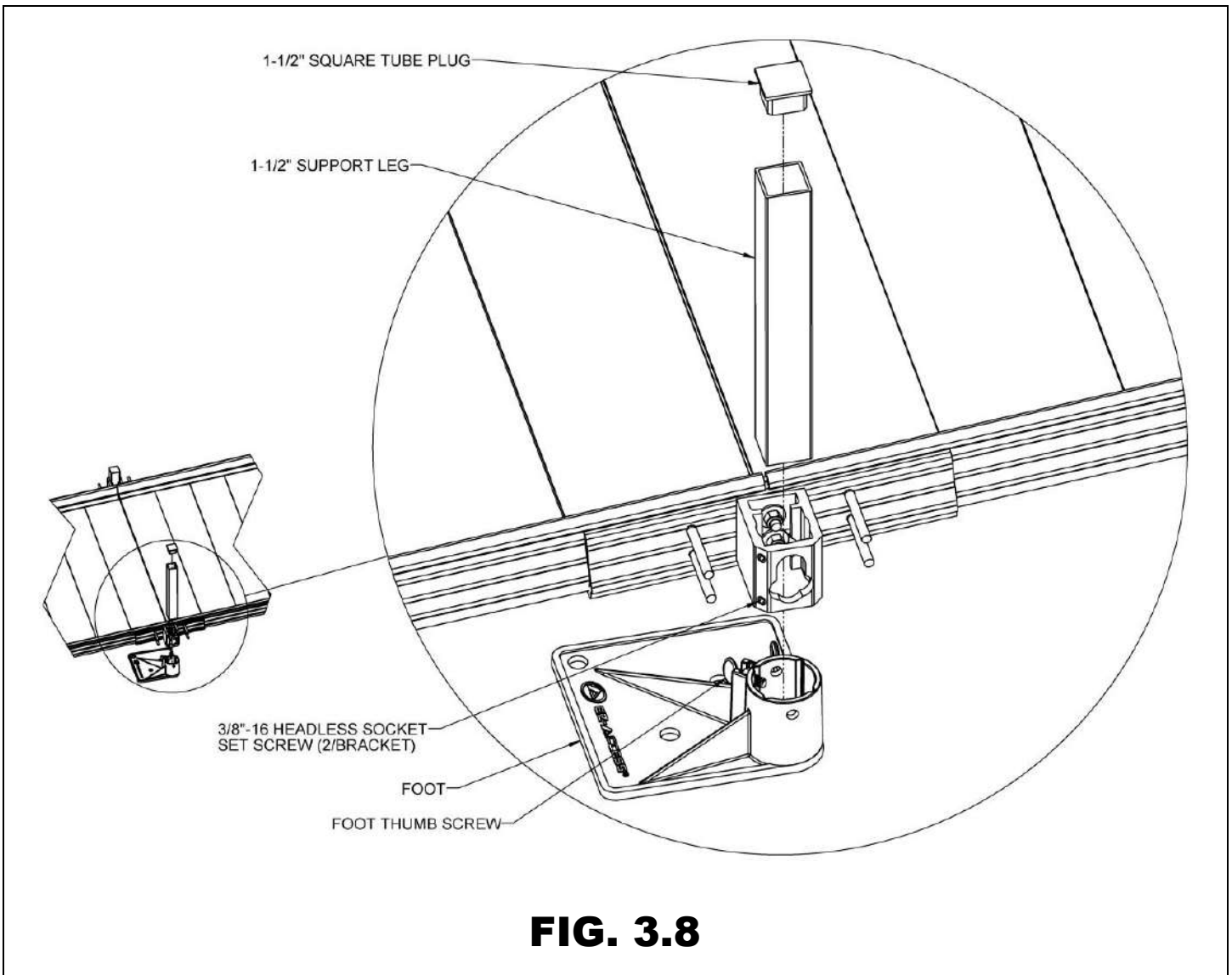


3.3. ATTACH SUPPORT LEGS TO RAMPS

- 3.3.1. Install the support leg bracket, included in the CONNECTOR – RAMP TO RAMP, on the center studs of the center saddle bracket. The round hole goes over the upper stud and the curved slot over the lower stud (FIG. 3.6).
- 3.3.2. Install the provided 5/16" flat washers and 5/16"-18 nylon insert locknuts onto the studs (FIG. 3.6) but do not tighten fully until the bracket has been leveled.
- 3.3.3. Level the support leg bracket, using a bubble level or similar tool, and then torque the two 5/16"-18 nylon insert locknuts to 20 ft.-lbs. (FIG. 3.7).

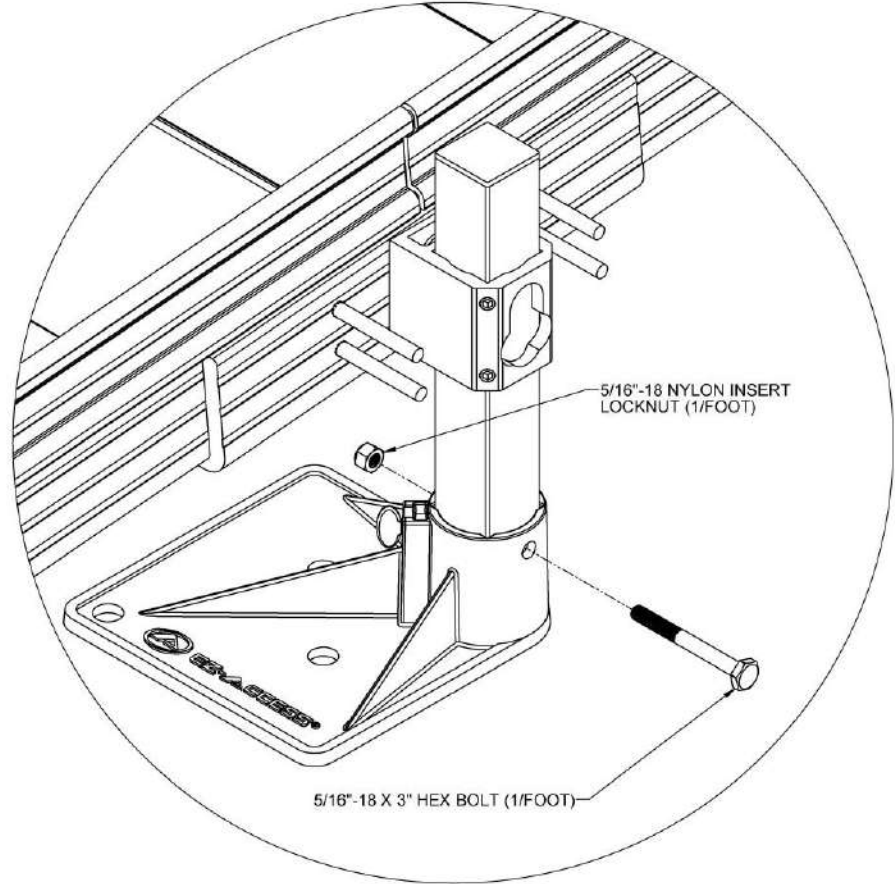


- 3.3.4. Locate the appropriate T3GSLxxPR SUPPORT LEG PAIR (where “xx” denotes the leg length) for the location.
- 3.3.5. Place a foot under the support leg bracket with the foot extending under the ramp, and then insert a 1-1/2” support leg through the support leg bracket into the foot. Loosen the two set screws in the support leg bracket and the foot’s thumb screw, if needed, to fully engage the support leg in the foot (FIG. 3.8).
 - 🖐 If installing on soft soil it may be necessary to set the foot on a concrete pad.
- 3.3.6. After the support leg is fully engaged in the foot, tighten the 3/8”-16 headless socket set screws in the support leg bracket to 15 ft.-lbs. (FIG. 3.8).
 - ⚠ Do not attempt to walk on the ramps until all support leg set screws have been tightened as specified.
- 3.3.7. Tighten the foot’s thumb screw securely.
- 3.3.8. Insert a plug into the top of each support leg. Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.



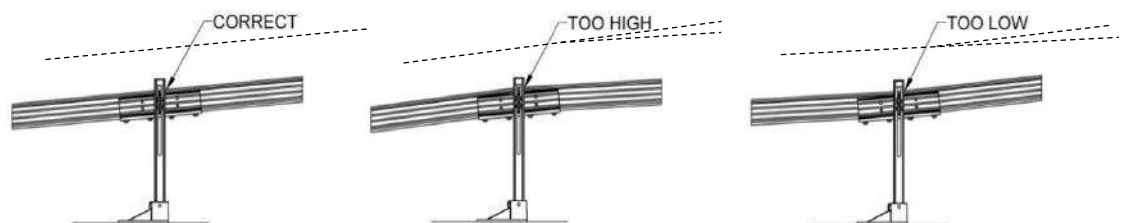
- 3.3.9. Use hole in the foot as a template to drill an 11/32" or 3/8" hole through each support leg (FIG 3.9).
- 3.3.10. Insert a 5/16"-18 x 3" long hex bolt through the support leg and foot. Secure with 5/16"-18 nylon insert locknut.

FIG. 3.9



- 3.3.11. Adjust the ramp support legs one at a time.
 - ✎ Building codes and ADA guidelines call for a maximum slope of 1:12. This is also the required slope for the TITAN system.
 - 3.3.11.1. Raise (or lower) the ramp sections at the center saddle bracket to take any sag out of the ramp run. Loosen and retighten the two set screws in each support leg bracket to 15 ft.-lbs. as needed.
 - ✎ Adjustment can be accomplished by having someone sight down the ramp while another person adjusts the ramp height or by using a straight string line.
- 3.3.12. Ensure that all bolts and set screws are fully tightened as specified.
- 3.3.13. Ensure that the ramp sections are aligned parallel, on the same plane, to one another (FIG 3.10).

FIG. 3.10



3.4. INSTALL CROSS BRACE – RAMPS

Ramps with walking surfaces over 36" high require bracing (certain configurations and site conditions may require bracing under 36"). The TXB36 (CROSS BRACE) must be installed under the ramp (FIG. 3.11).

- 3.4.1. Open the brace bands and slide around the support legs.
- 3.4.2. Install two bands on each leg, with the brace band bolt holes extending under the ramp and aligning with the brace bands on the opposite side (FIG. 3.11).
- 3.4.3. The cross brace should be placed approximately in the middle of the ramp legs with the top brace bands a minimum of two feet from the bottom brace bands (FIG. 3.11).
- 3.4.4. Assemble the cross brace by installing the 5/16"-18 x 1-1/2" hex bolt, 5/16"-18 hex nut, and 5/16" flat washer through the center hole in the braces. Tighten enough to hold brace together but still allow braces to pivot freely around the bolt (FIG. 3.11).
- 3.4.5. If needed for the location, trim the ends of the cross brace to fit.
- 3.4.6. Drill one 11/32" or 3/8" diameter hole on center approximately 1/2" from each end of each brace.
- 3.4.7. Install the assembled cross brace between the platform legs, into each of the 4 brace bands using the four 5/16"-18 x 1-1/2" long square neck carriage bolts, 5/16" washers, and 5/16"-18 hex nuts provided (FIG. 3.11).
- 3.4.8. Tighten all fasteners securely.

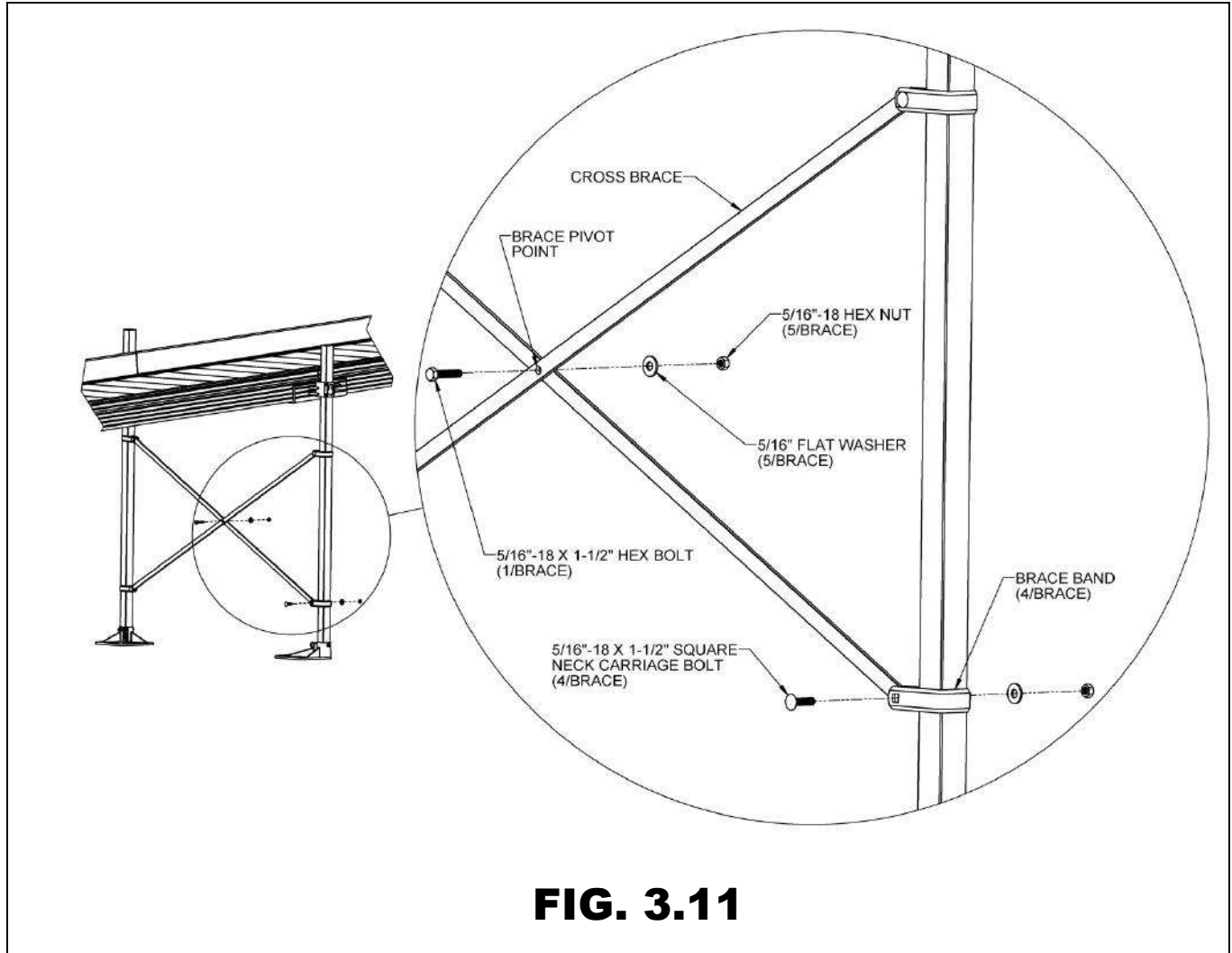


FIG. 3.11

3.5. INSTALL A SINGLE RAMP OR RAMP RUN TO AN EXISTING STRUCTURE

If installing a ramp or ramp run to an existing landing (other than a TITAN platform), such as a porch, deck, stairs, etc. follow these steps:

- 3.5.1. Installing a ramp or ramp run to an existing structure requires a RAMP SUPPORT TOP and a TRANSITION PLATE (48", 54" or 60" depending on the ramp width). Assemble and connect the ramp sections, connectors, legs, and feet as described in the previous sections, and then install ramp support top and a transition plate at the upper end of the ramp run as described in the 'OPTIONAL EQUIPMENT' section.
- 3.5.2. Maneuver the ramp to the desired position and place the transition plate onto a structurally sound supporting surface (platform, porch, etc.).
 - 3.5.2.1. Make sure the transition plate overlaps the surface of the platform, porch, or deck as much as possible but never less than 1".
 - 3.5.2.2. Level the transition plate by adjusting the legs in the ramp support top up or down as described in 'OPTIONAL EQUIPMENT' section.



The same method described above can be used if a ramp or ramp run begins at an existing structure.

3.6. ANCHOR RAMP TRANSITION PLATE

Transition plates must be anchored to a structurally sound surface. Use pre-drilled holes at each corner of the transition plate as guides.

- 3.6.1. IF RESTING ON AND ANCHORING TO A WOOD SURFACE:
 - 3.6.1.1. Secure transition plate by installing the provided 1/4" x 1" long self-drilling screws through each hole (FIG. 3.12).
- 3.6.2. IF RESTING ON AND ANCHORING TO A CONCRETE SURFACE:
 - 3.6.2.1. Using the transition plate as a template, transfer the hole locations to the concrete surface and note locations with marking device.
 - 3.6.2.2. Remove transition plate. Using a 1/4" masonry bit, drill two 1-1/2" (minimum) deep holes at the marked locations.
 - 3.6.2.3. After drilling, ensure holes are free of any dust or other debris.
 - 3.6.2.4. Re-attach the transition plate and align over the drilled holes. Using a hammer, drive the provided 1/4" diameter mushroom head pin drive anchors through the holes in the transition plate into the drilled holes until the head is seated flush with anchor body.



Other types of anchoring devices may work in specific situations; contact your local contractor for assistance.

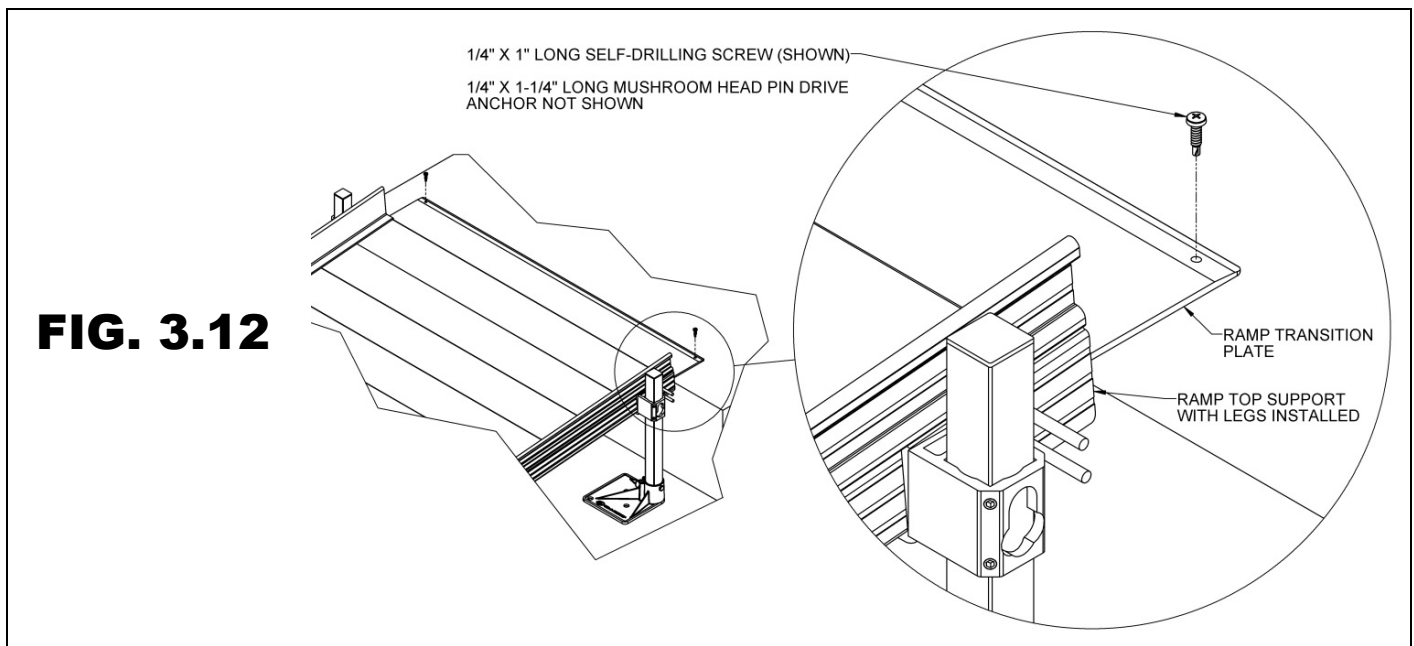


FIG. 3.12

3.7. ANGLE RAMPS WITH RESPECT TO LANDINGS

There are situations where it is necessary to angle ramps with respect to a landing. The required components are usually only included with a ramp or ramp run without a TITAN platform (such as an existing landing or deck). If a ramp must be angled when attaching to a TITAN platform, a 48", 54", or 60" TRANSITION PLATE with a RAMP SUPPORT TOP must be used instead of the RAMP HANGER PAIR. The same components can be used at the top and bottom of a ramp or ramp run.

- 3.7.1. Angles up to approximately 6-degrees can be accommodated. Refer to the appropriate sections in 'OPTIONAL EQUIPMENT' for installing a TRANSITION PLATE 48", 54" or 60" and RAMP SUPPORT TOP, and the previous sections for installing and adjusting ramp support legs (FIG. 3.13).
- 3.7.2. Make sure the transition plate overlaps the surface of the platform, porch or deck, as much as possible, but never less than 1", regardless of the angle required (FIG. 3.12).
- 3.7.3. Anchor the transition plate as described in 'ANCHOR RAMP TRANSITION PLATE' section.
- 3.7.4. Use the 1/4" x 1" long self-drilling screw when attaching to a TITAN platform.

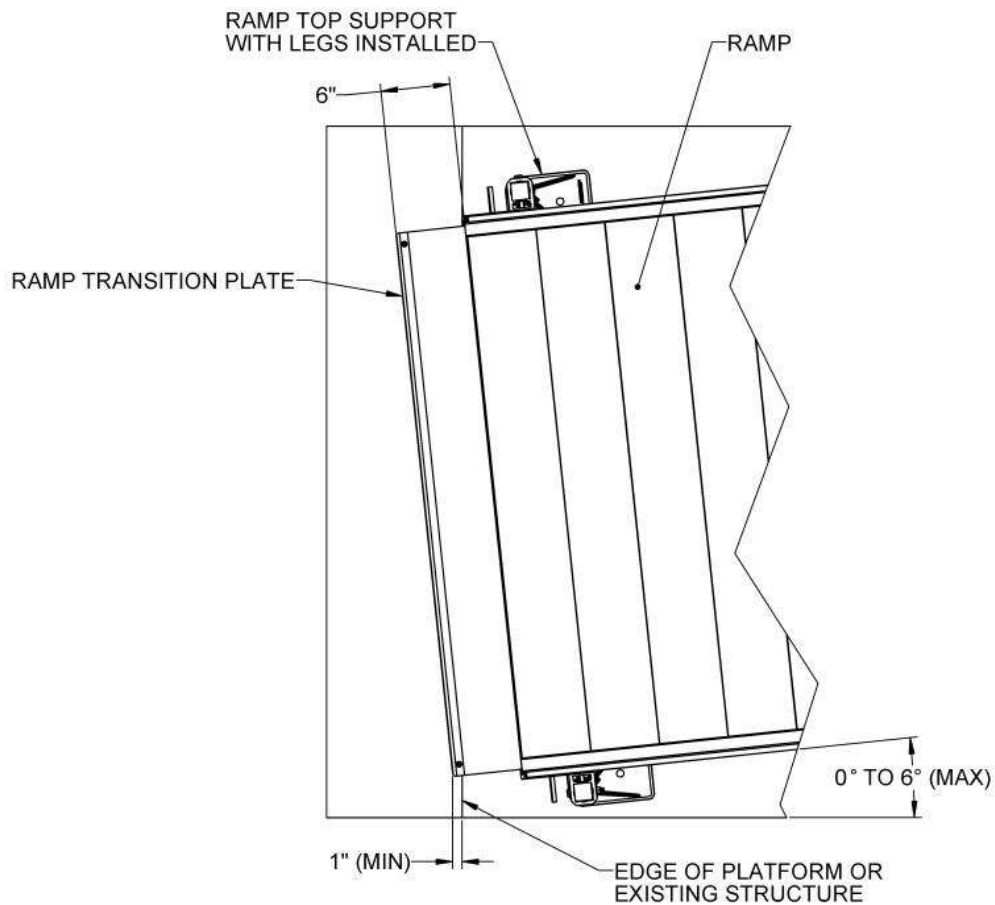
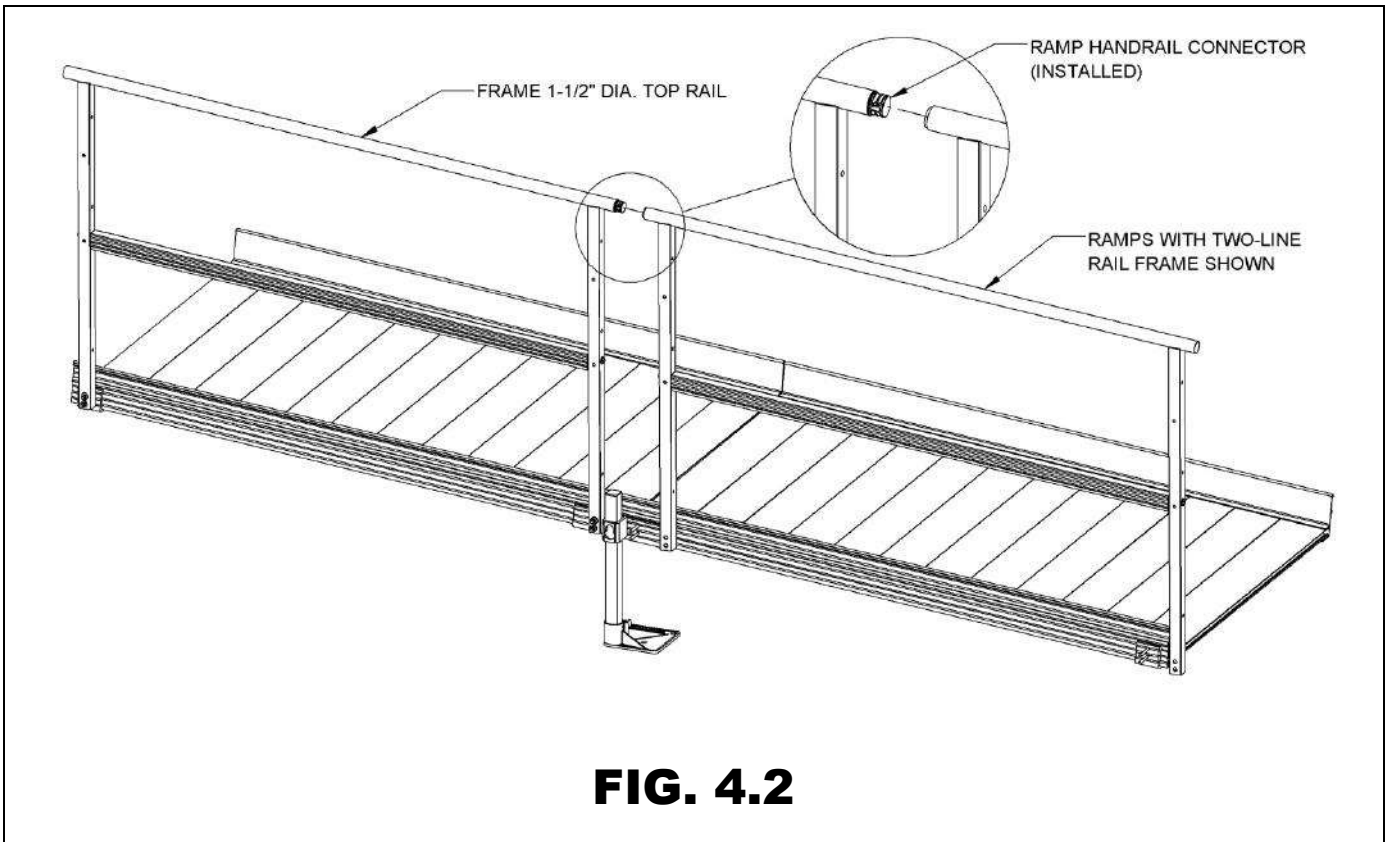
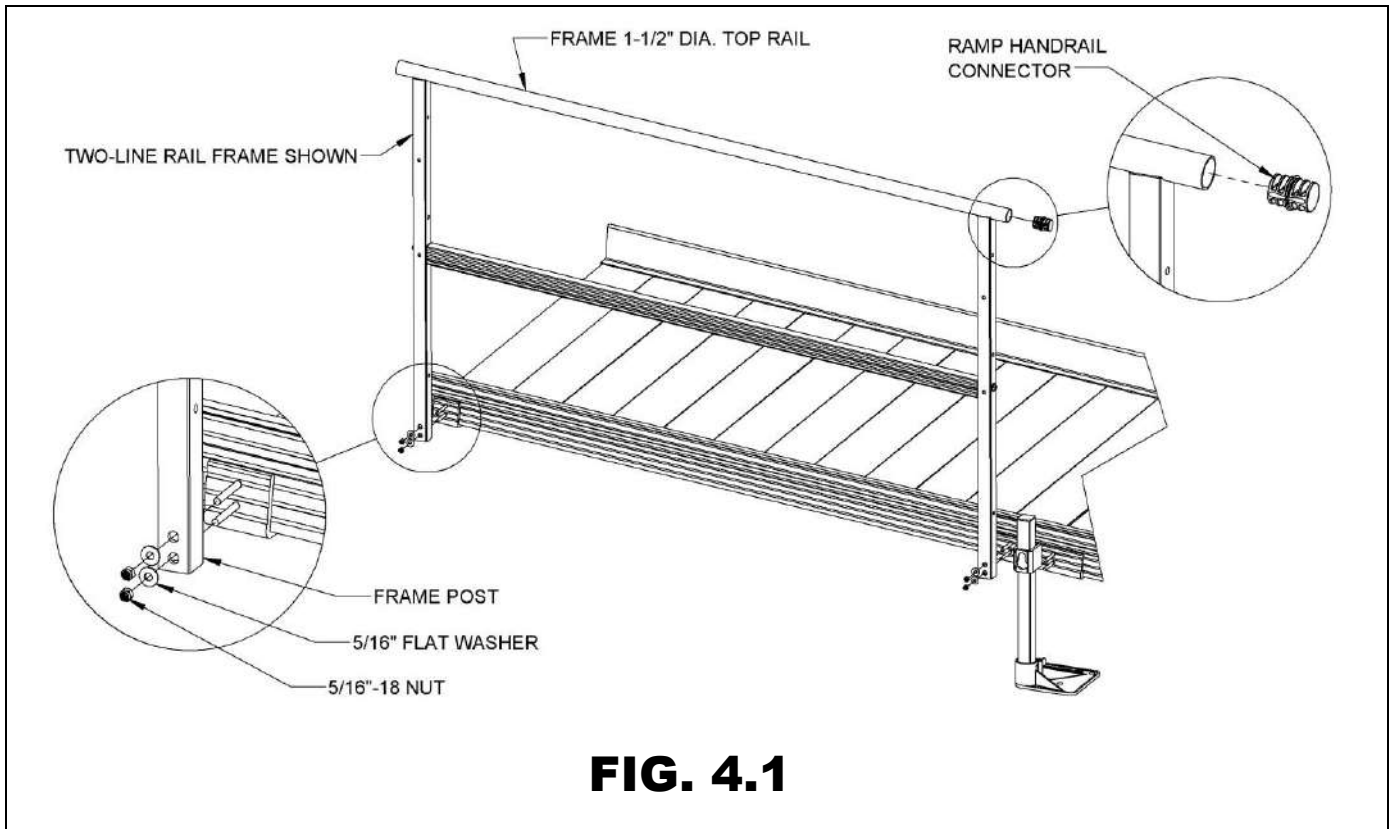


FIG. 3.13

4. HANDRAILS

4.1. FRAMES

- 4.1.1. Two-line rails, picketed guards, and handrails are specific to the ramp length and provided in pairs when ordered with the ramp. The procedure for frame attachment is the same for the two-line rails and picketed guards. The procedure for installing handrails is explained in a later step.
 - 🖐 Two-line rails can also be field-converted to picketed guards if needed.
- 4.1.2. One frame is required on each ramp side (frames of the same size are interchangeable side-to-side).
- 4.1.3. In a multiple ramp run configuration, handrail connectors (included in the CONNECTOR RAMP TO RAMP) are used to join both frame top rails and handrails together. Refer to FIGs. 4.1 and 4.2 for the following steps:
 - 4.1.3.1. The frame's vertical posts each have two holes which correspond with the studs on the end of center saddle brackets or end brackets (installed in previous steps).
 - 4.1.3.2. Attach frame to these studs using two each 5/16" flat washers and two each 5/16"-18 nuts per frame post. Tighten 5/16" nuts just enough to hold the frames in place.
 - 🖐 If the studs do not align with the holes in the frame post, the ramp handrail end bracket is most likely installed into the wrong threaded insert in the ramp side rail (refer back to FIG. 3.2 for proper installation location).
 - 4.1.3.3. Slide handrail connector into one end of the frame's 1-1/2" diameter top rail. If handrail connector does not fit in tube, use pliers to lightly compress the handrail connector while sliding into the 1-1/2" diameter top rail.
 - 4.1.3.4. Slide the next frame section over the handrail connector, ensuring the top rails are pushed firmly towards each other. Compress the handrail connector. Use a rubber mallet or similar tool to fully seat as needed.
 - 4.1.3.5. Rotate frame until the holes in frame post align with studs in brackets.
 - 4.1.3.5.1. Attach with 5/16"-18 nuts and 5/16" flat washers, tightening just enough to hold the handrail in place.
 - 🖐 Regardless of handrail/guard styles, assemble handrail/guard bolts loosely (do not fully tighten) until all handrails/guards have been installed on the ramp and/or platform.
 - 4.1.3.6. Repeat for the remaining frames in the run.
 - 4.1.3.7. Tighten all the fasteners securely.







4.2. STARTER FRAME

The starter ramp (tapered transition section) includes starter frames, lower post supports, and 6' handrails. The procedure for attaching starter frames is the same for both two-line rails and picketed guards.

- 4.2.1. One starter frame is required on each side of the ramp (frames are interchangeable side-to-side). The shorter starter frame post is the lower post (positioned at entrance of ramp).
- 4.2.2. Connect the starter frame top rails and upper frame post to the ramp in the same manner described in previous section.
- 4.2.3. Refer to FIGs. 4.3 and 4.4 and the following steps when installing the lower frame post supports:
 - 4.2.3.1. Lower frame post supports are left or right hand (looking up the ramp from the start).
 - 4.2.3.2. Install a lower frame post support on both starter frame lower posts. Orient the set screws in the pocket of the lower frame post support facing outward and toward the start of the ramp (FIG. 4.4).
 - 4.2.3.3. Loosen the set screws in the pocket of the lower frame post support, if needed, to fully engage the lower posts in the post support.

4.3. ANCHORING FRAMES AND CODE COMPLIANCY

The lower frame post supports must be anchored to the ground if a code compliant system is desired.

- 4.3.1. Using the holes in the lower frame post support base as a template, mark the drill holes for anchors.
- 4.3.2. Drill four holes in each lower frame post support base (FIG. 4.3), then install four 1/4" or 3/8" x 2-1/2" (minimum) concrete anchors (supplied by others) per lower post support. It is the installer's responsibility to ensure the intended mounting surface is of sufficient strength and quality to hold the anchors used.
 -  You may wish to remove the lower frame before drilling anchor holes, then reinstall when drilling is complete.
 -  Always install concrete anchors per the manufacture's recommendations.
 -  If attaching to a surface other than concrete, consult your contractor for alternate anchoring methods.
- 4.3.3. Attach the lower frame post supports to the ramp side rails using the supplied 5/16"-18 x 3" square neck carriage bolts, 5/16"-18 nylon insert locknuts and 5/16" flat washers. Ensure that the head of the carriage bolts are on the ramp side as shown (FIG. 4.4).
 -  If the holes in the lower frame post support do not align with the holes in the lower frame post and ramp side rail, the lower frame post support is most likely installed on the wrong side of the ramp.
- 4.3.4. Tighten all fasteners securely including the 3/8"-16 headless socket set screws in the pockets of the lower frame post supports.
- 4.3.5. The procedure for ramp handrail installation is the same for the starter ramp as other standard ramps; see 'RAMP HANDRAILS' section.

**LOWER FRAME POST SUPPORT
(RIGHT HAND SHOWN; LEFT HAND OPPOSITE)**

FIG. 4.3

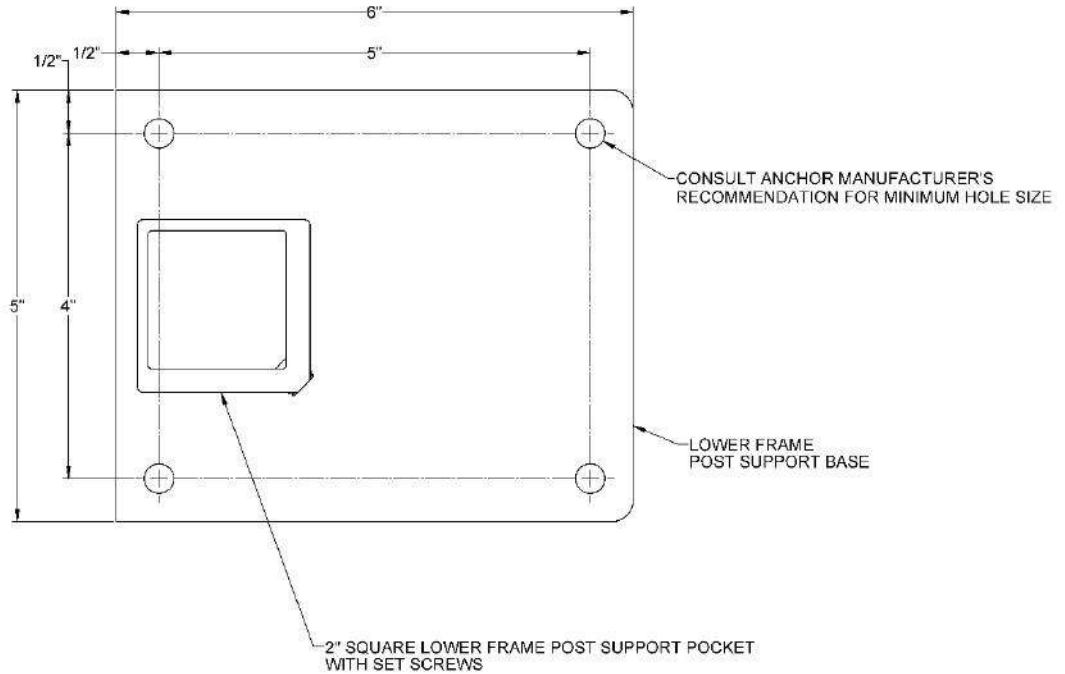
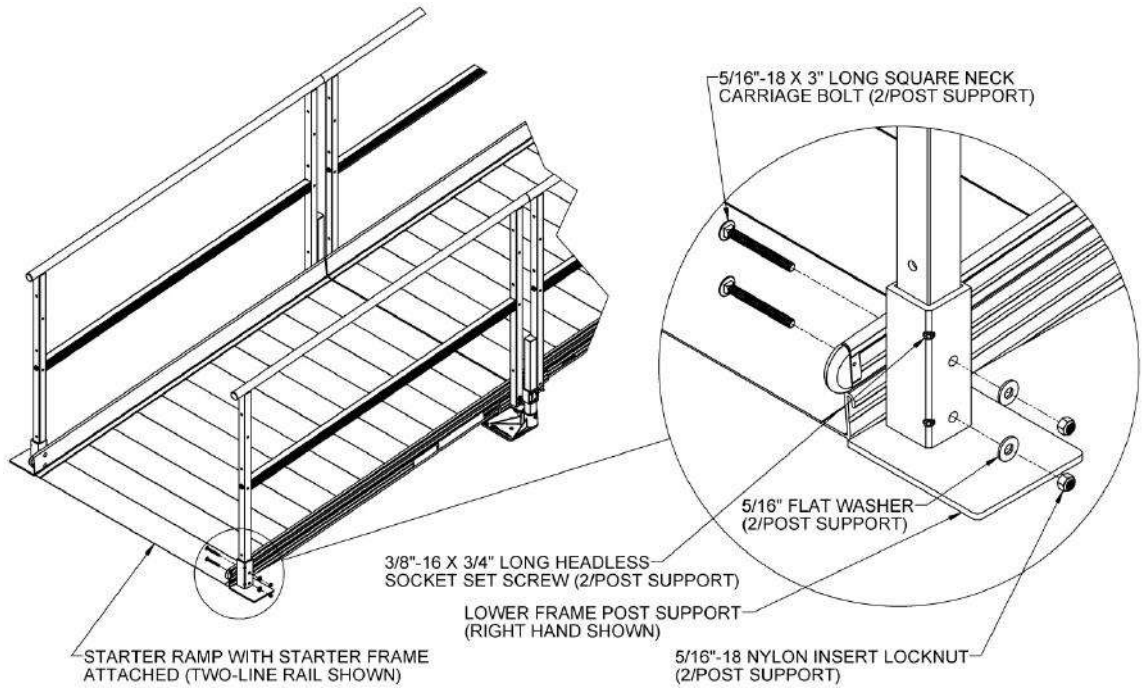
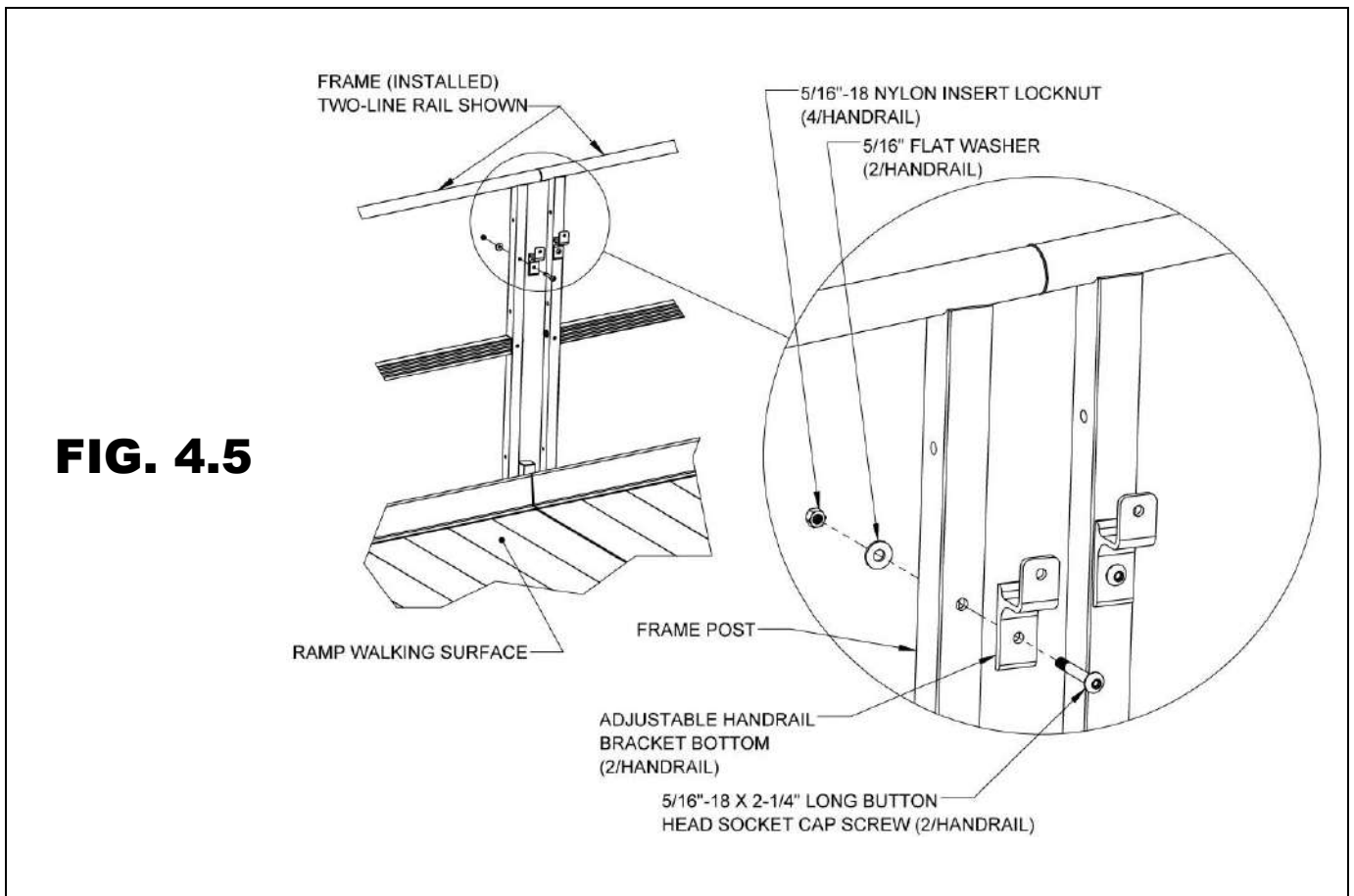


FIG. 4.4



4.4. RAMP HANDRAILS

- 4.4.1. Ramp handrails are specific to the ramp length and provided in pairs when ordered with the ramp. The procedure for attaching ramp handrails is the same for two-line rails and picketed guards.
 - 👉 Regardless of handrail/guard styles, assemble handrail/guard bolts loosely (do not fully tighten) until all handrails/guards have been installed on the ramps and or platforms.
- 4.4.2. One ramp handrail is required on each side of the ramp (handrails of the same length are interchangeable side-to-side).
- 4.4.3. In multiple ramp runs, handrail connectors (included in the CONNECTOR – RAMP TO RAMP) are used to join handrails together.
- 4.4.4. Refer to FIGs. 4.5 through 4.7 for the following steps:
 - 4.4.4.1. Install an adjustable handrail bracket bottom (included with ramp handrail hardware) in the upper holes of the frames facing the ramp walking surface (FIG. 4.5). Use the supplied 5/16"-18 x 2-1/4" socket head cap screws, 5/16"-18 nylon insert locknuts and 5/16" flat washers oriented as shown.
 - 4.4.4.2. Tighten the 5/16" nuts just enough to hold the adjustable handrail bracket bottoms in line with the frame posts but still allow the bracket to pivot.
 - 4.4.4.3. If a lower (child) handrail (purchased separately) is being used, install adjustable handrail bracket bottoms in the lower holes in the same manner.



