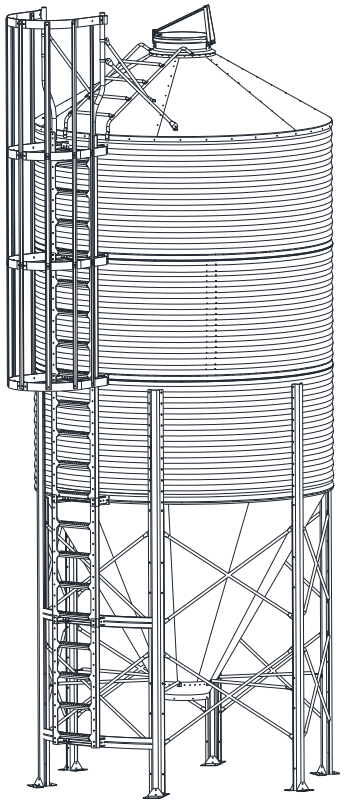
6', 7', 9', 12', & 15' BFT Models

Bulk Feed Tank
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: 240263 R11
Revised: February 2022
Original Instructions

New in this Manual

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

Description	Section
New remote roof cap opener instruction	Section 5.5 – Remote Roof Cap Opener Installation on page 33
Updated remote roof cap material list	Section 5.5.1 – Remote Roof Cap Material List on page 46

CONTENTS

1. Introduction

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly of this Westeel 6', 7', 9', 12', & 15' BFT Models.

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 feed tank 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 Westeel if you need assistance or additional information.
- Always follow applicable local codes and regulations.

2.3. Personal Protective Equipment

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

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.

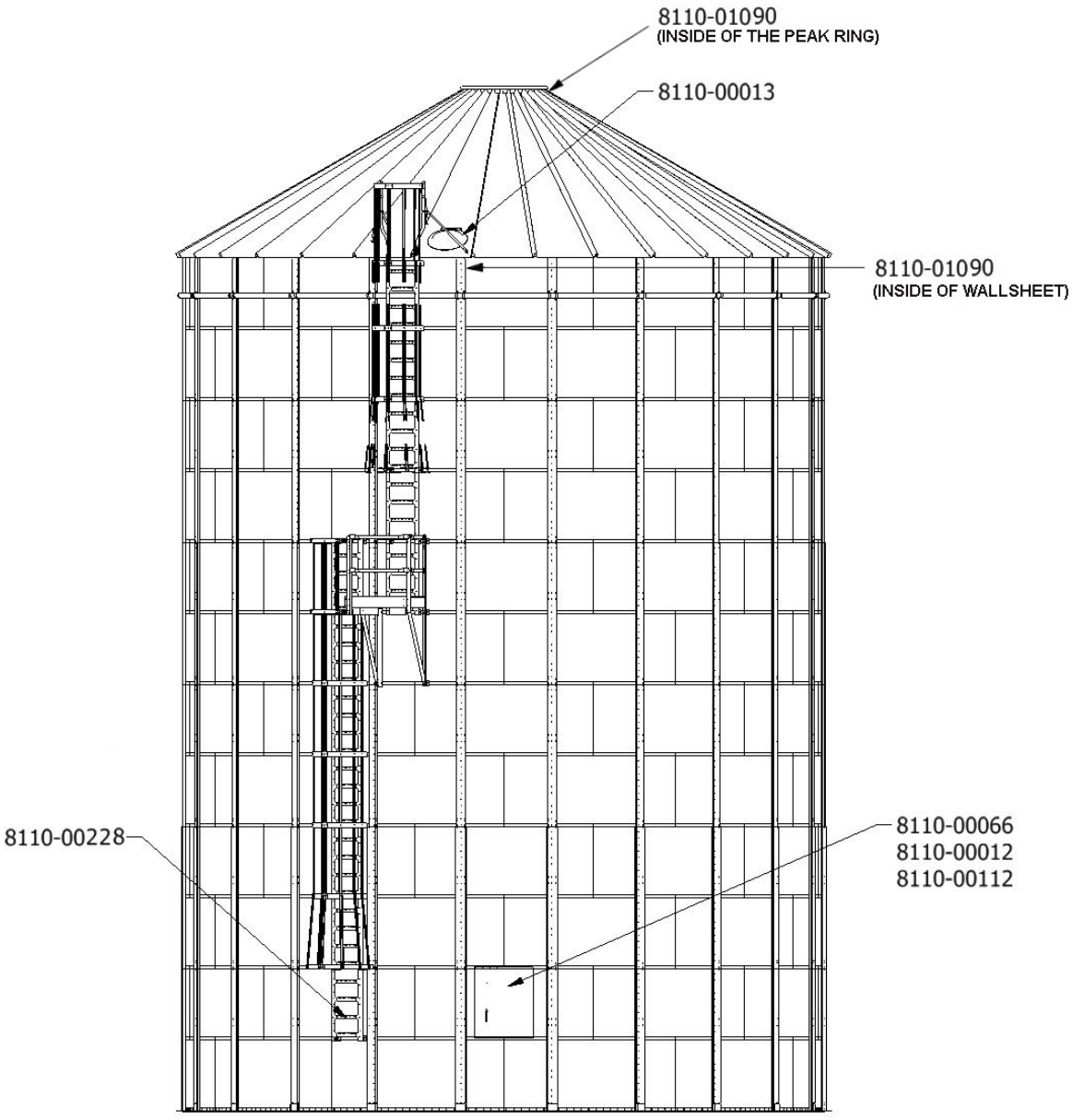
2.5. Decal Installation/Replacement

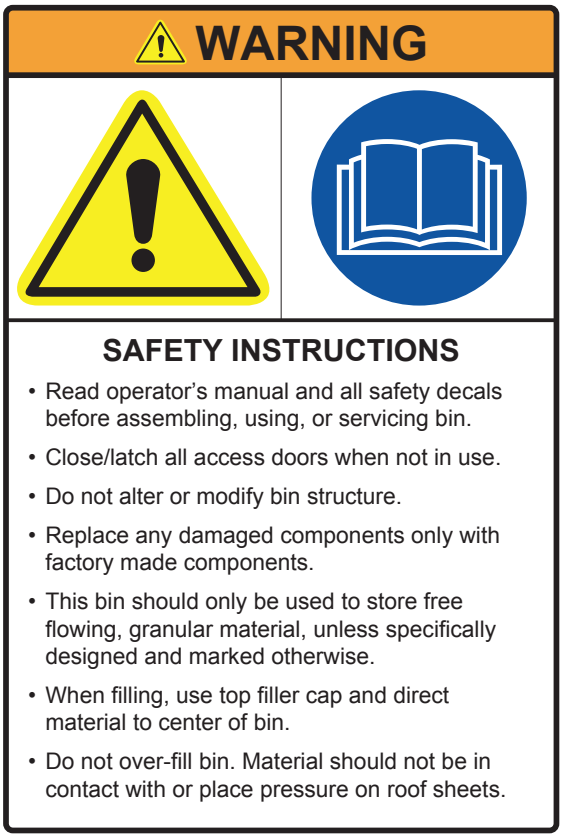
1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining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

2.6. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the feed tank and their messages are shown in the figure(s) that follow. Safe operation and use of the feed tank 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.

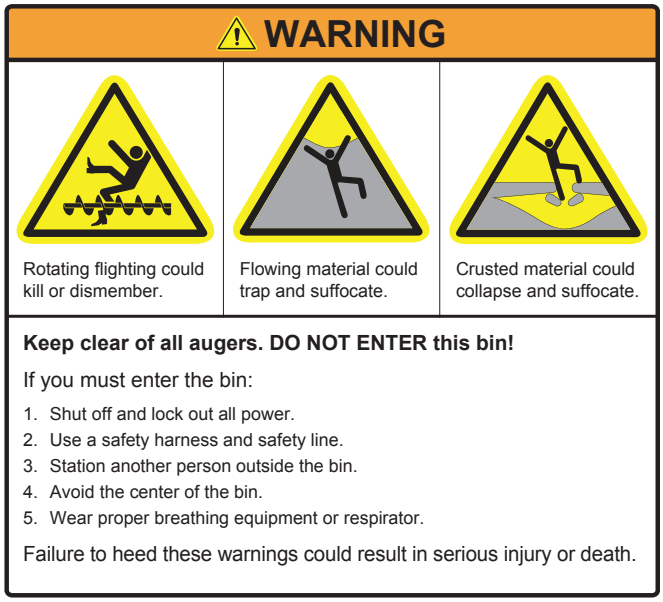
Figure 1. Safety Decals





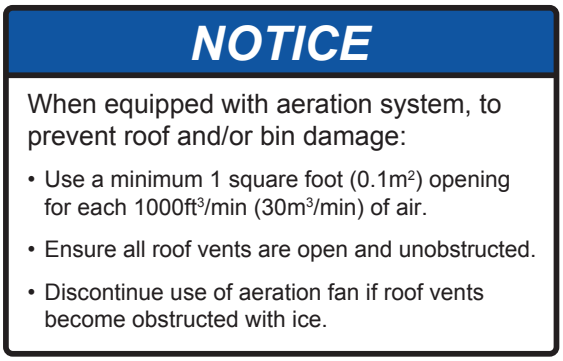
Part Number: 8110-00012

Part Number: 8110-00013



Part Number: 8110-00112

Part Number: 8110-00228



Part Number: 8110-00066

Part Number: 8110-01090

3. Before You Begin

3.1. Bulk Feed Tank Design and Capacity

Westeel Bulk Feed Tanks are designed for:

1. Non-corrosive free-flowing materials up to 40lbs/ft^3 (640 kg/m^3) average compacted bulk density.
2. Maximum horizontal wind pressure based on 94 mph (151 km/h) as per NBCC 2015 and 105 mph (169 km/h) as per ASCE 7-16.
3. Zero seismic activity.

   Note

   Seismic resistance in bulk feed tanks varies with height and diameter. Many standard designs have significant seismic capabilities. Designs can be reviewed and/or modified to reflect local seismic requirements.

4. Roof loading capabilities vary with diameter, peak load and snow load.

   a. Peak Loads – standard peak loads follow:

   Table 1. Peak Loads for Various Roofs

Size	Load (lbs)	Load (kg)
6’ to 9’	1000 lbs	454 kg
12’	2000 lbs	907 kg
15’	4000 lbs	1814 kg

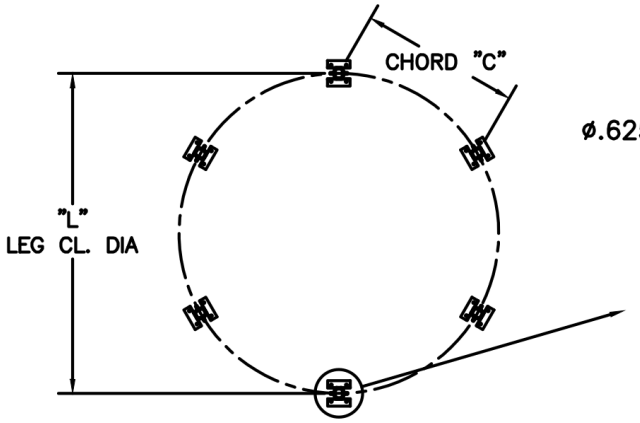
   b. Roof Snow Loads (RSL) – at the above stated standard peak loads, standard RSLs vary with diameter and range:

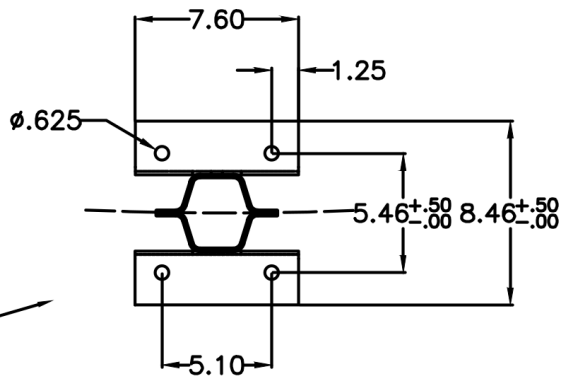
   - 6’ to 12’ – 24 psf
   - 15’ – 45 psf

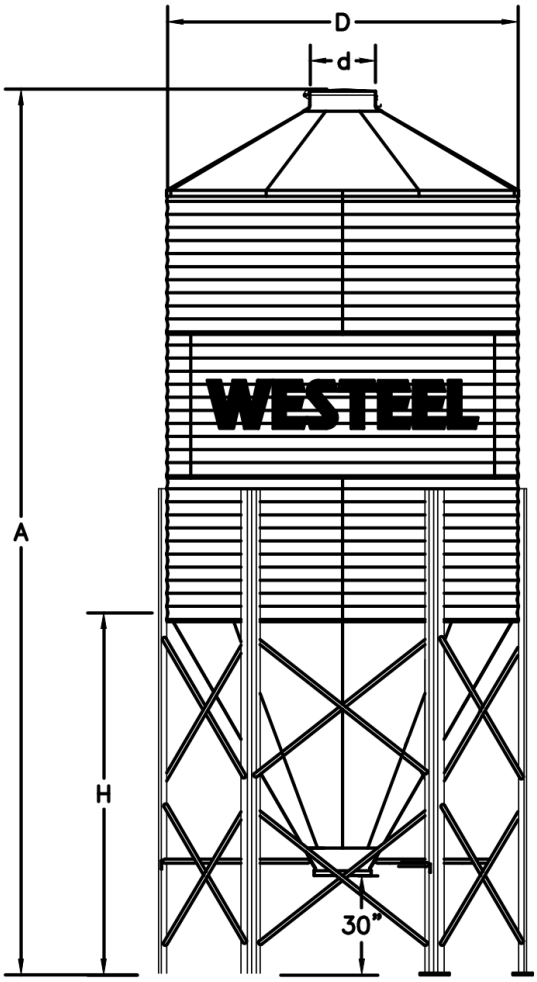
   Note

   The correlation between ground snow load (GSL) and roof snow load (RSL) for grain bin designs vary with jurisdictions. In the US GSL = 2 x RSL. In Europe GSL = 1.25 x RSL. In Canada the correlation between GSL and RSL varies and is site specific.

3.2. BFT Specifications







1. Capacities shown include 28° product angle of repose
2. Based on 1.244 cu.ft. per bushel, 640 kg/m^3 and 6% compaction in cylinder and cone
3. Based on 24 psf roof snow load on 6' ~ 12' roof, and 49 psf snow load on 15' roof
4. Based 1 kip peak load on 6' ~ 9' roof, 2 kip peak load on 12' roof, and 4 kip peak load on 15' roof
5. Based on maximum wind speed of 94 mph
6. Cone slope is 60°
7. d=20" for 6' ~ 12' BFT, d=33" for 15' BFT

Table 2. BFT Specifications

Model	# of Tiers	Capacity			Dimension				Bin and Hopper Weight	
		(2) bu	cu.ft.	(3) tonne	"A" (ft-in)	"A" (m)	"H" (ft-in)	"H" (m)	lbs	kgs
602BFT	2	225	265	5	15' 6"	4.72	6' 6"	1.98	719	326
603BFT	3	312	368	7	19' 2"	5.84	6' 6"	1.98	864	392
604BFT	4	400	470	9	22' 10"	6.96	6' 6"	1.98	1030	467
605BFT	5	487	573	11	26' 6"	8.08	6' 6"	1.98	1226	556
702BFT	2	319	375	7	16' 9"	5.11	7' 5"	2.26	918	416
703BFT	3	437	515	10	20' 5"	6.22	7' 5"	2.26	1087	493
704BFT	4	556	655	13	24' 1"	7.34	7' 5"	2.26	1253	568
705BFT	5	675	794	15	27' 9"	8.46	7' 5"	2.26	1445	655
902BFT	2	567	668	13	19' 0"	5.79	9' 1"	2.77	1401	635
903BFT	3	763	899	17	22' 8"	6.91	9' 1"	2.77	1619	734
904BFT	4	960	1130	22	26' 4"	8.03	9' 1"	2.77	1877	851
905BFT	5	1156	1361	26	30' 0"	9.14	9' 1"	2.77	2179	988
1202BFT	2	1114	1314	25	22' 5"	6.83	11' 8"	3.55	2637	1196
1203BFT	3	1463	1725	33	26' 1"	7.95	11' 8"	3.55	2969	1347
1204BFT	4	1813	2135	41	29' 9"	9.07	11' 8"	3.55	3332	1511
1205BFT	5	2162	2545	49	33' 5"	10.19	11' 8"	3.55	3723	1689
1502BFT	2	1906	2251	43	25' 10"	7.87	14' 3"	4.34	5337	2421
1503BFT	3	2452	2892	55	29' 6"	8.99	14' 3"	4.34	5752	2609
1504BFT	4	2999	3533	68	33' 2"	10.11	14' 3"	4.34	6274	2846
1505BFT	5	3545	4175	80	36' 10"	11.23	14' 3"	4.34	6835	3100

Table 3. Leg and Foot Pad Dimensions and Non-Factored Loads in Kips (´000) per Leg

Model	# of Legs	Leg Ctr. Dia. "L" (in)	Chord "C" (in)	Vertical Dead Load	Vertical Grain Load	Vertical Roof Snow & Peak Load	Vertical Wind Load	Horizontal Wind Load	Net Vert. Uplift Load
602BFT	4	72.12	51.0	0.2	2.7	0.4	1.8	0.3	1.6
603BFT	4	72.12	51.0	0.2	3.7	0.4	2.8	0.4	2.6
604BFT	4	72.12	51.0	0.3	4.7	0.4	4.1	0.5	3.8
605BFT	4	72.12	51.0	0.3	5.7	0.4	5.6	0.6	5.3
702BFT	4	84.06	59.5	0.2	3.8	0.5	2.0	0.4	1.8
703BFT	4	84.06	59.5	0.3	5.2	0.5	3.1	0.5	2.9
704BFT	4	84.06	59.5	0.3	6.6	0.5	4.5	0.6	4.2
705BFT	4	84.06	59.5	0.4	8.0	0.5	6.0	0.7	5.7
902BFT	6	107.9	54.0	0.2	4.5	0.4	1.9	0.5	1.7
903BFT	6	107.9	54.0	0.3	6.0	0.4	2.8	0.6	2.5
904BFT	6	107.9	54.0	0.3	7.6	0.4	3.9	0.7	3.6
905BFT	6	107.9	54.0	0.4	9.1	0.4	5.1	0.8	4.7
1202BFT	8	143.7	55.0	0.3	6.6	0.6	2.3	0.5	2.0
1203BFT	8	143.7	55.0	0.4	8.7	0.6	3.1	0.6	2.7
1204BFT	8	143.7	55.0	0.4	10.7	0.6	4.0	0.7	3.6
1205BFT	8	143.7	55.0	0.5	12.8	0.6	5.0	0.8	4.5
1502BFT	10	179.56	55.5	0.6	9.1	1.3	1.9	0.5	1.3
1503BFT	10	179.56	55.5	0.6	11.6	1.3	2.5	0.6	1.9

Table 3 Leg and Foot Pad Dimensions and Non-Factored Loads in Kips (´000) per Leg (continued)

Model	# of Legs	Leg Ctr. Dia. "L" (in)	Chord "C" (in)	Vertical Dead Load	Vertical Grain Load	Vertical Roof Snow & Peak Load	Vertical Wind Load	Horizontal Wind Load	Net Vert. Uplift Load
1504BFT	10	179.56	55.5	0.7	14.2	1.3	3.3	0.7	2.6
1505BFT	10	179.56	55.5	0.7	16.8	1.3	4.1	0.8	3.4

3.3. Site and Assembly

Unless otherwise specifically provided in writing, Westeel 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:

- Bulk feed tank location and siting
- Soil conditions and corresponding foundation requirements (note that the examples provided in manuals are for specifically stated soil conditions)
- Bulk feed tank assembly (Westeel recommends the use of qualified installers; contact Westeel for information on installers in your area)
- Field modifications or equipment additions that affect the bulk feed tank structure
- Interconnections with neighboring structures
- Compliance with all applicable safety standards, including but not limited to fall restraint systems (ladders or other systems). Local safety authorities should be contacted as standards vary between jurisdictions.

3.4. Methods of Installation

The recommendations for assembling and installing Westeel bulk feed tanks must be closely followed to achieve the full strength of the bin and to achieve adequate weather sealing. The product warranty is void if:

1. Wall sheets and/or uprights not specified for a given tier are used.
2. Foundations are found to be inadequate or out-of-level.
3. Anchor bolts (cast-in-place, drill-in, chemical type or other) are found to be inadequate.
4. Off-center loading or unloading is used. (This does not apply to the use of approved side unloading systems.)
5. Materials stored in the bin are not free-flowing or have a compacted bulk density greater than 40 lbs/ft^3 (640 kg/m^3).

