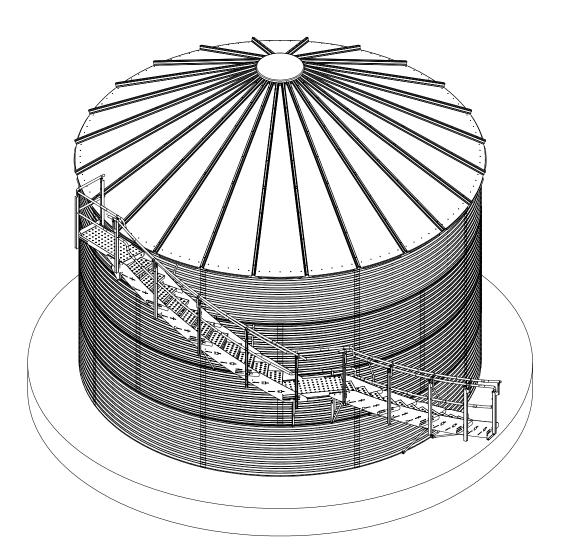


# **Circular Stair**

# Grain Bin Installation and Storage Instructions





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: 198400 R10 Revised: November 2024 Original Instructions

### New in this Manual

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

Description	Section
Updated content to reflect the merged circular stair design of Westeel and MFS.	Various sections

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# **1. Introduction**

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly of this AGI Circular Stair.

Everyone present at the assembly site is required to be familiar with all safety precautions.

Keep this manual available for frequent reference and review it with new personnel. Call your local distributor or dealer if you need assistance or additional information.

# 2. Safety

# 2.1. 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.

DANGER Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.
 WARNING Indicates a hazardous situation that, if not avoided, could result in serious injury or death.
 CAUTION Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.
 NOTICE Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

# 2.2. General Safety Information

Read and understand all safety instructions, safety decals, and manuals and follow them when assembling the equipment.

• Only experienced personnel who are familiar with this type of assembly and installation should perform this work. Untrained assemblers/installers expose themselves and bystanders to possible serious injury or death.



- Do not modify the circular stair in any way or deviate from the instructions in this manual without written permission from the manufacturer. Unauthorized modification or methods 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.
- Contact your local representative or AGI if you need assistance or additional information.
- Always follow applicable local codes and regulations.

Wear steel-toe boots to protect feet from

Wear work gloves to protect your hands

from sharp and rough edges.

### 2.3. Personal Protective Equipment

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

**Steel-Toe Boots** 

Work Gloves

falling debris.

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.

# 2.4. 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.

# 2.5. 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.

# **3. Before You Begin**

## 3.1. Site and Assembly

Unless otherwise specifically provided in writing, AGI does not take responsibility for any defects or damages to any property, or injury to any persons, arising from or related to any site or assembly considerations, including but not limited to:

- Bin location and bin siting
- Soil conditions and corresponding foundation requirements (Note that the examples provided in manuals are for specifically stated soil conditions.)
- Bin assembly (AGI recommends the use of qualified bin installers. Contact AGI for information on installers in your area.)
- Field modifications or equipment additions that affect the bin structure
- Interconnections with neighboring structures
- Have the builder make all non-bin equipment in excess of AGI's recommendations. All such equipment including: LEGS, WALKWAYS, SPOUTING, and CONVEYORS must be self supporting.
- Compliance with all applicable safety standards, including but not limited to fall restraint systems (ladders or other systems). Contact local safety authorities as the standards vary between jurisdictions.

### **3.2.** Critical Assembly Requirements

To ensure a successful, safe and reliable outcome you must comply with the following assembly techniques and practices:

- 1. Comply with all local code and jurisdictional requirements applicable to your circular stair installation.
- 2. Make sure that the proper hardware is utilized for all bolted connections. If a shortage occurs, do not substitute. Take the necessary steps to obtain the proper hardware. Make sure nuts are tightened to the required torque values as specified in the appropriate assembly manual.
- 3. Comply with all assembly instructions provided in the appropriate assembly manual to make sure your whole circular stair is constructed safely.

### 3.3. Product Storage

If you won't be assembling the bin right away, store the bundles and boxes inside a building with good ventilation to prevent white or red rust from forming.

### Note

White rust can be removed and does not cause permanent damage.

### NOTICE

Red rust causes permanent structural damage.

Do not assemble any part containing red rust.

If you can't store the bundles and boxes inside, follow the instructions below for outdoor storage.

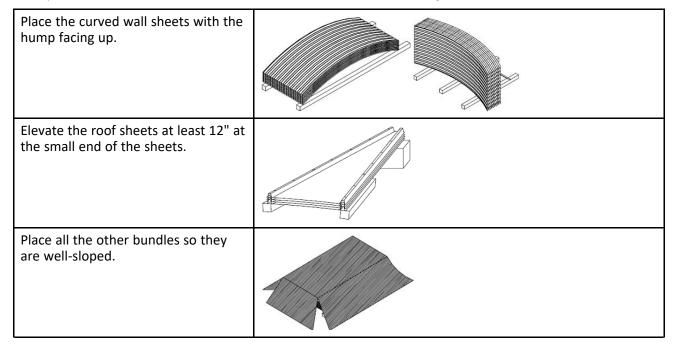
### **Storing Bin Bundles and Boxes Outdoors**

**Required Materials:** 

- Wood blocks
- Waterproof tarp

Storage Procedure:

1. First, place the bundles and boxes on wood blocks about 6"-8" off the ground.



2. For the bin boxes, ladder boxes, and hardware boxes: build a simple framework to support, cover with a waterproof tarp, and secure.

### Note

The boxes are not waterproof and will deteriorate in normal weather conditions, allowing moisture to contact the parts inside.

### If Parts Become Wet

- 1. Open the bundles as soon as possible.
- 2. Separate and dry the bin sheets or parts. Keep the parts separated until assembly.

# ▲ WARNING Risk of injury or damage.

Brace parts securely to avoid damage or injury from material falling when in storage.

- 3. Dry any boxed parts that are wet and store them in a new, dry box.
- 4. After drying the wall sheets, apply a food-grade oil with a clean, lint-free cloth.

### Note

Applying oil will help prevent moisture to contact with the dried wall sheets.

# **WARNING** Risk of slipping.

Do not use oil on roof sheets, ladders, or other parts where a person may walk or stand after the bin is assembled.

### 3.4. Important Notes

- AGI does not provide a foundation design for this product, and is not liable for any damages or injuries related to inadequately designed or constructed foundations. Customers must contract professional services for all foundation design and construction work.
- Contact local power officials for minimum power line clearance.
- See Section 3.2 Critical Assembly Requirements on page 7 for mandatory siting and assembly requirements.
- Tighten all bolts to the recommended torque settings.

# **4. Preparation**

# 4.1. Check the Shipment

Unload the parts at the assembly site and compare the packing slip to the shipment. Ensure that all items have arrived and that none are damaged.

Report damaged parts or shortages immediately to your Dealer. The Dealer will order any replacement parts immediately to ensure that assembly will not be held up by missing parts. All parts will be charged for and credit will be issued by party at fault. No credit will be issued if freight bills are signed as received in good condition.

# 4.2. List of Tools and Equipment

Use quality tools and equipment. Use them safely, and correctly, for their intended use. Tools for this application should include:

### Tools

- Electric or pneumatic (air) impact tools
- Power drill and drill bits
- Sockets (multiple 9/16" and 1/2" sockets recommended)
- Large-pocket carpenter pouch
- 8" (20 cm) metal punches (for aligning bolt holes)
- Step and extension ladders, construction grade
- 6-point wrenches (Imperial, box end)
- Metal-cutting saw suitable for cutting handrails
- Scaffolding

### **Minimum Recommended Safety Equipment**

- A properly-stocked first-aid kit
- Eye, foot, head, and hand protection (safety glasses, steel-toed boots, hard hat, work gloves)
- Cable, chain, or rope to tie-off bin or jacks in case of wind
- Body harness and lifeline (for use where falling hazard exists)
- Ground fault interrupt protected electrical hook-ups

# 4.3. Order Optional Equipment

Optional equipment such as block-off gate, self-closing gate, etc., should all be on site and checked before assembly starts. Plan your installation in advance. For details, see assembly instruction supplied with optional equipment.

### 4.4. Stair Location Planning

Planning the location of the circular stairs relative to the other grain bin features is important. It is important that all components of the grain bin be properly located to maximize their efficiency and effectiveness. It is also important to plan grain bin locations relative to other grain bins. These locations should be considered before the foundation is poured. Double-check desired locations of the inspection hatch, roof ladder or stairs, platforms, walkways, fans and/or heaters, unload system, venting equipment, and side entry door.

The stairs are designed to be installed using existing wall sheet holes as installation pickup points. The few exceptions to this are noted in the installation instructions. The circular stairs are also designed to be installed in either direction. Therefore, once the starting position at the top of the bin is designated, the stairs can progress down to the right, or down to the left, which ever is preferable.

The stairs are assembled in half-tier increments. Each half tier progresses a total of three standard 9 <sup>3</sup>/<sub>8</sub>" wall sheet hole spacings around the bin. The top platform, and rest platforms, also span three standard 9 <sup>3</sup>/<sub>8</sub>" wall sheet hole spacings. Since there are a total of twelve standard 9 <sup>3</sup>/<sub>8</sub>" hole spacings per wall sheet, it takes a combination of two full vertical tiers of circular stairs, or three half-tier sections and a platform section, to progress the equivalent of one full wall sheet around the bin.

### Note

Toward the bottom of larger bins, the horizontal wall sheet hole spacing may decrease to 4 11/16". In this case the number of hole spacings per half stair section, or platform, would double to six.

Uprights (on stiffened bins) and vertical wall sheet seams, create the need for special consideration as it is wise to avoid these locations. This is relatively easy to do since uprights are spaced at six standard wall sheet hole locations, as are vertical seams (both which are multiples of three). Therefore when starting the circular stair at the top of a stiffened bin, it is suggested to use any of the horizontal wall sheet seam holes that are not a stiffener location, or a vertical wall seam location. On non-stiffened bins, the vertical wall seams are the only consideration. Once started properly, the balance of the circular stair should proceed without any interference with either stiffener, or wall sheet seams.

The top platforms can be located at a full tier height location (which is aligned with the horizontal wall sheet seams) or at a half tier height location (which is located midway between the horizontal wall sheet seams).

- Align the top platform with the roof ladder or stairs, or the inspection hatch (subject to owner's preference).
- Locating the top platform at the eave may be preferable if accessing a roof stair, or roof ladder.
- Locating the top platform at the mid-tier location may be preferable if accessing the inspection hatch. A shortened ladder section, or step, can be used to access the roof ladder.

Rest platforms are located at full tier height locations only (i.e. aligned with the horizontal wall sheet seams).

#### Note

All circular stair installation details contained within this manual are provided as if the circular stairs are installed on a 24' bin and are spiralling down the bin from the top platform in a counter-clockwise direction. The circular stairs are also designed to spiral down the bin in a clockwise direction. This is not illustrated.

The figure below shows a suggested typical layout. Fan, heater, and transition should be placed directly opposite unload auger.

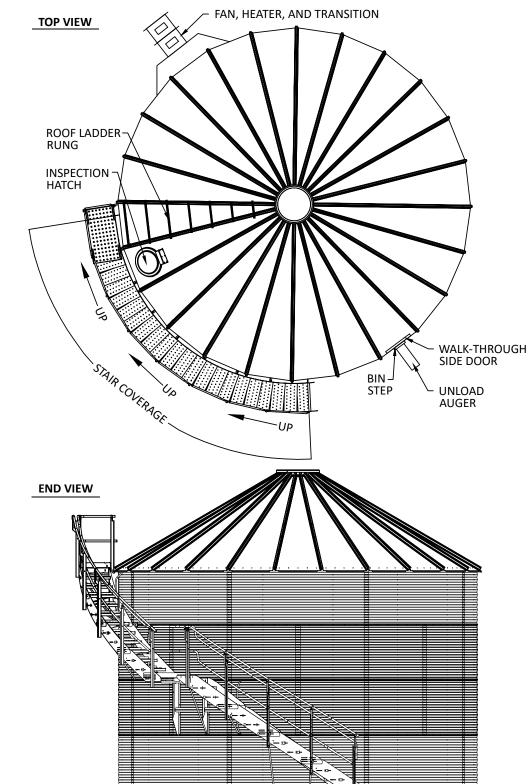
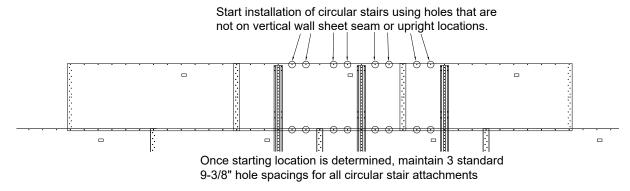


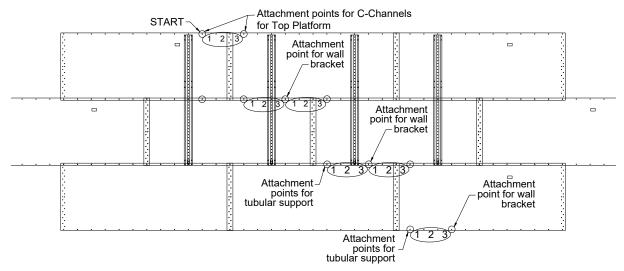
Figure 1. Circular Stair Coverage (2404 bin example)

Refer to the following figures and tables to plan Circular Stair layout.

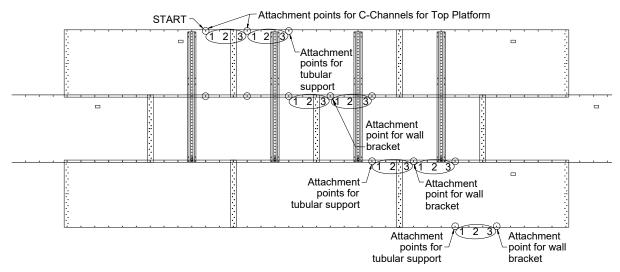
### Figure 2. Attachment Points for Circular Stair Installation











### Note

The following tables do not account for rest platforms. If rest platforms are being installed you must add 3 to the amount of 9-3/8" bolt spaces.

