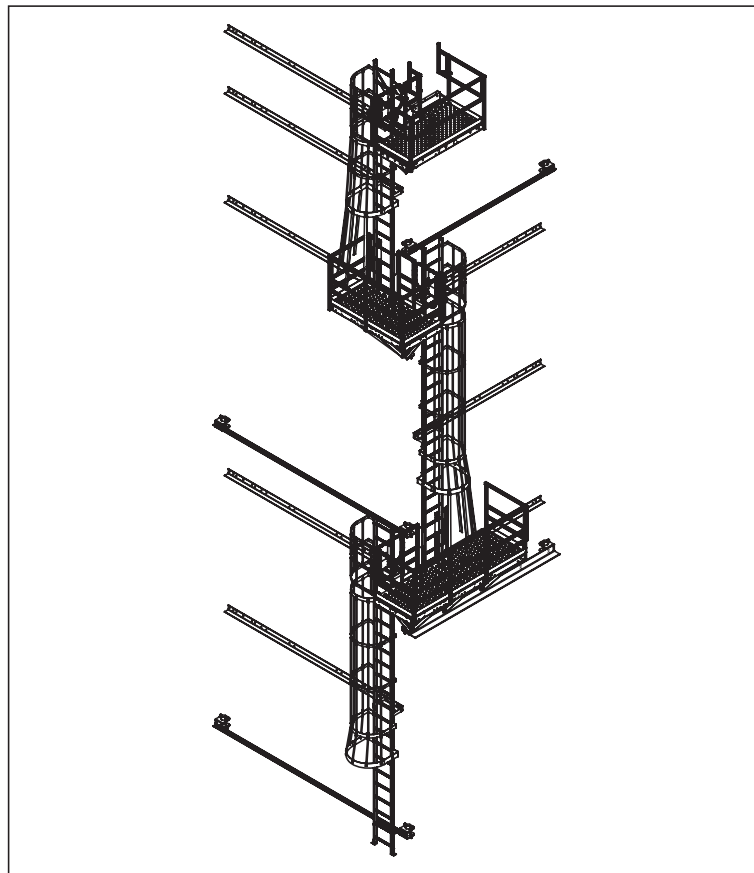




Tower Ladder and Ladder Platforms

Towers Construction, Maintenance, and Safety Manual



Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: 4000052 R1

Revised: May 18, 2021

Original Instructions

New in this Manual

The following changes have been made in this revision of the manual:

Description	Section
Platform supports changed.	Multiple manual sections
Part number corrections were made.	Multiple manual sections
Style and formatting changes were made.	Multiple manual sections

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1. Safety

1.1. Safety Alert Symbol and Signal Words



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

Signal Words: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.



Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.



Indicates a hazardous situation that, if not avoided, could result in serious injury or death.



Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.



Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

1.2. General Product Safety

Read and understand all safety instructions, safety decals, and manuals and follow them.

- Owners must give instructions and review the information initially and annually with all personnel. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- Use for intended purposes only.
- Do not modify the tower ladder and ladder platforms in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety. Any unauthorized modification will void the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Always follow applicable local codes and regulations.



1.3. Ladder Safety

WARNING

- Do not climb ladder if damaged, wet, icy, greasy, or slippery.
- Remove slippery materials on platforms, rungs and gripping surfaces.
- Maintain good balance by having at least three points of contact at all times.
- Use a fall restraint and arrest system when required. Consult your local health and safety organization.



1.4. Fall Restraint and Arrest Safety

WARNING

To prevent serious injury or death:

- Use in accordance with manufacturer's recommendations and instructions.
- Confirm the fall restraint or fall arrest meets local and/or national codes.
- Ensure the fall restraint or fall arrest will support the maximum load including a person, any equipment, and other external forces.
- Connect the fall restraint or fall arrest only to a labeled anchor point on the equipment.
- Inspect components before each use for wear, damage and other deterioration.



1.5. Working At Height Safety

- Ensure that all work at height are properly planned, organized and carried out by a competent person.
- Use appropriate work equipment and make sure that they are inspected to ensure safety.
- Select collective measures to prevent falls (such as guard rails and working platforms) before other measures which may only reduce the distance and consequences of a fall (such as nets or air bags) or may only provide fall-arrest through personal protection equipment.
- Ensure that those persons working at height are trained in how to avoid falling and how to avoid or minimise any injuries should they fall.
- Check the weather condition. Postpone any work at height until there is no risk to the health and safety of any person working at height.
- Ensure that nothing is thrown or tipped from height if it is likely to injure a person.

1.6. Platform Safety

- Check the platform working load. Do not overload. Contact Brownie before adding any equipment to a platform.
- Close platform access door before and after working on the platform.

1.7. Auxiliary Equipment Safety

Unapproved auxiliary equipment could cause performance issues or structural failure, and is not covered by warranty.

- Do not install auxiliary equipment if the tower ladder and ladder platforms is not designed for use with it. Refer to the specific information provided in this manual for auxiliary equipment or check with Brownie or your dealer for written approval, if necessary.
- Obtain, read, and understand the instructions and safety warnings of the auxiliary equipment manufacturer.
- Attach auxiliary safety decals to the tower ladder and ladder platforms as applicable.
- Store auxiliary operations/maintenance manuals in a safe place available for future use.

1.8. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when assembling the equipment.

Safety Glasses

- Wear safety glasses at all times to protect eyes from debris.



Coveralls

- Wear coveralls to protect skin.



Hard Hat

- Wear a hard hat to help protect your head.



Steel-Toe Boots

- Wear steel-toe boots to protect feet from falling debris.



Work Gloves

- Wear work gloves to protect your hands from sharp and rough edges.



1.9. Safety Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory as applicable.

1.9.1 Decal Installation/Replacement

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the decal backing paper.

1.9.2 Safety Decal Locations and Details

Replicas of the safety decals that are attached to the tower ladder and ladder platforms and their messages are shown in the figure(s) that follow. Safe operation and use of the tower ladder and ladder platforms requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

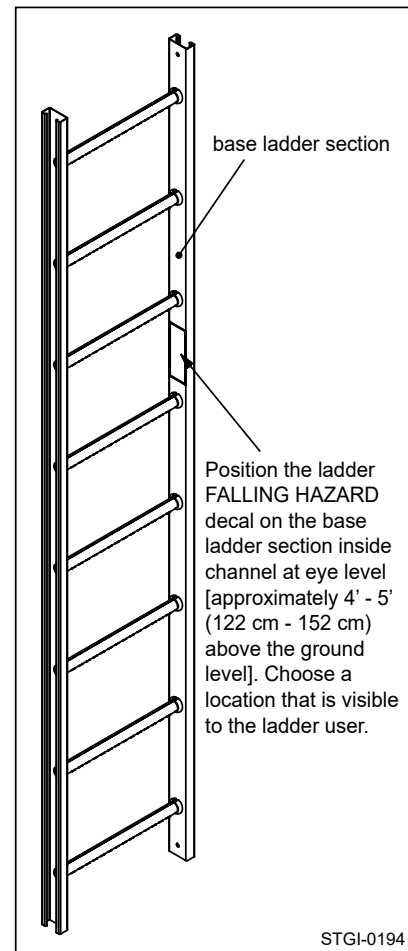
Falling Hazard Decal

Important

The Falling Hazard WARNING decal is supplied along with this manual. If it is not, contact MFS|Stormor to obtain a copy of this decal (Part Number SAF-136). Position this decal in a visible location on the base ladder section inside channel at eye level as shown.



Figure 1. Ladder Falling Hazard Decal Location



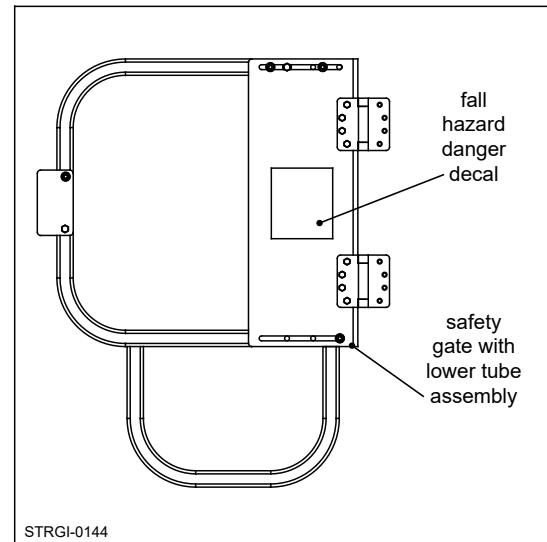
Platform Fall Hazard Danger Decal

Important

The Fall Hazard DANGER decal is pre-affixed to both sides of platform safety gates in a visible location. If it is not, contact MFS|Stormor to obtain a copy of this decal (Part Number K20106).



Figure 2. Fall Hazard Danger Decal Location



2. Assembly



Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

2.1. Tower Ladder and Platforms General Assembly

**WARNING**

Do not use, put weight onto, or enter any space below a ladder or platform which is not fully installed and secured.

Important

In order for Brownie tower ladder and ladder platforms ladder runs to be OSHA compliant, ladder runs must not exceed 24' (7.31 m) in distance above the ground or enclosed platform walking-working surface.

Note

Brownie recommends drawing a ladder and platform layout of the entire ladder and platform installation before construction begins. Predetermine the locations of the platforms, ladder runs, ladder sections, ladder brackets, cages, ladder/platform angles, ladder/platform support angles, and mid angles. Brownie makes available cad blocks you can use to make a plan drawing of your ladder system installation using the appropriate cad software. Please contact your Brownie to obtain these cad blocks.

Tower Ladder and Platforms General Assembly Instructions

1. First assemble together the 10' base tower section at the tower base and install this section to the tower foundation.
2. Assemble together stackable tower sections preparing them for hoisting.
 - a. Install tower ladder/platform angles to the bottom ears of platform posts on the tower face where the ladder will be installed.
 - b. At the locations where platforms will be installed, install platform support angles at the correct distance below tower post connection splices.
3. Assemble platform(s) together as fully as possible before they are lifted into position on the stackable tower sections.
4. Lift the platforms and completely install these to planned locations on each stackable tower section on the correct tower face(s).
5. Stack the tower sections.
6. Assemble together ladder run segments on the ground along with cages secured to ladder segments where cages will be used.
7. Install the ladder runs with cages between platforms.
 - a. Install the ladder runs with cages to the tower support angles and platforms in the correct locations on the tower.

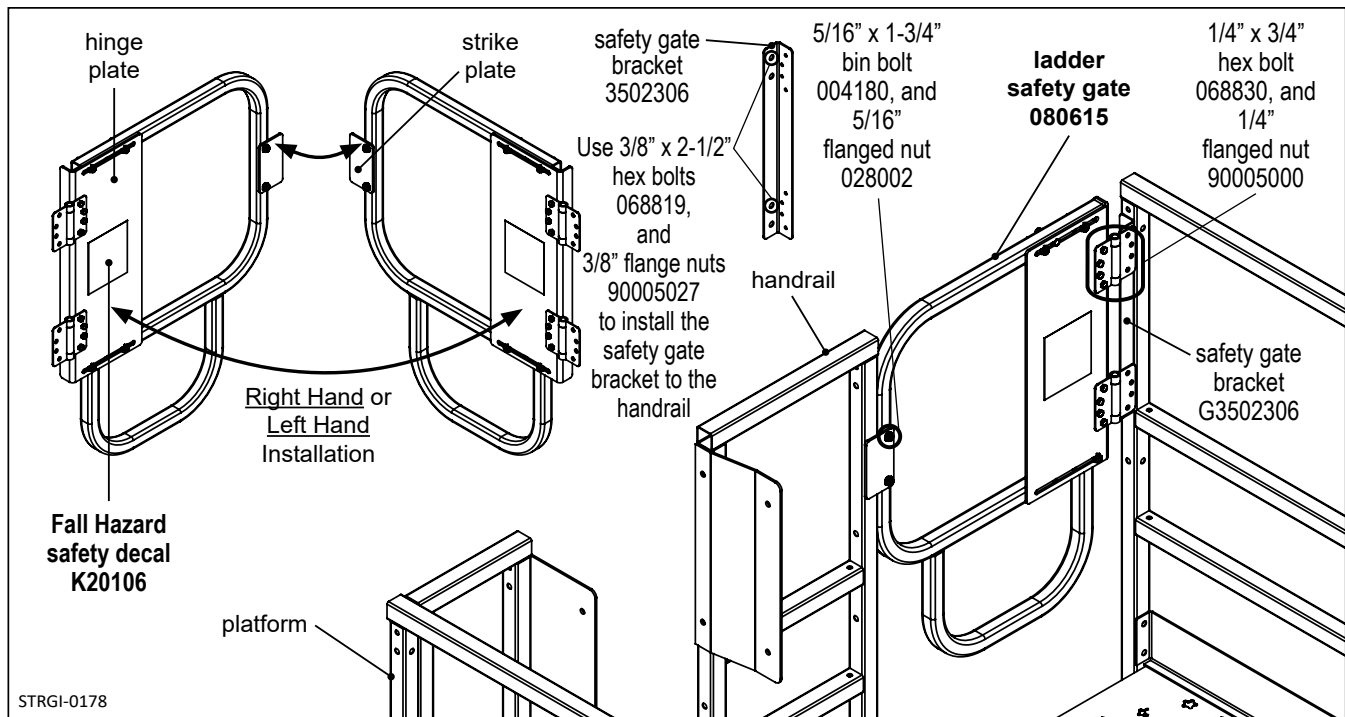
2.2. Typical Ladder and Platforms Components Assembly

2.2.1 Safety Gate Installation

Note

The ladder safety gate comes pre-assembled but is reversible for use in Right Hand or Left Hand situations.

1. Determine whether Right Hand or Left Hand assembly is required.
2. If pre-assembly does not match the required Right Hand or Left Hand door orientation, then remove the hinge plates and striker plates. Reverse by installing these on the door opposite side and then reattach.
3. Connect the safety gate bracket to the platform handrail using the top handrail attachment holes using the hardware indicated in the following figure.
4. Connect the hinges to the safety gate bracket using the hardware indicated in the following figure.
5. Make certain the gate is installed correctly so it fully closes on its own by spring tension only. If it is not fully closing by spring tension only, adjust it until it does.
6. Tighten all bolts.



2.2.2 Install Mid Angles

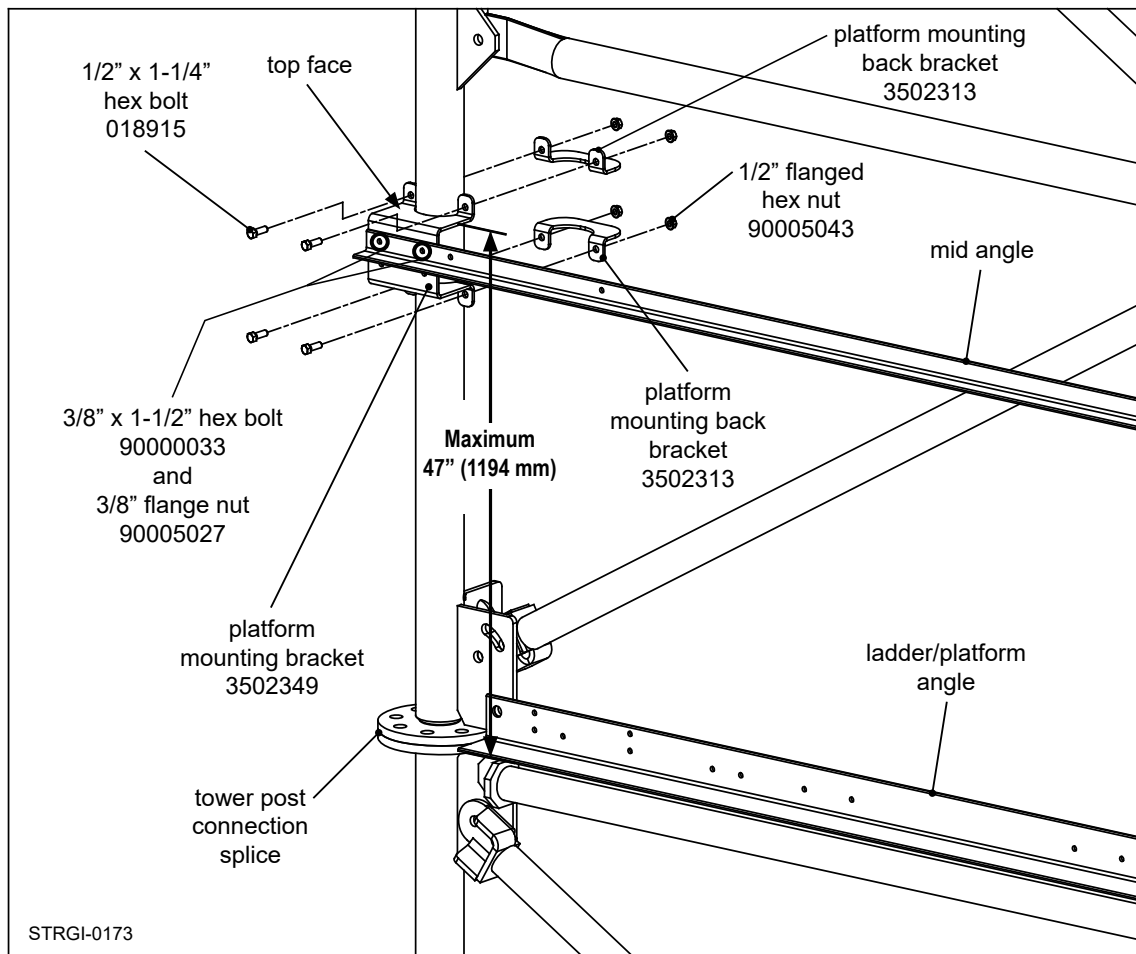
Note

Install the mid angle at the tower bottom low enough to stabilize the bottom ladder section. The mid angle at the tower bottom is installed to the tower in the same way as typical mid angles are installed.

Typical Mid Angle Installation

1. Determine the locations on the tower where mid angles need to be installed. Determine where the top of each ladder run will terminate on the tower. These are the locations where a mid angle is necessary.
2. Plan to position the mid angle a few inches below the top of the ladder run (planned location).
 - a. See the tower, ladder, and platform layout drawing prepared before construction. The customer is responsible for providing ladder and platform layout drawings. Brownie is not responsible for providing ladder and platform layout drawings.
3. Install platform mounting brackets to the platform mid angle ends as shown in [Figure 3](#).
 - a. Use 3/8" x 1-1/2" hex bolts and 3/8" flange nuts.
 - b. Position the flanged hex nuts on the platform mounting bracket side.
 - c. Tighten this hardware.
4. At the mid angle planned location install platform mounting brackets to tower posts by connecting these to platform mounting back brackets.
 - a. Use 1/2" x 1-1/4" hex bolts and 1/2" flanged nuts.
 - b. Tighten this hardware.
5. Install platform mounting brackets so the platform mounting bracket top face is no higher than 47" (1194 mm) above the bottom of the ladder/platform angle as shown in the figure below.
6. Tighten all hardware.

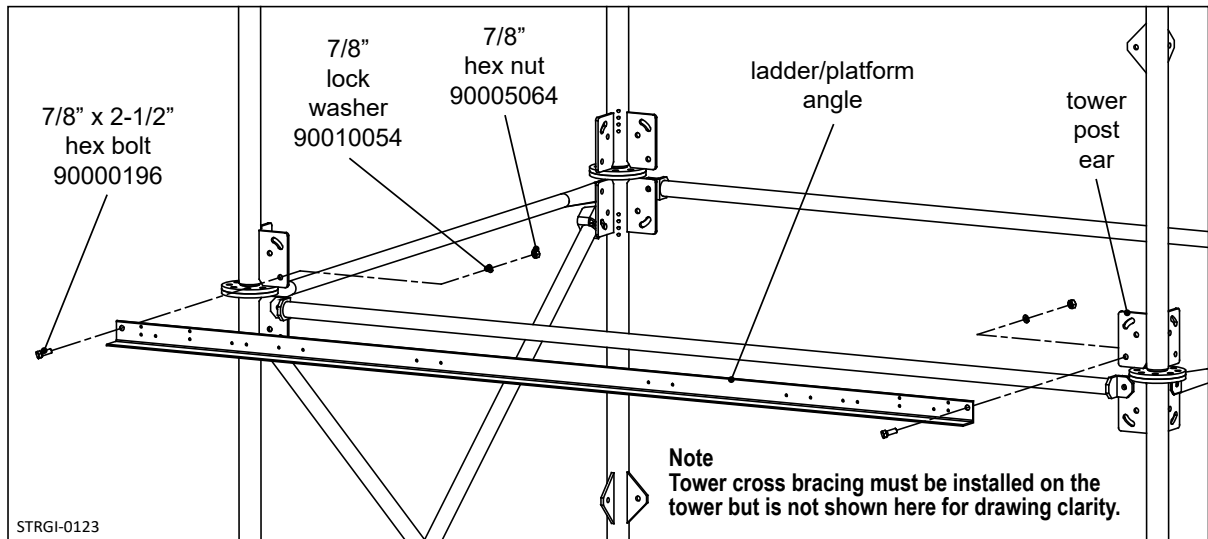
Figure 3. Installing Mid Angles to Platform Mounting Brackets. Installing Platform Mounting Brackets to Tower Posts.



2.2.3 Install Ladder/Platform Angles

1. Install tower ladder/platform angles to the bottom ears of platform posts on the tower face at each location where the ladders and platforms will be installed.
2. Install tower ladder/platform angles as shown in the following figure so the angle flange with no holes is below the flange with holes pointing out, away from the tower.
 - a. Use 7/8" x 2-1/2" hex bolts, 7/8" lock washers, and 7/8" hex nuts.
 - b. Position the 7/8" lock washers, and 7/8" hex nuts on the tower ear side.

Figure 4. Installing Tower Ladder/Platform Angles



2.2.4 Install Horizontal Mount Brackets to Ladder/Platform Angles

Note

Brownie recommends installing the horizontal mount brackets to the ladder/platform angles before the rest platform is lifted and set in position on the tower.

1. Connect horizontal mount brackets to the ladder/platform angle in the locations shown in the following figure.
2. Use 3/8" x 1" hex bolts and 3/8" flange nuts to make this connection.

Figure 5. Installing Horizontal Mount Brackets to Ladder/Platform Angles

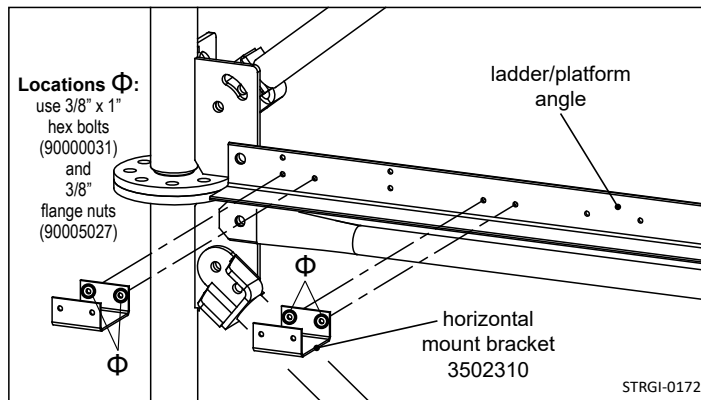
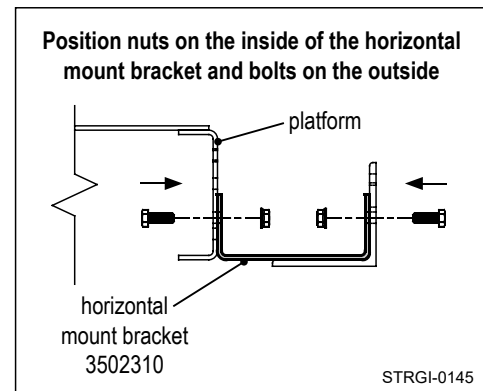


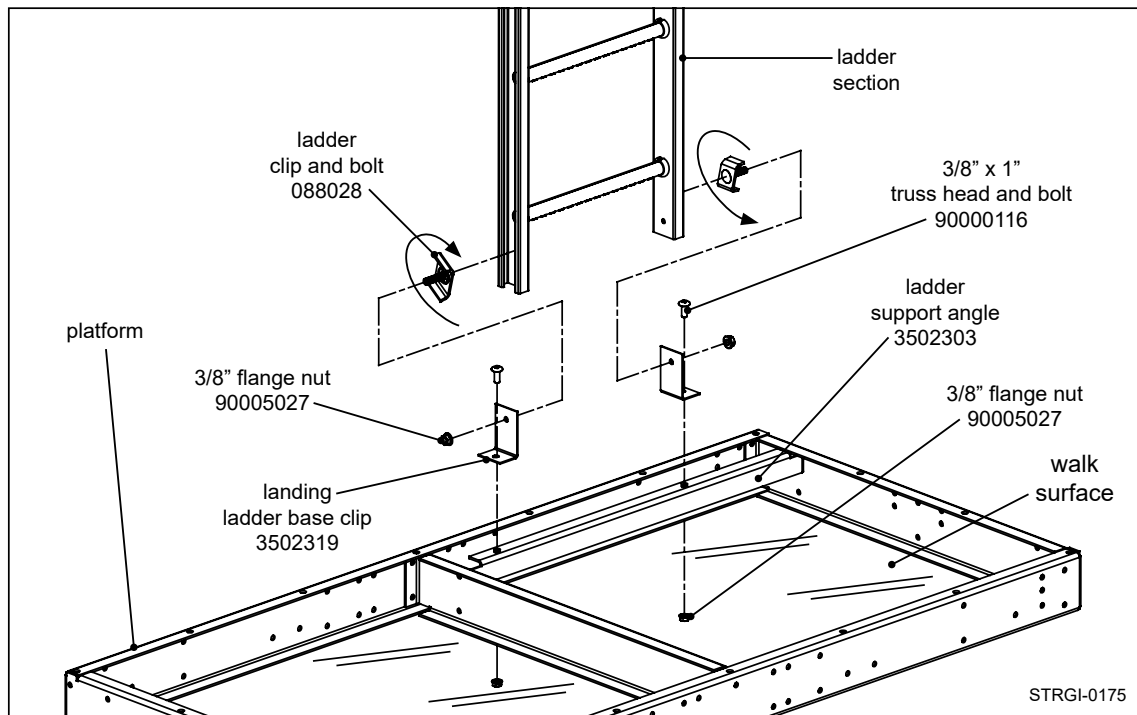
Figure 6. Horizontal Mount Brackets Hardware Orientation



2.2.5 Ladder to Platform Base Installation Using Ladder Base Clips

1. Connect (2) ladder base clips to the platform walk surface and the ladder support angle.
 - a. Use (1) 3/8" x 1" truss head bolt and (1) 3/8" flange nut for each ladder base clip connection.
2. Connect ladder base clips to the ladder by first inserting ladder clip and bolt assemblies into the ladder channels and rotating them and then inserting the ladder clip and bolt assembly bolt shanks through the ladder base clips.
 - a. Put a 3/8" nut on the end of each ladder clip and bolt assembly.
3. Tighten all hardware connections.

Figure 7. Installing the Ladder to the Platform Base



Note

Also use ladder base clips to connect the bottom ladder section to the tower foundation. At the bottom ladder location, use the same procedure described above to connect the ladder to the ladder base clips. Then instead of using a 3/8" truss head bolt to connect the base clip to the foundation, use a 3/8" anchor bolt. (3/8" anchor bolts are not supplied by Brownie).