If using bin jacks during assembly, always lift on an upright. Choose a hoist with a adequate capacity for the expected empty bin deadload. Make sure the rated capacity of the hoist is not exceeded.

3.5. 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 feed tank installation.
2. Design and build foundations with the necessary strength for the loads they must support, and for local soil conditions.

3. Your foundation must provide uniform and level support to the structure being supported. Surface imperfections causing gapping must be remedied. This may involve, but not be limited to a) grouting under the bottom ring of a non-stiffened bin or tank, and b) shimming under the uprights of a stiffened bin or tank, or under the legs of a hopper.
4. 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.
5. Comply with all assembly instructions provided in the appropriate assembly manual to make sure your whole feed tank is constructed safely. **Important: Do not deviate from the wall sheet and upright layouts provided.**
6. Before anchoring your structure to its foundation, make sure the structure is round. The maximum variation from perfect roundness is 3/4" on the radius. Locate anchor bolts toward the outside of the anchor bolt holes (away from the circle) to permit the incremental expansion that can occur with the initial filling.
7. When installing roof stiffening rings, if it is necessary to shorten the stiffening ring tubes, shorten them as little as possible. Initially the nuts on the expanders should be centered and as close together as possible. When tightening, share the amount of take-up between expanders such that the nuts remain centered, and the amount of engagement between all expanders on the same ring is equalized.
8. If extending an existing bin or tank, ensure that the foundation is adequate for the increased loads it must support.
9. If installing an existing bin on a hopper, make sure the bin is designed for a hopper application, and that the foundation is capable of withstanding the substantial point loads that the hopper legs apply. If uprights are present, make sure that they are supported.
10. Make sure that an integral end-to-end connection exists between all mating uprights. Successive uprights must not overlap.
11. Vertical tolerances between uprights and wall sheets are tight. This can be affected by “jacking” techniques, which can allow the tolerance to grow or shrink depending on the technique used. The gapping between successive uprights must be monitored to ensure that upright holes align with wall sheet holes.
12. If catwalks are being installed on the structure, upright catwalk upgrades are likely required. The upgraded stiffeners must be installed in the correct locations to support the intended catwalk loads. Also, the structure must be properly oriented to ensure the eventual correct alignment between the catwalks and the supporting uprights. Finally, the connectors that tie into the uprights and support the catwalks are best installed during assembly of the structure. See the catwalk assembly manual for additional details.

3.6. Product Storage

Rust on Galvanized Parts

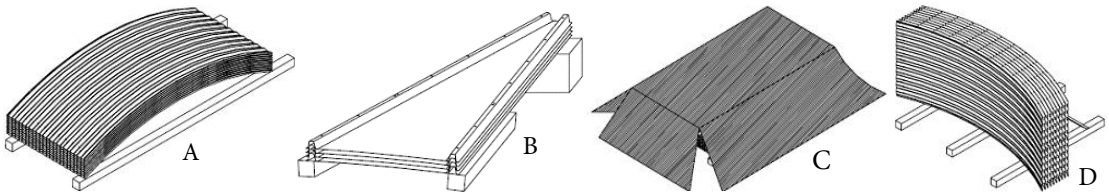
1. White rust forms when moisture is allowed to collect on galvanized surfaces that have yet to develop the durable zinc oxide layer. This zinc oxide layer naturally occurs as the surface interacts with carbon dioxide, and is characterized over time by the dull grey appearance that weathered galvanized surfaces get.
2. Parts that are not well ventilated or well drained can collect water between surfaces and develop white rust.
3. White rust is not a structural concern if its development is stopped in the early stages. A light film or powdery residue can occur after a period of heavy rainfall or a short time of improper storage. If white rust has started to develop, separate parts and wipe off any moisture. Next, using a clean cloth, apply a thin layer of petroleum jelly or food-grade oil to the entire part.

4. If moisture is left on parts, this white rust can become more aggressive and turn into red rust. Red rust can cause degradation in the material and become a structural concern. Any parts that have red rust should be replaced immediately.

Storage Guidelines

- Keep all bundles dry before assembly of the bin.
- Start assembly as soon as possible.
- Do not lay bundles on the bare ground. Raise all bundles 6" to 8" off the ground on wood blocks or timbers. (See Detail A in Figure 2 on page 16.)
- Store curved wall sheets 'hump-up'. (See Detail A in Figure 2 on page 16.)
- All other bundles material should be placed so they are well sloped to promote good drainage. (See Detail B in Figure 2 on page 16.)
- Roof sheets must be elevated at least 12" at the small end of the sheets. (See Detail B in Figure 2 on page 16.)
- Temporary storage can be provided by erecting a simple framework supporting a waterproof tarp. (See Detail C in Figure 2 on page 16.)
- All bin boxes, ladder boxes and hardware boxes should be stored inside. These are not waterproof, and will deteriorate in normal weather conditions, allowing moisture to contact the parts inside.

Figure 2. Product Storage



If Parts Become Wet

1. If parts become submerged or wet, the bundles should be opened as soon as possible, sheets or material separated and dried. Keep separated until assembly.

   Brace parts properly so as to avoid damage or injury from material falling when in storage. (See Detail D in Figure 2 on page 16.)

2. Any boxed parts that become wet should be dried and stored in a new box that is free of moisture.
3. In addition to wiping down wall sheets, a food-grade oil can also be applied with a clean, lint-free cloth. This will assist in preventing any further moisture from contacting the galvanizing on the steel. Due to safety concerns with installation and use, Westeel does not recommend the use of oil on other parts such as roof sheets and safety ladders.

3.7. Grain Bin Use

- Do not off-center unload a grain bin. It is imperative to unload from the center of the bin first, until as much grain as possible has been removed, and only then proceed to unload from the next closest unload gate to the center. Continue utilizing the unload gates in succession from the center towards the outside. Gate control mechanisms should be clearly marked and interconnected to prevent an external gate from being opened first.

- The only exception to center unloading is when a properly designed and installed side draw system is utilized. However, as bins tend to go out of round when employing side draws, the bin must be completely emptied before refilling.
- When unloading a bin with a mobile auger through a properly designed auger chute, the entry end of the auger should be pushed into the center of the bin before the auger is engaged. Slower rates of flow are preferable and should not exceed the capacity of an 8” auger.
- Ensure that the inner door panels of grain bin doors are completely closed and latched before filling the grain bin.
- Never enter a loaded grain bin for any reason. Grain can be a killer.

3.8. Important Notes

- Westeel 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.
- In order to maintain your wall sheets in good condition separate sheets and allow air circulation between them. Store sheets in a dry place. Do not store sheets with sheet ends pointing upwards.
- To keep an even pressure on walls, the bin must always be unloaded from the centre.
- Contact local power officials for minimum power line clearance.
- See Section 3.5 – Critical Assembly Requirements on page 14 for mandatory siting and assembly requirements.
- Store only non-corrosive, free-flowing materials up to 40 lbs/ft^3 (640 kg/m^3) average compacted density in Westeel bins.
- Tighten all bolts to the recommended torque settings.
- Do not locate grain bins close to high buildings, which might cause snow to fall onto or build up on the roof of the grain bin. Consider future expansion and allow space for loading and unloading of the bin. Your dealer and local government agricultural consultants can help you plan your storage system for maximum efficiency.

4. Preparation

4.1. Check 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. Your dealer will order 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 roof rings and wind rings
- Scaffolding
- Centre-post bin stand
- Crane and/or bin jacks

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 unloading augers, aeration equipment, anchor bolts, foundation sealant, external ladders, safety cage and platforms, 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.

5. 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.

5.1. Assembly Safety

WARNING

- 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.
- Carry out assembly in a large open area with a level surface.
- Always have two or more people assembling the feed tank.
- 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. Assembly Process and Methods

Keys Steps in the Assembly Process

Although order of assembly may vary depending on the situation, the following list outlines the key steps. The order given in this list is recommended.

1. Verify all required parts and tools are on hand.
2. Plan the assembly process.
3. Locate a flat, level area of sufficient size for the assembly process.
4. Assemble the top tier of wall sheets.
5. Assemble the roof.
6. Add the roof inspection hatch (optional).
7. Add ladders, cages and pass-through rails (optional).
8. Assemble the remaining wall sheets. Continue to add optional ladders and cages to each ring of wall sheets as they are assembled.
9. Assemble the legs.
10. Assemble the hopper.
11. Add ladder bands, ladders, and cages to the legs (optional)
12. Add the gate assembly.

Timing Considerations

When planning the location of the bulk feed tank and related items, consider the following:

1. The position of the vent cap and remote vent cap opener relative to the filling location and desired auger positioning. Note the eye bolt gets bolted on at the eave relative to the cable location.
2. The location of the stencil sheet relative to other features–particularly leg locations.
3. The location of the roof ladder and sidewall ladder. Note that hopper ladder braces are bolted between the supporting legs. Therefore ladder placement should be timed such that they are between a pair of legs.

Features of 6', 7', 9', 12' and 15' BFTs

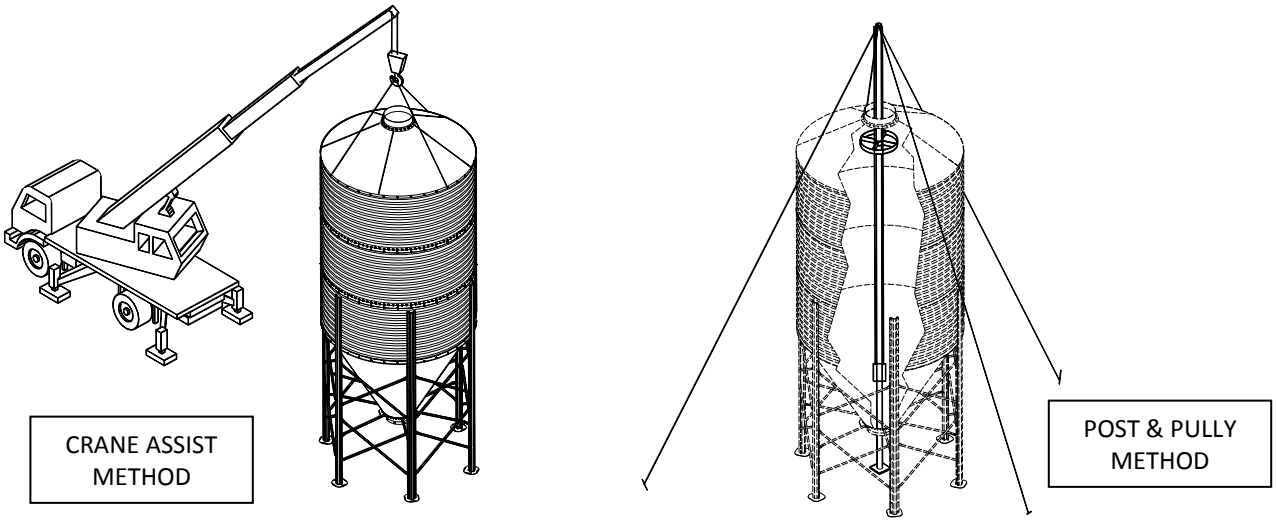
Important features of the various sizes of Westeel bulk feed tanks include:

- 6', 7' and 9' bins have a simple one-part leg and a ribless roof panel
- 12' and 15' bins have a multi-part complex leg assembly, and a ribbed roof panel
- 6', 7', 9' and 12' bins have a single hopper sheet
- 15' bins have upper and lower hopper sheets

Lifting BFTs

Smaller BFTs can be lifted by a ring underneath the center cap as illustrated in the post and pully method below. This technique should be used for the assembly of wall sheets only; not for the slinging of the entire bin. For larger loads, and for slinging completed bins, a more secure attachment to the eave of the bin, as illustrated in the crane assist method, is recommended.

Figure 3. Lifting BFTs



5.3. Assemble the Top Tier

Layout the assembly area

1. Prepare a flat, level area large enough to assemble the bulk feed tank.
2. Determine and mark the center of the area where the tank will be assembled.
3. Determine the scribe radius value for the tank to be assembled. (See Table 4.)

Table 4. Scribe Radius and Peak Ring Height - 6', 7', 9', 12' & 15' BFT

Nominal Bin Dia.	Scribe Radius		Top of Peak Ring Height "H" with 1 tier of wall sheets	
(ft)	(ft in)	(m)	(ft in)	(m)
6'	2'11"	0.889	5'6-1/2"	1.689
7'	3'5"	1.042	5'10-1/2"	1.791
9'	4'5"	1.346	6'5-1/2"	1.969
12'	5'10-7/8"	1.800	7'3-1/2"	2.223
15'	7'4-¾"	2.255	7'9-⅜"	2.372

4. Using a string and the scribe radius value for the bin, mark the bin circumference on the surface of the assembly area.

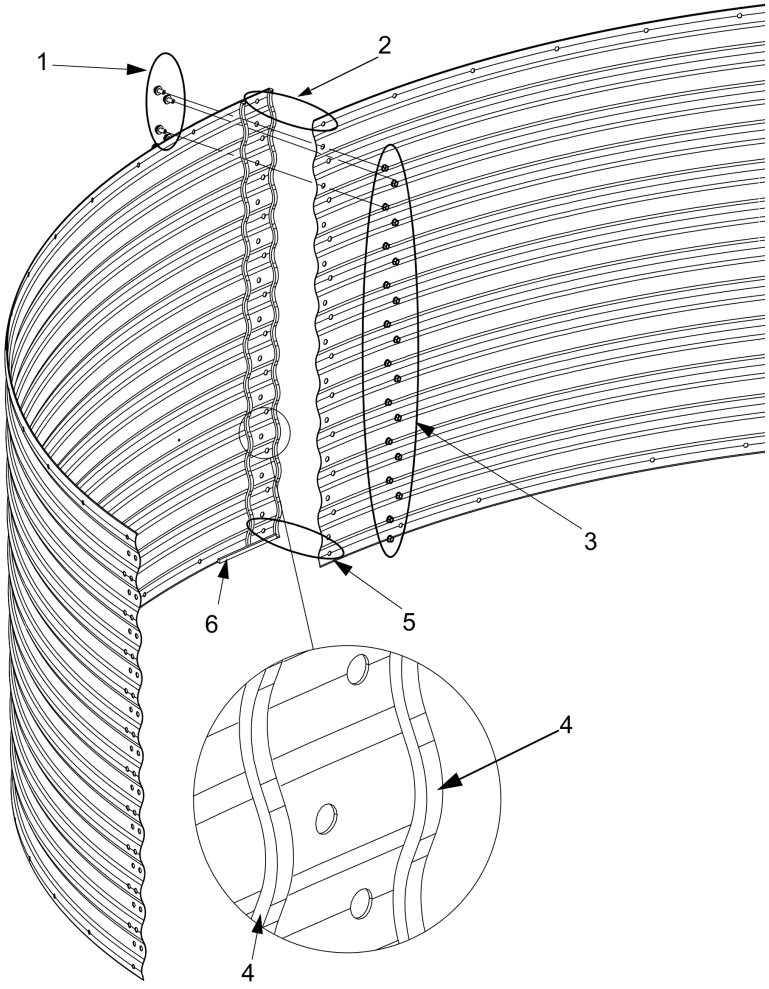
Note

The radius values given in the chart are ¾" smaller than the wall sheet radius at the bottom. This ensures that the scribed circle can be seen during assembly. A perfectly placed ring of sheets should be ¾" on the outside of this scribed circle.

Assemble the top tier wall sheets

1. Position the wall sheets for assembly.

Figure 4. Assembling wall sheets



Detail	Description
1	Sidewall bolts
2	Top single bolt holes left empty (will be filled when roof angle sections are installed)
3	Sidewall nuts
4	Vertical caulking
5	Bottom single bolt holes left empty (will be filled when attaching next tier)
6	Horizontal caulking (8 inches)

a. When connecting bin sheets, caulk the vertical and horizontal edges on the right hand side of each sheet (as seen from the inside of the bin circle):

   - Apply caulking all the way down on both sides of the vertical seam (4).
   - Centre the caulking between the edge of the bolt holes and the outside edge of the sheet.

- Apply 8” of caulking horizontally at the bottom of the sheet (6).

See Figure 4 on page 22.

b. Place sheets in a clockwise direction, one sheet at a time, lapping each new sheet toward the centre of the bin.

c. For ease of construction, bolt sheets together with three or four bolts (finger tight) per seam (1), until all bin sheets have been connected, then follow up with all remaining bolts and nuts (3).

d. Leave the top single bolt holes (2) empty so that the roof angle sections can be bolted through these holes.

e. Leave the bottom single bolt holes (5) empty so that the next tier of wall sheets can be bolted through these holes.

2. Insert all remaining bolts and nuts, and tighten fully.

Important

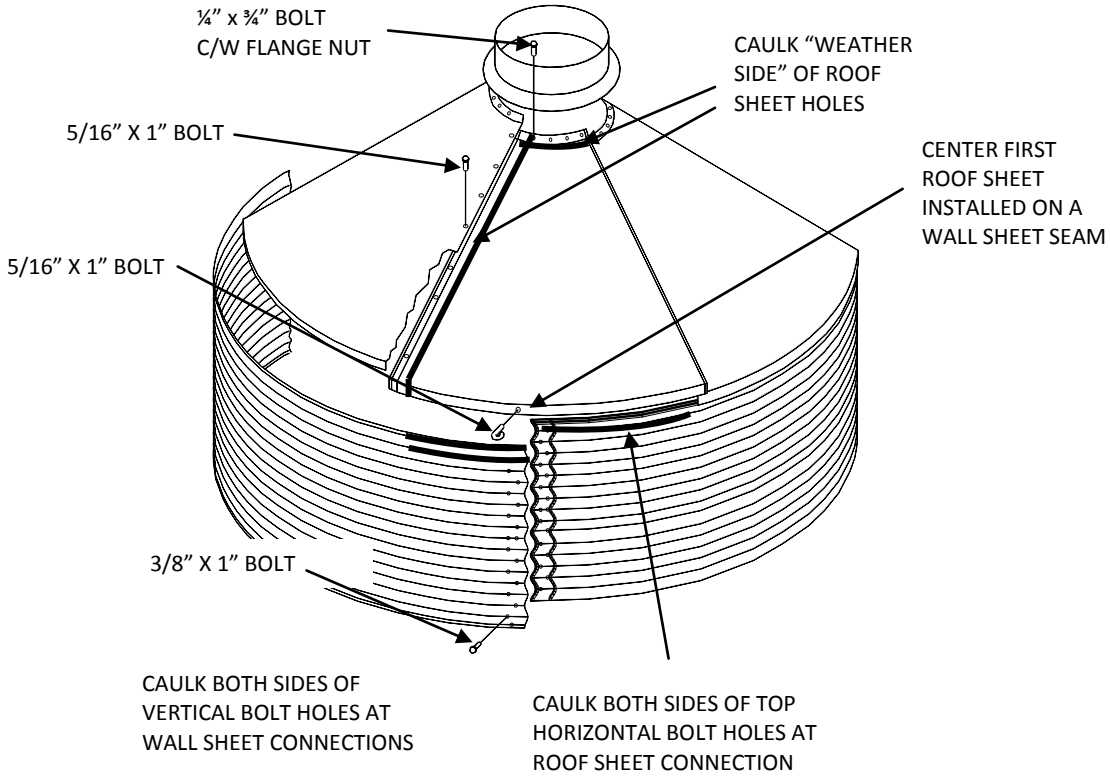
Before each additional tier is added, the tier above must be complete — all sheets placed, bolts inserted, and nuts tightened.

5.4. Roof Assembly

5.4.1 Roof Assembly - 6', 7', and 9' BFTs

1. When positioning roof panels onto wall sheets, apply caulking to both sides of the mating horizontal wall sheet holes.

Figure 5. Assembling roof panels to wall sheets



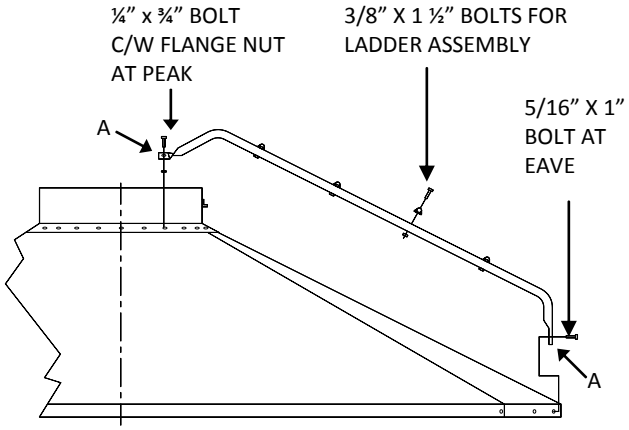
2. Center the first roof panel on a vertical wall seam and attach using 5/16" x 1" hardware.
3. Assemble roof panels in a clockwise pattern as shown in Figure 5 on page 23.
   a. Apply caulking to the weather side of the roof panel bolt holes.
   b. Use 5/16" x 1" hardware.
4. Attach the remote vent cap opener (RVCO) to the vent cap using the instructions provided with the RVCO.
   a. Note that an eye bolt is included for the remote vent opener cable.
   b. Attach the eye bolt at the eave, in line with the vent cap hinge.
   c. Enlarge the hole, if necessary.
   d. Install a second eye bolt on a leg.
5. Apply caulking to the weather side of top bolt holes.
   a. Attach the vent cap.
   b. Use ¼" x ¾" bolts and nuts.
6. Assemble the roof ladder rungs to the roof ladder side rails using 3/8" x 1 ½" bolts.
7. If the roof ladder side rails do not fit perfectly, use an adjustable wrench to bend the ends to make the connection. See Detail A in Figure 6 on page 24.