- 4.4.4.4. Slide handrail connector into one end of the 1-1/2" diameter ramp handrail (FIG. 4.6). If connector does not fit, use pliers to lightly compress connector while sliding it into the handrail.
- 4.4.4.5. Slide the next handrail over the connector until fully engaged and align the adjustable handrail bracket tops (FIG. 4.6).
- 4.4.4.6. Connect all ramp handrails for one side of the ramp run in the order matching ramp lengths. Connect ramp handrails for the opposite side in the same manner.
- 4.4.4.7. Position ramp handrail run and orient the fasteners as shown (FIG. 4.7). Attach assembled ramp handrail run to adjustable handrail bracket bottoms using 5/16"-18 x 3/4" socket head cap screws and 5/16"-18 nylon insert locknuts.
- 4.4.4.8. Align ramp handrail runs to be parallel to the ramp walking surface and the adjustable handrail bracket bottoms are parallel to the frame posts.
- 4.4.4.9. Tighten all the fasteners securely.
- 4.4.4.10. Repeat the process for all ramp handrail runs in the system, including the lower (child) handrails, if present.

FIG. 4.6

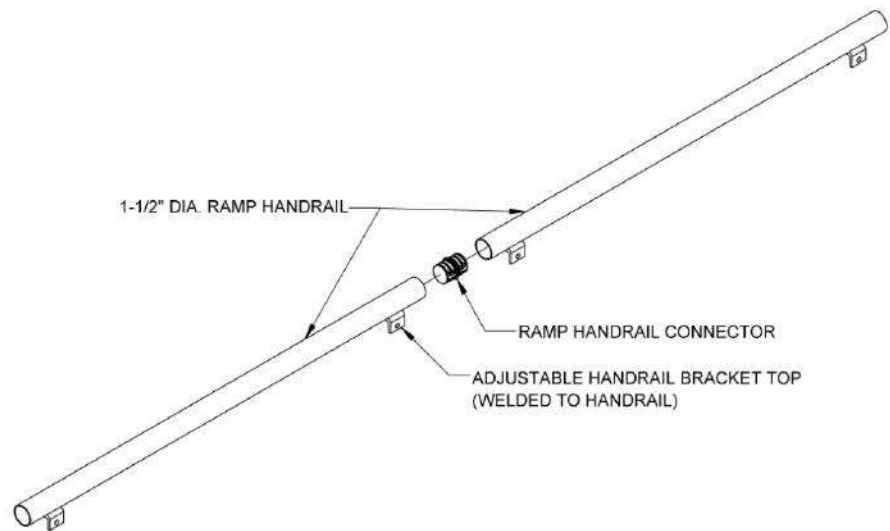
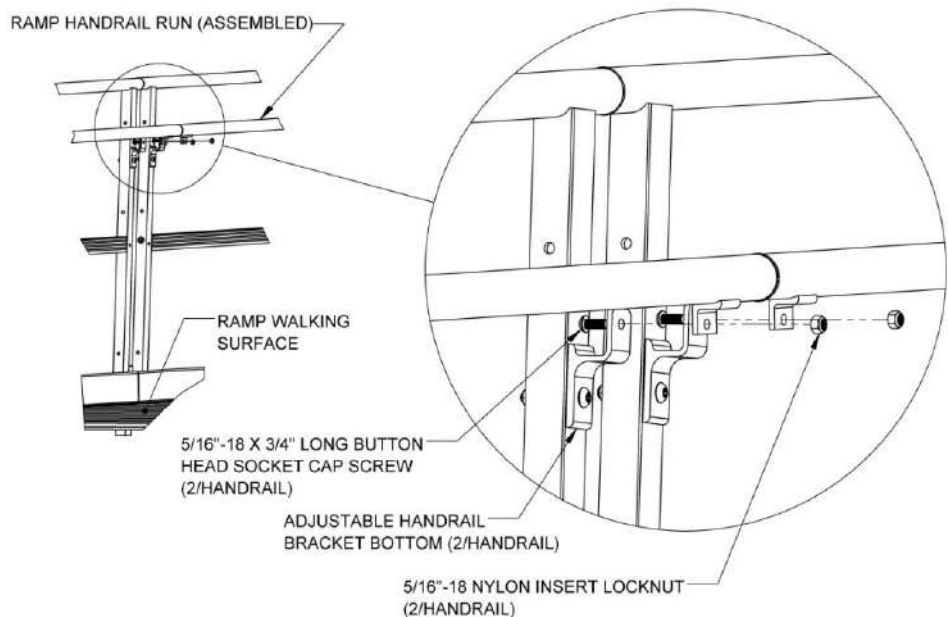
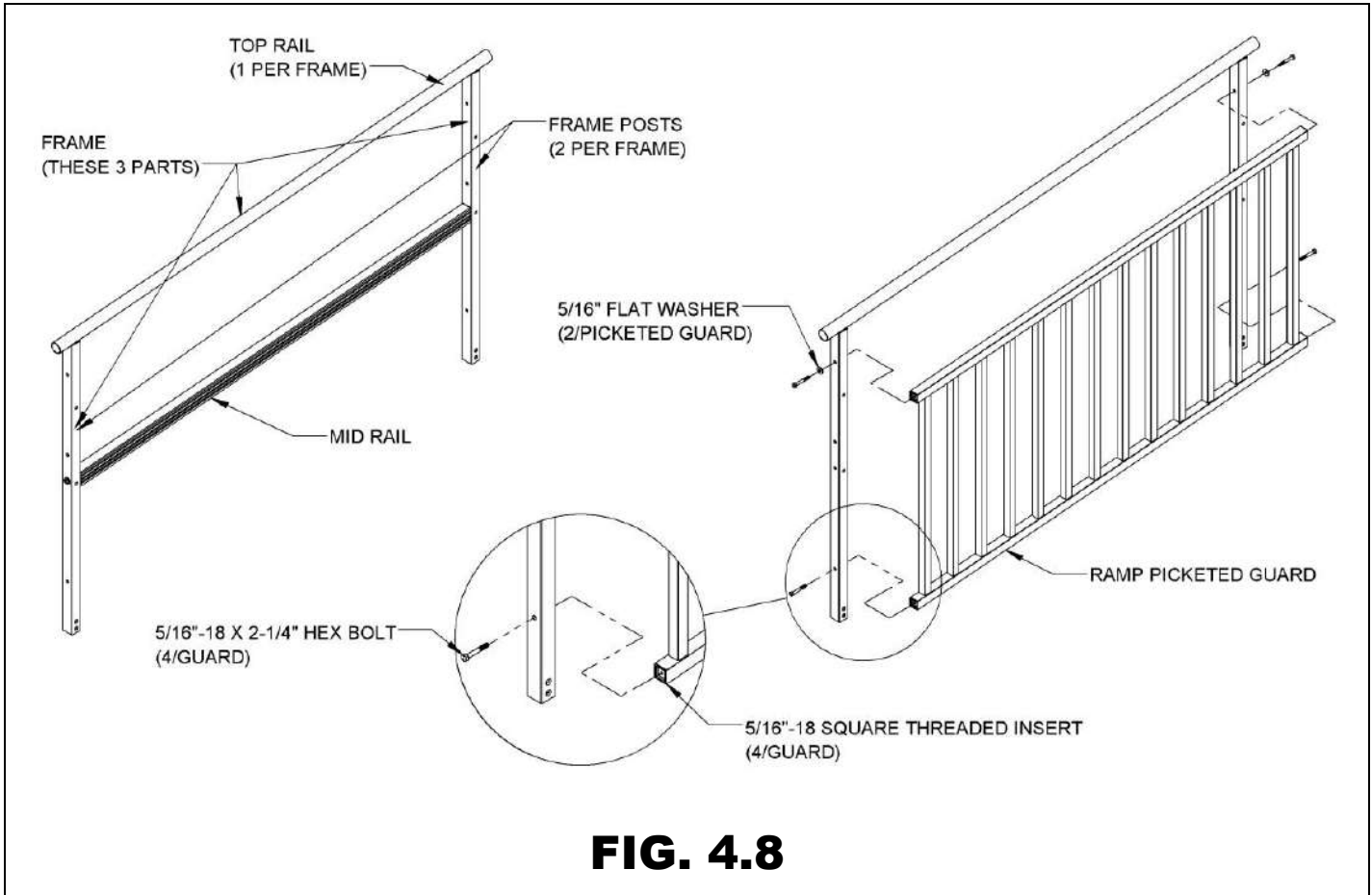


FIG. 4.7



4.5. CONVERT TWO-LINE RAMP RAILS TO PICKETED GUARDS

- 4.5.1. Remove the frame from ramp and remove the mid rail from the frame (FIG. 4.8).
- 4.5.2. Install the picketed guard section into the two uppermost and lowermost holes in the frame using the provided 5/16"-18 x 2-1/4" hex bolts and 5/16" flat washers.
👉 Regardless of handrail/guard styles, assemble handrail/guard bolts loosely (do not fully tighten) until all handrails/guards have been installed on the ramp and or platform.
- 4.5.3. Install the picketed guard on the ramp and connect the ramp handrails per the 'RAMP HANDRAILS' section.



4.6. ASSEMBLE TWO-LINE PLATFORM RAILS AND PICKETED GUARDS

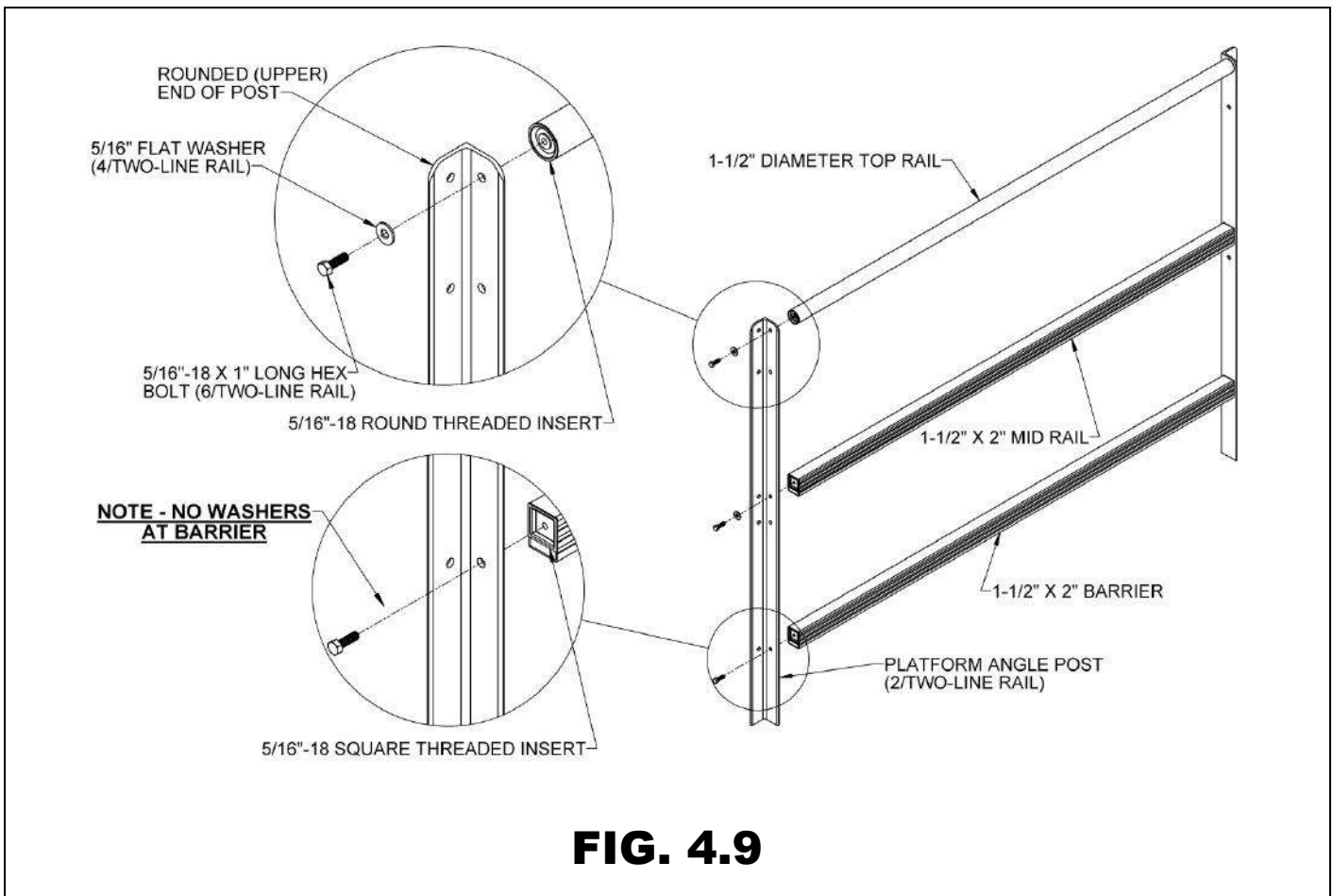
- 4.6.1. Two-line rails and picketed guards are provided in pairs when ordered with a platform. Two-line rails can be converted to picketed guards in the field, see 'CONVERT TWO-LINE PLATFORM HANDRAILS TO PICKETED GUARDS' section.

👉 Regardless of handrail/guard styles, assemble handrail/guard bolts loosely (do not fully tighten) until all handrails/guards have been installed on the ramp and or platform.

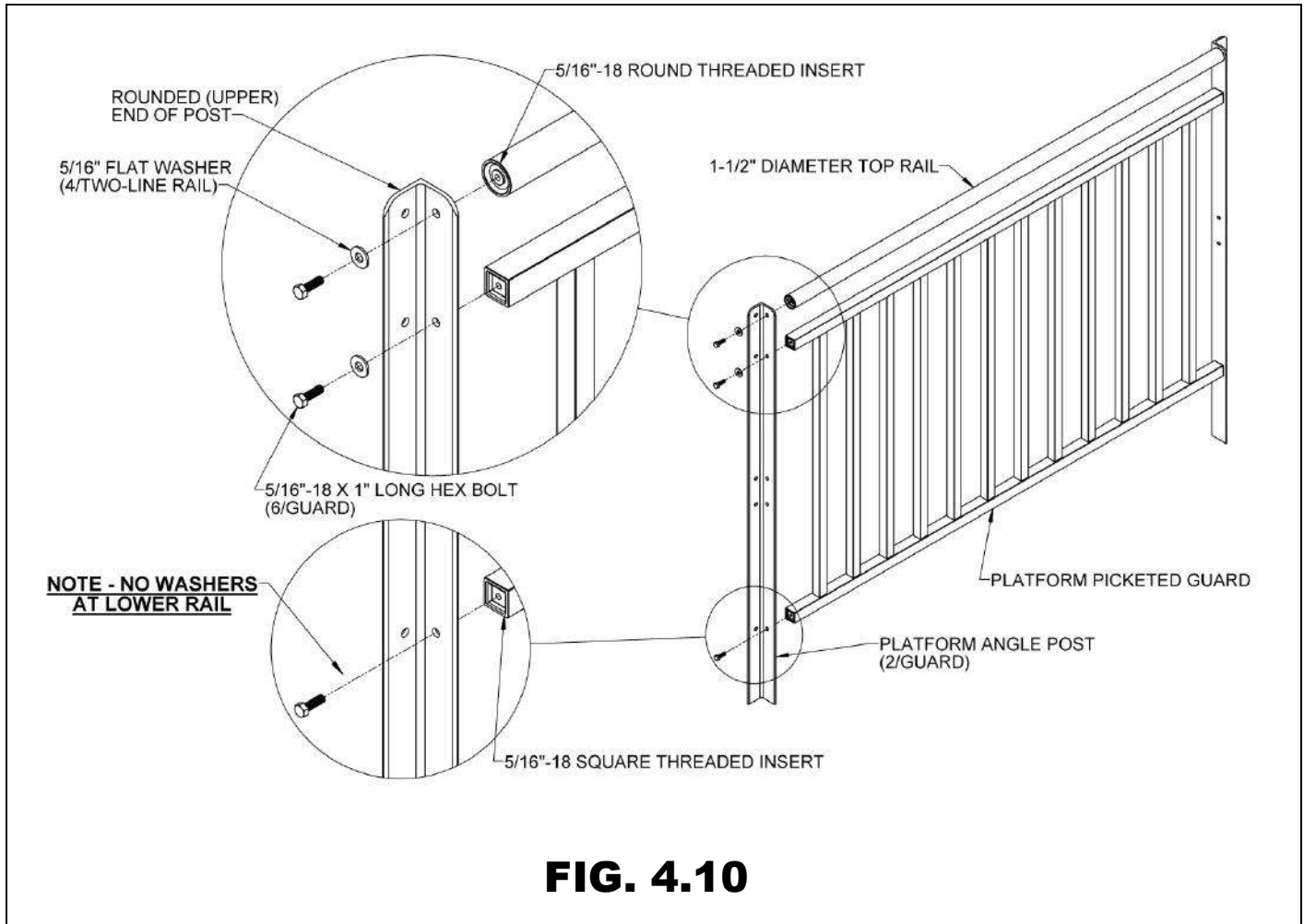
- 4.6.2. For two-line rails, pre-assemble the top rail by inserting a 5/16" -18 x 1" long hex bolt through a 5/16" flat washer, the uppermost hole in the platform angle post (angle post) and into the 5/16" -18 round threaded inserts in the top rail.

👉 The rounded end (FIG. 4.9) of the post is the upper end.

- 4.6.3. Pre-assemble the barrier and mid rail by inserting 5/16" -18 x 1" long hex bolts through 5/16" flat washers (for the mid rail only, do not use washers on the lowermost holes), the platform angle post and into the 5/16" -18 square threaded inserts in the barrier and mid rail (FIG. 4.9). Assemble both platform angle posts in the same manner.



- 4.6.4. For platform picketed guards, pre-assemble the top rail by inserting 5/16"-18 x 1" long hex bolts through a 5/16" flat washers, the uppermost hole in the platform angle posts, and into the 5/16"-18 round threaded inserts in the top rail.
- 4.6.5. Pre-assemble the platform picketed guard by inserting a 5/16"-18 x 1" long hex bolt through a 5/16" flat washer (use flat washer for the upper rail only; do not use a washer on the lowermost holes), the platform angle post, and into the 5/16"-18 square threaded inserts in the picketed guard (FIG. 4.10).



4.7. INSTALL TWO-LINE PLATFORM RAILS AND PICKETED GUARDS

- 4.7.1. Platform two-line rails and picketed guards install in the same manner. Depending on the configuration, refer to FIGs. 4.11 or 4.12 as needed.
- 4.7.2. Pre-assemble (as described 'ASSEMBLE TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' section) platform handrail sections for a straight configuration (FIG. 4.11) or only "first" frame (FIG 4.12) of a turn configuration.
 - 👉 Note the orientation of the platform angle posts in relation to the platform. The angle's outside points in toward center of platform (FIG. 4.11 and FIG. 4.12).
- 4.7.3. For "second" two-line rail or picketed guard in a turn configuration, only assemble one platform angle post (as described in 'HANDRAILS' section).
 - 👉 Note the orientation of the platform angle posts (first and second) relative to the platforms.
- 4.7.4. For straight platform configurations, or the "first" two-line rail or picketed guard on a turn platform, drop the platform two-line rail or picketed guard into the corner pockets. Align the bottom of the platform angle posts with the bottom of the platform corner pockets.
 - 4.7.4.1. Securely tighten the 3/8"-16 headless socket set screws on the inside of the platform and below the platform deck for each angle post (FIG. 4.11).
- 4.7.5. For the "second" two-line rail or picketed guard on a turn platform, insert the platform angle post into a corner pocket at 90-degrees from the "first" rail. Align the bottom of the platform angle post with the bottom of the platform corner pockets (FIG. 4.12).
 - 4.7.5.1. Securely tighten the 3/8"-16 headless socket set screws on the inside of the platform and below the platform deck.

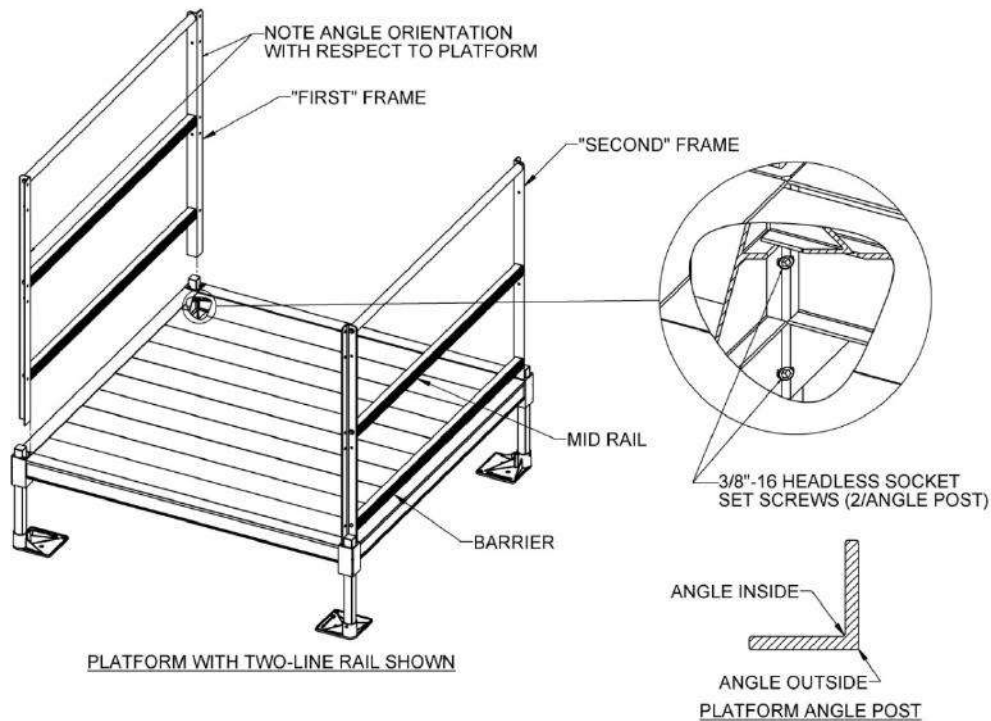
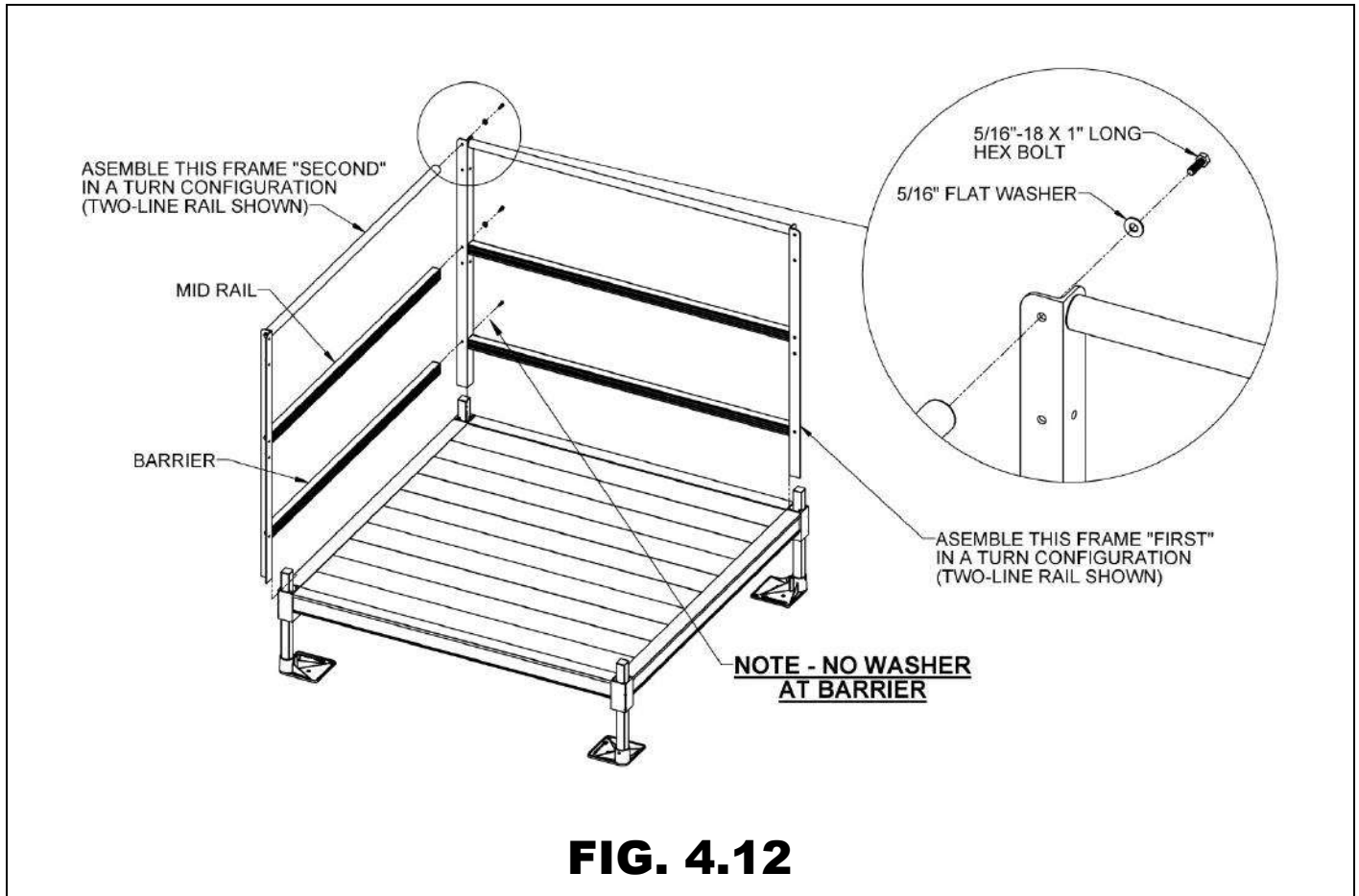


FIG. 4.11

- 4.7.6. Install 5/16"-18 x 1" long hex bolts through a 5/16" flat washer for the top rail, mid rail, and platform angle post of the "first" frame and through the angle post of the "first" frame only for the barrier (do not use a flat washer on the lowermost hole) into the threaded inserts in the top rail, mid rail and barrier of the "second" frame (FIG. 4.12).
- 4.7.7. Tighten all fasteners securely, including the angle post set screws under the platform deck and the assembly fasteners of the two-line rails or picketed guards which were assembled loosely in an earlier section.



4.8. CONVERT TWO-LINE PLATFORM RAILS TO PICKETED GUARDS

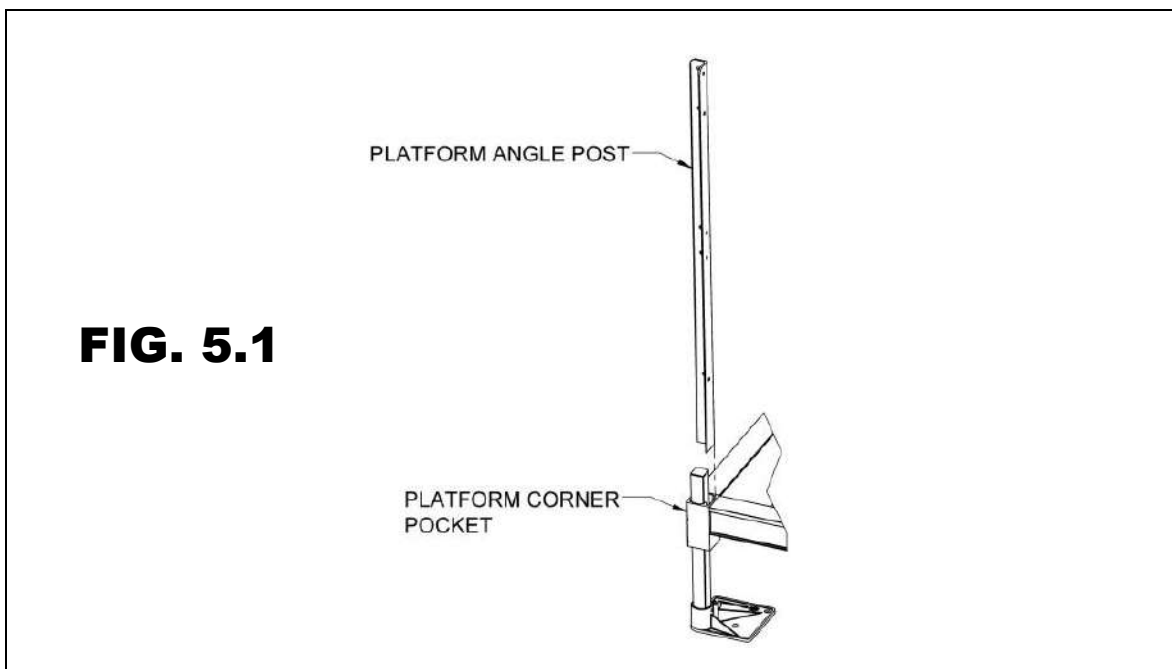
- 4.8.1. To convert a two-line rail to a picketed guard in the field, leave the top rail in place but loosen the attachment bolts on both sides.
- 4.8.2. Remove attachment bolts for mid rail and barrier on both sides. Remove mid rail and barrier.
- 4.8.3. Install the picketed guard in the same manner described in 'ASSEMBLE TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' section.
- 4.8.4. Repeat for all sections requiring conversion.

5. CLOSURES

5.1. INTRODUCTION

Closures are necessary to fill the space between ramp posts and platform posts. Like handrails, they are available in two-line or picketed guards. Closures come with components which require the ramp to be mounted to either side of a platform. However, the ramp can be centered or mounted in any location on a platform side using the two-line rail closure. When centering the ramp or mounting in a location other than the side of the platform, a second two-line rail closure must be used. When mounting to the side, the ramp frame post should be aligned with (or just slightly inside of) the inside of the platform angle post.

- ✎ If the frame post is outside the platform angle post, you will not be able to install the end loops (refer to the 'INSTALL RAMP HANDRAIL END LOOPS' section).
 - ✎ The two-line rail or picketed guard closure should be installed before installing the handrail or connecting the ramp frame top rail.
- 5.1.1. If installing a closure on a platform in the "straight" configuration, the platform angle post will already be in place.
 - 5.1.2. If installing a closure on a platform in the "turn" configuration, install the platform angle post not attached to a platform two-line rail or picketed guard in the open platform corner pocket. Align the bottom of the post with the bottom of the corner pocket (FIG. 5.1).
 - 5.1.3. Tighten the set screws securely.
 - 5.1.4. Refer to 'HANDRAILS' section for additional details on securing the post.



5.2. TWO-LINE RAIL BARRIER AND MID RAIL

- 5.2.1. The 1.5" x 2" barrier will come in the length required for the platform side and should not need to be trimmed.
- 5.2.2. Insert 1-1/2" square threaded inserts into both ends of the barrier (FIG. 5.2). Use a rubber mallet or similar tool to fully seat as needed.
- 5.2.3. Attach the lower 1.5" x 2" barrier in the lowermost hole in the platform angle post using a 5/16"-18 x 1" long hex bolt (do not use a flat washer at this location). The 1.5" x 2" barrier is commonly installed with the larger cavity (into which the 1-1/2" square threaded insert is installed) on top and the smaller cavity on the bottom (FIG. 5.2).
- 5.2.4. Locate the appropriate barrier attachment plate (FIG 5.3). If the upper end of the ramp or ramp run terminates at a platform, use the "up sloping" version of the plate. If the lower end of a ramp or ramp run starts at a platform use the "down sloping" version. Note the orientation of the larger 3/8" diameter hole with respect to the 1-1/2" x 2" section of the plate as shown (FIG. 5.3) to identify the barrier attachment plate needed.

FIG. 5.2

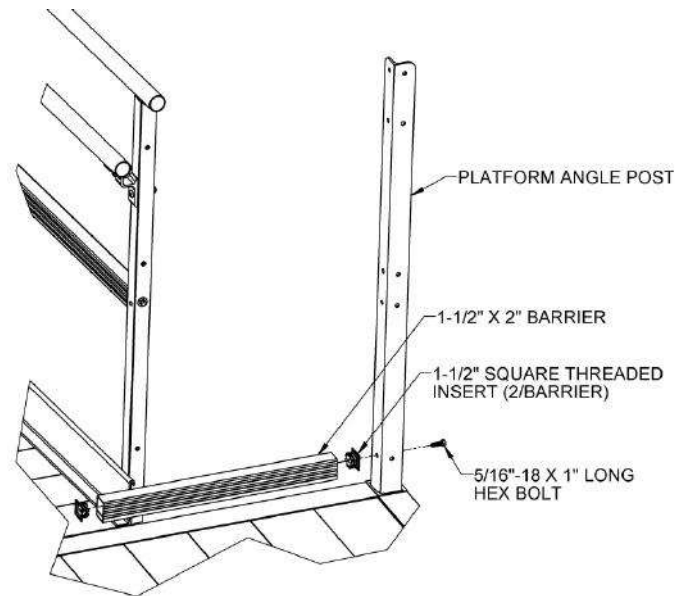
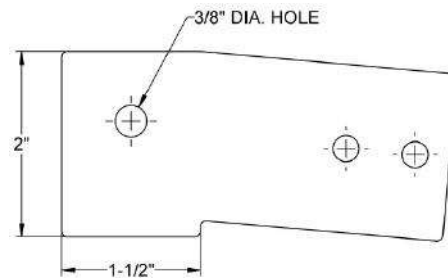
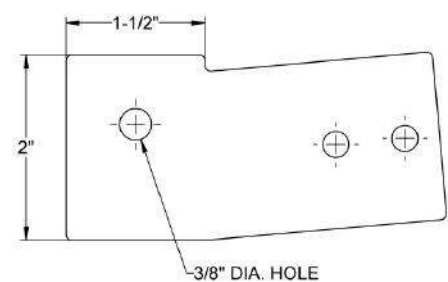


FIG. 5.3



BARRIER ATTACHMENT PLATE FOR RAMP WHICH ENDS AT A PLATFORM ("UP SLOPING")



BARRIER ATTACHMENT PLATE FOR RAMP WHICH STARTS AT A PLATFORM ("DOWN SLOPING")

- 5.2.5. Attach the barrier attachment plate to the barrier using a 5/16"-18 x 1" long hex bolt and 5/16" flat washer. Make sure the leg of the attachment plate with the two smaller holes is captured under the upper hook and in contact with the ramp side rail.
- 5.2.6. Move the ramp or platform slightly (if needed) and clamp the attachment plate to the side rail before drilling (FIG. 5.4).
- 5.2.7. Use the two smaller holes in the barrier attachment plate to drill two 1/4" or 9/32" holes through the ramp side rail (FIG. 5.5).
- 5.2.8. Connect the barrier attachment plate to the ramp side rail using 1/4"-20 x 3/4" long ribbed neck carriage bolts, 1/4"-20 nylon insert locknuts, and 1/4" flat washers. Orient the head of the carriage bolt on the ramp side as shown (FIG. 5.5).
- 5.2.9. Tighten all fasteners securely.