2.2.6 Tower Ladder Top Braces and Side Strap Installation

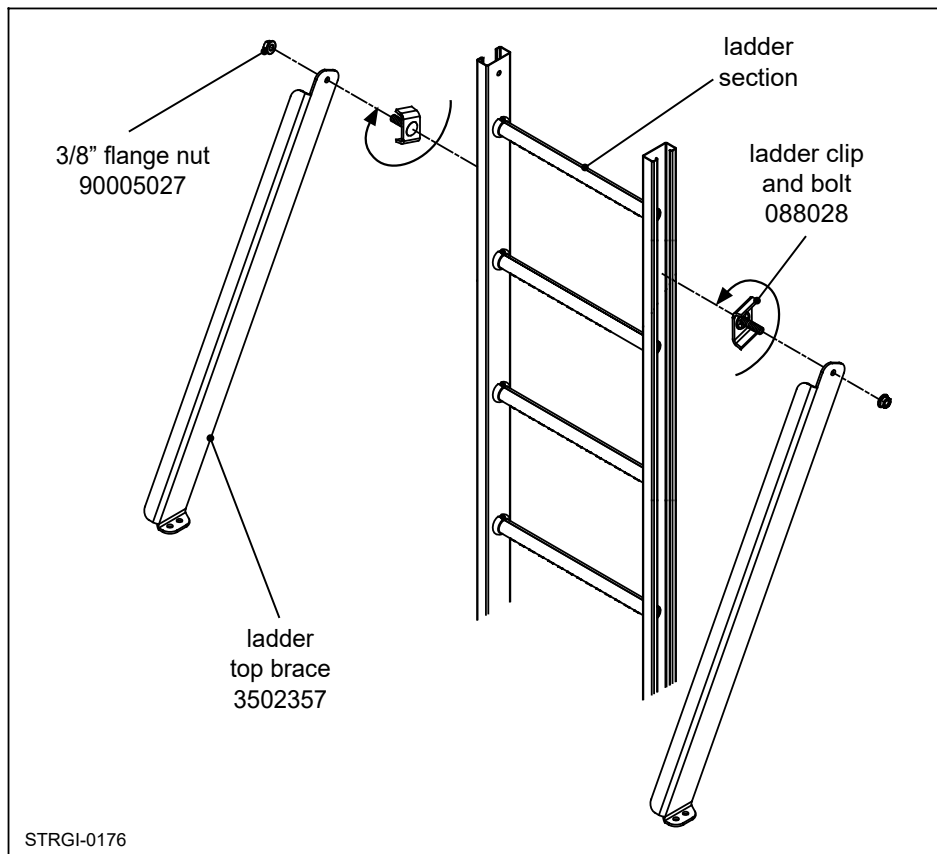
Ladder Top Braces Installation

Note

On tower ladder installations which include ladder access to the tower top level ladder platform and tower internal platform, ladder top braces have been designed for top ladder section termination. Following are instructions for ladder top braces installation.

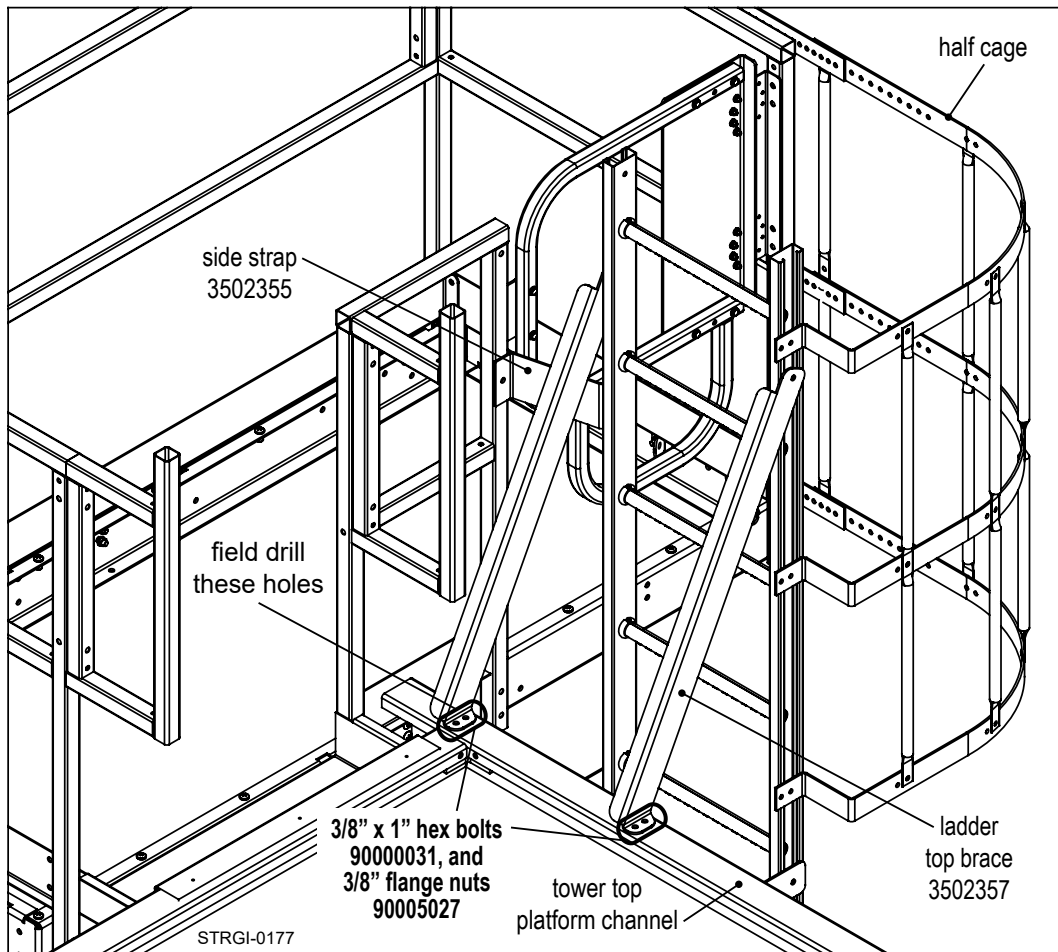
1. After the tower topmost ladder section is installed, install the ladder top braces to the topmost ladder section as shown in the following figure.
 - a. Use ladder clip and bolt assemblies and 3/8" flange nuts to make these connections.

Figure 8. Installing the Top Braces to the Ladder



2. Rest the ladder top braces on the tower top platform channel as shown in the following figure.
3. Using the ladder top braces as templates, field drill the ladder top brace attachment holes in the tower top platform channel.
4. Connect the ladder top braces to the tower top platform channel using 3/8" x 1" hex bolts and 3/8" flange nuts.
5. Tighten all hardware.

Figure 9. Installing Ladder Top Braces



Side Strap Installation

1. At the tower topmost ladder section location, select a location for the side strap that is high enough to stabilize the top of the ladder and low enough so the side strap doesn't interfere with ladder top brace. See [Figure 9 on page 18](#).
2. Install a 3/8" ladder clip and bolt assembly to connect the ladder and side strap assembly.
 - a. Put a 3/8" nut on the bolt shank of the ladder clip and bolt.
 - b. Tighten this hardware.
3. Use the sidestrap as a template and field drill the hole through the middle of the mating handrail post.
4. Install a 3/8" x 2-1/2" hex bolt through the newly drilled hole in the handrail.
 - a. Position the bolt head on the inside of the platform facing the platform user and the nut on the outside of the platform.
5. Tighten all hardware.

Figure 10. Installing the Side Strap

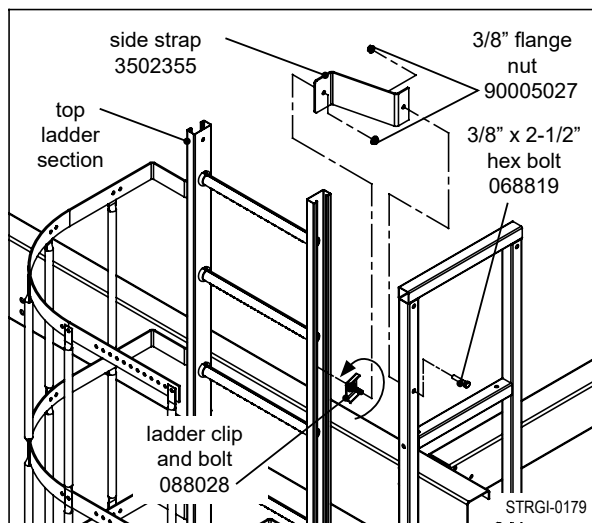
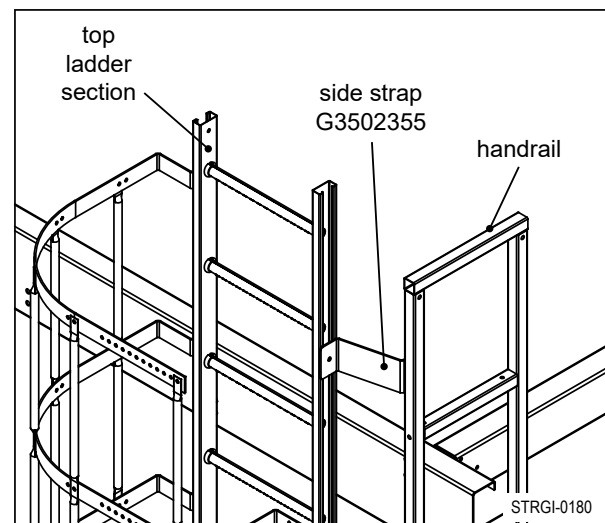


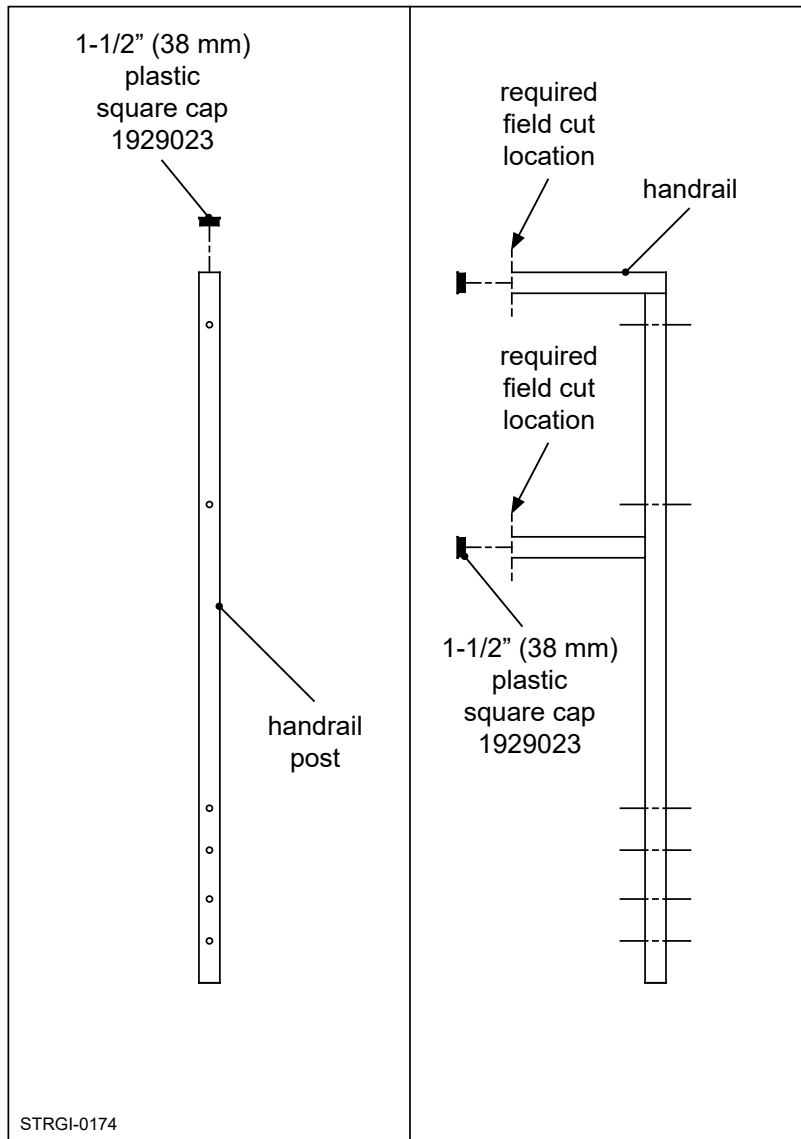
Figure 11. Example Installed Side Strap



2.2.7 Install Handrail Caps Where Required

1. Throughout assembly install handrail caps in handrail or handrail post ends where required as shown in the following figure.
2. Tap on the end of each cap until it is fully set into position.

Figure 12. Installing Handrail End Caps



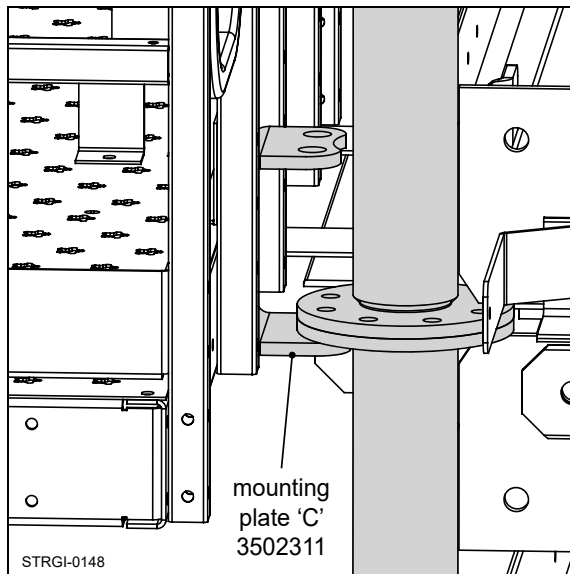
2.3. Rest Platform Installation

2.3.1 Platform Mounting Plate 'C' Position

Note

When installing the mounting plate 'C' to the tower, the bottom flange of the Platform Mounting Plate 'C' installs to the underside of the tower post connection. See the following figure.

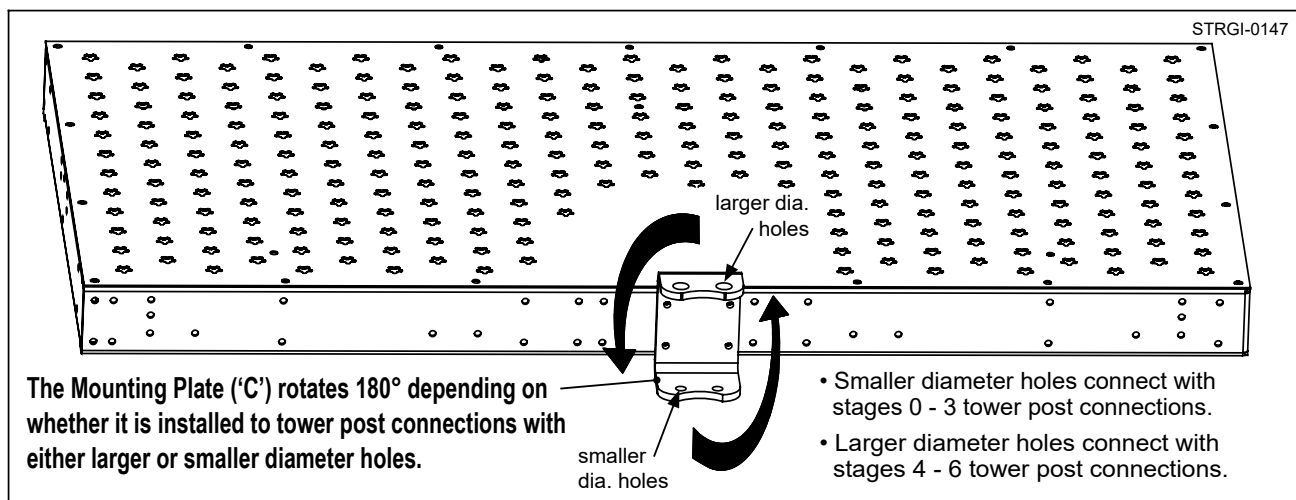
Figure 13. Mounting Plate 'C' Install Location



Note

Before installing the platform mounting plate 'C' determine the stage of the tower posts at the tower posts connection that the platform will mount to. When assembling the platform mounting plate 'C' to the platform base, position the platform mounting plate 'C' correctly for installing to either a stage 0 — 3 or stage 4 — 6 tower post connection. See the following figure.

Figure 14. Rotating the Mounting Plate 'C' to the Correct Position For Installation



2.3.2 Install the Angle, Channel, Mounting Plate 'C', and Clips to the Platform Base

Note

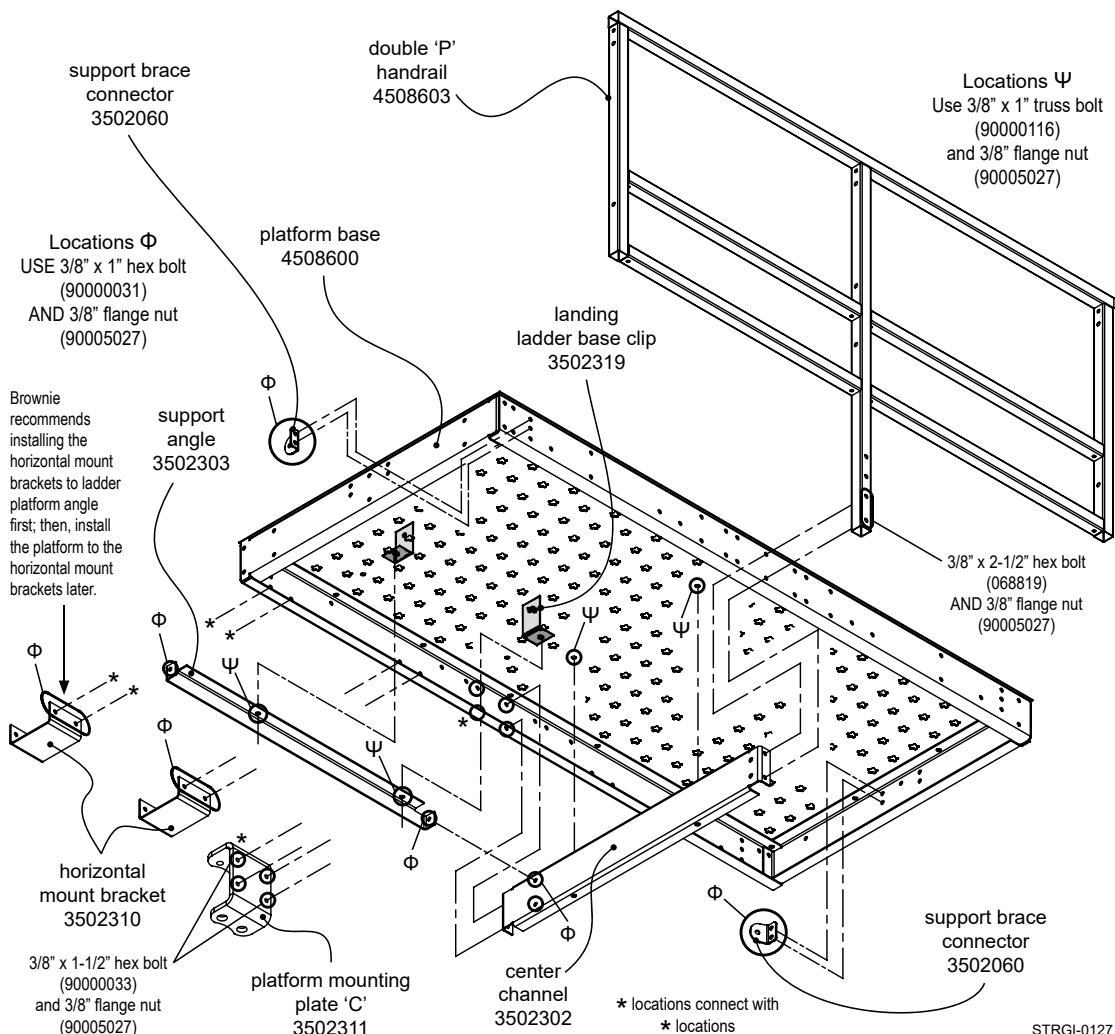
It may be necessary to turn the platform base over, tip it up on end, or raise it up onto supports during assembly. Be careful to not damage or bend platform channels, brackets, or clips.

Note

Horizontal mount brackets are shown in the following figure for reference. Horizontal mount brackets will install to the platform using 3/8" x 1" hex bolts and 3/8" flange nuts. Brownie recommends installing the horizontal mount brackets to the platform angle on the tower first; then, install the platform to the horizontal mount brackets during platform to tower installation.

1. Correctly install channel, brackets, clips, and hardware to the platform as shown in the following figure.
2. Install the platform mounting angle and support brace connector to the platform base. Use 3/8" x 1" hex bolts and 3/8" flange nuts.
3. Install the center channel, platform mounting plate 'C', and Double 'P' handrail to the platform base.
4. Install the support angle and landing ladder base clips to the platform base and to each other.

Figure 15. Installing the Rest Platform Angle, Channel, Mounting Plate 'C', and Clips.



2.3.3 Assemble Platforms Before Lifting Into Position

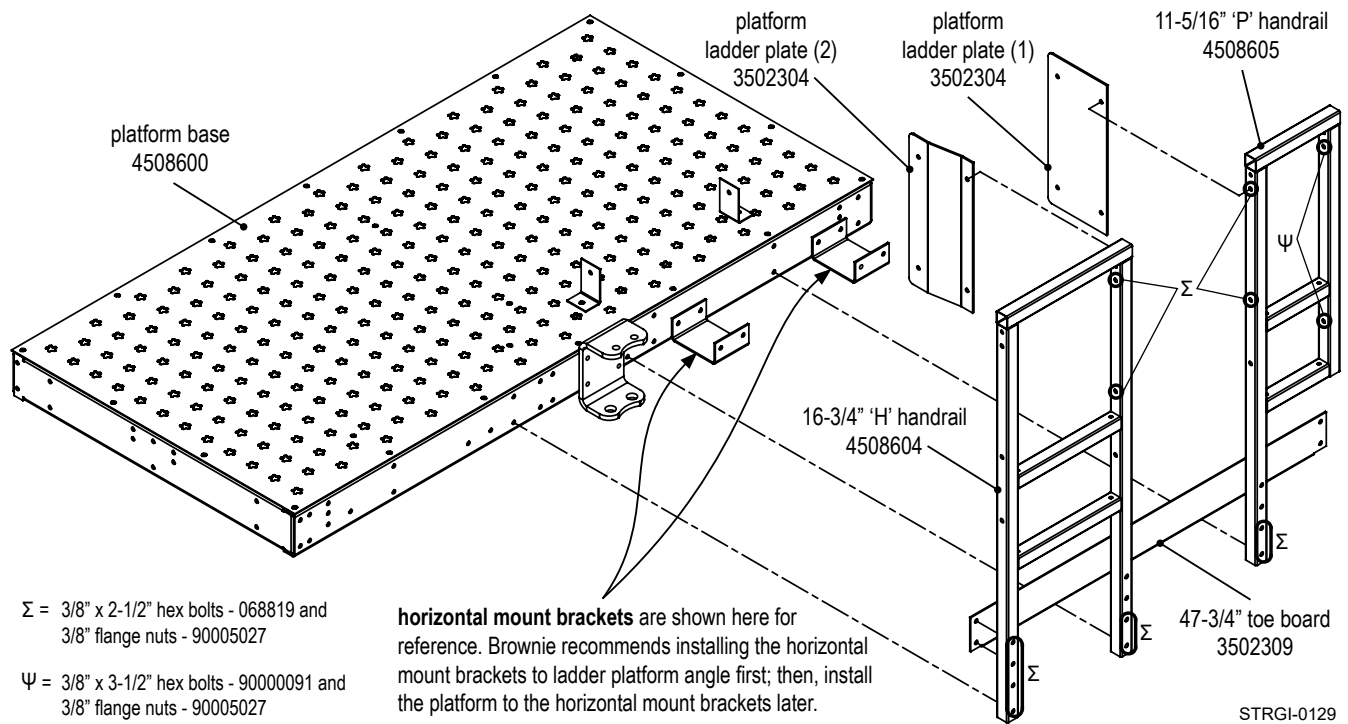
Install the Small 'H' and 'P' Handrails to the Platform Base.

Note

In the steps that follow, install all parts in the locations shown and use the appropriate hardware indicated in the following figure to make each connection.

1. Install the 16-3/4" 'H' handrail and the 11-5/16" 'P' handrails to the platform base.
2. Install the 47-3/4" Toe Board and Platform Ladder Plates to the Small 'H' and 'P' Handrails.

Figure 16. Installing the Small 'H' and 'P' Handrails



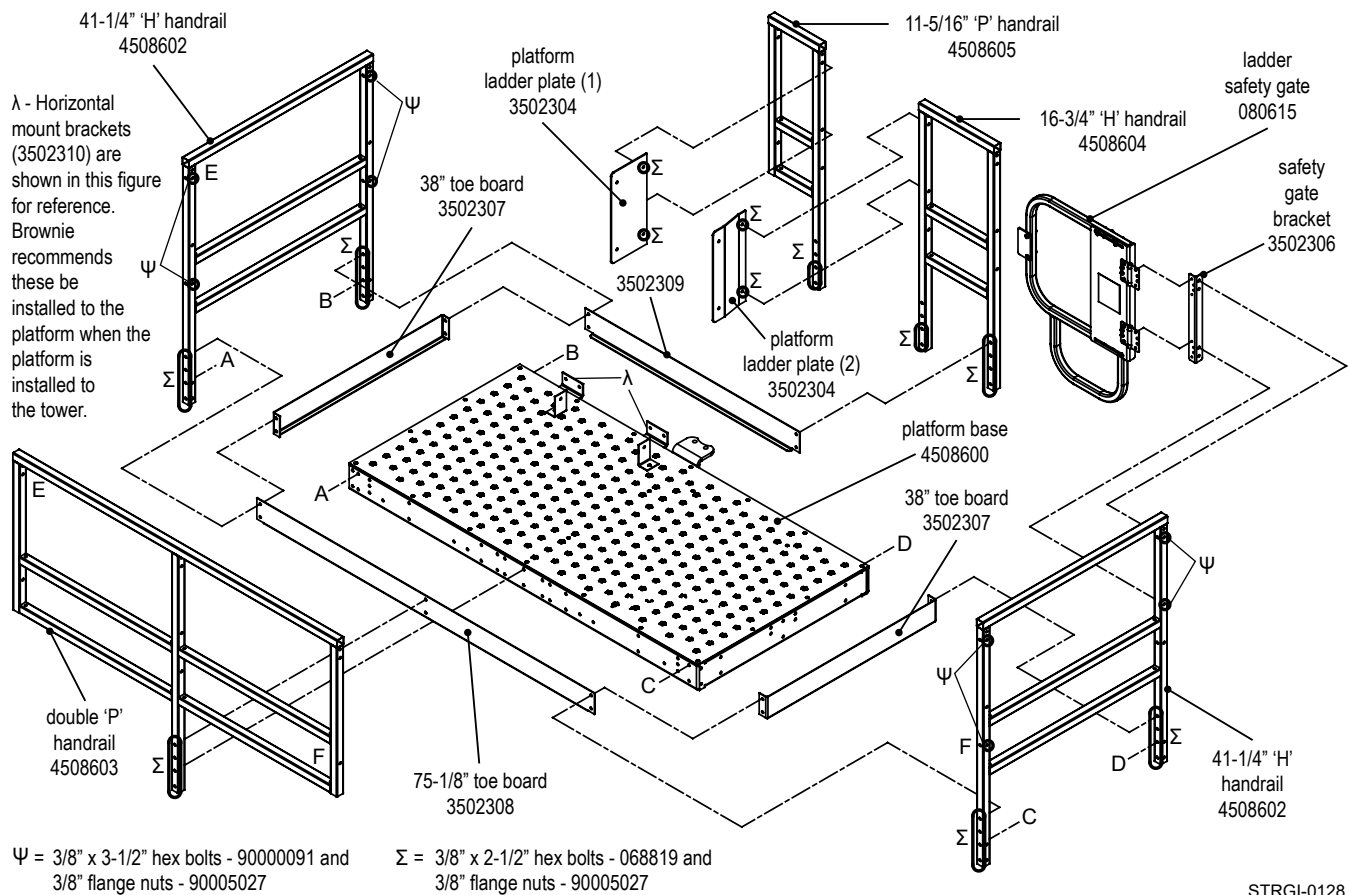
Assemble the Handrails, Toe Boards, and the Rest of the Parts to the Platform Base

Note

In the steps that follow, install all parts in the locations shown and use the appropriate hardware indicated in the following figure to make each connection.