   Note

   The 6’ bins do not have a roof ladder.

8. Assemble the ladder to the roof using ¼" x ¾" bolts at peak and 5/16" x 1" bolts at eave. (See Figure 6 on page 24.)
   a. Install the ladder such that it is centered on a roof sheet panel.
   b. Time the ladder location with the desired wall sheet ladder and hopper ladder location.

Figure 6. 7' and 9' Roof Ladder Assembly Detail



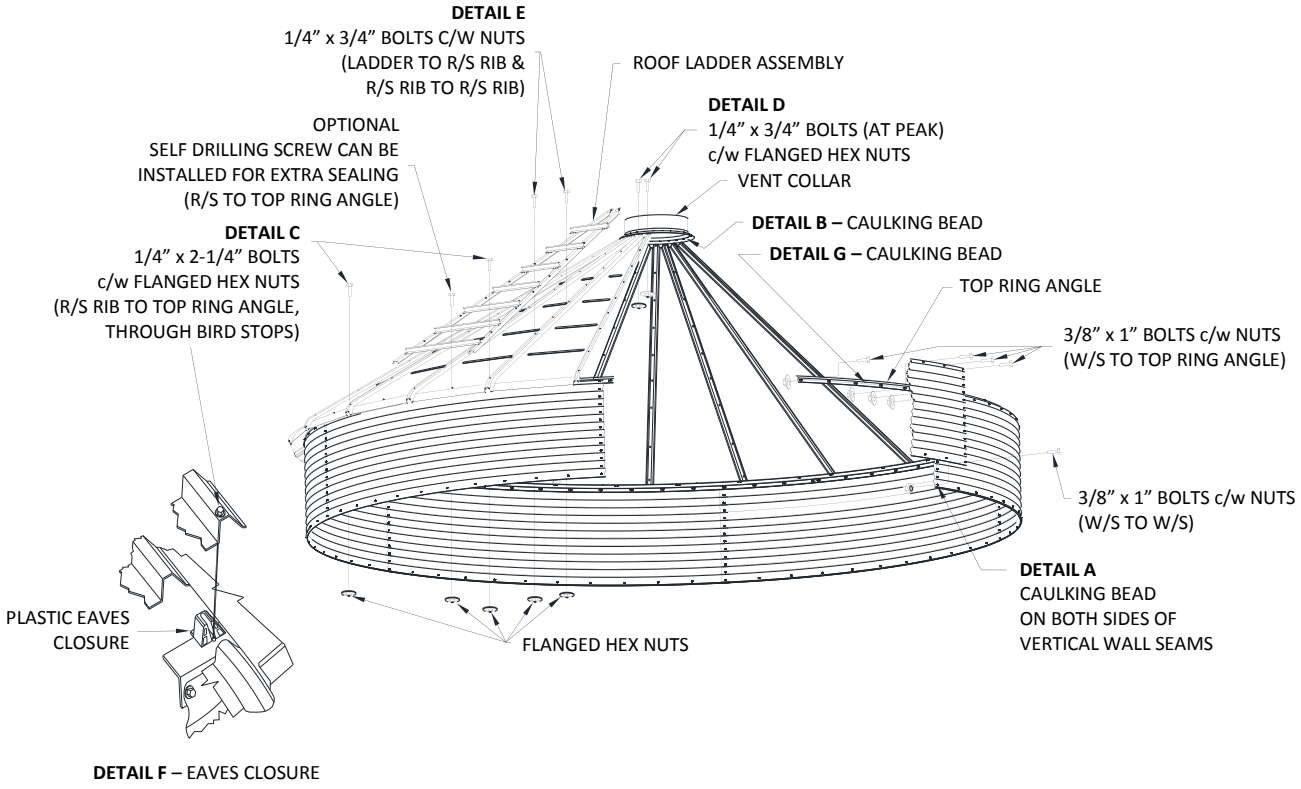
FOR CORRECT INSTALLATION CENTER ROOF LADDER ON A ROOF PANEL.

9. Make sure all nuts and bolts are tightened before proceeding.

5.4.2 Roof Assembly - 12' BFTs

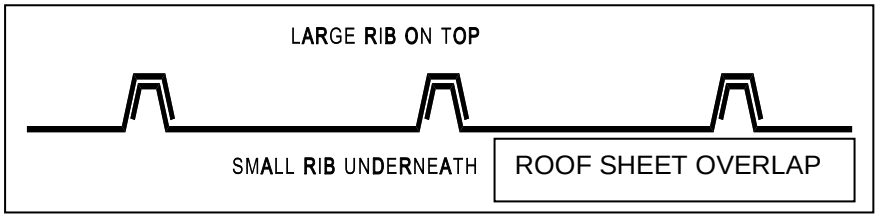
1. Bolt on the top ring angles to the wall sheets using ⅜" x 1" bolts.
2. Apply caulking to the weather side of the top ring angle and wall sheet connection as shown in Details G and H in Figure 7 on page 25.
3. Attach the remote vent cap opener (RVCO) to the vent cap using the instructions provided with the RVCO.
   a. Note that an eye bolt is included for the remote vent opener rope.
   b. Attach the eye bolt at the eave, in line with the vent cap hinge.
   c. Enlarge the hole, if necessary.

Figure 7. 12' Roof Assembly Detail



4. Position the vent cap and add roof sheets between the top ring angle and vent collar as shown in Figure 7 on page 25.
   a. Add roof sheets in a clockwise manner with the large rib on top and the small rib on the bottom.

Figure 8. Roof Sheet Overlap Detail



Description	Roof Sheet	Top Ring Angle	Vent Assembly	Ladder	Eaves Closure
P/N for 12' Bin	235600	212243	236053	235615	235651

b. Use ¼" x ¾" bolts at all roof panel connections.

c. Caulk around the weather side of the vent collar and between the roof sheets and top angles as shown in Details A and B in Figure 7 on page 25.

5. Bolt on roof ladder at appropriate location using the same bolt holes and hardware as for the roof panels.

   a. Use the 235615 ladder assembly and cut off the last rung on site to properly fit the assembly.

6. Plastic eaves closures bolt on where the roof ribs meet the top ring angle as illustrated in Detail F in Figure 7 on page 25.

   a. Secure with ¼" x 2 ¼" bolts.

5.4.3 Roof Assembly - 15' BFTs

Lay Out the Bin

1. Install the center post making sure the post is vertical, braced and anchored properly for safe installation.
2. Lay out the bin circumference (for the bottom tier of wall sheets) on the foundation:

   a. Anchor a string to the exact center of the concrete foundation.

   b. Determine the required string length using Table 5 on page 26.

      Note

      The radius values given in the chart are ¾" smaller than the wall sheet radius at the bottom. This ensures that the scribed circle can be seen during assembly. A perfectly placed ring of sheets should be ¾" on the outside of this scribed circle.

   c. Scribe the bin circumference onto the foundation.

      Important

      Follow these steps carefully. It is imperative that the bin be as round as possible.

Table 5. Scribe Radius and Peak Ring Height - 15' BFT

Nominal Bin Dia.	Scribe Radius		Top of Peak Ring Height "H" with 1 tier of wall sheets	
(ft)	(ft in)	(m)	(ft in)	(m)
15	7'4-¾"	2.255	7'9-⅜"	2.372

Assemble the Top Tier of Wall Sheets

1. Assemble a single tier of wall sheets.
2. Refer to the Appendix for information on proper hardware usage.
3. After the first ring of wall sheets has been assembled, check the position and roundness of the ring:

   a. Verify that the bin is round, with **no more than ¾" variation** on the radius, when measured from the center of the bin.

   b. Verify that the wall sheets form a smooth circle with no flat spots or cauliflower shaped curves.

      Note

      Correcting for roundness becomes much more difficult the longer you wait.

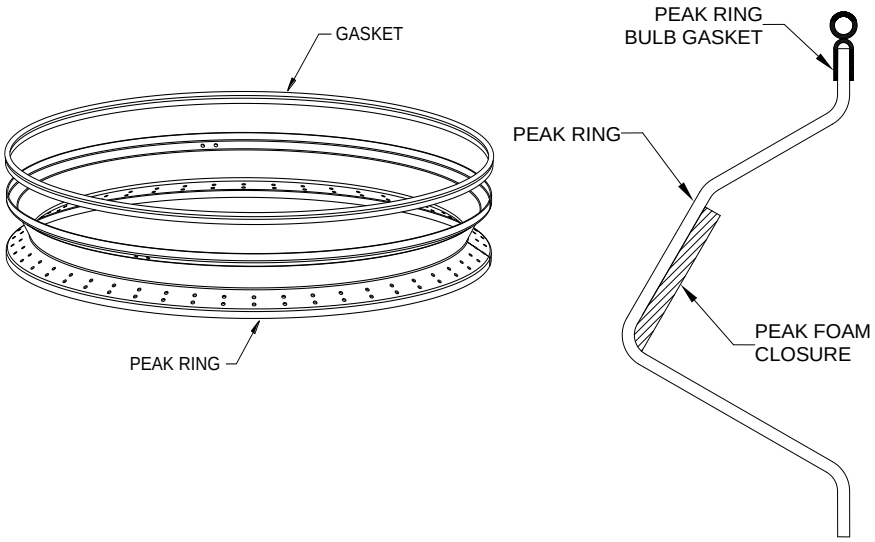
4. When setting jacks, make sure they are also set round and that they are anchored to the concrete.
5. Attach the top ring angle to the inside top of the wall sheets.
   - Do not align the top ring angle joints with wall sheet joints.

Install the Peak Ring

1. Install the supplied bulb gasket around the top of the peak ring.
2. Install the foam closure gasket around the center section of the peak ring.

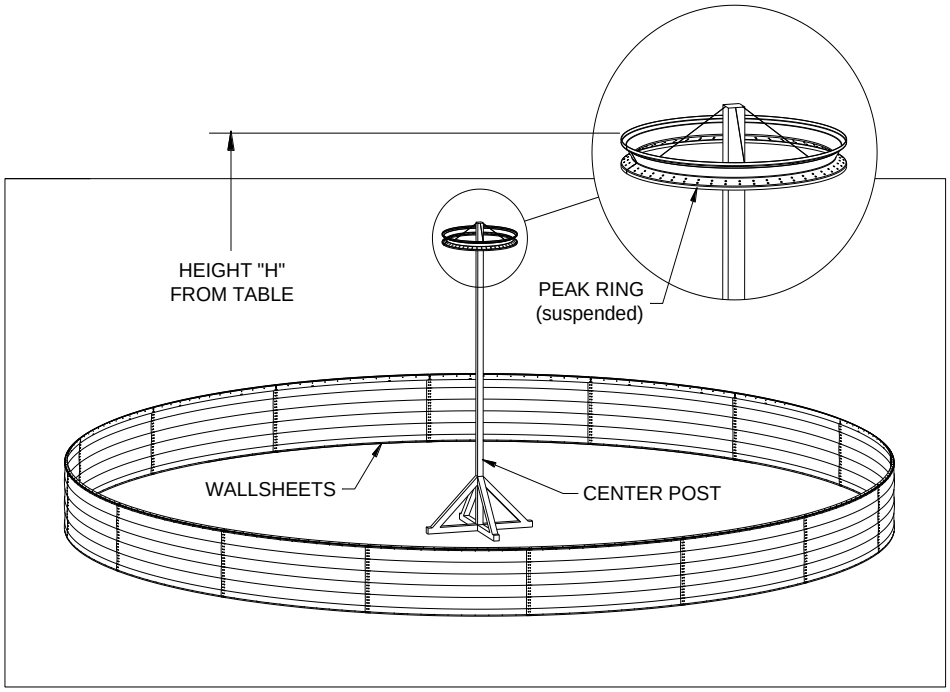
   Refer to Figure 9 on page 27.

Figure 9. Gasket and Foam Closure Assembly to Peak Ring



3. Determine the correct peak ring height (H) for the bin size from Table 5 on page 26.
4. Attach the peak ring assembly to the top of the center post at the correct height.

Figure 10. Peak Ring Installation

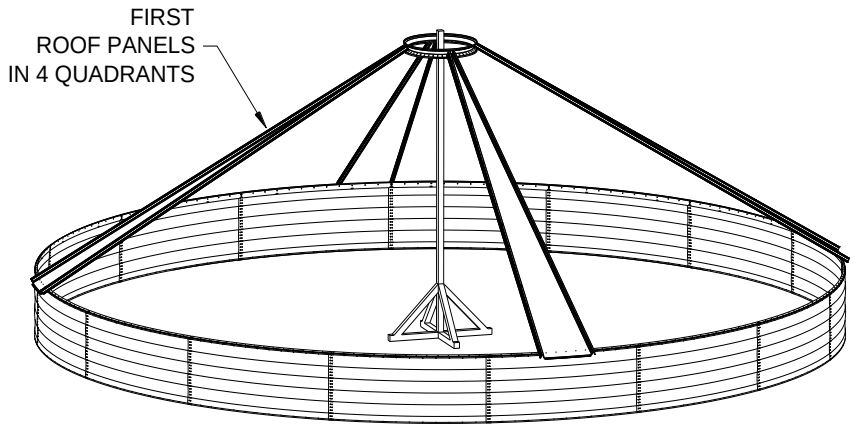


Install the Roof Sheets

1. Attach roof sheets with the narrow end to the peak ring and the wide end to the top ring angle.
2. Initially, attach four roof panels at the quarter points of the bin. (See Figure 11 on page 29.)

   This will stabilize and support the peak ring for the rest of the install.

Figure 11. Roof Panel Installation



Tip

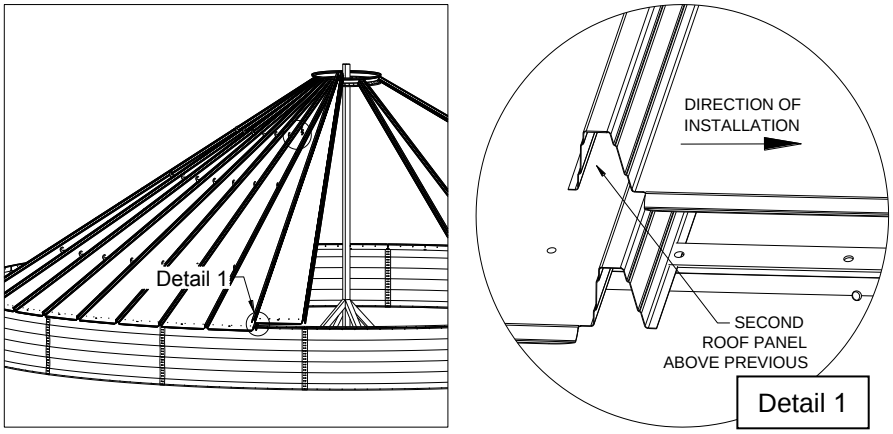
The narrow end of the roof panels gets pushed into the foam closure. Once this occurs there is little room for adjustment at the top end as the roof panel is embedded in the foam. Sometimes the roof panels get “flattened” slightly from bundling, shipping and handling. It is relatively easy to push the rigs together slightly but this should occur before the panel is seated in the foam. Monitor the alignment of mating roof panels with the underlying holes in the peak ring and make adjustments, if necessary, before anchoring the roof panel into the foam.

Important

Be careful when attaching the bottom of the roof panels to the top ring angle. The center round holes at the bottom of the roof panels must align with round holes in the top ring angle. This locks in the correct centering location for the roof sheet. The other holes in the bottom of the roof sheet align with the round holes in the top ring angle.

3. Make sure that the gap between the roof panel and the peak-ring is sealed by the foam closure.
4. Make sure the center hole in the roof panels aligns with round holes in the top ring angle.
5. Install the remaining roof panels, working in a counter clockwise direction:
   a. Attach the center roof panel hole first.
   b. Use two bolts at each roof panel to peak ring connection.
   c. Fill in every bolt hole in roof panel ribs with rubber washered bolts to the outside and nuts on the underside.
   d. Make sure the left roof rib overlaps the right rib of the preceding panel. (See Detail 1 in Figure 12 on page 30.)

Figure 12. Roof Rib Orientation



Important

As assembly proceeds, additional support is advised to keep the peak ring level. Alternatively sequentially add roof panels in the different quadrants such that the weight of the panels on the peak ring remains uniformly distributed. Leave all roof bolts loose until the roof is completely assembled, especially those at the peak ring and top ring angle locations.

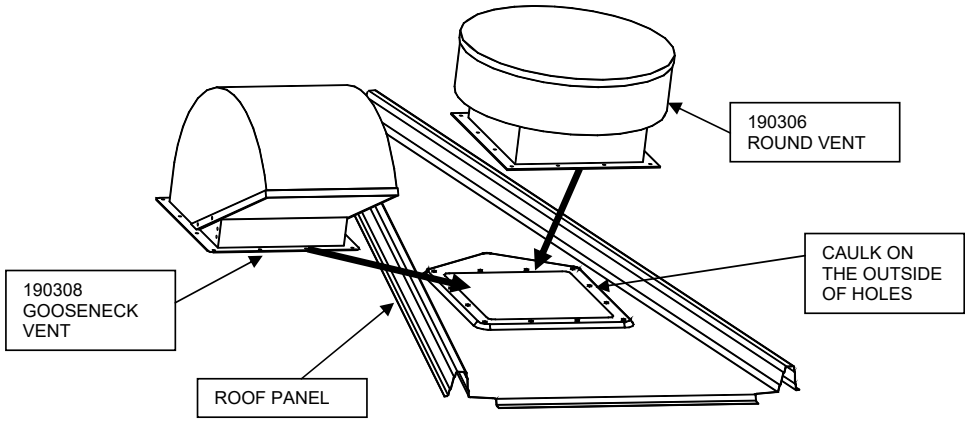
6. Install vent roof panels where required, as the roof is being assembled.

   Distribute vent roof panels evenly around the roof. Ensure that they do not interfere with other roof elements such as roof stairs or rungs, temperature cables, etc.

   Note

   Westeel supplied roof vents come in two styles: Gooseneck and Round. Both have pre-formed bolt holes for mounting to the roof panel. The vent roof panels have a raised mount section, mounting holes for mounting to the roof panel and a pre-cut ventilation opening. No on-site cutting is required. A recommended practice is to assemble the vents to the roof panels at ground level before installing. Place a strip of caulking all the way around the weather side of the connection, position the vent, and bolt into place.

Figure 13. Roof Vent Assembly



7. Install inspection hatch roof panel where required.

   The inspection hatch can be pre-assembled if desired. See Section 5.14 – Roof Inspection Hatch (Option) on page 70.

8. Install the roof ladder on the roof sheet to the left of the inspection hatch. See Roof Ladder Details on page 32.

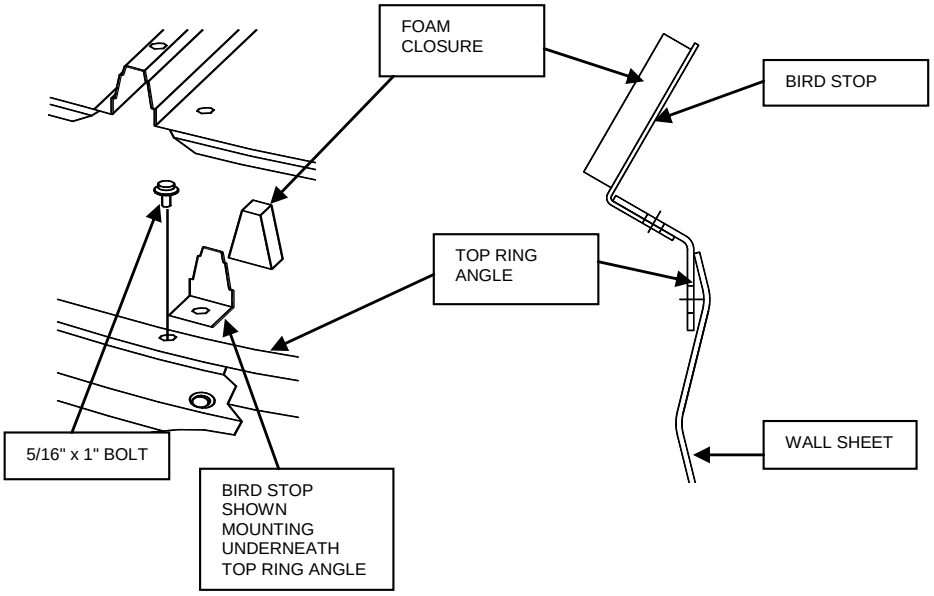
Enough roof ladder rungs are supplied to the bridge across every pair of holes on a single roof panel. Roof ladder rungs are installed with the higher vertical flange facing the peak ring.