FIG. 5.4

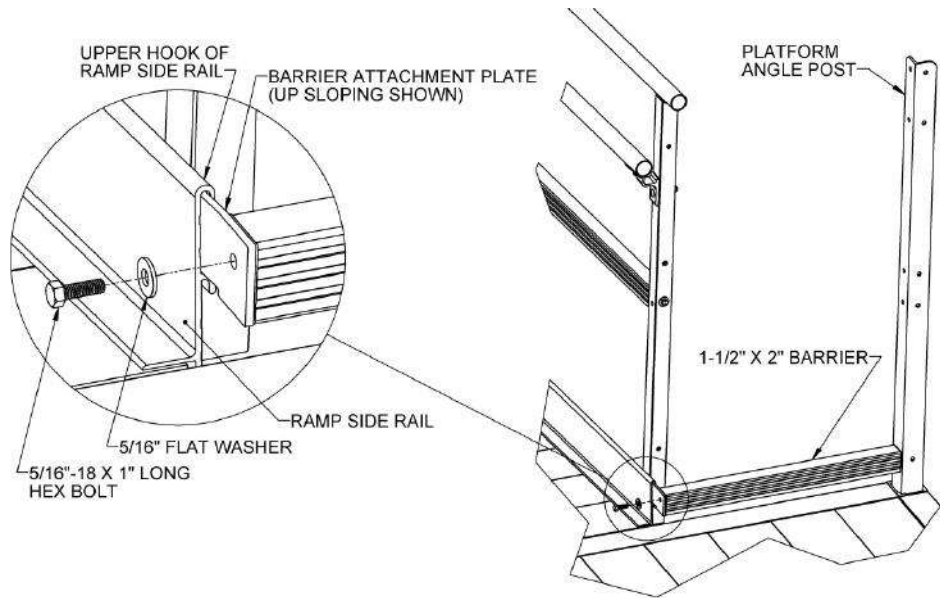
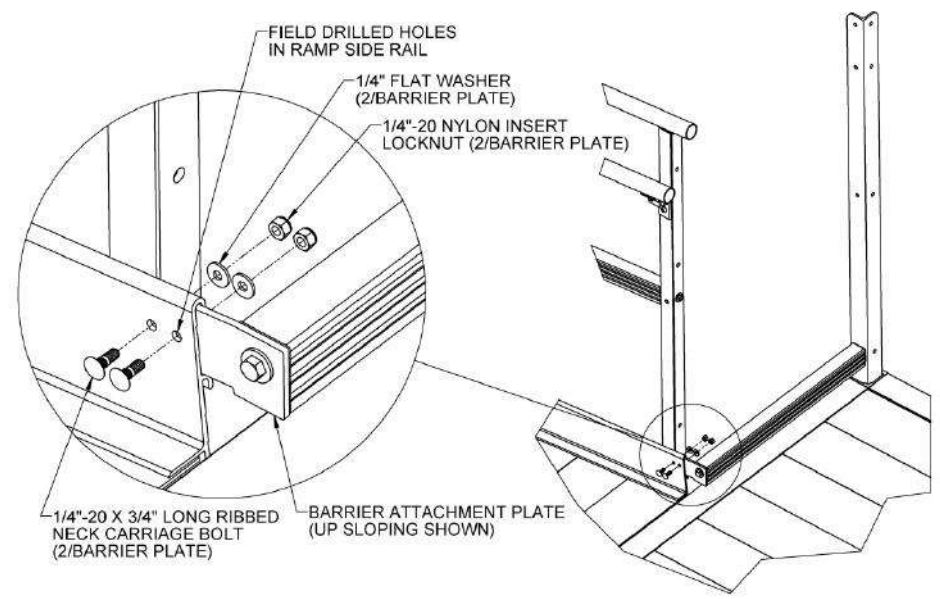


FIG. 5.5



- 5.2.10. Locate a closure bracket (FIG. 5.6). Remove the 5/16"-18 x 2-1/4" hex bolt and 5/16" flat washer attaching the mid rail of the frame, then reinstall the bolt and washer through the slot in the short leg of the bracket, the frame post, and back into the threaded insert in the mid rail.
- 5.2.11. Orient the bracket so the long leg is on the same side as, and parallel to, the platform angle post, and then tighten lightly (enough to hold the bracket against the post but still allow it to rotate).
- 🖐 The closure bracket is the larger of the two closure brackets with 1-13/16" and 4" long legs and is only used in platform closures and turn back arrangements.
- 5.2.12. Measure the gap between the long leg of the closure bracket and the platform angle post (FIG. 5.7).
- 5.2.13. Cut the 1.5" x 2" closure mid rail to the measured length less 1/8" to account for the threaded inserts which will be installed after cutting.
- 5.2.14. Using a metal file, remove any sharp edges from cutting.

FIG. 5.6

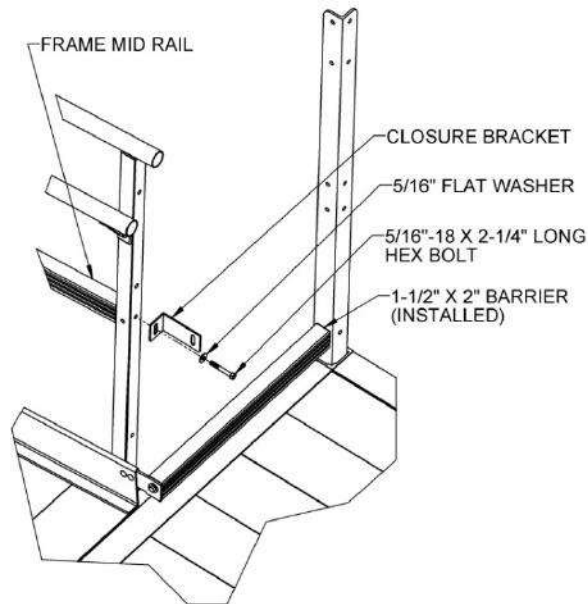
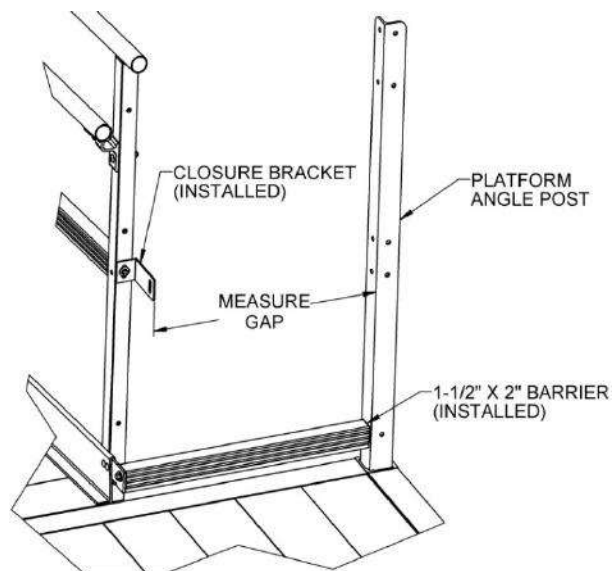
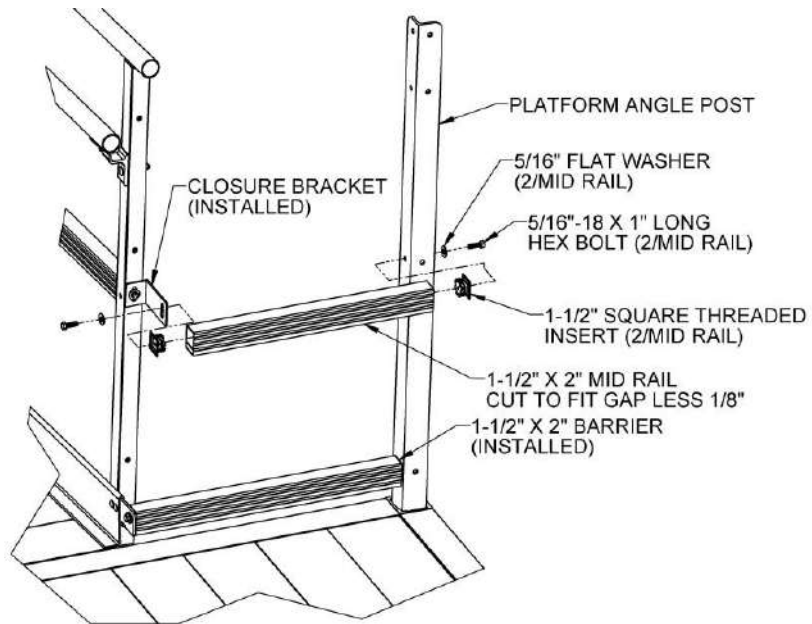


FIG. 5.7



- 5.2.15. Insert 5/16"-18 square threaded inserts into both ends of the mid rail (FIG. 5.8). Use a rubber mallet or similar tool to fully seat as needed.
- 5.2.16. Install 5/16"-18 x 1" hex bolts through 5/16" flat washers, the long leg of the closure bracket, and the platform angle post into the 5/16"-18 square threaded inserts installed in the mid rail. Use the hole approximately in the middle of the platform angle post as shown (FIG. 5.8).
- 5.2.17. Tighten all fasteners securely.

FIG. 5.8



5.3. TWO-LINE RAIL TOP RAIL

- 5.3.1. Insert a 2-15/16" ring joiner in the frame top rail and install an adjustable elbow with another 2-15/16" ring joiner as shown (FIGs. 5.9 and 5.10).
- 5.3.2. Assemble an adjustable elbow with threaded insert in the uppermost hole in the platform angle post where the closure will connect using a 5/16"-18 x 1" long hex bolt and 5/16" flat washer.
 - 5.3.2.1. For a 5' platform side, use the hole shown in FIG. 5.9. For larger platforms use the hole shown in FIG. 5.10.
- 5.3.3. Tighten only enough to hold the elbow in place.
- 5.3.4. Insert a 2-15/16" ring joiner in the opposite end of the adjustable elbow with threaded insert (FIGs. 5.9 and 5.10).

FIG. 5.9

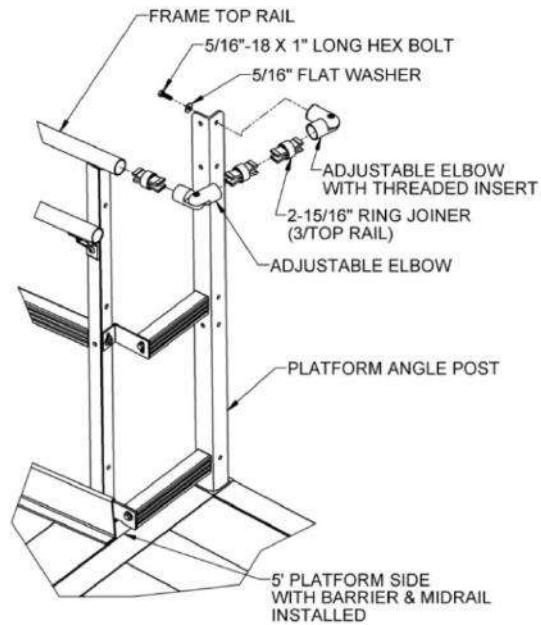
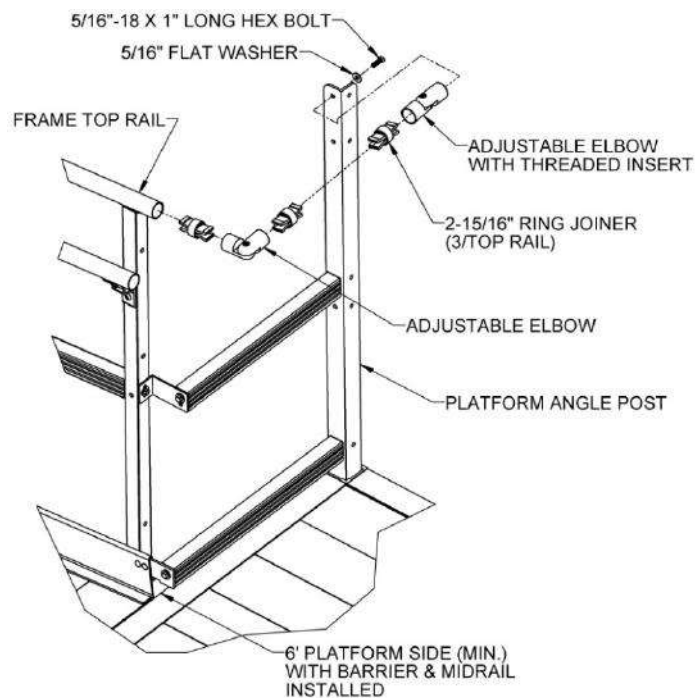


FIG. 5.10



- 5.3.5. Loosen the elbow assembly screws and align the round faces of the adjustable elbows, and then tighten the elbow assembly screws and joiner set screws enough to hold them in position (FIG. 5.11).
- 5.3.6. Measure the gap between the faces of the opposing rings of the 2-15/16" ring joiners (FIG. 5.11).
- 5.3.7. Cut the 1-1/2" diameter round tube to the length measured.
- 5.3.8. Using a metal file, remove any sharp edges from cutting.
- 5.3.9. Install the cut 1-1/2" diameter round tube between the 2-15/16" ring joiners.
- 5.3.10. To facilitate installation, remove and reinstall the adjustable elbow with threaded insert from the platform angle post (FIG. 5.12).
- 5.3.11. Tighten the adjustable elbow assembly screws and all 2-15/16" ring joiner set screws securely.

FIG. 5.11

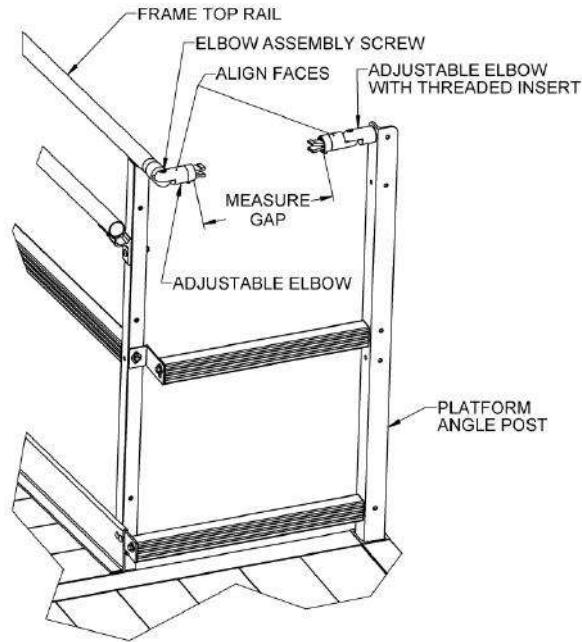
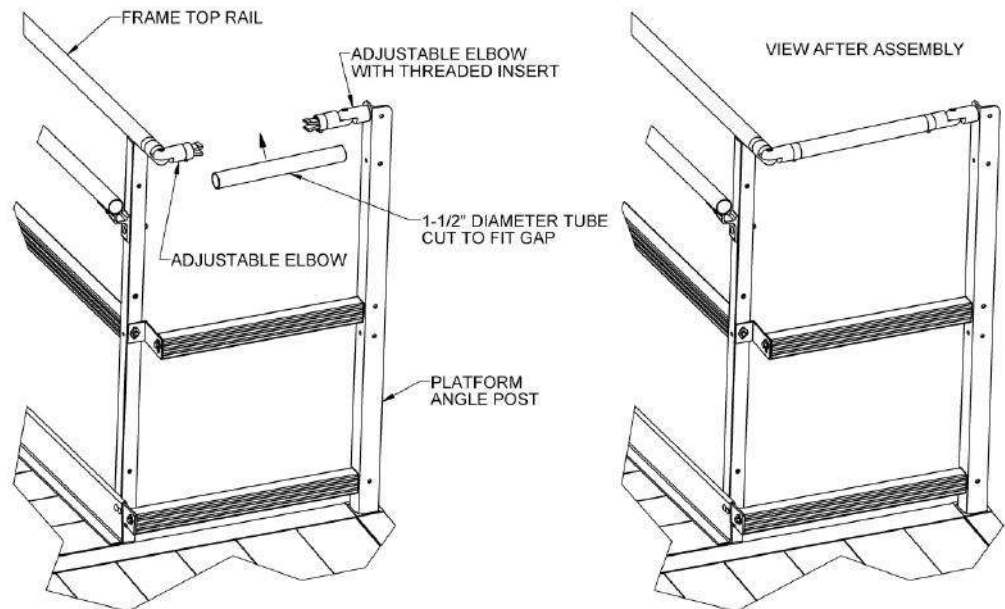
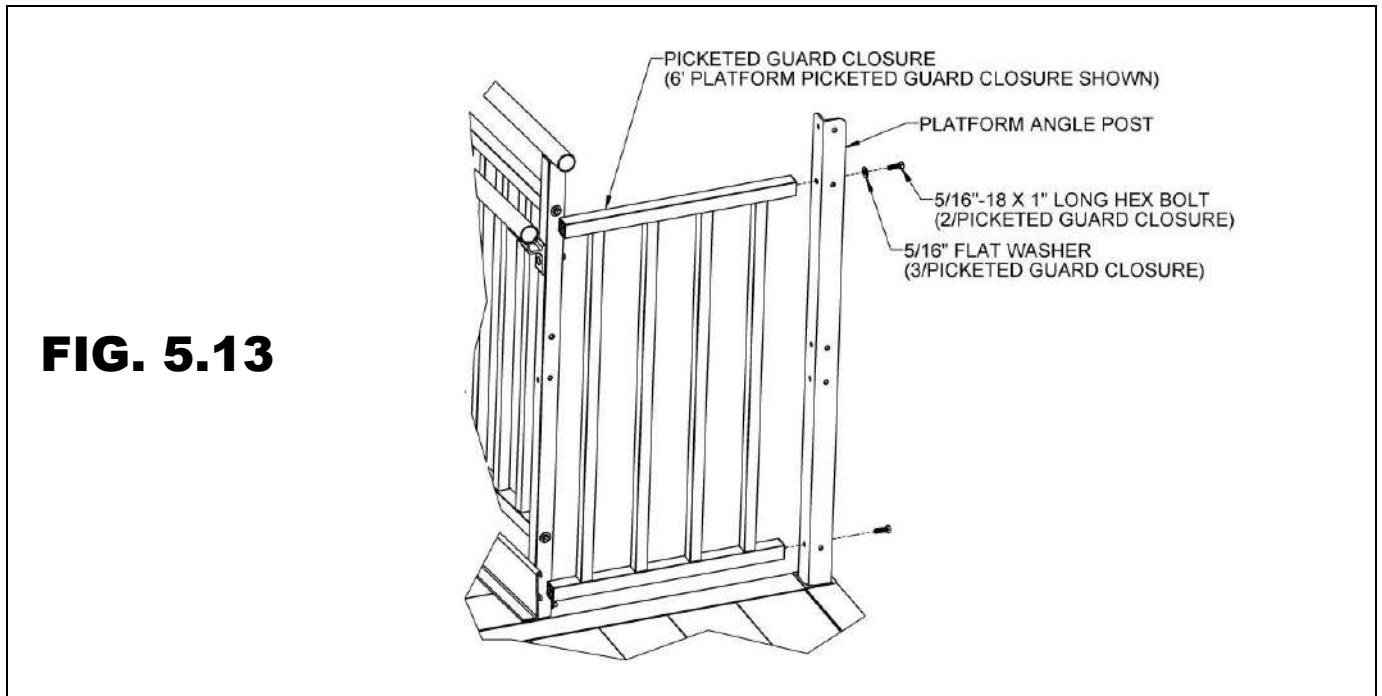


FIG. 5.12

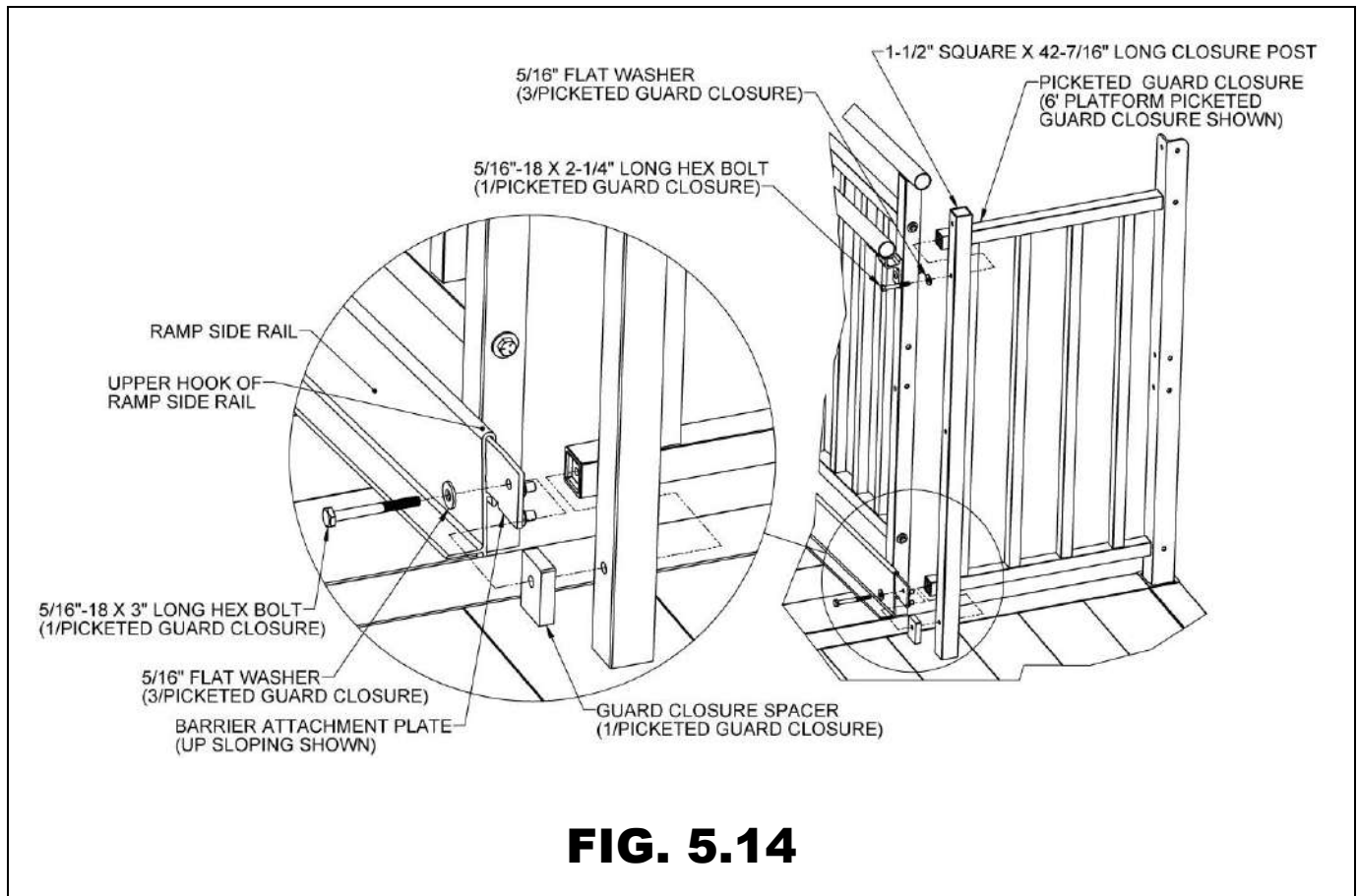


5.4. PICKETED GUARD CLOSURE

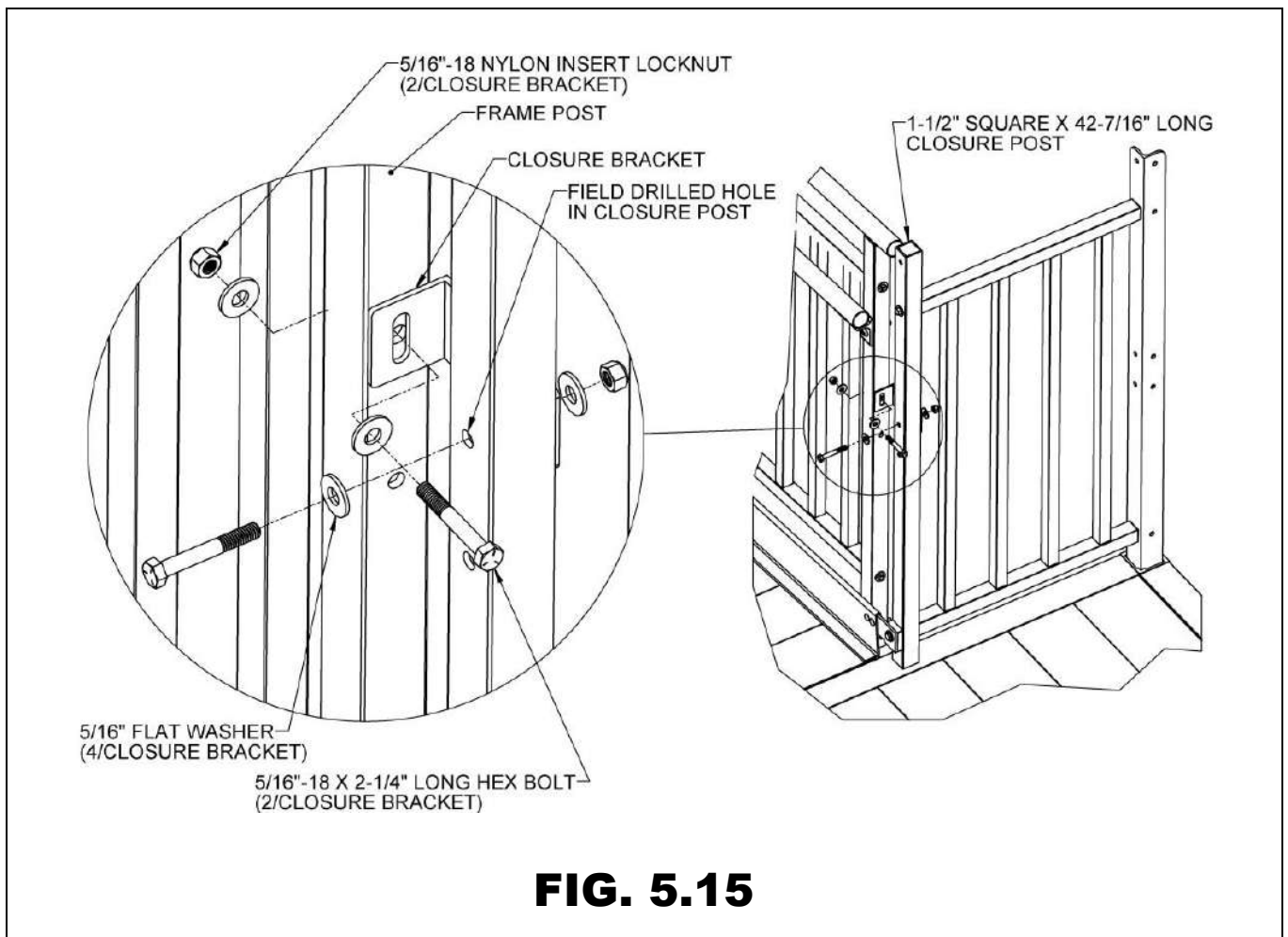
- 5.4.1. Picketed guard closures are specific to the platform size (5', 6', or 7') and require the ramp to be mounted to one side or the other of a platform. If the ramp is to be placed anywhere other than the side of a platform, custom components will be needed (consult your sales representative for the required components).
 - 5.4.2. Attach the picketed guard closure to the platform angle post.
 - 5.4.2.1. Upper Rail: Use 5/16"-18 x 1" long hex bolts and 5/16" flat washers to attach the upper rail.
 - 5.4.2.2. Lower Rail: Use 5/16"-18 x 1" long hex bolt; do not use a flat washer at this location (FIG. 5.13).
- 🖐️ Picketed guard closures are symmetric so can be installed with either rail on top. What becomes the "upper" or "lower" rail depends on how the closure is positioned at installation.



- 5.4.3. Locate the appropriate barrier attachment plate. If the upper end of the ramp or ramp run terminates at a platform, use the “up sloping” version of the plate. If the lower end of a ramp or ramp run starts at a platform, use the “down sloping” version. Note the orientation of the larger $\frac{3}{8}$ ” diameter hole with respect to the $1\text{-}\frac{1}{2}$ ” x 2” section of the plate as shown (refer back to FIG. 5.3) to identify which barrier attachment plate is needed.
- 5.4.4. Fasten barrier attachment plate to the lowermost hole in the $1\text{-}\frac{1}{2}$ ” square x $42\text{-}\frac{7}{16}$ ” long closure post and lower rail of the picketed guard closure using a $\frac{5}{16}$ ”-18 x 3” long hex bolt and $\frac{5}{16}$ ” flat washer with the guard closure spacer between the barrier attachment plate and the closure post.
- 5.4.4.1. Orient the closure post with the two holes which are the closest together on top. If the uppermost hole in the closure post does not align with the uppermost hole in the platform angle post, the closure post is upside down. Make sure the leg of the attachment plate with the two smaller holes is captured under the upper hook and in contact with the ramp side rail. Move the ramp or platform slightly (if needed) and clamp the attachment plate to the side rail if possible before drilling (FIG. 5.14).
- 5.4.5. Attach upper rail of picketed guard closure to closure post using a $\frac{5}{16}$ ”-18 x $2\text{-}\frac{1}{4}$ ” hex bolt and $\frac{5}{16}$ ” flat washer through the second hole from the top of the closure post (FIG. 5.14).
- 5.4.6. Drill holes in the ramp side rail and attach the barrier attachment plate to the side rail in the same manner described in ‘CLOSURES’ section and shown (refer back to FIG. 5.5).



- 5.4.7. Locate a closure bracket and attach the short leg of the bracket to the frame post with a 5/16"-18 x 2-1/4" hex bolt, 5/16" flat washers, and 5/16"-18 nylon insert locknut oriented as shown (FIG. 5.15). Use the uppermost hole available or field drill at a higher location on the post if desired.
- 👉 The closure bracket is the larger of the two closure brackets with 1-13/16" and 4" long legs and is only used at platform closures and turn back arrangements.
- 5.4.8. Orient the bracket so the long leg is on the same side of the closure post as the picketed guard closure and in contact with the closure post, and then tighten lightly (enough to hold the bracket against the post but still allow it to rotate).
- 5.4.9. Drill a 5/16" or 11/32" hole through the 1-1/2" square x 42-7/16" long closure post at the slot in the long leg of the closure bracket (FIG. 5.15).
- 5.4.10. Attach the long leg of closure bracket to the closure post with a 5/16"-18 x 2-1/4" hex bolt, 5/16" flat washers, and 5/16"-18 nylon insert locknut oriented as shown (FIG. 5.15).
- 5.4.11. Tighten all fasteners securely.



- 5.4.12. Measure the gap between the 1-1/2" square x 42-7/16" long closure post and the platform angle post (FIG. 5.16).
- 5.4.13. Locate the 1-1/2" diameter round tube and cut to the length measured in the previous step, less 1/8" to account for the threaded inserts which will be installed after cutting.
- 5.4.14. Using a metal file, remove any sharp edges left from cutting.
- 5.4.15. Place 5/16"-18 round threaded inserts into both ends of the 1-1/2" diameter round tube (FIG. 5.16). Use a rubber mallet or similar tool to fully seat as needed.
- 5.4.16. Attach 1-1/2" diameter round tube to platform angle post using a 5/16"-18 x 1" hex bolt through a 5/16" flat washer and into the 5/16"-18 round threaded insert installed in the tube.
- 5.4.17. Attach the other end of the tube to the closure post using a 5/16"-18 x 2-1/4" long hex bolt through a 5/16" flat washer, the uppermost hole in the closure post and, into the 5/16"-18 round threaded insert (FIG. 5.16).
- 5.4.18. Insert a square tube plug and fully seat into the top of the closure post. Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.
- 5.4.19. Tighten all fasteners securely.

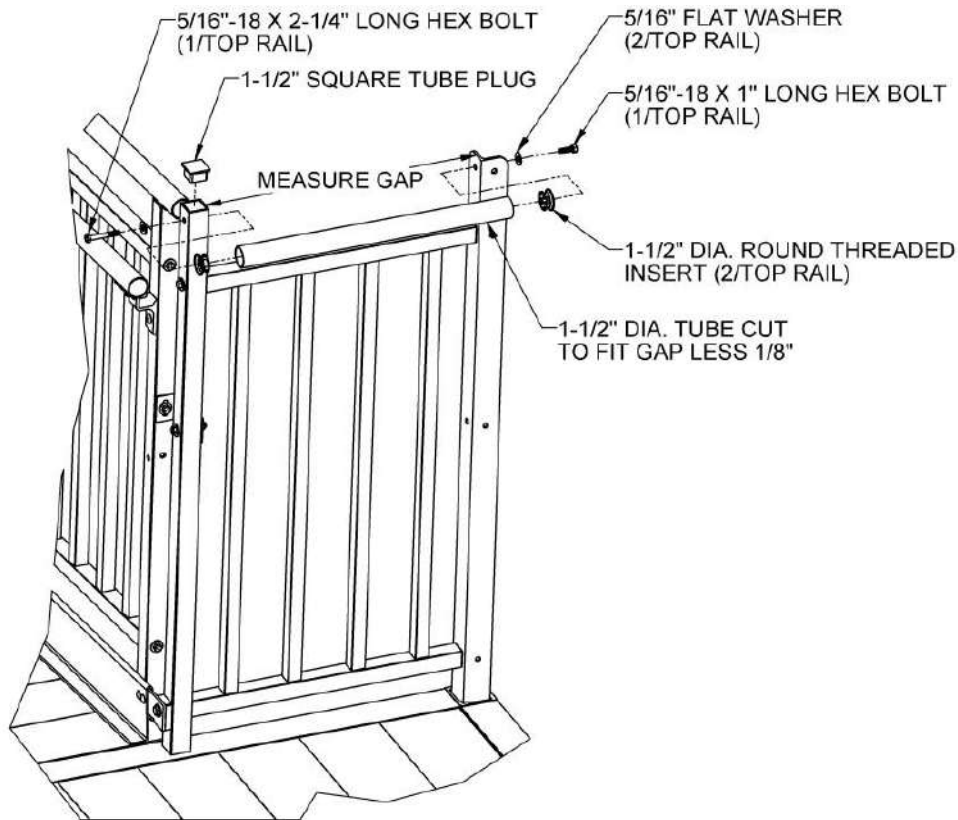


FIG. 5.16

5.5. CLOSURE HANDRAILS



Closure handrails are installed in the same manner for the two-line rail and the picketed guard closure. The images in this section show the installation using a two-line rail closure.

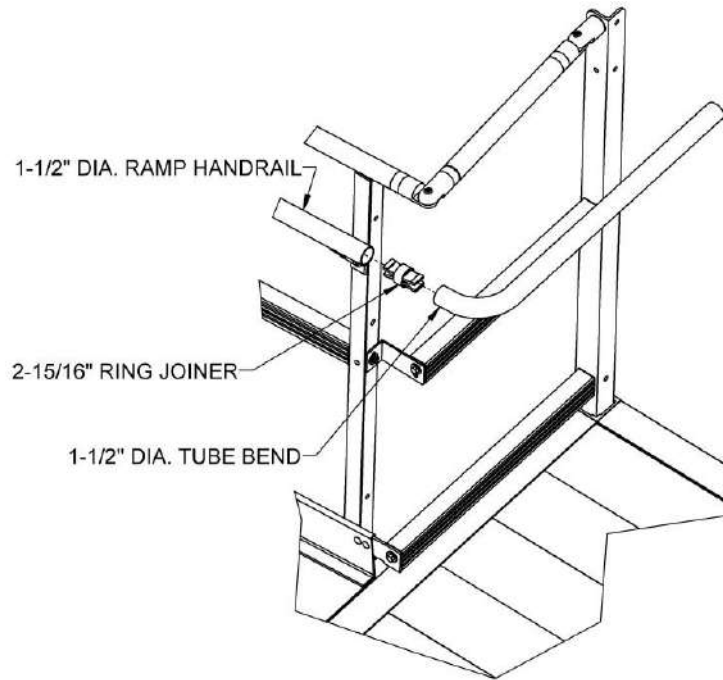
5.5.1. Insert a 2-15/16" ring joiner in the ramp handrail and install a 1-1/2" diameter tube bend ("tube bend") onto the other end of the joiner. Orient the joiner set screw toward the underside of the handrail (FIG. 5.17).



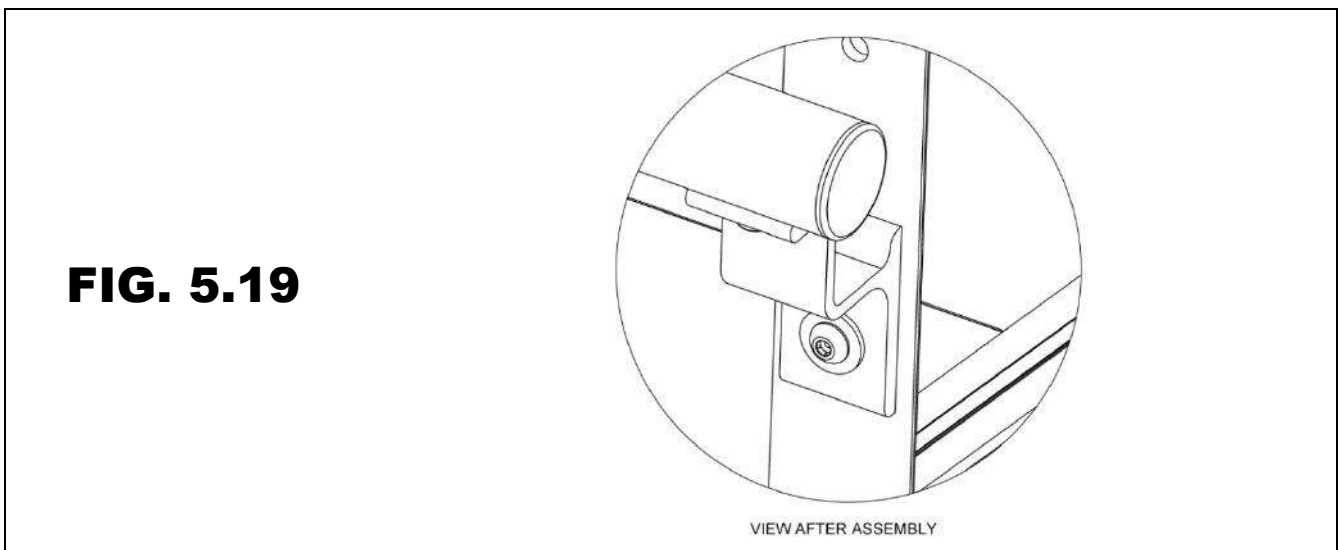
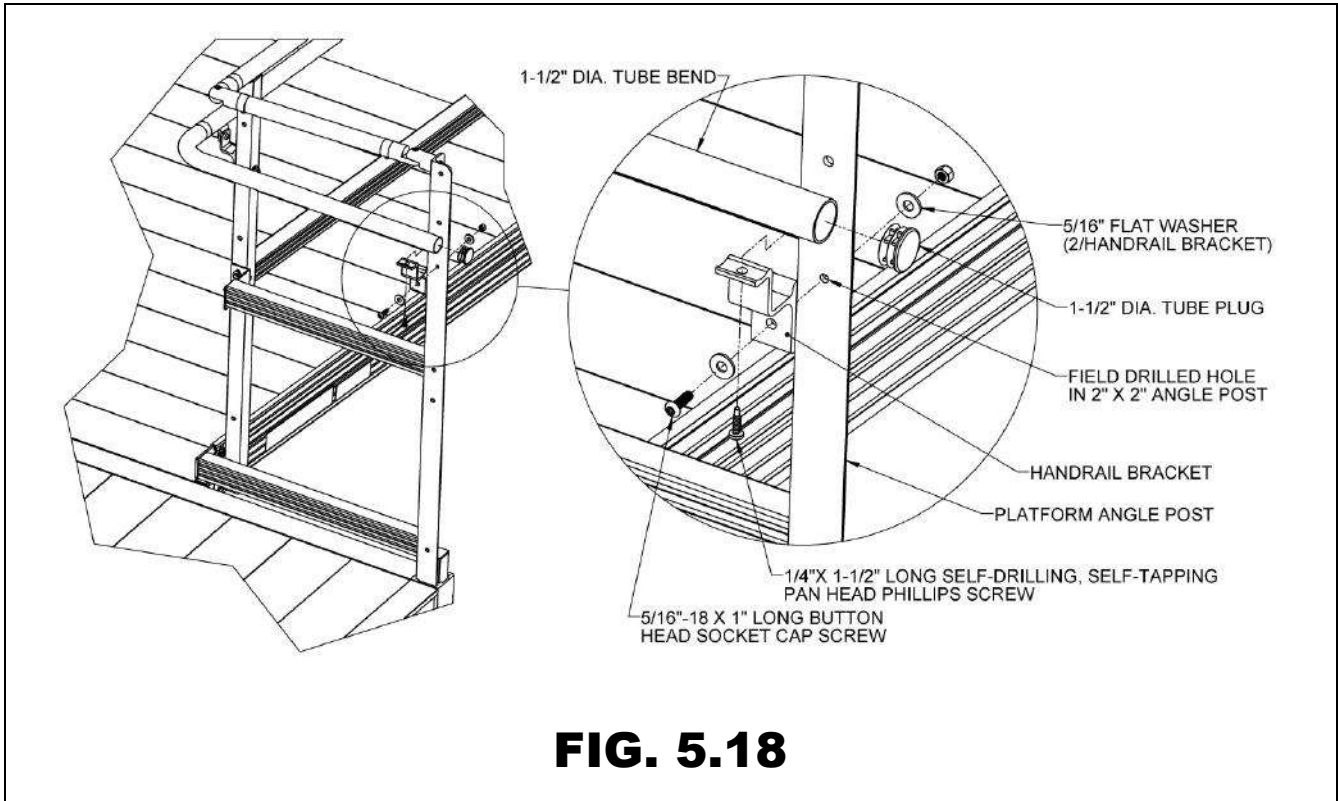
The tube bends are specific to the length of the platform side but may still need to be field-trimmed. If trimming, use a metal file to remove all sharp edges.

5.5.2. Level the tube bend with respect to the platform deck, and then tighten the joiner set screw to hold the tube bend in place (FIG. 5.17).