1. Install the double 'P' handrail as indicated previously in this manual section.
2. Install the small 'P' handrail, the small 'H' handrail, and platform ladder plates as indicated previously in this manual section.
3. Install the 41-1/4" 'H' handrails to the platform base ends.
4. Install the toe boards that attach to the double 'P' and small 'H' handrails first. Then install the 38" toe boards to the toe boards installed first and to the 41-1/4" 'H' handrails.
5. Install the safety gate bracket to the 41-1/4" 'H' handrail.
6. Install the hinges and ladder safety gate to the ladder safety gate bracket.

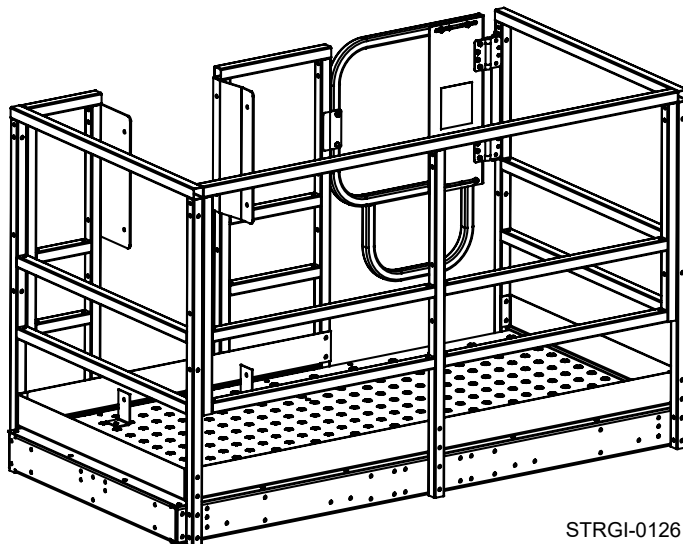
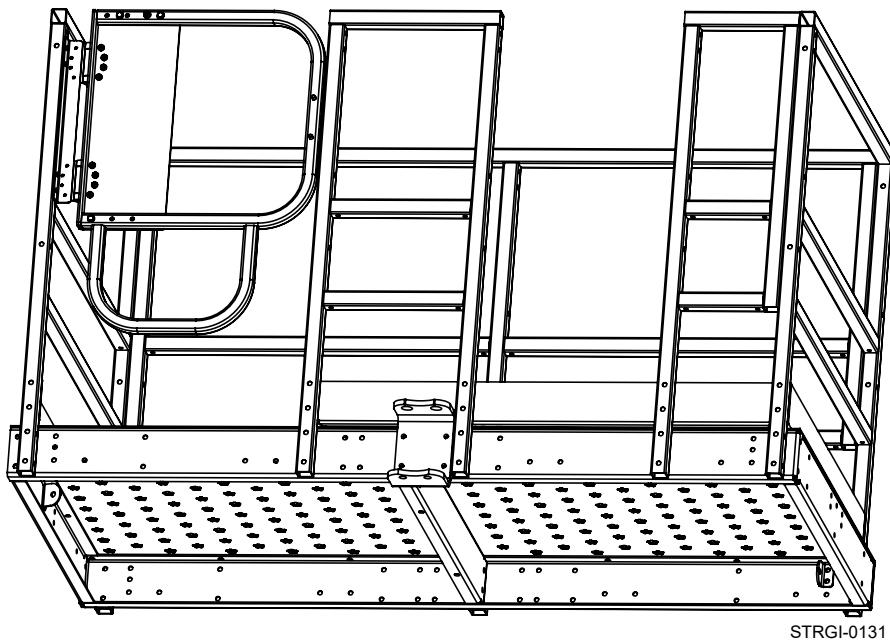
Figure 17. Installing the Handrails and Toe Boards



STRGI-0128

Complete the Platform Base and Handrails Assembly

1. Complete the handrails to the platform base assembly.
2. Complete the toe boards to handrails assembly including the ladder safety gate to handrail assembly.
3. Tighten all bolts.
4. The platform should now be complete and ready for lifting into position onto tower sections as illustrated in the following figures.

Figure 18. Completed Platform with Support Braces Installed

2.3.4 Install Rest Platforms to the Tower

Note

Where not indicated in the instructions below, use the hardware indicated in the following figures to connect the rest platform assembly to the tower post connection, ladder platform angle, and platform support angle.

1. Safely lift the rest platform assembly up to the tower.
2. Install the tower mounting plate ('C') to the tower post connection.
 - a. Use the hardware from the tower post connection to connect the tower mounting plate ('C') to the tower post connection.
3. Connect the platform to the horizontal mount brackets which are installed to the ladder platform angle.
 - a. Position the horizontal mount bracket hardware as shown in [Figure 20 on page 27](#).
4. Connect the support brace connector and support brace clip to the platform support angle at the locations indicated in the following figures.

Figure 19. Example Platform to Tower Installation

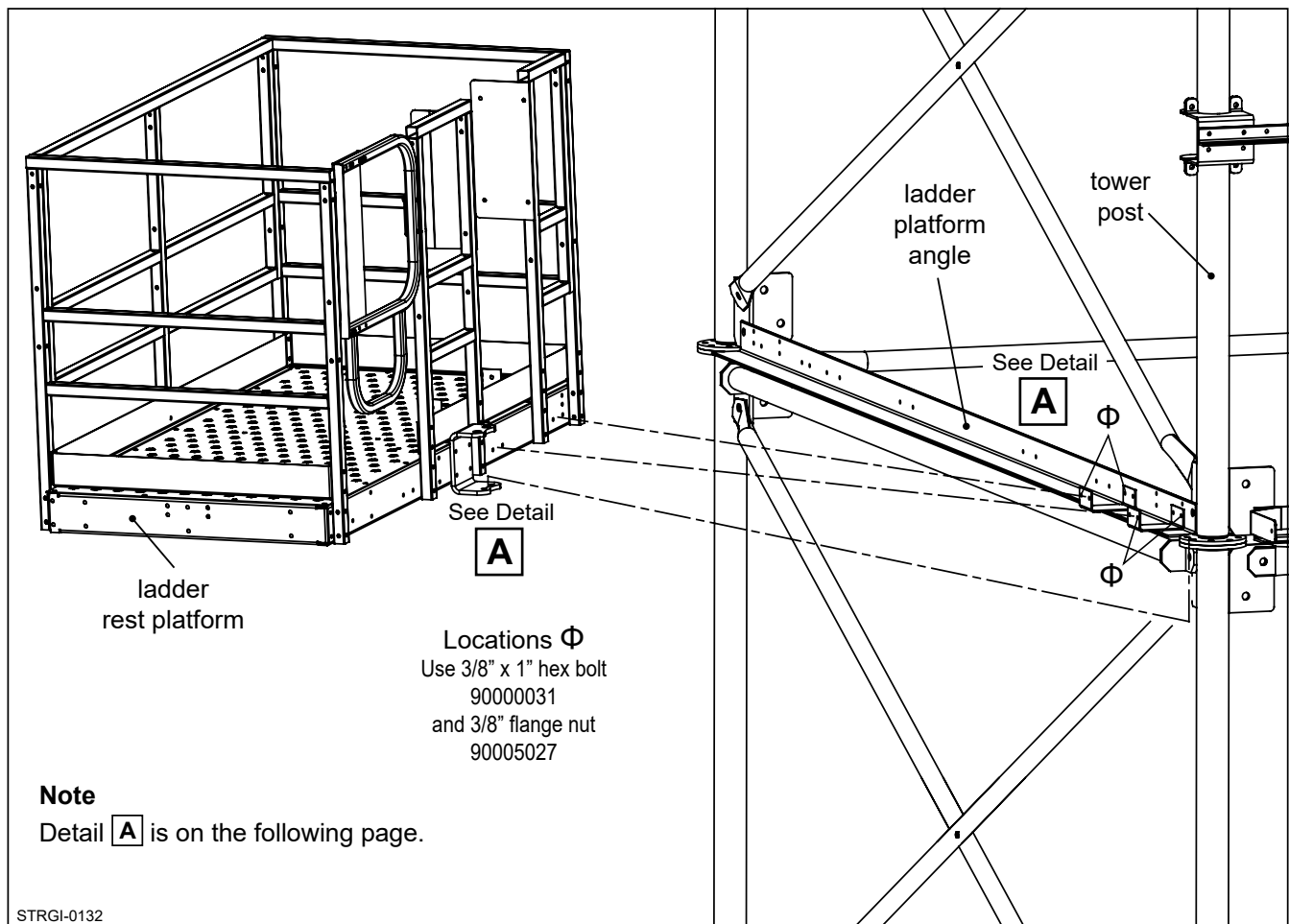
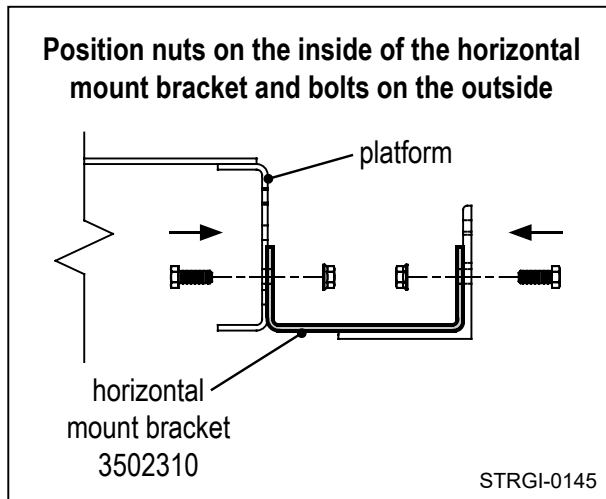
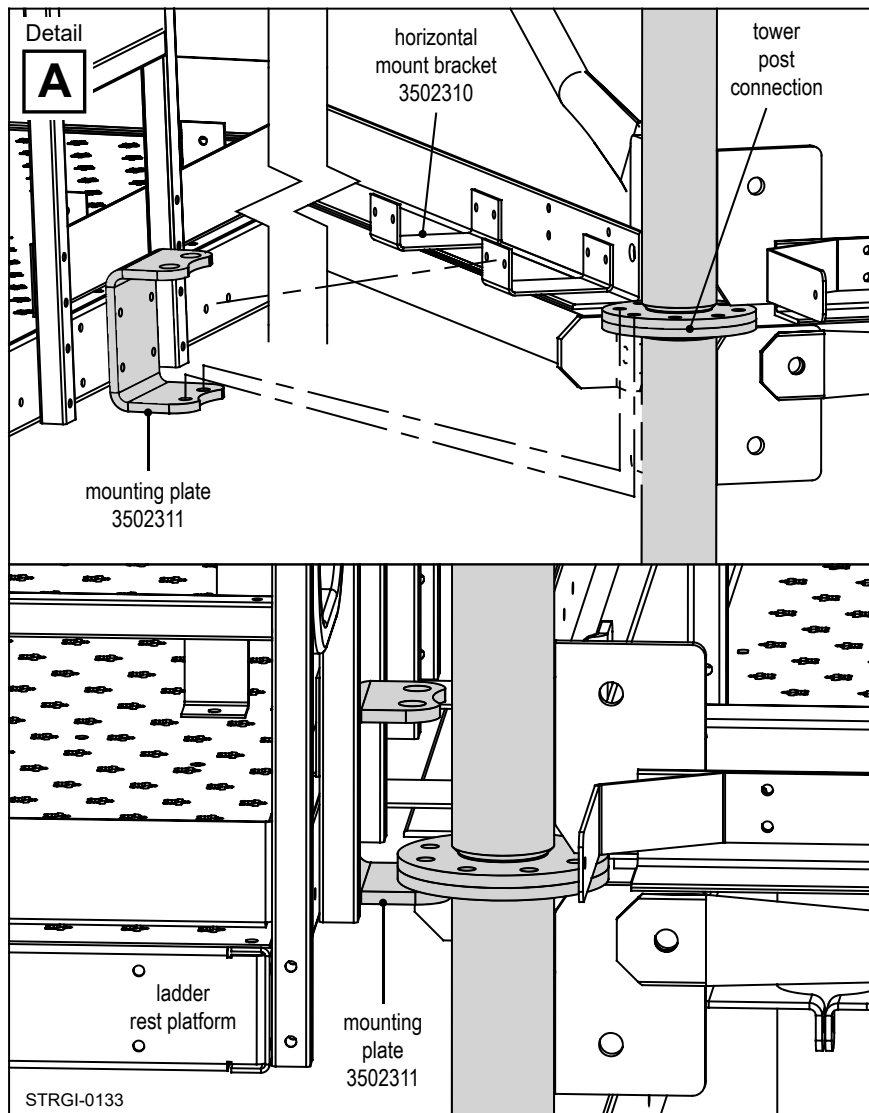


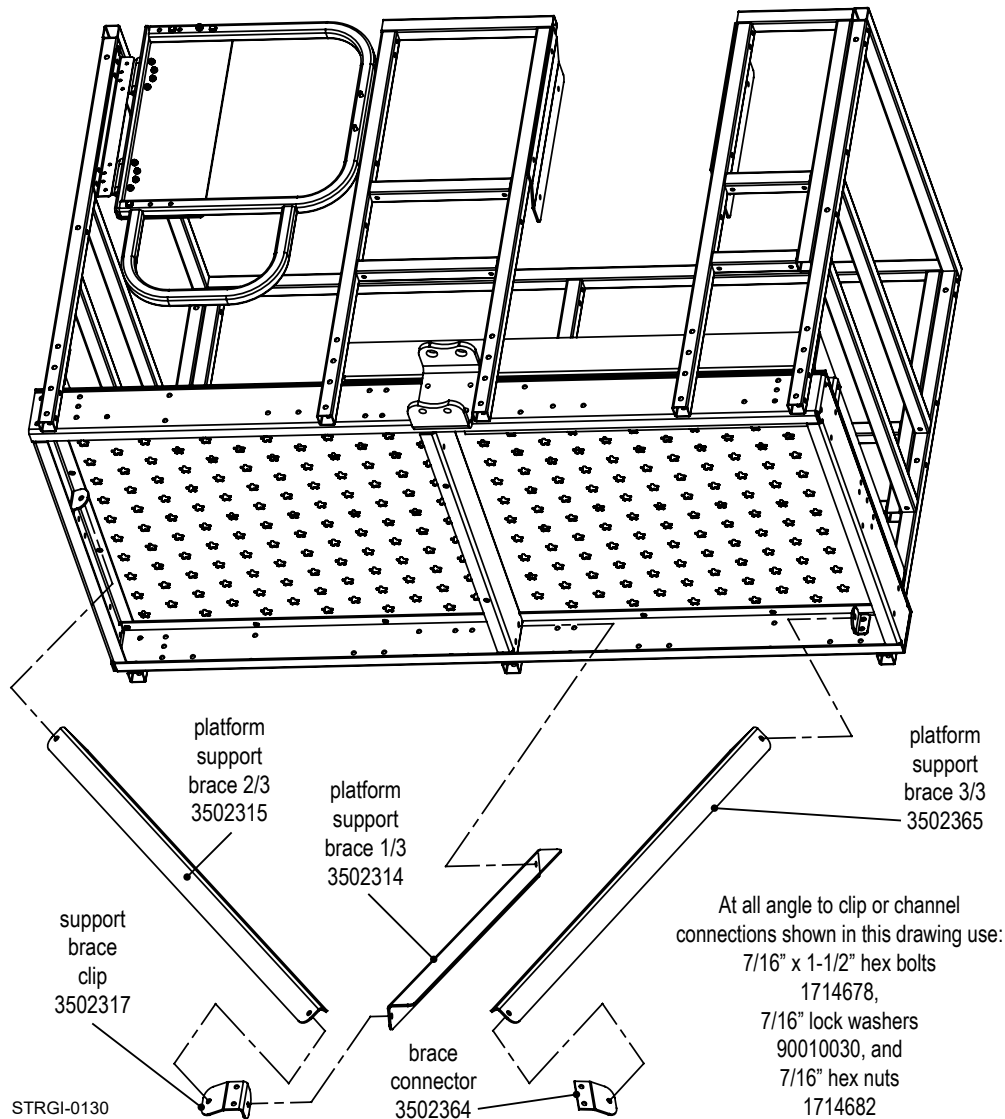
Figure 20. Horizontal Mount Brackets Hardware Position**Figure 21. Installing the Mounting Plate 'C' to the Underside of the Tower Post Connection**

Note

In the steps that follow, install all parts in the locations shown and use the appropriate hardware indicated in the following figure to make the connections shown.

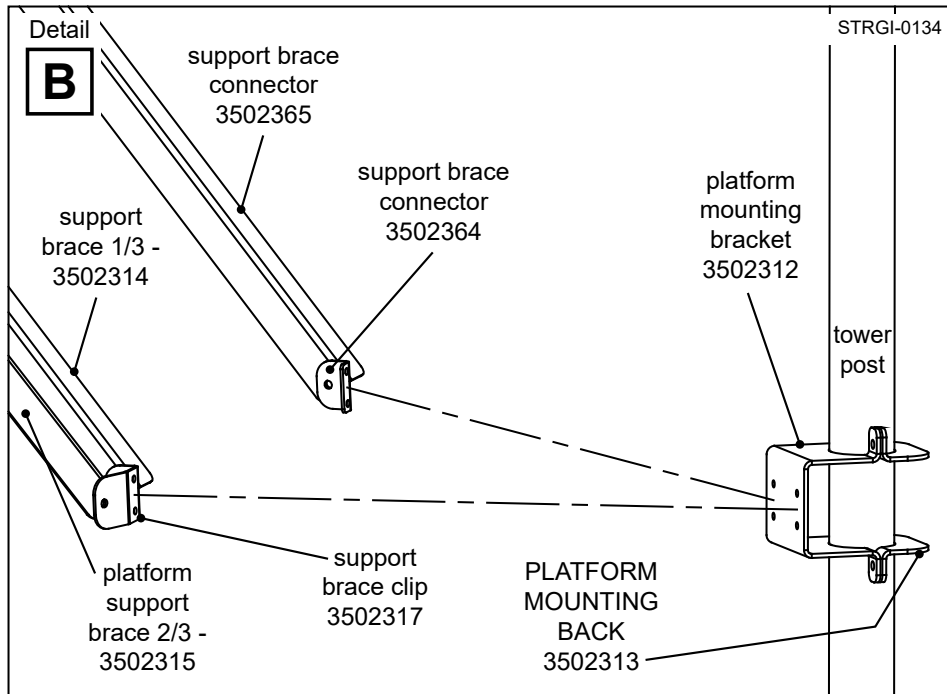
5. Install the platform support braces 1/2 and 2/2 to the clips and channel on the underside of the platform.
6. Install the platform support braces to the support brace clip and the brace connector as shown in the following figure. At the same time install the (platform) support braces to the platform support angle on the tower using the provided clips.

Figure 22. Installing the Platform Support Braces to the Platform Base and to the (Bottom) Clips



7. Connect the support brace connector clip and support brace clip to the platform support angle at the locations indicated in the following figure.
 - a. Use 3/8" x 1" hex bolts (90000031) and 3/8" flange nuts (90005027) to make these connections.

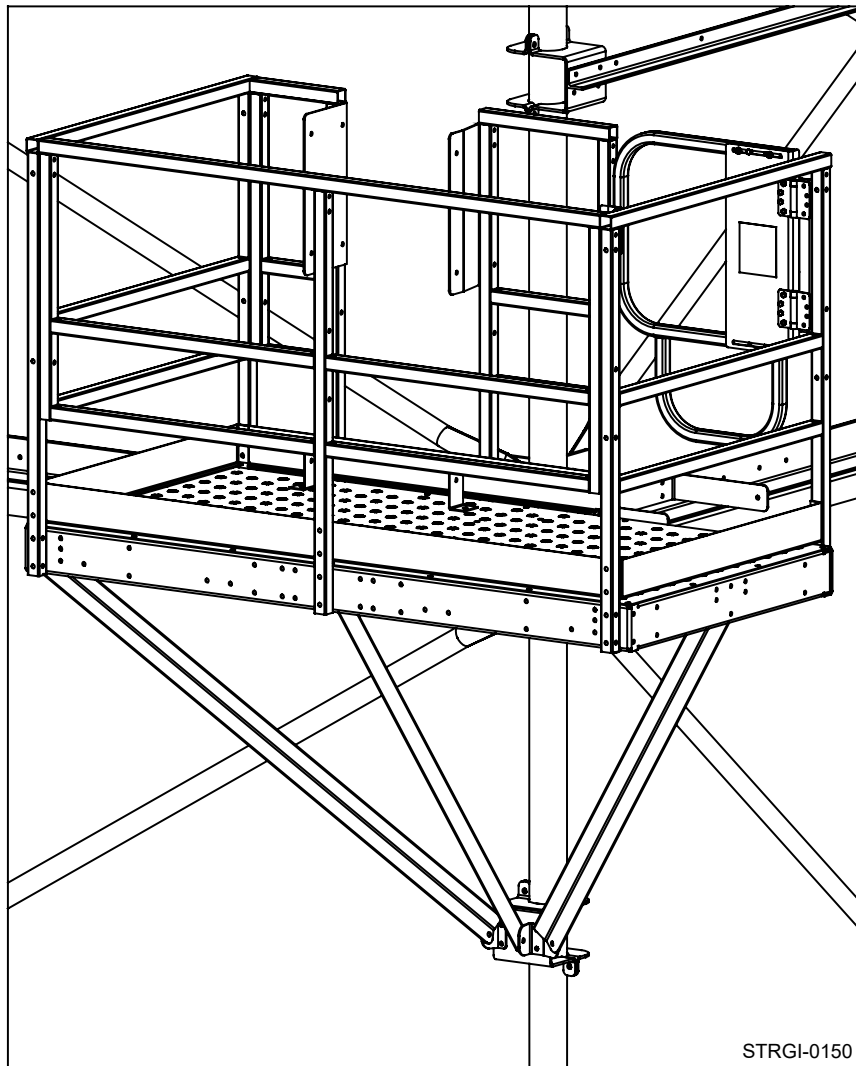
Figure 23. Installing the Rest Platform Support Braces to the Platform Support Angle



Note

The following figure is an illustration of a completed rest platform after it is installed to the tower.

Figure 24. Example Completed Rest Platform Installation



2.4. Ladders and Cages General Assembly

Important

OSHA Regulation — Subpart D., Section 1910.27 (d) (iv) states in part: “Cages shall extend down the ladder to a point not less than (7') feet nor more than eight (8') feet above the base of the ladder.”

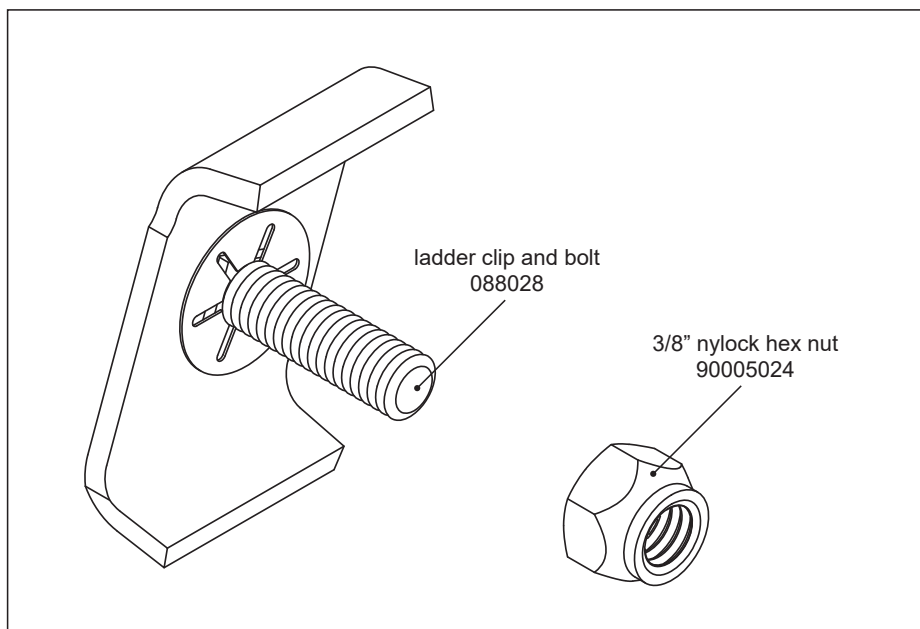
Ladder Clip and Bolt Assembly at Ladder Brackets and Ladder Cages to Ladders Connections

Important

Adhere to the following instructions and figures to correctly install ladder clip and bolt assemblies.

1. Install ladder clip and bolt assemblies at each ladder cage to ladder connection and at each ladder bracket to ladder connection.
2. At the locations where you install a ladder cage or ladder bracket to a ladder, insert the ladder clip and bolt into the ladder 'C' channel and rotate the ladder clip so it nests properly inside the ladder 'C' channel for clamping.
3. Insert the bolt through the ladder bracket or ladder cage 'D' ring and install a lock nut onto the end of the bolt.

Figure 25. Ladder Clip and Bolt Assembly



4. Tighten the nut so the ladder clip flattens out.

Figure 26. Ladder Clip and Bolt, Not Tightened

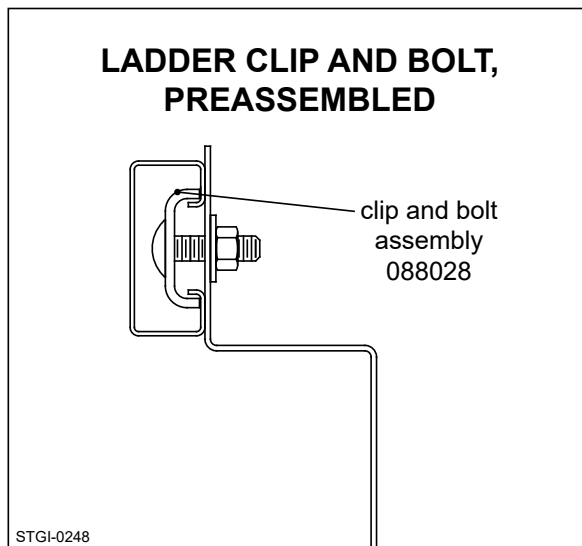


Figure 27. Ladder Clip and Bolt, Tightened

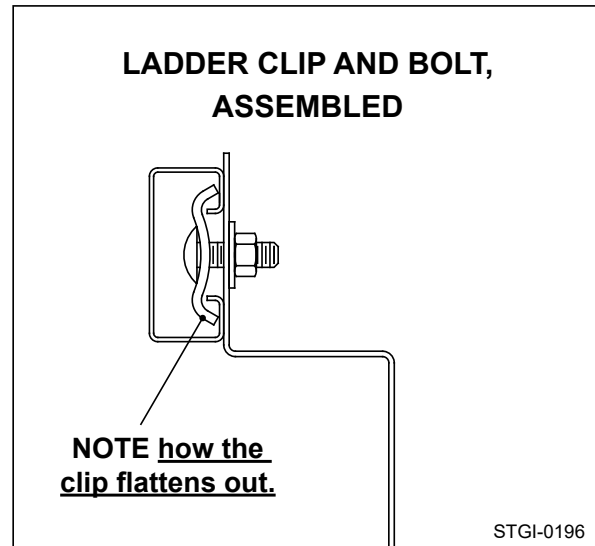
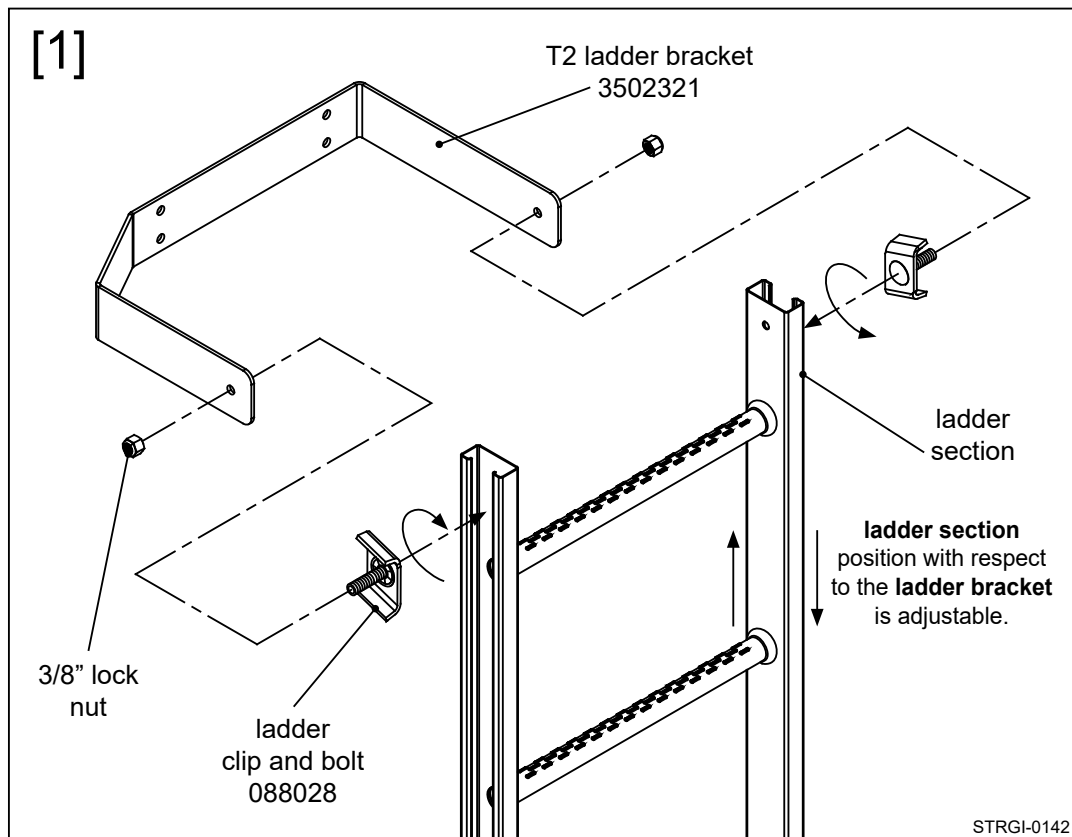
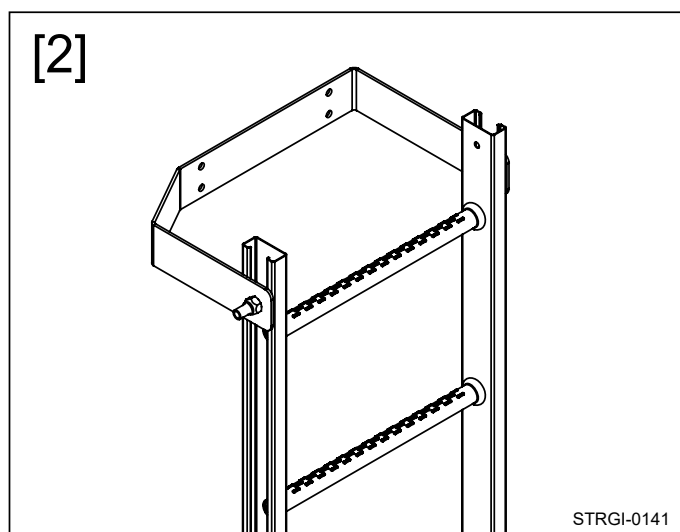


Figure 28. Typical Ladder Bracket to Ladder Installation with Ladder Clip and Bolt





Install Ladder Splices Between Ladder Sections

Note

Adhere to the following instructions and figures to correctly install ladders splices.