Install Bird Stops

Bird stops consist of a metal bird stop bracket, an adhesive backed foam closure and a nut and bolt.

1. Install bird stops at the bottom end of all roof panel ribs:
   a. Best practice is to install bird stops before attaching the roof panels. (Easier access to bolts and aids with timing).
   b. Install bird stops at locations that are five holes to the left or right of the roof panel center mounting holes in the top ring angle.
   c. Best practice is to mount the bird stop under the top ring angle.

Figure 14. Bird Stop Installation



Tip

Mounting the bird stop under the top ring angle prevents it from turning when tightening the nut. Other methods of installing are acceptable.

Install Associated Components

1. Assemble roof cap, roof cap opener, ladders and associated components (if applicable).

- See Roof Ladder Details on page 32
- See Section 5.5 – Remote Roof Cap Opener Installation on page 33

Roof Ladder Details

1. Locate the roof panel containing the roof ladder components to the left or right of the inspection hatch, and in line with the outside ladder.
2. Recommended (for convenience): Attach the ladder and a section of the outside ladder early, when the roof section is at ground level.
3. Start at the bottom with the longest ladder rung supplied and move up the roof using progressively shorter ladder sections.
4. Bolt ladder rungs to the roof panel ribs using the pre-drilled holes in the ribs.

   Note

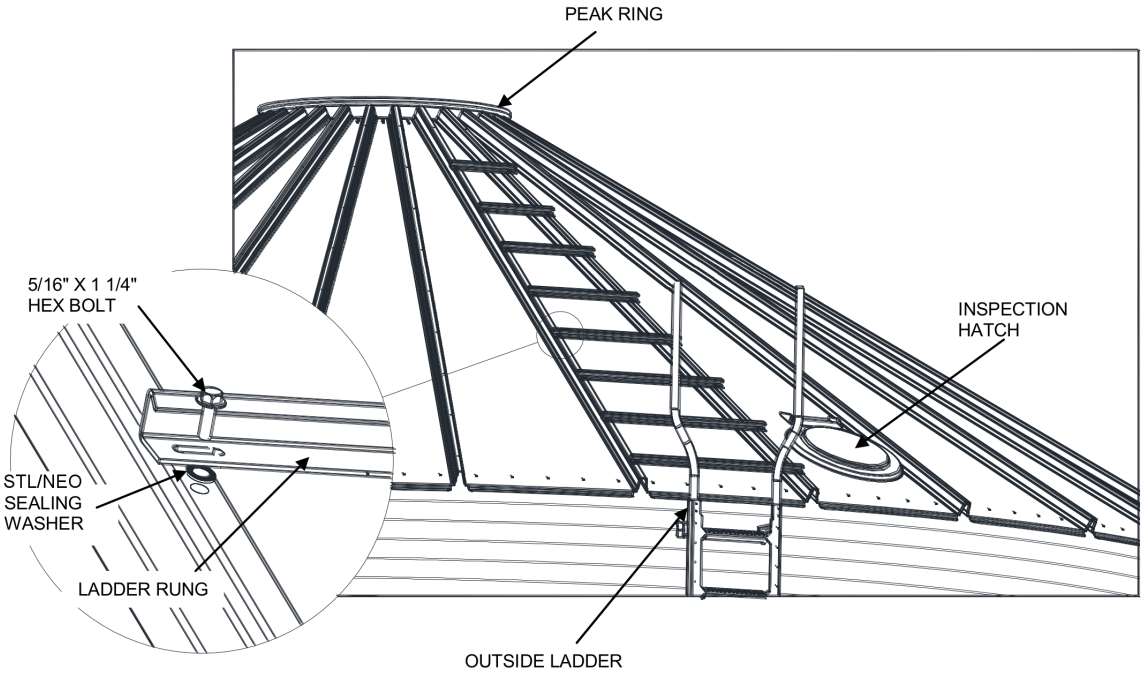
   The ladder rung is oriented with the vertical portion facing up towards the peak ring. When a ladder rung is located at a double hole pattern designed for a roof-ring element, bolt through the upper holes and fill the other hole with a 1" hex bolt.

5. Use 5/16" x 1 1/4" hex bolts and hex nuts (bolts above and nuts underneath).

   Note

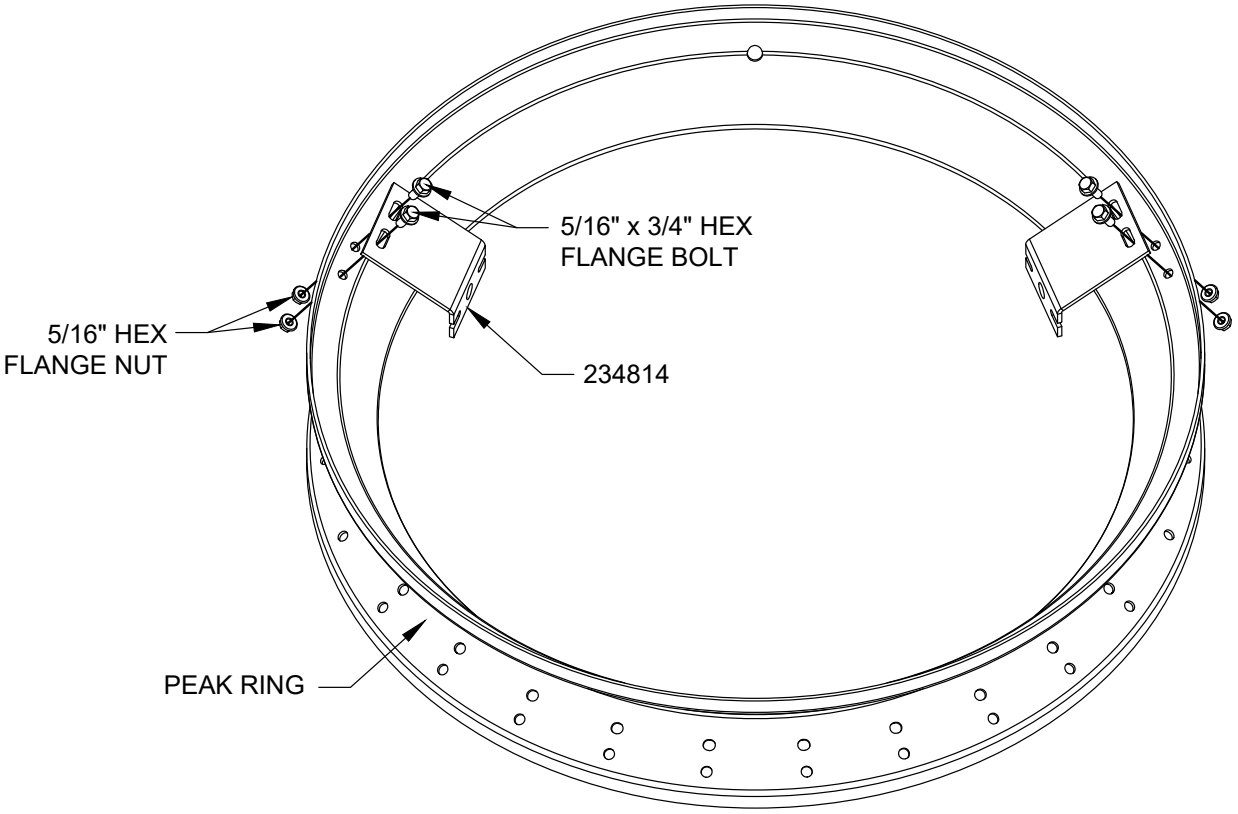
   Make sure that a steel backed neoprene sealing washer is installed between the last part and the roof sheet.

Figure 15. Roof Ladder Details



5.5. Remote Roof Cap Opener Installation

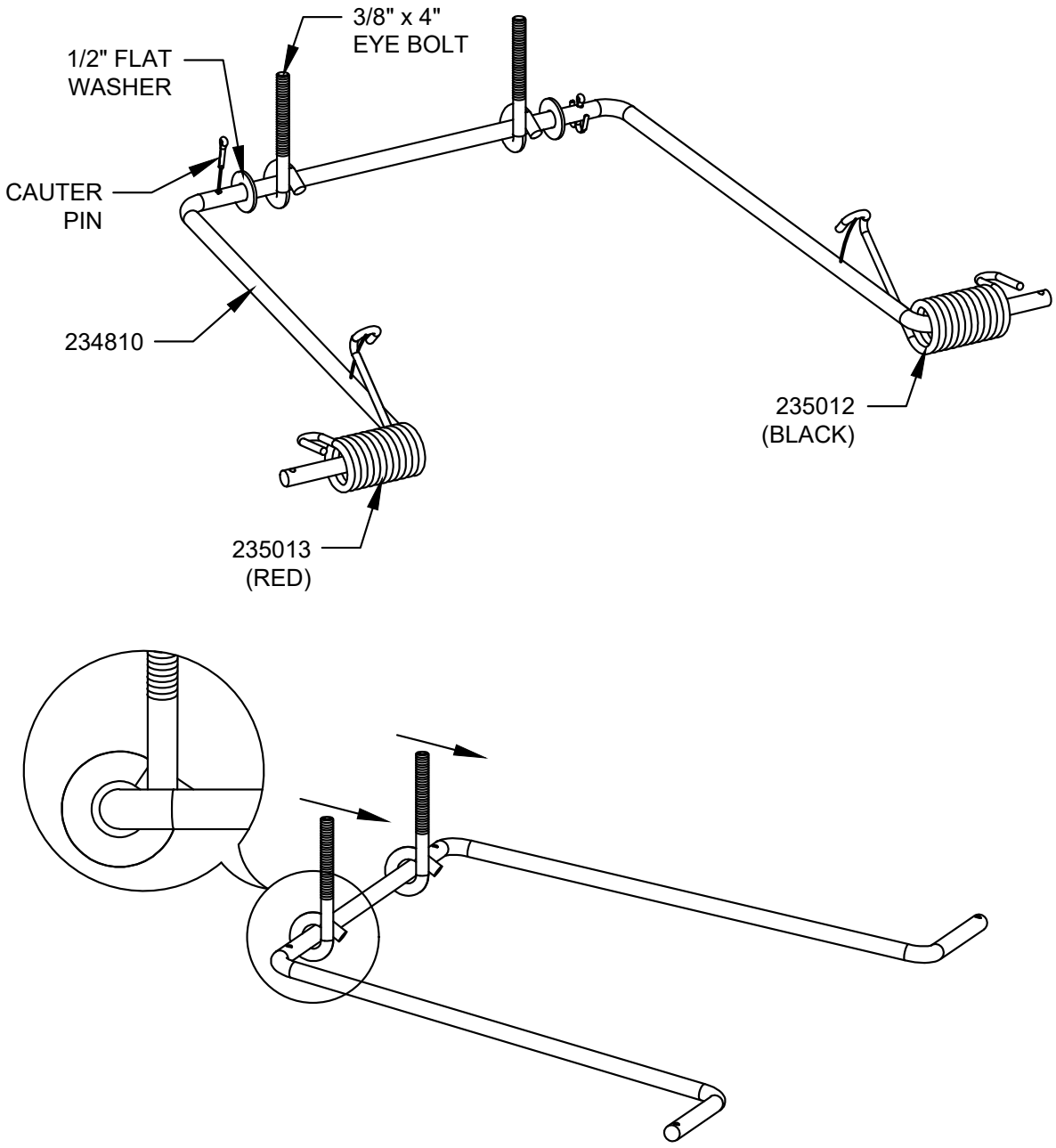
Install the Pivot Arm Brackets



Note

The brackets are interchangeable, right to left.

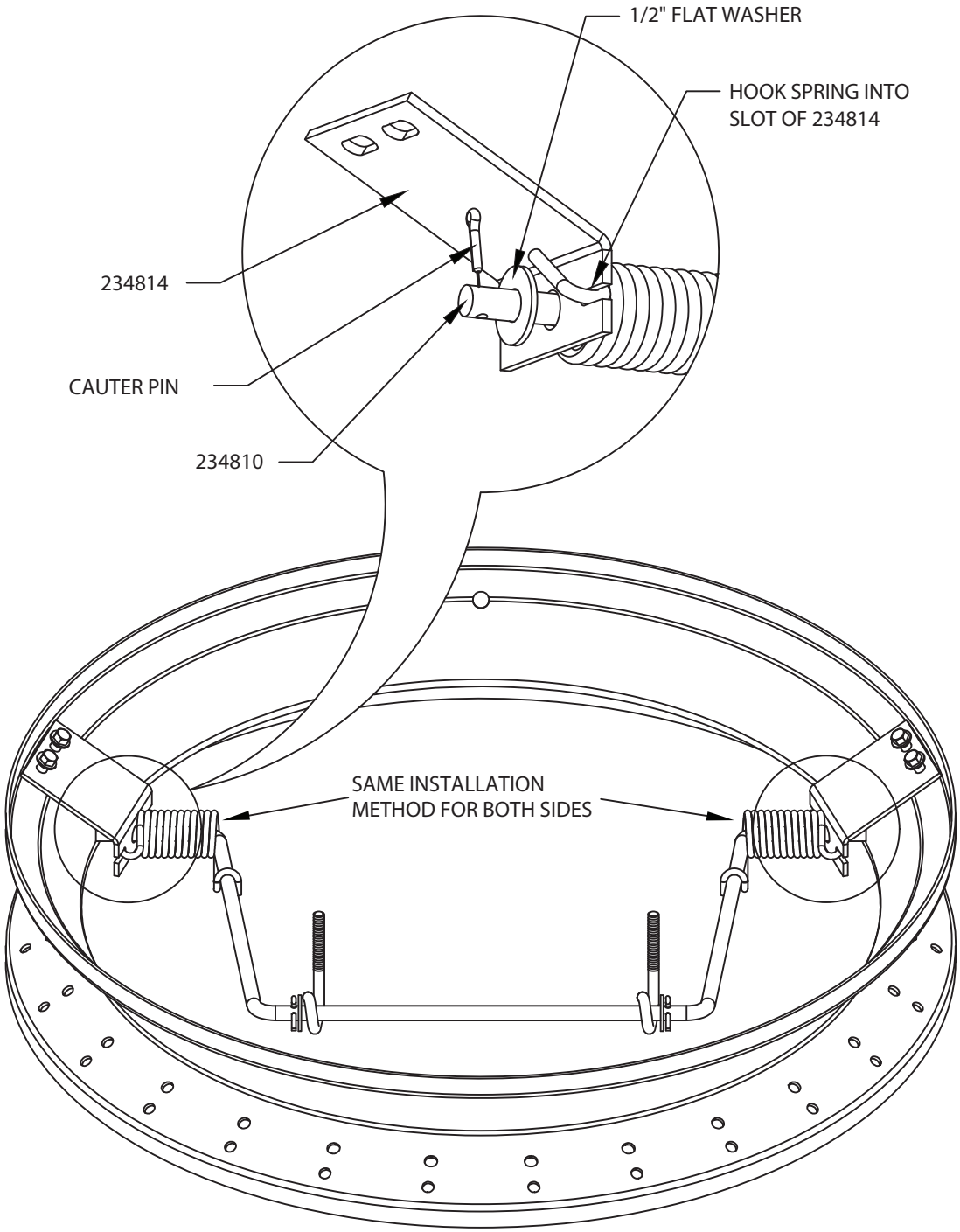
Install the Pivot Arm Hardware



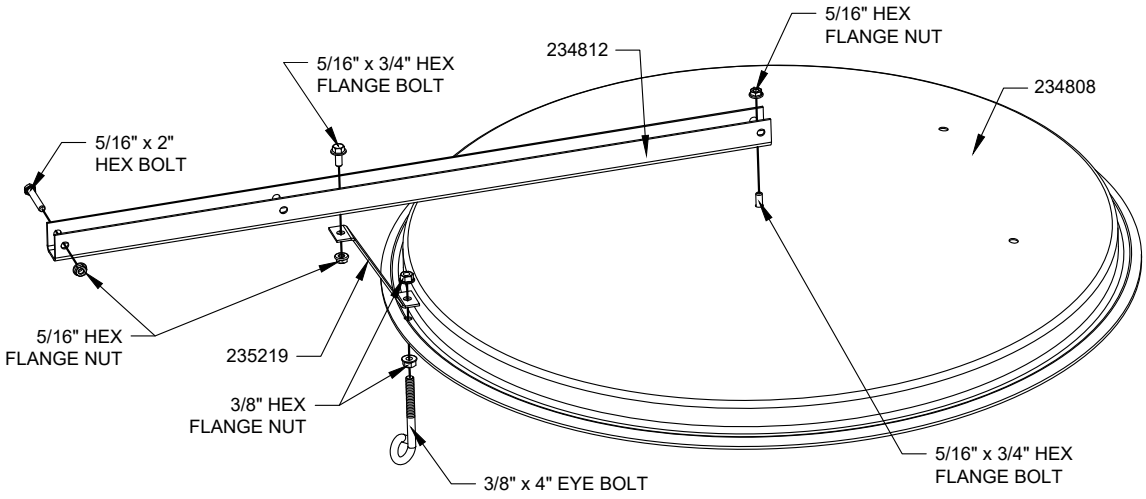
Important

Critical assembly feature — threaded rods of both eye bolts must be positioned towards the inside of the pivot arm.

Install the Pivot Arm to the Brackets



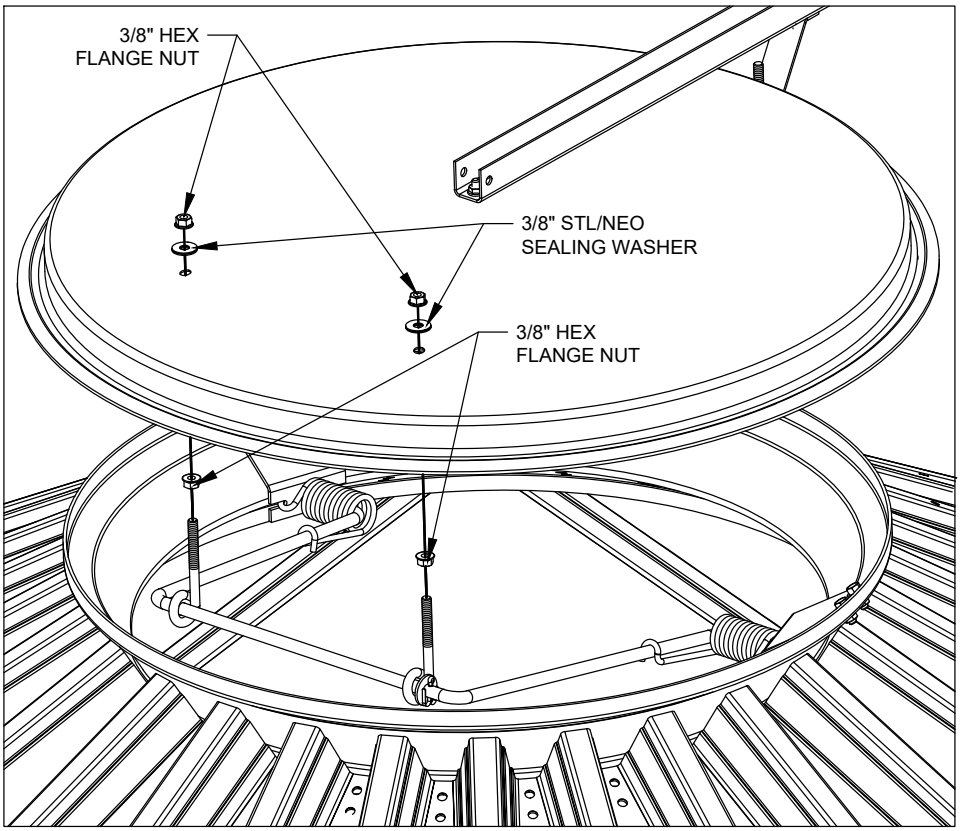
Pre-assemble the Roof Cap



Important

Do not tighten the 3/8" x 4" eye bolt until the slide rod has been fully installed.