# of Tiers	Tier Height <sup>1</sup>	9-3/8" Bolt Spaces <sup>2</sup>	Horizontal Distance <sup>3</sup>	
			ft - in	meters
3	11' 0"	18	14' 3/4"	4.29
4	14' 8"	24	18' 9"	5.72
5	18' 4"	30	23' 5-1/4"	7.14
6	22' 0"	36	28' 1-1/2"	8.57
7	25' 8"	42	32' 9-3/4"	10.00
8	29' 4"	48	37' 6"	11.43
9	33' 0"	54	42' 2-1/4"	12.86
10	36' 8"	60	46' 10-1/2"	14.29
11	40' 4"	66	51' 6-3/4"	15.72
12	44' 0"	72	56' 3"	17.15
13	47' 8"	78	60' 11-1/4"	18.57
14	51' 4"	84	65' 7-1/2"	20.00
15	55' 0"	90	70' 3-3/4"	21.43
16	58' 8"	96	75' 0"	22.86

Table 1. Circular Stair Running Distance for Platform at Mid-Tier Location — Farm

1. Tier height based on 44" distance between horizontal seams on a wall sheet.

2. Based on twelve 9-3/8" horizontal bolt spaces per wall sheet.

3. Horizontal distance measured around grain bin from platform's rear support to front of bottom tread.

# of Tiers	Tier Height <sup>1</sup>	9-3/8" Bolt Spaces <sup>2</sup>	Horizontal Distance <sup>3</sup>	
			ft - in	meters
3	11' 0"	21	16' 4-7/8"	5.00
4	14' 8"	27	21' 1-1/8"	6.43
5	18' 4"	33	25' 9-3/8"	7.86
6	22' 0"	39	30' 5-5/8"	9.29
7	25' 8"	45	35' 1-7/8"	10.72
8	29' 4"	51	39' 10-1/8"	12.14
9	33' 0"	57	44' 6-3/8"	13.57
10	36' 8"	63	49' 2-5/8"	15.00
11	40' 4"	69	53' 10-7/8"	16.43
12	44' 0"	75	58' 7-1/8"	17.86
13	47' 8"	81	63' 3-3/8"	19.29
14	51' 4"	87	67' 11-5/8"	20.72
15	55' 0"	93	72' 7-7/8"	22.15
16	58' 8"	99	77' 4-1/8"	23.57

 Table 2.
 Circular Stair Running Distance for Platform at Eave Location — Farm

1. Tier height based on 44" distance between horizontal seams on a wall sheet.

2. Based on twelve 9-3/8" horizontal bolt spaces per wall sheet.

3. Horizontal distance measured around grain bin from platform's rear support to front of bottom tread.

# **5. Assembly**

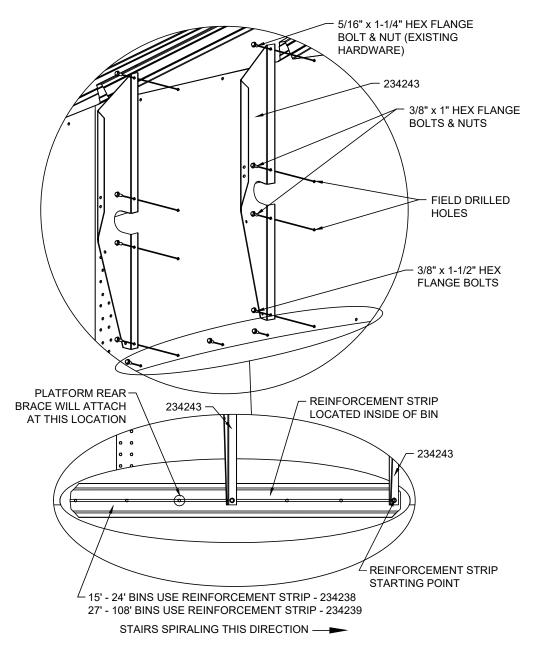
### 5.1. Assembly Safety

### • Do not take chances with safety. The components can be large, heavy, and hard to handle. Always use the proper tools, rated lifting equipment, and lifting points for the job.

- Do not stand on, under, or near any component that is not secured.
- Carry out assembly in a large open area with a level surface.
- Always have two or more people assembling the circular stair.
- Make sure you have sufficient lighting for the work area.
- Tighten all fasteners according to their specifications. Do not replace or substitute bolts, nuts, or other hardware that is of lesser quality than the hardware supplied by the manufacturer.
- Stay away from overhead power lines and other obstructions during assembly. Contact with power lines can cause electrocution.
- Do not work in high winds.
- The equipment shall be installed in accordance with applicable local codes and regulations.

# 5.2. Top Platform at Mid-Tier Location

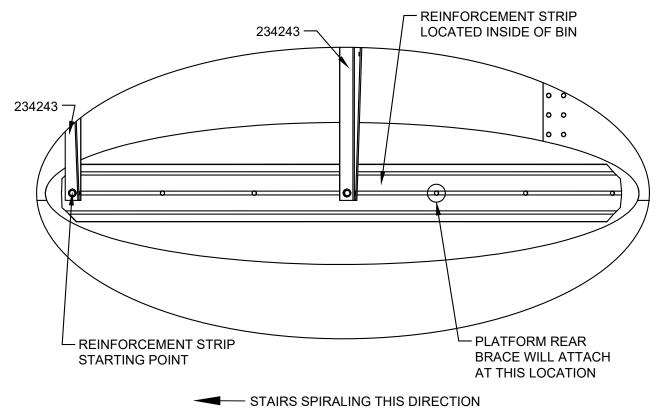
### Figure 5. C-Channel Brace Installation



**For stairs spiraling counter-clockwise down the bin and viewing the bin from the outside:** Align the right-most hole of the reinforcement strip with the platform's leading channel support. The other six holes in the reinforcement strip will be to the left and share bolt holes with the platform's rear channel support and platform's rear brace attachment.

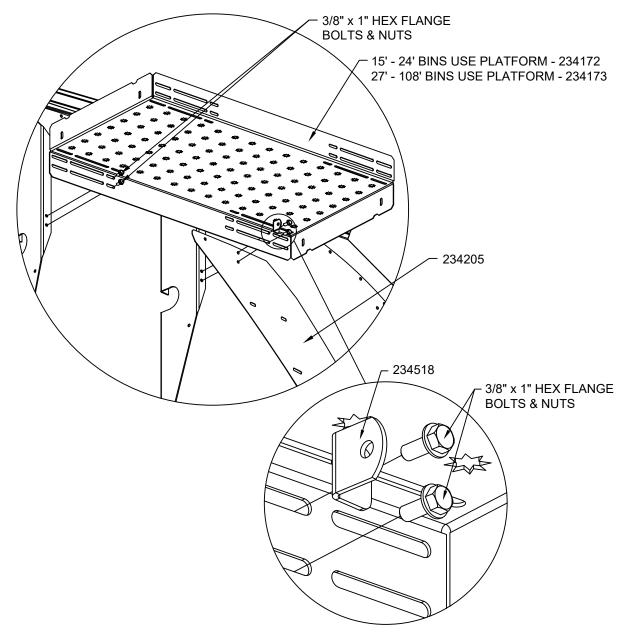
### Note

When installing the Reinforcement Strip, it may overlap holes in the vertical seams of the wall sheets. Holes may need to be field drilled in the Reinforcement Strip at these locations.



### Figure 6. Reinforcement Strip Installation & Orientation for Stairs Spiraling Clockwise

**For stairs spiraling clockwise down the bin and viewing the bin from the outside:** Align the left-most hole of the reinforcement strip with the platform's leading channel support. The other six holes in the reinforcement strip will be to the right and share bolt holes with the platform's rear channel support and platform's rear brace attachment.



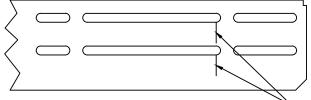
### Figure 7. Platform and Inner Stringer Installation

27' - 108' PLATFORM - 234173



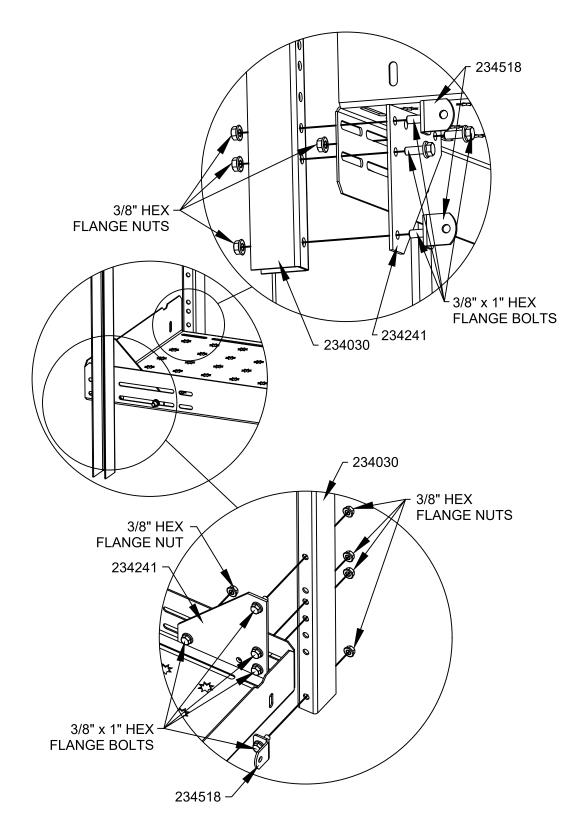
ENGRAVED DASH MARKS SHOW THE ATTACHMENT POINT FROM THE LEADING EDGE OF THE PLATFORM TO THE LEADING CHANNEL SUPPORT

15' - 24' PLATFORM - 234172

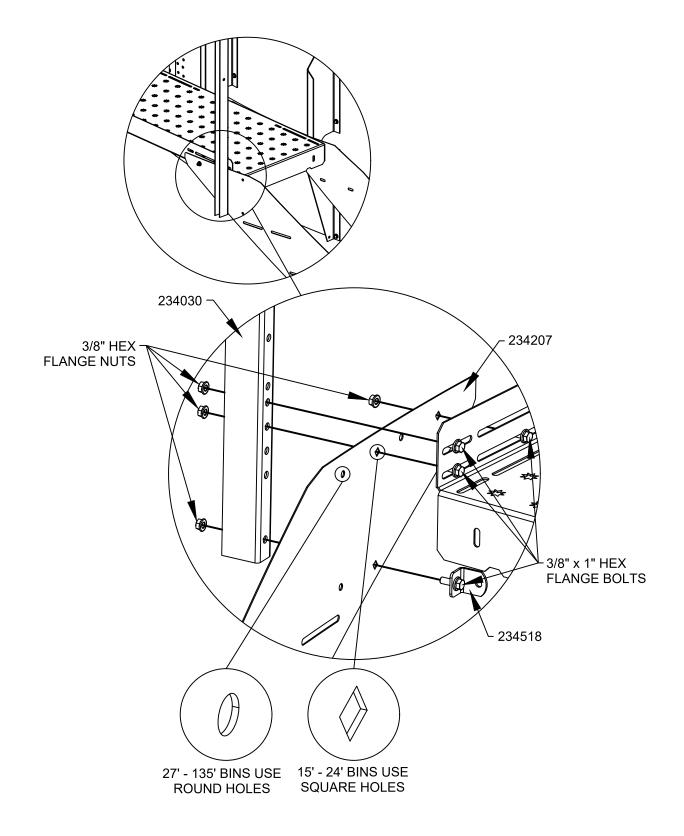


ENGRAVED DASH MARKS SHOW THE ATTACHMENT POINT FROM THE LEADING EDGE OF THE PLATFORM TO THE LEADING CHANNEL SUPPORT

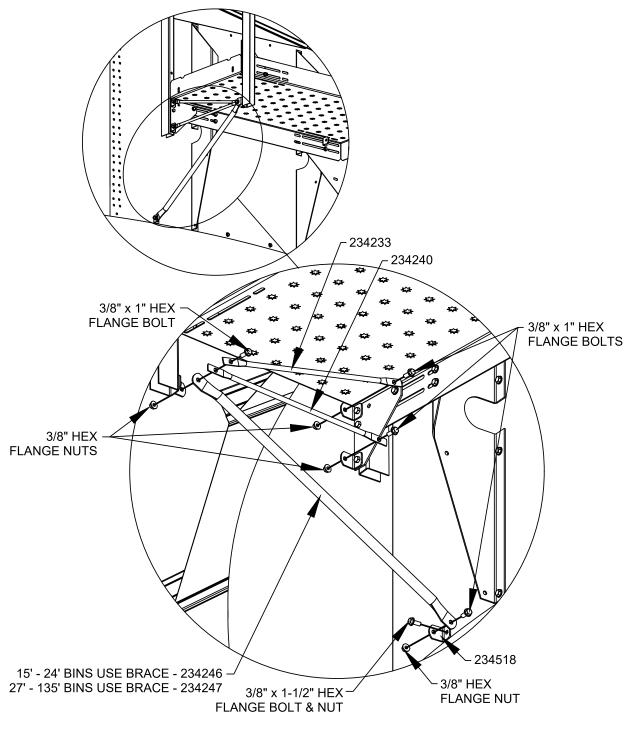
### Figure 8. Rear Handrail Posts Installation



### Figure 9. Handrail Post and Outer Stringer Installation



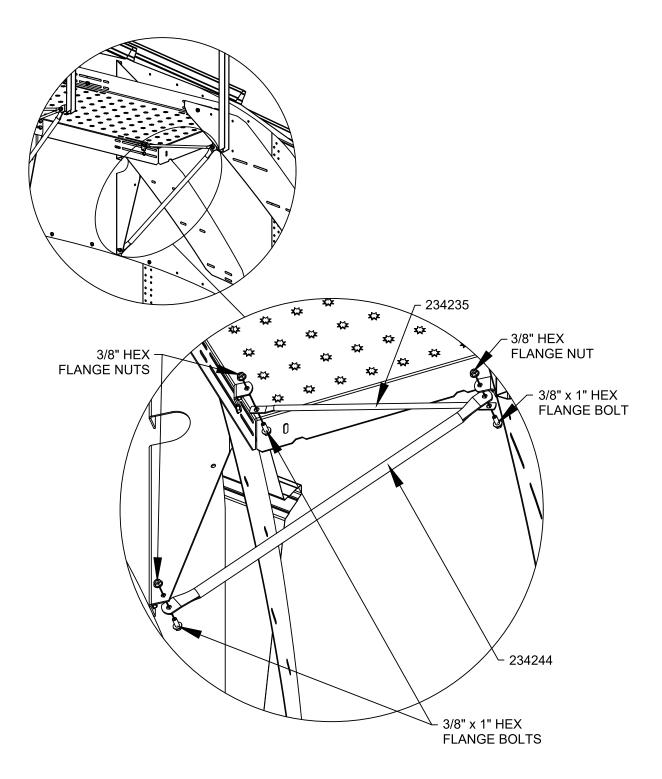


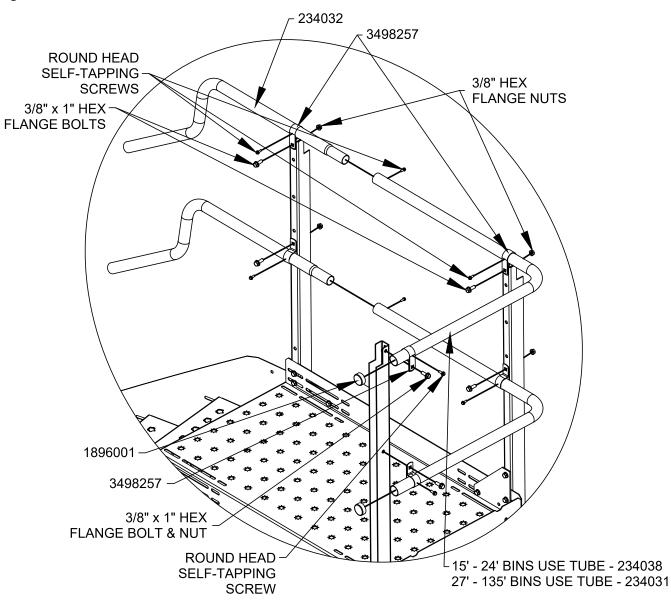


### Note

Install 234518 one bolt hole over from the C-Channel (234243).