1. Install ladder splices at each ladder to ladder connection.
2. Insert the 'U' shaped ladder splice into the mating ends of the adjoining ladder 'C' channels.
 - a. Have the open ends of the ladder splice 'U' and ladder rail 'C' face the same direction at each connection.
3. Insert bolts into the ladder 'C'-s and through the ladder splice.
4. Install a lock washer and nut onto the end of each ladder splice bolt.
 - a. Securely tighten each bolt.

Figure 29. Ladder Connection with Ladder Splice Connection Detail

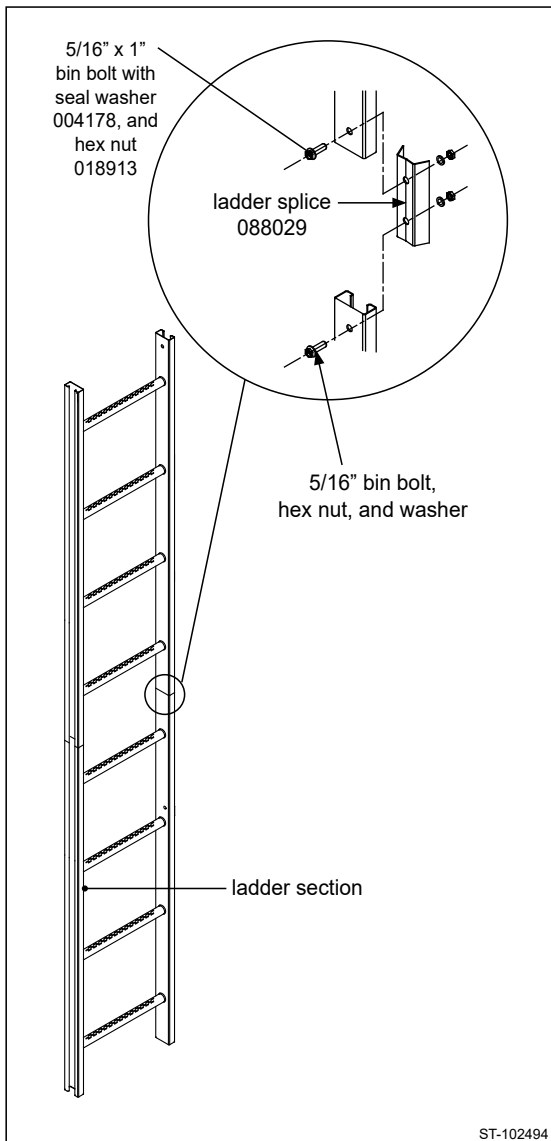
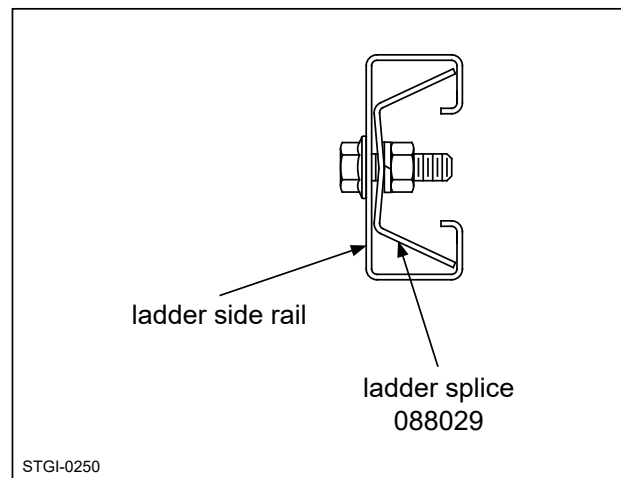


Figure 30. Ladder Splice, Top View



Assemble Ladder and Cage Sections Together

1. Assemble ladder sections together into ladder runs.
2. Assemble ladders together with cages.

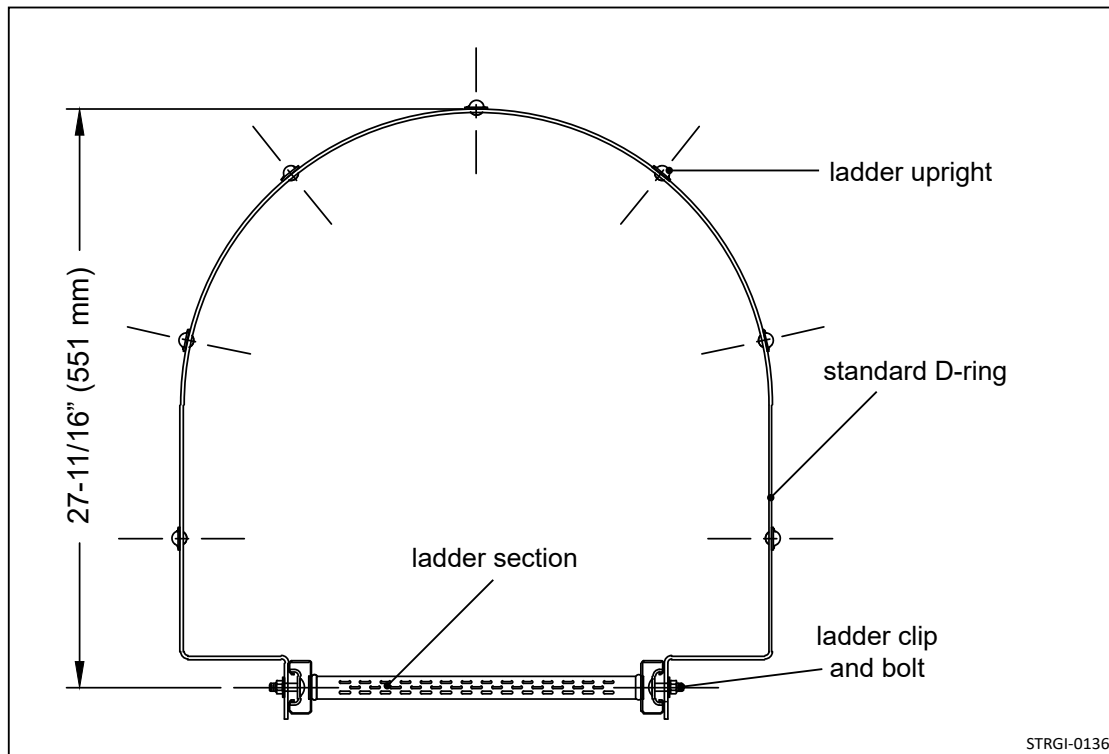
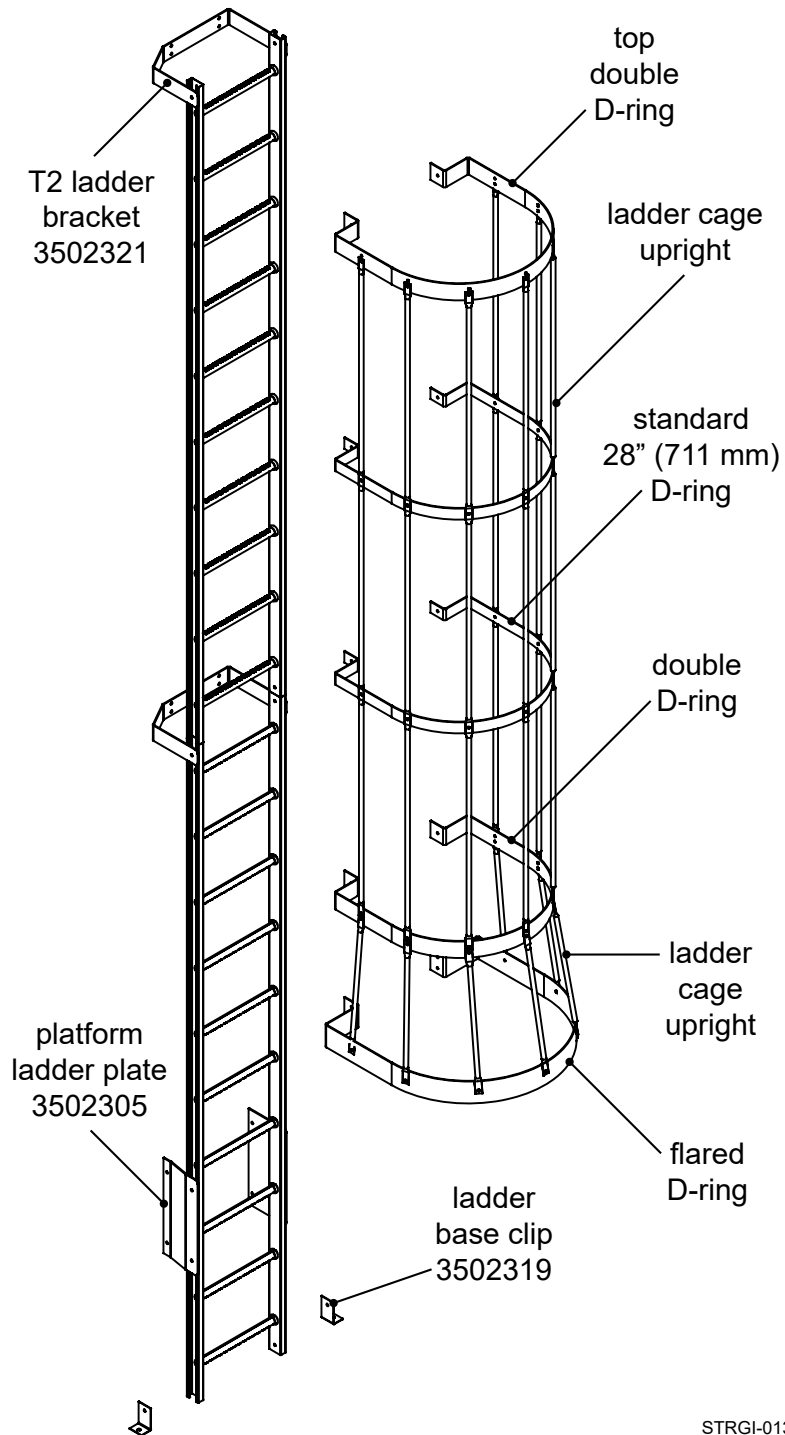
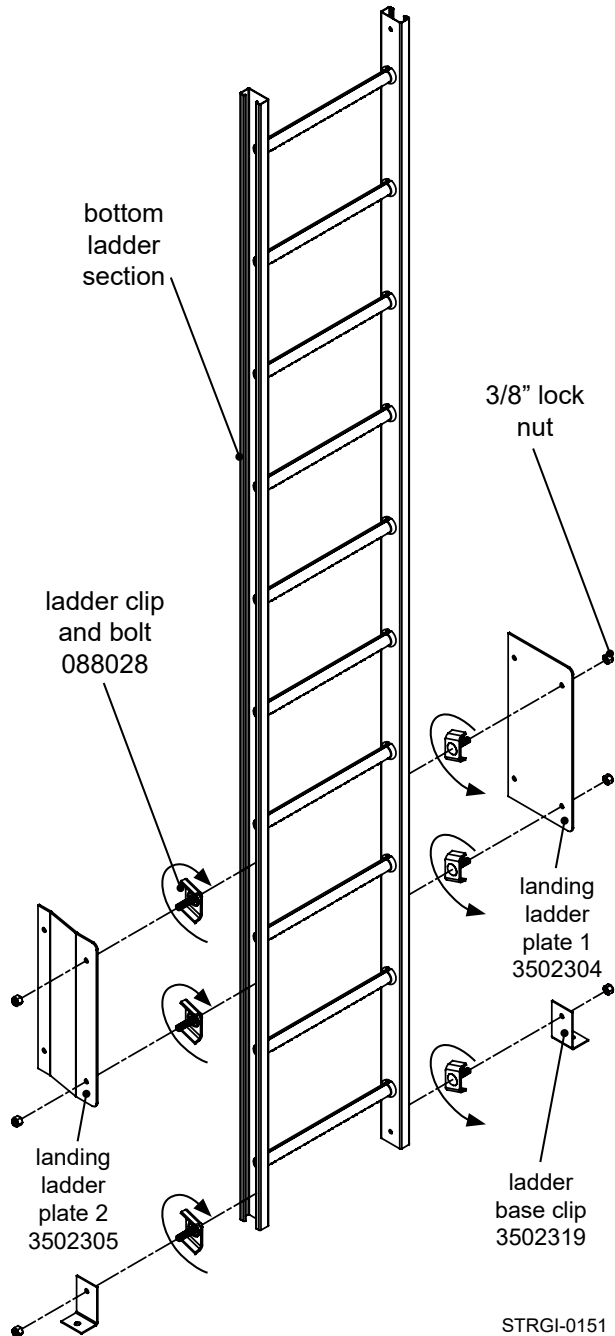
Figure 31. Standard D-Ring and Ladder Section, Top View

Figure 32. Example Ladder Cages Assembly Installing to Ladder Run Assembly

Install the Bottom Ladder Section to the Landing Ladder Plates 1 and 2

1. Install the bottom ladder section to the landing ladder plate 1, landing ladder plate 2, and the base clips using ladder clip/bolt assemblies and 3/8" lock nuts.
2. Install the bottom ladder section to the landing ladder plate 1, landing ladder plate 2, and the base clips as shown in the following figure.

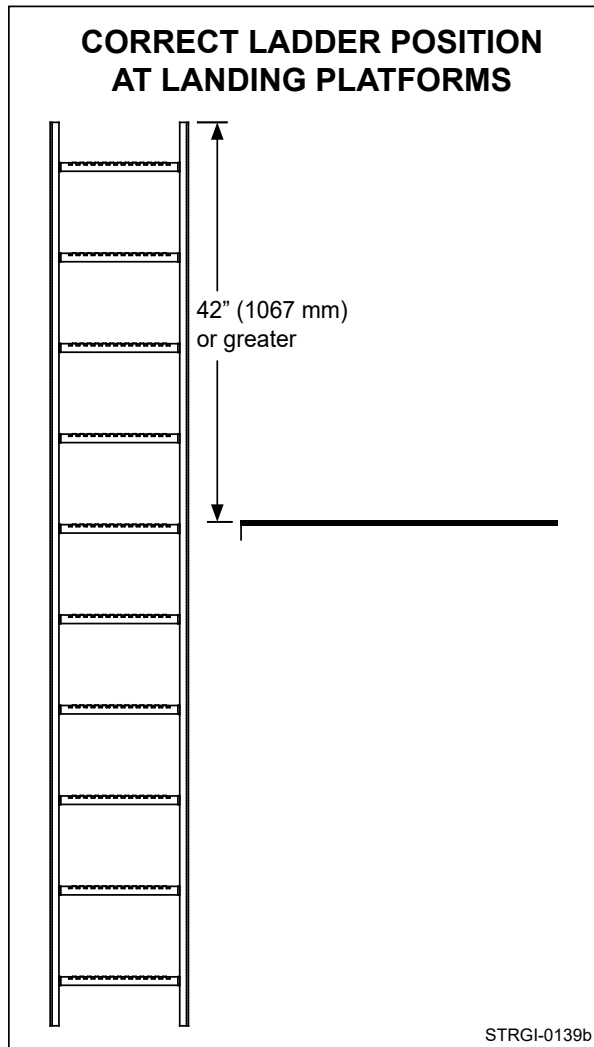
Figure 33. Installing Ladder Plates and Base Clips to the Ladder

2.4.1 Correct Ladder Placement at the Platform Location

Important

OSHA 1910.23(d)(4) states “The side rails of through or sidestep ladders extend 42 inches (1.1 m) above the top of the access level or landing platform served by the ladder.

Figure 34. Position Ladders at Least 42” (1067 mm) Above the Platform Base



2.4.2 Ladder Brackets to Ladder Angles Connections

Install ladder brackets to ladder angles as shown in the following figures before installing any ladders or cages. Ladder brackets may be installed at either the left or right side of tower angles.

Figure 35. Ladder End Bracket to Mid Angle Installation

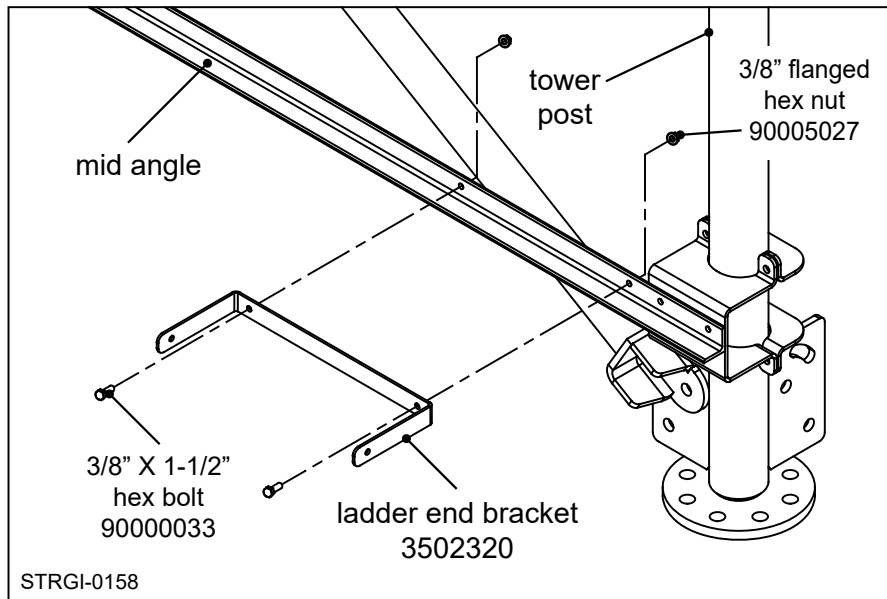
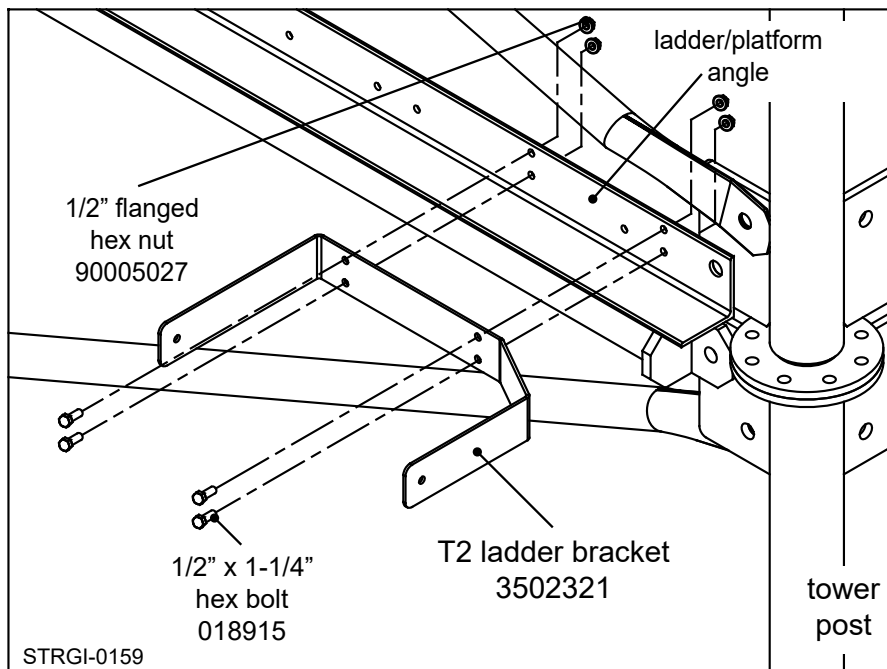


Figure 36. T2 Ladder Bracket to Ladder/Platform Angle Installation



2.4.3 Half Cage at Platform Assembly

Note

Assemble the half cage at the platform level using the hardware indicated in the following figure.

1. Install the platform to the tower.
2. Install the ladder run top section at the platform location into position.
3. Install the platform/cage connector plate to the mating platform handrail. Use the hardware indicated in the following figure.
 - a. Tower top platform only — Use the platform/cage connector plate as a template, field drill the bottom platform/cage connector plate attachment hole in the mating platform handrail.
4. Install the half D-rings to the ladder using ladder clip and bolt assemblies.
 - a. Make certain the half D-rings and connector straps will be level with the platform/cage connector which is already installed.
 - b. Make certain the half D-rings are level.
5. Install safety cage uprights between half D-rings.
6. Install connector straps between the platform/cage connector plate and half D-rings.
7. Securely tighten all bolts.

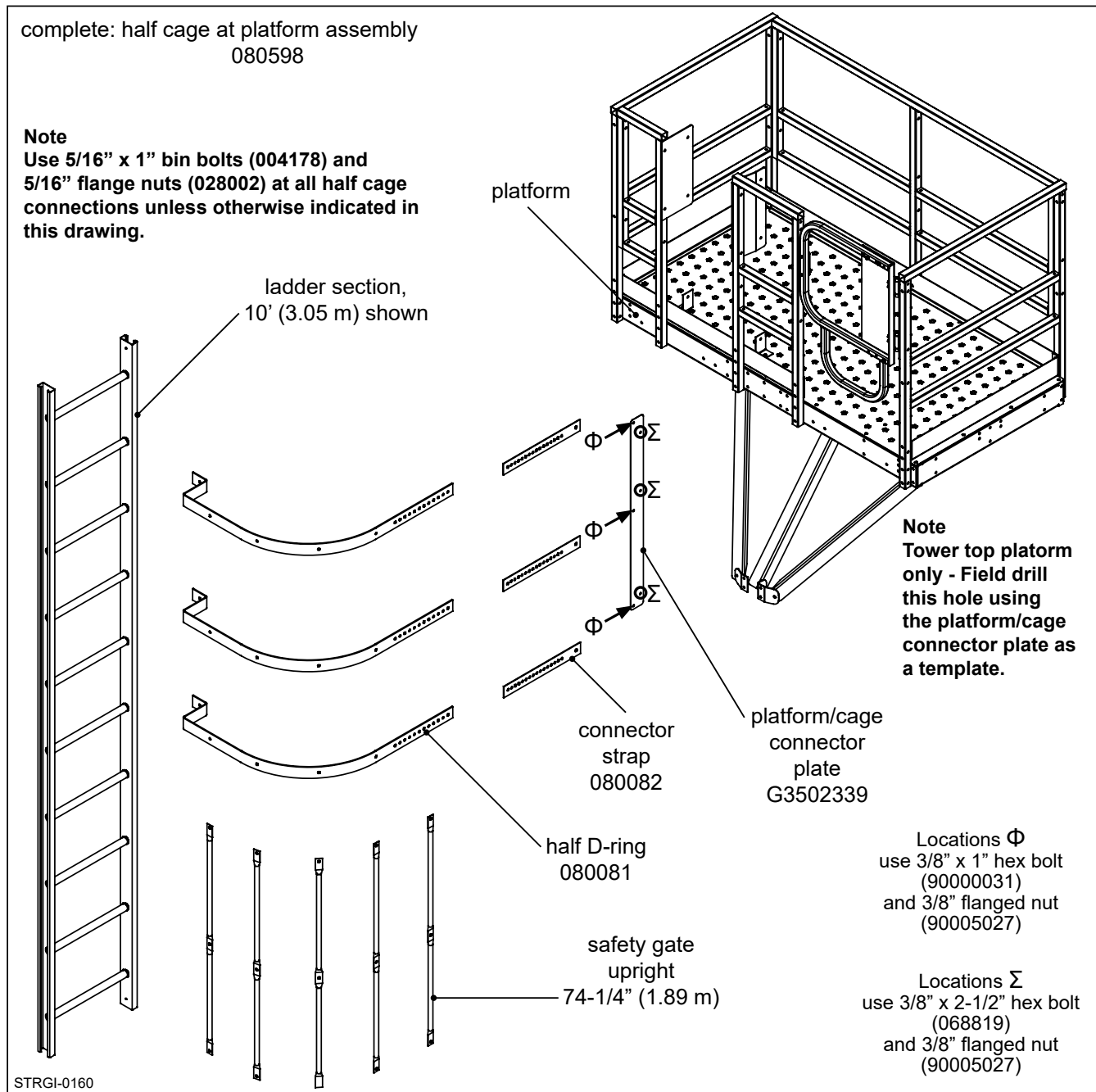
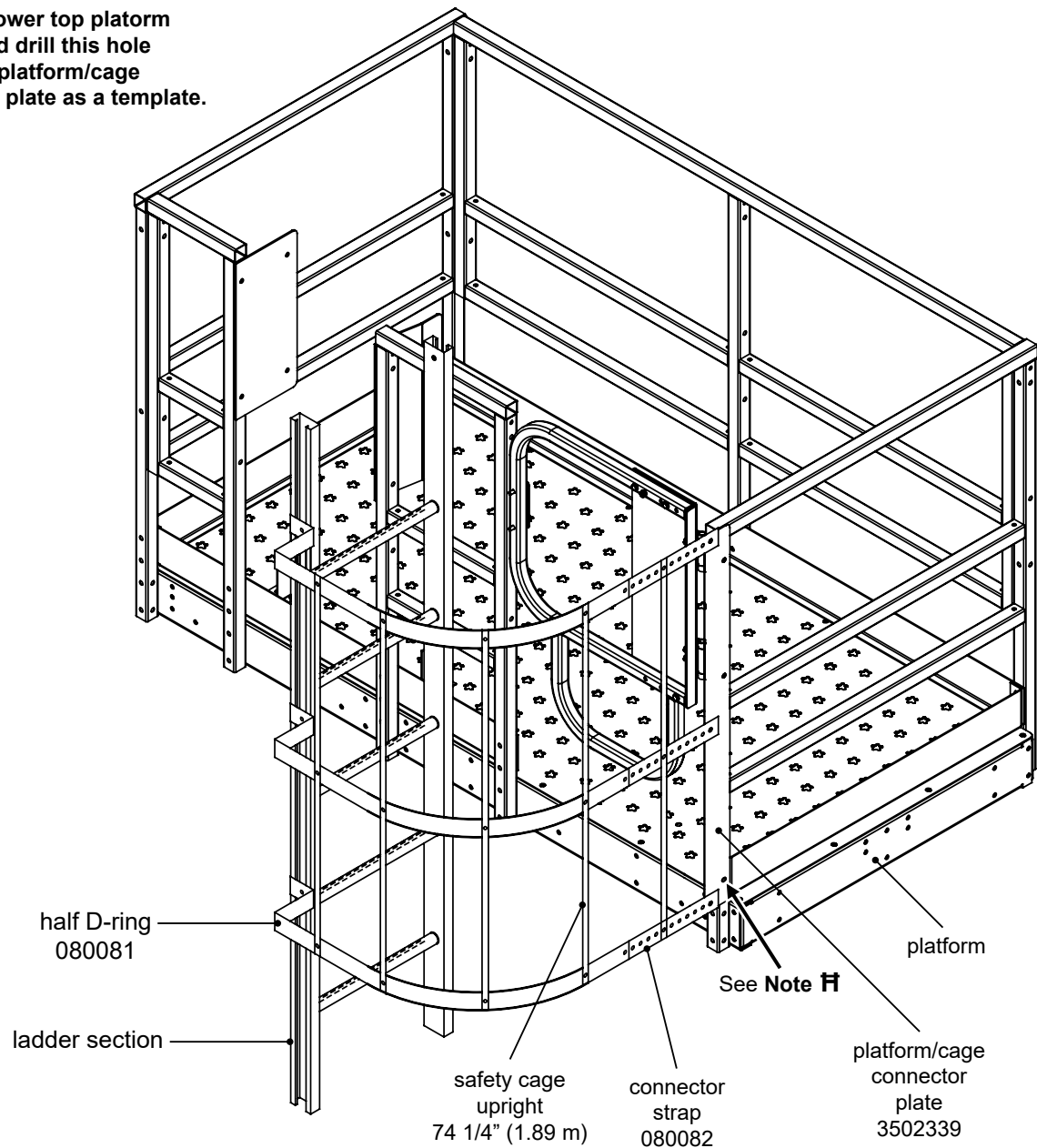
Figure 37. Installing the Half Cage to the Platform and Ladder