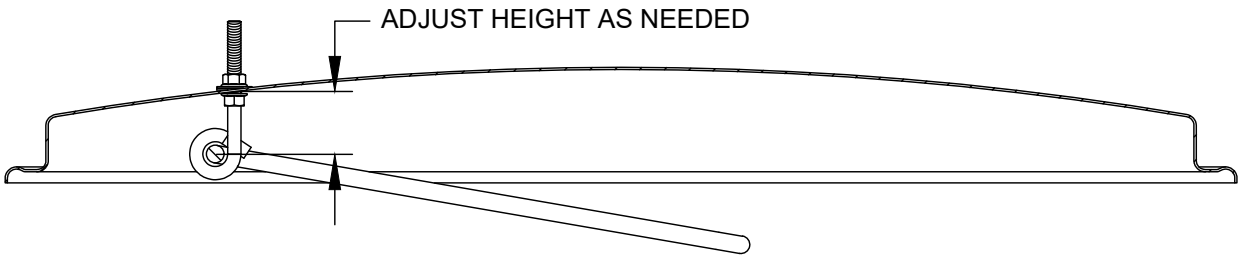
Install the Roof Cap to the Pivot Arm

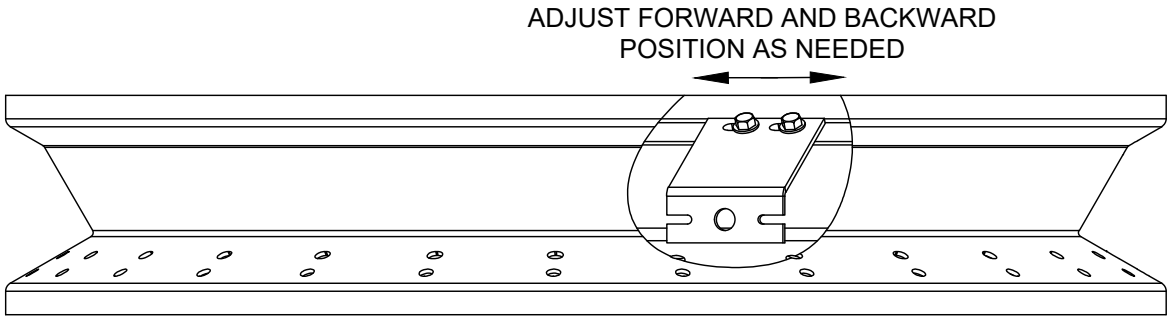


Note

To help with installing the pivot arm eye bolts to the roof cap, rotate the pivot arm up and over the top of the peak ring. Then place a 2x4 across the peak ring, under the pivot arm.

Center the Roof Cap

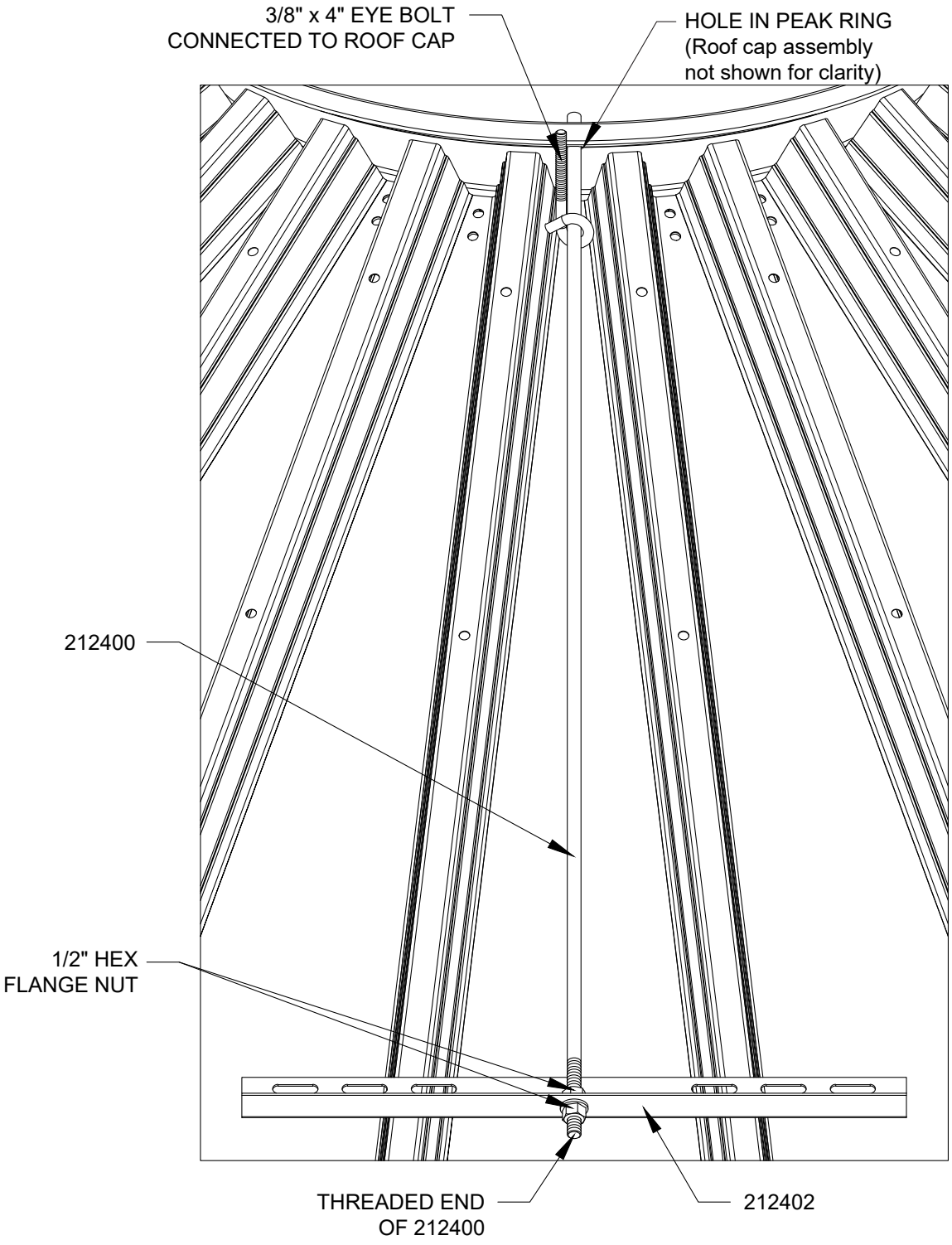




Note

Adjust position of pivot arm brackets in combination with pivot arm eye bolt nut height to center roof cap on peak ring.

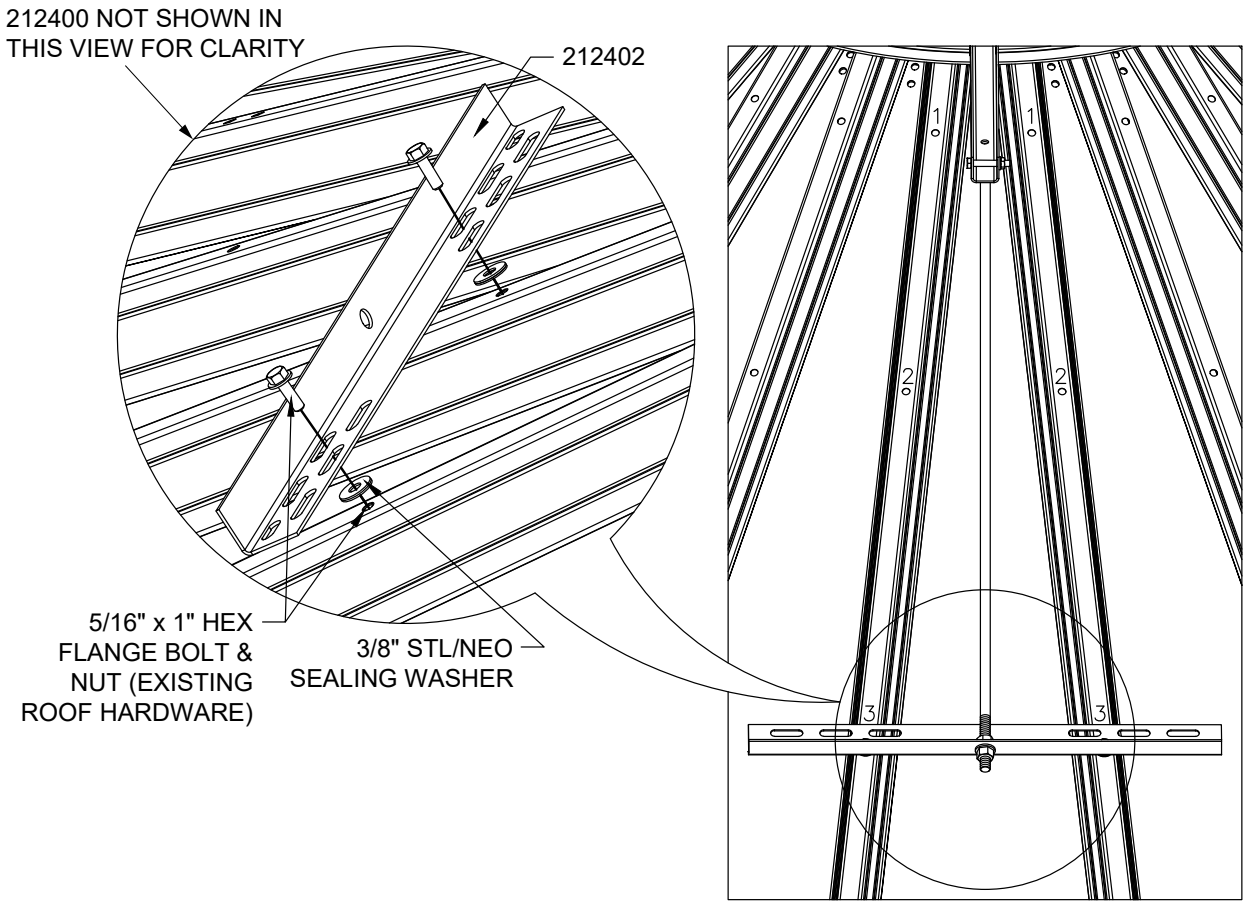
Install the Slide Rod



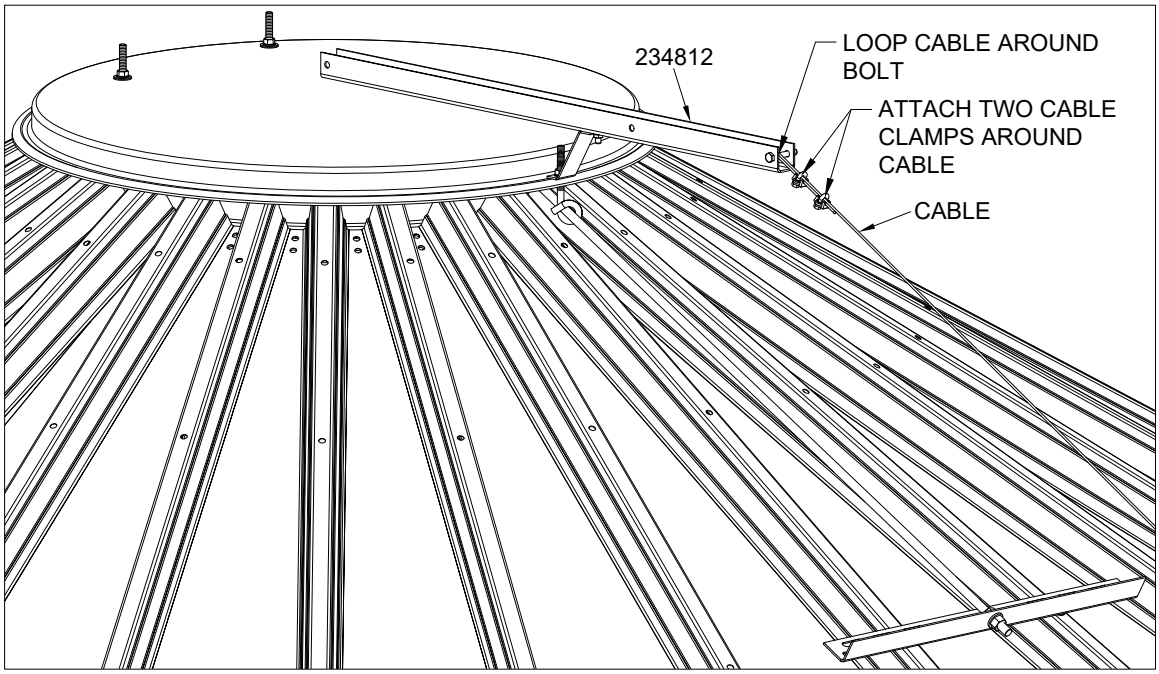
Note

Adjust the 3/8" x 4" eye bolt so that the roof cap is supported on the slide rod, and tighten the eye bolt hardware.

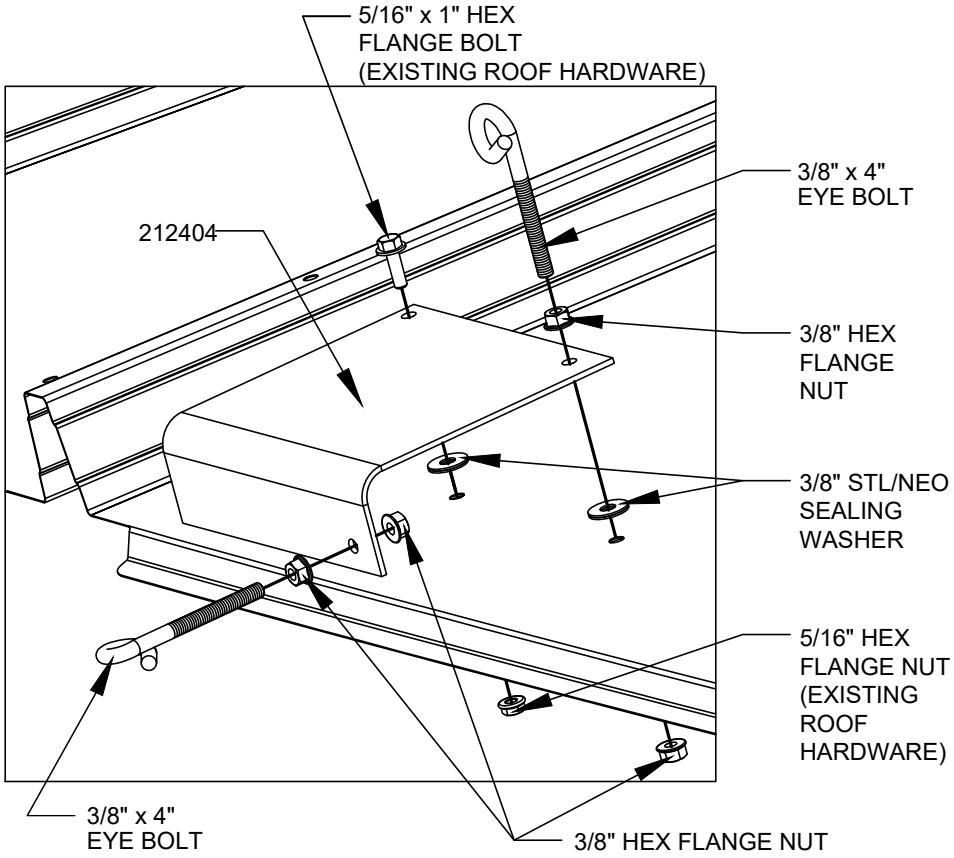
Install the Slide Rod Bracket



Attach the Cable to the Roof Cap Assembly



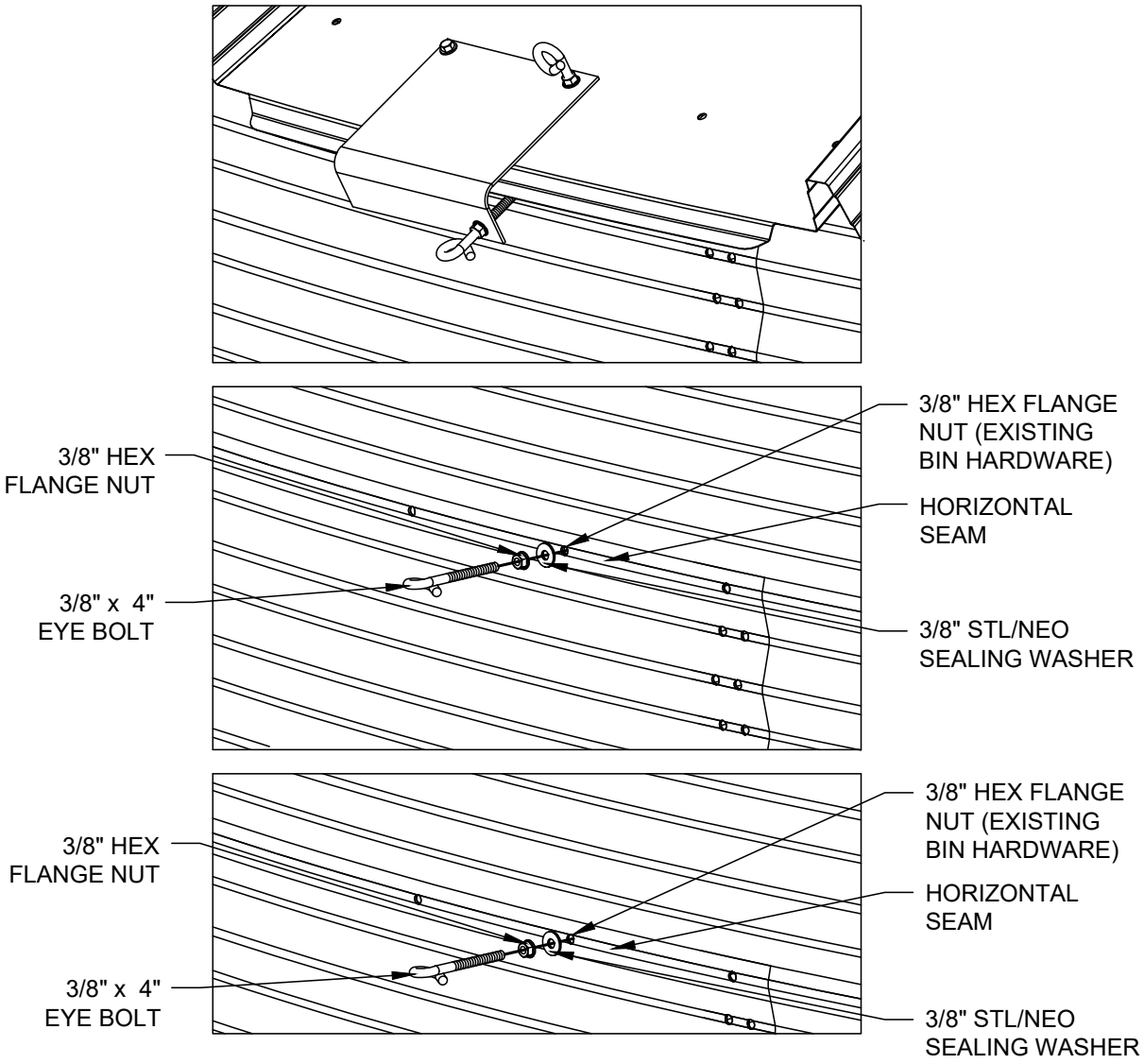
Install the Eave Guide Plate



Note

Insert the eye bolt into the center bolt hole of the roof sheet.