Figure 11. Platform Front Tubing Braces Installation





#### Figure 12. Handrail Installation

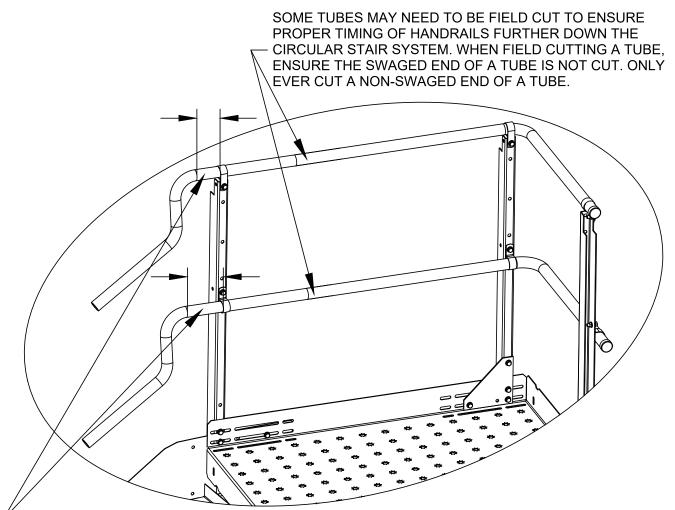
#### Note

- For easier installation, slide 3498257 onto tubes before attaching them to the posts.
- Ensure round head self-tapping screws are installed 1" from the open end of the handrails to ensure they secure the swaged section.

### Important

Do not install self-tapping screws until entire handrail system is installed. Some handrails may need to be cut down to ensure proper fit-up.

### Figure 13. Handrail Timing Considerations

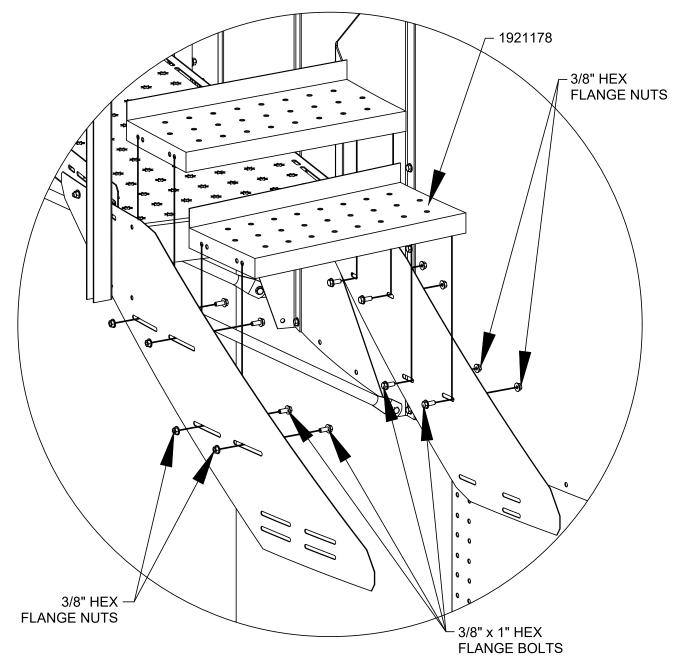


<sup>2</sup> TO ENSURE PROPER TIMING OF HANDRAILS FURTHER DOWN THE CIRCULAR STAIR SYSTEM, TIME THE DISTANCE FROM THE CORNER OF 234032 TO THE FRONT EDGE OF 3498257 AS PER THE FOLLOWING DIMENSIONS:

15' - 24' BINS: UPPER 234032 - 3" - 4" & LOWER 234032 - 5" - 6"

27' - 135' BINS: UPPER 234032 - 1" - 3" & LOWER 234032 - 3" - 5"

### Figure 14. Stair Tread Installation

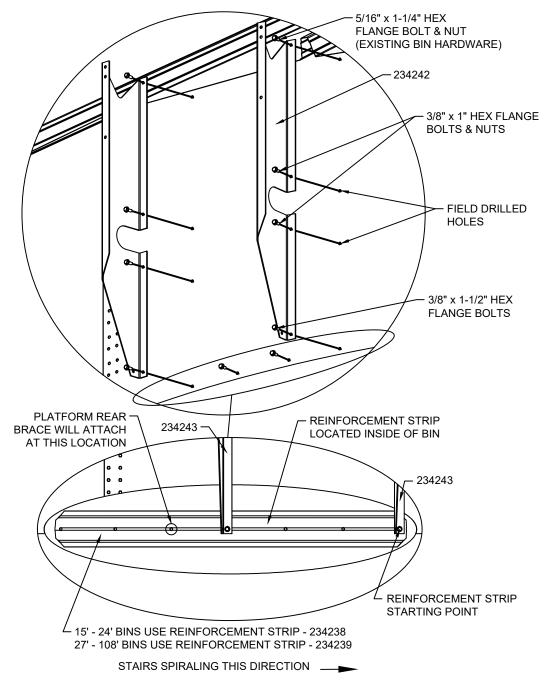


### Note

Ensure the back toe-board of the stair tread is aligned with the front face of the previous stair tread or platform.

### 5.3. Top Platform at Eave Location

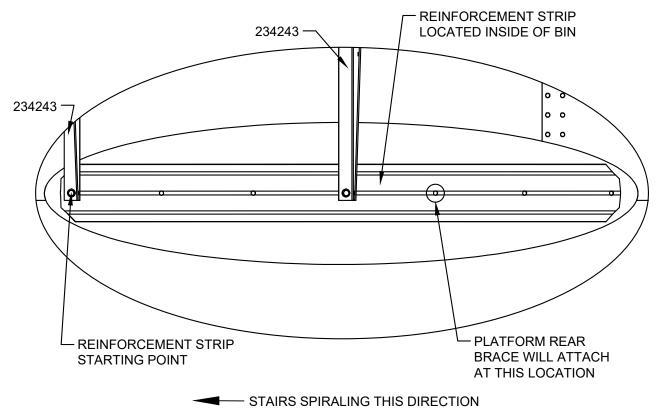
### Figure 15. C-Channel Brace Installation



**For stairs spiraling counter-clockwise down the bin and viewing the bin from the outside:** Align the right-most hole of the reinforcement strip with the platform's leading channel support. The other six holes in the reinforcement strip will be to the left and share bolt holes with the platform's rear channel support and platform's rear brace attachment.

### Note

When installing the Reinforcement Strip, it may overlap holes in the vertical seams of the wall sheets. Holes may need to be field drilled in the Reinforcement Strip at these locations.



### Figure 16. Reinforcement Strip Installation & Orientation for Stairs Spiraling Clockwise

**For stairs spiraling clockwise down the bin and viewing the bin from the outside:** Align the left-most hole of the reinforcement strip with the platform's leading channel support. The other six holes in the reinforcement strip will be to the right and share bolt holes with the platform's rear channel support and platform's rear brace attachment.

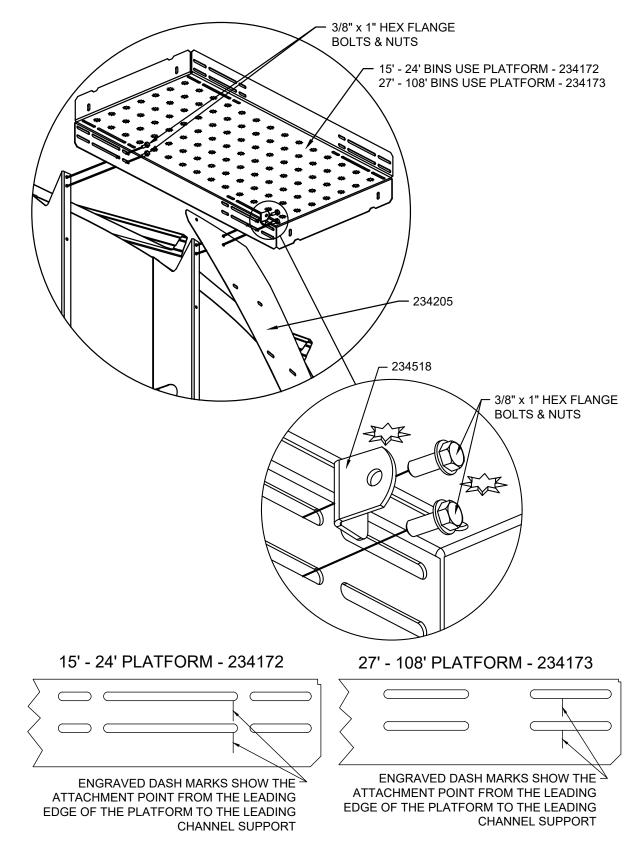
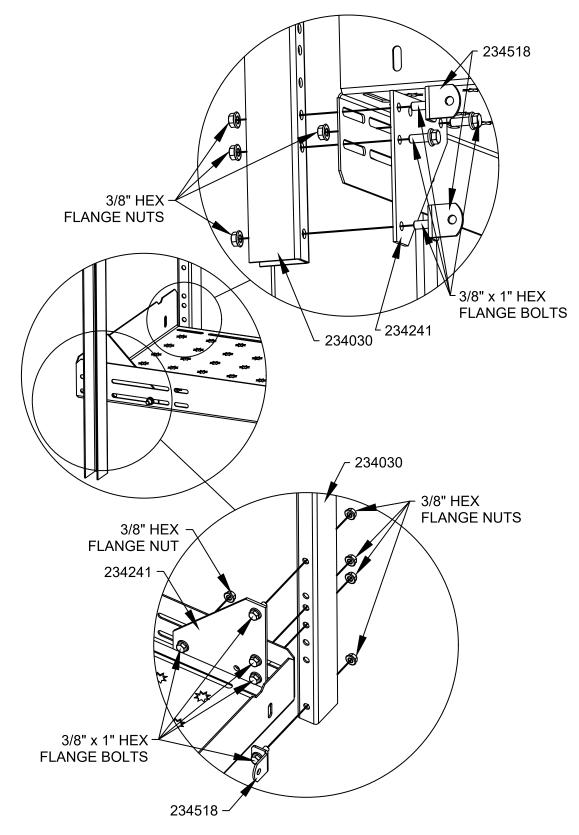
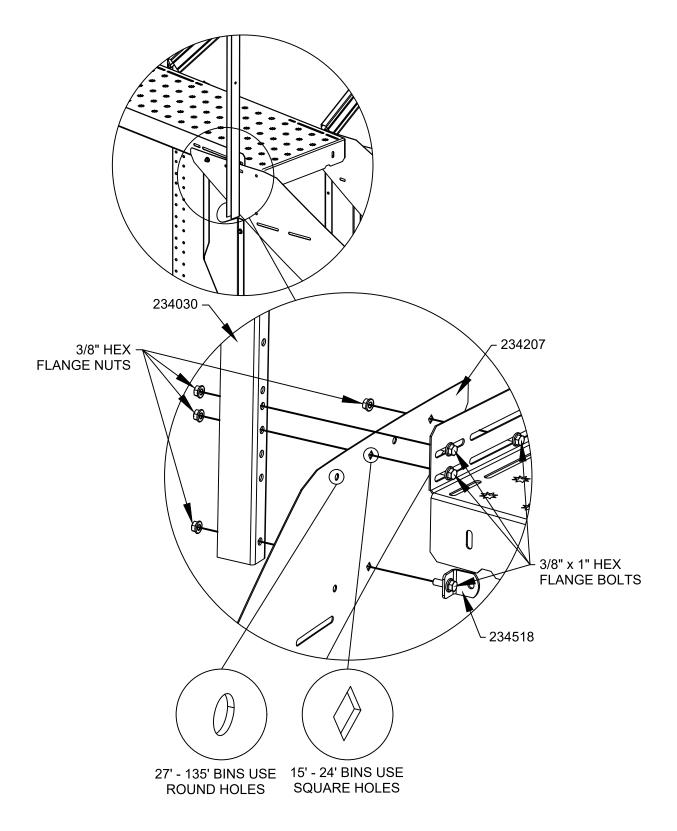


Figure 17. Platform and Inner Stringer Installation

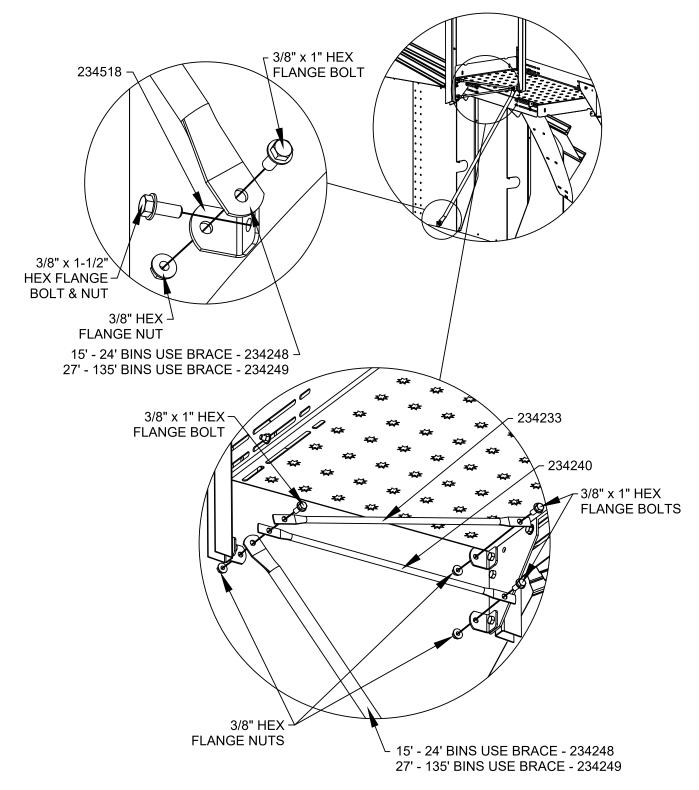
### Figure 18. Rear Handrail Posts Installation





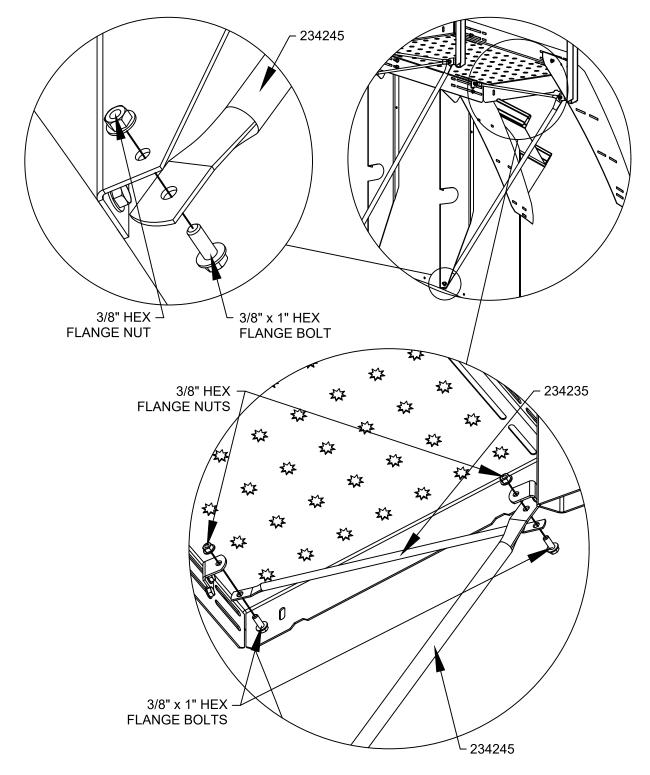






### Note

Install 234518 one bolt hole over from the C-Channel (234243).