Figure 38. Example Half Cage at Platform Installed

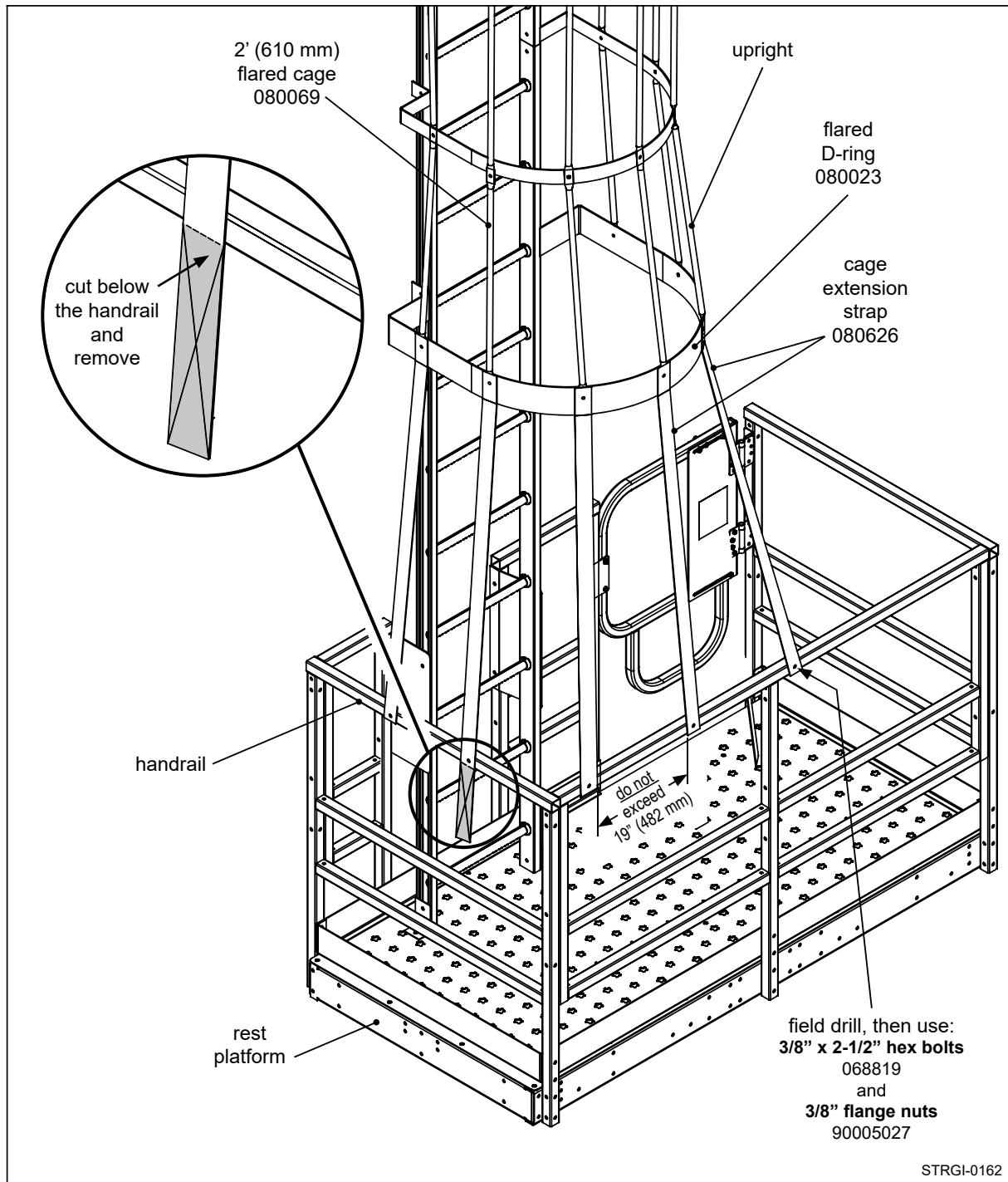
Note H: Tower top platform only - Field drill this hole using the platform/cage connector plate as a template.



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2.4.4 Install Cage Extension Straps Between Bottom Flared Cages and Handrails

1. Refer to [Figure 39 on page 44](#). Disconnect the uprights from the cage run bottom flared D-ring.
2. Hang cage extension straps from the bottom flared D-ring, Install uprights to the straps and flared D-ring.
3. Align cage extension straps vertically extending the straps from the flared D-ring to the handrails.
 - a. Horizontal spacing between cage extension straps must not exceed 19”.
4. Field drill holes through the cage extension straps and handrails at the selected connection point locations.
5. Connect the cage extension straps to the handrails at the field drilled holes.
 - a. Use 3/8” x 2-1/2” hex bolts (068819) and 3/8” flange nuts (90005027). Position bolt heads inside the platform handrail and flange nuts outside the platform.
6. Cut off the unused portion of each cage extension strap (the portion of the cage extension strap extending below the handrail).

Figure 39. Installing Cage Extension Straps Between the Flared D-Ring to the Platform Handrail

2.4.5 Standard Ladder Cage Assemblies

Figure 40. Flared Cages Starter Sections

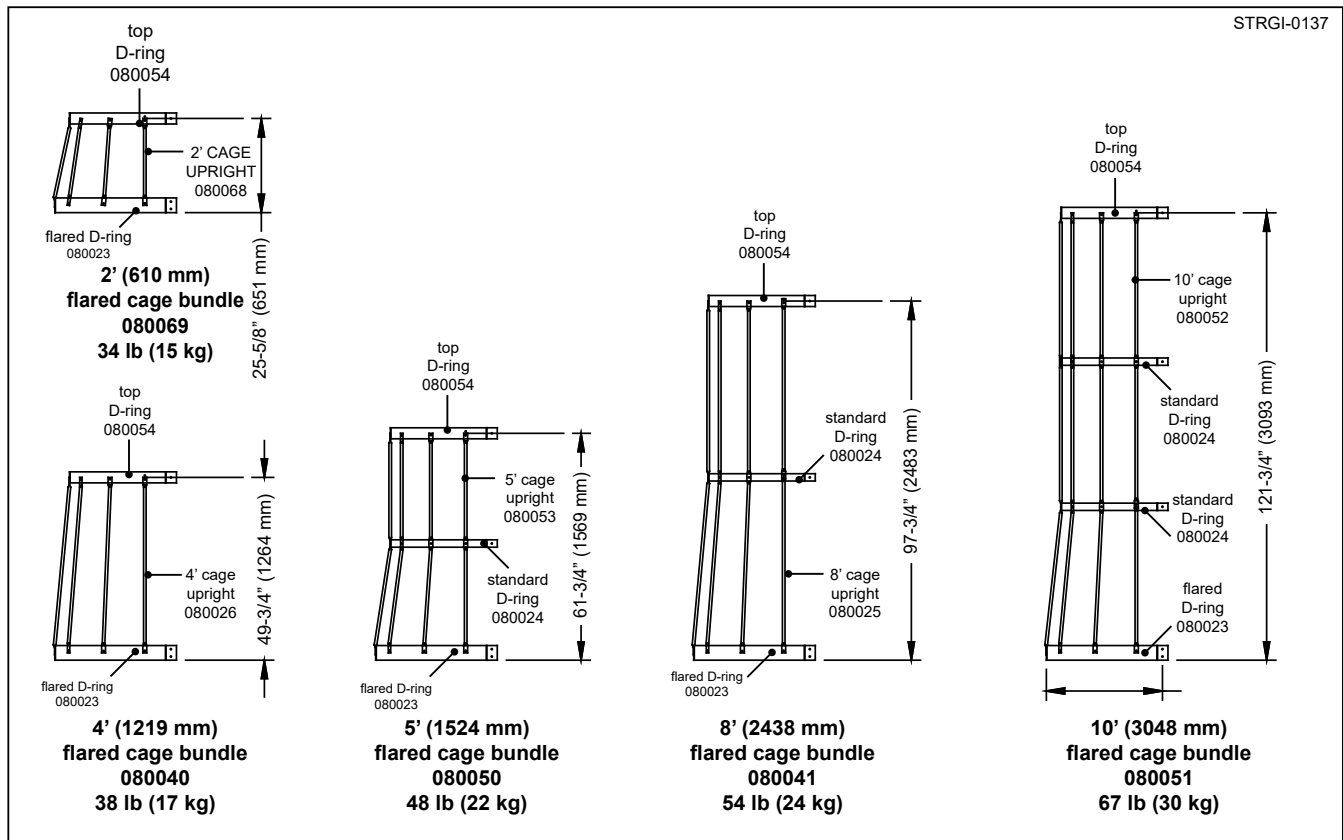
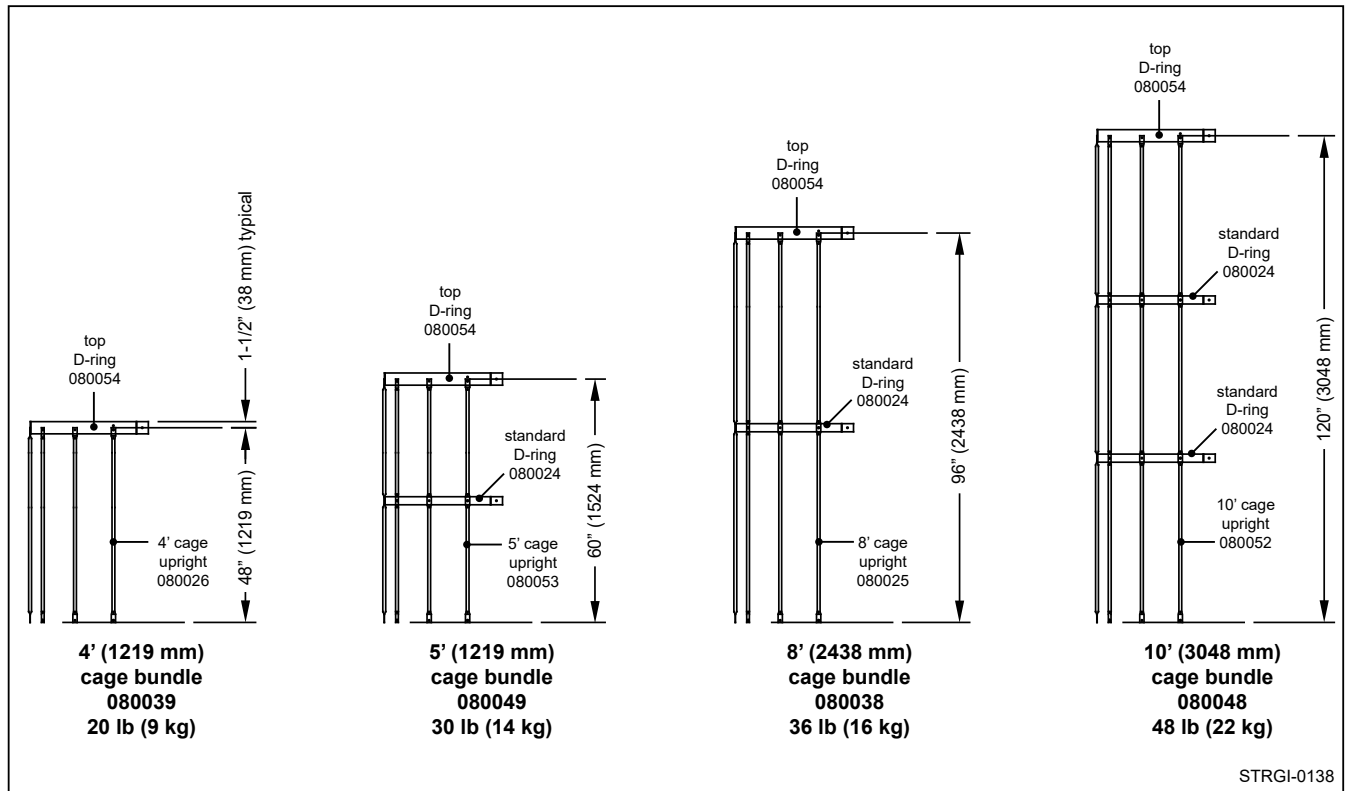


Figure 41. Cages Standard Intermediate Sections

2.5. Tower Top Landing

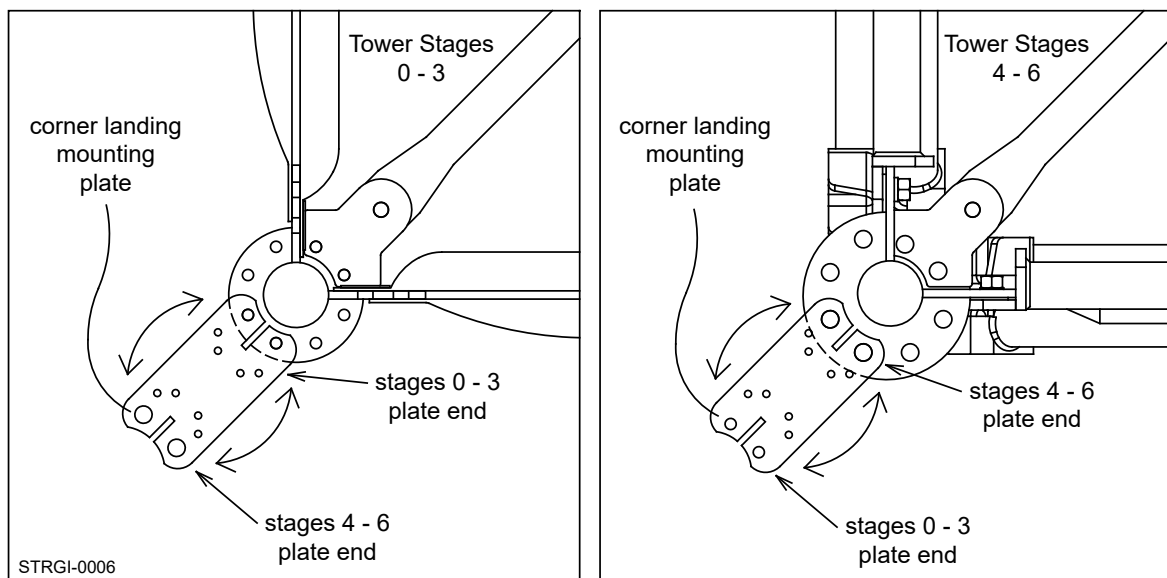
Table 1. Tower Top Landing [(G)4508318] Parts

Part Number	Description	Part Number	Description
4508327	Handrail	3502071	Toe-board
4508332	Rail Assembly	3502072	Support Brace 1/2
4508333	H Handrail	3502073	Support Brace 2/2
4508334	Top Platform	4508335	Top Vertical Brace
3502070	Top Landing Mounting Plate	3502076	Hardware Package

Note

The 2 corner mounting plate opposite ends are different. One end allows attachment with tower stages 0 — 3. The other end allows attachment with tower stages 4 — 6. Both ends allow attachment with the corner landing platform. Position the mounting plate correctly depending on the tower stage the plate will attach to.

Figure 42. Positioning the Corner Landing Mounting Plate Correctly Per the Tower Post (Connection) Stage

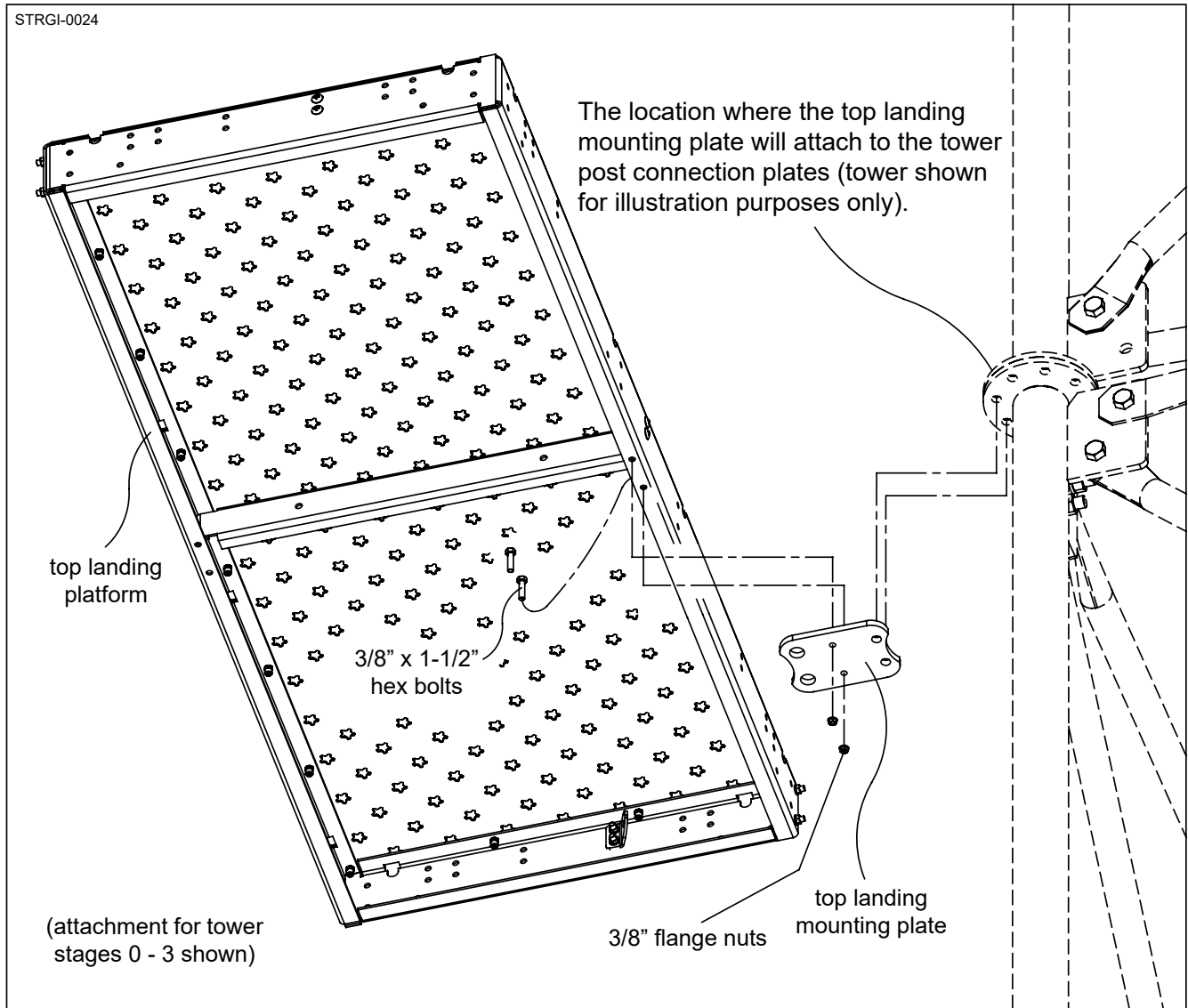


Note

The tower top landing is designed to allow access to a tower top platform or a tower internal platform.

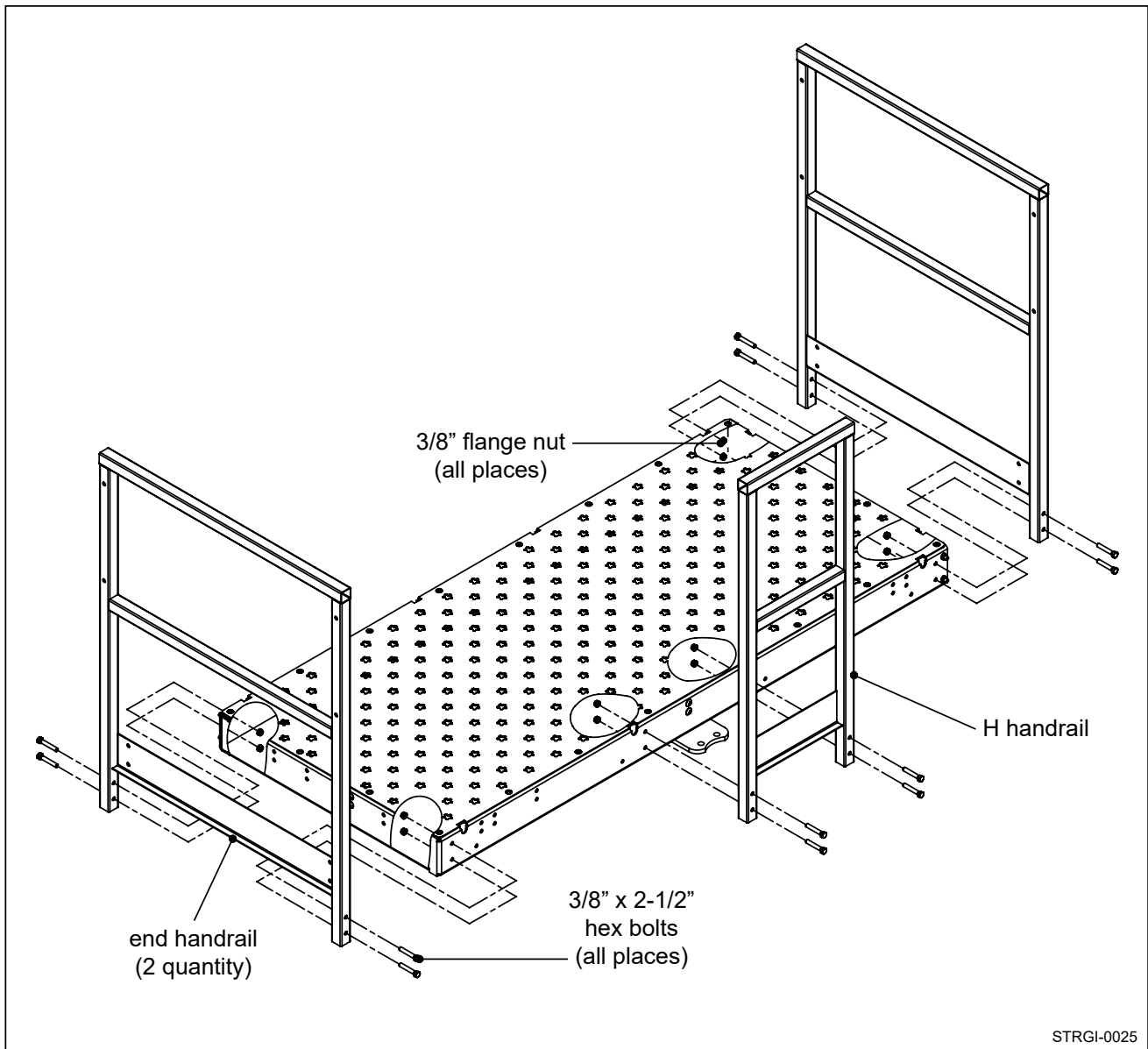
1. Position the tower top landing mounting plate correctly for this installation and install it to the tower top landing platform. Use 3/8" x 1" hex bolts and 3/8" flange nuts.

Figure 43. Installing the Tower Top Landing Mounting Plate



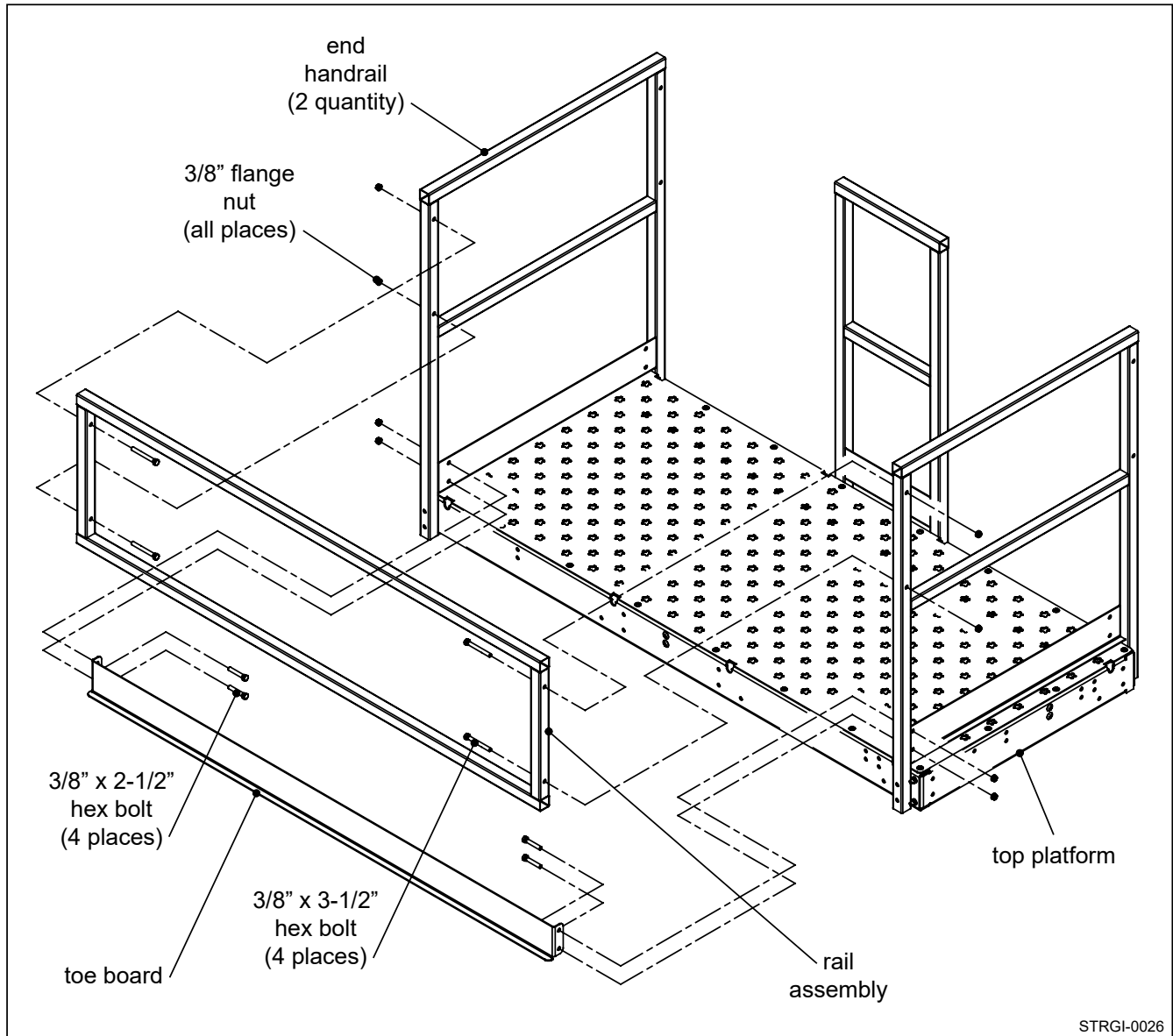
2. Install the End handrails to the top landing platform. Use 3/8" x 2-1/2" hex bolts and 3/8" flange nuts.
3. Install the H handrail to the top landing platform. Use 3/8" x 2-1/2" hex bolts and 3/8" flange nuts.