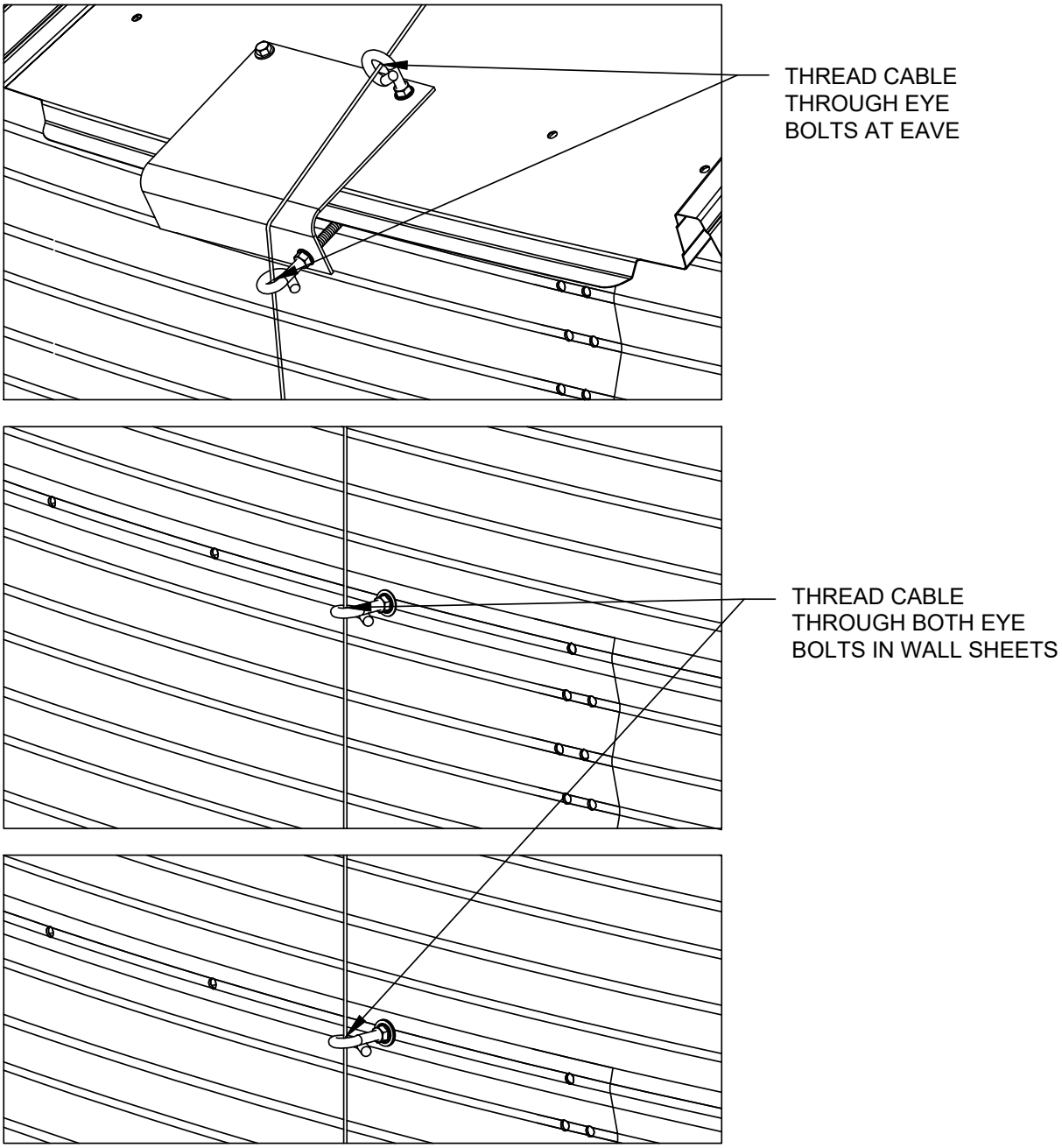
Install the Down Bin Eye Bolts



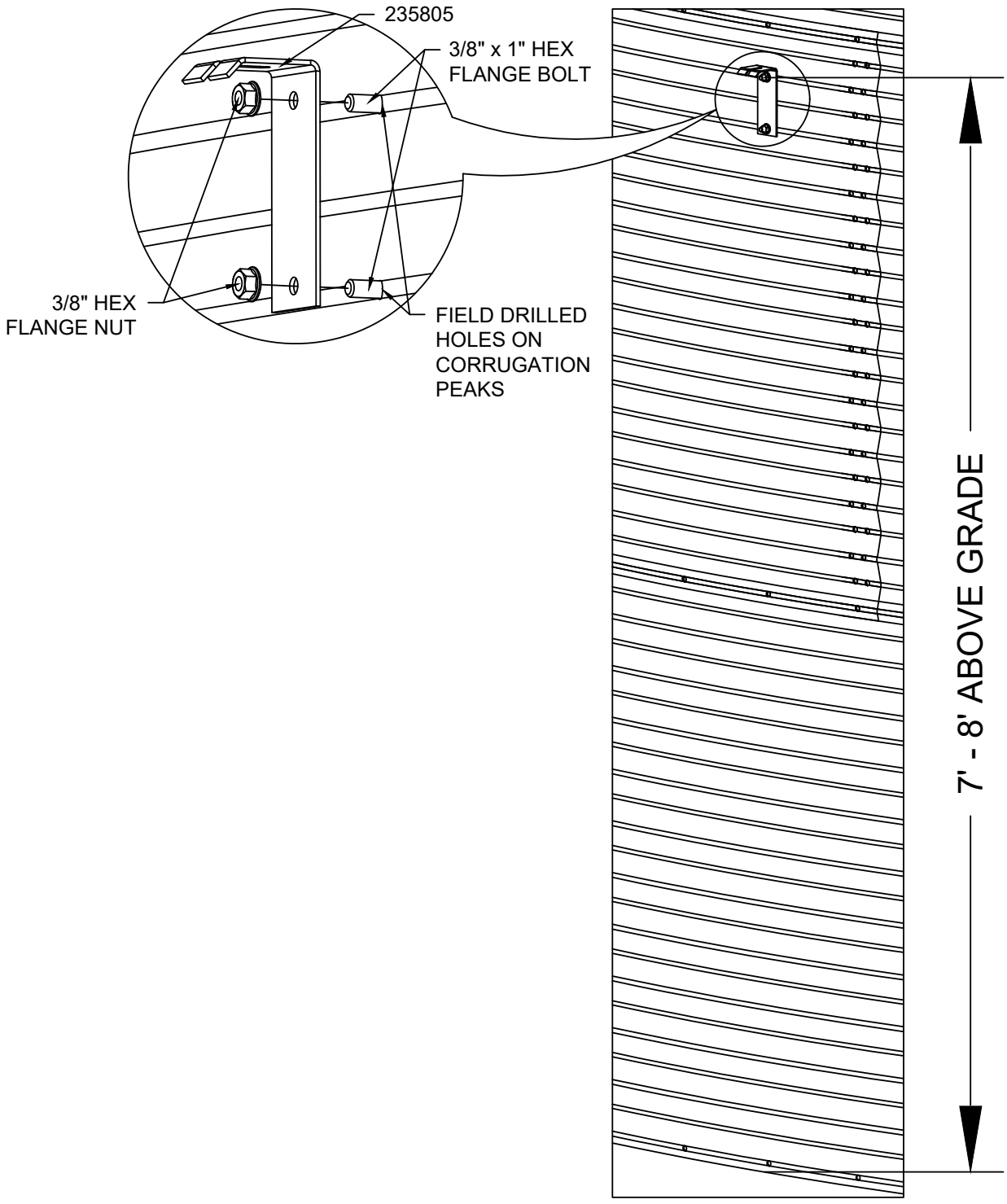
Note

Ensure eye bolts installed at horizontal seams are vertically aligned with eye bolts in 212404. Space the eye bolts so there is an even distance between the Eave Guide Plate, down bin eye bolts, and cleat hook.

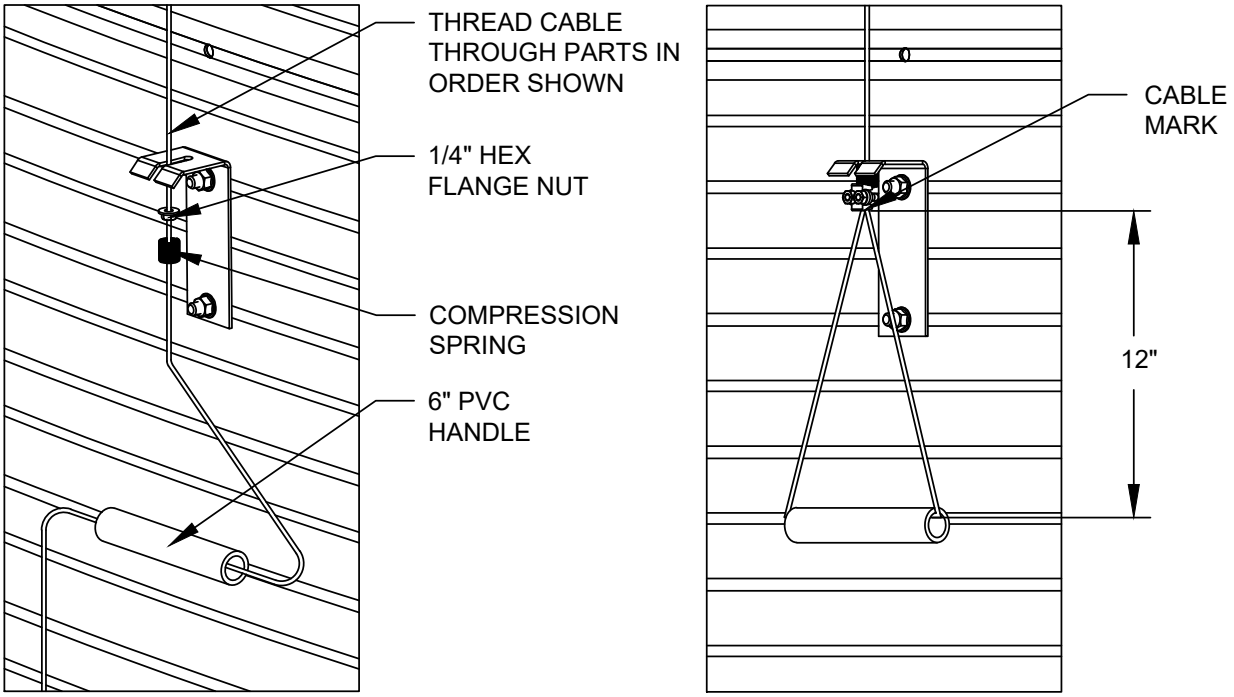
Thread the Cable Through the Eye Bolts



Install the Cleat Hook

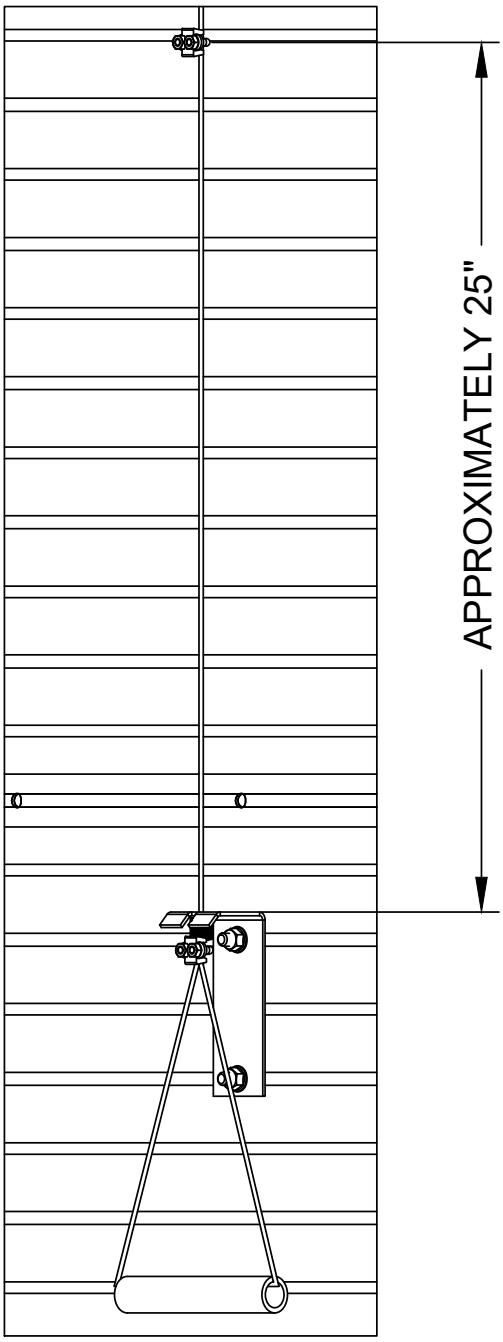


Install the Handle



1. Thread the cable through the 1/4" hex flange nut, compression spring, and PVC handle, in that order.
2. Pull the cable tight enough to just being to open the roof cap.
3. Mark the spot on the cable that is even with the cleat hook when the cable is in tension.
4. Push the nut and spring above the mark.
5. Loop the cable large enough to allow the handle to hang horizontally 12" down from the mark.
6. Clamp the cable at the mark and trim the extra cable.
7. Insert the nut into the spring, and position the spring on top of the clamp.

Install the Indicator for Open Cap



1. With the lid closed, attach a cable clamp approximately 25" above the cleat hook. This will act as the indicator for when the cap is fully opened.
2. Adjust the height of the cable clamp as needed for a more open, or more closed cap.
3. Do not increase the height to more than 30" as this may cause damage to the RCO assembly.

5.5.1 Remote Roof Cap Material List

Table 6. Remote Roof Cap Material

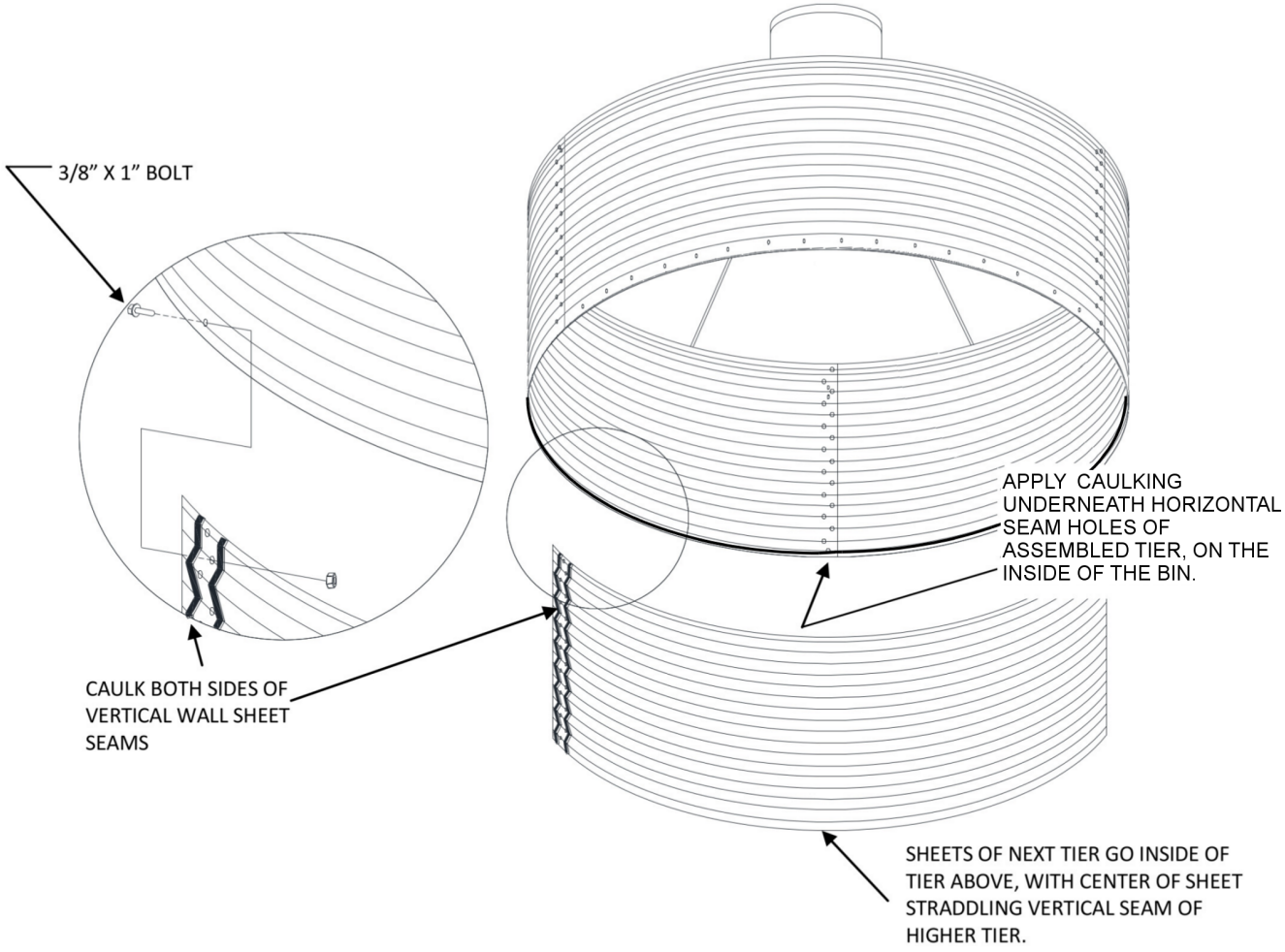
Item	Description	15'	
		P/N	Quantity
1	PIVOT ARM	234810	1
2	PIVOT ARM BRACKET	234814	2
3	ROPE ARM	234812	1
4	ROPE ARM SUPPORT	235219	1
5	CABLE GUIDE EAVE PLATE	212404	1
6	CABLE	235798	1
7	SLIDE ROD	212400	1
8	SLIDE ROD ANGLE	212402	1
9	5/16" X 3/4" HFW BOLT	193801	10
10	5/16" X 2" HEX BOLT	234588	1
11	5/16" HEX FLLK NUT	235923	15
12	3/8" X 4" EYE BOLT	150013	7
13	3/8" HEX FLLK NUT	235955	15
14	1/2" HEX FLLK NUT	154201	2
15	LEFT HANDED SPRING (BLACK)	235012	1
16	RIGHT HANDED SPRING (RED)	235013	1
17	CABLE CLAMP	235804	4
18	6" PVC CABLE HANDLE	235807	1
19	CLEAT HOOK	235805	1
20	COMPRESSION SPRING	235806	1
21	1/4" HEX FLLK NUT	154156	1
22	1/2" FLAT WASHER	154981	6
23	5/32" X 1-1/4" COTTER PIN	154952	6
24	3/8" STL/NEO SEALING WASHER	193775	10

- Items 9 to 24 are packaged in a poly-bag, P/N 234804, for 15' and found in the Roof Parts Box.

5.6. Wall Sheet Assembly Detail

1. Assemble the remaining wall sheets as per Figure 16 on page 47.
   a. Use 3/8" x 1" hardware.
2. Apply rope caulking underneath the bottom holes of the assembled wall seams on the weather side on the inside surface before bolting on lower tiers.
3. Center the wall sheets on the previous tier and place lower sheets on the inside of the upper sheets such that water sheds.
4. Caulk both sides of vertical wall sheet seams.
5. The bottom tier of wall sheets must be oriented such that the connection holes to the hopper sheets are along the bottom edge.
6. Tighten all hardware.

Figure 16. Wall sheet caulking and assembly detail



Note

Install the bottom tier such that the holes that mate to the hopper sheets are along the bottom edge.

5.7. Wall Sheet Layouts

Install the bottom tier such that the holes that mate to the hopper sheets are along the bottom edge.