FIG. 5.17



- 5.5.3. Locate a handrail bracket. Hold handrail bracket in place, centered on the platform angle post with the saddle in contact with the tube bend (FIG. 5.18).
- 5.5.4. Use the hole in the handrail bracket as a template to drill a 5/16" or 11/32" hole through the platform angle post.
- 5.5.5. Attach the handrail bracket to the platform angle post using a 5/16"-18 x 1" button head socket cap screw, 5/16" flat washers, and 5/16"-18 nylon insert locknut oriented as shown (FIG. 5.18).
- 5.5.6. Attach handrail bracket to the tube bend with a 1/4" x 1-1/2" self-drilling, self-tapping pan head Phillips screw through the hole in handrail bracket saddle (FIG. 5.18).
- 5.5.7. If needed, trim the open end of the tube bend.
- 5.5.8. Insert a 1-1/2" end plug into the open end of the tube bend (FIGs. 5.18 and 5.19). Use a rubber mallet or similar tool to fully seat as needed.
- 5.5.9. Tighten all fasteners securely.



5.6. TWO-LINE RAIL TURN BACK CLOSURE

There are four closures available for filling the space between two ramps in a turn back configuration: Two-line rail for a 5' platform side, picketed guard for a 5' platform side, two-line rail for a 6' platform side, and picketed guard for a 6' platform side. Turn back closures for a 7' platform side are uncommon and must be ordered as a custom closure.

5.6.1. First, install corner pocket covers in the two platform corner pockets between the ramps which do not have platform angle posts.

5.6.1.1. Make sure the 1-1/2" support legs and platform connector stub tubes are flush or slightly below the tops of the platform corner pockets, and then drop the angles on the underside of the corner pocket covers into the pockets where the post would normally be installed (FIG. 5.20).

5.6.2. Tighten the set screws in the corner pocket to hold the covers in place (refer back to FIG. 2.9 for additional details on set screw locations).

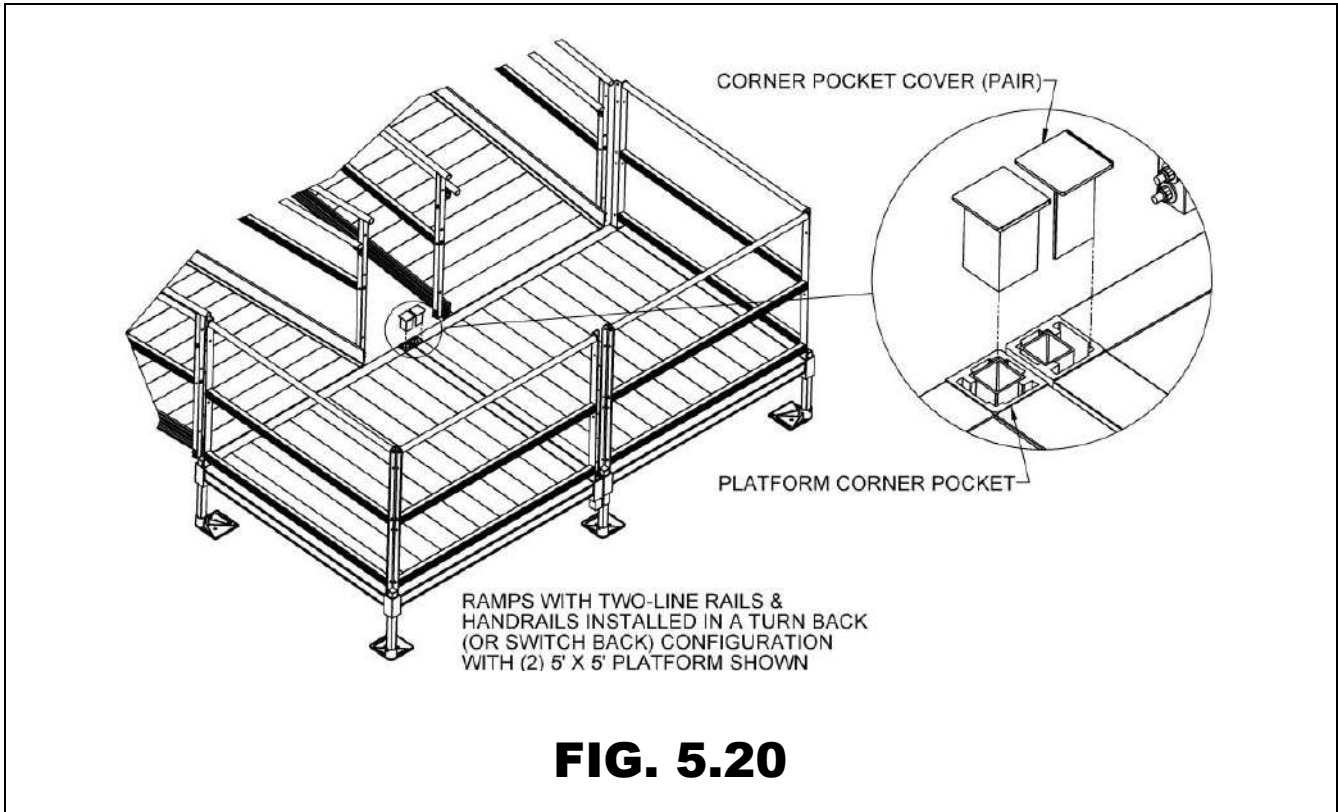
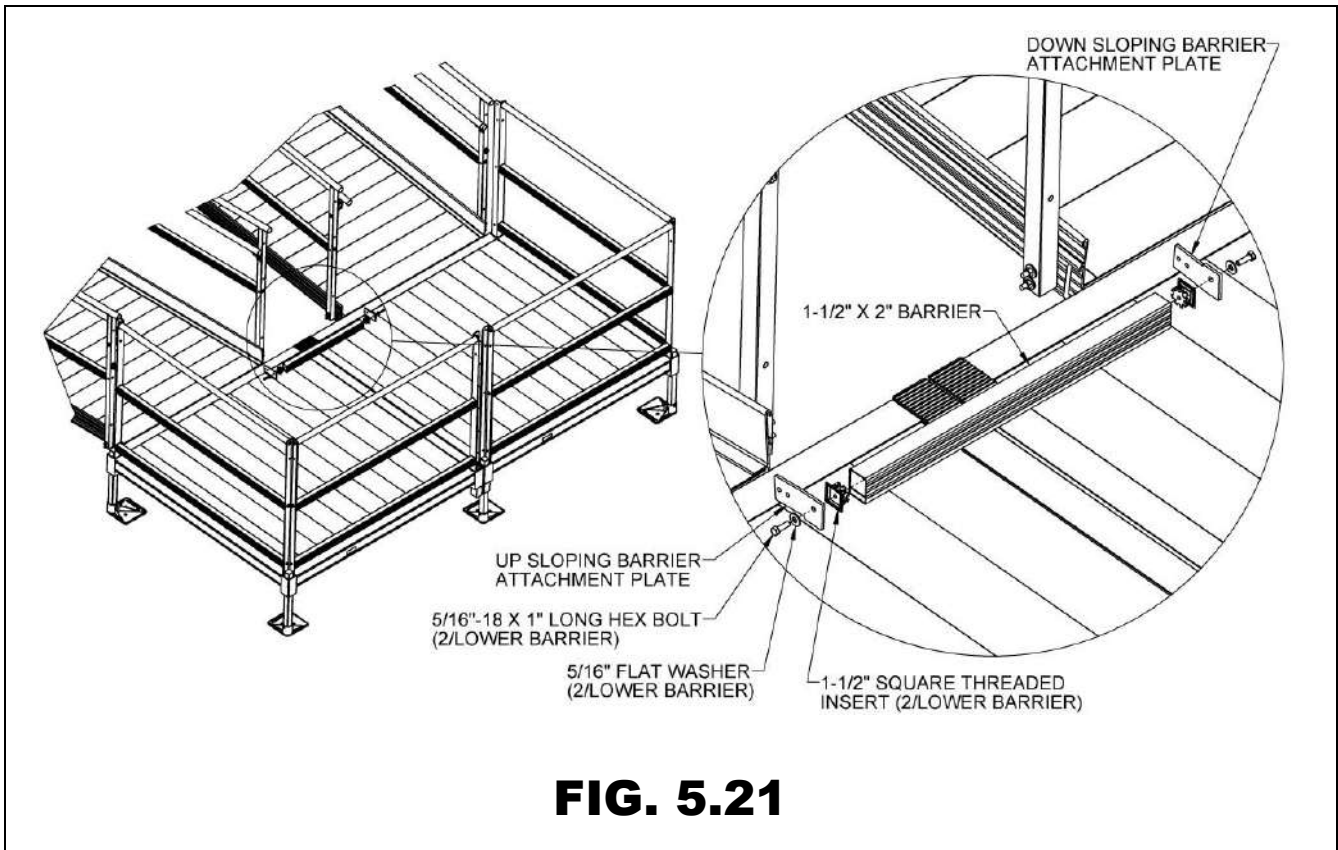
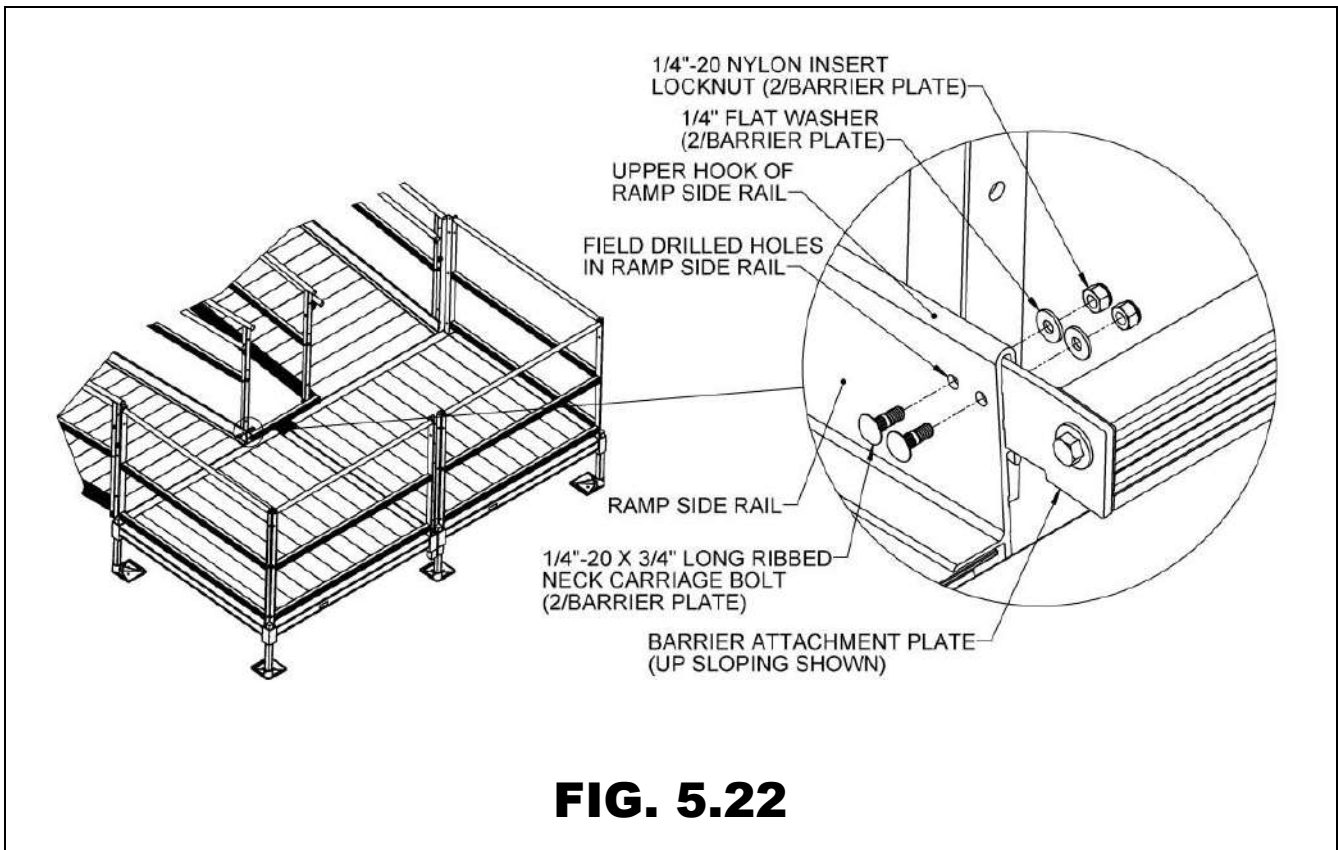


FIG. 5.20

- 5.6.3. The barrier is provided in the length needed for the platform side and should not need to be trimmed. Insert 1-1/2" square threaded inserts into both ends of the 1-1/2" x 2" barrier. Use a rubber mallet or similar tool to fully seat as needed (FIG. 5.21).
- 5.6.4. Assemble barrier attachment plates to barrier using a 5/16"-18 x 1" long hex bolts and 5/16" flat washers. Note which side of the barrier the plates are attached to and match the direction of ramp slope. If the upper end of the ramp or ramp run terminates at a platform, use the "up sloping" plate. If the lower end of a ramp or ramp run starts at a platform use the "down sloping" plate.
- 5.6.5. Note the orientation of the larger 3/8" diameter hole with respect to the 1-1/2" x 2" section of the plate (refer back to FIG. 5.3) to identify which barrier attachment plate is needed.
- 5.6.6. Align the barrier attachment plates with sides of the barrier and tighten fasteners securely (FIG. 5.21).



- 5.6.7. Place the assembly into the space between the ramp side rails. Make sure the legs of the barrier attachment plates with the two smaller holes are captured under the upper hooks and in contact with the ramp side rails. Move the ramps slightly if needed. Level the barrier with respect to the platform and clamp the attachment plates to the side rails, if possible, before drilling (FIG. 5.22).
- 5.6.8. Use the two smaller holes in the barrier attachment plates to drill two 1/4" or 9/32" holes through each ramp side rail (FIG. 5.22).
- 5.6.9. Connect the barrier attachment plates to the ramp side rails using 1/4"-20 x 3/4" long ribbed neck carriage bolts, 1/4"-20 nylon insert locknuts, and 1/4" flat washers. Orient the head of the carriage bolt on the ramp side as shown (FIG. 5.22).
- 5.6.10. For the mid rail, first measure the distance between the frame posts at the turn back, and then cut the 1-1/2" x 2" mid rail to the measured length less 5/8" to account for threaded inserts and attachment plates which will be installed in the following steps.
- 5.6.11. Using a metal file, remove all sharp edges from cutting.



- 5.6.12. Insert 1-1/2" square threaded inserts into both ends of the 1-1/2" x 2" mid rail (FIG. 5.23). Use a rubber mallet or similar tool to fully seat as needed.
- 5.6.13. Attach the mid rail attachment plates to mid rail with 5/16"-18 x 1" long flat head socket cap screws (the hole in the mid rail attachment plate is offset to account for the offset of the threaded insert in the mid rail). Orient the plate such that the mid rail is centered on both sides, and then tighten screws securely (FIG. 5.24).

FIG. 5.23

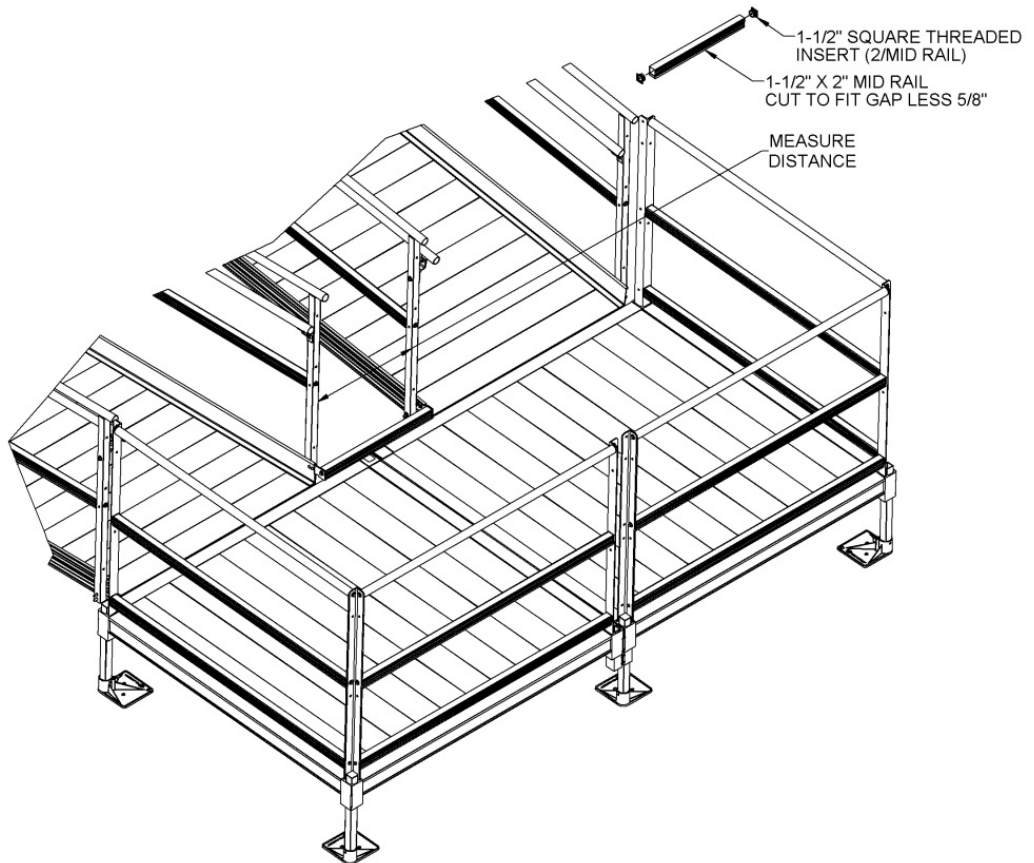
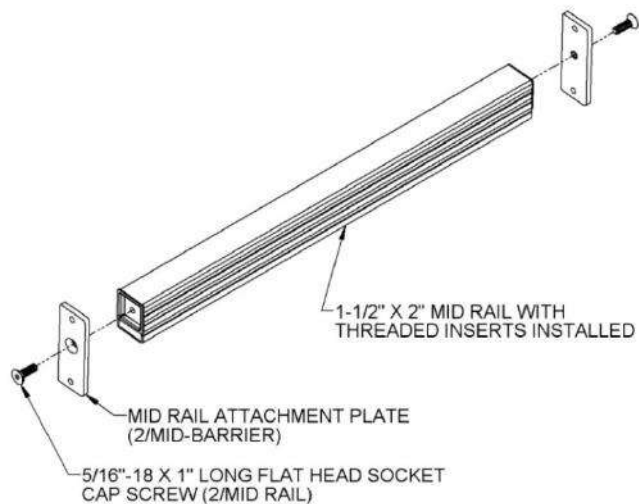
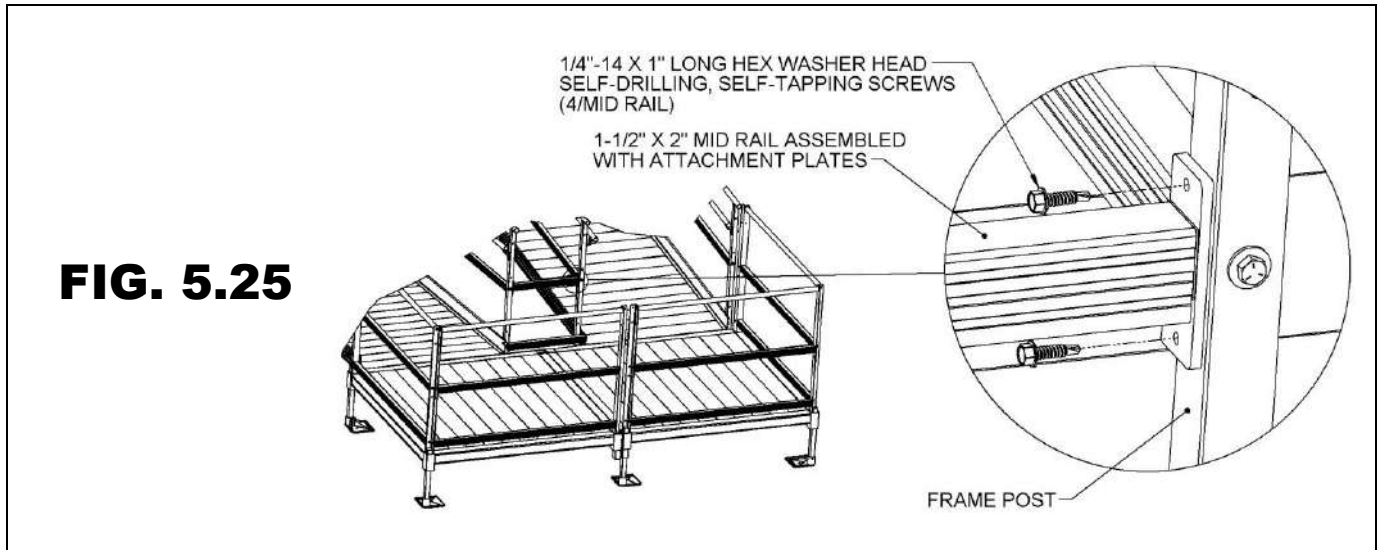


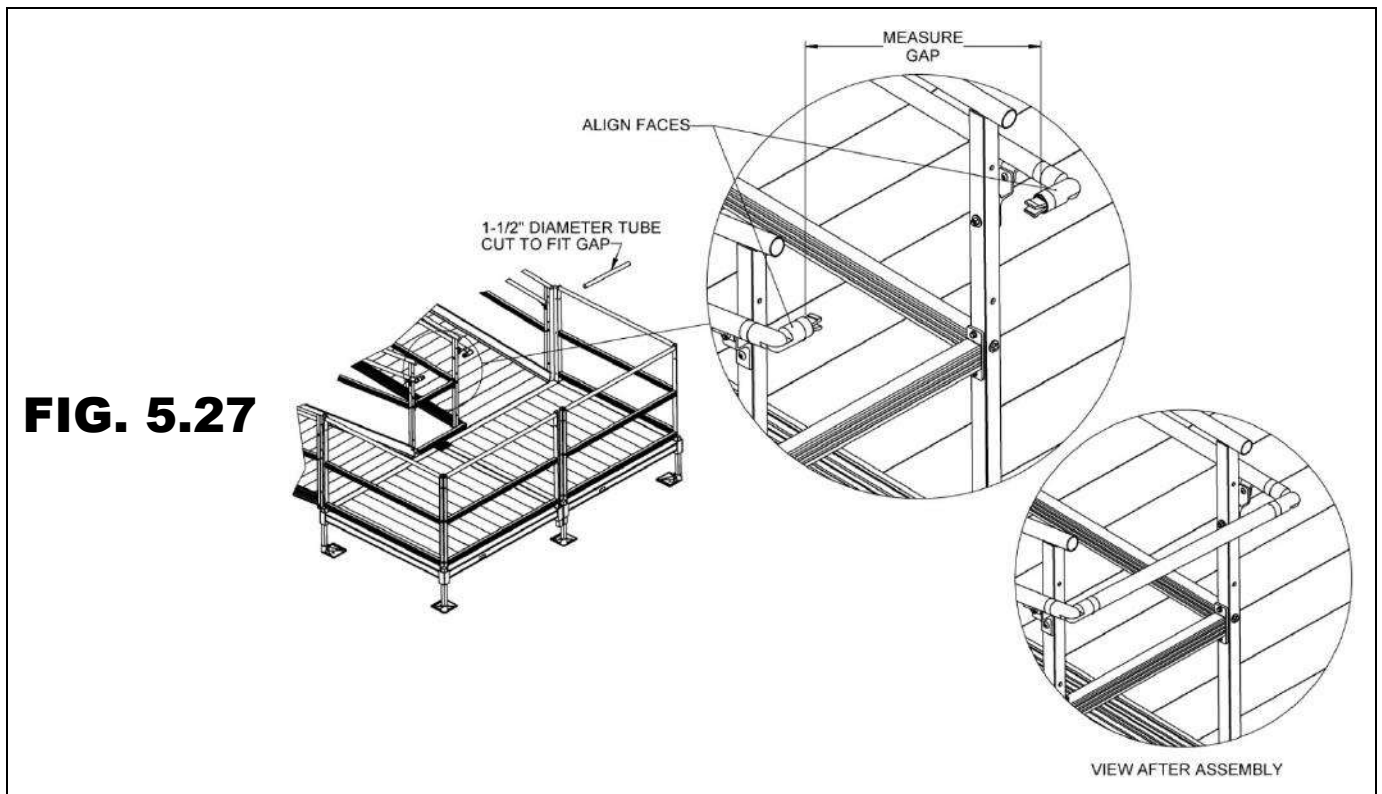
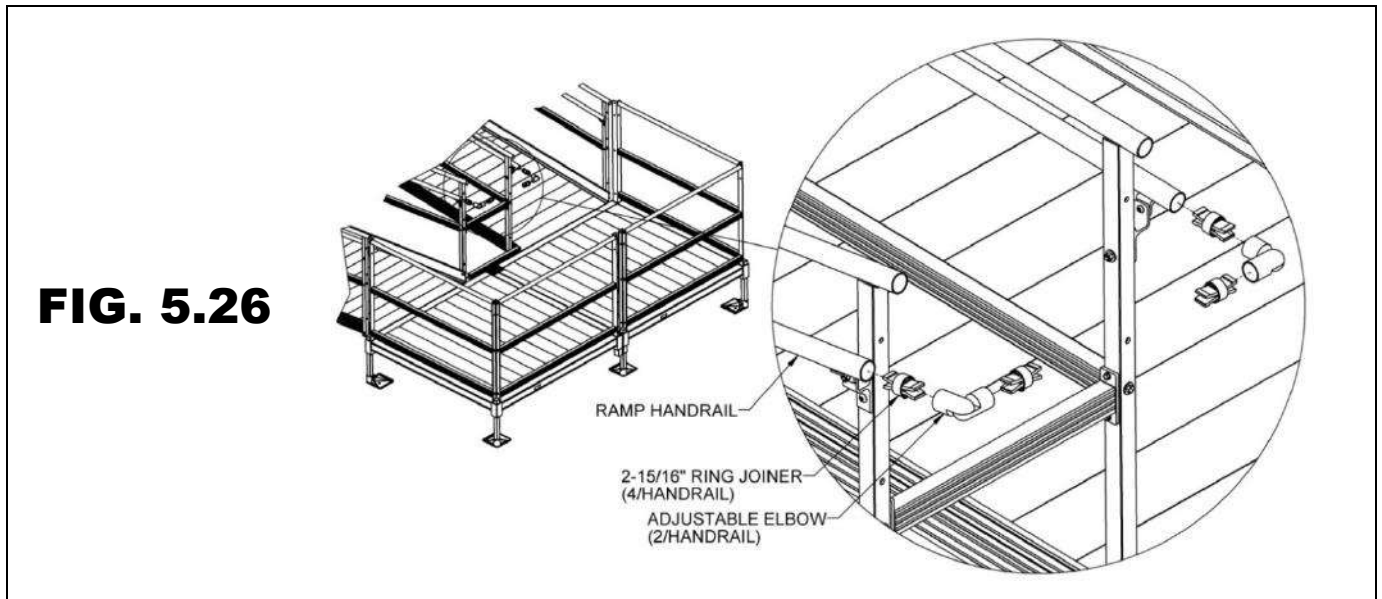
FIG. 5.24



- 5.6.14. Attach the mid rail assembly between the frame posts using two each 1/4"-14 x 1" long hex washer head self-drilling, self-tapping screws per attachment plate. Center the mid rail assembly (approximately) between frame mid rails, about 18" to 18-1/2" above the lower barrier (FIG. 5.25).
- 5.6.15. Connect the ramp handrails at the turn back by first inserting 2-15/16" ring joiners in the open ends of the ramp handrails and adjustable elbows on the opposite end of the ring joiner.



- 5.6.16. Install another 2-15/16" ring joiner into the other ends of the elbows. Orient joiner set screw toward the underside of ramp handrail (FIG. 5.26).
- 5.6.17. Loosen the elbow assembly screws and align the opposing faces of the elbows shown, and then tighten elbow assembly screws and joiner set screws enough to hold the components in position (FIG. 5.26 and FIG. 5.27).
- 5.6.18. Measure gap between faces of opposing rings of the 2-15/16" ring joiners (FIG. 5.27).
 - 5.6.18.1. Make sure the faces of the opposing rings of the 2-15/16" ring joiners are parallel before measuring or cutting the 1-1/2" diameter tube.
- 5.6.19. Cut the 1-1/2" diameter tube to the length measured. Using a metal file, remove any sharp edges from cutting.
- 5.6.20. Install the cut 1-1/2" diameter round tube between the 2-15/16" ring joiners. Remove and reinstall the adjustable elbows, if needed (FIG. 5.27).
- 5.6.21. Securely tighten adjustable elbow assembly screws and all ring joiner set screws.



5.7. PICKETED GUARD TURN BACK CLOSURE

There are four special closures available for filling the space between two ramps in a turn back configuration: Two-line rail for a 5' platform side, picketed guard for a 5' platform side, two-line rail for a 6' platform side, and picketed guard for a 6' platform side. Turn back closures for a 7' platform side are uncommon and must be ordered as a custom closure.

5.7.1. First, install two turn back angle posts (the shorter of the two angle posts), into the open platform corner pockets with rounded end oriented upward.

5.7.1.1. Align the bottom of posts with bottom of corner pockets, and then tighten set screws in the corner pockets securely to hold posts in place (FIG. 5.28). Refer back to FIG. 2.9 for additional details on set screw locations.

5.7.2. Attach picketed guard closures to the turn back angle posts using 5/16"-18 x 1" long hex bolts and 5/16" flat washers to attach the upper rail. To attach lower rail, use 5/16"-18 x 1" long hex bolts (do not use a flat washer at this location) (FIG. 5.29).

🖐 Picketed guard closures are symmetric so can be installed with either rail on top. What becomes the "upper" or "lower" rail depends on how the closure is positioned at installation.

FIG. 5.28

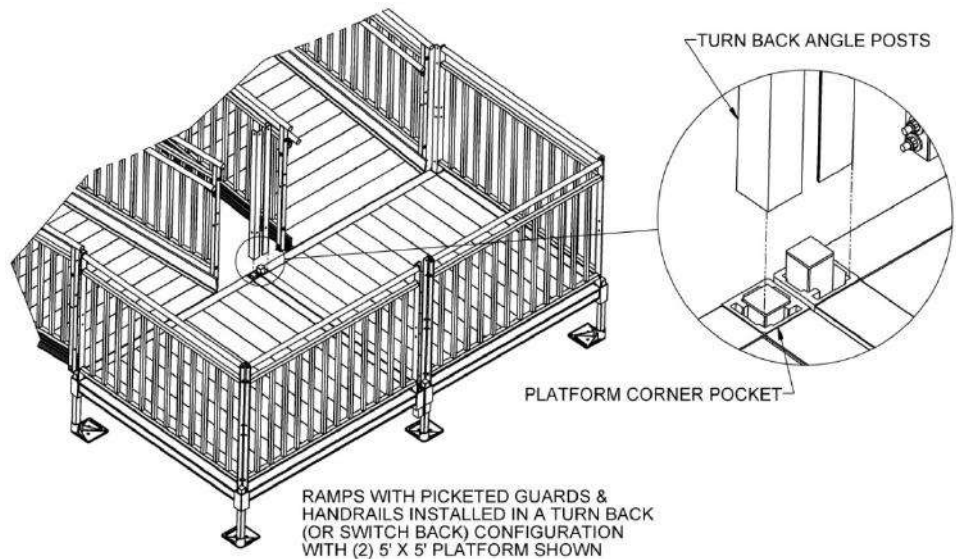
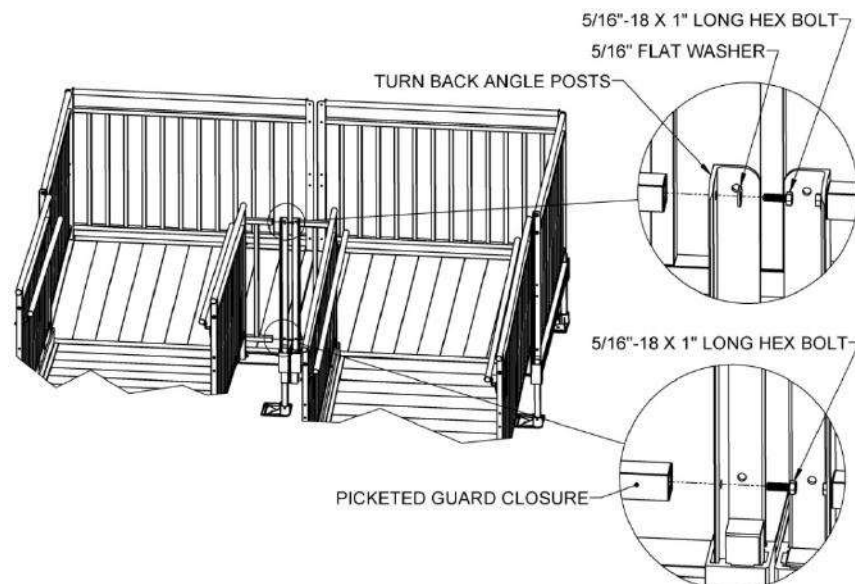


FIG. 5.29



5.7.3. The 1-1/2" square x 42-7/16" long closure posts, barrier attachment plates, and closure brackets are all installed at a guarded turn back in the same manner shown in the 'PICKETED GUARD CLOSURE' section except that the spacer between the closure posts and the barrier attachment plates is not used. FIG. 5.30 shows the components installed.

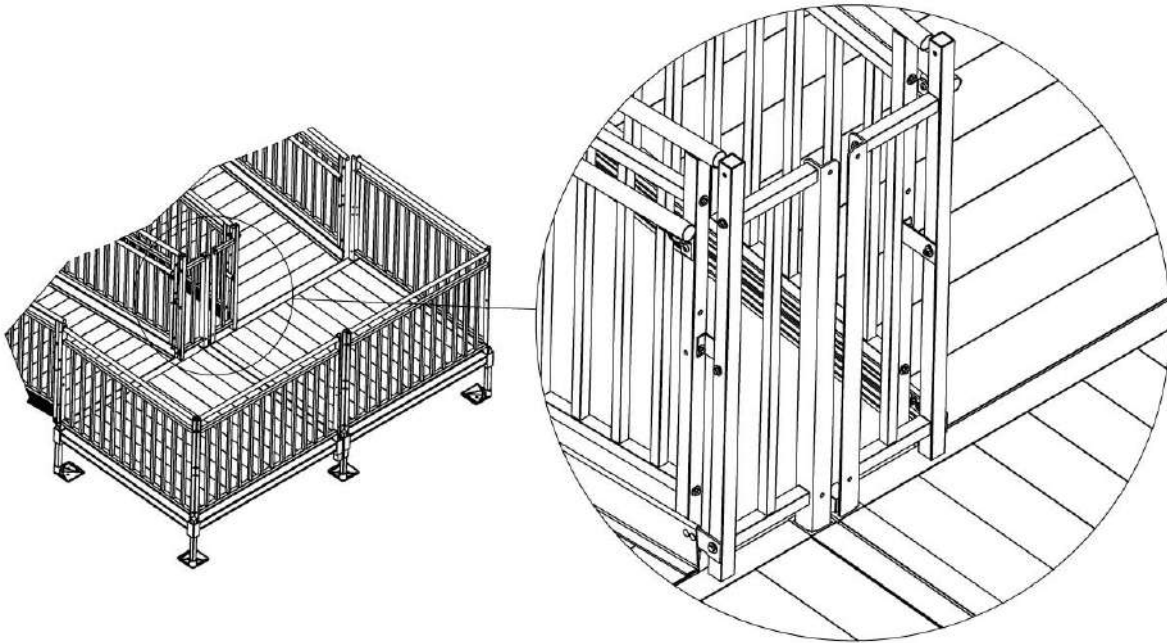
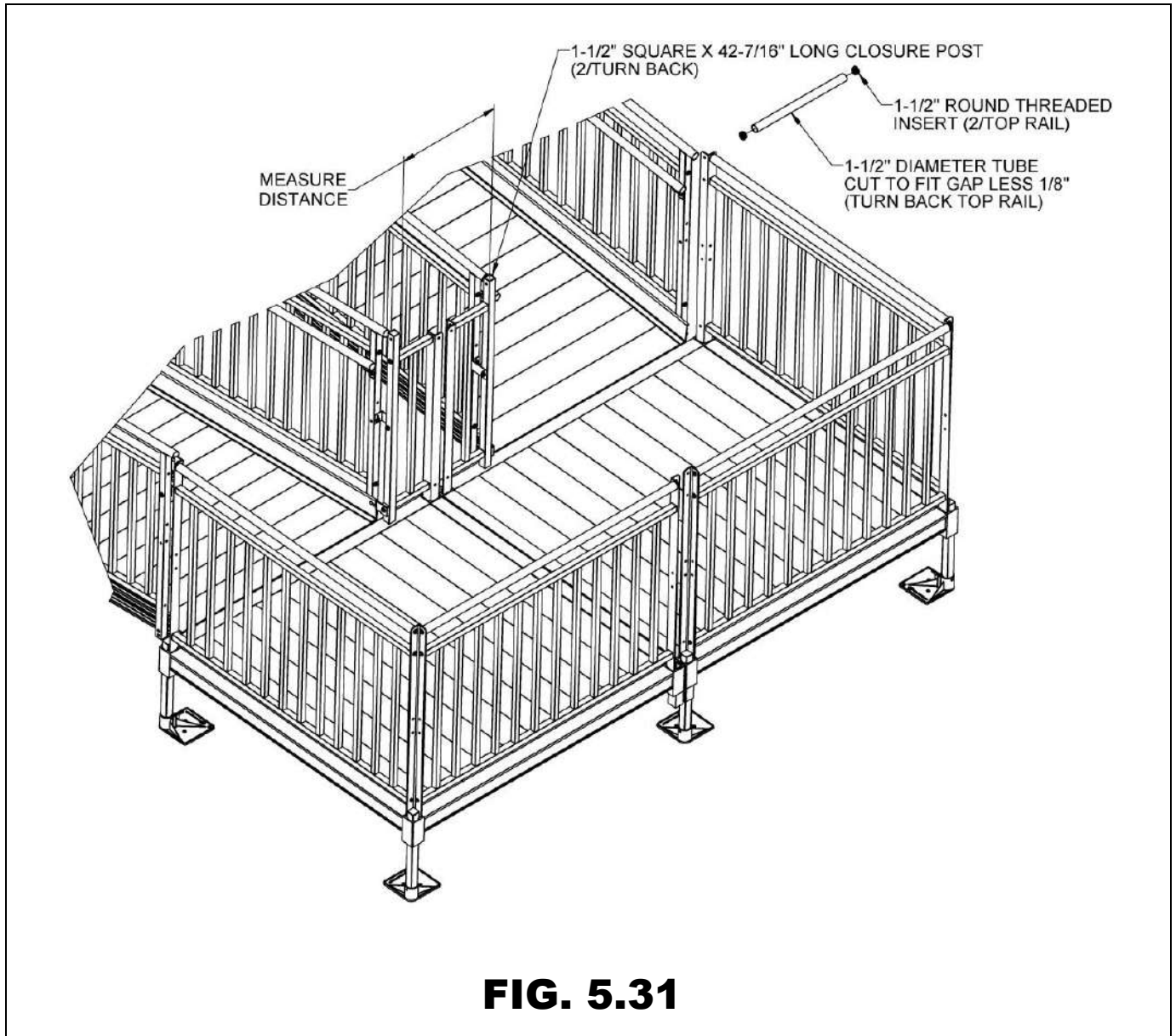


FIG. 5.30

- 5.7.4. For the turn back top rail, measure the distance between the 1-1/2" square x 42-7/16" long closure posts at the turn back, and then cut the 1-1/2" diameter tube to the measured length less 1/8" to account for the threaded inserts which will be installed in the following steps (FIG. 5.31).
- 5.7.5. Using a metal file, remove all sharp edges from cutting.
- 5.7.6. Insert 1-1/2" round threaded inserts into both ends of the 1-1/2" diameter tube. Use a rubber mallet or similar tool to fully seat as needed. (FIG. 5.31).



- 5.7.7. Attach the top rail between the 1-1/2" square x 42-7/16" long closure posts using a 5/16"-18 x 2-1/4" long hex bolt through a 5/16" flat washer, the uppermost hole in the closure post, and into the 5/16"-18 round threaded insert (FIG. 5.32).
- 5.7.8. Repeat this process for the opposite side.
- 5.7.9. Insert a square tube plug into the top of both closure posts (FIG. 5.32). Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.
- 5.7.10. Connect ramp handrails at the turn back by first inserting 2-15/16" ring joiners in the open ends of the ramp handrails. Install a 1-1/2" diameter tube bend on the opposite end of the joiner. Orient the joiner set screws toward the underside of the ramp handrails (FIG. 5.33).