### Figure 21. Platform Front Tubing Braces Installation

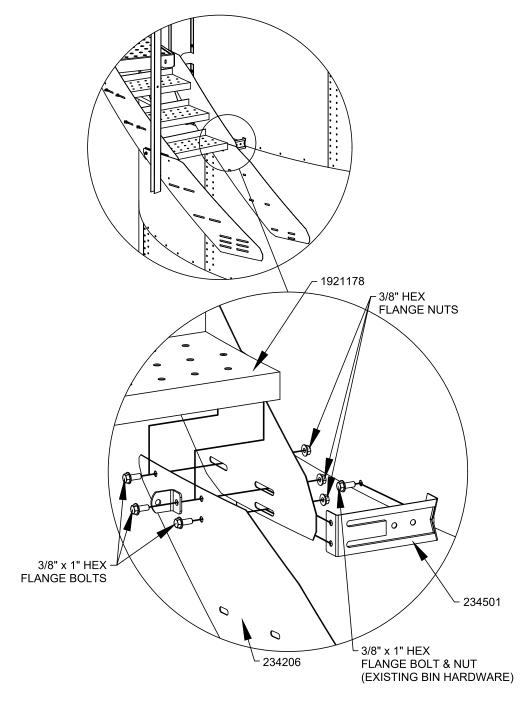
### Note

The rest of the installation of the Top Platform at Eave Location (handrails and treads) is as per the Top Platform at Mid-Tier Location. Some other required parts are supplied with the mating stair modules.

### 5.4. Circular Stair Modules Installation

The circular stair components are supplied in 1, 2 or 3 tier packages. There are two inner and outer stingers, and six stair treads, per tier. The attachment of the first stair section to a platform is provided in the section dealing with platform installations. The assembly of mating single tier circular stair modules is as follows.

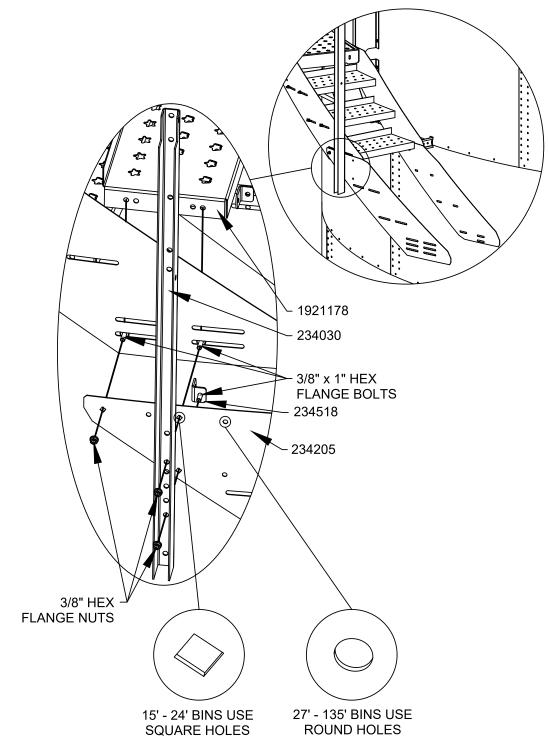
### Figure 22. Inner Stringer and Tread Installation at Horizontal Seam



#### Note

Ensure the back toe-board of the stair tread is aligned with the front face of the previous stair tread or platform.

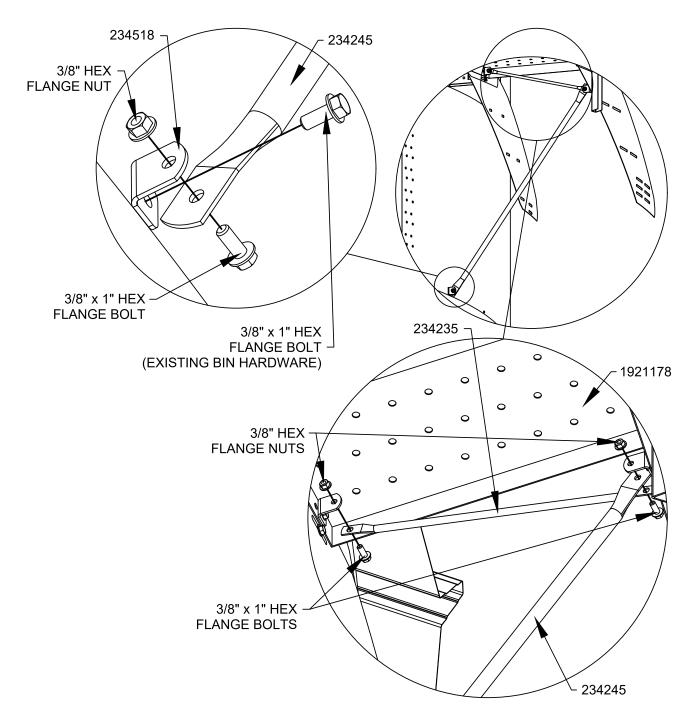
### Figure 23. Handrail Post, Outer Stringer and Tread Installation



#### Note

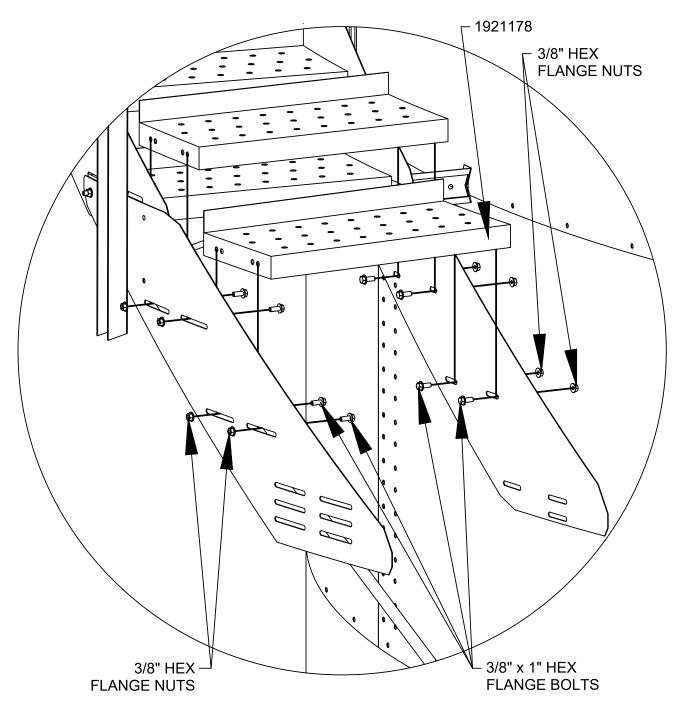
Ensure the back toe-board of the stair tread is aligned with the front face of the previous stair tread or platform.





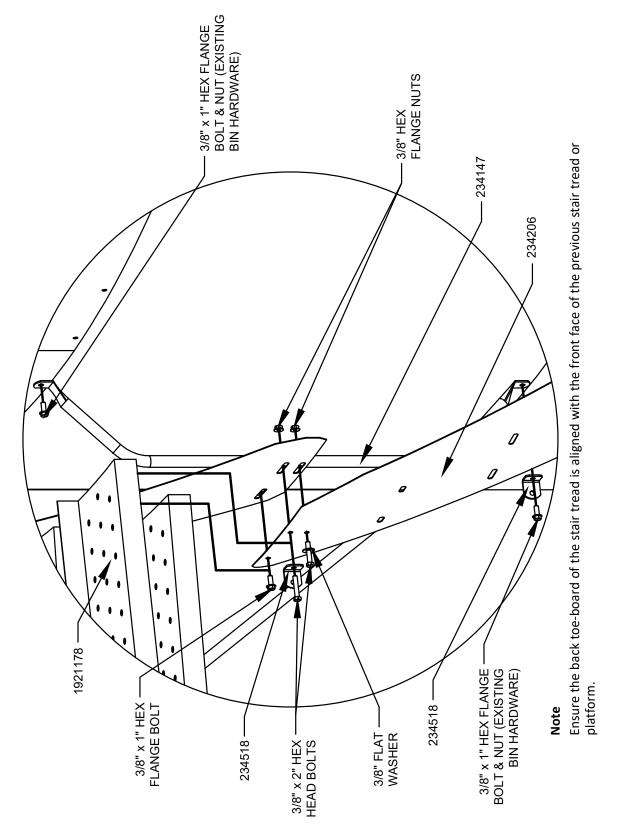
**Note** Attach 234518 at an existing wall sheet bolt hole.

### Figure 25. Stair Tread Installation



#### Note

Ensure the back toe-board of the stair tread is aligned with the front face of the previous stair tread or platform.



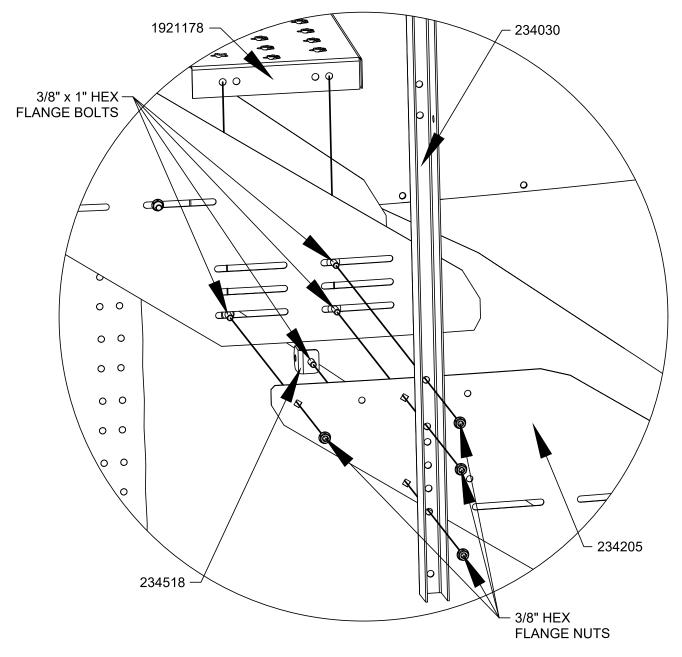


Figure 27. Handrail Post & Outer Stringer Installation

#### Note

Ensure the back toe-board of the stair tread is aligned with the front face of the previous stair tread or platform.

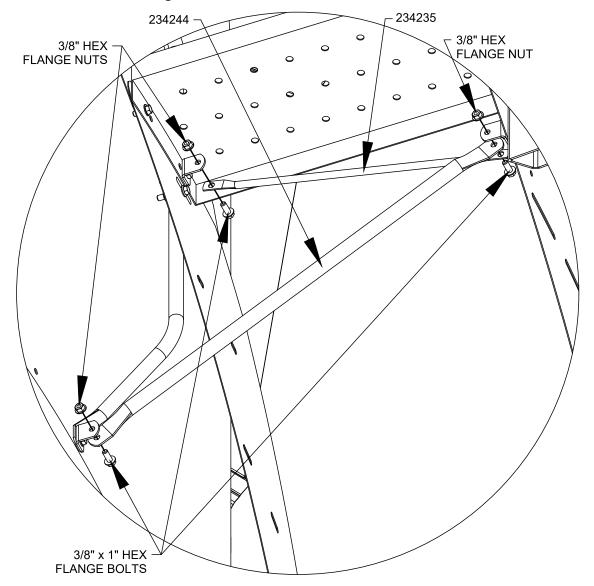
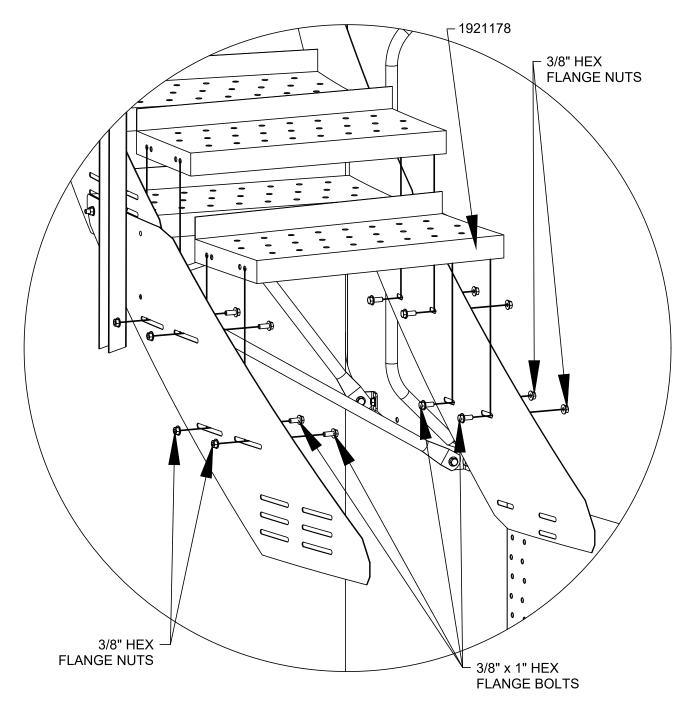


Figure 28. Tread Mid-Tier Tubing Braces Installation

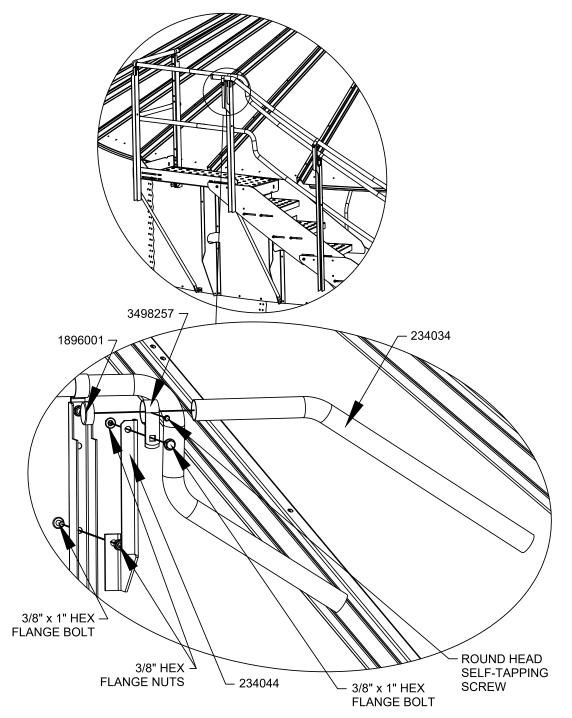
#### Figure 29. Tread Installation



#### Note

Ensure the back toe-board of the stair tread is aligned with the front face of the previous stair tread or platform.