Figure 17. 602 to 605

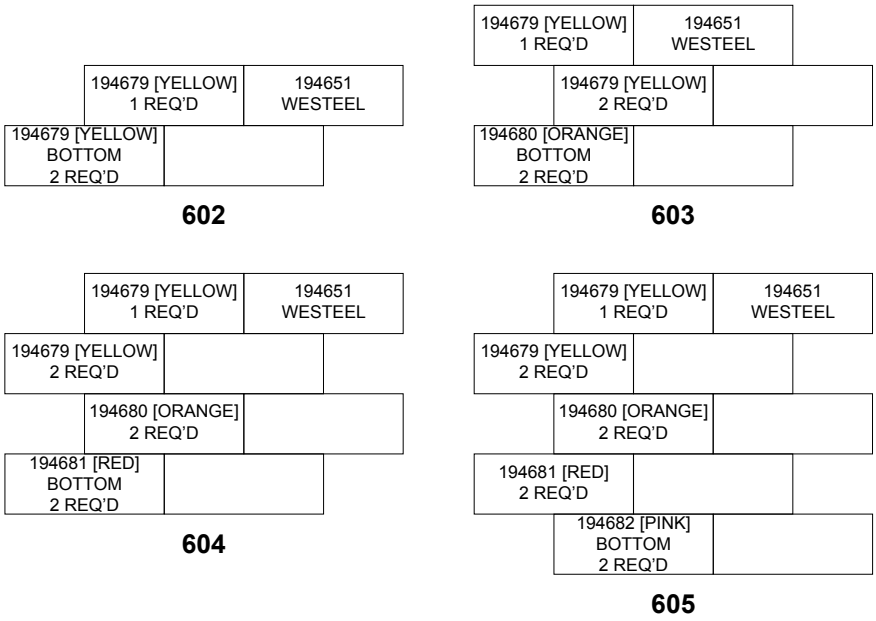


Figure 18. 702 to 705

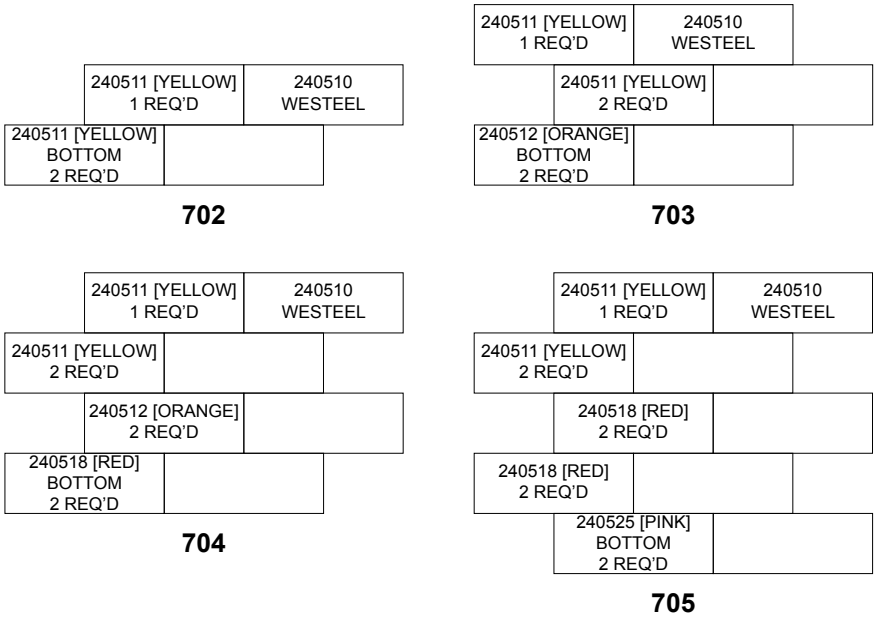


Figure 19. 902 to 905

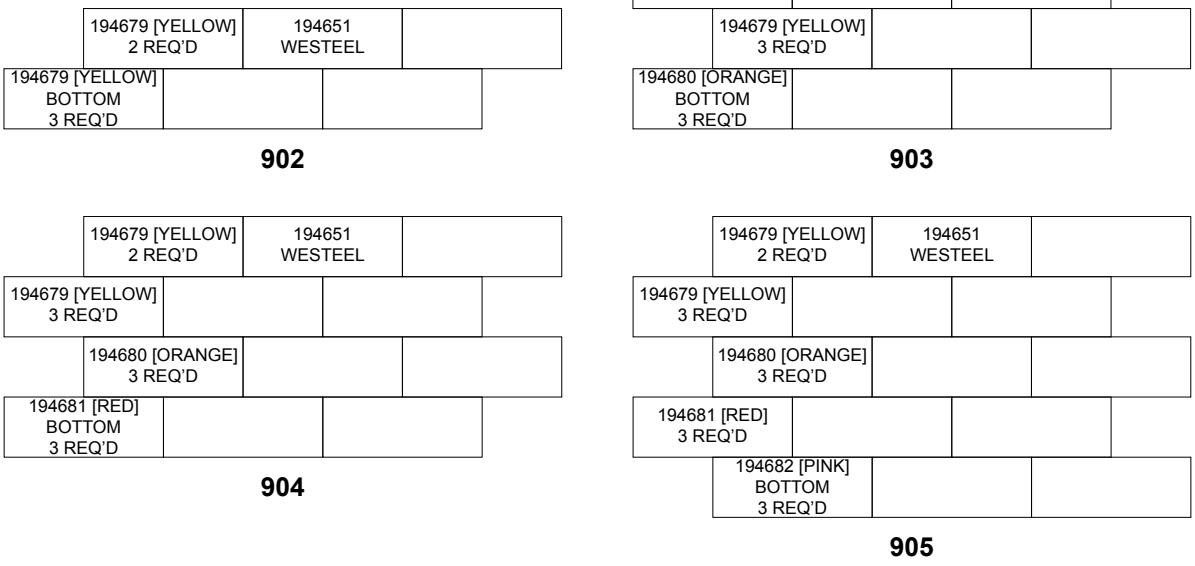


Figure 20. 1202 to 1205

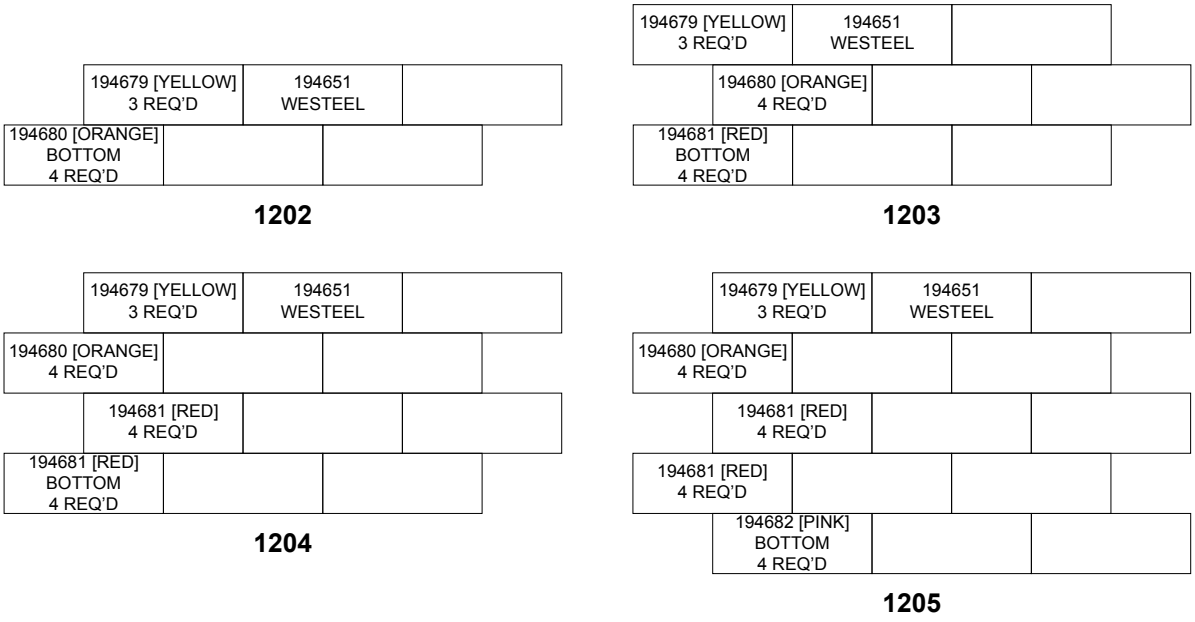
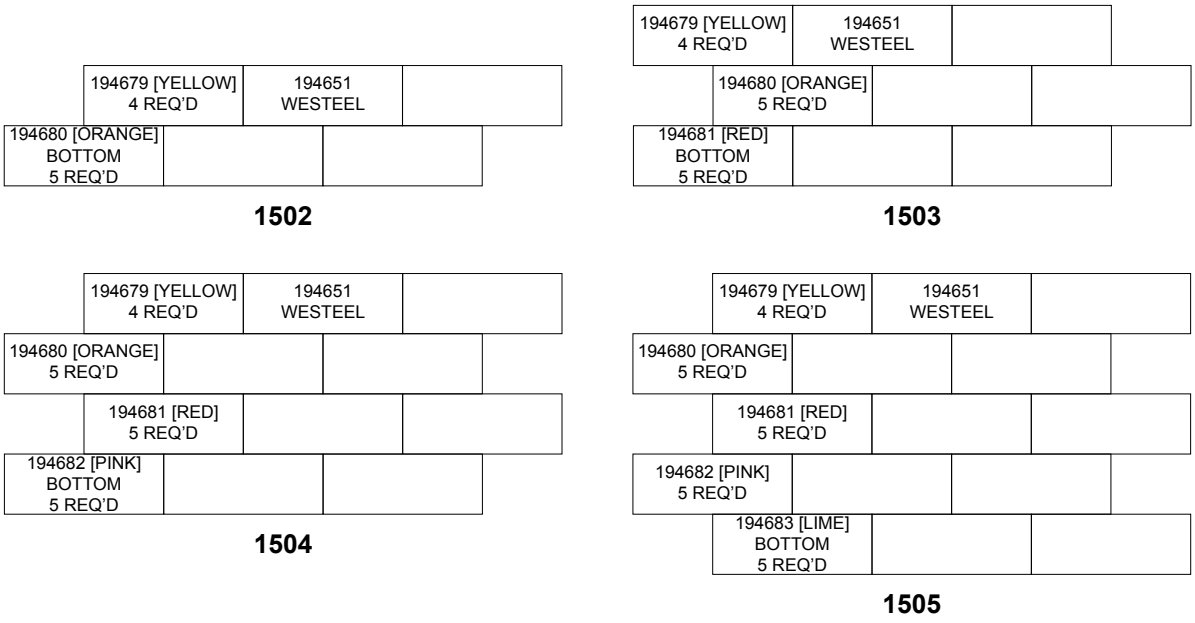


Figure 21. 1502 to 1505



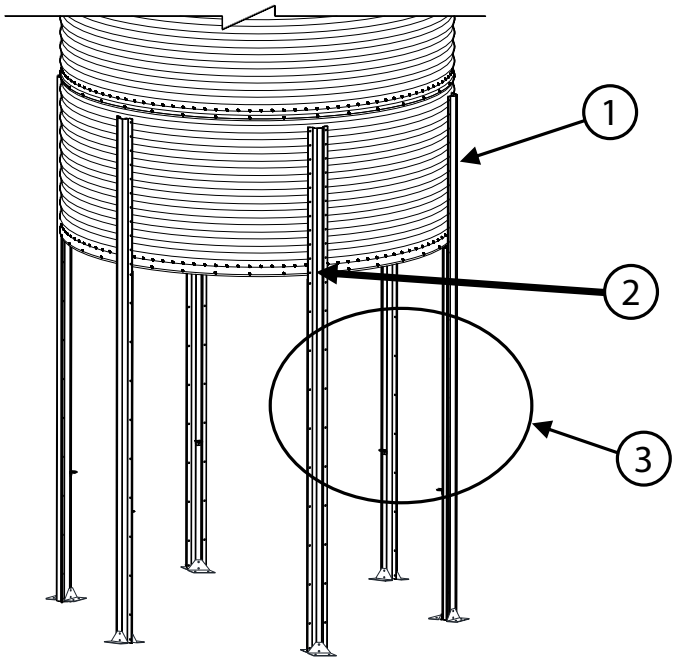
5.8. Leg Assembly

Leg Assembly – General

1. Assemble the legs as described in the following sections:
   - Leg Assembly – General on page 50
   - 6', 7' and 9' Leg Assembly on page 52
   - 12' Leg Assembly on page 54
   - 15' Leg Assembly on page 56
2. Before attaching the legs to the wall sheets, ensure that a bolt has been installed into the bottom wall sheet hole underneath the leg connection.

   There is a blind hole behind the legs at the bottom wall sheet seam that must be filled before the legs are attached. See:
   - Detail 2 in Figure 22 on page 51
   - Section 5.9 – Hopper Sheet Assembly on page 59
3. Bolt the legs onto the wall sheets at the appropriate locations to provide support for the bulk feed tank during the construction. (See detail 1 in Figure 22 on page 51.)
   a. Secure the legs with 3/8" x 1" bolts.
   b. Make sure the bolt heads are on the inside and the nuts are on the outside.
4. If the legs are going to be used to support the bulk feed tank during the addition of hopper sheets, install the cross bracing to stabilize the structure while the hopper sheets are being installed. (See detail 3 in Section 5.9 – Hopper Sheet Assembly on page 59.)

Figure 22. Leg Assembly Detail



Detail	Description
1	Lift assembled wall sheets and roof, and attach legs to the wall sheets at the appropriate locations. Secure with 3/8" x 1" bolts with the bolt heads on the inside and the nuts on the outside.
2	There is blind hole behind the legs at the bottom wall sheet seam that must be filled before the legs are attached.
3	If legs are going to be used to support the bulk feed tank during the addition of hopper sheets, the cross braces should be installed prior to this as per cross brace detail.

6', 7' and 9' Leg Assembly

The 6', 7' and 9' legs consist of two main components: an outer hat section (5) , and an inner hat section (2). The sections bolt together to form a boxed section. (See detail 4 in Figure 23 on page 52.)

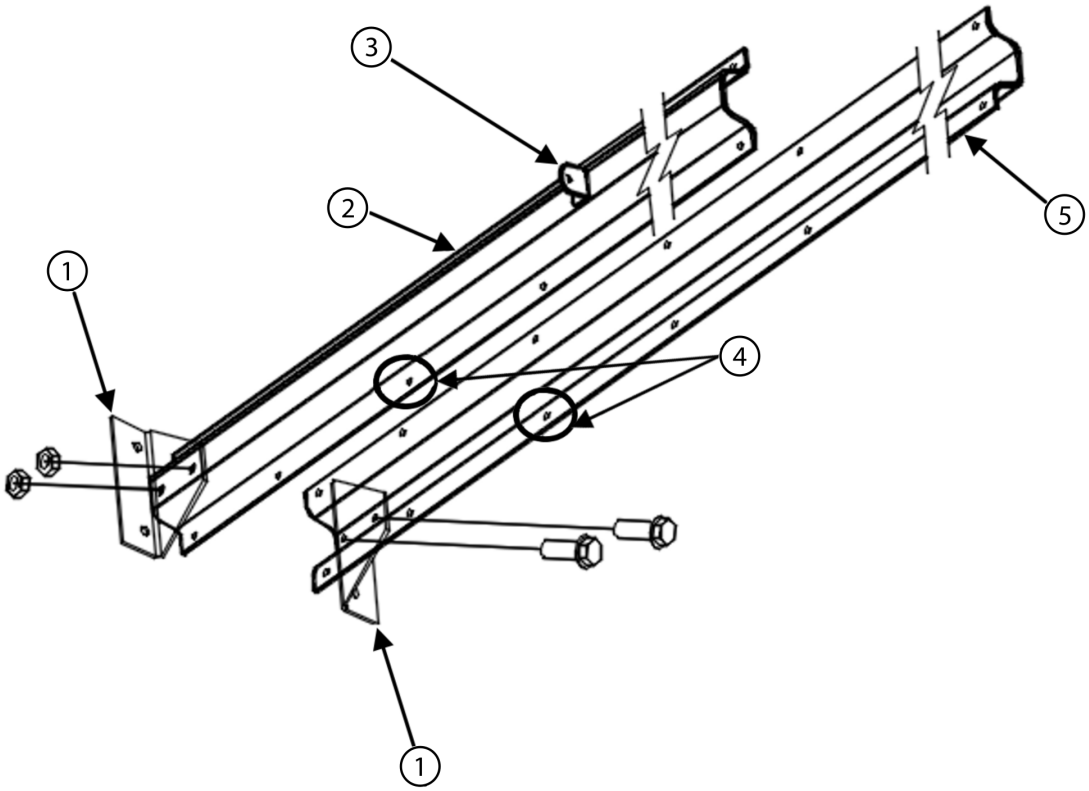
1. The components can be assembled using either of the following methods:
   - Bolted together prior to assembly to the wall sheets

     OR
   - Bolted together after attaching the longer outer hat section to the wall sheets

     Note

     In either case make sure that the brace clips are attached to the inner leg segment before the entire leg assembly is bolted together. Otherwise it will not be possible to make these connections after the assembly is completed. Install with the longer, rounded segment towards the hopper and the short segment on the leg. (See detail 3 in Figure 23 on page 52.)

Figure 23. 6', 7' and 9' Leg Assembly



Detail	Description
1	Base plate
2	Inner hat section
3	Brace Clip — Secure to inner leg before completing assembly. Install with longer, rounded segment towards hopper and short segment on leg
4	When completing assemblies do not bolt at cross brace locations
5	Outer hat section

2. Secure the base plates to the inner leg and outer leg sections as shown in Figure 23 on page 52:
   a. Use two 1/2" x 5-1/2" hex bolts and 1/2" nuts per leg.
   b. Insert the bolts from the outer base plate side, through the inner base plate to attach to the boxed leg (see detail 1).

      Note

      Make sure the bolt head is toward the outside.

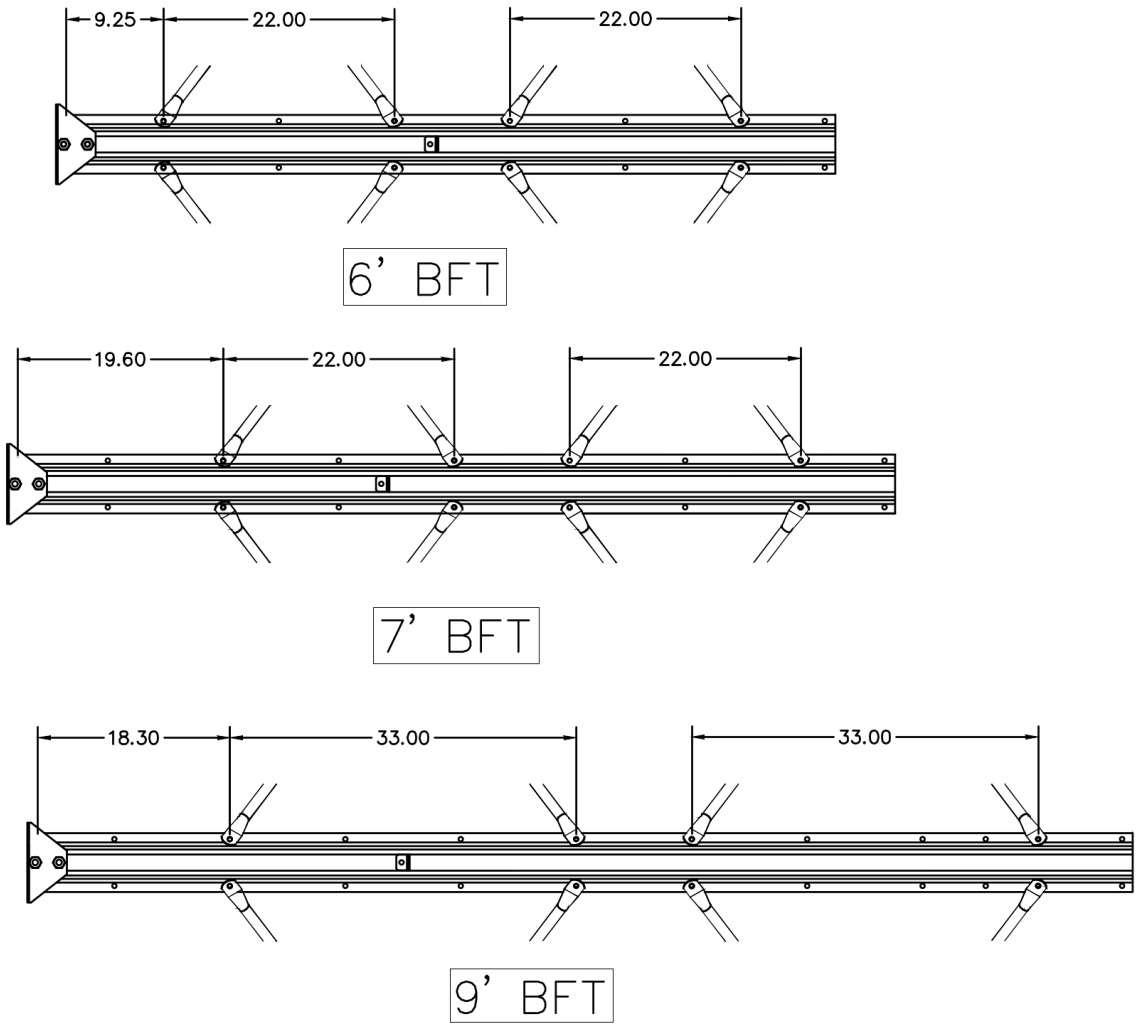
3. Assemble the legs as shown in Figure 23 on page 52:
   a. Use 3/8" x 1" hardware for the assemblies.
   b. Do not bolt assemblies at cross brace locations.

      Note

      When completing the leg assemblies, do not bolt at the cross brace locations. (See detail 4 in Figure 23 on page 52.)

6', 7' and 9' Cross Brace Locations

Figure 24. 6', 7' and 9' Cross Brace Locations



12' Leg Assembly

The 12' leg assembly consists of four main components (see Details 2, 3, 5 and 6 in Figure 25 on page 55.):

1. An upper outer hat section (Detail 6)
2. A lower outer hat section (Detail 4)
3. An inner hat section (Detail 2)
4. A splice (Detail 5)

These can be pre-bolted together to form a boxed section prior to assembly to the wall sheets as illustrated in Figure 25 on page 55.