FIG. 5.32

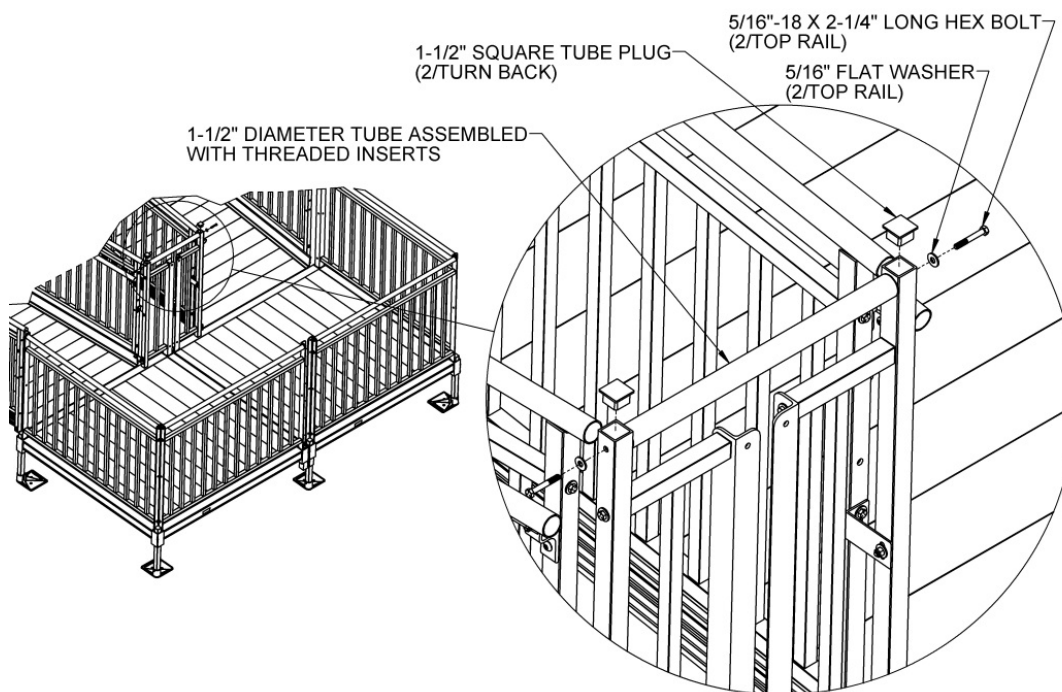
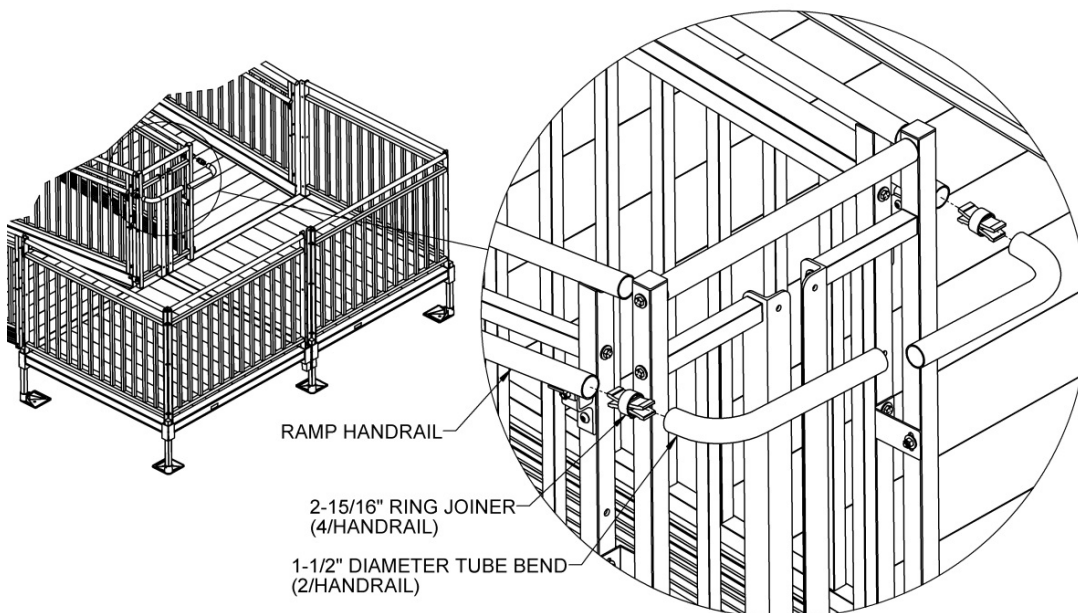
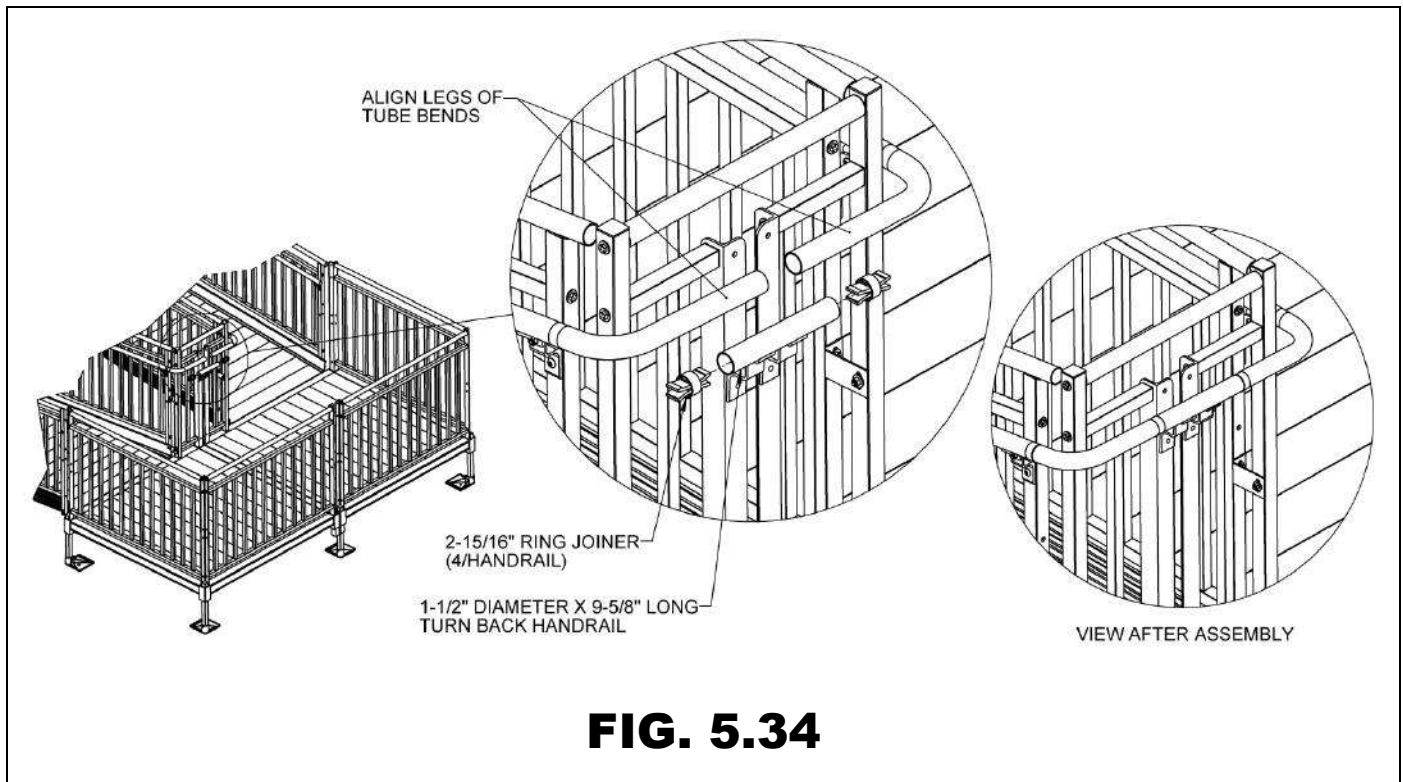


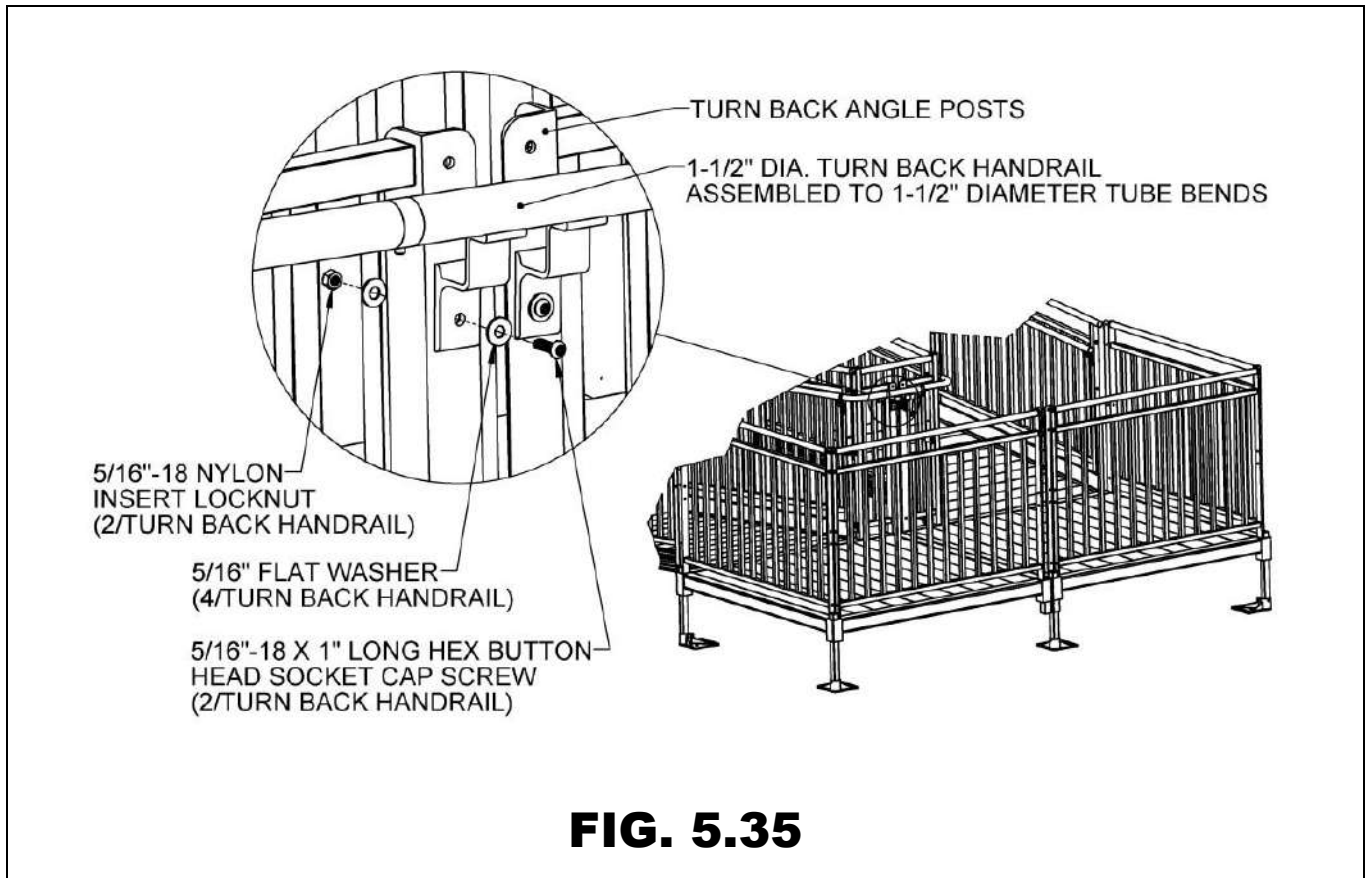
FIG. 5.33



- 5.7.11. Locate the special turn back handrail (1-1/2" diameter x 9-5/8" long tube with two welded handrail brackets).
- 5.7.12. Insert 2-15/16" ring joiners into both ends. Orient the joiner set screw toward the brackets on the underside and tighten the joiner set screws securely (FIG. 5.34).
- 5.7.13. Loosen joiner set screws in the ring joiners connecting the ramp handrails to the tube bends, if needed, and align the long leg of the 1-1/2" diameter tube bends.
- 5.7.14. After alignment, tighten the joiner set screws enough to hold the components in position. Hold the turn back handrail under the 1-1/2" diameter tube bends to assist in the alignment. It will be necessary to trim the short leg of one of the tube bends to align properly. Remove and reinstall the tube bends as needed (FIG. 5.34).
- 5.7.15. Once the 1-1/2" diameter tube bends have been aligned, use the turn back handrail with the ring joiners installed to mark the tube bends for trimming (FIG. 5.34).
- 5.7.16. Remove the 1-1/2" diameter tube bends from the 2-15/16" ring joiners in the ramp handrails and cut at the marked locations.
- 5.7.17. Using a metal file, remove any sharp edges from cutting.
 - ✎ Pay attention to which ramp handrail the tube bend has been removed from and mark if needed. After trimming, the tube bends will need to be reinstalled in the same ramp handrail they were removed from for correct installation.
- 5.7.18. Install the long legs of the cut 1-1/2" diameter tube bends onto the 2-15/16" ring joiners installed in the special turn back handrail, making sure they are on the same side they were removed from originally (FIG. 5.34).
- 5.7.19. Align the short legs of the tube bends with the 2-15/16" ring joiners installed in ramp handrails and install the assembly onto the joiners.
- 5.7.20. Tighten all ring joiner set screws securely.
- 5.7.21. Use the holes in the handrail brackets welded to the turn back handrail as a template to drill 5/16" or 11/32" holes through the turn back angle posts.



- 5.7.22. Attach the turn back handrail to both turn back angle posts using 5/16"-18 x 1" button head socket cap screws, 5/16"-18 nylon insert locknuts, and 5/16" flat washers oriented as shown (FIG. 5.35).
- 5.7.23. Tighten all fasteners securely, including the ring joiner set screws if not tightened previously.

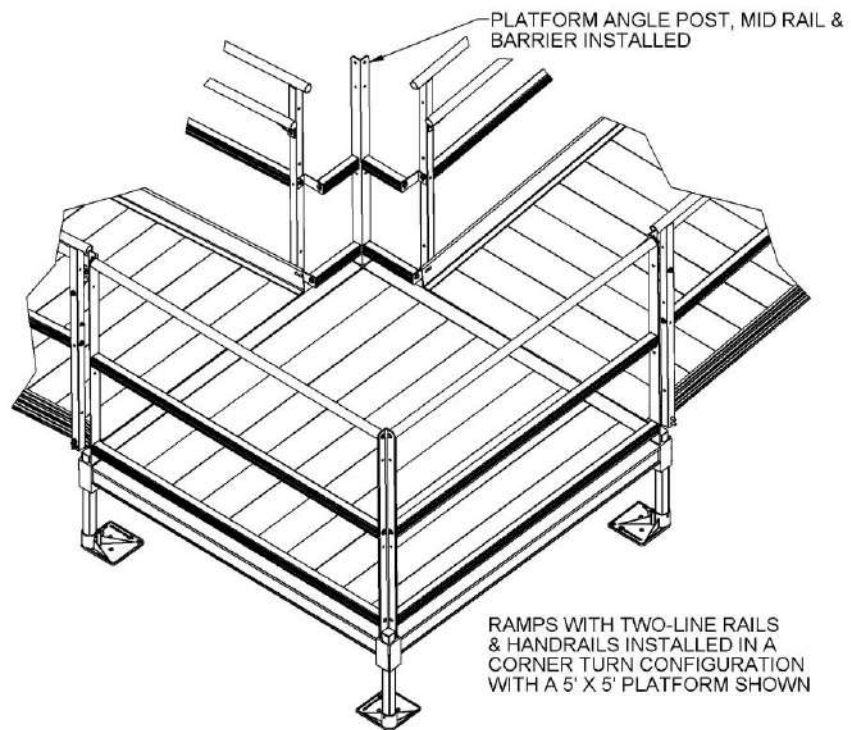


5.8. TWO-LINE RAIL CORNER TURN

There are five special closures available for filling the space between two ramps in a corner turn configuration: Two-Line Rail for a 5' x 5' platform, picketed guard for a 5' x 5' platform, two-line rail for a 6' x 6' platform, picketed guard for a 6' x 6' platform, and special closure for 54" wide ramps used on a 5' platform side. Corner turn closures for a 5' x 7' and 5' x 6' platforms are uncommon so must be ordered as customs for the specific configuration.

- 5.8.1. Install the platform angle post (not already attached to the platform) in the open platform corner pocket. Align the bottom of post with the bottom of corner pocket, and then tighten the set screws securely. Refer to 'HANDRAILS' section for additional details on securing the post to corner pocket.
- 5.8.2. The barrier and mid rail of a two-line corner turn are installed in the same manner as a two-line closure. Refer to 'TWO-LINE RAIL BARRIER AND MID RAIL' section and complete the steps described to connect both frames to the platform angle post in the corner. FIG. 5.36 shows this stage of the assembly.

FIG. 5.36



- 5.8.3. Connect the frame top rails at the corner turn by inserting 2-15/16" ring joiners in the open ends of the frame top rails and adjustable elbows on the opposite end of the ring joiners, and then insert 2-15/16" ring joiners into the other end of the elbows. Orient the joiner set screw toward the underside and the side of the adjustable elbows not attached to the ramp handrail toward the platform angle post in the corner.
- 5.8.4. Tighten joiner set screws and adjustable elbow assembly screws enough to hold in place (FIG. 5.37).
- 5.8.5. Clamp the top rail standoff to the platform angle post in the corner at 1-1/2" from the top of the post. Hold a 1-1/2" diameter 90° elbow such that the middle of the bend is centered on top of the top rail standoff. Rotate the adjustable elbows with the joiners until they are parallel with the ends of the 1-1/2" diameter 90° elbow (FIG. 5.38).
 - ✎ There are two standoffs used at the corner turn post. The top rail standoff is the smaller, shorter one of the two.
- 5.8.6. Mark the 1-1/2" diameter 90° elbow at the ends of the ring joiners and trim at the marked locations. Using a metal file, remove any sharp edges from trimming.
- 5.8.7. Install the 1-1/2" diameter 90° elbow between the joiners. Remove and reinstall the adjustable elbows and ring joiners as needed.
- 5.8.8. Tighten all joiner set screws and elbow assembly screws securely.

FIG. 5.37

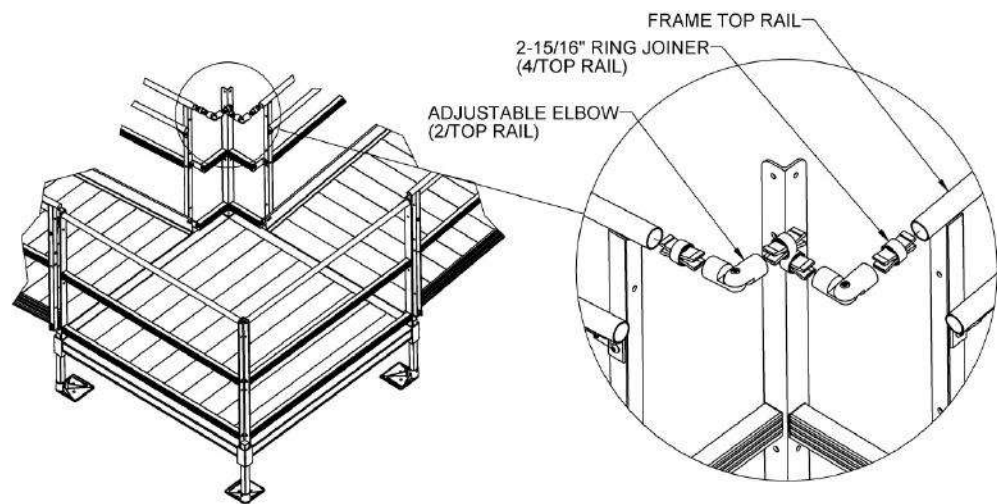
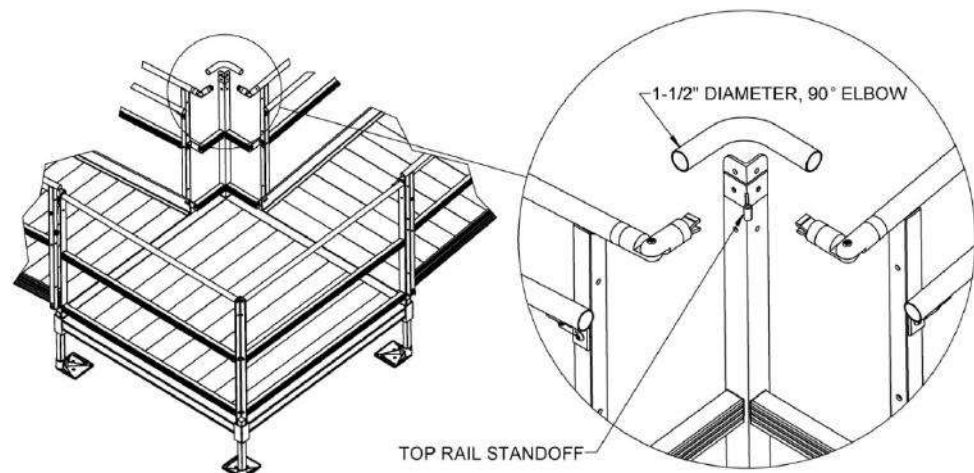


FIG. 5.38



- 5.8.9. Adjust the top rail standoff to contact the underside of the elbow and use the holes in the standoff as a template to drill 5/16" or 11/32" holes through the platform angle posts (FIG. 5.39).
- 5.8.10. Attach the top rail standoff to the platform angle posts using 5/16"-18 x 1" button head socket cap screws, 5/16"-18 nylon insert locknuts, and 5/16" flat washers oriented as shown (FIG. 5.39).
- 5.8.11. Drive a 1/4"-14 x 1-1/2" self-drilling, self-tapping screw up through the underside of the top rail standoff into the 1-1/2" diameter 90° elbow. Put pressure on the elbow until the threads engage and pull the components together (FIG. 5.40).
- 5.8.12. Tighten all fasteners securely, including all ring joiner set screws and elbow assembly screws, if not completed previously.

FIG. 5.39

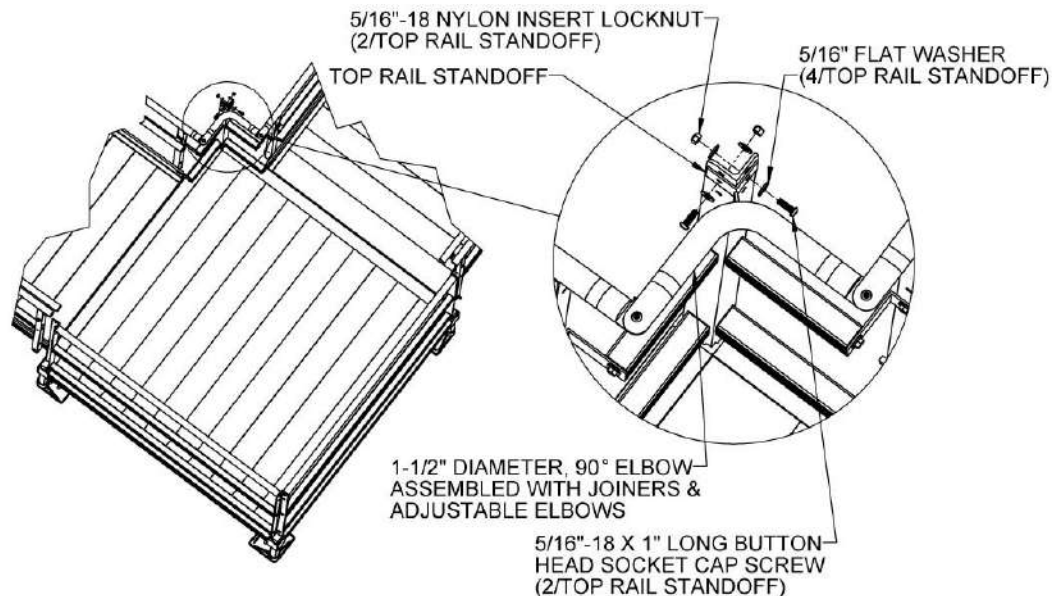
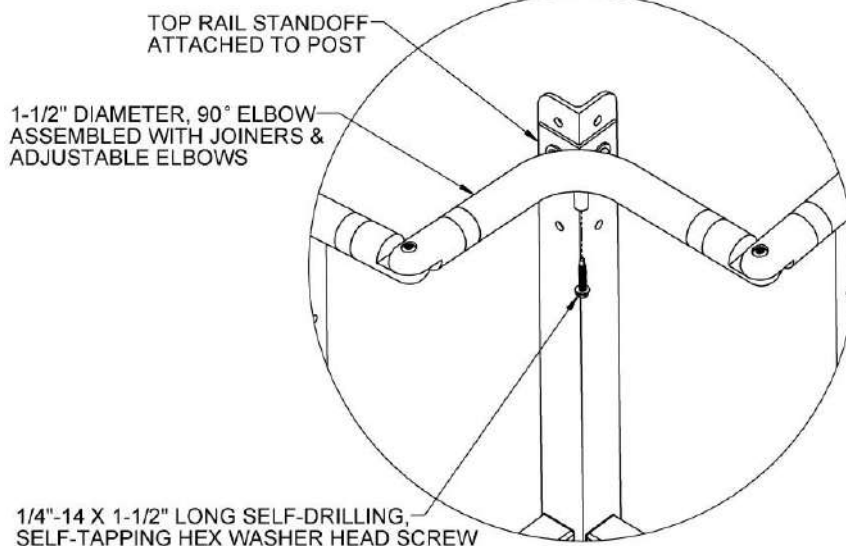


FIG. 5.40



5.8.13. Connect the ramp handrails at the corner turn by first trimming one leg from two 1-1/2" diameter 90° elbows. Trim the elbow leg which will be installed on the lower ramp handrail such that the leg pointing toward the platform angle post in the corner is 2-1/2" (approximately) from the angle post with a 2-15/16" ring joiner installed in the ramp handrail. Trim the elbow leg which will be installed on the upper ramp handrail such that the leg pointing toward the platform angle post in the corner is approximately 2" from the angle post with a 2-15/16" ring joiner installed in the ramp handrail (FIG. 5.41).

✎ The "lower" ramp is the ramp with the upper end which stops at the platform; the "upper" ramp is the ramp with the lower end which starts at a platform. The 1-1/2" diameter 90° elbows are trimmed to different lengths because the relationship of the frame posts to the platform is not the same for "upper" and "lower" ramps.

5.8.14. Using a metal file, remove all sharp edges resulting from tube cuts.

5.8.15. Insert 2-15/16" ring joiners in the open ends of the ramp handrails. Install the 90° elbow leg trimmed for the lower ramp handrail to the joiner in lower ramp handrail and the 90° elbow leg trimmed for the upper ramp handrail to the joiner in the upper ramp handrail. Orient joiner set screws toward the underside of ramp handrails and the 90° elbows toward platform angle post in the corner, and then tighten the joiner set screws enough to hold the elbows in place (FIG. 5.41).

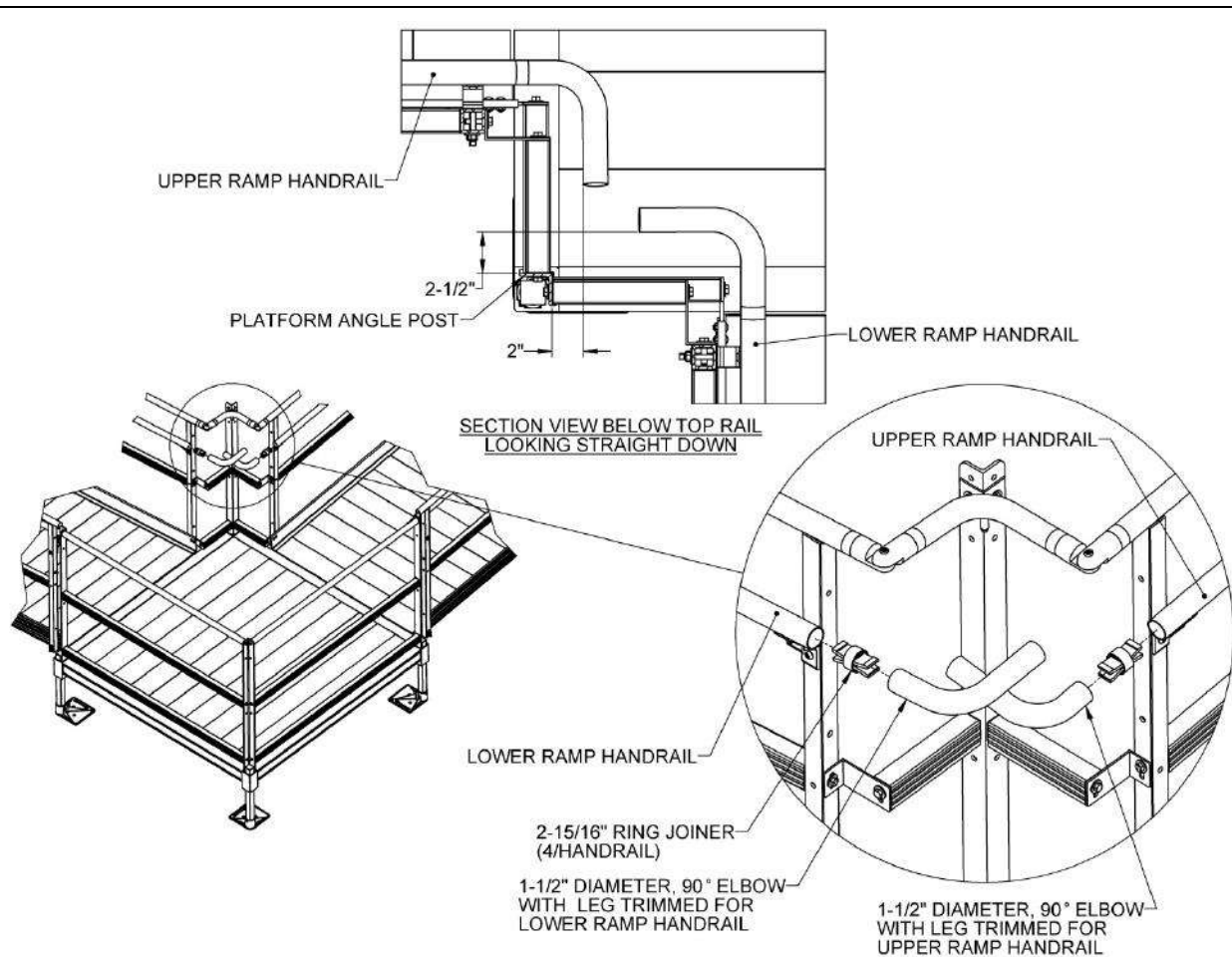
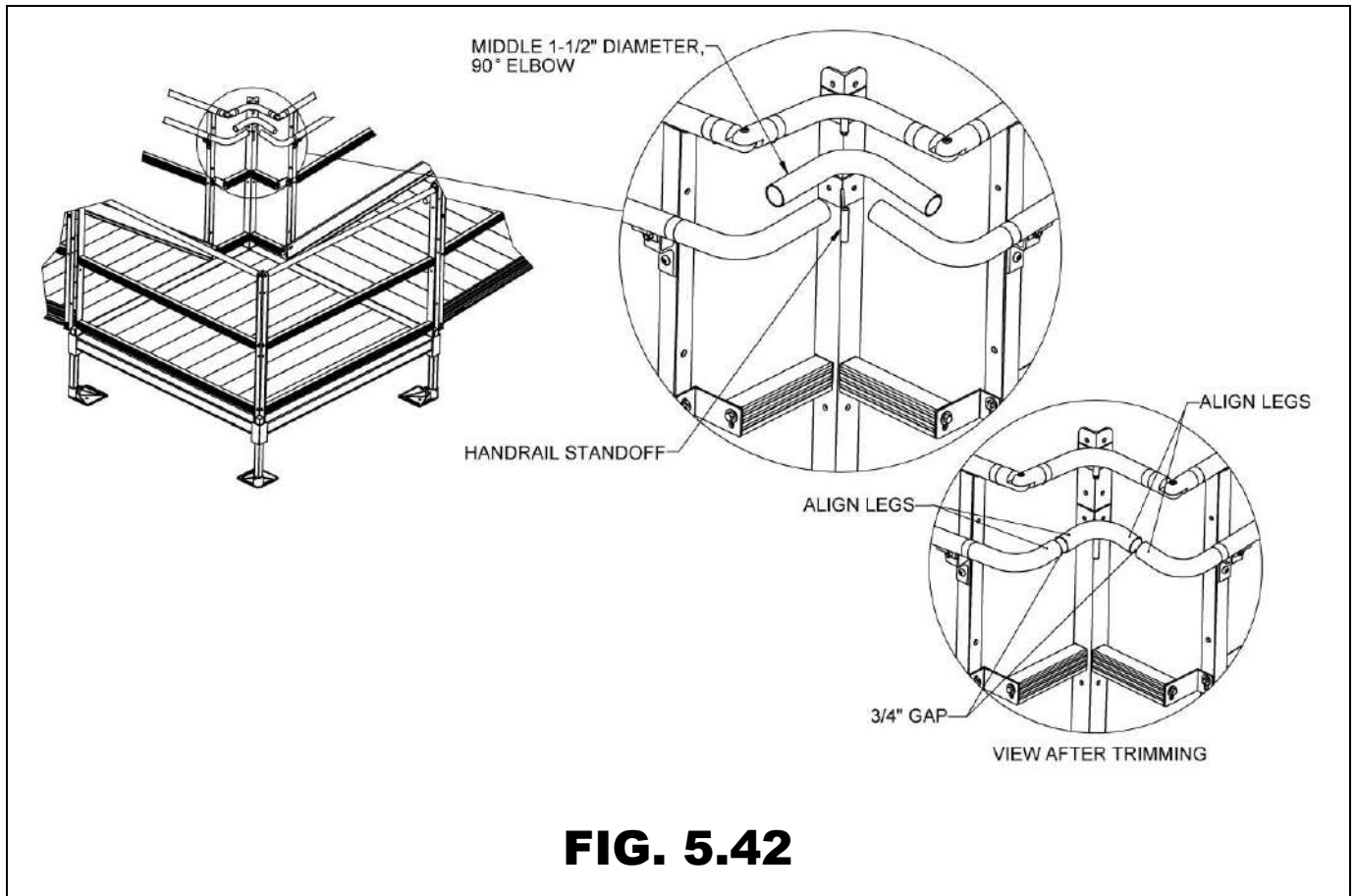


FIG. 5.41

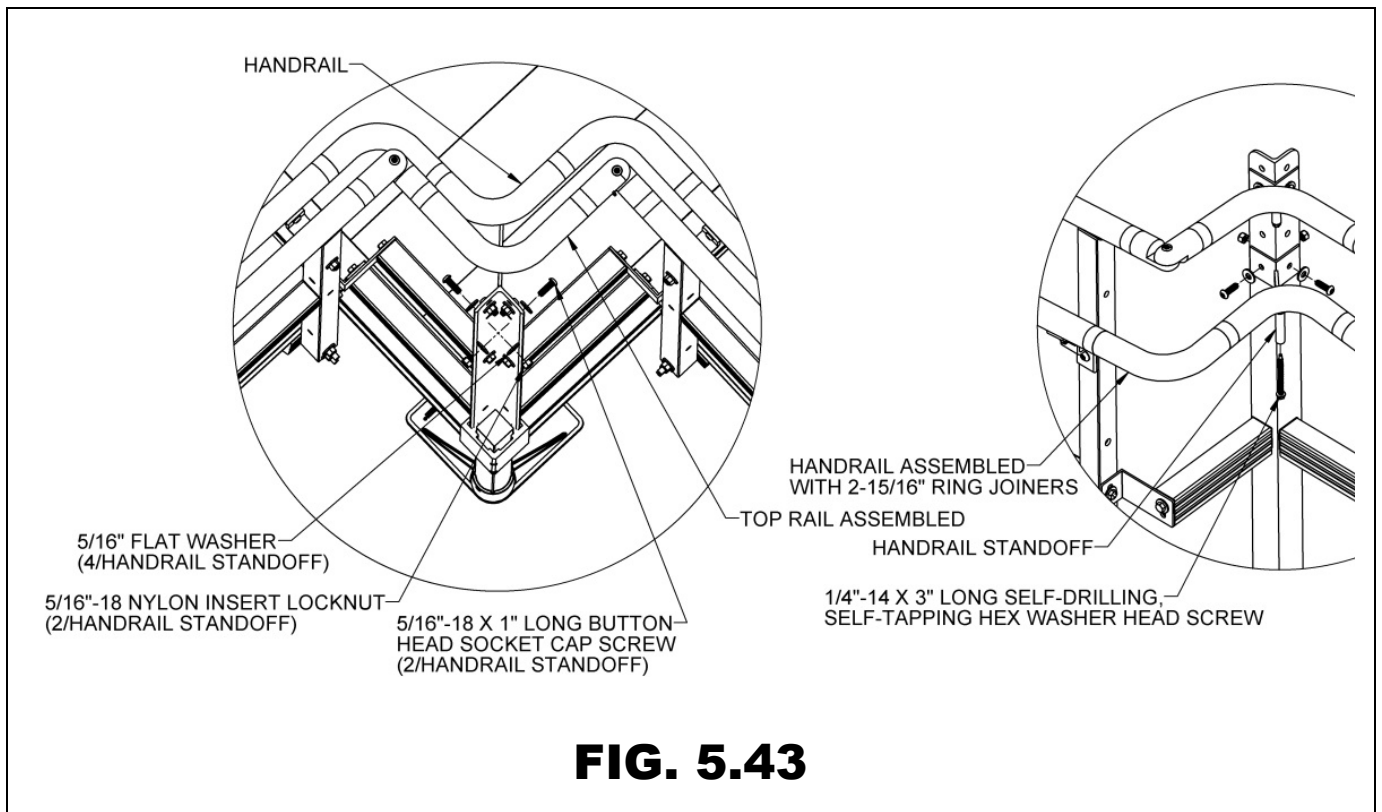
- 5.8.16. Clamp the handrail standoff to the platform angle post in the corner at 7-3/8" from the top of the post. Hold a third 1-1/2" diameter 90° elbow such that the middle of the bend is centered on top of the handrail standoff. Rotate the 90° elbows attached to the ramp handrails until they are parallel to the ends of the elbows as needed (FIG. 5.42).

✎ There are two standoffs used at the corner turn post. The handrail standoff is the larger, longer one of the two.

- 5.8.17. Trim all three 1-1/2" diameter 90° elbows until the legs of the elbows align and there is a 3/4" gap between the legs. Use a ring joiner centered (approximately) between the legs of the bends to assist in estimating where the cuts should be and use caution not to trim too much off any one elbow leg (FIG. 5.42).
- 5.8.18. Using a metal file, remove any sharp edges from cutting.



- 5.8.19. Assemble three 1-1/2" diameter 90° elbows using 2-15/16" ring joiners. Remove the elbows from the ramp handrail if needed but be sure to keep track of the cut ends so they can be reinstalled in the same orientation with respect to the handrails and each other. Orient all joiner set screws toward the underside and tighten all joiner set screws securely (FIG. 5.43).
- 5.8.20. Adjust the handrail standoff to contact the underside of the middle elbow, and then use the holes in the standoff as a template to drill 5/16" or 11/32" holes through the platform angle posts (FIG. 5.43).
- 5.8.21. Attach handrail standoff to platform angle posts using 5/16"-18 x 1" button head socket cap screws, 5/16"-18 nylon insert locknuts, and 5/16" flat washers oriented as shown (FIG. 5.43).
- 5.8.22. Drive a 1/4"-14 x 3" self-drilling, self-tapping hex washer head screw up through the underside of the handrail standoff into the middle 1-1/2" diameter 90° elbow. Put pressure on the elbow until the threads engage and pull the components together (FIG. 5.43).
- 5.8.23. Tighten all fasteners securely including all ring joiner set screws and elbow assembly screws if not completed previously.



5.9. PICKETED GUARD CORNER TURN

There are five special closures available for filling the space between two ramps in a corner turn configuration: Two-line rail for a 5' x 5' platform, picketed guard for a 5' x 5' platform, two-line rail for a 6' x 6' platform, picketed guard for a 6' x 6' platform, and special closure for 54" wide ramps used on a 5' platform side. Corner turn closures for 5' x 6' and 5' x 7' platforms are uncommon and must be ordered as customs for the specific configuration.

- 5.9.1. Install the platform angle post (not attached to a platform) in the open platform corner pocket. Align the bottom of the post with the bottom of the corner pocket and tighten the set screws securely.
- 5.9.2. Picketed guards and top rails of a guarded corner turn are installed in the same manner as a picketed guard closure. Refer to 'PICKETED GUARD CLOSURE' section and complete the steps described to assemble the picketed guards and connect the top rails to the platform angle post in the corner. FIG. 5.44 shows the installation at this stage.
- 5.9.3. The handrails of a guarded corner turn are installed in the same manner as the handrails two-line rail corner turn. Refer to 'CLOSURES' section and complete the steps described to assemble the handrails. FIG. 5.45 shows the completed guarded corner turn installation.