#### Figure 30. Handrail Installation



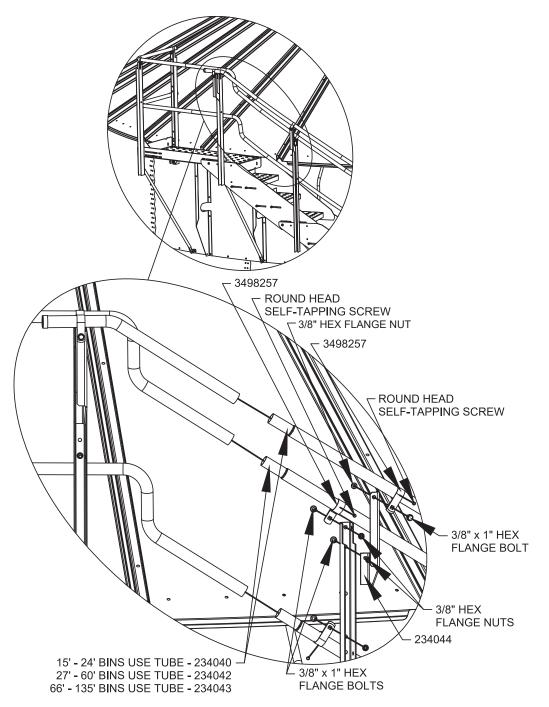
#### Note

- For easier installation, slide 3498257 onto tubes before attaching them to the posts.
- Ensure round head self-tapping screws are installed 1" from the open end of the handrails to ensure they secure the swaged section.

#### Important

Do not install self-tapping screws until entire handrail system is installed. Some handrails may need to be cut down to ensure proper fit-up.

#### Figure 31. Handrail-Guardrail-Midrail Installation



#### Note

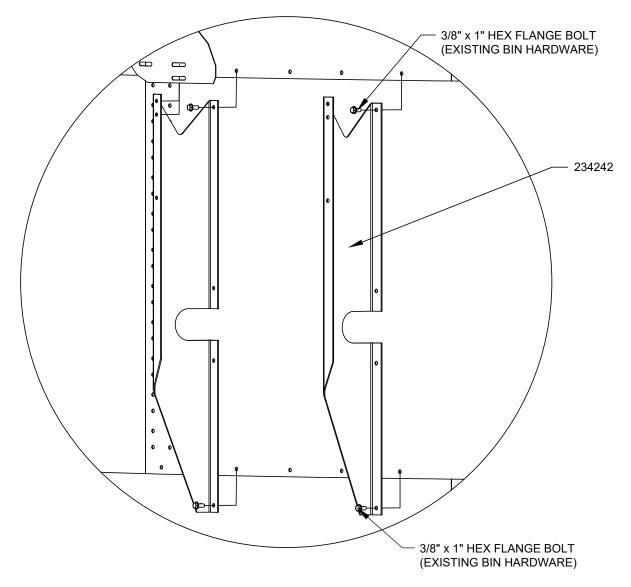
- For easier installation, slide 3498257 onto tubes before attaching them to the posts.
- Ensure round head self-tapping screws are installed 1" from the open end of the handrails to ensure they secure the swaged section.

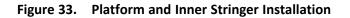
#### Important

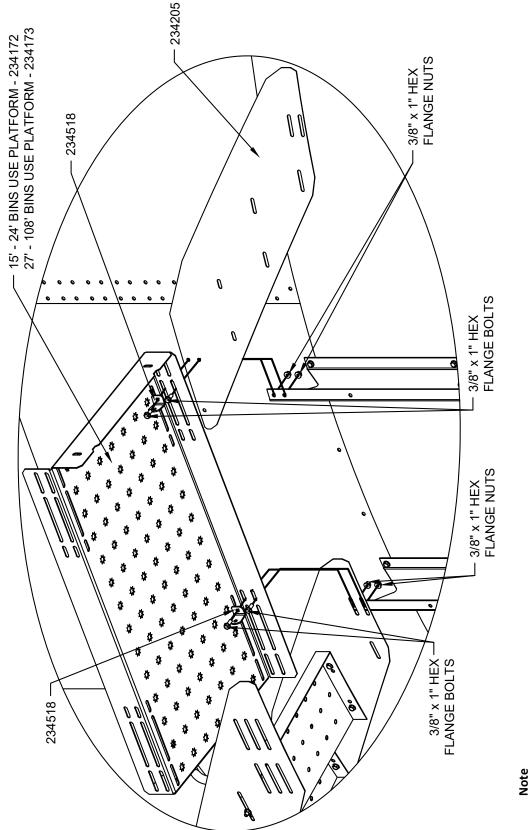
Do not install self-tapping screws until entire handrail system is installed. Some handrails may need to be cut down to ensure proper fit-up.

# 5.5. Rest Platform Installation

#### Figure 32. C-Channel Brace Installation

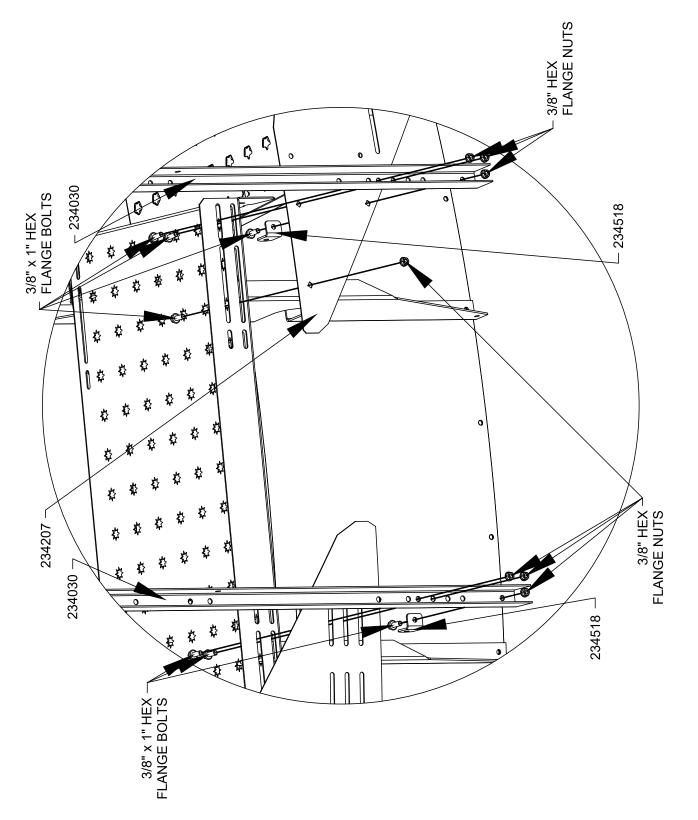




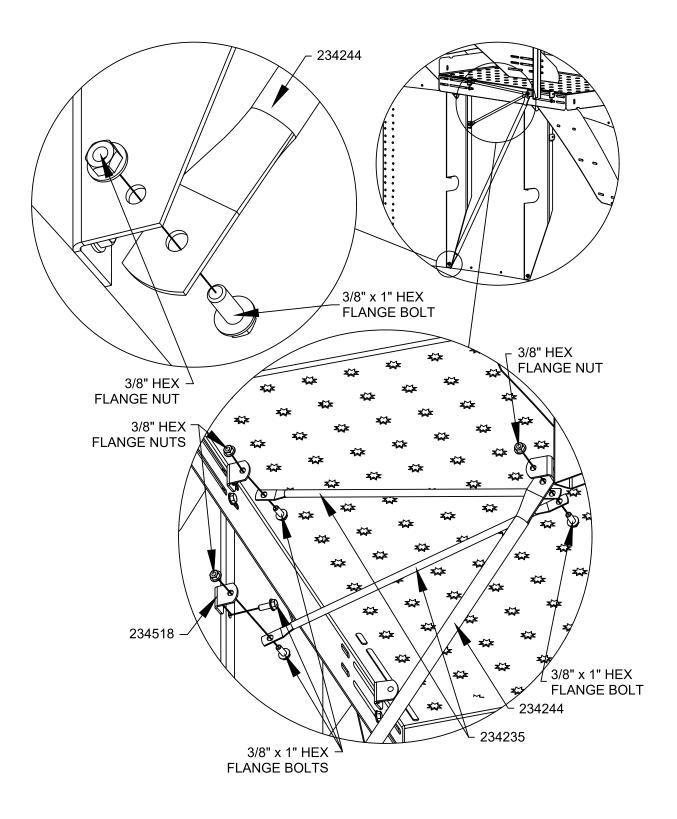


Note The timing of the front edge of the rest platform is the same as the top platform. Refer back to Figure 14 for dimensions.

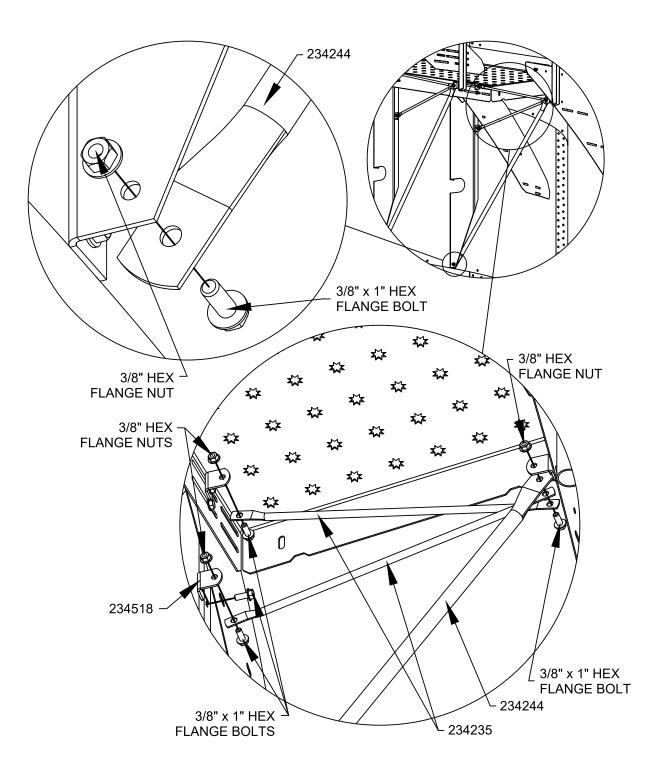
#### Figure 34. Handrail Posts and Outer Stringer Installation

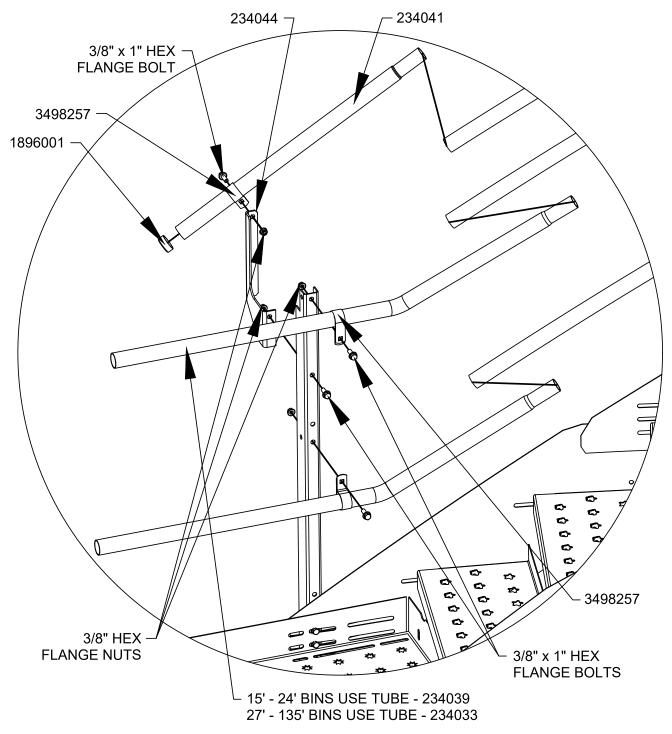










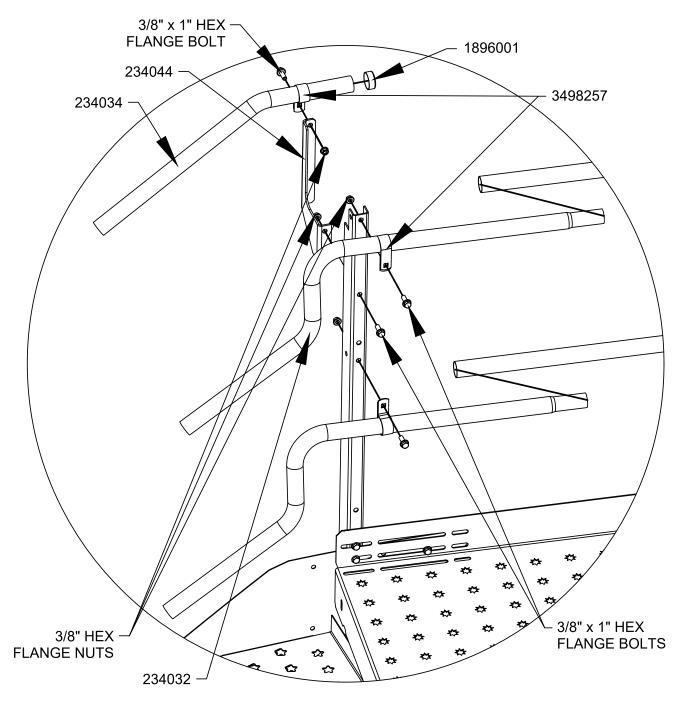


#### Figure 37. Handrail Installation

#### Note

- It may be necessary to field cut and shorten the preceding handrail/guardrail/midrail, in order for the guardrail/midrail for the rest platform to fit.
- For easier installation, slide 3498257 onto tubes before attaching them to the posts.