Figure 44. Installing the End Handrails and H Handrail to the Platform Base



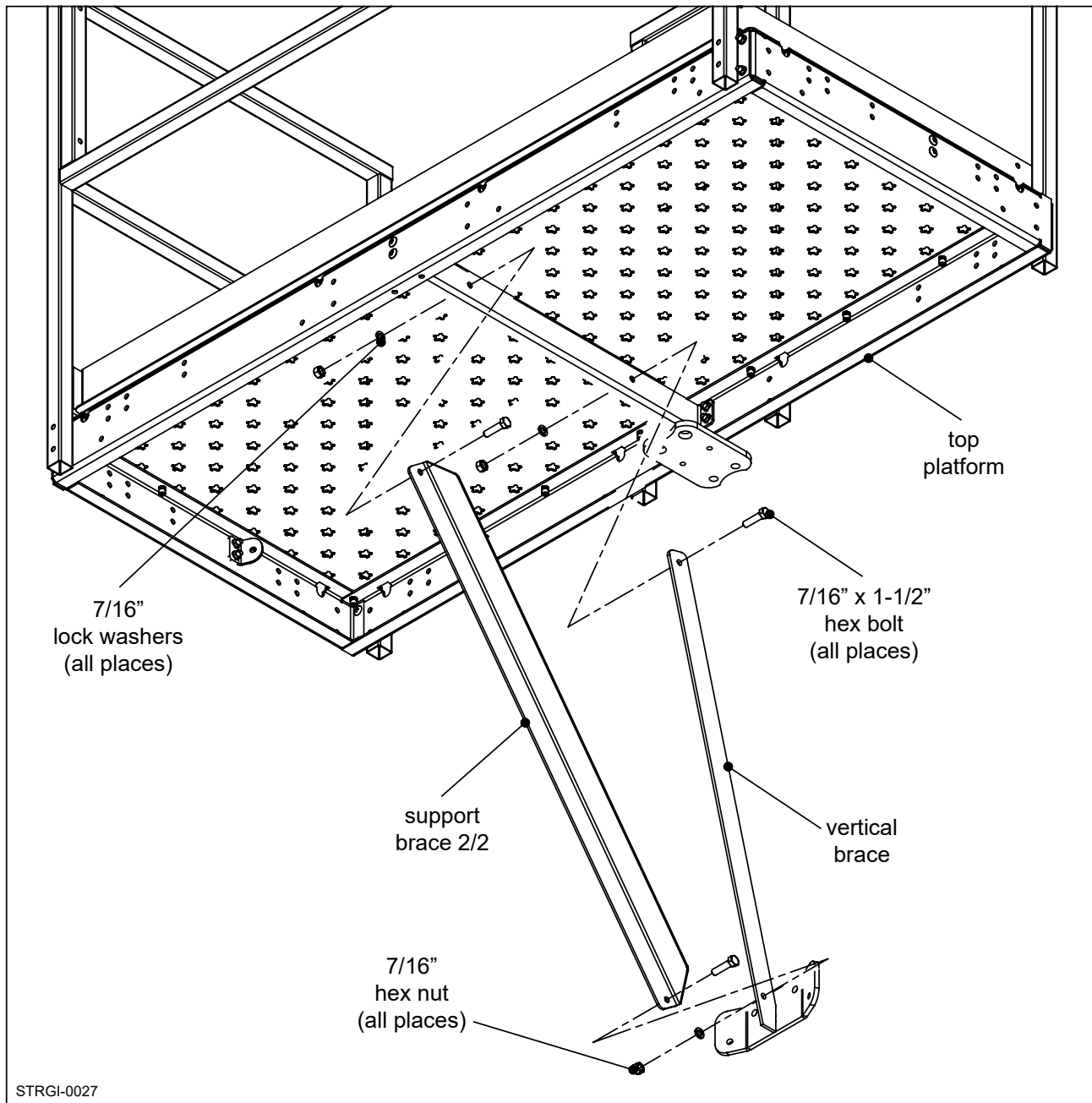
4. Install the rail assembly and toe board to the end handrails. Use $\frac{3}{8}$ " x $3\frac{1}{2}$ " hex bolts and $\frac{3}{8}$ " flange nuts to install the rail assembly. Use $\frac{3}{8}$ " x $2\frac{1}{2}$ " hex bolts and $\frac{3}{8}$ " flange nuts to install the toe board.

Figure 45. Installing the rail assembly and Toe Board to the End Handrails



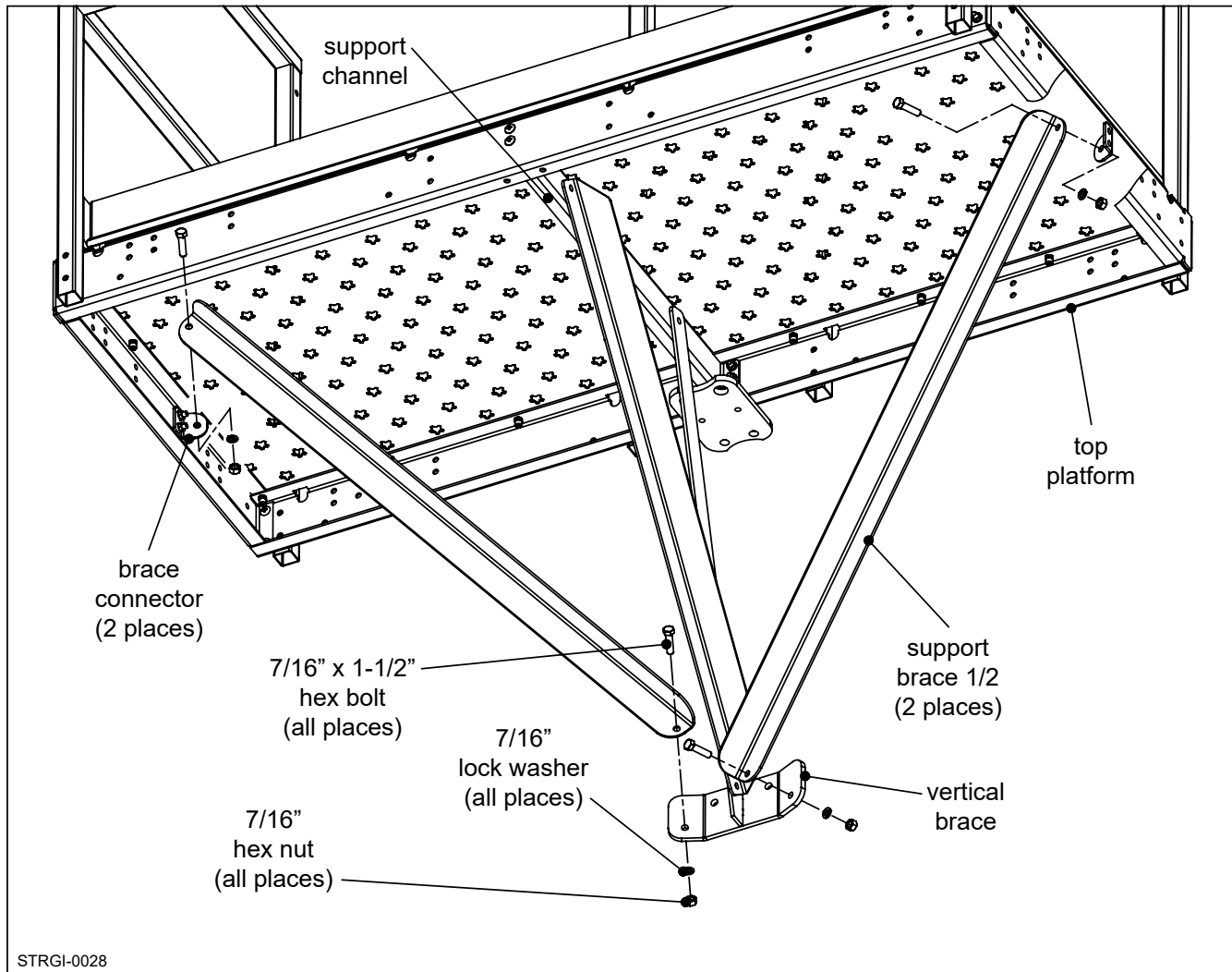
5. Install the vertical brace to the top landing platform. Install the support brace 2/2 to the top landing platform and vertical brace. Use 7/16" x 1-1/2" hex bolts, 7/16" lock washers and 7/16" hex nuts to make these connections.

Figure 46. Installing the Vertical Brace and Support Brace 2/2 to Each Other and to the Platform Base



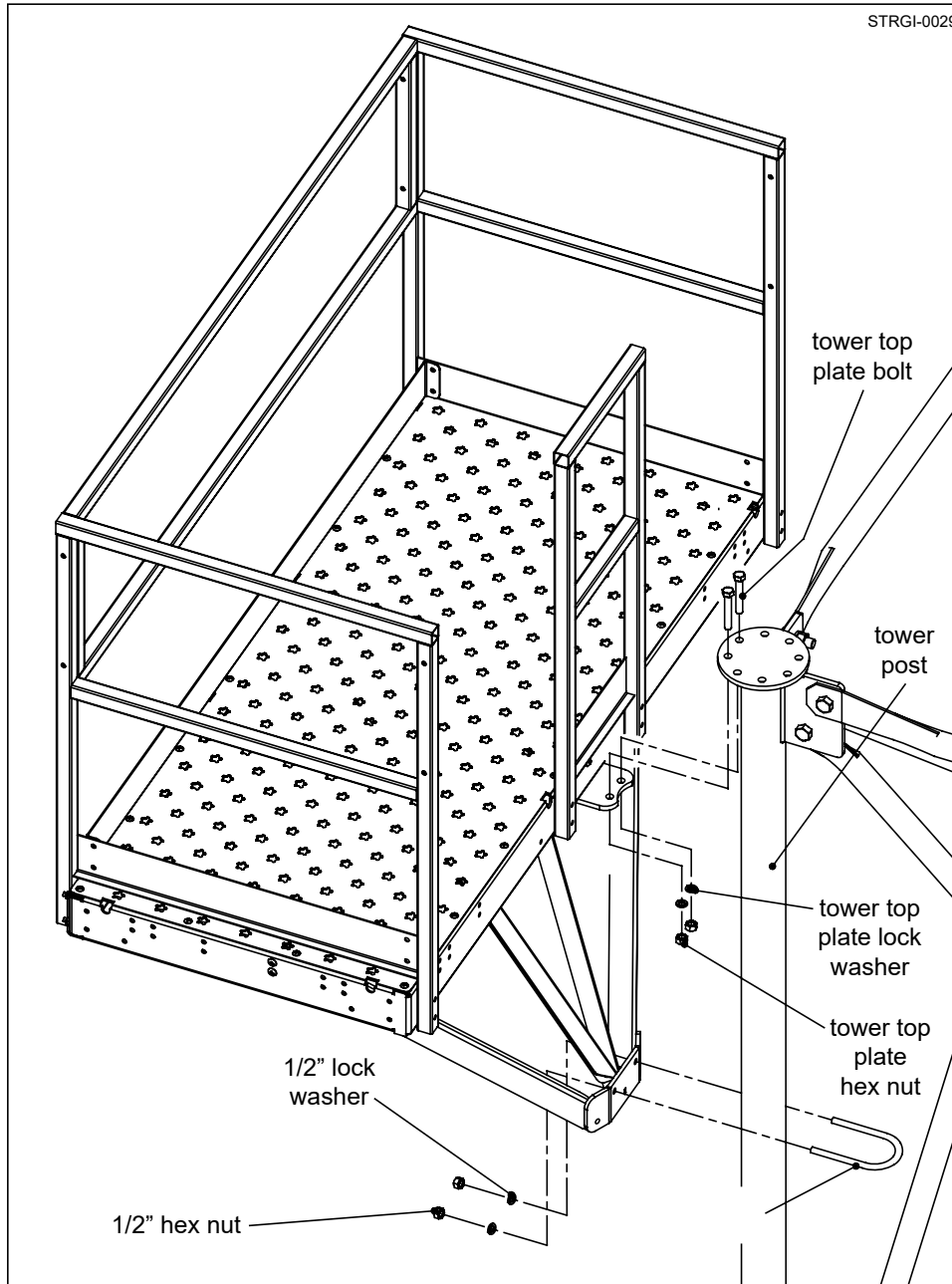
6. Install the (2) support braces 1/2 to the top landing platform brace connectors and the vertical brace. Use 7/16" x 1-1/2" hex bolts, lock washers, and nuts at each of these connections.

Figure 47. Installing the Support Braces 1/2 to the Platform Base and to the Vertical Brace



7. Install the tower top landing assembly to the tower top post connection plate and tower top plate (or tower post connection plates if the tower is installed in an tower-intermediate location). Use (2) tower post top plate or connection bolts, lock washers, and nuts. Install the vertical brace to the tower post. Use $1/2"$ x $4"$ x $5-1/2"$ U-bolt, $1/2"$ lock washers, and $1/2"$ hex nuts.

Figure 48. Installing the Top Landing Platform to the Tower



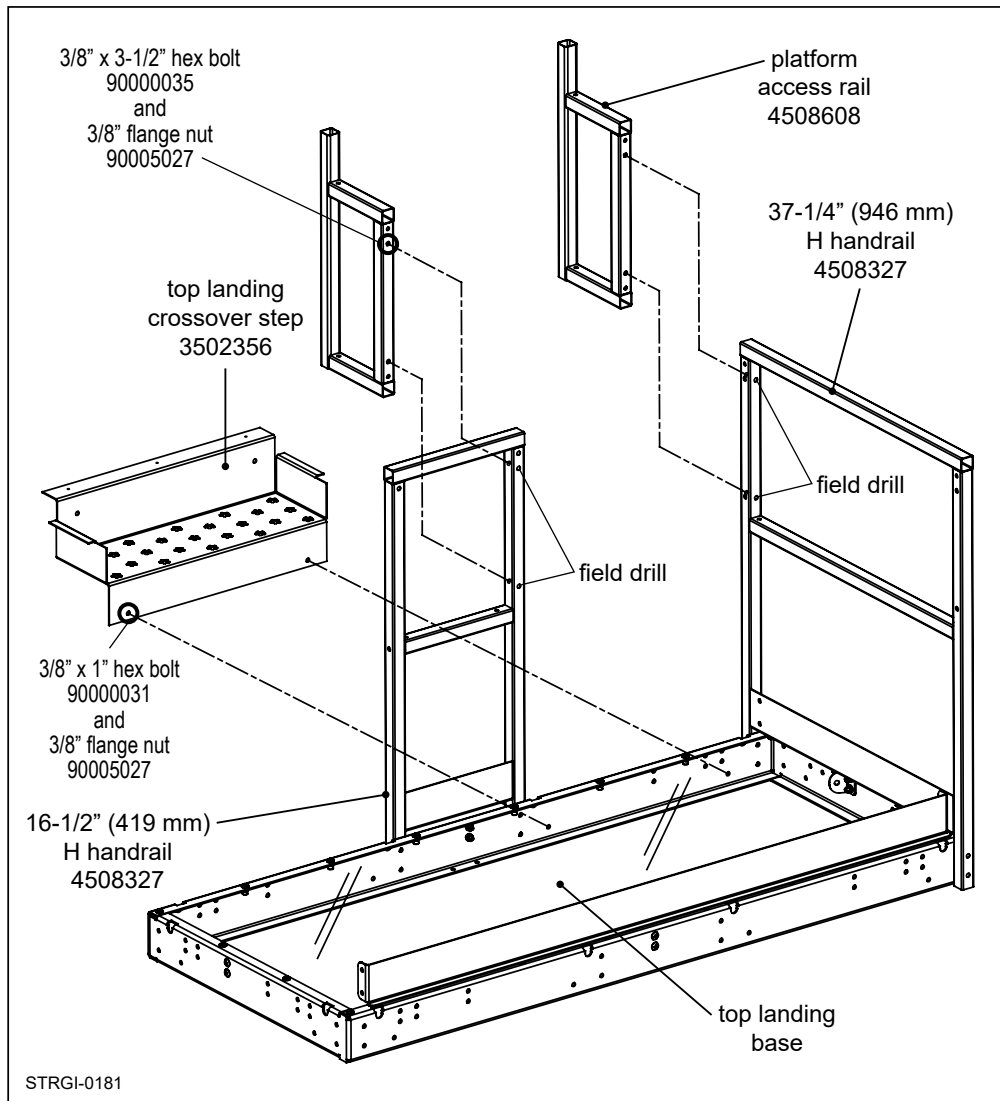
Important

Make certain the platform is level in both directions and square (90°) to the tower side before tightening all connection bolts.

2.5.1 Crossover Step And Handrails

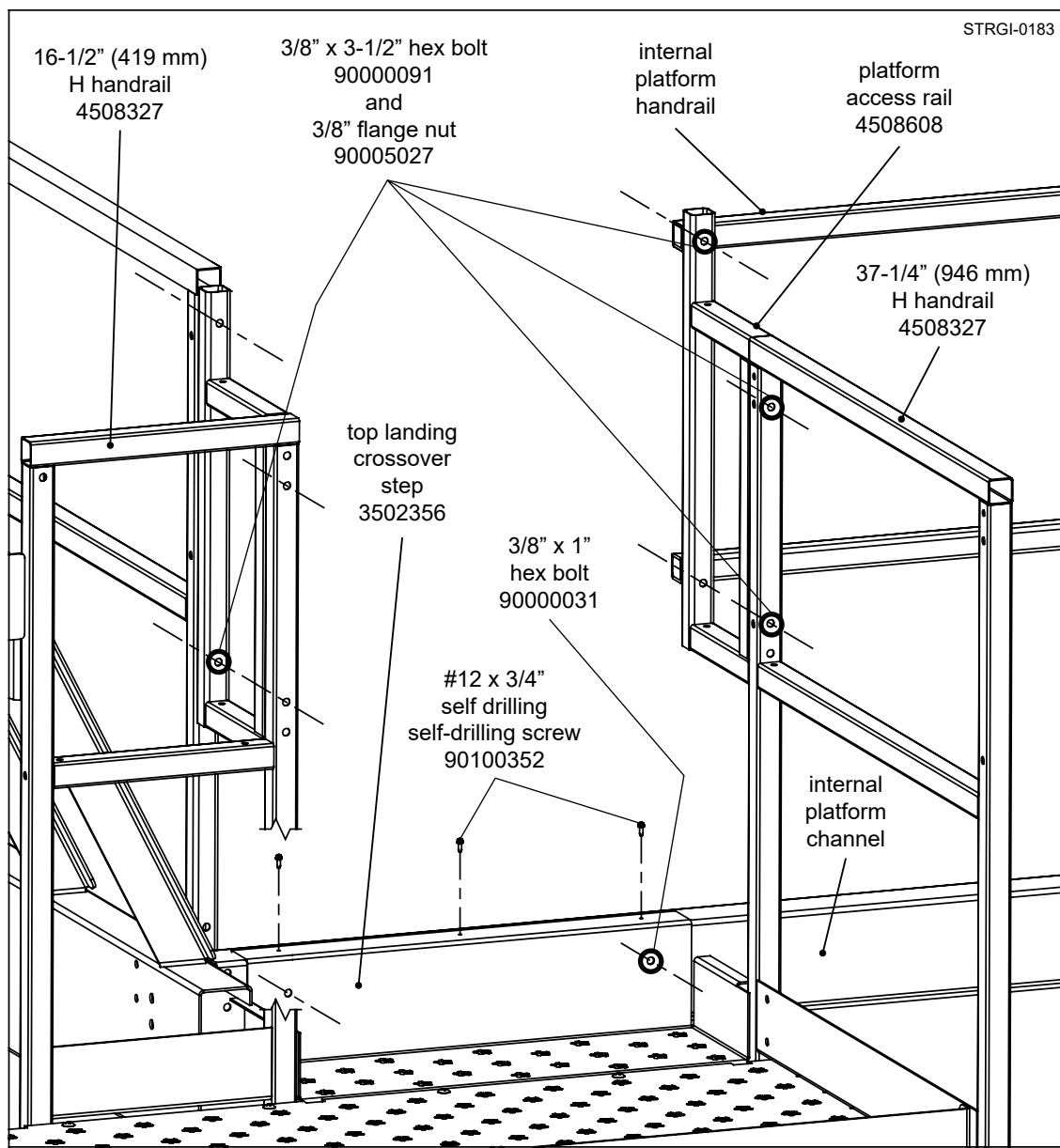
1. Rest the top landing crossover step on the internal platform channel. Install the top landing crossover step to the top landing base in the location and using the hardware shown in the following figure.
2. Using the platform access rail as a template, determine the field drill hole locations in the 37-1/4" (946 mm) and 16-1/2" (419 mm) H Handrails. Drill those holes.
3. Install the platform access rails to the H Handrails as shown in the following figure. Use the hardware shown in the following figure.

Figure 49. Installing the Crossover Step and Platform Access Rails



4. Field drill the holes for connecting the platform access handrail with the internal platform handrail.
5. Connect the platform access rails to the internal platform handrail using the hardware indicated in the following figure.
6. Install the #12 x 3/4" self drilling screws evenly spaced across the top of the top landing crossover step.
7. Using the top landing crossover step as a template, field drill the holes in the internal platform channel for connecting the top landing crossover step and the internal platform channel.
8. Connect the top landing crossover step to the internal platform channel using the holes just field drilled and the hardware indicated in the following figure.
9. Tighten all hardware.

Figure 50. Completing Platform Access Rails Installation



2.6. Tower Section Ladder and Platform Layout Examples

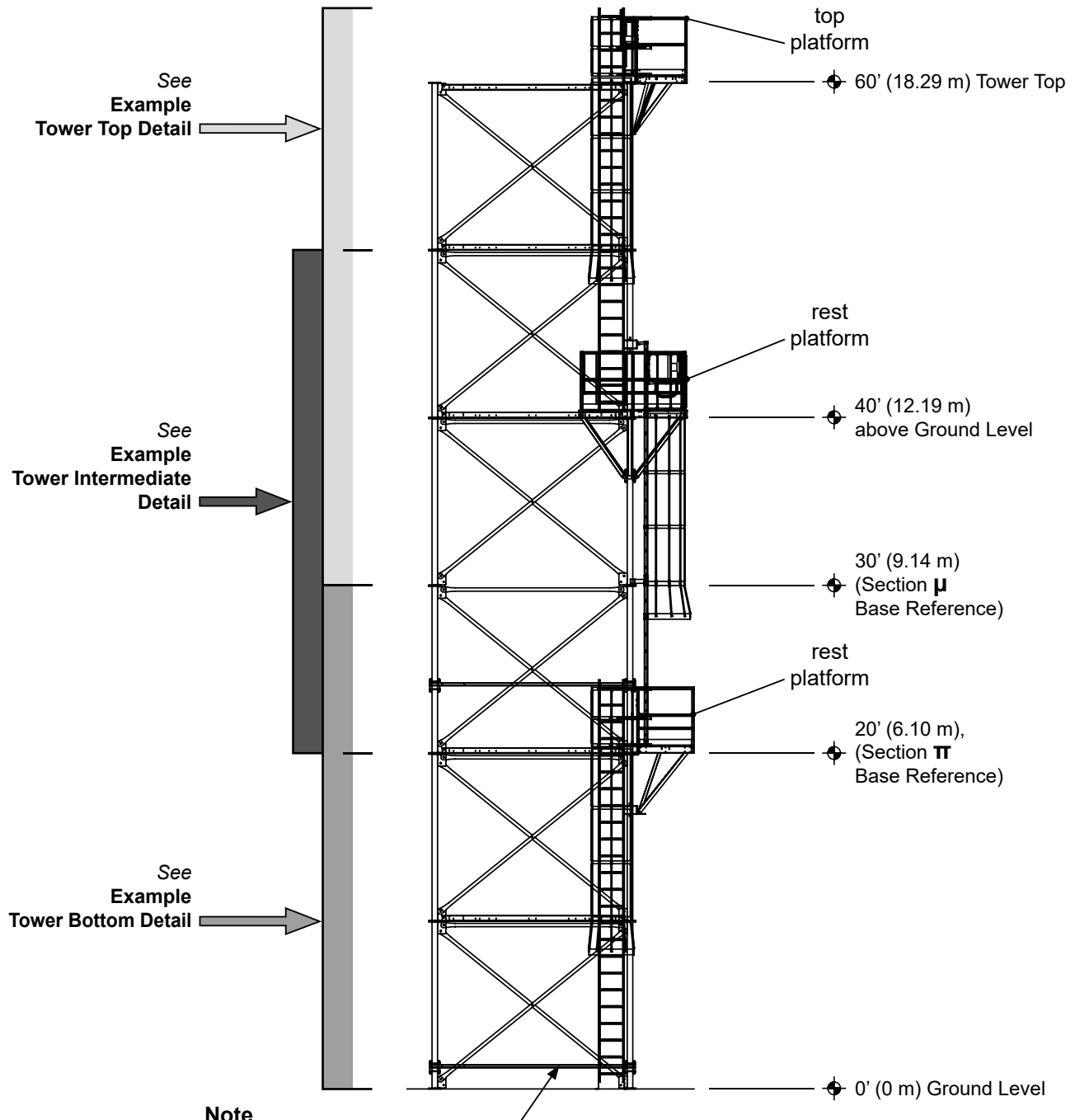
2.6.1 Example Tower — Ladders and Platforms Layout

Note

Following is an example ladders and platforms layout. [A tower 12' (3.66 m) in width is shown.] This layout is included in this manual to show how assemblies are commonly arranged in relationship to each other. In the next manual section are detail drawings for the following figure.

Important

Cage extension straps are not shown in the following layout. However, to be OSHA compliant, cage extension straps must be correctly installed between cage lower end terminations and rest platforms.

Figure 51. Example Complete Tower — Ladders and Platforms Layout Drawing**Note**

To install the mid angle at the tower bottom see the “Install Mid Angles” section in this manual. Install this bottom mid angle low enough to stabilize the bottom ladder section.