FIG. 5.44

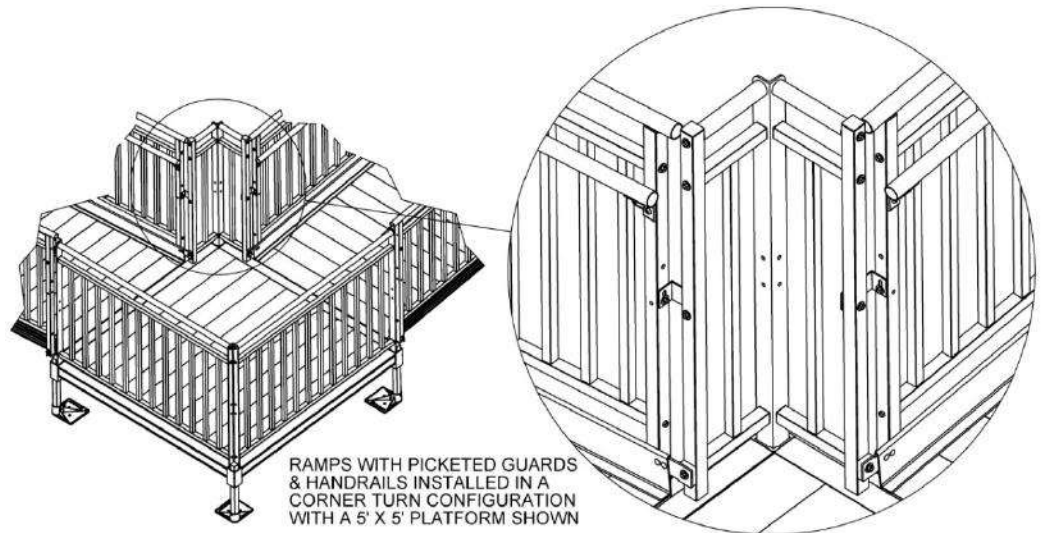
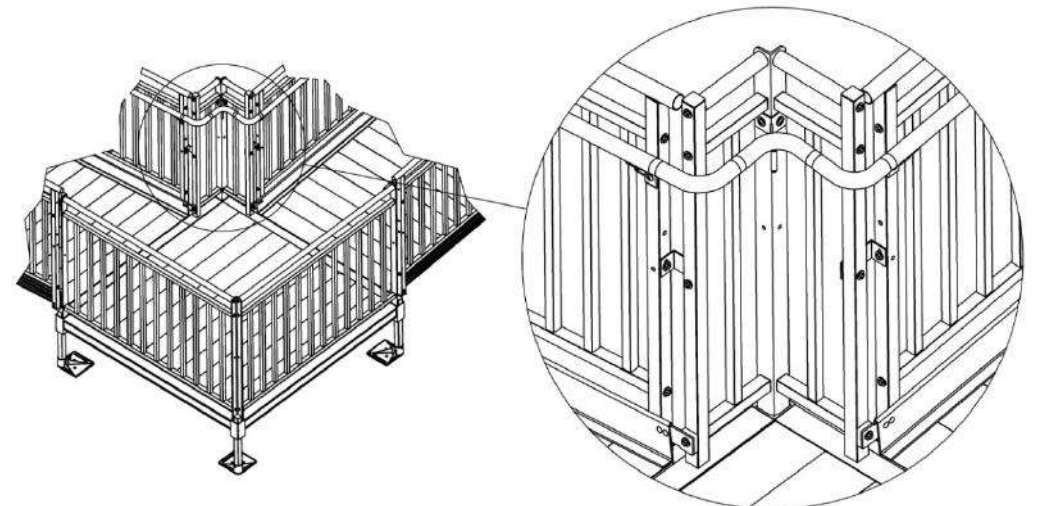


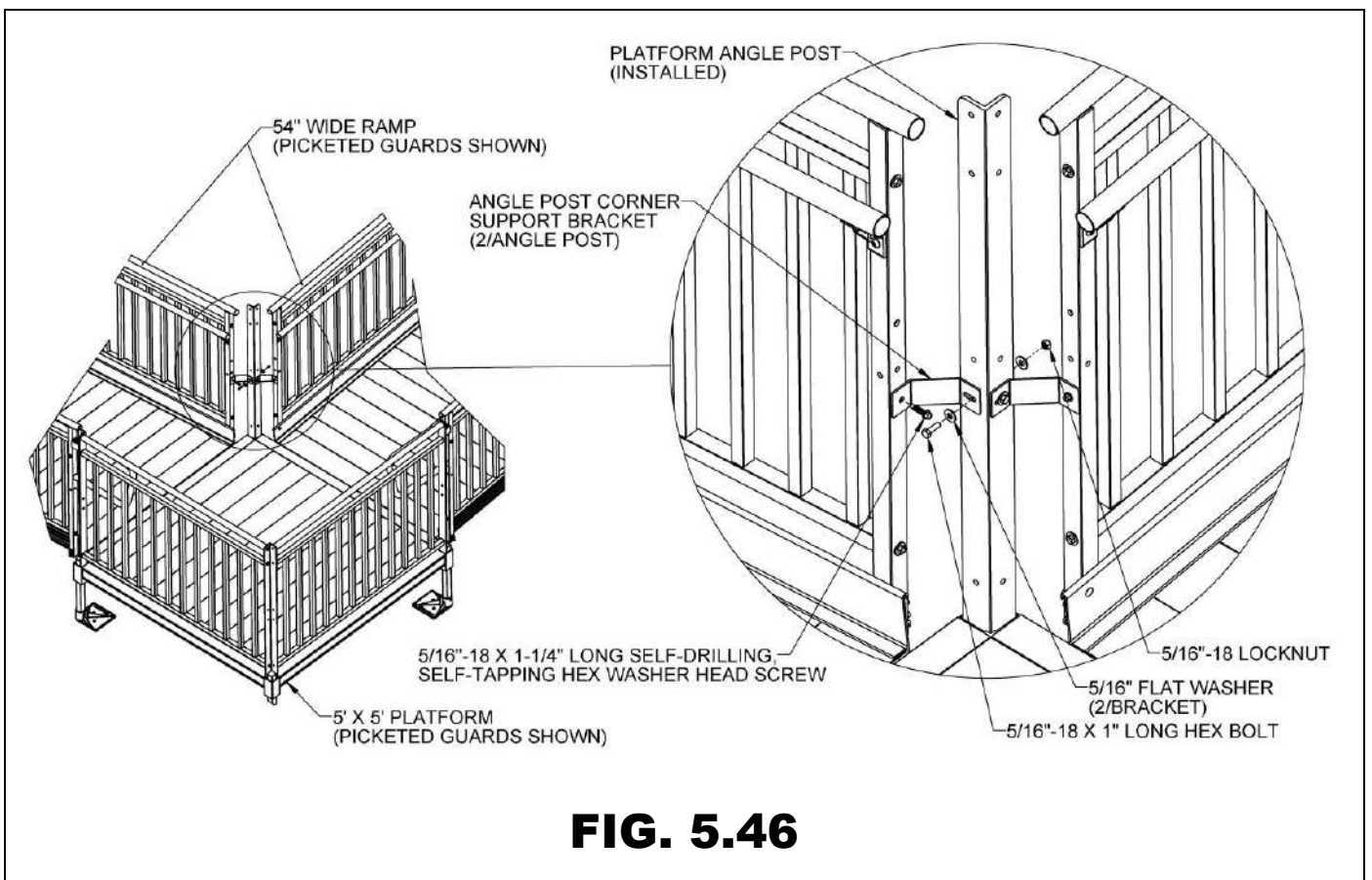
FIG. 5.45



5.10. **CORNER TURN CLOSURE 54-IN WIDE RAMP ON 5-FT X 5-FT PLATFORM**

Because 54" wide ramps take up almost the entire platform side and the gap between the ramp frame and the platform angle post is less than 4", the special closure for 54" wide ramps installed on a 5' x 5' platform is used for both two-line rails and picketed guards.

- 5.10.1. Install the platform angle post (not attached to a platform) in the open platform corner pocket. Align the bottom of the post with the bottom of the corner pocket and tighten the set screws securely. Refer to 'INSTALL TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' section for additional details on securing the post to corner pocket.
- 5.10.2. Attach the slotted leg of both angle post corner support brackets to the platform angle post using a 5/16"-18 x 1" long hex bolt, 5/16"-18 nylon insert locknut, and 5/16" flat washers oriented as shown. Either use the hole shown or field drill a 3/8" or 11/32" hole between the two middle holes and the two upper holes (FIG. 5.46).
- 5.10.3. Attach the legs of the angle post corner support brackets with the hole to the ramp frame posts using a 5/16"-18 x 1-1/4" long self-drilling, self-tapping hex washer head screws (FIG. 5.46).



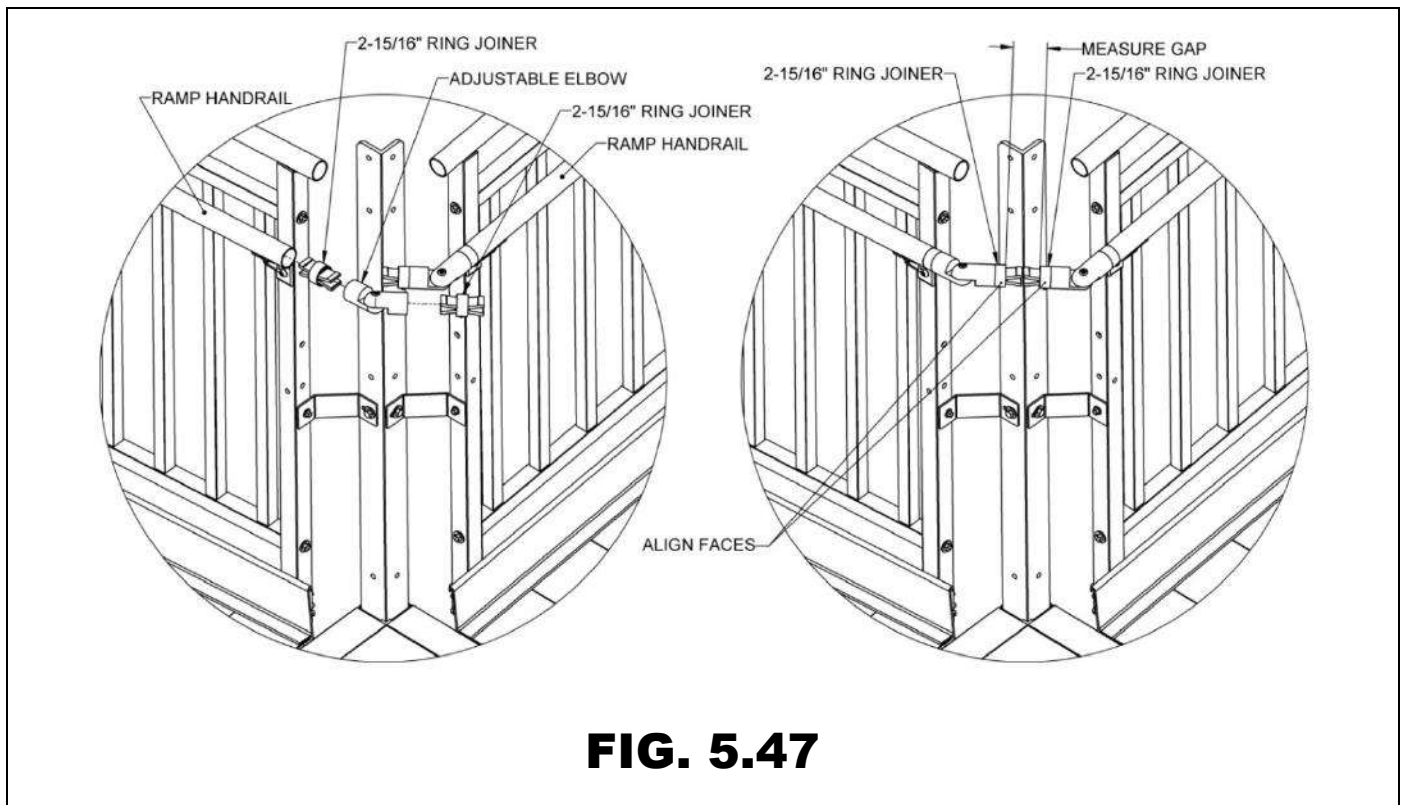


FIG. 5.47

- 5.10.4. Insert a 2-15/16" ring joiner in one of the ramp handrails at the corner turn, followed by an adjustable elbow and another 2-15/16" ring joiner. Orient the ring joiner set screws toward the underside of handrail. Tighten ring joiner set screws and adjustable elbow assembly screw enough to hold components in place but still allow them to rotate. Install 2-15/16" ring joiners and adjustable elbow in the other ramp handrail in the same manner (FIG. 5.47).
- 5.10.5. Align the faces of the two closest 2-15/16" ring joiners in the corner and measure gap between the two parallel faces. Trim the 1-1/2" diameter tube to measured length (FIG. 5.47).
- 5.10.6. Using a metal file, remove sharp edges from cutting.
- 5.10.7. Install trimmed 1-1/2" diameter tube in gap between the 2-15/16" ring joiners. Disassemble and reassemble ring joiners and adjustable elbows as needed to complete the installation (FIG. 5.48).
- 5.10.8. Insert 1-1/2" end plugs on all open ends of frame top rails. Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond plug in place.
- 5.10.9. Tighten all fasteners securely, including all ring joiner set screws and elbow assembly screws if not completed previously.

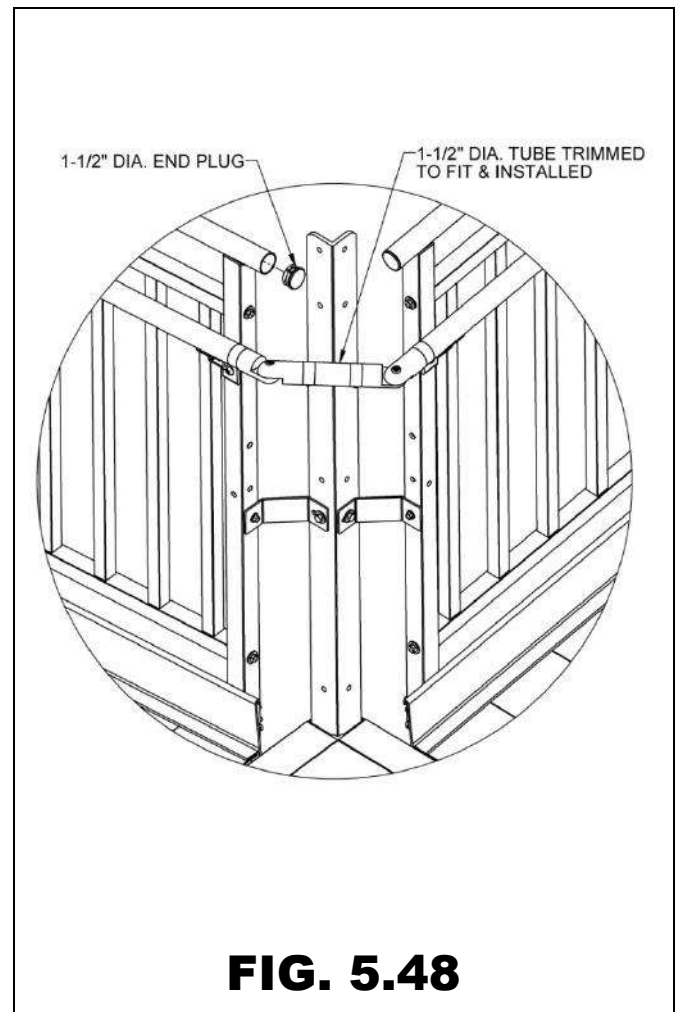
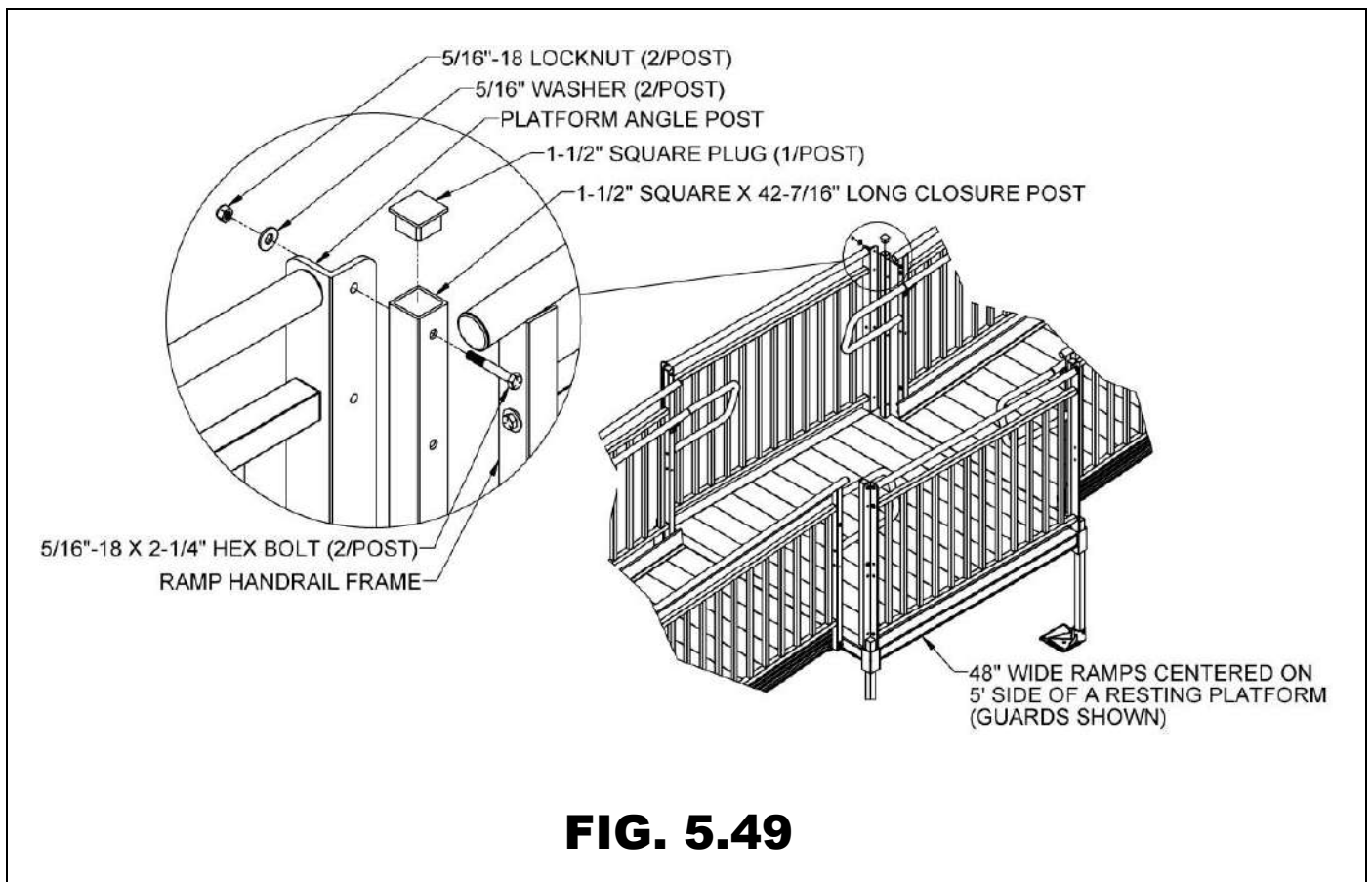


FIG. 5.48

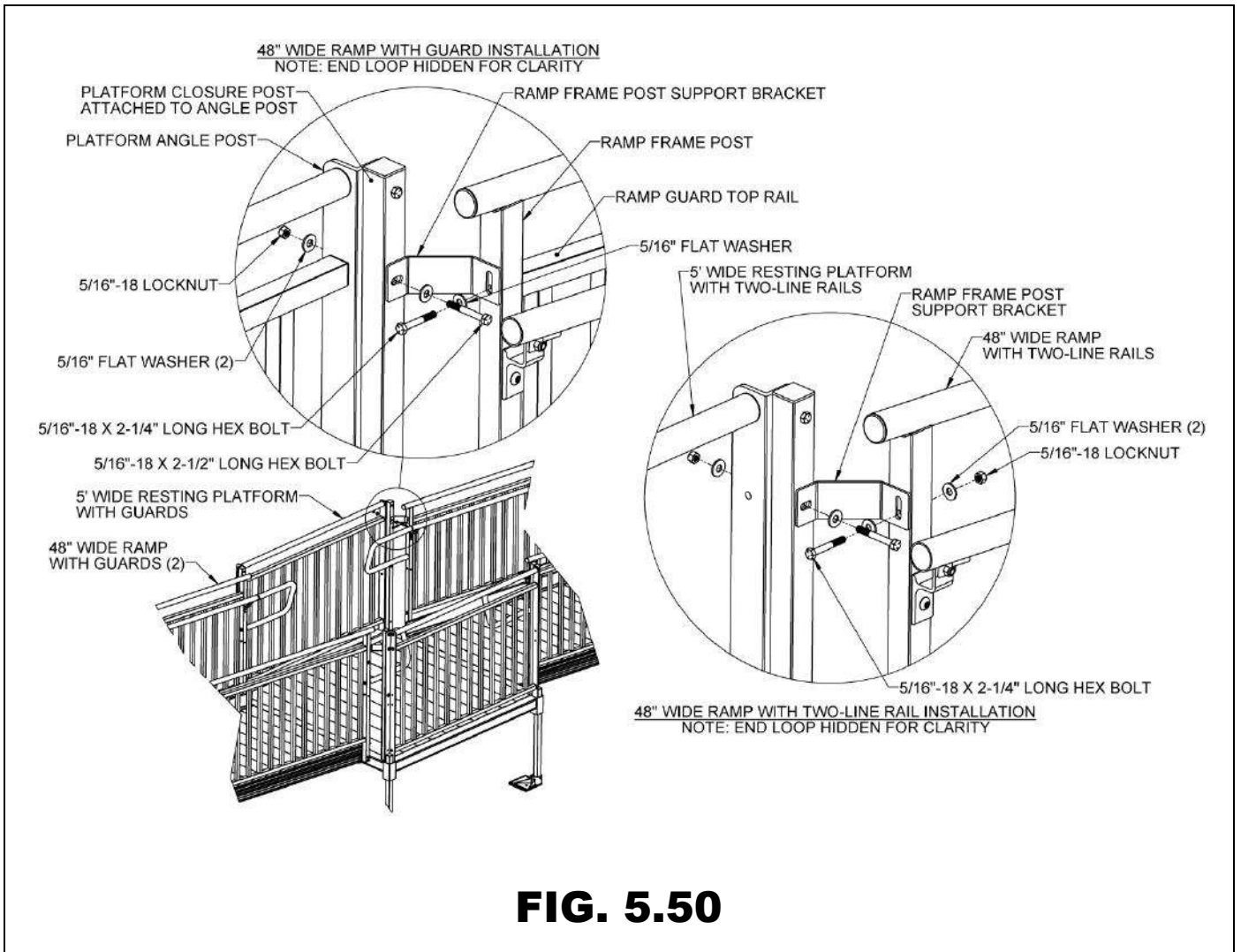
5.11. 5-FT WIDE RESTING PLATFORM

If the system includes 48" wide ramps centered on the 5' side of a resting platform, a special closure must be used to reduce the space between the ramp handrail frames and the platform angle posts to less than 4". If 48" wide ramps are placed to one side of a 5' platform or a platform wider than 5' is being used as a resting platform, follow the instructions in sections 5.1 through 5.6 and treat as a standard closure. This special closure is not required for 54" wide ramps centered on the 5' side of a resting platform; skip to section 5.8.5 for all ramps other than a 48" wide ramp.

- 5.11.1. Align the holes in a 1-1/2" square x 42-7/16" long closure post with the holes in a platform angle post on the side adjacent to the ramp handrail frame. Attach the posts together using 5/16"-18 x 2-1/4" hex bolts, 5/16"-18 locknuts, and 5/16" washers oriented as shown (FIG 5.49) through the uppermost holes and the upper of the two middle holes in the platform angle post.
- 5.11.2. Insert 1-1/2" square plugs into tops of 1-1/2" square closure posts (FIG. 5.49). Use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.
- 5.11.3. Repeat the procedure for all four corners of the platform.
- 5.11.4. Tighten all fasteners securely.



- 5.11.5. If ramps are guarded, first remove the 5/16"-18 x 2-1/4" hex bolt and 5/16" flat washer attaching the guard top rail to the ramp frame post adjacent to the platform angle post (FIG. 5.50). If ramps have two-line rails, 5/16"-18 x 2-1/4" hex bolts, 5/16"-18 locknuts, and 5/16" flat washers are provided for bracket attachment to the uppermost hole in the ramp frame post.
- 5.11.6. For 48" wide ramps, attach the long leg of the ramp frame post support bracket with the vertical slot to the ramp frame post using either the 5/16"-18 x 2-1/4" hex bolt and 5/16" flat washer removed from the guard or a 5/16"-18 x 2-1/4" hex bolt, 5/16"-18 locknut, and 5/16" flat washers if installing a two-line rail (FIG. 5.50).



- 5.11.7. Align the horizontal slot in the ramp frame post support bracket with the second hole from the top of the platform angle post (or the 1-1/2" square x 42-7/16" long closure post if installing a 48" wide ramp) as shown (FIG. 5.51 or FIG. 5.50).
- 5.11.8. Attach the Ramp Frame Post Support Bracket to the platform angle post using a 5/16"-18 x 2-1/2" long hex bolt, 5/16"-18 locknut and 5/16" flat washers oriented as shown through both the 1-1/2" square x 42-7/16" long closure post and platform angle post if installing a 48" wide ramp or directly to the platform angle post using a 5/16"-18 x 1" long hex bolt, 5/16"-18 locknut and 5/16" flat washers oriented as shown (FIG. 5.51 or FIG. 5.50).
- 5.11.9. Repeat the procedure for all four corners of the platform.
- 5.11.10. Tighten all fasteners securely.

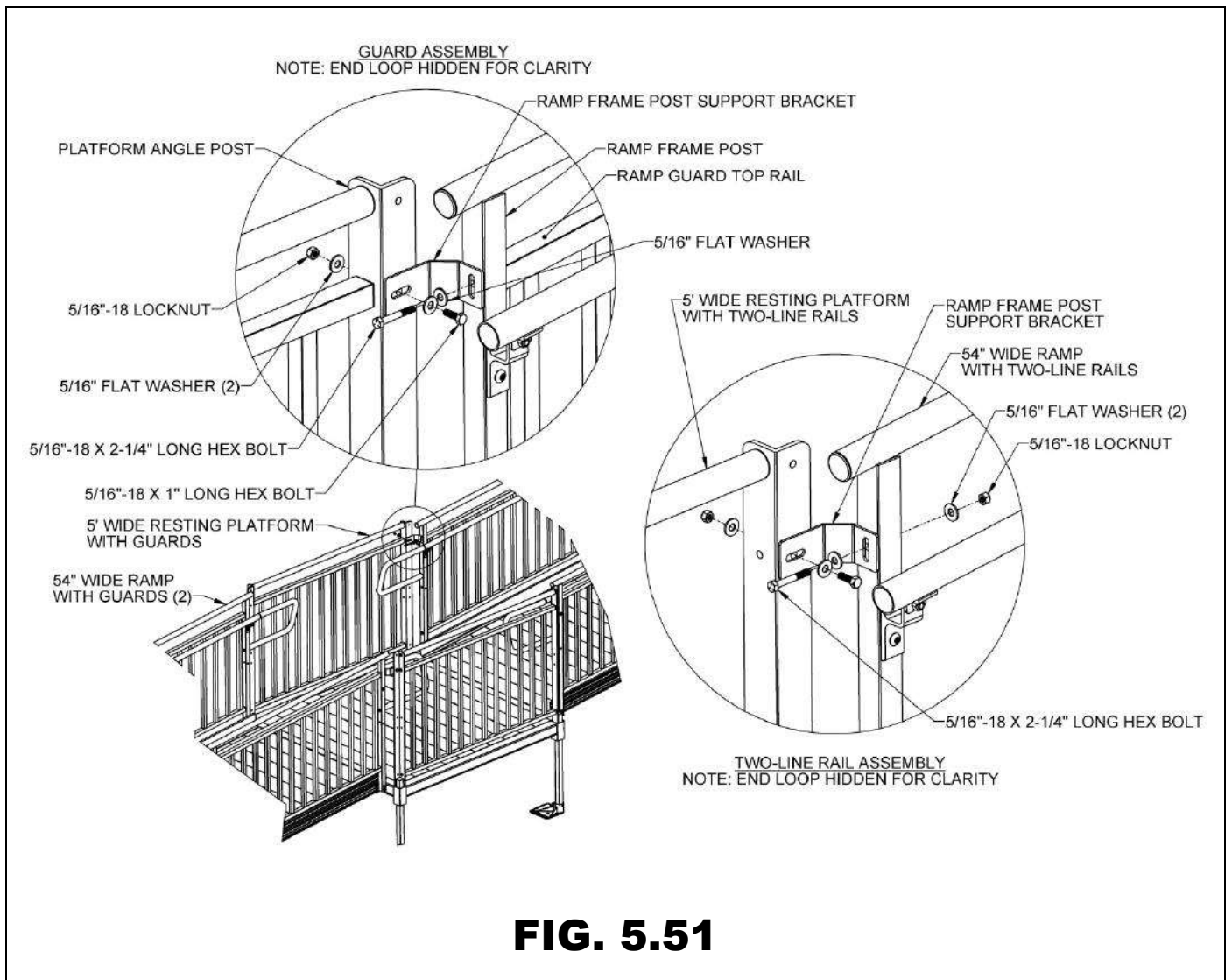


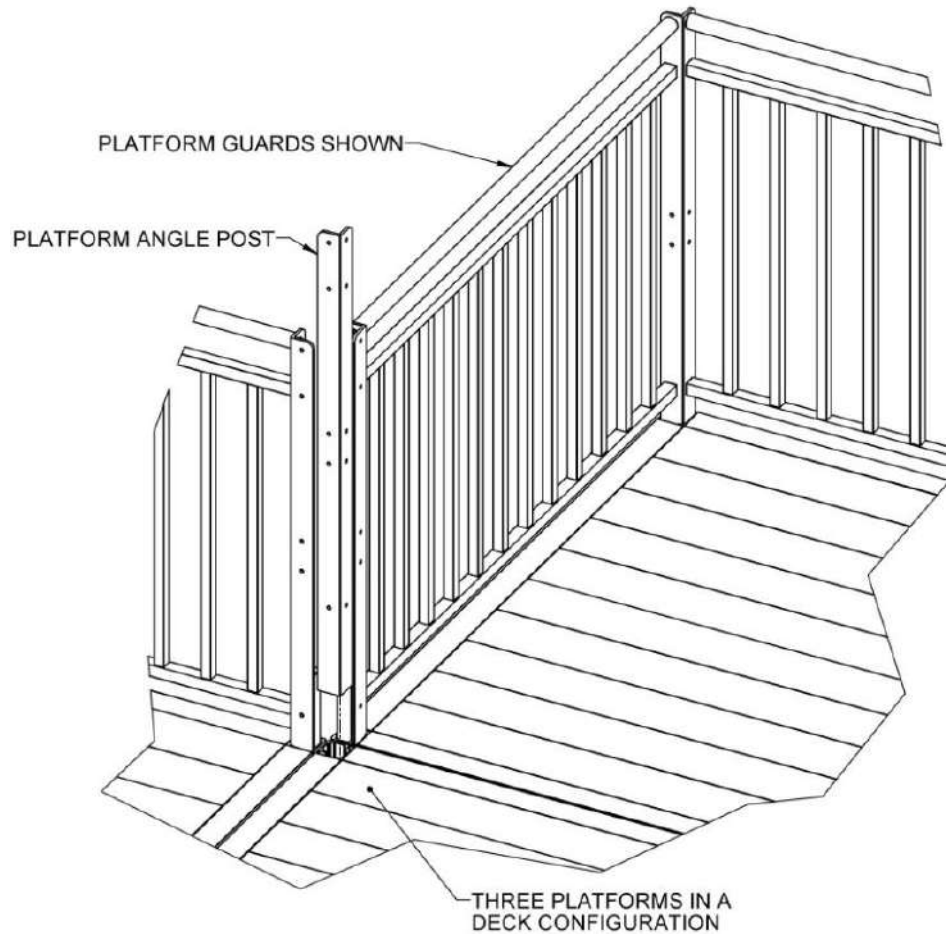
FIG. 5.51

5.12. **THREE PLATFORM DECK CORNER CLOSURE**

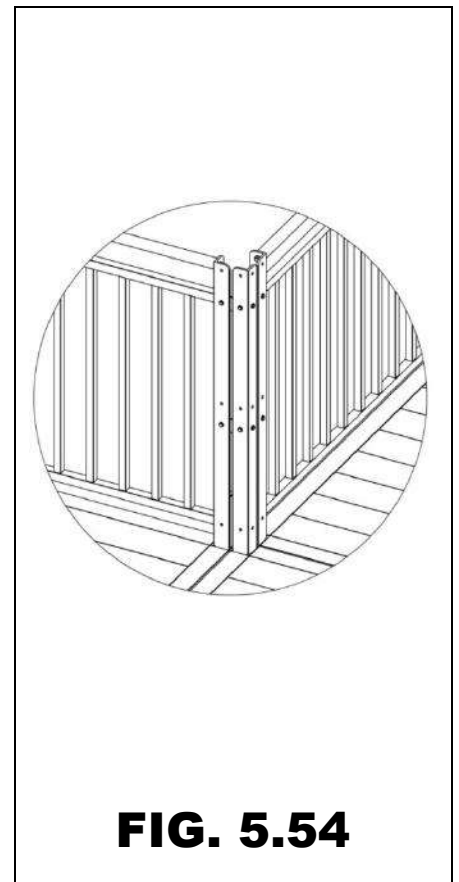
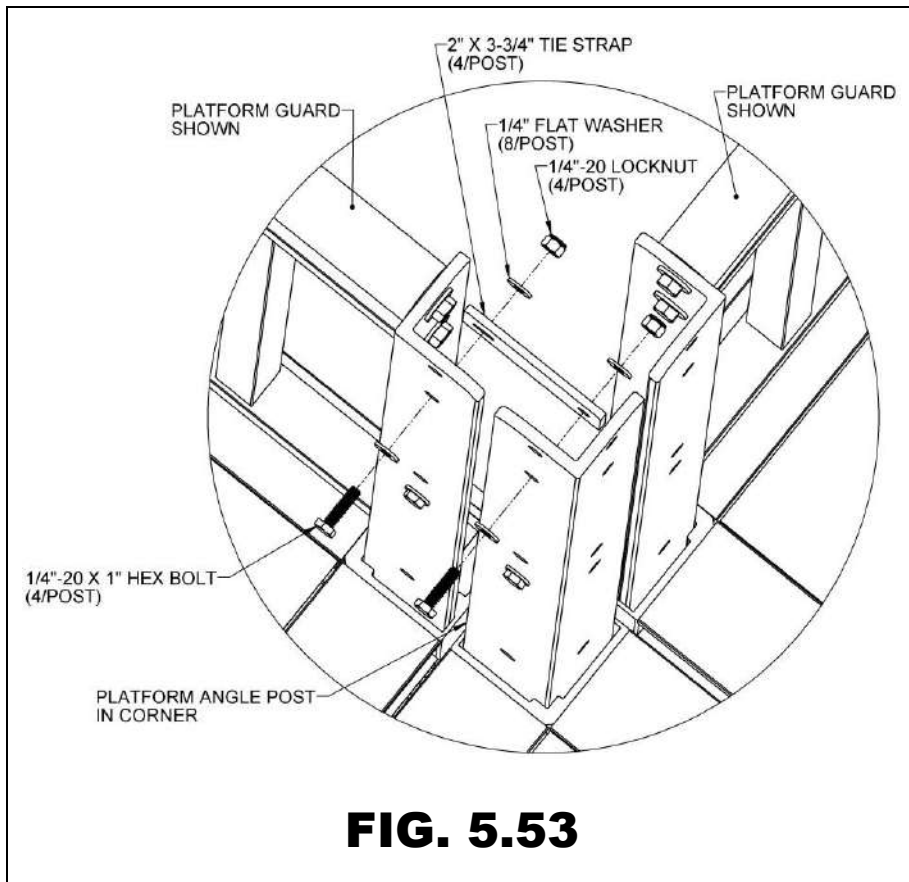
The three platform deck corner closure is required wherever three platforms are assembled in an inside corner, regardless of whether the corner includes a closure, guard, or two-line rail.

5.12.1. After assembling the platform picketed guards or two line rails (or other closure component if present), but before any of the handrail components, install a platform angle post in the open corner pocket at the corner (FIG. 5.52) and secure in place in the same manner as described in 'ASSEMBLE TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' section.

FIG. 5.52



- 5.12.2. Using the second hole from the top of the post and the lower of the two middle holes, connect the platform angle post (installed in previous step) to the adjacent platform angle posts of the guards or two-line rails using 1/4"-20 x 1" hex bolts, 1/4"-20 locknuts, and 1/4" flat washers thru the platform angle posts and 2" x 4-1/8" tie straps. Place the tie straps on the outside and the hex bolts on the inside of the guards or two-line rails as shown (FIG 5.53).
- 5.12.3. FIG. 5.54 shows the completed corner closure installation.
- 5.12.4. Tighten all fasteners securely, including the platform leg and post setscrews, if not tightened in previous steps.
- 5.12.5. Complete the installation of all handrail components (if required for your installation) and 'FINAL PLATFORM/RAMP STEPS AND CHECKS' section.



6. FINAL PLATFORM/RAMP STEPS AND CHECKS

6.1. ATTACH FRAME POSTS TO PLATFORM POSTS

6.1.1. At all locations where a frame post is not connected to a rail, picketed guard, or closure component it must be connected to a platform angle post using a ramp closure bracket (FIG. 6.1).

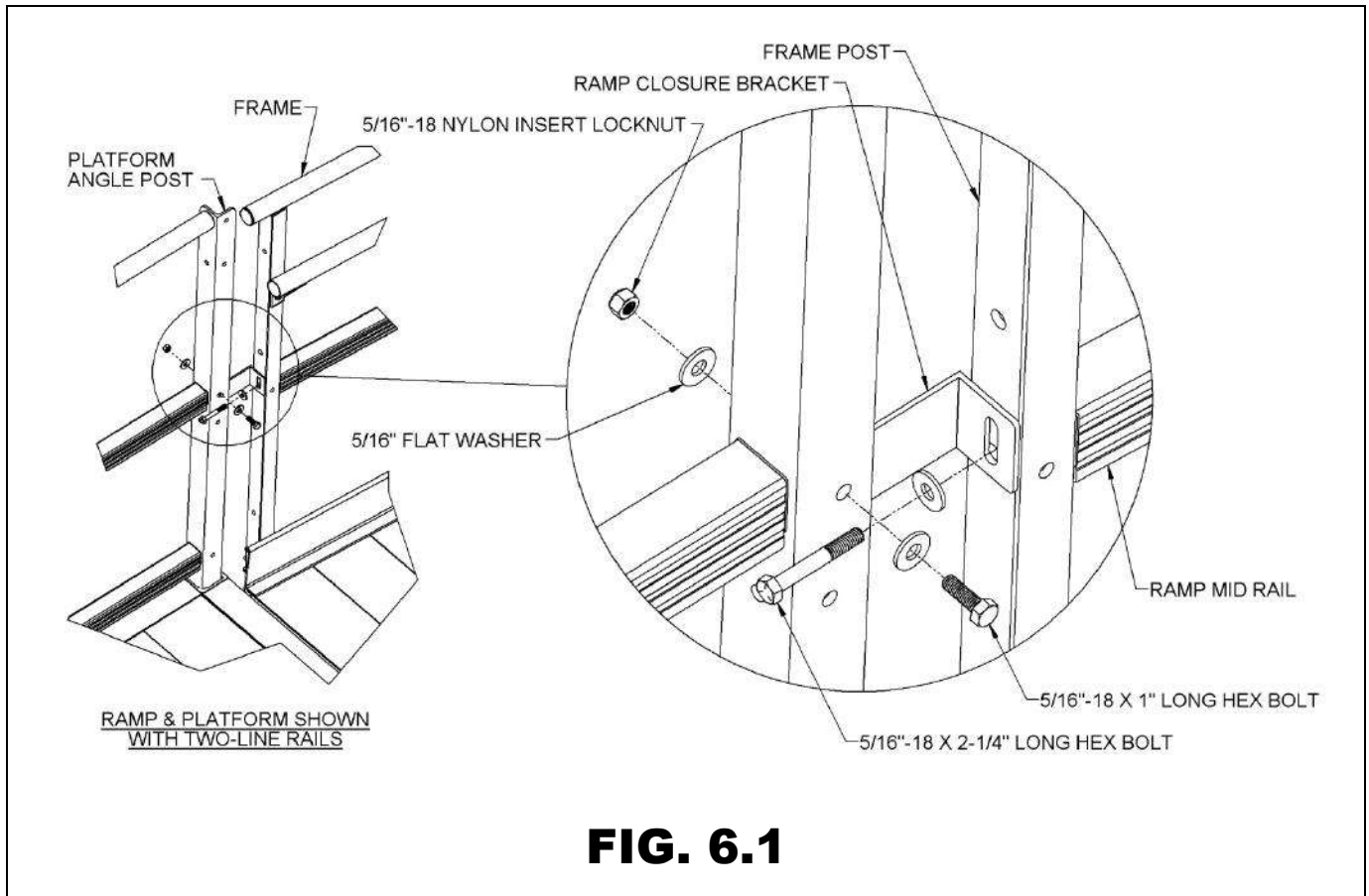
✎ The ramp closure bracket is the smaller of the two closure brackets with 1-3/4" and 3-3/4" long legs and is only used on the outside where a ramp meets a platform.