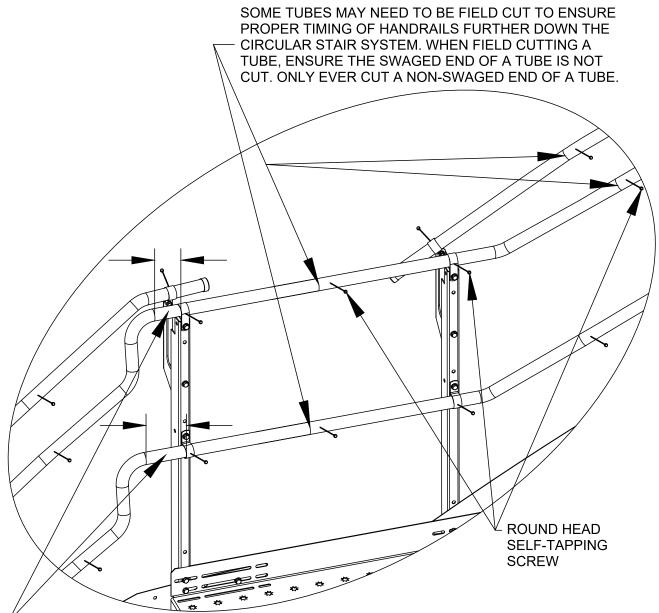




#### Note

For easier installation, slide 3498257 onto tubes before attaching them to the posts.

#### Figure 39. Rest Platform Rail Installation



✓ TO ENSURE PROPER TIMING OF HANDRAILS FURTHER DOWN THE CIRCULAR STAIR SYSTEM, TIME THE DISTANCE FROM THE CORNER OF 234032 TO THE FRONT EDGE OF 3498257 AS PER THE FOLLOWING DIMENSIONS:

15' - 24' BINS: UPPER 234032 - 3" - 4" & LOWER 234032 - 5" - 6"

27' - 135' BINS: UPPER 234032 - 1" - 3" & LOWER 234032 - 3" - 5"

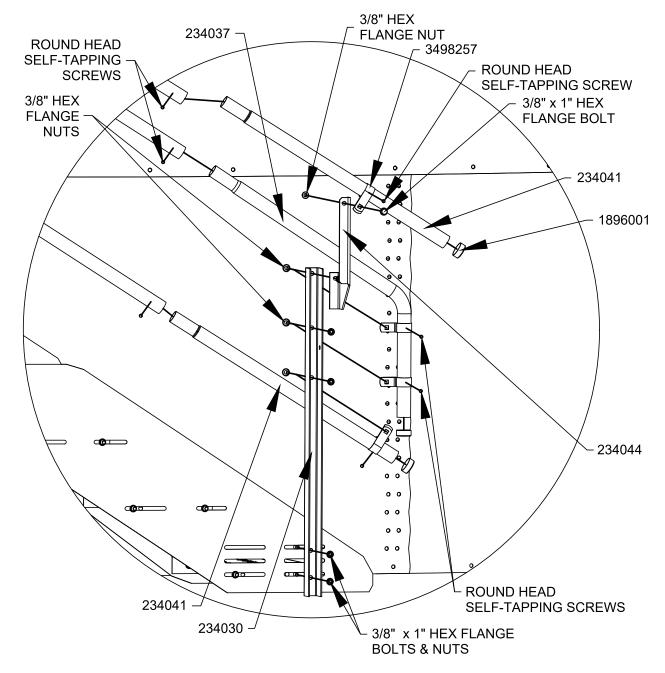
#### Note

Ensure round head self-tapping screws are installed 1" from the open end of the handrails to ensure they secure the swaged section.

#### Important

Do not install self-tapping screws until entire handrail system is installed. Some handrails may need to be cut down to ensure proper fit-up.

### 5.6. Bottom Tier Installation



#### Figure 40. Bottom Handrail Installation

#### Note

- For easier installation, slide 3498257 onto tubes before attaching them to the posts.
- Ensure the round head self-tapping screw is installed 1" from the open end of the handrails after they have been attached to the posts.

#### Important

Do not install self-tapping screws until entire handrail system is installed. Some handrails may need to be cut down to ensure proper fit-up.

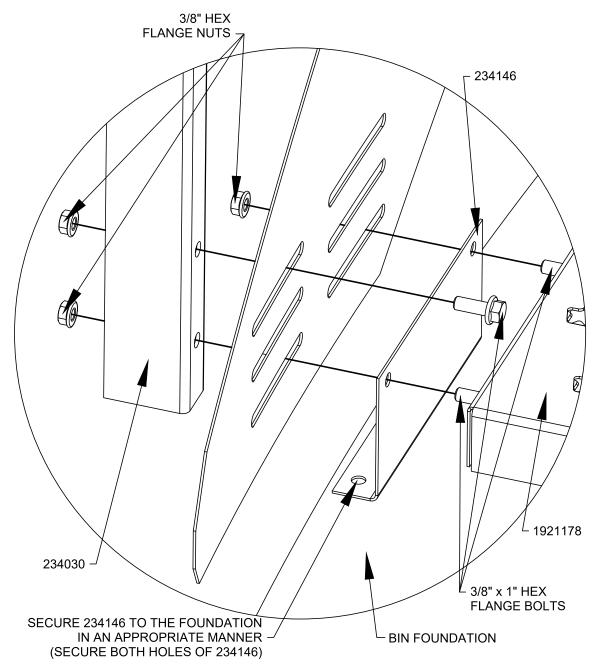
#### **Bottom Tier Support Assemblies**

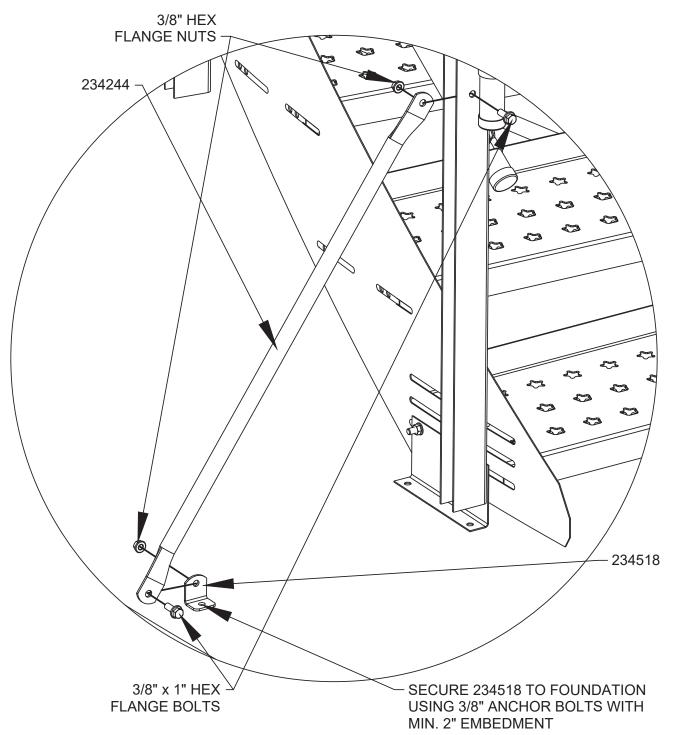
There are two different bottom stair support assemblies that can be used depending on where the outside edge of the foundation ends in comparison to the outside stringer of the circular stairs.

- If the stairs do not overhang the foundation, see 5.6.1 Bottom Tier Stair Support for Stairs not Overhanging the Foundation on page 52.
- If the stairs do overhang the foundation, see 5.6.2 Bottom Tier Stair Support for Stairs Overhanging the Foundation on page 54.

### 5.6.1 Bottom Tier Stair Support for Stairs not Overhanging the Foundation





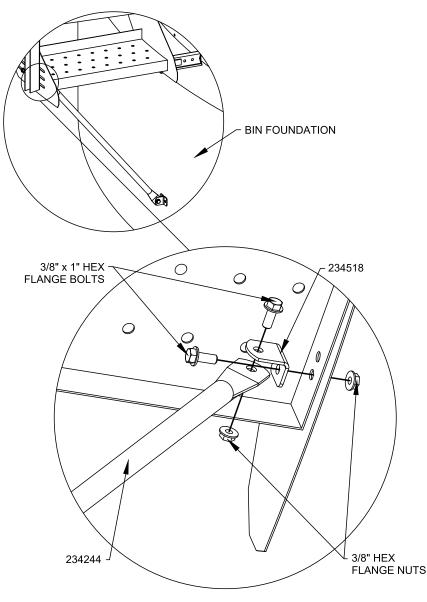


#### Figure 42. Bottom Post Brace For Stairs Not Overhanging the Foundation

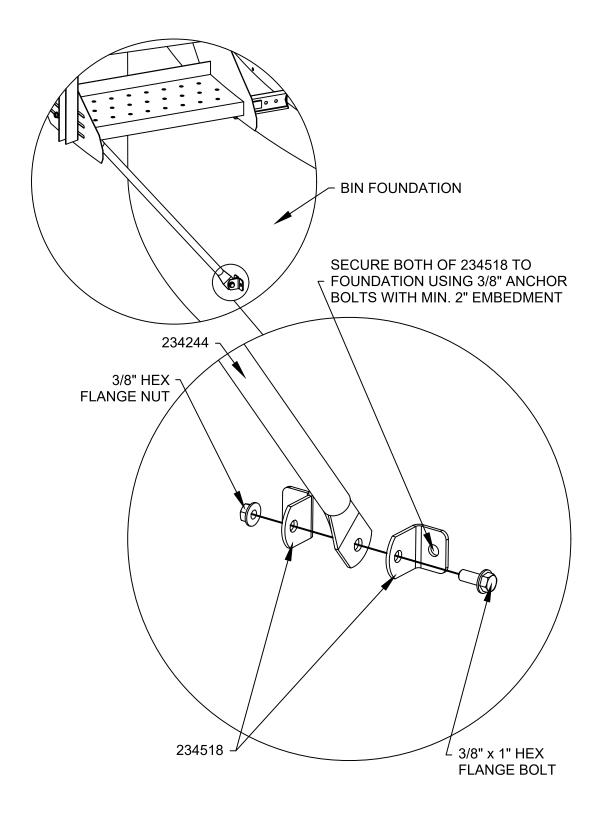
### 5.6.2 Bottom Tier Stair Support for Stairs Overhanging the Foundation

- 1. Attach one end of 234244 to the underside of the bottom tread as shown in Figure 43.
- 2. Attach both of 234518 to the loose end of 234244 as show in Figure 44.
  - a. Swing the loose end of 234244 against the foundation and mark the locations for the anchor bolts.
  - b. Move the loose end away and drill the holes for the anchor bolts.
  - c. Attach the loose end using the anchor bolts and tighten the hardware.
- 3. If 234244 swings lower than the bottom of the foundation, refer to Figure 45 and complete the following instructions.
  - a. Field cut the flat end of 234244 so that it will attach as low on the foundation as possible.
  - b. Field drill a 3/8" hole into 234244, 1" away from the cut end of 234244.
  - c. Follow Step 2 above to attach the field cut end of 234244 to the foundation.

#### Figure 43. Bottom Support for Stairs Overhanging the Foundation







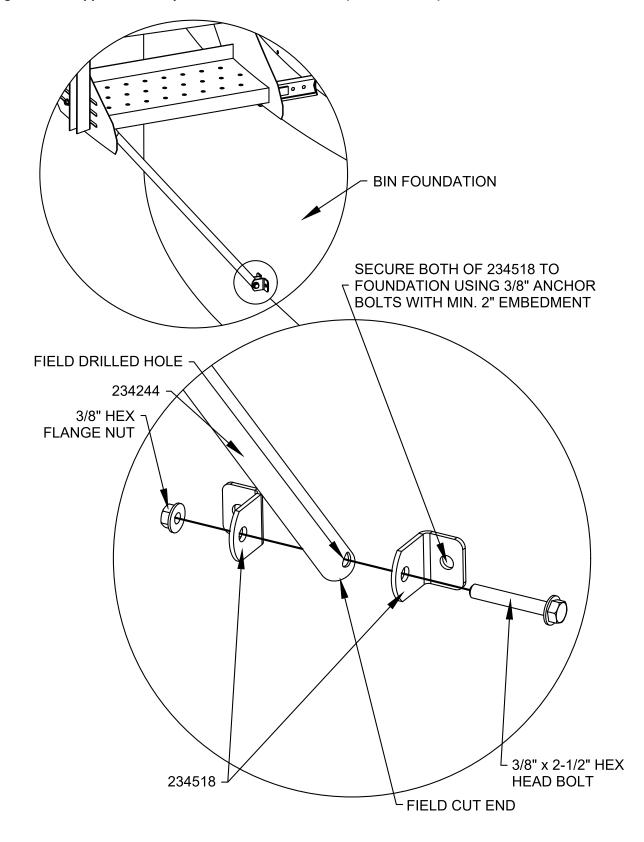


Figure 45. Support Assembly Connection to Foundation (Field Cut Tube)

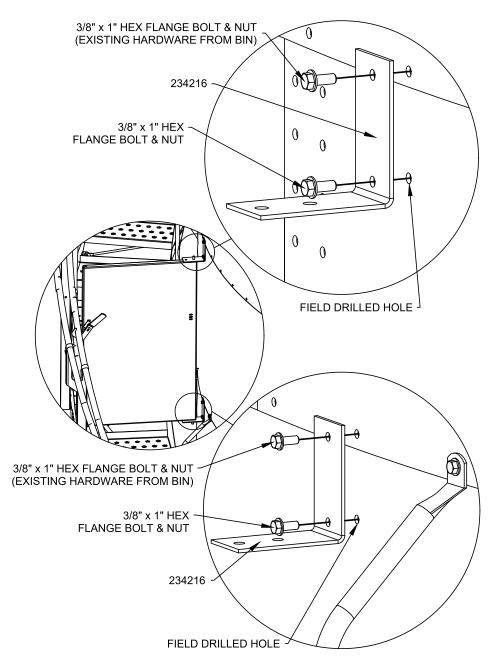
## 5.7. Optional Circular Stair Gates

### 5.7.1 Circular Stair Access Gate

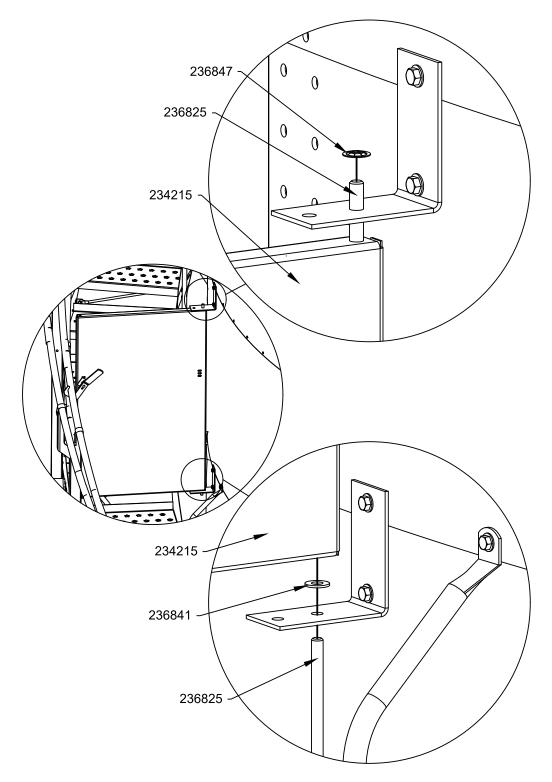
An optional circular stair gate is available to restrict access to the circular stairs and the roof. The Circular Stair Access Gate must be installed on the second half-tier or higher.