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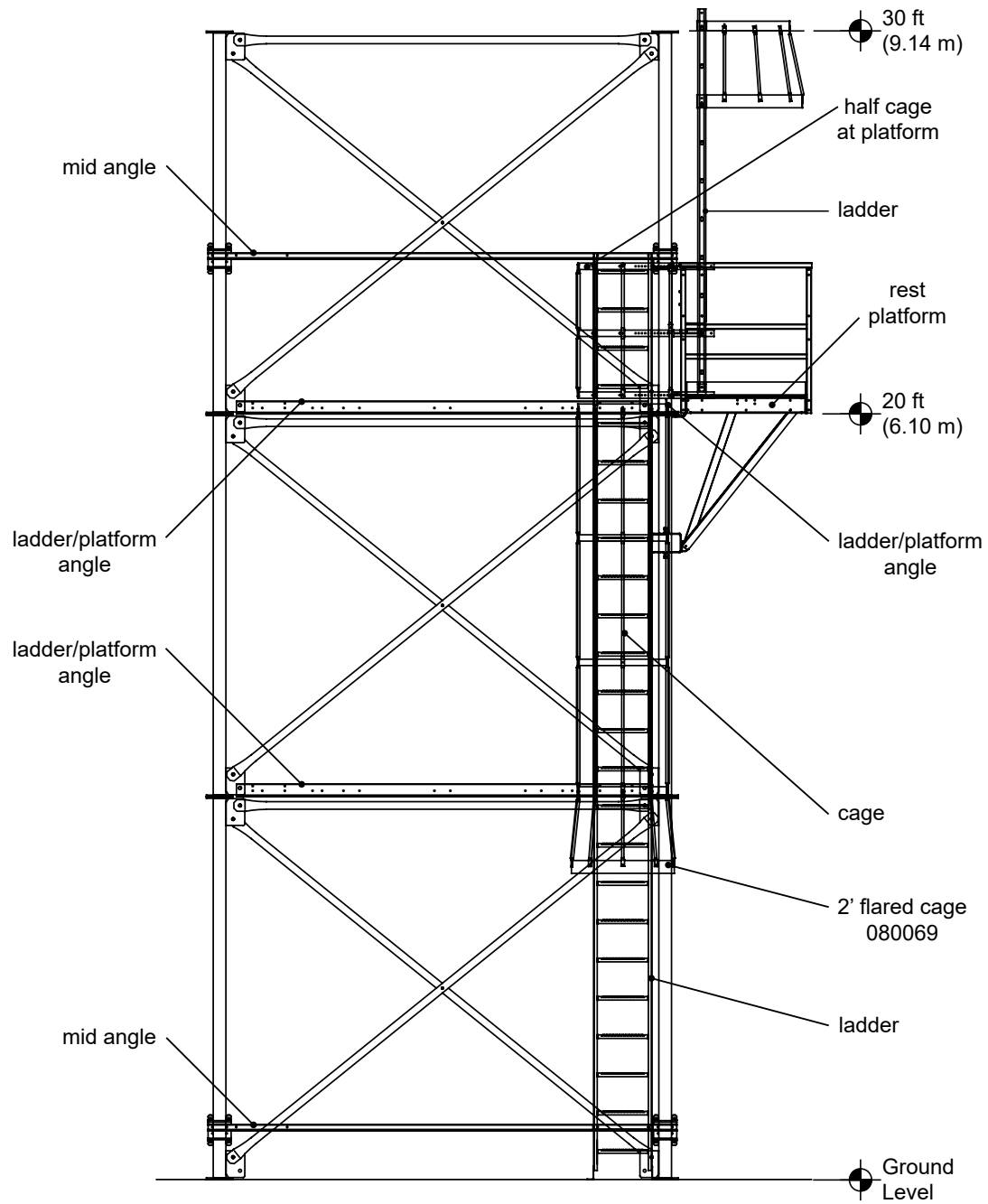
2.6.2 Example Tower Sections Ladders and Platforms Installations

Note

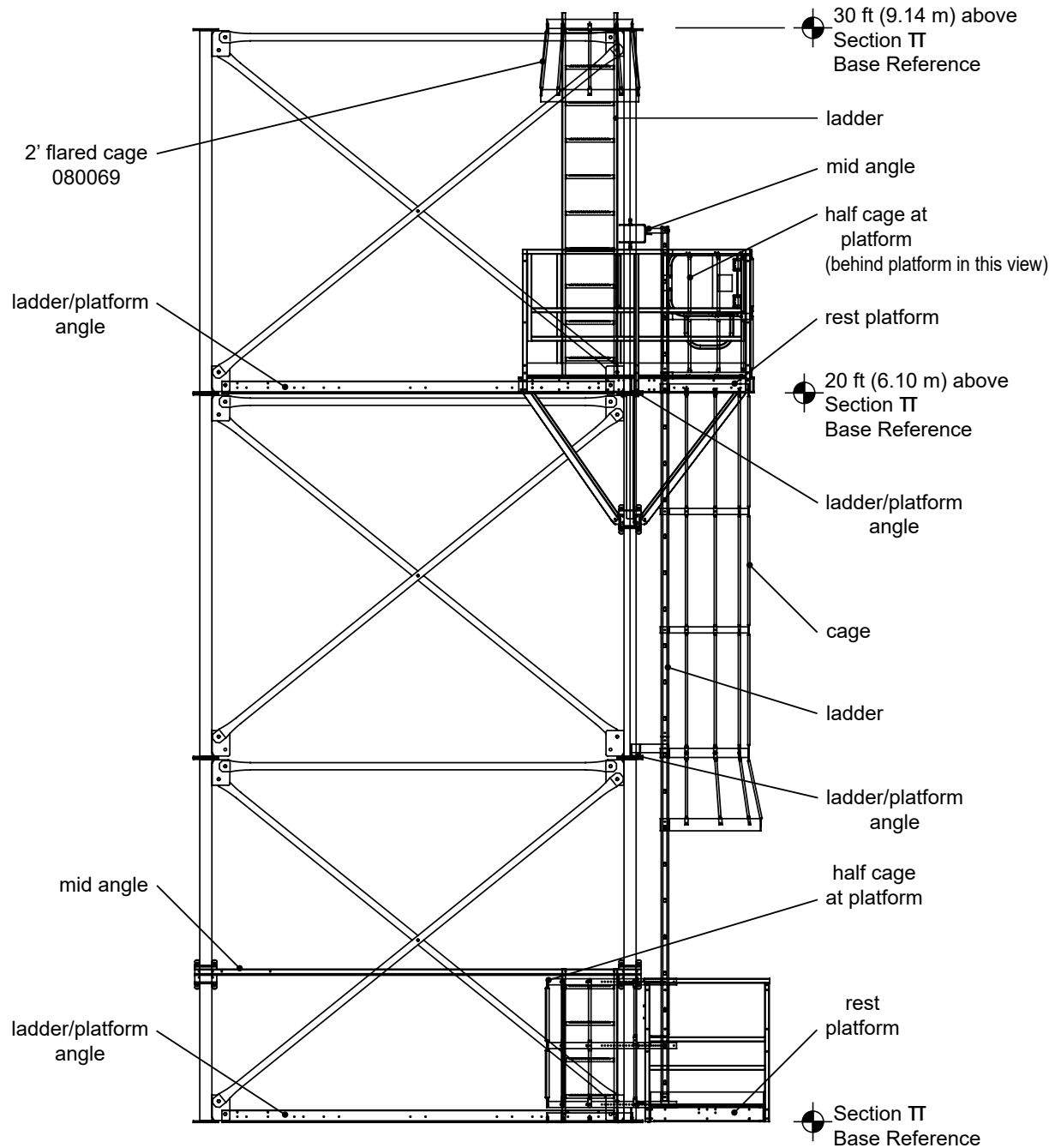
Following are some common ladder and platform layouts. [Tower sections 12' (3.66 m) in width are shown.] These layouts are included in this manual to show how assemblies are commonly arranged in relationship to each other.

Important

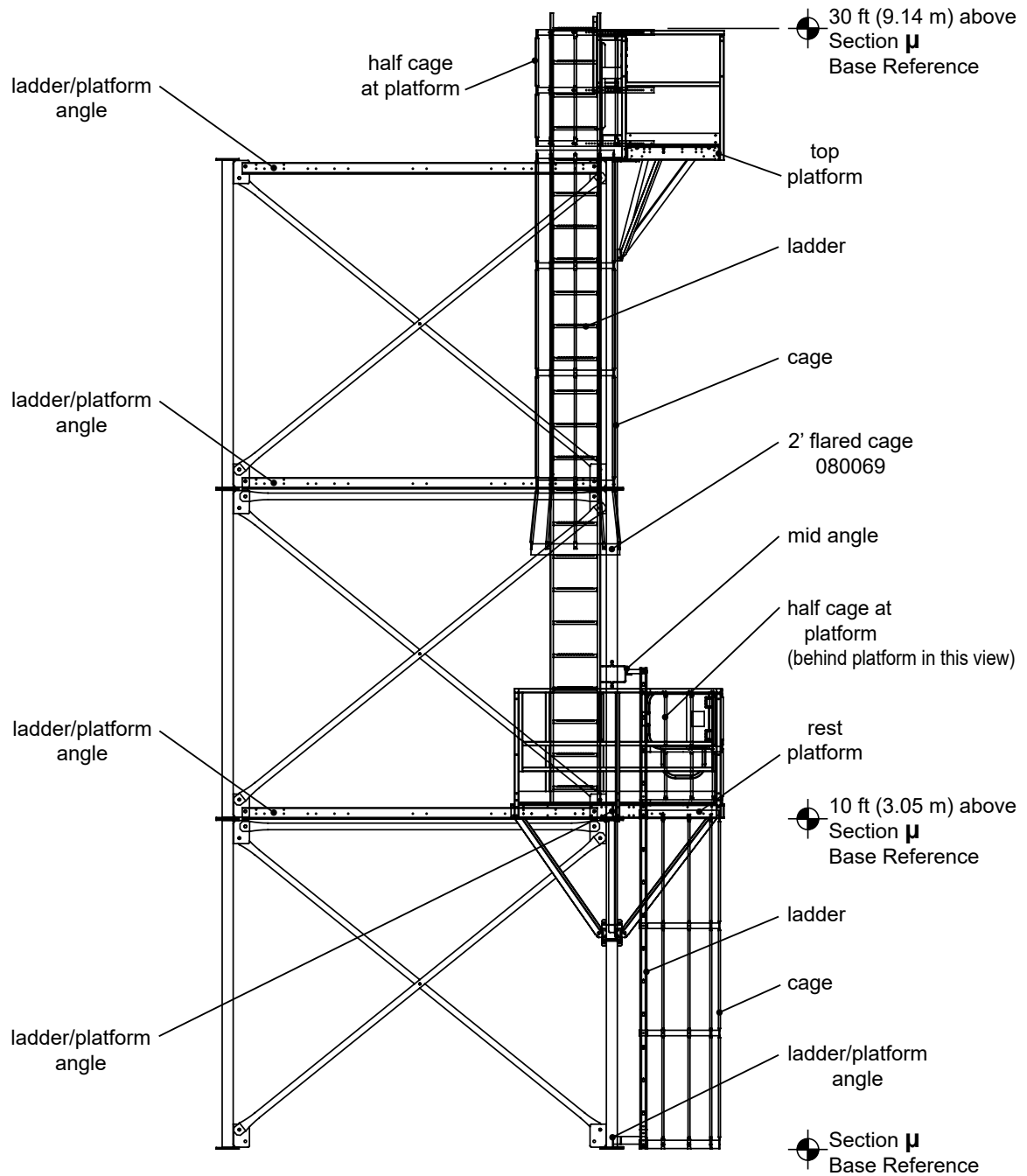
Cage extension straps are not shown in any of the layouts in this manual section. However, to be OSHA compliant, cage extension straps must be correctly installed between cage lower end terminations and rest platforms.

Figure 52. Tower Ladders and Platforms — Example Tower Bottom Detail

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Figure 53. Tower Ladders and Platforms — Example Tower Intermediate Detail

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Figure 54. Tower Ladders and Platforms — Example Tower Top Detail

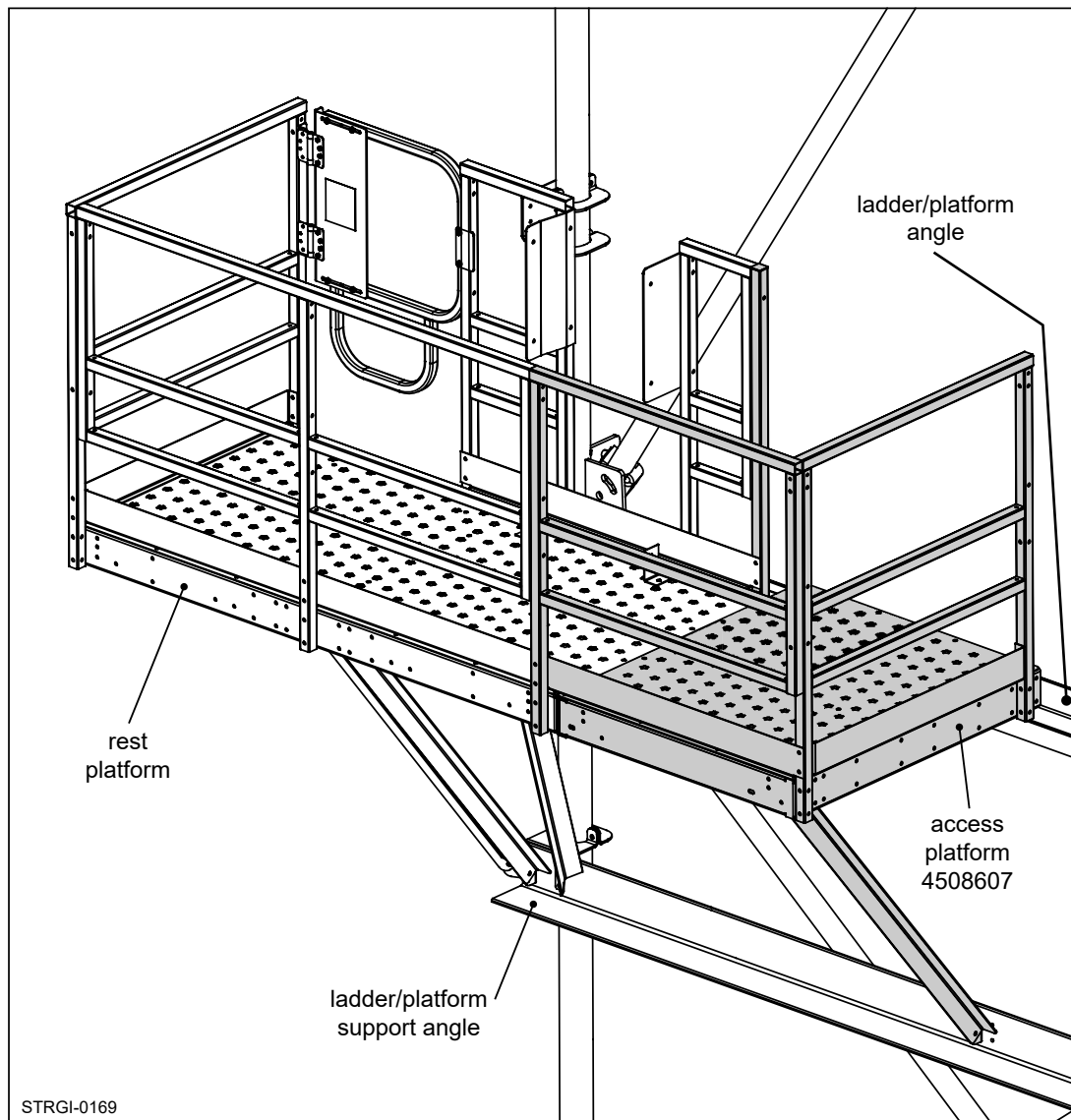
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2.7. Access Platform Installation

Note

This manual section offers Access Platform Installation instructions. Following, shaded in gray, is an illustration of a Right Hand installation Access Platform.

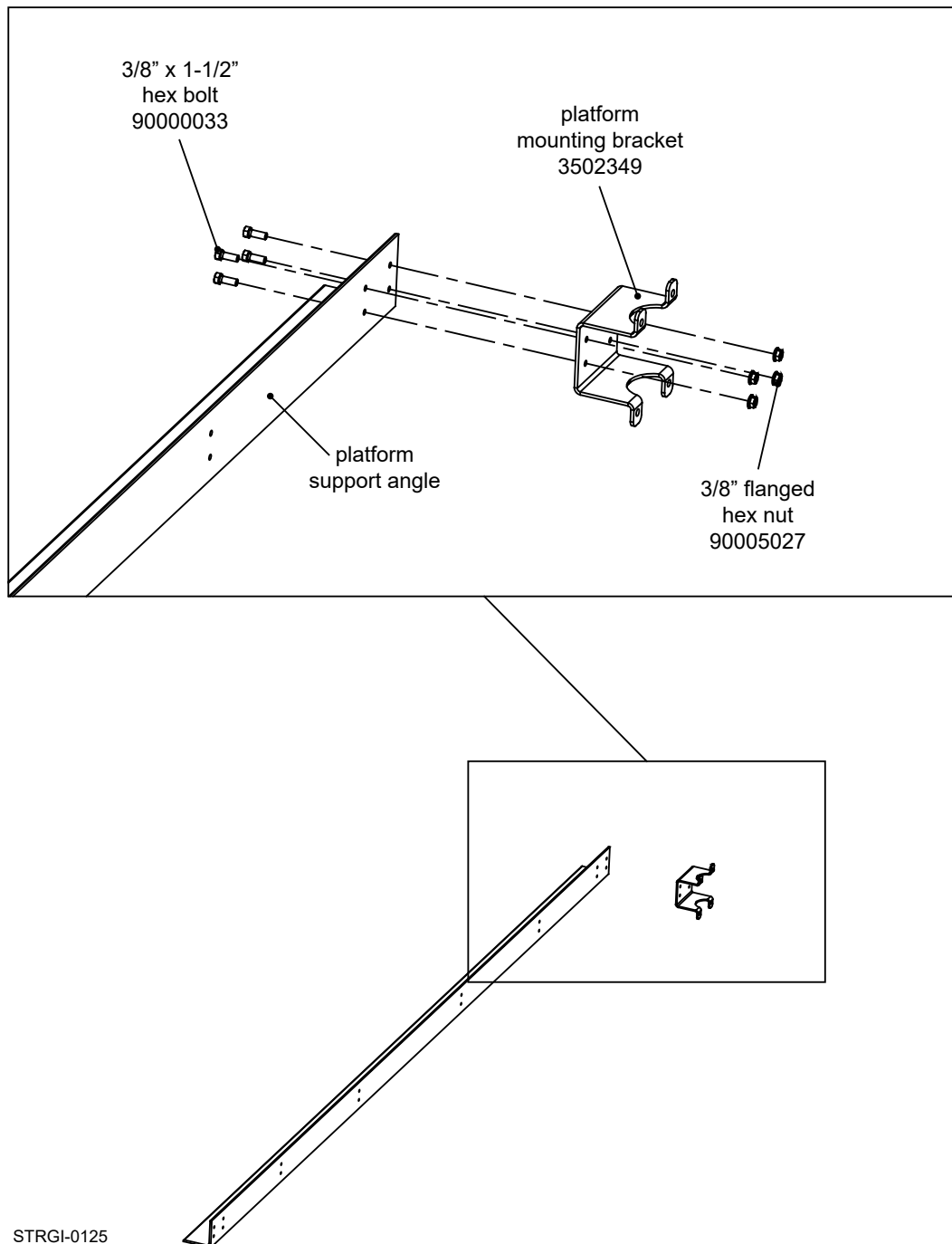
Figure 55. Example Access Platform installed to a Rest Platform



Install Platform Support Angles

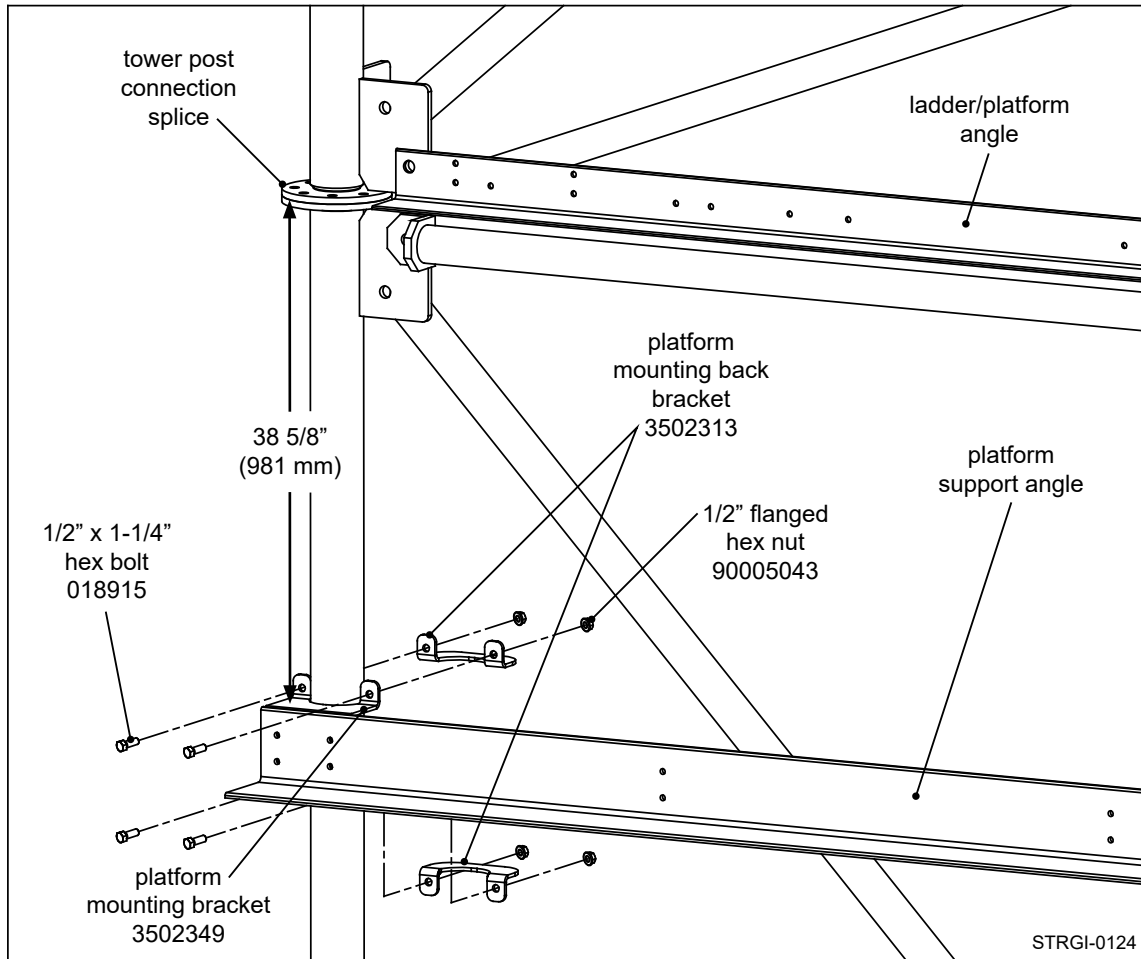
1. Install platform mounting brackets to the platform support angle ends as shown in the following figure.
 - a. Use 3/8" x 1-1/2" hex bolts and 3/8" flanged hex nuts.
 - b. Position the flanged hex nuts on the platform mounting bracket side.
 - c. Securely tighten this hardware.

Figure 56. Installing Platform Mounting Brackets to Platform Support Angles



2. Install the platform mounting brackets (and platform support angle) to the tower posts with platform mounting back brackets as shown in the following figure.
 - a. Position the platform mounting bracket top flat horizontal surface $38\text{--}5/8"$ (981 mm) below the tower post connection splice (measured from the middle of the splice).
 - b. Install the platform mounting brackets to the platform mounting back brackets using $1/2"$ x $1\text{--}1/4"$ hex bolts and $1/2"$ flanged hex nuts.
 - c. After locating the platform mounting brackets in the correct locations securely tighten this hardware.

Figure 57. Installing Platform Mounting Brackets to Tower Posts



Install the Access Platform Base to the Rest Platform Base and Install the Platform Mounting Angle

1. Determine if this access platform will be a Right Hand installation or a Left Hand installation.
2. Refer to the correct following drawing for this installation.
3. Remove bolts from the holes at (*) locations.
4. Connect holes (a) on the access platform with holes (a) on the rest platform to join the access platform with the rest platform.
5. Reinstall bolts in the holes at (*) locations using the original hardware from those locations.
6. Install bolts through the remaining locations (a) using 3/8" x 1" hex bolts (90000031) and 3/8" flange nuts (90005027) from the access platform hardware package.
7. Install the platform mounting channel to the access platform in the location shown in the appropriate following figure.
 - a. Use 3/8" x 1" hex bolts (90000031) and 3/8" flange nuts (90005027).