6.1.2. If installing the ramp closure bracket on a ramp with a two-line rail, first remove the 5/16"-18 x 2-1/4" long hex bolt and 5/16" flat washer from the mid rail then reinstall through the short leg of the bracket, the frame post and back into the threaded insert. Orient the bracket as shown (FIG. 6.1) with the long leg contacting the platform angle post.

6.1.3. If installing the ramp closure bracket on a ramp with a picketed guard, install a 5/16"-18 x 2-1/4" long hex bolt through a 5/16" flat washer, the short leg of the bracket and the hole approximately in the middle of the frame post then secure with another 5/16" flat washer and a 5/16"-18 nylon insert locknut. Orient the bracket as shown (FIG. 6.1) with the long leg contacting the platform angle post.

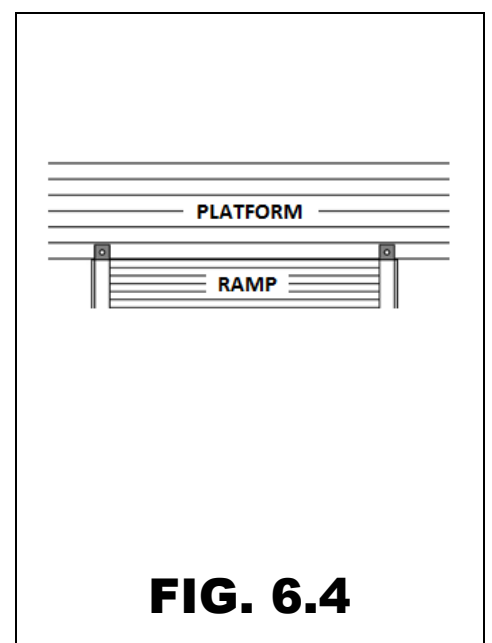
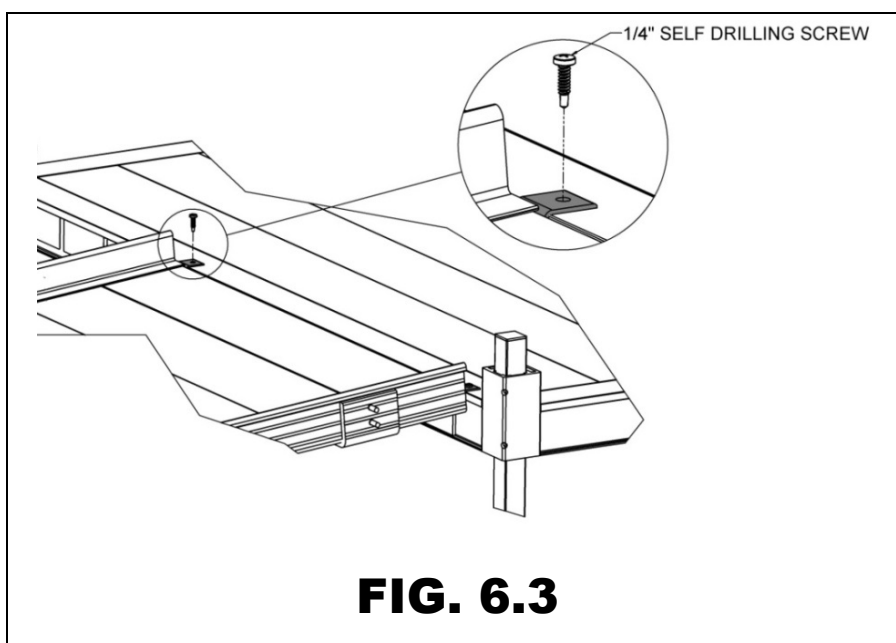
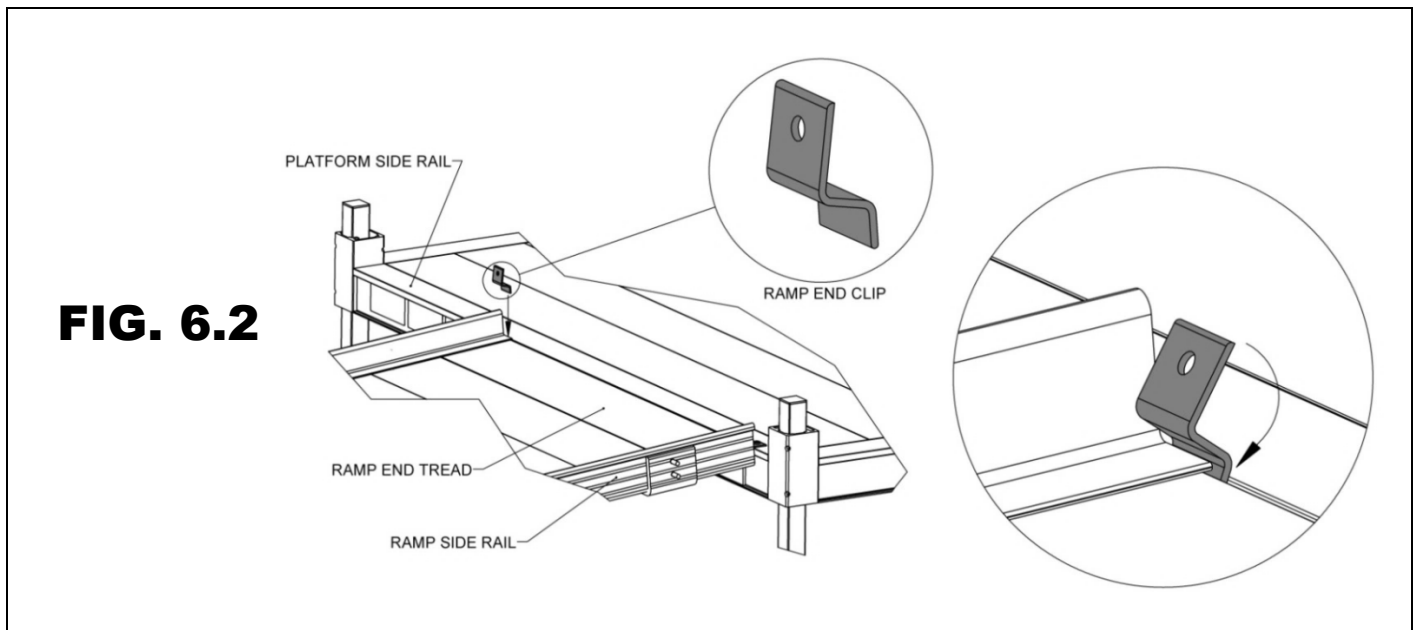
6.1.4. Attach the long leg of closure bracket to the platform angle post using a 5/16"-18 x 1" long hex bolt, 5/16" flat washers, and a 5/16"-18 nylon insert locknut oriented as shown (FIG. 6.1). Use an existing hole in the platform angle post if possible or field-drill a new 11/32" or 3/8" hole.

6.1.5. Tighten all fasteners securely.



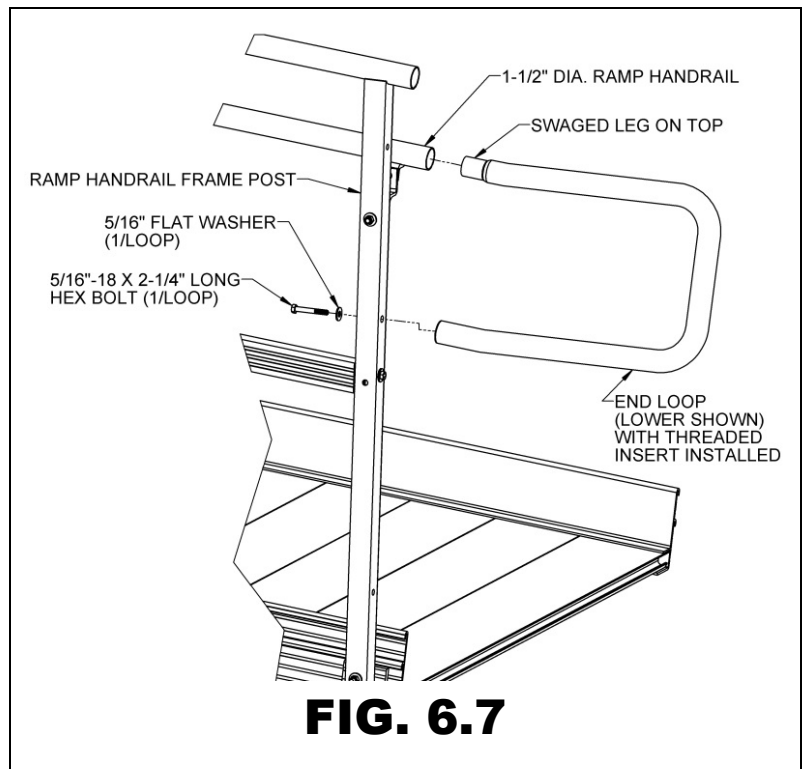
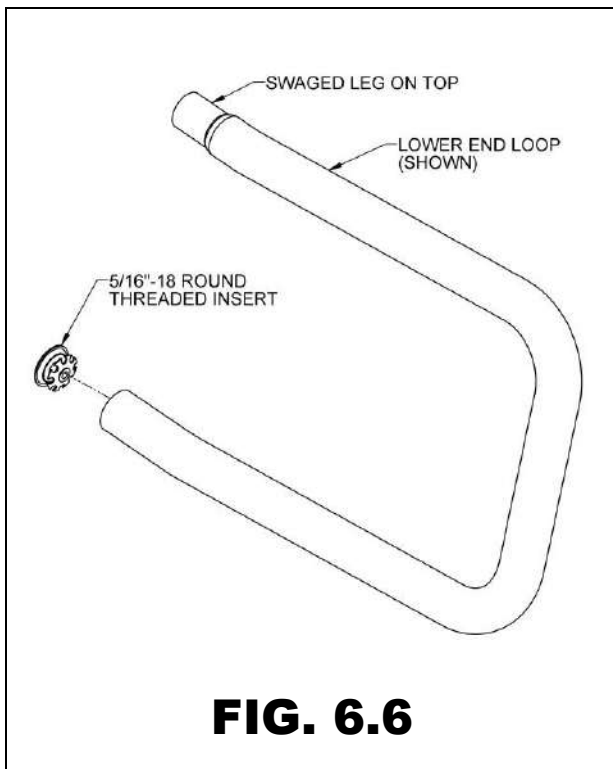
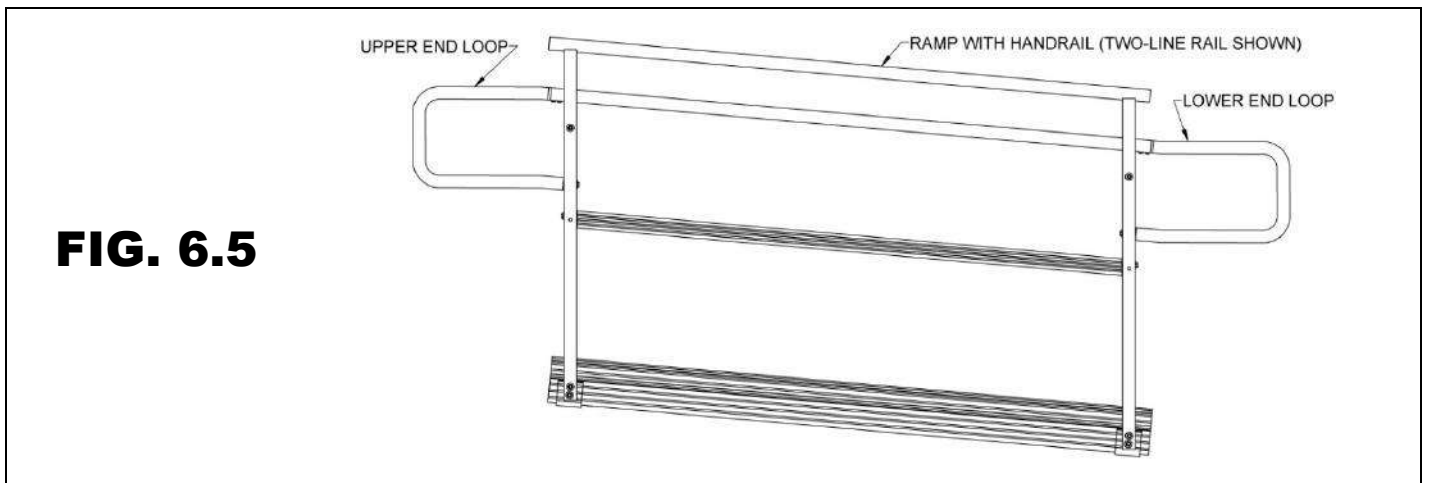
6.2. SECURE RAMPS TO PLATFORMS

- 6.2.1. Once installation of ramps, platforms, handrails, connectors, and closures are complete and all fasteners and set screws have been tightened, secure ramps to platforms with ramp end clips (included in RAMP HANGER PAIR).
▲ Use two ramp end clips at all locations where ramps meet platforms.
- 6.2.2. Position each ramp end clip with the hole pointing up and oriented as shown (FIG. 6.2), then insert the short end of the ramp end clip into small gap between the ramp and the platform in the area where the ramp side rail overlaps the ramp end tread.
- 6.2.3. Before the ramp end clip contacts the ramp side rail, rotate the ramp end clip so the short end extends into the recess under the ramp end tread (FIG. 6.2).
- 6.2.4. Use the hole in the ramp end clip as a template to drill 1/8" pilot hole in the platform side rail, and then use the 1/4" x 1" long self-drilling screws to secure the ramp end clip to the platform side rail (FIG. 6.3).
- 6.2.5. FIG. 6.4 shows the top view of the completed end clip installation.
- 6.2.6. Repeat this process for all locations where a ramp meets a platform.

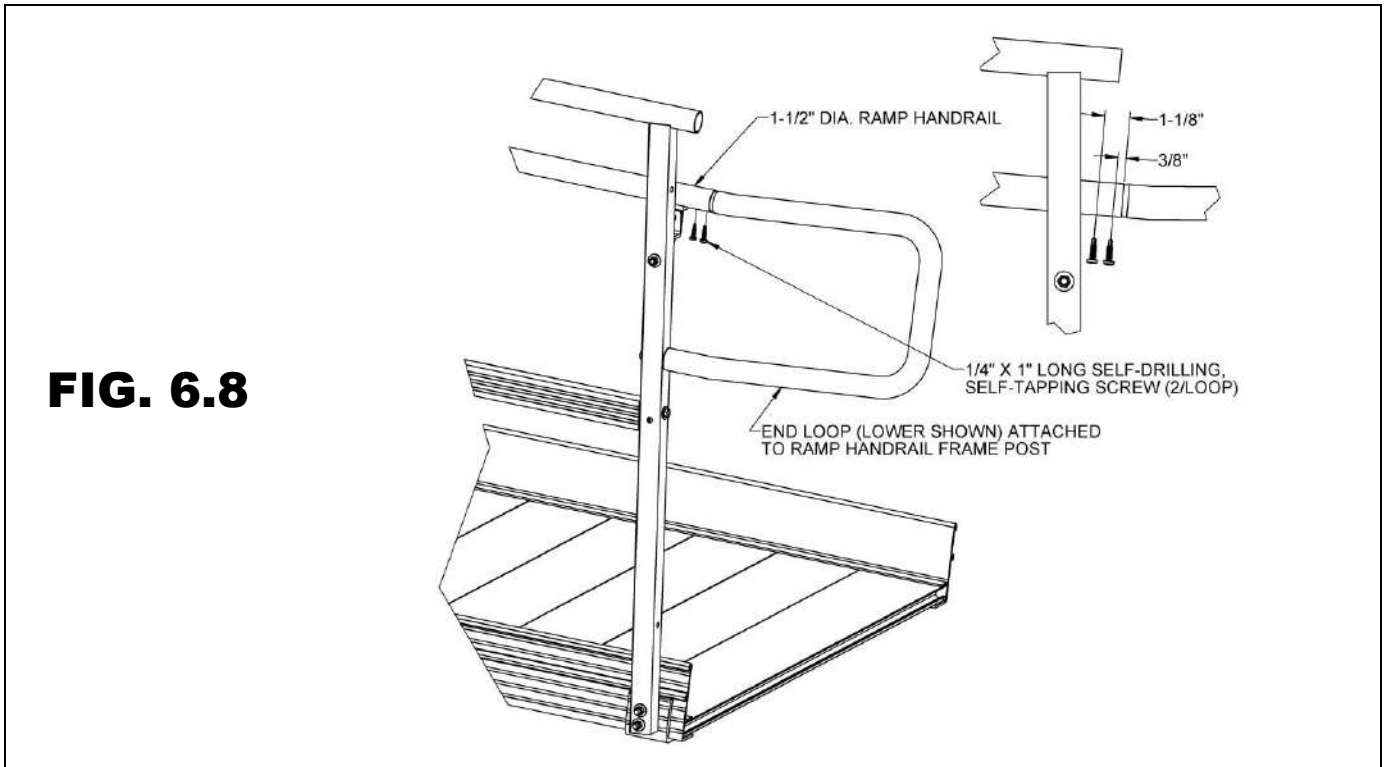


6.3. INSTALL RAMP HANDRAIL END LOOPS

- 6.3.1. The system may include both upper and lower end loops (FIG. 6.5). End loops are installed in all locations where the handrail does not terminate in some other manner (for example, a return to a building, a post, or the ground).
- 6.3.2. Upper loops and lower loops differ from one another but are installed in the same manner. If the loop does not fit correctly, you are most likely trying to install it on the wrong end of the ramp or ramp run.
 - 6.3.2.1. Referencing FIG. 6.5, note how the ends of the upper end loop angle downward and ends of the lower end loop angle upward.
 - 6.3.2.2. The swaged leg of the end loop is always the upper leg. Insert a 5/16"-18 round threaded insert into the lower leg (FIG. 6.6). Use a rubber mallet or similar tool to fully seat as needed.
 - 6.3.2.3. Install the upper (swaged) end of the loop in the ramp handrail and attach the lower leg to the ramp handrail frame post using a 5/16"-18 x 2-1/4" hex bolt through a flat washer, the frame post, and into the threaded insert installed in the lower leg (FIG. 6.7).
 - 6.3.2.4. Tighten the hex bolt securely.

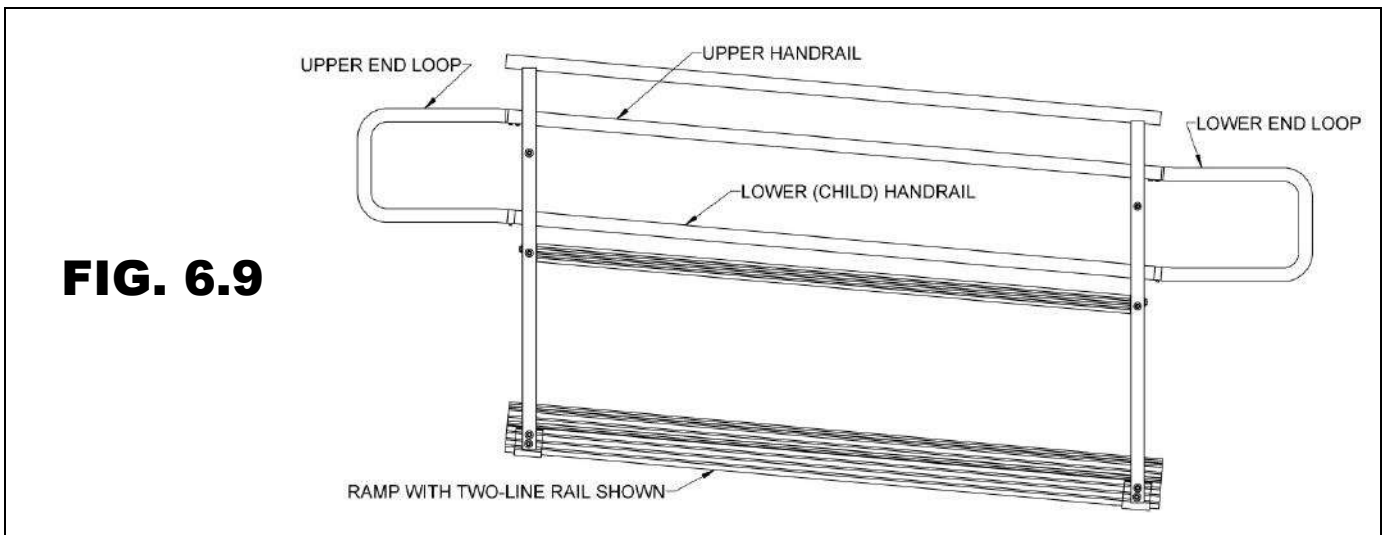


- 6.3.2.5. Drill two 1/8" diameter pilot holes in the underside of ramp handrail through both the handrail and swaged end of the loop. Drill one hole at 3/8" and the other at 1-1/8" from the end of the ramp handrail and install two 1/4" x 1" self-drilling, self-tapping pan head Phillips screws (FIG. 6.8).



6.4. INSTALL RAMP HANDRAIL END LOOPS WITH LOWER (CHILD) HANDRAILS

- 6.4.1. Upper and lower end loops are also used when lower (child) handrails are present (FIG. 6.9) and are installed in all locations where the handrail does not terminate in some other manner (for example, a return to a building, a post, or the ground).
- 6.4.2. Upper loops and lower loops differ from one another but are installed in the same manner. If the loop being installed does not fit correctly, you are most likely trying to install it on the wrong end of the ramp or ramp run. Referencing FIG. 6.9, note how the ends of the upper end loop angle downward and ends of the lower end loop angle upward.



- 6.4.2.1. The lower handrail must be trimmed by 3/4" before installing either the upper or lower end loop to accommodate a 2-15/16" ring joiner.
 - ✋ Only trim the lower handrail if a loop will be installed. Do not trim if the lower handrail will be connected to another handrail in a ramp run. Do not trim the upper handrail.
- 6.4.2.2. Using a metal file, remove any sharp edges from cutting.
- 6.4.2.3. Install a 2-15/16" ring joiner in the trimmed end of the lower 1-1/2" diameter ramp handrail. Orient the set screw in the ring joiner toward the underside of the handrail (FIG. 6.10).
- 6.4.2.4. Insert the swaged end of the loop as far as it will go into the upper handrail and position so it is adjacent to the ring joiner. Mark the lower leg of the end loop at the ring of the ring joiner and trim the lower leg at the marked location. Remove the end loop to achieve a square cut (FIG. 6.10).
- 6.4.2.5. Using a metal file, remove any sharp edges from cutting.
- 6.4.2.6. Reinstall the end loop in the upper handrail and over the joiner in the lower handrail then tighten the joiner set screws securely.
- 6.4.2.7. Drill pilot holes and install two 1/4" x 1" long self-drilling, self-tapping pan head Phillips screws in the upper handrail in the same manner described in step 6.3.2.5.

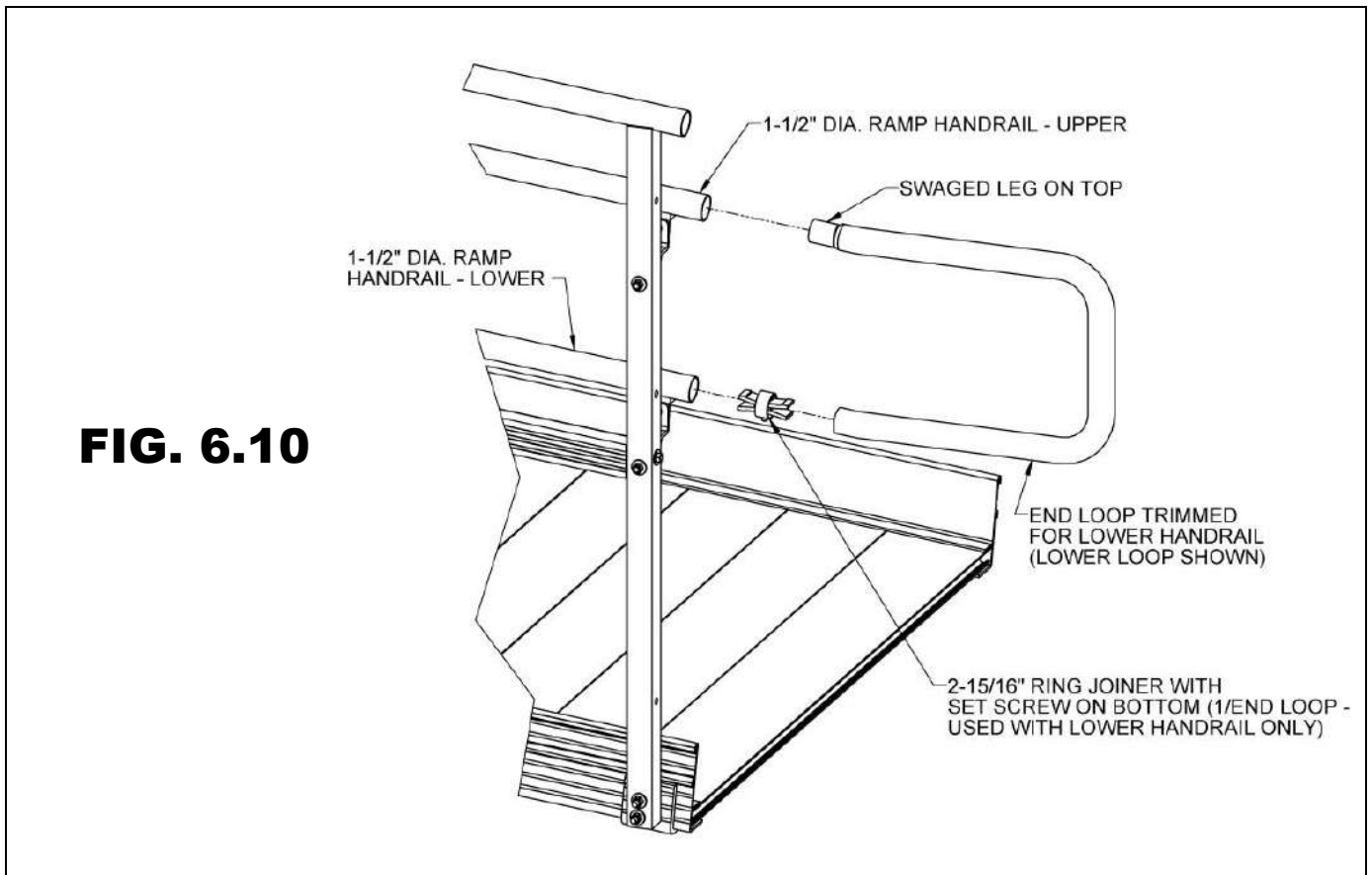


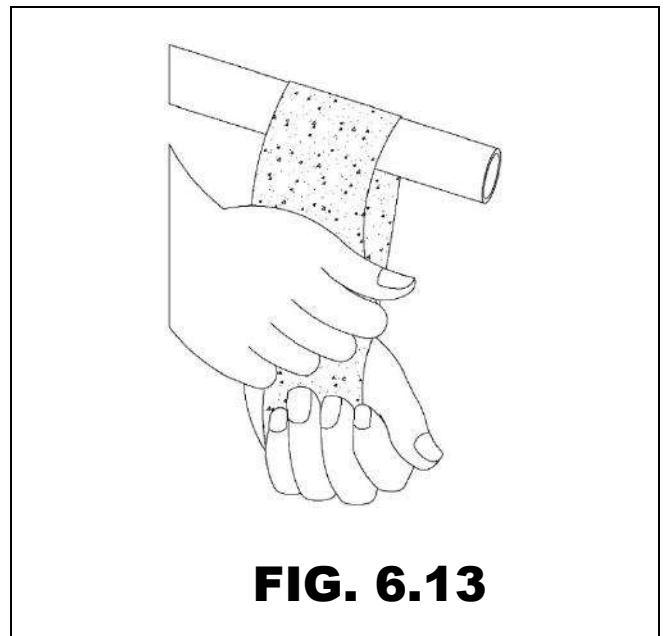
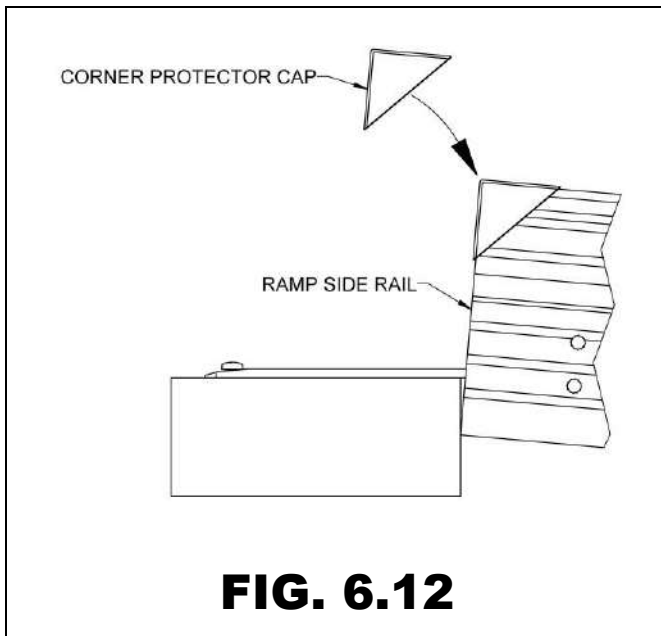
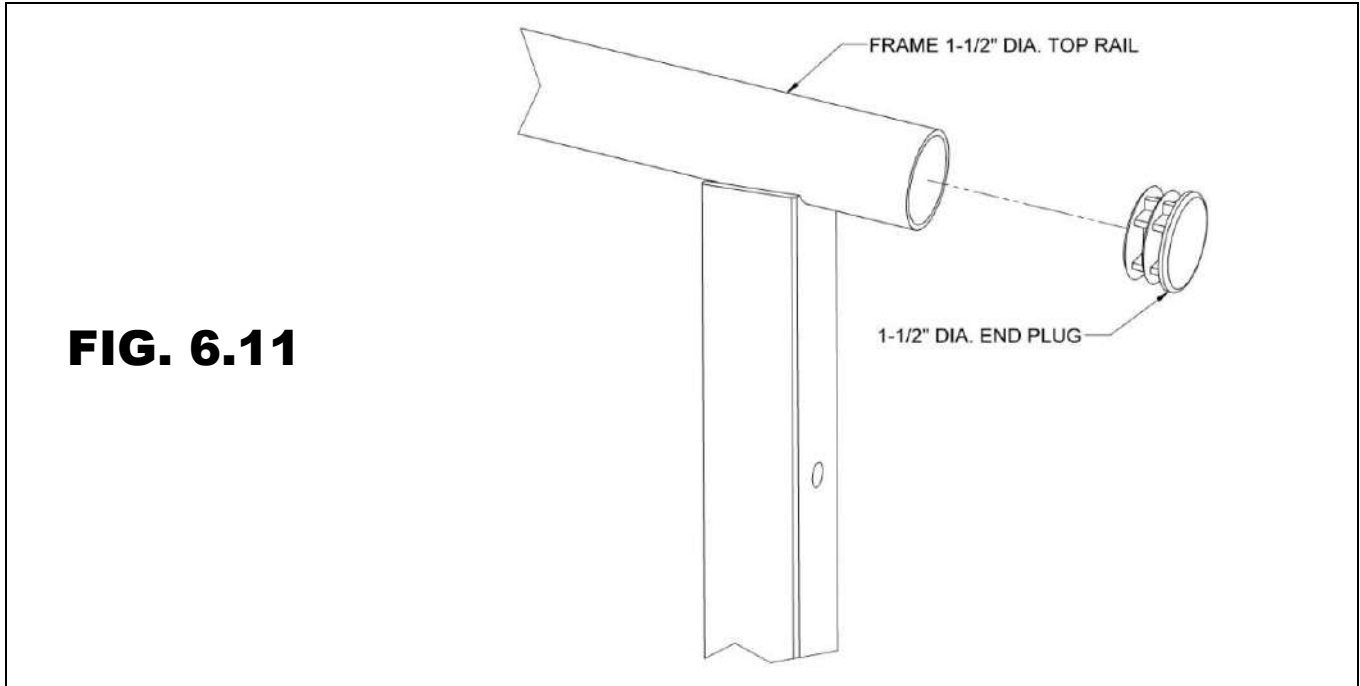
FIG. 6.10

6.5. INSTALL FRAME TOP RAIL END PLUGS AND RAMP CORNER PROTECTORS

- 6.5.1. Insert 1-1/2" end plugs on all open ends of the frame top rails (FIG. 6.11). Push them in by hand or use a rubber mallet or similar tool to fully seat as needed. If necessary, use construction adhesive to bond the plug in place.
- 6.5.2. Install corners protector caps over side rail corners by placing one cap on each side at both the top and bottom of the ramp or ramp run (FIG. 6.12). If necessary, use construction adhesive to bond the cap to the ramp side rail.

6.6. TOUCH-UP HANDRAILS

- 6.6.1. As needed, use sandpaper (180 grit or equivalent) for blending scratches on handrails. Sand in direction of the grain as shown (FIG. 6.13).
 - ✎ Do not use on painted or powder coated surfaces.



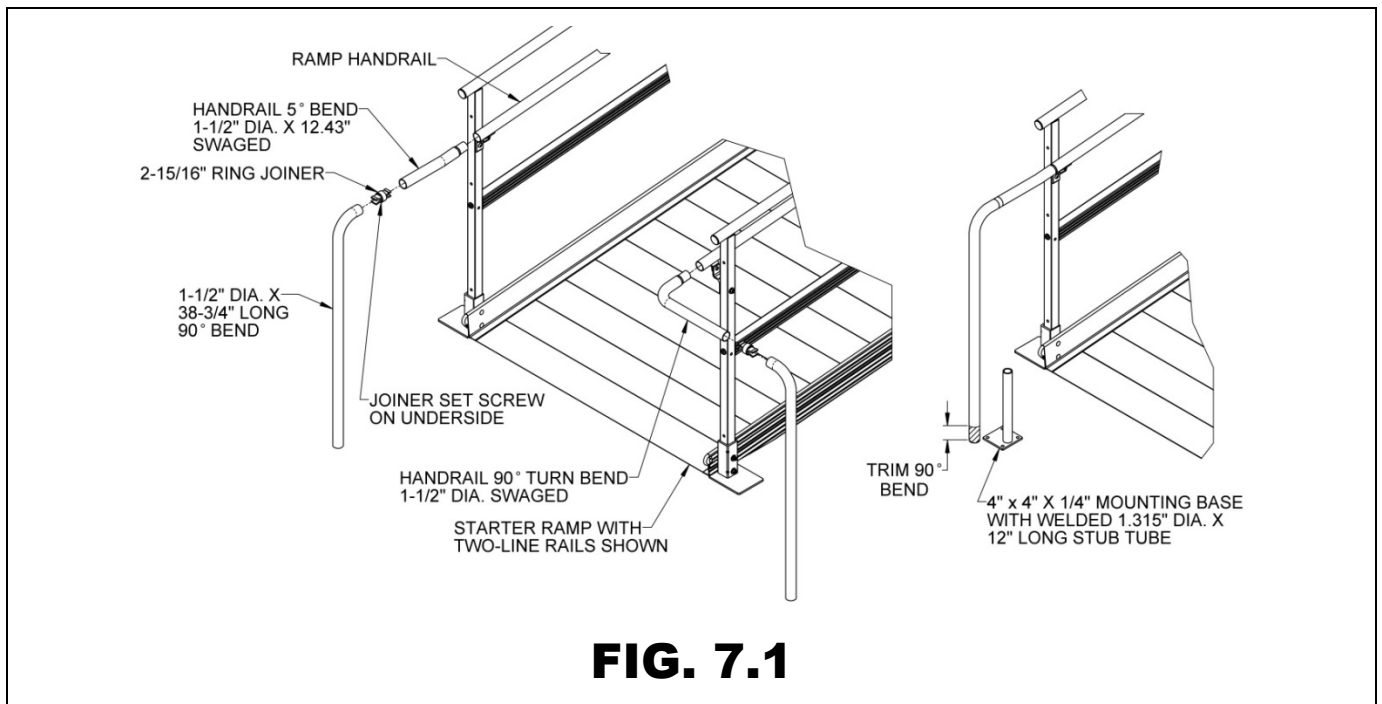
6.7. FINAL CHECKS

- 6.7.1. Ensure that all fasteners are in place and secure.
- 6.7.2. Remove any installation debris and metal chips.
- 6.7.3. Ensure that the level and slope has not shifted during installation.
- 6.7.4. Ensure that all handrail ends are terminated with loops or returned to a post, the ground, or building.
- 6.7.5. Check that all frame top rails are covered with end plugs and ramp side rails have corner protector caps installed.
- 6.7.6. Walk on the assembled system and check for any undue movement. If movement is noted, refer back to this Manual and ensure all installation steps were followed.

7. OPTIONAL EQUIPMENT

7.1. HANDRAIL RETURN TO GROUND

- 7.1.1. The handrail return to ground is most commonly used at the starter ramp but can also be used to return a ramp handrail to the deck of a platform or an existing landing. There are two options available: One extends the handrail one-foot level (minimum) straight out from the end of a ramp or ramp run, the other makes a 90° turn then extends one-foot level (minimum). Both can be used at either the top or bottom of a ramp or ramp run and can be used on either side of the ramp.
- 7.1.2. Similar to the end loop (refer to 'INSTALL RAMP HANDRAIL END LOOPS' section), insert the swaged end of the handrail 5° bend 1.5" diameter x 12.43" (swaged 5° bend) into the end of a ramp handrail. Use a swaged 5° bend if installing a straight handrail return to ground, use the handrail 90° turn bend 1.5" diameter swaged (swaged 90° bend) if installing a turn handrail return to ground (FIG. 7.1).
- 7.1.3. Insert a 2-15/16" ring joiner with the set screw on the underside of handrail (FIG. 7.1), and then install the 4-1/4" leg of 1-1/2" diameter x 38-3/4" (non-swaged) 90° bend onto the opposite end of the ring joiner with the 38-3/4" leg oriented toward the ground.
- 7.1.4. Hold the swaged 1-1/2" diameter tube bend, either the swaged 5° or swaged 90° bend, level to ground then trim the bottom of the 38-3/4" long, 90° bend such that the bottom is above the weld which attaches the 1.315" x 12" long stub tube to the 4" x 4" x 1/4" mounting base (FIG. 7.1).



- 7.1.5. Insert mounting base weldment into the bottom of trimmed 38-3/4" long, 90° bend. Rotate or disassemble as needed to install the base weldment, and then re-level the swaged 1-1/2" diameter tube bend and tighten 2-15/16" ring joiner set screw securely (FIG. 7.2).
- 7.1.6. Ensure the swaged end of the 1-1/2" diameter tube bend is inserted as far as possible into ramp handrail, and then install two 1/4" x 1" long self-drilling, self-tapping pan head Phillips screws in the handrail in the same manner described in step 6.3.2.5.
- 7.1.7. Orient the 4" x 4" x 1/4" thick mounting base away from the expected path of travel (to minimize the tripping hazard), and then drill two 1/8" diameter pilot holes through one wall of both the trimmed 38-3/4" long, 90° bend and the 1.315" x 12" long stub tube at 90° apart (FIG. 7.2). Orient the pilot holes such that the screws installed in the next step will be as unobtrusive as possible.
- 7.1.8. Install two 1/4" x 1" long self-drilling, self-tapping pan head Phillips screws through the bottom of the trimmed 38-3/4" long, 90° bend (FIG 7.2). Tighten securely.
- 7.1.9. If anchoring the mounting base to the ground or an existing landing, use the fastener or anchor most appropriate for the surface (provided by others).
- 7.1.10. If anchoring the mounting base to a platform, place 1/4" flat washers over the mounting holes and use provided 1/4" x 1" long self-drilling, self-tapping hex washer head screws to secure the base to the deck of the platform (FIG. 7.3).