- In order for the gate to stay closed, the latch catches onto the hand rail.
- The gate can be locked shut by using a padlock through the matching holes on the latch bracket and the latch.

#### Figure 46. Bracket Installation



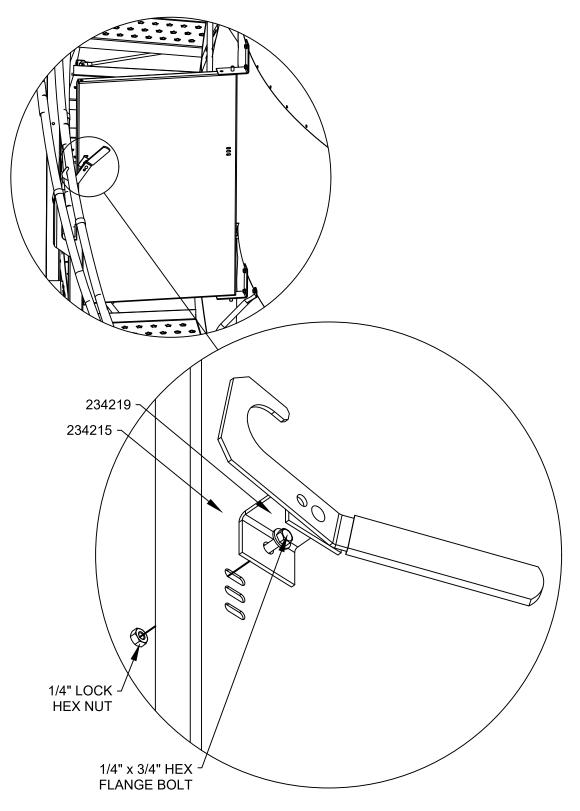
#### Figure 47. Door Pan Installation



#### Note

For easiest installation, install 236825 through the bottom 234216 and continue it up through the top 234216.

#### Figure 48. Latch Installation



#### Note

Handrails not shown for installation clarification.

# 5.8. Circular Stair Optional Support Details on Hoppers

Figure 49. Circular Stair Configuration

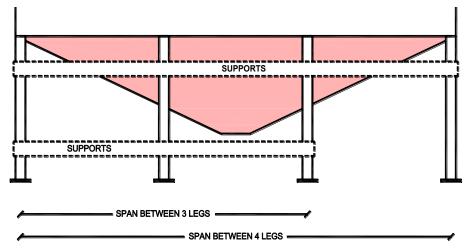
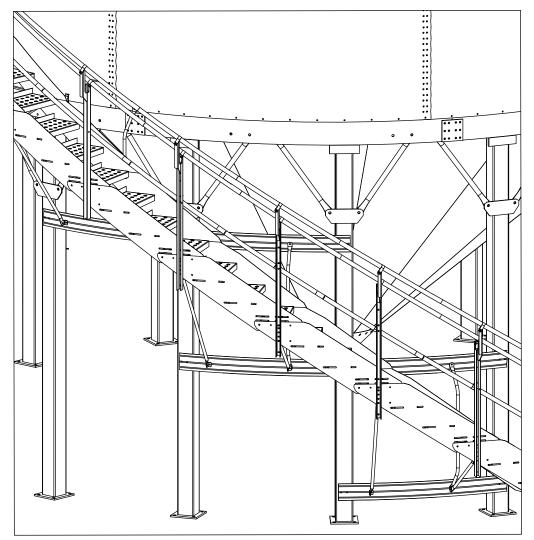


Figure 50. Circular Stair to Hopper Legs Connection



Use the appropriate table to identify the quantity of supports needed to span between hopper legs.

- For spans greater than 60", use two supports, overlapped and connected together with at least two self drilling screws, 3/8" diameter min.
- Ensure enough hopper legs are spanned across with supports to properly attach the circular stairs.
- For every one of 234568 or 234569 purchased, you will also need to purchase four of 297418, 3/8" self-tapping screw.

Hopper Size	# of Legs	Hopper Ht (ft)	Rows of Supports	Needed For Span Between 2 Legs	Needed For Span Between 3 Legs	Needed For Circular Stairs Configu- ration	Curved Stair Packages For Hopper Bottom
				Stiffened S	SK		
15' Dia	10	9.2	3	1	2	6	1x 234753, 1x 234762
18' Dia	12	10.6	3	1	2	6	1x 234756
21' Dia	14	12.1	4	1	2	8	1x 234756, 1x 234762
			AGI W	elded - Nor	-Stiffened		
14' Dia	6	6.6	2	2	4	8	1x 234753
15' Dia	6	7.2	2	2	4	8	1x 234753
15' Dia	7	7.2	2	2	3	6	1x 234753
16' Dia	8	7.8	2	2	3	6	1x 234753
18' Dia	9	8.0	3	2	3	9	1x 234753, 1x 234762
19' Dia	9	8.4	3	2	3	9	1x 234753, 1x 234762
19' Dia	11	8.4	3	2	3	9	1x 234753, 1x 234762
21' Dia	11	9.1	3	2	3	9	1x 234753, 1x 234762
21' Dia	13	9.1	3	2	3	9	1x 234753, 1x 234762
			AGI	Welded - S	tiffened		
18' Dia	12	11.7	3	1	2	6	1x 234756
21' Dia	14	13.2	4	1	2	8	1x 234756, 1x 234762
			AGI	Commercial	Hoppers		
15' Dia	10	9.9	3	1	2	6	1x 234756
18' Dia	12	11.4	3	1	2	6	1x 234756
21' Dia	14	13.0	4	1	2	8	1x 234756, 1x 234762

Table 3. 21' Diameters or Less (Use Support 234569)

Hopper Size	# of Legs	Hopper Ht (ft)	Rows of Supports	Needed For Span Between 2 Legs	Needed For Span Between 3 Legs	Needed For Circular Stairs Configu- ration	Curved Stair Packages For Hopper Bottom
				Stiffened S	SK		
24' Dia	16	11.9	4	1	2	8	1x 234756, 1x 234762
27' Dia	18	13.2	4	1	2	8	1x 234757, 1x 234763
			AGI W	elded - Nor	Stiffened		
24' Dia	12	10.4	3	2	3	9	1x 234756
27' Dia	16	11.8	4	2	3	12	1x 234757, 1x 234763
			AGI	Welded - S	tiffened		
24' Dia	16	14.7	4	1	2	8	1x 234750, 1x 234756
			AGI	Commercial	Hoppers		
24' Dia	16	14.5	4	1	2	8	1x 234750, 1x 234756
27' Dia	18	13.9	4	1	2	8	1x 234751, 1x 234757
30' Dia	20	15.1	4	1	2	8	1x 234751, 1x 234757
33' Dia	22	15.2	5	1	2	10	1x 234751, 1x 234757, 1x 234763
36' Dia	24	16.4	5	1	2	10	1x 234751, 1x 234757, 1x 234763

Table 4. 24' Diameters or Greater (Use Support 234568)

# 6. Appendix

# 6.1. Circular Stair Packages

#### Table 5. Circular Stair Packages

		S	rd 44" tie	ER	2 X	2 X STD 44" TIER			3 X STD 44" TIER			BOTTOM TIER		
		15'-24'	27'-60'	66'-135'	15'-24'	27'-60'	66'-135'	15'-24'	27'-60'	66'-135'	15'-24'	27'-60'	66'-135'	
PART NUMBER	DESCRIPTION	234750	234751	234752	234753	234754	234755	234756	234757	234758	234759	234760	234761	
234147	TUBE BRACE	1	1	1	2	2	2	3	3	3	1	1	1	
234206	STRINGER O/S	2	2	2	4	4	4	6	6	6	2	2	2	
234205	STRINGER I/S	2	2	2	4	4	4	6	6	6	2	2	2	
1921178	STAIR TREAD	6	6	6	12	12	12	18	18	18	8	8	8	
234244	TUBING BRACE 33.88"	1	1	1	2	2	2	3	3	3	2	2	2	
234245	TUBING BRACE 48.94"	1	1	1	2	2	2	3	3	3	1	1	1	
234501	LADDER CLIP	1	1	1	2	2	2	3	3	3	2	2	2	
234146	BOTTOM BRACKET	-	-	-	-	-	-	-	-	-	1	1	1	
234235	PLATFORM POST BRACE	2	2	2	4	4	4	6	6	6	2	2	2	
234518	SUPPORT ARM BRACKET	6	6	6	12	12	12	18	18	18	9	9	9	
234290	EASY STEP LEFT BRACKET	-	-	-	-	-	-	-	-	-	1	1	1	
234291	EASY STEP RIGHT BRACKET	-	-	-	-	-	-	-	-	-	1	1	1	
234030	HANDRAIL POST	2	2	2	4	4	4	6	6	6	2	2	2	
234036	BOTTOM HANDRAIL POST	-	-	-	-	-	-	-	-	-	1	1	1	
234037	HANDRAIL END	-	-	-	-	-	-	-	-	-	1	1	1	
234040	HAND-MID-GUARDRAIL 15'-24'	6	-	-	12	-	-	18	-	-	6	-	-	
234041	GUARD & MID RAIL END	-	-	-	-	-	-	-	-	-	2	2	2	
234042	HAND-MID-GUARDRAIL 27'-60'	-	6	-	-	12	-	-	18	-	-	6	-	
234043	HAND-MID-GUARDRAIL 66'-135'	-	-	6	-	-	12	-	-	18	-	-	6	
234044	GUARDRAIL BRACKET	2	2	2	4	4	4	6	6	6	3	3	3	
M3498257	HANDRAIL POST STRAP	6	6	6	12	12	12	18	18	18	10	10	10	
	HARDWARE BAG	234790	234790	234790	234791	234791	234791	234792	234792	234792	234793	234793	234793	

### Circular Stair Packages (continued)

		STD HALF TIER			TOP PLATFORM & HALF TIER + BOTTOM TIER			TOP PLATFORM & HALF TIER		TOP PLATFORM (FULL TIER)		REST PLATFORM	
		15'-24'	27'-60'	66'-135'	15'-24'	27'-60'	66'-135'	15'-24'	27'-135'	15'-24'	27'-135'	15'-24'	27'-135'
PART NUMBER	DESCRIPTION	234762	234763	234764	234765	234766	234767	234768	234769	234770	234771	234772	234773
234147	TUBE BRACE	-	-	-	1	1	1	-	-	-	-	-	-
234206	STRINGER O/S	1	1	1	2	2	2	-	-	-	-	-	-
234205	STRINGER I/S	1	1	1	3	3	3	1	1	-	-	-	-
1921178	STAIR TREAD	3	3	3	10	10	10	2	2	-	-	-	-
234207	PLATFORM STRINGER O/S	-	-	-	1	1	1	1	1	1	1	1	1
234244	TUBING BRACE 33.88"	-	-	-	3	3	3	1	1	-	-	-	-
234245	TUBING BRACE 48.94"	1	1	1	1	1	1	-	-	-	-	1	1
234246	TUBING BRACE 35.45"	-	-	-	1	-	-	1	-	-	-	-	-
234247	TUBING BRACE 34.55"	-	-	-	-	1	1	-	1	-	-	-	-
234248	TUBING BRACE 49.88"	-	-	-	-	-	-	-	-	1	-	-	-
234249	TUBING BRACE 49.31"	-	-	-	-	-	-	-	-	-	1	-	-
234172	PLATFORM 15'-24'	-	-	-	1	-	-	1	-	1	-	1	-
234173	PLATFORM 27'-135'	-	-	-	-	1	1	-	1	-	1	-	1
234501	LADDER CLIP	1	1	1	2	2	2	-	-	-	-	-	-
234146	BOTTOM BRACKET	-	-	-	1	1	1	-	-	-	-	-	-
234241	POST GUSSET	-	-	-	2	2	2	2	2	2	2	-	-
234238	REINFORCEMENT STRIP 15'-24'	-	-	-	1	-	-	1	-	1	-	-	-
234239	REINFORCEMENT STRIP 27'-135'	-	-	-	-	1	1	-	1	-	1	-	-
234242	PLATFORM EAVE MOUNT CHANNEL	-	-	-	-	-	-	-	-	2	2	2	2
234243	PLATFORM MID-TIER MOUNT CHANNEL	-	-	-	2	2	2	2	2	-	-	-	-
234235	PLATFORM POST BRACE	1	1	1	3	3	3	1	1	-	-	3	3
234240	TUBING BRACE 22.5"	-	-	-	1	1	1	1	1	1	1	-	-
234233	TUBING BRACE 21.94"	-	-	-	1	1	1	1	1	1	1	-	-
234518	SUPPORT ARM BRACKET	3	3	3	15	15	15	6	6	4	4	4	4
234290	EASY STEP LEFT BRACKET	-	-	-	1	1	1	-	-	-	-	-	-
234291	EASY STEP RIGHT BRACKET	-	-	-	1	1	1	-	-	-	-	-	-
234030	HANDRAIL POST	1	1	1	5	5	5	3	3	2	2	1	1
234031	PLATFORM END RAIL 27'-135'	-	-	-	-	2	2	-	2	-	2	-	-
234032	PLATFORM GUARD-HAND RAIL TRANSITION	-	-	-	2	2	2	2	2	2	2	2	2
234033	PLATFORMM HAND-GUARD RAIL 27'-135'	-	-	-	-	-	-	-	-	-	-	-	2
234034	GUARDRAIL START	-	-	-	1	1	1	1	1	1	1	1	1
234036	BOTTOM HANDRAIL POST	-	-	-	1	1	1	-	-	-	-	-	-
234037	HANDRAIL END	-	-	-	1	1	1	-	-	-	-	-	-
234038	PLATFORM END RAIL 15'-24'	-	-	-	2	-	-	2	-	2	-	-	-
234039	PLATFORM HAND-GUARD RAIL 15'-24'	-	-	-	-	-	-	-	-	-	-	2	-
234040	HAND-MID-GUARDRAIL 15'-24'	3	-	-	6	-	-	-	-	-	-	-	-
234041	GUARD & MID RAIL END	-	-	-	2	2	2	-	-	-	-	1	1
234042	HAND-MID-GUARDRAIL 27'-60'	-	3	-	-	6	-	-	-	-	-	-	-
234043	HAND-MID-GUARDRAIL 66'-135'	-	-	3	-	-	6	-	-	-	-	-	-
234044	GUARDRAIL BRACKET	1	1	1	4	4	4	1	1	-	-	1	1
M3498257	HANDRAIL POST STRAP	3	3	3	17	17	17	7	7	4	4	3	3
	HARDWARE BAG	234790	234790	234790	234794	234794	234794	234795	234795	234795	234795	234796	234796