Figure 58. Right-Hand Access Platform Base Installing to a Rest Platform

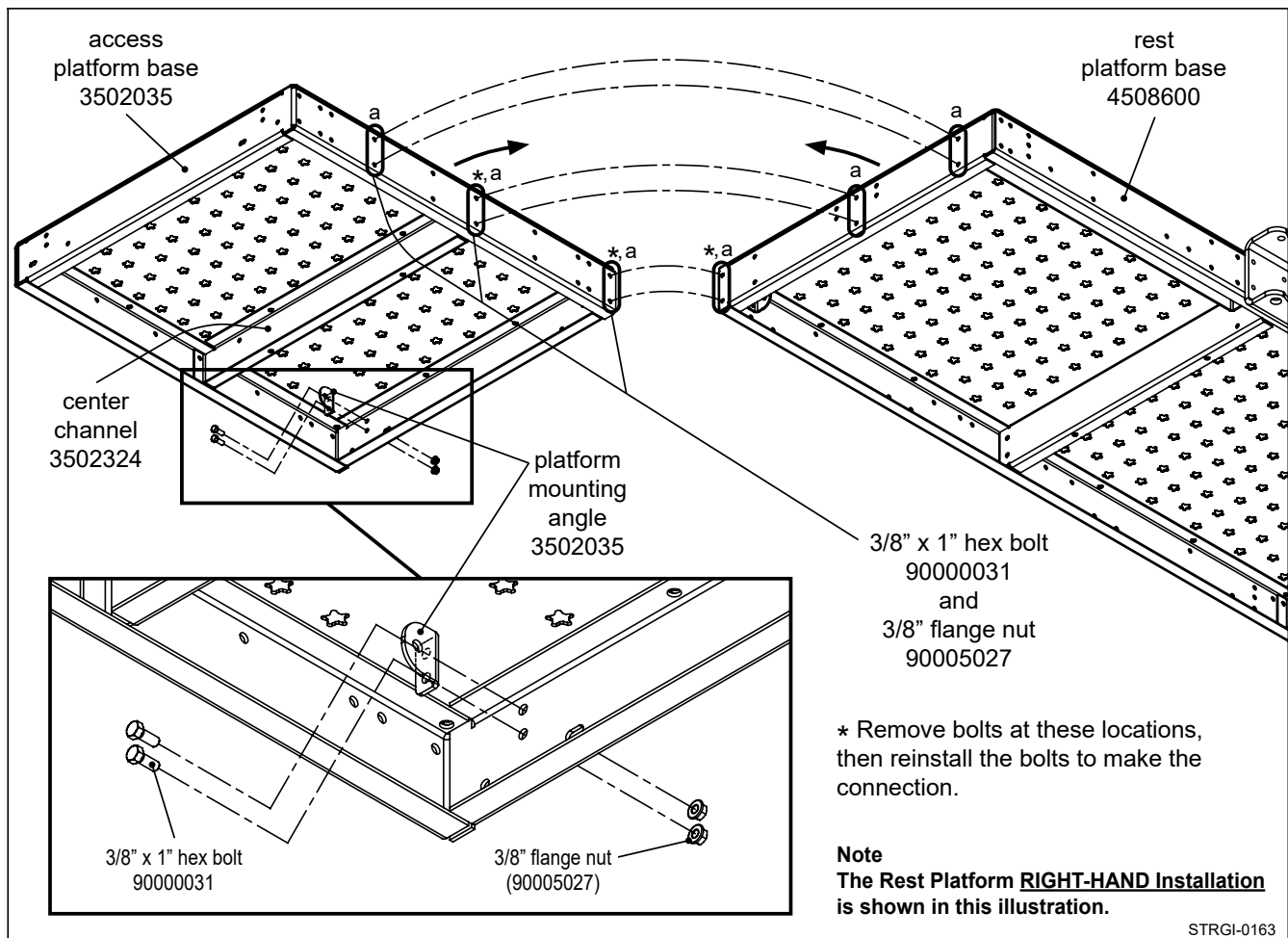
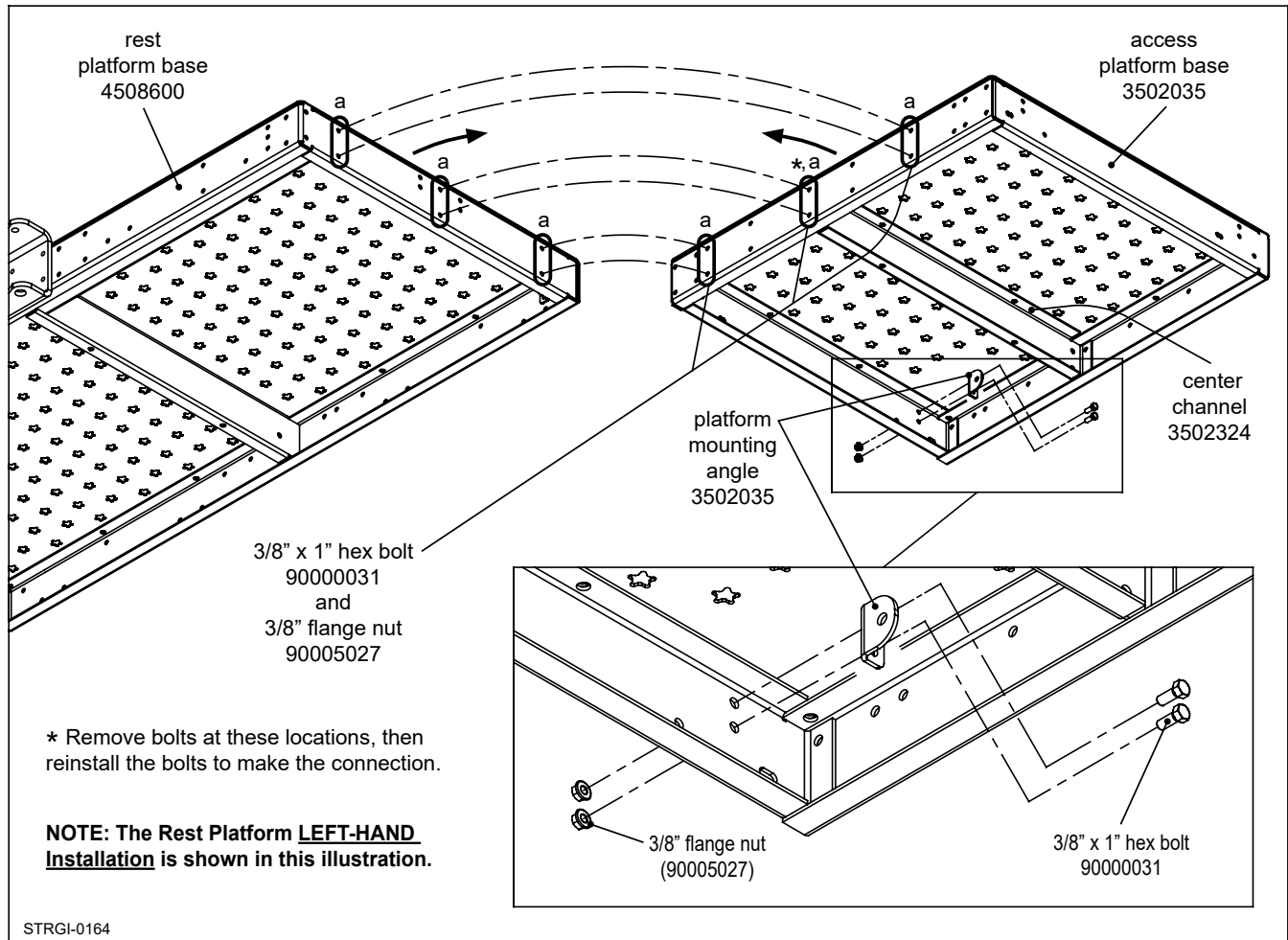
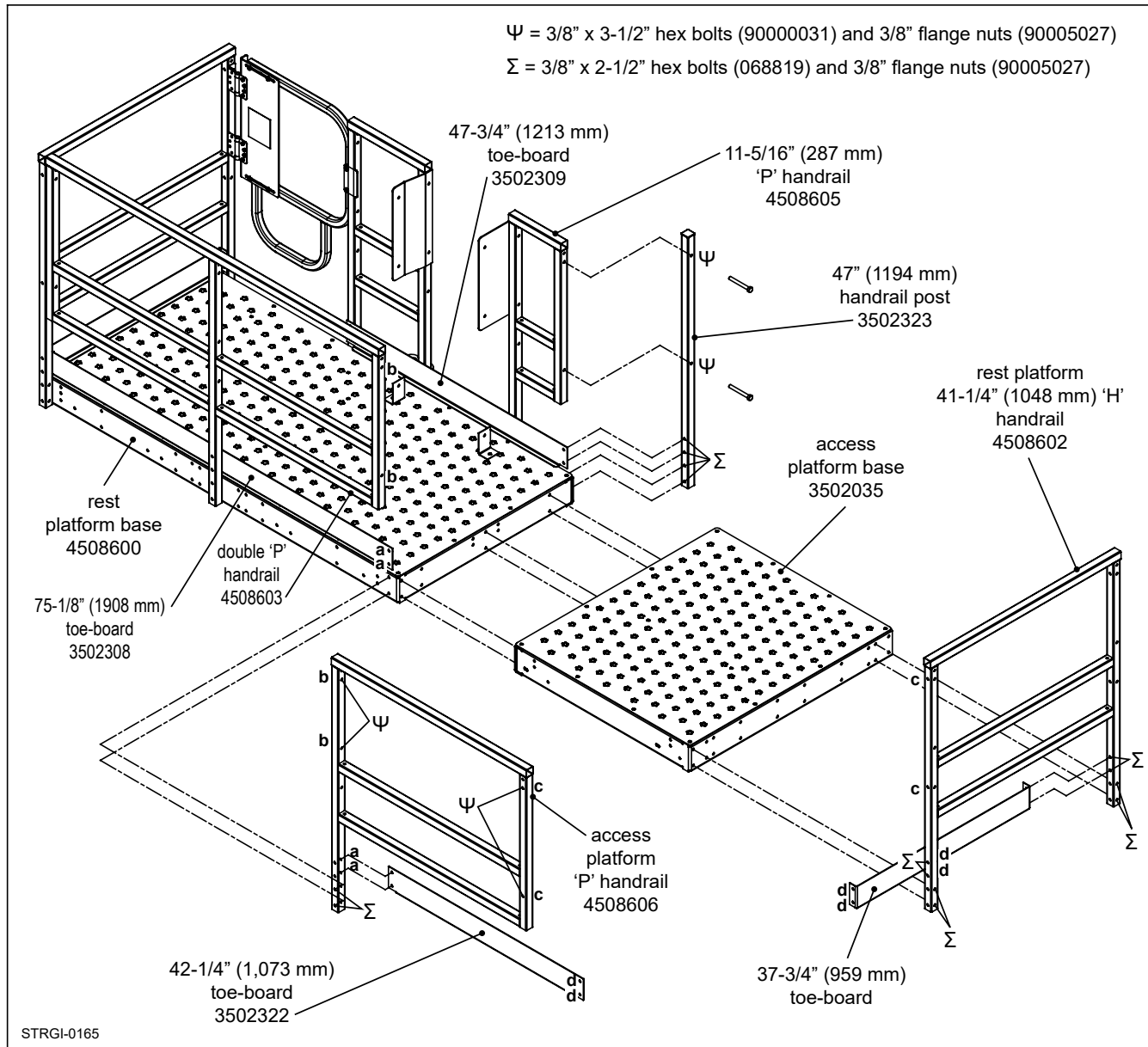


Figure 59. Left-Hand Access Platform Base Installing to a Rest Platform

Install Access Platform Handrails

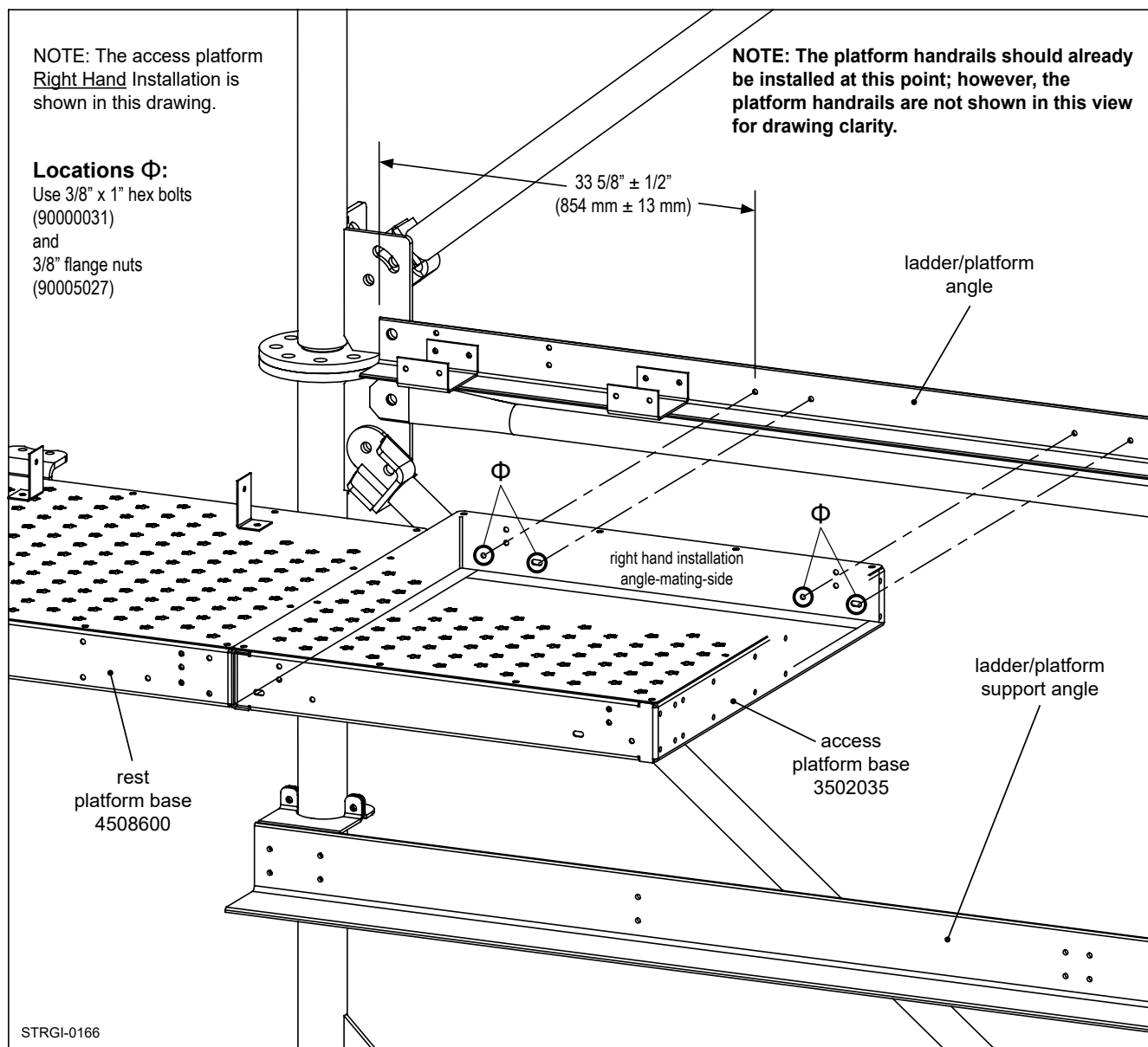
1. Install the access platform base to the rest platform base as indicated in the previous steps.
2. Install the handrails to the access platform using the hardware indicated in the following figure.
3. In the following figure lettered hole locations a, b, c, and d connect with hole locations having the same letter.
4. Install the rest platform 41–1/4" (1048 mm) 'H' handrail (4508602) to the access platform at the location shown in the following figure.
5. Install the 47" (1194 mm) handrail post to the rest platform base at the location shown in the following drawing.
 - a. The post should line up with the end holes in the 47–3/4" (1213 mm) toe-board (3502309).
6. Install the 47" (1194 mm) handrail post to the rest platform 11–5/16" (287 mm) 'P' handrail.
7. Install the access platform 'P' handrail (4508606) to the rest platform base and the rest platform double 'P' handrail (4508603) at the locations shown in the following figure.
8. Install the access platform 'P' handrail (4508606) to the 41–1/4" (1048 mm) 'H' handrail.
9. Install the 75–1/8" (1908 mm) toe-board and the 42–1/4" (1073 mm) toe-board to the access platform 'P' handrail.
10. Install the 42–1/4" (1073 mm) toe-board and the 37–3/4" (959 mm) toe-board to the 41–1/4" (1048 mm) 'H' handrail.
11. Tighten all bolts. The access platform handrail assembly should now be complete.

Figure 60. Installing Access Platform Handrails

Lift the Platforms into Position on the Tower and Install the Platform Base Sections to the Ladder/Platform Angle

1. Safety and securely lift the platforms into position to connect with the tower.
2. Install the access platform base in the location shown in the following figure.
3. Connect the access platform to the ladder/platform angle using each of the (2) single holes and (2) slotted holes on the access platform base angle-mating side (as shown in the following figure).
 - a. Use the hardware indicated in the following figure to make the connection.
4. Tighten all bolts.

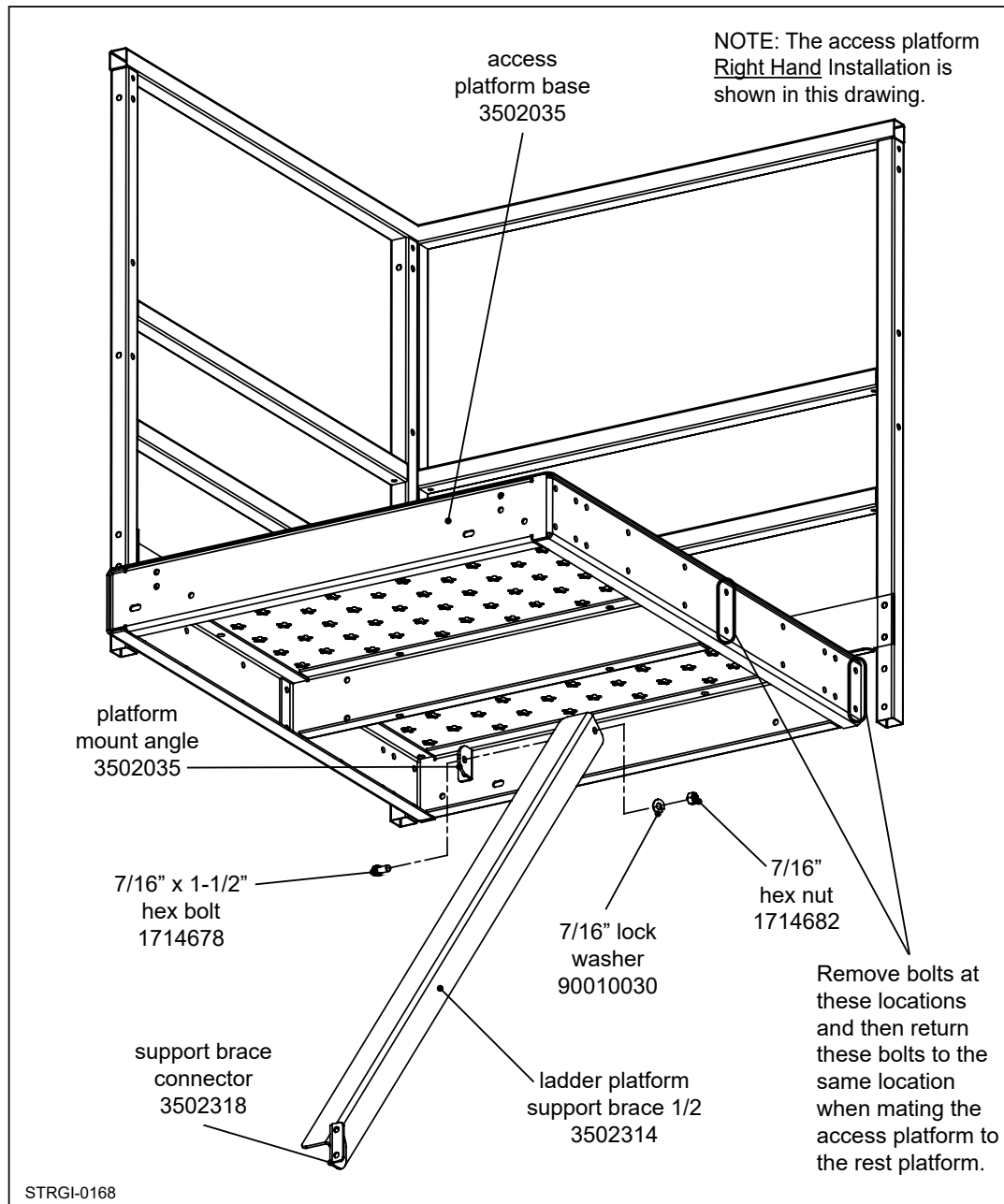
Figure 61. Installing the Access Platform Base Section to the Ladder/Platform Angle



Install the Ladder Platform Support Brace to the Access Platform

1. Connect the ladder platform support brace 1/2 to the platform mounting angle.
 - a. Use a 7/16" x 1-1/2" hex bolt, 7/16" lock washer, and 7/16" hex nut.
2. Tighten this hardware.

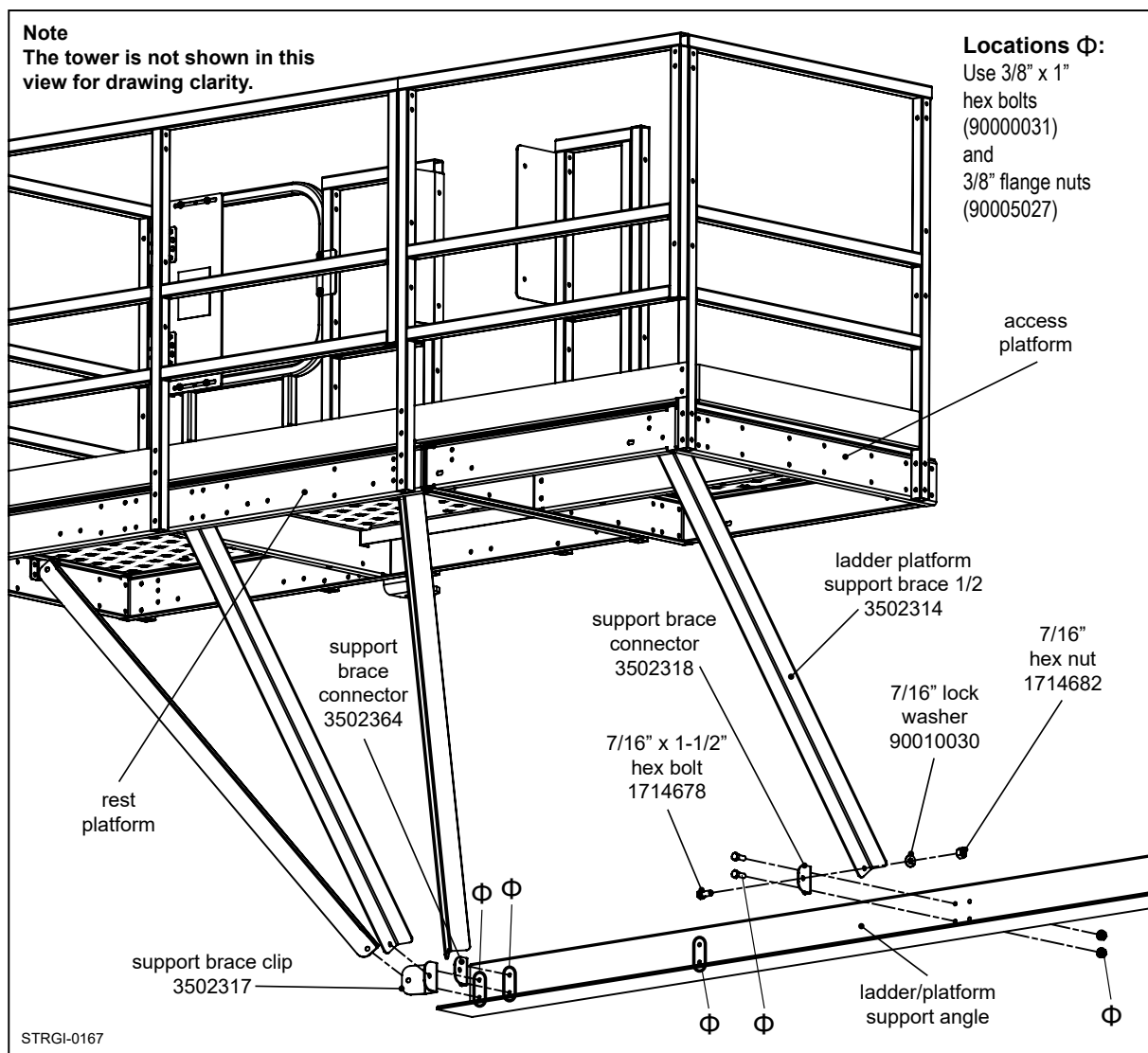
Figure 62. Installing the Ladder Platform Support Brace to the Access Platform



Install the Platforms Support Braces to the Ladder/Platform Support Angle

1. Refer to the following figure.
2. Install the support braces to the ladder/platform support angle in the locations shown in the following figure.
3. Install support braces to the support brace connectors and the support brace clip.
 - a. Use 7/16" hex bolts, 7/16" lock washers, and 7/16" hex nuts.
4. Install the support brace connectors and the support brace clip to the ladder/platform support angle.
 - a. Use 3/8" x 1" hex bolts and 3/8" flange nuts.
5. Tighten all hardware.

Figure 63. Installing Platform Support Braces to the Ladder/Platform Support Angle



3. Replacement Parts

Table 2. Ladder Parts

Part Number	Description
3502321	T2 ladder bracket
3502320	ladder end bracket
088026	4' [1219 mm] ladder section
10021889	5' [1524 mm] ladder section
088027	8' [2438 mm] ladder section
10021887	10' [3048 mm] ladder section
088029	ladder splice
080009	inside ladder bracket
3502357	ladder top brace
3502355	(ladder top) side strap

Table 3. Ladder Platform Angle and Ladder Platform Support Angle Hardware

Part Number	Description
90000196	7/8" x 2-1/2" hex bolt
90010054	7/8" lock washer
90005064	7/8" hex nut
018915	1/2" x 1-1/4" hex bolt
90005043	1/2" flanged hex nut

Table 4. Ladder Mid Angle Hardware

Part Number	Description
018915	1/2" x 1-1/4" hex bolt
90005043	1/2" flanged hex nut
90000033	3/8" x 1-1/2" hex bolt
90005027	3/8" flange nut

Table 5. Ladder Hardware

Part Number	Description
004179	5/16" x 1-1/4" bin bolt
004178	5/16" x 1" bin bolt
018913	5/16" hex nut
90000032	3/8" x 1-1/4" hex bolt
90000031	3/8" x 1" hex bolt
004181	3/8" x 1" grade 8.2 bin bolt with seal washer
068811	3/8" x 1" carriage bolt
90010020	3/8" flat washer
90005021	3/8" hex nut
90005027	3/8" flanged hex nut
90005024	3/8" nylock hex nut
088028	ladder clip and bolt
90005024	3/8" nylock hex nut
088028	ladder clip and bolt
088029	ladder splice
3502319	ladder base clip
SAF-136	falling hazard warning decal
SAF-087	gate fall hazard danger decal

Table 6. Cage Parts

Part Number	Description
080023	flared D-ring
080024	standard D-ring
080054	double D-ring
080081	half D-ring
080068	2' (610 mm) upright
080026	4' (1,219 mm) upright
080053	5' (1,524 mm) upright
080025	8' (2,438 mm) upright
080052	10' (3,048 mm) upright
080086	upright at platform
080082	connector strap
080626	cage extension strap

Table 7. Ladder Rest Platform Parts

Part Number	Description
4508600	platform base
4508605	11–5/16" 'P' handrail
4508604	16–3/4" 'H' handrail
4508602	41" 'H' handrail
4508603	double 'P' handrail
3502307	37–3/4" toe board
3502309	47–3/4" toe board
3502308	75" toe board
3502302	center channel (platform underside)
3502303	support channel (platform underside)
3502319	ladder base clip
3502035	platform mounting angle
3502060	support brace connector
080615	ladder safety gate
3502302	platform mounting plate 'C'
3502310	horizontal mount bracket
3502339	platform / cage connector plate

Table 8. T2 Ladder Platforms Hardware

Part Number	Description
90000031	3/8" hex bolt
90000116	3/8" x 1" truss bolt
90000033	3/8" x 1-1/2" hex bolt
068819	3/8" x 2-1/2" hex bolts
90000091	3/8" x 3-1/2" hex bolts
90005027	3/8" flange nuts
1714678	7/16" x 1-1/2" hex bolts
90010030	7/16" lock washers
1714682	7/16" hex nuts
3502310	horizontal mount brackets
1929023	1-1/2" (36 mm) plastic square cap

Table 9. Safety Gate Parts


Part Number	Description
90100853	gate spring hinge
K20106	safety decal, danger fall hazard
068830	1/4" x 3/4" grade 5 hex bolt
90005000	1/4" flanged hex nut
004180	5/16" x 1-3/4" bin bolt
028002	5/16" flange nut

Table 10. Top Landing Crossover Step And Handrails Parts

Part Number	Description
3502356	top landing crossover step
4508608	platform access handrail

4. Appendix

4.1. Bolt Tightening

 **WARNING** Under no circumstances shall any other bolt be substituted for those supplied by Brownie.

Important

- **Have your contractor demonstrate that he/she is tightening the bolts correctly.**
- Tighten all hardware connections until a “snug-tight” condition is achieved as defined in the AISC Steel Construction Manual (Fifteenth Addition)^.
- When tightening bolts, tighten the bolt until they are “snug-tight”. “Snug-tight” is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench to bring the connected plies into firm contact.
- Bolts, nuts, and hardware supplied for Brownie Towers, ladders, platforms, assemblies, and other parts are specialty hardware that is an inherent part of the overall tower ladder and ladder platforms system design. Use only the hardware provided by and specified by Brownie. Do not replace this hardware with different hardware, including those that might by specification appear to be of equivalent design or strength. If additional bolts or nuts are required for any reason (e.g. replacement/repair or insufficient supply during construction), contact your Brownie dealer.

^ AISC — American Institute of Steel Construction (www.aisc.org)

5. Warranty

Brownie (the **Company**) makes the following warranty to the initial retail purchaser of its products (the **Customer**).

Materials and Workmanship

The Company warrants products manufactured by it to be free from defects in materials and workmanship in normal use and service for a period of one (1) year after date of delivery to the Customer.

Company's Obligation and Customer's Exclusive Remedy

The Company's sole obligation and the Customer's exclusive remedy under this warranty is as follows:

If within one (1) year after delivery to the customer the product fails to function properly due to a defect in either materials or workmanship, the Company will at its option, either repair the defective part or replace the defective part with a new or reconditioned part. Labor charges for removing defective parts and installing replacement parts, shipping charges with respect to such parts, and applicable sales and other taxes, if any, shall not be covered by this warranty.

Conditions, Limitations, and Exclusions

There are no warranties or merchantability or fitness for a particular purpose with respect to any product manufactured or sold by the Company. Motors provided by the Company are in most instances warranted by the manufacturer thereof and are not warranted by the Company. The Company shall not be responsible under this warranty or otherwise for personal injury or for Incidental or Consequential Damages, including, without limitation, loss of use and lost profits. This warranty does not apply to defects or damages caused by misuse, improper maintenance, or improper installation of the Company's product or any equipment attached to or used in connection with the Company's product. The Company reserves the right to make changes or improvements to its products without incurring any obligation with respect to previously manufactured products. Field modification of this product without the expressed written permission of the Company constitutes a misuse of the product. The Company shall have no liability under this warranty until payment in full for the product in question has been made by the customer. The foregoing is the sole warranty made by the Company. No one is authorized to make other warranties on behalf of the Company.



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Please include the part number listed on the cover page in your message.