FIG. 7.2

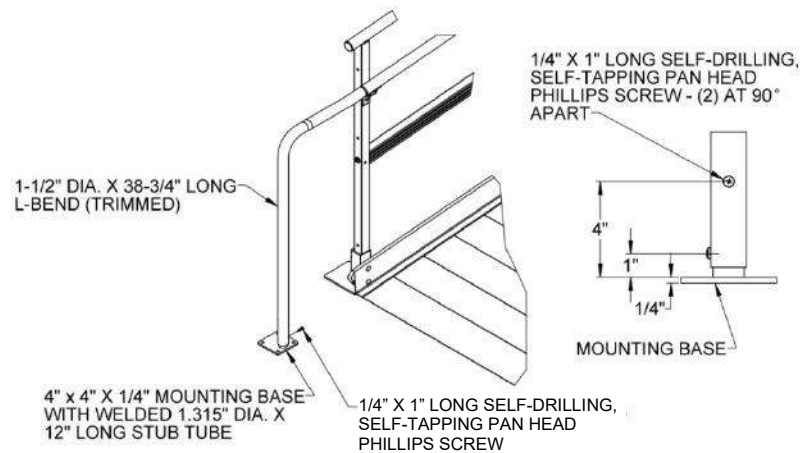
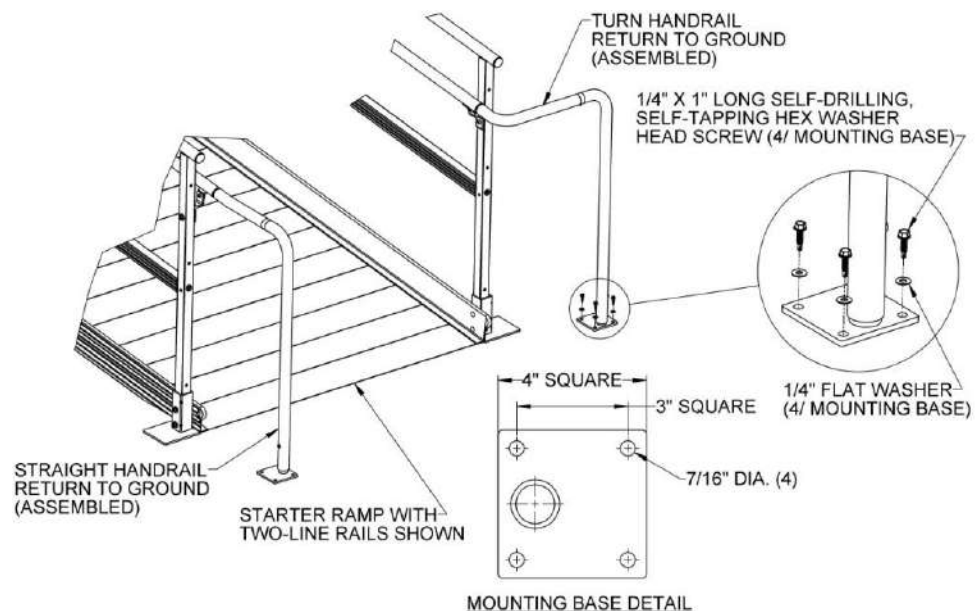


FIG. 7.3



7.2. RAMP SUPPORT

7.2.1. The ramp support provides supplemental support at the upper or lower end of a ramp. When used, the ramp support replaces the ramp handrail end bracket pair.

7.2.1.1. Attach the ramp supports with two each 5/16"-18 x 1-1/2" hex bolts and 5/16" flat washers (FIG. 7.4).

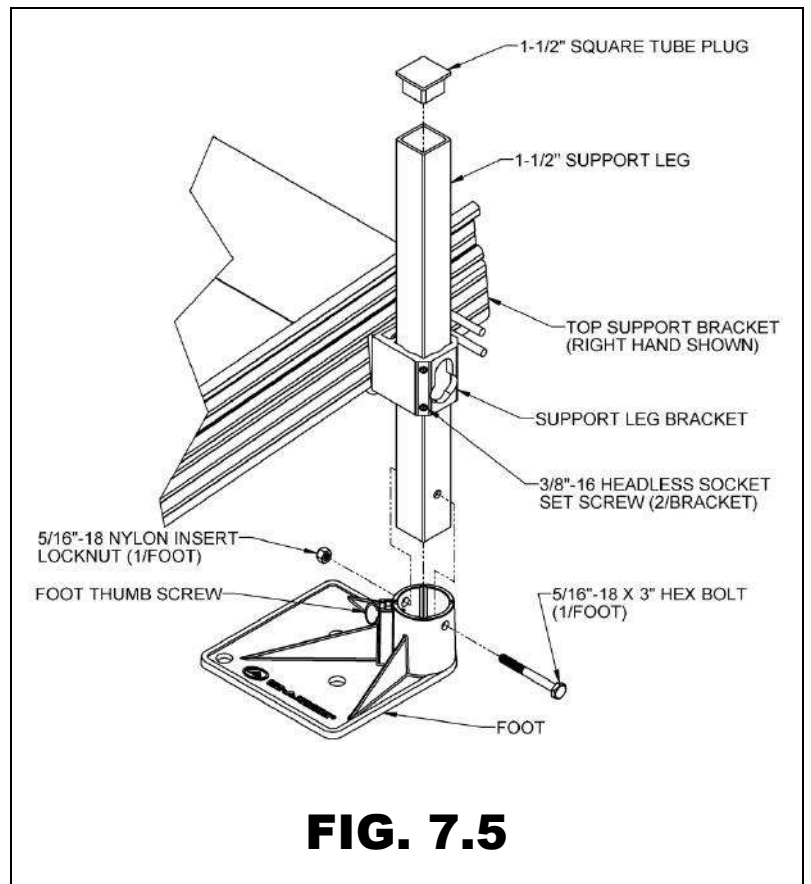
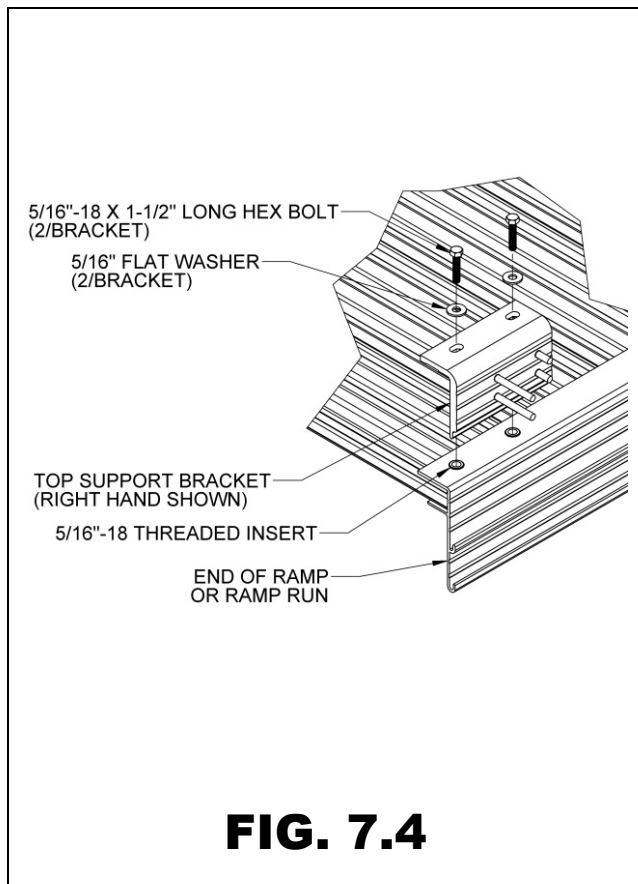
🖐 There is a "left" and "right" support bracket, but they can be installed on either side of the ramp, depending on whether they are used at the upper or lower end of the ramp or ramp run. Note the two longer studs must be oriented toward the end of the ramp, regardless of which side they are being installed.

7.2.1.2. Install support leg brackets on the two shorter studs of the ramp supports. Support leg brackets are installed and adjusted in the same manner as the ramp to ramp connector (see 'CONNECT RAMP SECTIONS' section).

7.2.1.3. Support legs are installed, attached, and braced in the same manner as other ramp support legs. Refer to 'ATTACH SUPPORT LEGS TO RAMPS' section and complete the remaining steps.

7.2.1.4. If used with optional 48", 54" or 60" ramp transition plates (see 'RAMP TRANSITION PLATE' section), it may be necessary to lift the end of the ramp or ramp run to install the transition plate and adjust the height such that the transition plate lays flat on the platform or landing.

7.2.1.5. Refer to 'ANCHOR RAMP TRANSITION PLATE' section for anchoring ramp transition plate.

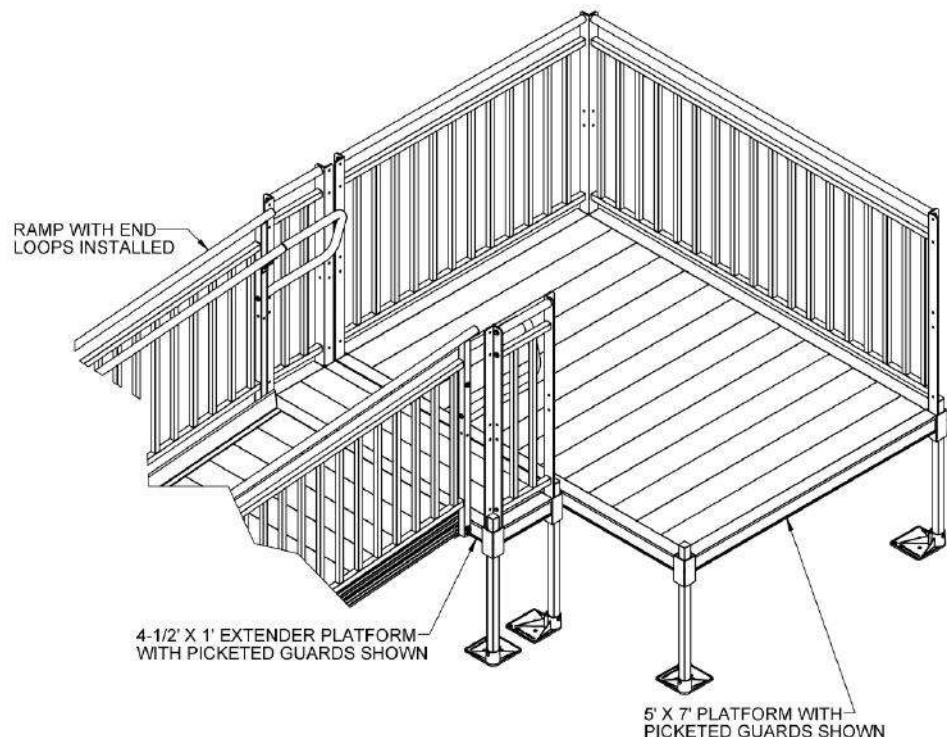


7.3. PLATFORM EXTENDERS

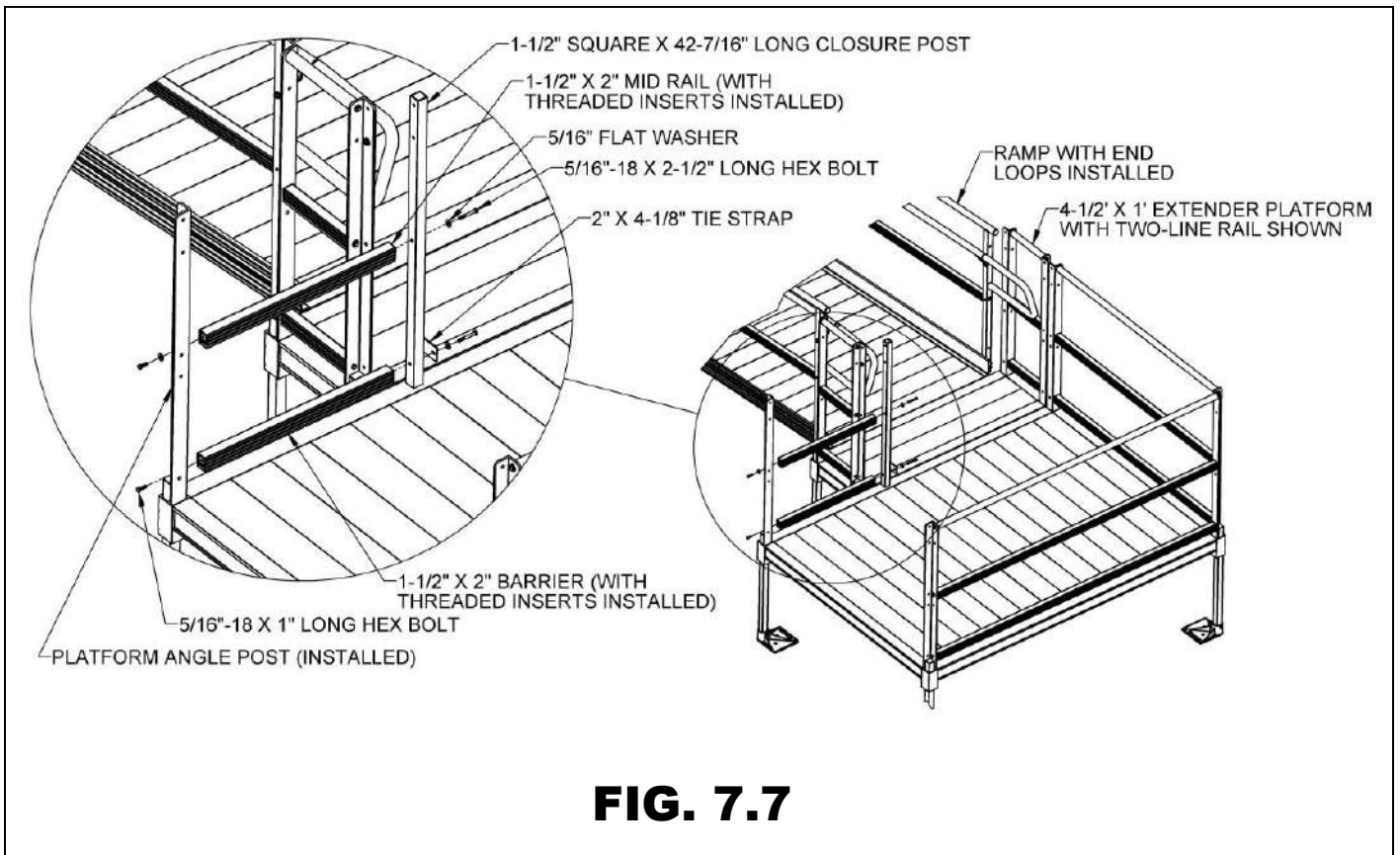
Except for being smaller, platform extenders are the same as standard platforms. They are intended to allow end loops to be used on both sides of a ramp without impeding the walking area of an adjacent platform or landing. Platform extenders are available in two sizes: 4-1/2-ft x 1-ft (for 48" wide ramps) and 5-ft x 1-ft (for 54" wide ramps) and are available with either picketed guards or two-line rails. If a 5-ft x 1-ft platform extender is used on a 5-ft platform side, no closure is required. Otherwise, special platform extender closures are available (in both picketed guards and two-line rails) for the specific combination of platform extender and the platform side to which it will be attached.

- 7.3.1. Install legs in the platform extender and set at the desired height (as described in 'PLATFORMS' section), including bracing the legs if required for the height, and then set the long side next to the main platform in the desired location.
 - ▲ Always use four legs in the platform extender even if the extender is being used with a platform connector.
- 7.3.2. Install a ramp hanger pair on the side of the platform extender opposite the main platform and set the ramp end in the hangers per 'INSTALL RAMPS ON PLATFORMS' section.
- 7.3.3. Install picketed guards or two-line rails on the 1-ft. sides of the platform extender as described in 'ASSEMBLE TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' and 'INSTALL TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' sections.
- 7.3.4. Install end loops in the ramp handrails as described in 'INSTALL RAMP HANDRAIL END LOOPS' section (or 'INSTALL RAMP HANDRAIL END LOOPS WITH LOWER (CHILD) HANDRAILS' section if lower handrails are present). FIG. 7.6 shows the installation at this stage.
 - 7.3.4.1. Platform extender closures are installed in essentially the same manner as other closures, except there is no adjacent ramp so the barrier attachment plate and spacer are not used. Refer to 'INSTALL TWO-LINE PLATFORM RAILS AND PICKETED GUARDS' and 'CLOSURES' sections for installing the platform angle post in the open platform corner pocket.
 - 7.3.4.2. Refer to 'HANDRAIL CLOSURES' section for installing a two-line rail closure or picketed guard closure.

FIG. 7.6



- 7.3.4.3. The 1-1/2" x 2" barrier and mid rail for a two-line rail closure will come in the required length and should not need to be trimmed.
- 7.3.4.4. Insert 1-1/2" square threaded inserts into both ends of the barrier and mid rail (refer back to FIG. 5.2). Use a rubber mallet or similar tool to fully seat as needed.
- 7.3.4.5. Attach the lower 1.5" x 2" barrier to the lowermost hole in the platform angle post using a 5/16"-18 x 1" long hex bolt (do not use a flat washer at this location) and the 1.5" x 2" mid rail at the higher of the two middle holes in the angle post using both a 5/16"-18 x 1" long hex bolt and 5/16" flat washer (FIG. 7.7).
- 7.3.4.6. Attach the 1-1/2" square x 42-7/16" long closure post to the 1.5" x 2" barrier and mid rail on the opposite side using 5/16"-18 x 2-1/4" long hex bolts and 5/16" flat washers with a 2" x 4-1/8" tie strap between the flat washer and 1-1/2" square x 42-7/16" long closure post, oriented toward the platform extender at the 1-1/2" x 2" barrier (FIG. 7.7).



- 7.3.4.7. Install the top rail and plug the top of the 1-1/2" square x 42-7/16" long closure post in the same manner as a standard picketed guard closure. FIG. 7.8 shows the installation at this stage.
- 7.3.4.8. Attach a second 2" x 4-1/8" tie strap to the second hole from the top of the 1-1/2" square x 42-7/16" long closure post using a 5/16"-18 x 2-1/4" long hex bolt, 5/16"-18 locknut, and 5/16" flat washers oriented as shown (FIG. 7.9), then attach tie straps to the adjacent platform angle post in the platform extender using 5/16"-18 x 1" long hex bolts, 5/16"-18 locknuts, and 5/16" flat washers oriented as shown.
- 7.3.4.9. Tighten all fasteners securely.

FIG. 7.8

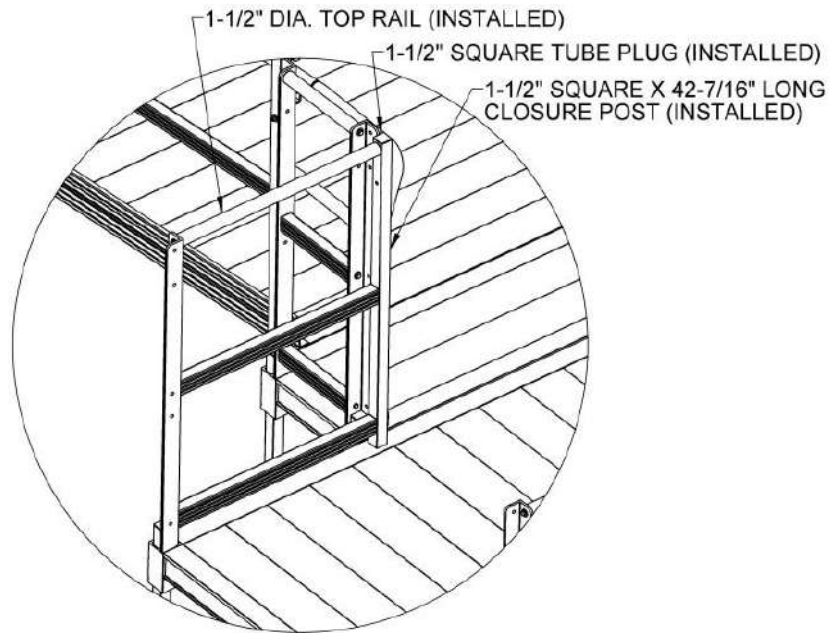
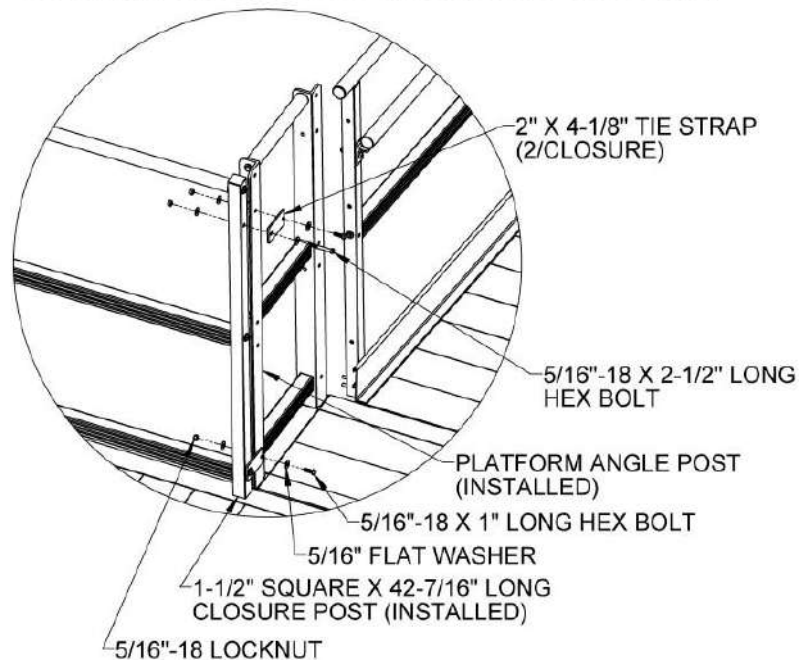
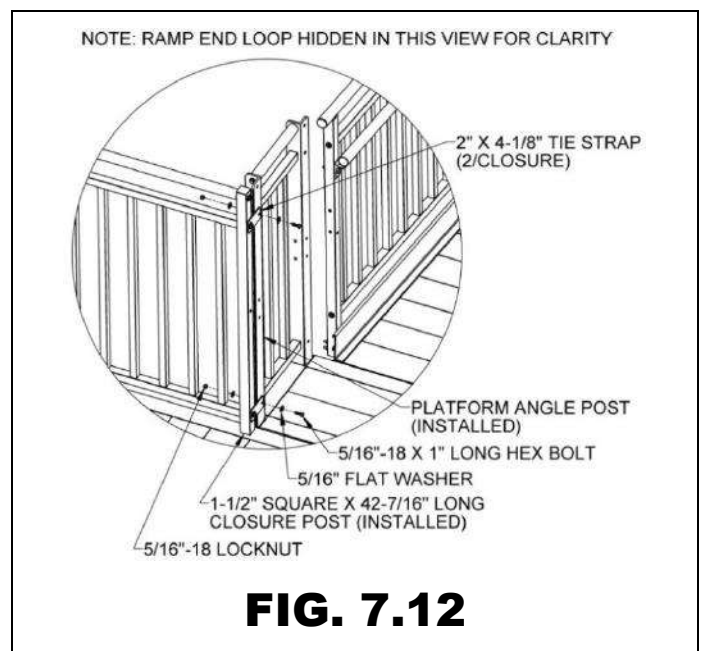
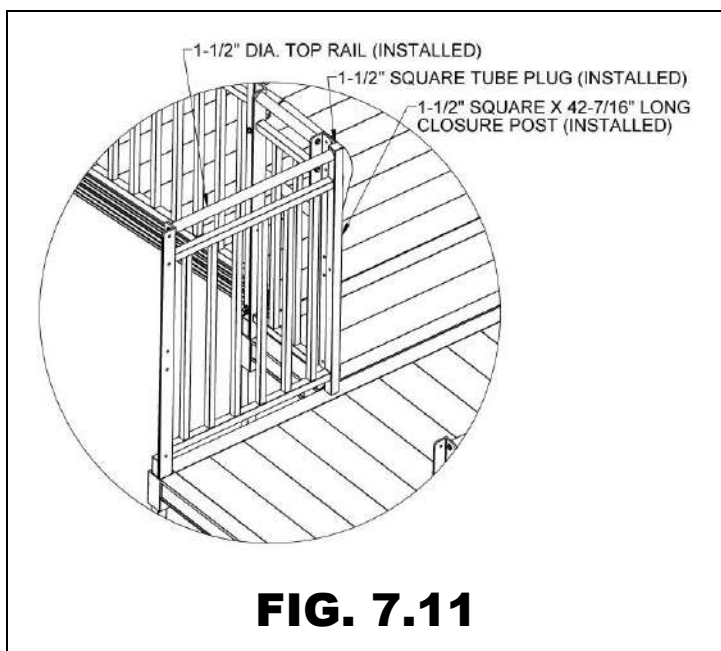
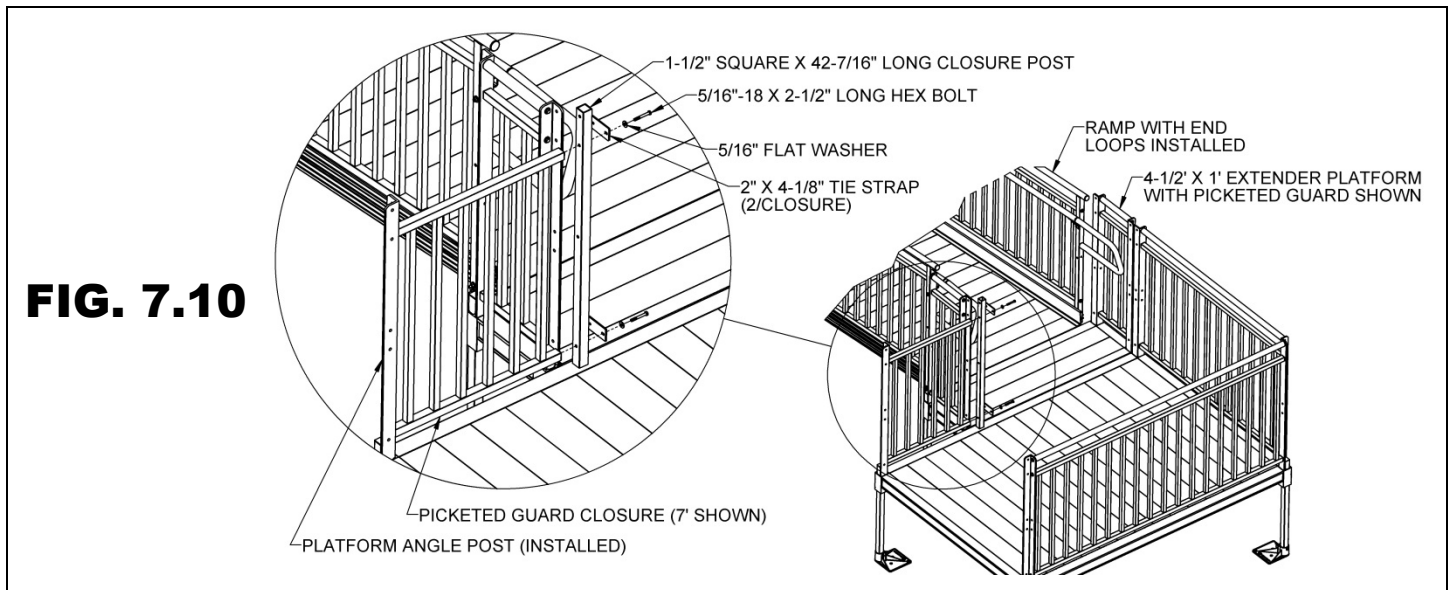


FIG. 7.9

NOTE: RAMP END LOOP HIDDEN IN THIS VIEW FOR CLARITY

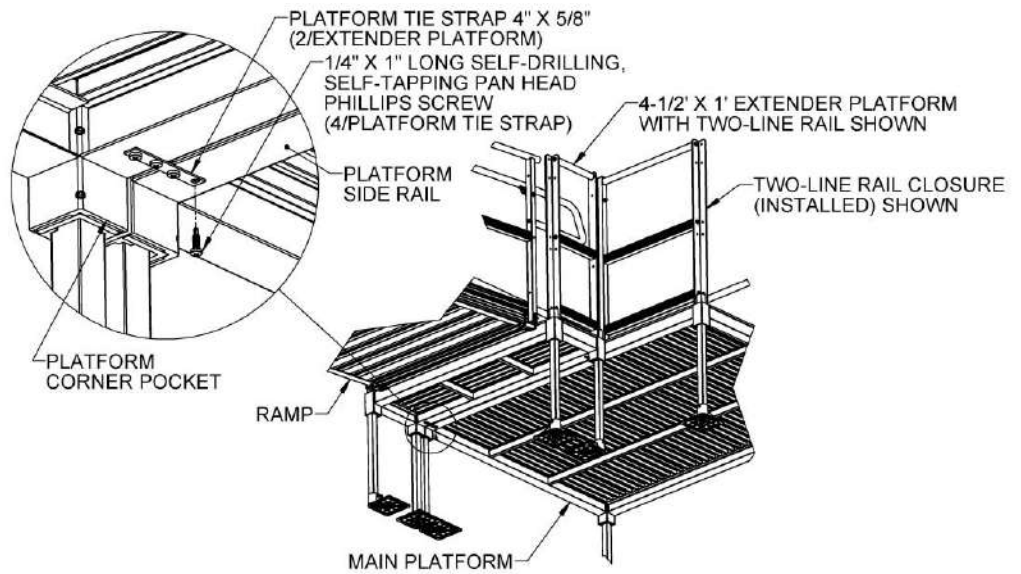


- 7.3.4.1. The picketed guard closure for the platform extender is installed in a similar manner to the standard picketed guard closure. Refer to sections 5.7.1 through 5.7.11 for the initial steps installing the platform angle post and attaching the picketed guard closure to the angle post.
- 7.3.4.2. Attach the 1-1/2" square x 42-7/16" closure post to the picketed guard closure on the opposite side using 5/16"-18 x 2-1/4" hex bolts and 5/16" flat washers with 2" x 4-1/8" tie straps between the flat washer and 1-1/2" square x 42-7/16" long closure post oriented toward the platform extender at both the upper and lower rail as shown (FIG. 7.10).
- 7.3.4.3. Install the top rail and plug the top of the 1-1/2" square x 42-7/16" closure post in the same manner as a standard picketed guard closure. FIG. 7.11 shows the installation at this stage.
- 7.3.4.4. Attach tie straps to the adjacent platform angle post in the platform extender using 5/16"-18 x 1" long hex bolts, 5/16"-18 locknuts, and 5/16" flat washers oriented as shown (FIG. 7.12).
- 7.3.4.5. Tighten all fasteners securely.

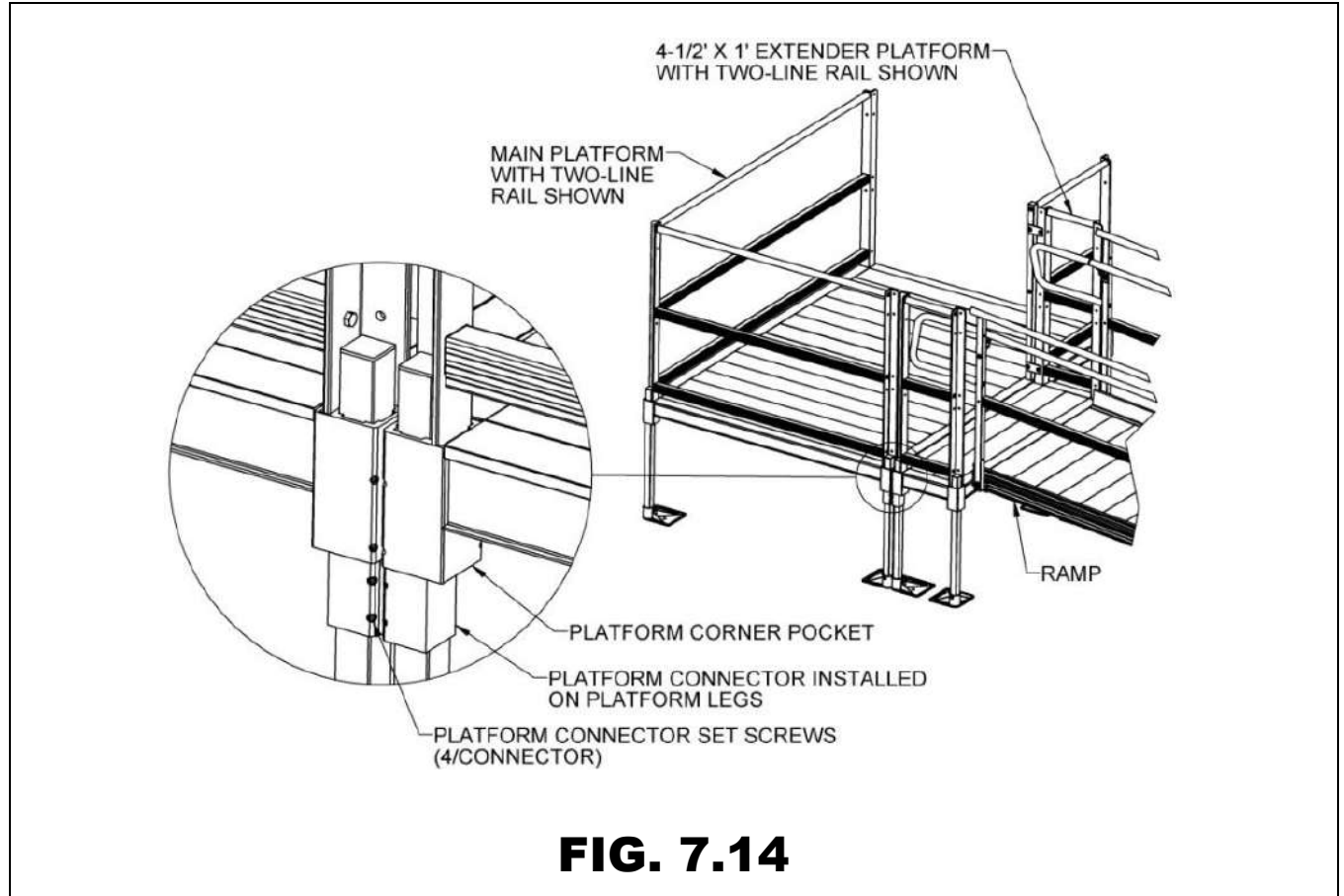


- 7.3.4.6. Attach the platform extender to the main platform using platform tie straps, platform connectors, or a combination of one of each.
 - ⚠ Regardless of the combination used, the platform extender must be connected to the main platform in two locations.
- 7.3.4.7. If using platform tie straps, hold platform extender as close as possible to the main platform, and then center platform tie strap between the platform side rails approximately 1" to 2" from platform corner pocket.
- 7.3.4.8. Attach using the four 1/4" x 1" long self-drilling, self-tapping pan head Phillips screws provided (FIG. 7.13).

FIG. 7.13



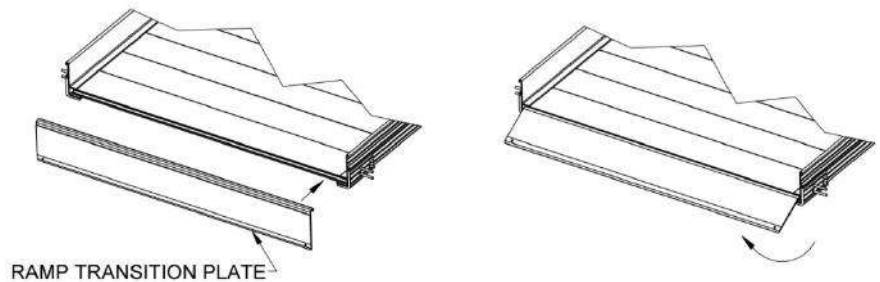
- 7.3.4.9. If using platform connectors, align the corner pocket of the platform extender with the main platform corner pocket, and then install the platform connector onto the adjacent legs until it contacts the underside of the platform corner pockets. Tighten the set screws in the platform connector securely. This will require loosening the platform leg set screws, foot thumb screws, and removing the bolt attaching the foot to the leg (and possibly removing cross bracing, if present), then lifting the leg out of the foot if the legs and feet have already been installed (FIG. 7.14). Refer to 'INSTALL SUPPORT LEGS AND FEET AND ADJUST PLATFORM HEIGHT' section for additional information on installing platform legs and feet, 'CONNECT TWO PLATFORMS TOGETHER' section for additional information on platform connectors, and 'INSTALL CROSS BRACE – PLATFORMS' section for additional information on cross braces.
- 👉 Two platform connectors can only be used when connecting a 5-ft x 1-ft platform extender to a 5-ft platform side. In other situations, use either two platform tie straps or one platform tie strap with a platform connector.
- 7.3.4.10. Complete all remaining steps in 'FINAL PLATFORM/RAMP STEPS AND CHECKS' section as required for the installation.



7.4. RAMP TRANSITION PLATE

- 7.4.1. 48", 54", and 60" ramp transition plates, in combination with a ramp support, are commonly used to span wider gaps or accommodate angular misalignment. The ramp transition plate can be used at either end of a ramp or ramp run.
- ⚠ The ramp transition plate will not support the end of a ramp or ramp run without a ramp support.
 - ✋ The ramp transition plate, with a ramp support, can be used instead of the ramp hanger pair, if desired. In some situations, it can also be used when transitioning from a ramp to an existing porch or deck or when transitioning to the ground instead of the starter ramp.
- 7.4.2. Lift the end of the ramp and install the ramp transition plate as shown (FIG. 7.15).
- 7.4.3. If a transition plate is resting on any type of raised area (i.e. a platform, deck, or porch), it must be anchored. Refer to 'ANCHORING RAMP TRANSITION PLATE' section.
- 7.4.4. If the transition plate is resting on the ground, anchoring is optional.

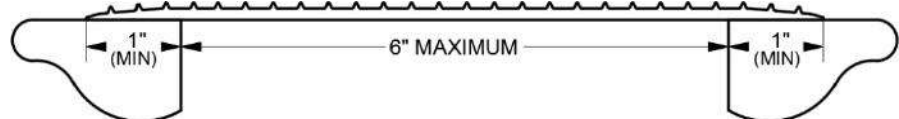
FIG. 7.15



7.5. SINGLE BRIDGE PLATE (TBPxx - BRIDGE PLATE)

- ⚠ The single bridge plate (bridge plate) is only intended to span gaps up to a maximum of 6" between a platform and a porch or deck; it is not intended to be used as a ramp or on an incline.
- 7.5.1. Securing to WOODEN SURFACE OR PLATFORM:
- 7.5.1.1. To secure to a wooden deck or platform, use the four supplied 1/4" x 1" self-drilling, self-tapping pan head Phillips screws.
- 7.5.2. Securing to CONCRETE:
- 7.5.2.1. To secure to concrete, drill a 1/4" diameter hole at least 1-1/2" deep.
- 7.5.2.2. After drilling, ensure holes are free of any dust or other debris.
- 7.5.2.3. Using a hammer, drive the two provided 1/4" diameter mushroom head pin drive anchors through the holes in the single bridge plate and into the drilled holes until the head is seated flush with anchor body.
- 7.5.2.4. Attach the other side of bridge plate to the platform using the 1/4" x 1" self-drilling self-tapping pan head Phillips screws.
- ✋ Other types of anchoring devices may work in specific situations; contact your local contractor for assistance.
- ⚠ Use in the horizontal (flat) position only.
 - ⚠ Ensure that at least 1" on each of the supporting edges of the single bridge plate is supported on a level, sound surface that is free from defects and can support the same structural loads as the system (FIG 7.16).

FIG. 7.16



8. MAINTENANCE

8.1. PERIODIC MAINTENANCE

- 8.1.1. Caution should be used at all times. Maintenance and upkeep to the ramp system is vital.
- 8.1.2. Periodically check the ramp for damage and tighten any loose fasteners.
- 8.1.3. At all times, keep the system clear of dirt, leaves, and other debris that may accumulate on the surface. Simply sweeping the surface or using a garden hose will usually suffice, but, if needed, a damp cloth or soft brush with soap and water can be used (avoid use of alkaline detergents).
- 8.1.4. If system surface is covered with ice and/or snow, do not use until accumulation is removed and the tread surface swept clean. See 'DEICING' section for additional information.
- 8.1.5. If any part of the ramp is damaged or loose, do not use until repairs are made by an EZ-ACCESS approved technician.

9. DEICING

- ⚠ For the safety of all users, it is important to keep your system clear of snow, ice, and other debris.
- ⚠ Always follow the deicing agent manufacturer's directions.
- ⚠ EZ-ACCESS® will not be held responsible for any injuries or damages that arise from the information provided. ALWAYS check with the deicing product's manufacturer or your local supplier to determine which method is best for your situation.
- ⚠ After the snow and/or ice threat has cleared, be sure to clean the tread surface with mild soap and water (avoid alkaline detergents) to remove deicing residue.
 - ✋ Sodium Chloride (salt) and Calcium Chloride are particularly damaging to newly poured concrete. In addition, these chemicals should not be applied to brick and stone surfaces.
 - ✋ While care has been taken to ensure that the table below is accurate, the information shown is not all-inclusive. Manufacturers of deicing products may make changes to their products as well as recommended functions and usage requirements. The deicing method you choose should be researched with your deicer supplier so you can determine which method is best for your situation.
 - ✋ The information below is taken from Fact Sheet 707, Cooperative Extension Service, University of Maryland at College Park, University of Maryland Eastern Shore and was up-to-date at the time of this manual's publication.

PRODUCT	MINIMUM WORKING TEMP (°F)	SPEED OF ACTION	DAMAGES CONCRETE & METAL	HARMFUL TO PLANTS
MAGNESIUM CHLORIDE	-13	VERY FAST	NO	MODERATE
CALCIUM CHLORIDE	5	FAST	YES	YES
SODIUM CHLORIDE (SALT)	18	MODERATE	YES	YES
POTASSIUM CHLORIDE	25	SLOW	OK ON OLD CONCRETE	MODERATE
CALCIUM MAGNESIUM ACETATE (CMA)	25	SLOW	NO	NO

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