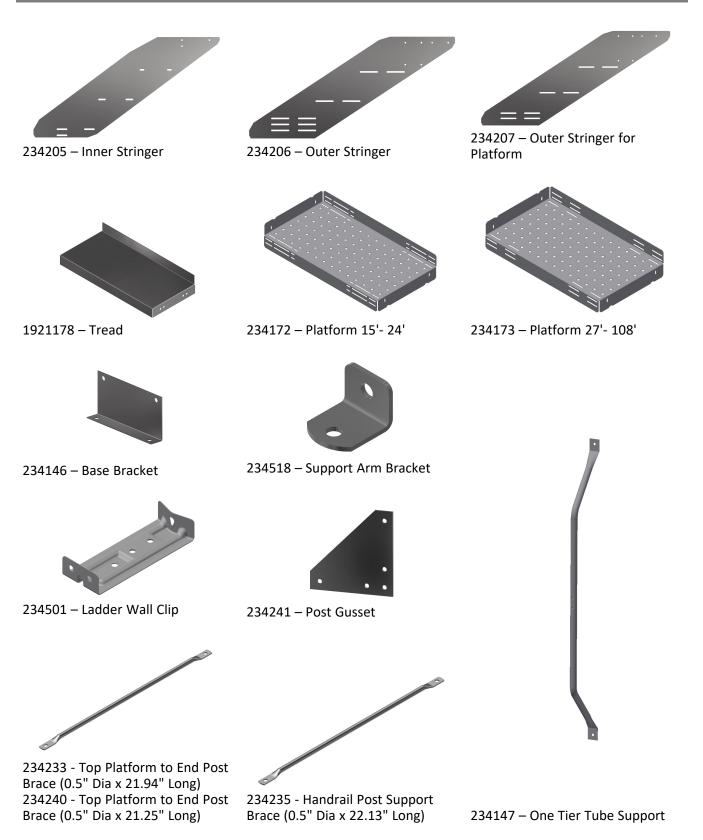
#### Table 6. Circular Stair Bottom Tier Packages for Hoppers

			A & HALF TIER + R for HOPPER	BOTTOM TIER for HOPPER		
		15' - 24'	27' - 60'	15' - 24'	27' - 60'	
PART NUMBER	DESCRIPTION	234774	234775	234776	234777	
234147	TUBE BRACE	1	1	1	1	
234206	STRINGER O/S	2	2	2	2	
234205	STRINGER I/S	3	3	2	2	
1921178	STAIR TREAD	9	9	7	7	
234207	PLATFORM STRINGER O/S	1	1	-	-	
234244	TUBING BRACE 33.88"	3	3	2	2	
234245	TUBING BRACE 48.94"	1	1	1	1	
234246	TUBING BRACE 35.45"	1	-	-	-	
234247	TUBING BRACE 34.55"	-	1	-	-	
234172	PLATFORM 15'-24'	1	-	-	-	
234173	PLATFORM 27'-135'	-	1	-	-	
234501	LADDER CLIP	2	2	2	2	
234146	BTM BRACKET	1	1	1	1	
234241	POST GUSSET	2	2	-	-	
234238	REINFORCEMENT STRIP 15'-24'	1	-	-	-	
234239	REINFORCEMENT STRIP 27'-135'	-	1	-	-	
234243	PLATFORM MID-TIER MOUNT CHANNEL	2	2	-	-	
234235	PLATFORM POST BRACE	3	3	2	2	
234240	TUBING BRACE 22.5"	1	1	-	-	
234233	TUBING BRACE 21.94"	1	1	-	-	
234518	SUPPORT ARM BRACKET	15	15	9	9	
234030	HANDRAIL POST	5	5	2	2	
234031	PLATFORM END RAIL 27'-135'	-	2	-	-	
234032	PLATFORM GUARD-HAND RAIL TRANSITION	2	2	-	-	
234034	GUARDRAIL START	1	1	-	-	
234036	BOTTOM HANDRAIL POST	1	1	1	1	
234037	HANDRAIL END	1	1	1	1	
234038	PLATFORM END RAIL 15'-24'	2	-	-	-	
234040	HAND-MID-GUARDRAIL 15'-24'	6	-	6	-	
234041	GUARD & MID RAIL END	2	2	2	2	
234042	HAND-MID-GUARDRAIL 27'-60'	-	6	-	6	
234044	GUARDRAIL BRACKET	4	4	3	3	
M3498257	HANDRAIL POST STRAP	17	17	10	10	
	HARDWARE BAG	234794	234794	234793	234793	

PART NUMBER	DESCRIPTION	QUANTITY
234215	DOOR PAN	1
234216	BRACKET FOR STAIR GATE	2
234219	SUB ASSEMBLY FOR LATCH	1
236825	HINGE ROD	1
236841	SPACER WASHER 1/2	1
152398	BLT HFW .25 x .75 GR8.2	2
150014	NUT HX LK NI .25-20 ZN G2	2
236847	DOOR PUSH NUT 1/2	1

#### Table 7. Circular Stair Gate Package-234218 (Optional)

### 6.2. Circular Stair Parts Identification





234244 - Support Brace (Short) (1" Dia x 33.88" Long) 234245 - Support Brace (Long) (1" Dia x 48.94" Long)



234246 - Mid-Tier Platform Rear Brace (15' - 24') 234247 - Mid-Tier Platform Rear Brace (27' - 108')



234238 - Reinforcement Strip (15' - 24') 234239 - Reinforcement Strip (27' - 108')

234248 - Eave Platform Rear Brace (15' - 24') 234249 - Eave Platform Rear Brace (27' - 108')



234242 - Platform Eave Mount Channel



Channel



234290 - Easy Step Left Bracket



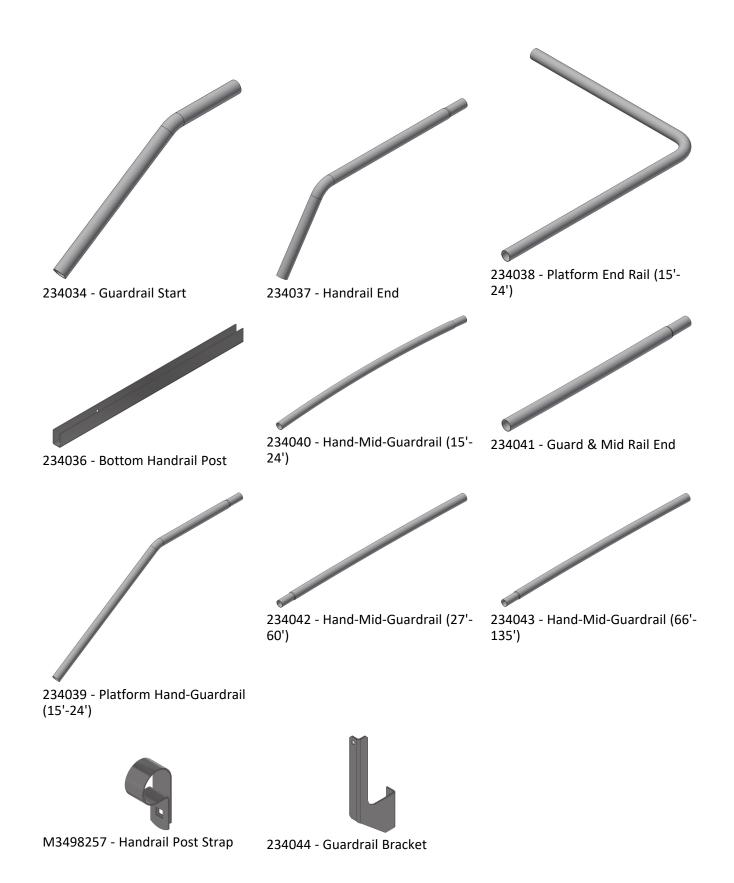
234291 - Easy Step Right Bracket



234031 - Platform End Rail (27'-135')

234032 - Platform Guard-Handrail Transition

234033 - Platform Hand-Guardrail (27'-135')



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234216 – Bracket for Stair Gate





234215 – Block-Off Door Pan



234219 – Latch Assembly



# 7. Warranty

#### **AGI Grain Bin Products**

Ag Growth International, Inc. ("AGI") warrants that the goods and/or services being supplied (the "Goods") will be free from defects in materials and workmanship under normal conditions, use, service, and maintenance, for a period of twelve (12) months from the date of first operation of the Goods, but in no event more than eighteen (18) months from the date of delivery of the Goods to the end-user (or as otherwise set out in the chart below) (the "Warranty Term"). If the Goods are being used for rental purposes, the Warranty Term for the subject Goods shall be limited to 90 days.

Galvanized Bins	5 Years			
SureTrack	2 Years			
Easyflow2	2 Years			
Fans	3 Years			
Heaters	1 Year			
Side Draw	5 Year			
Transitions	3 Years			
Roof Exhauster	1 Year			
Floors	5 Years			
Catwalk	1 Year			
Bulk Feed Tanks	2 Years			
Hopper Tanks	5 Year			
SeedSto	r-K Cones			
Paint	1 Year			
Structural	10 Year			
Commercia	HBB Hopper			
Paint	1 Year			
Structural	10 Year			
Welded	l Cone(s)			
Paint	1 Year			
Structural	10 Year			
Farm Smo	othwall Bins			
Paint	1 Year			
Structural	10 Year			
Commercial S	moothwall Bins			
Paint	1 Year			
Structural	10 Year			
	Accessories			
Trolley	1 Year			
Down Auger	1 Year			
Disconnected Box	1 Year			
Grain Spreader	1 Year			
EasyDry A	Accessories			
Plenum	5 Year			
Controls	1 Year			
Blower Heater	1 Year			

Subject to AGI's sole discretion, if the Goods, or a component thereof, are found to have a default in materials and/or workmanship within the Warranty Term, AGI will, at its own option and expense, repair or replace the subject Goods or refund the purchase price for the applicable Goods. Any warranty related expenses incurred on behalf of or by the end-user without the prior written consent of AGI shall be the sole responsibility of the end-user. Expenses relating to travel, customs or import duties and tariffs, equipment rental, and any costs associated with accessing the Goods are the sole responsibility of the customer. Warranty shall be void in the event that the Goods are returned or disposed of without the written consent of AGI.

The customer shall not assert a claim that the Goods are defective unless the customer gives written notice to AGI of such defect within forty-eight (48) hours of discovering such defect. In the event of a warranty claim, the customer must complete any and all information

required by AGI in order to properly assess or investigate the claim. AGI shall be given a reasonable opportunity to inspect and test the Goods in question. Failure by the customer to notify AGI of such claim within 48 hours shall operate as a waiver of any and all such claims by the customer.

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THE SOLE AND EXCLUSIVE REMEDY FOR ANY CLAIM HEREUNDER SHALL BE LIMITED TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE. AGI SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND IN NOT EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL AGI'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PURCHASE PRICE OF THE GOODS. BUYER AGREED THAT IN NO EVENT SHALL AGI'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES. THE TERM "CONSEQUENTIAL DAMAGES" SHALL INCLUDE, BUT NOT BE LIMITED TO, LOSS OF ANTICIPATED PROFITS, LOSS OF USE, LOSS OF REVENUE, FAILURE TO MEET GOVERNMENT AND/OR ADMINISTRATIVE REQUIREMENTS, CLEAN UP COSTS, COST OF CAPITAL AND DAMAGE OR LOSS TO OTHER GOODS, PROPERTY OR EQUIPMENT.

To the fullest extent permitted by law, Buyer, on behalf of itself, its suppliers, their agents, employees or any entity or person for which Buyer is or may be responsible ("Indemnitors") shall fully indemnify, save and hold AGI, its agents, employees, officers, directors, partners and related entities harmless from and against all liability, damage, loss, claims, demands, actions and expenses of any nature whatsoever, including, but not limited to reasonable attorney's fees which arise out of or are connected with: (a) any negligent act, error or omission by any Indemnitor in the performance of this agreement; (b) the failure of the Indemnitor to comply with the laws, statutes, ordinances or regulations of any governmental or quasi-governmental authority; or (c) the material breach of any term or condition of this agreement by any of the Indemnitors. Without limiting the generality of the foregoing, the indemnity hereinabove set forth shall include all liability, damage, loss, claims, demands, and actions on account of personal injury, death or property loss to any third party, any Indemnitee, any of Indemnitee's employees, agents, licensees or invitees. The indemnity set forth herein shall survive any termination of this agreement.

THIS WARRANTY IS NON-TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL END-USER AND SHALL BE CONSIDERED VOID IF NOT REGISTERED WITHIN 30 DAYS OF RECEIPT OF THE GOODS BY THE ORIGINAL END USER.

AGI is a leading provider of equipment solutions for agriculture bulk commodities including seed, fertilizer, grain, and feed systems with a growing platform in providing equipment and solutions for food processing facilities. AGI has manufacturing facilities in Canada, the United States, the United Kingdom, Brazil, South Africa, India and Italy and distributes its products globally.



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