1. The components can be assembled in two possible ways:
   - Bolted together prior to assembly to the wall sheets

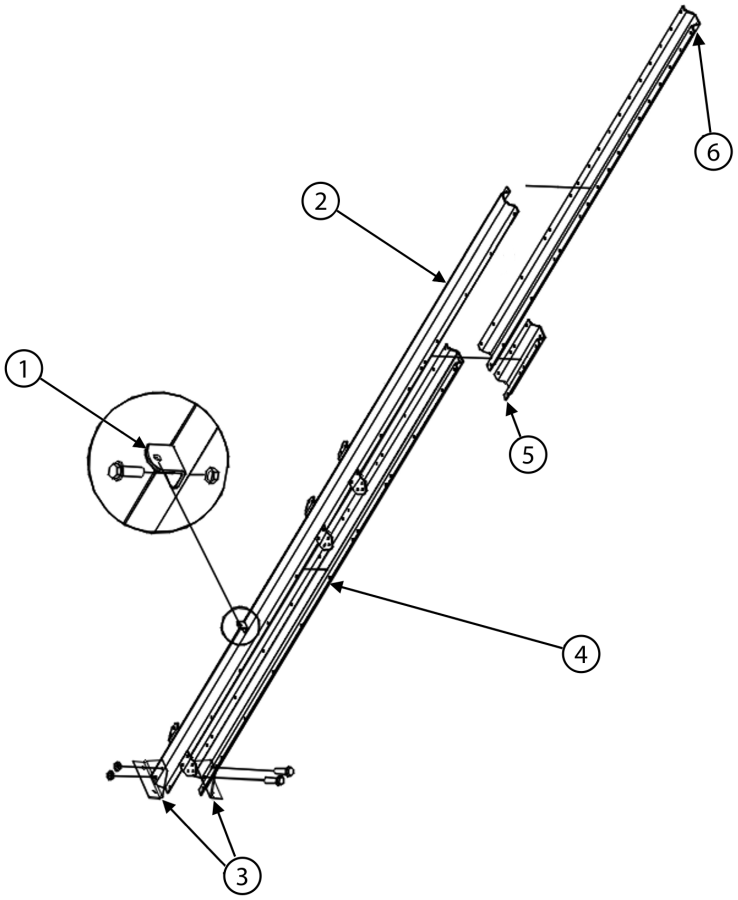
     OR
   - Bolted together after attaching the upper, outer hat section (6) to the wall sheets first, and then adding the other components to complete the assembly

     Note

     In either case, make sure that the brace clips (1) are attached to the inner leg segment before the entire leg assembly is bolted together. Install with the longer, rounded segment towards the hopper and the short segment on the leg. (See detail 1 in Figure 25 on page 55.)

     Also, bolt the splice to both outer legs using the holes in the center web first, before completing the assembly. Otherwise it will not be possible to make these connections after the assembly is completed. (See detail 5 in Figure 25 on page 55.)

Figure 25. 12' Leg Assembly



Detail	Description
1	Brace clip — secure to the inner leg before completing assembly. Install with longer, rounded segment towards hopper and short segment on leg.
2	Inner leg section
3	Base plate
4	Lower outer leg section
5	Splice — Bolt splice to both upper and lower outer leg sections through the four center web holes first before the inner leg section is bolted on.
6	Upper outer leg section

2. Secure the base plates to the inner leg and lower outer leg sections as shown in Figure 25 on page 55:
   a. Use two 1/2" x 5-1/2" hex bolts and 1/2" nuts per leg.
   b. Insert the bolts from the outer base plate side, through the inner base plate to attach to the boxed leg (see detail 3).

      Note

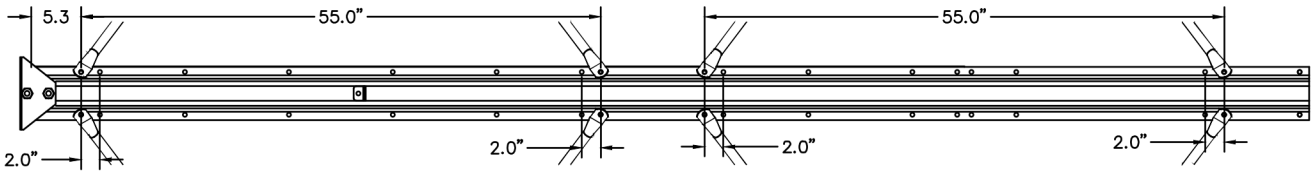
      Make sure the bolt head is toward the outside.

3. Assemble the legs as shown in Figure 25 on page 55:
   a. Use 3/8" x 1" hardware for the assemblies.

b. Do not bolt assemblies at cross brace locations.

12' Cross Brace Locations

Figure 26. 12' Cross Brace Locations



15' Leg Assembly

The 15' leg assembly consists of six main components (see Details 2, 3, 4, 5, 6 and 8 in Figure 27 on page 57.):

1. An inner hat section (2)
2. An inner hat section - laminate (3)
3. An upper outer hat section - laminate (4)
4. An upper outer hat section (5)
5. A lower outer hat section - laminate (6)
6. A lower outer hat section (8)

These can be pre-bolted together to form a boxed section prior to assembly to the wall sheets as illustrated in Figure 27 on page 57.

1. The components can be assembled in two possible ways:
   - Bolted together prior to assembly to the wall sheets

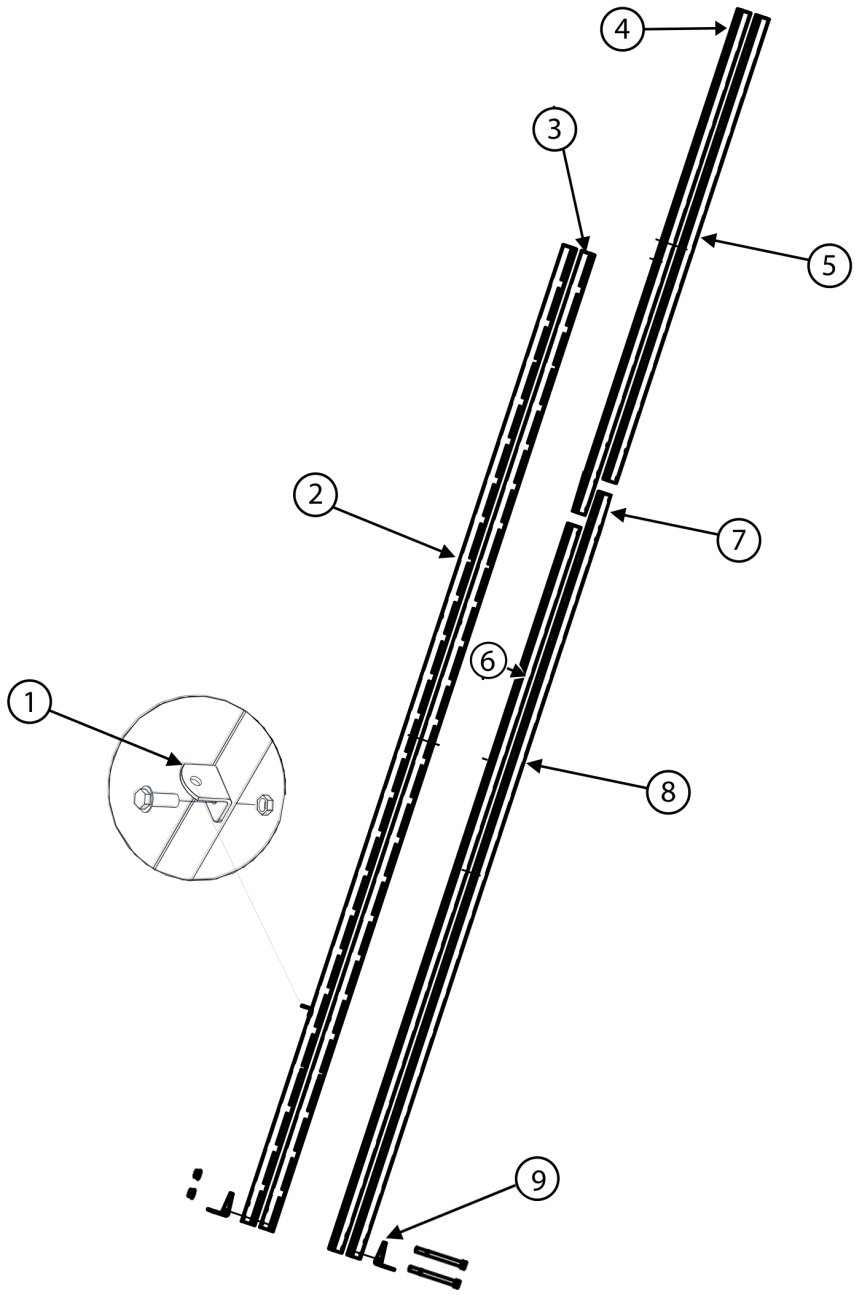
     OR
   - Bolted together after attaching the upper outer hat section (5) and upper outer hat section - laminate (4) to the wall sheets first, and then adding the lower outer hat section (8) and lower outer hat section - laminate (6) to the upper outer leg butt to butt through the five center web holes (see Detail 7).
   - Put the inner hat section (2) and inner hat section - laminate (3) on the outer leg - laminate (6).

     Note

     In either case, make sure that the brace clips (1) are attached to the inner leg segment before the entire leg assembly is bolted together. It is not possible to make these connections after the assembly is completed. (See detail 1 in Figure 27 on page 57.)

     Bolt the upper and lower outer hat sections using the five holes in the center web first, before the inner hat sections and inner laminate section are bolted on. (See detail 7 in Figure 27 on page 57.)

Figure 27. 15' Leg Assembly



Detail	Description
1	Brace clip — Secure to inner leg before completing assembly. Install with longer, rounded segment towards hopper and short segment on leg.
2	Inner hat section
3	Inner hat section — Laminate
4	Upper outer hat section — Laminate
5	Upper outer hat section
6	Lower outer hat section — Laminate

Figure 27 15' Leg Assembly (continued)

Detail	Description
7	Bolt upper and lower outer hat sections and upper and lower outer hat laminate sections through the five center web holes first before the inner hat and inner hat laminate sections are bolted on.
8	Lower outer hat section
9	Base plate

2. Secure the base plates to the lower inner legs and laminate sections as shown in Figure 27 on page 57:
   a. Use two 1/2" x 5-1/2" hex bolts and 1/2" nuts per leg.
   b. Insert the bolts from the outer base plate side, through the inner base plate to attach to the boxed leg (see detail 9).

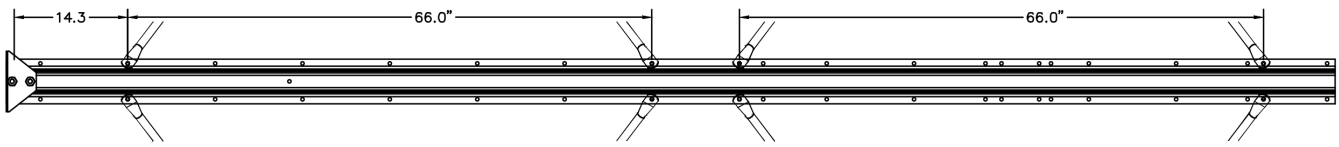
      Note

      Make sure the bolt head is toward the outside.

3. Assemble the legs as shown in Figure 27 on page 57:
   a. Use 3/8" x 1-1/2" hardware for the assemblies.
   b. Do not bolt assemblies at cross brace locations.

15' Cross Brace Locations

Figure 28. 15' Cross Brace Locations



5.9. Hopper Sheet Assembly

The hopper sheets are installed to the wall sheets with 3/8" x 1" bolts inserted from the inside with nuts on the outside. **The one exception to this is at the leg locations, which must have a bolt pre-installed before the leg is attached. At these locations, the bolt is installed from the outside and a bolt retainer is installed on the inside to hold the bolt in position until the hopper sheet is eventually installed.**

Note

The timing of the hopper sheets is important. There is a square timing hole in the center of the top row of bolt holes in the each hopper cone sheet.

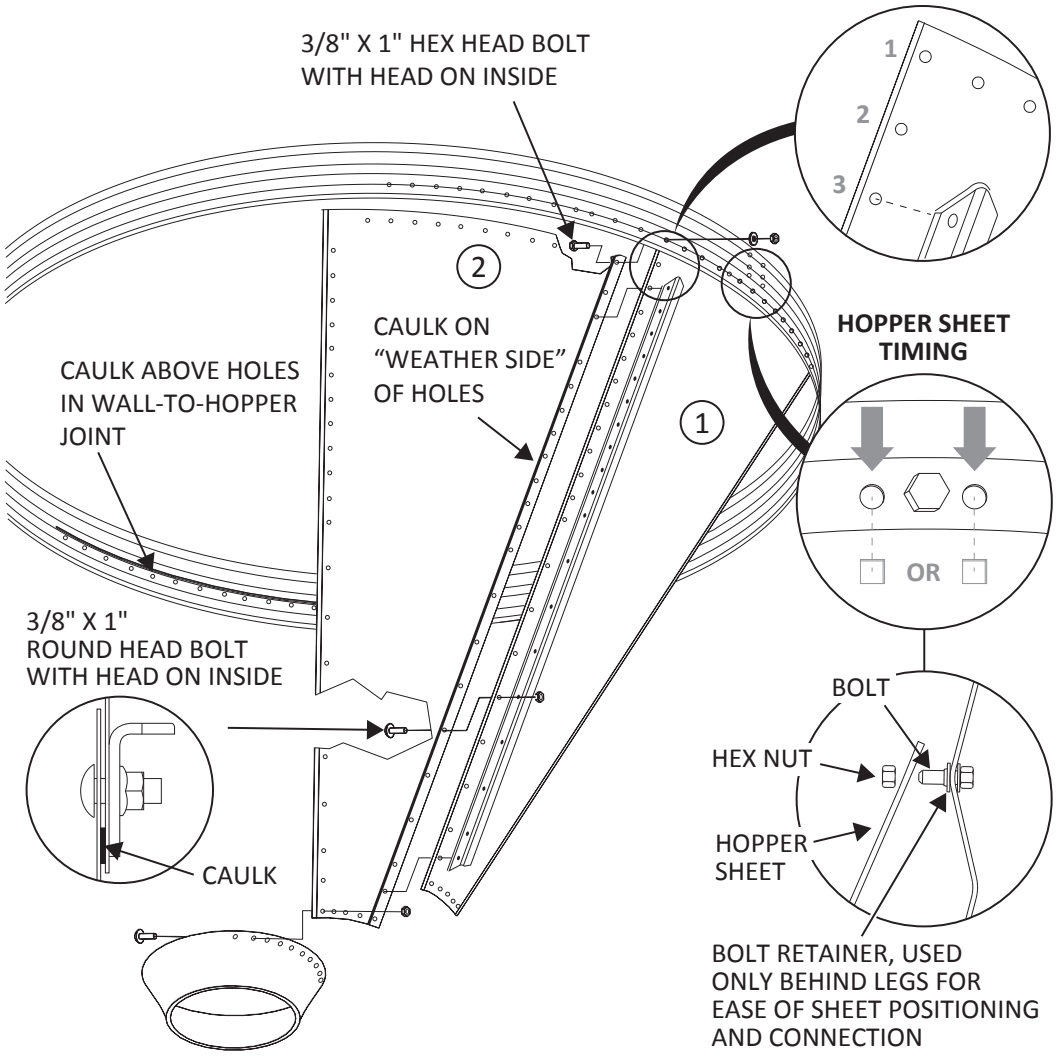
Note

Ensure that before hopper legs are installed, a 3/8" x 1" bolt must be pre-installed in the blind bolt hole behind each leg, and secured with a bolt retainer clip on the inside of the bin.

6’ to 12’ Diameter Bins

1. Apply caulking above the bottom holes in the bottom wall sheets.

Figure 29. Hopper Sheet Details, 6–12’ Bins



2. Select a position behind a hopper leg to install the first hopper cone sheet.
3. Hang the first hopper sheet (1) centred on the pre-installed bolt behind the leg position, such that the square timing hole in the hopper sheet is one hole position to the right or left of the bolt, and fasten the sheet in place with a nut. Use 3/8" x 1" hex bolts with the bolt heads inserted from the inside at all other locations on the top edge of the sheet.
4. Install the remaining sheets in a clockwise direction (as viewed from above the bin), using 3/8" x 1" round head bolts inserted from the inside. As each new sheet (2) is installed:
   a. Locate the bent edge along one side of the hopper sheet, and apply a continuous line of caulk down the full length of the outside edge, to ensure that the seam between the installed sheet and the next installed sheet is sealed on the “weather side”.
   b. Install a reinforcing angle to the outside of each vertical hopper sheet seam while bolting the seams. The reinforcing angle is installed in the third bolt hole below the sidewall seam bolt hole. The bottom end stops above the discharge cone connection.
5. Install the discharge cone. See Installing the Discharge Cone on page 63 for more detail.

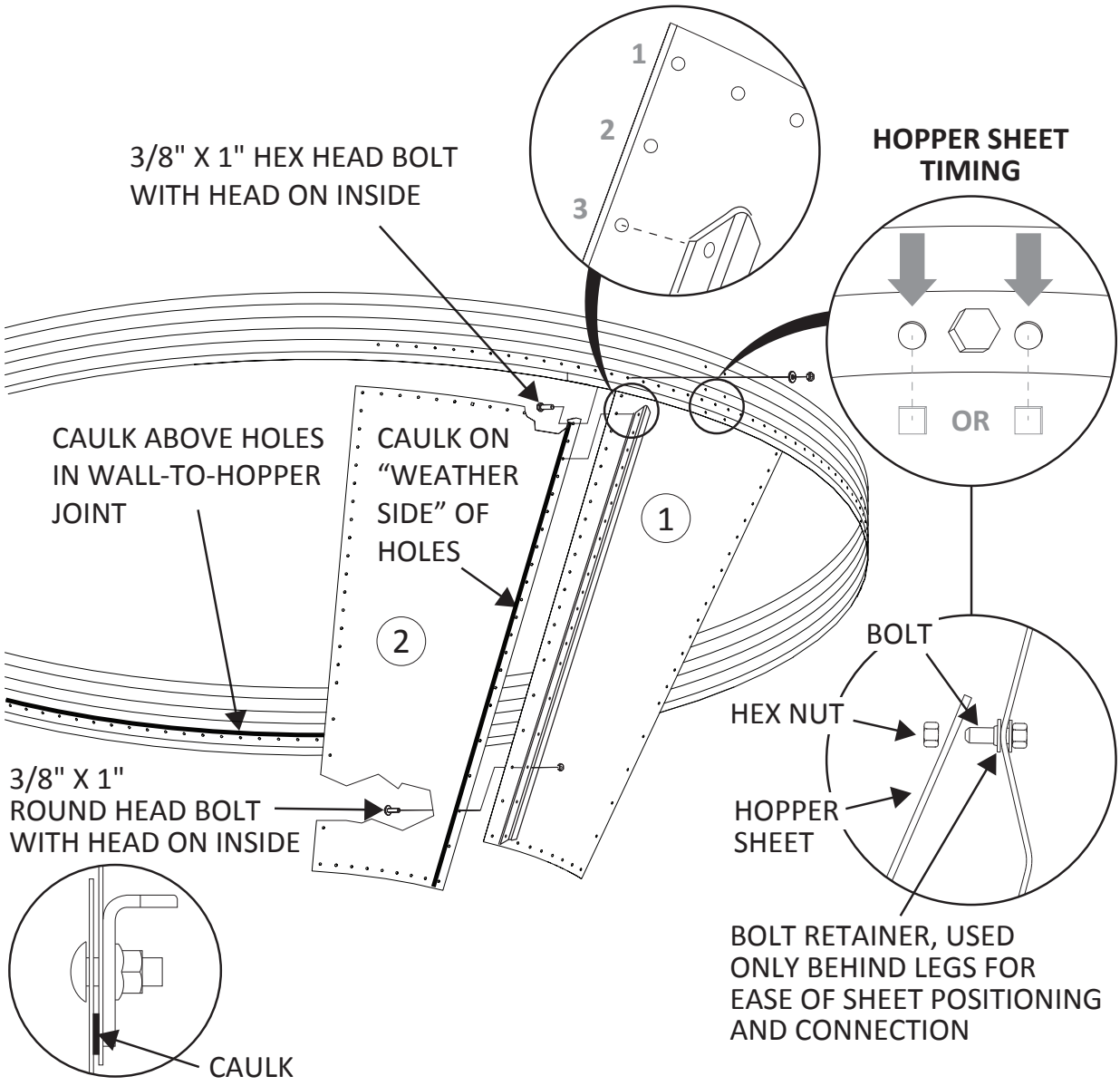
   Note

   To facilitate installation of the discharge cone on the inside, locate it inside before the final hopper sheet is installed.

15’ Diameter Bins

1. Apply caulking above the bottom holes in the bottom wall sheets.

Figure 30. Upper Hopper Sheet Details, 15’ Bins

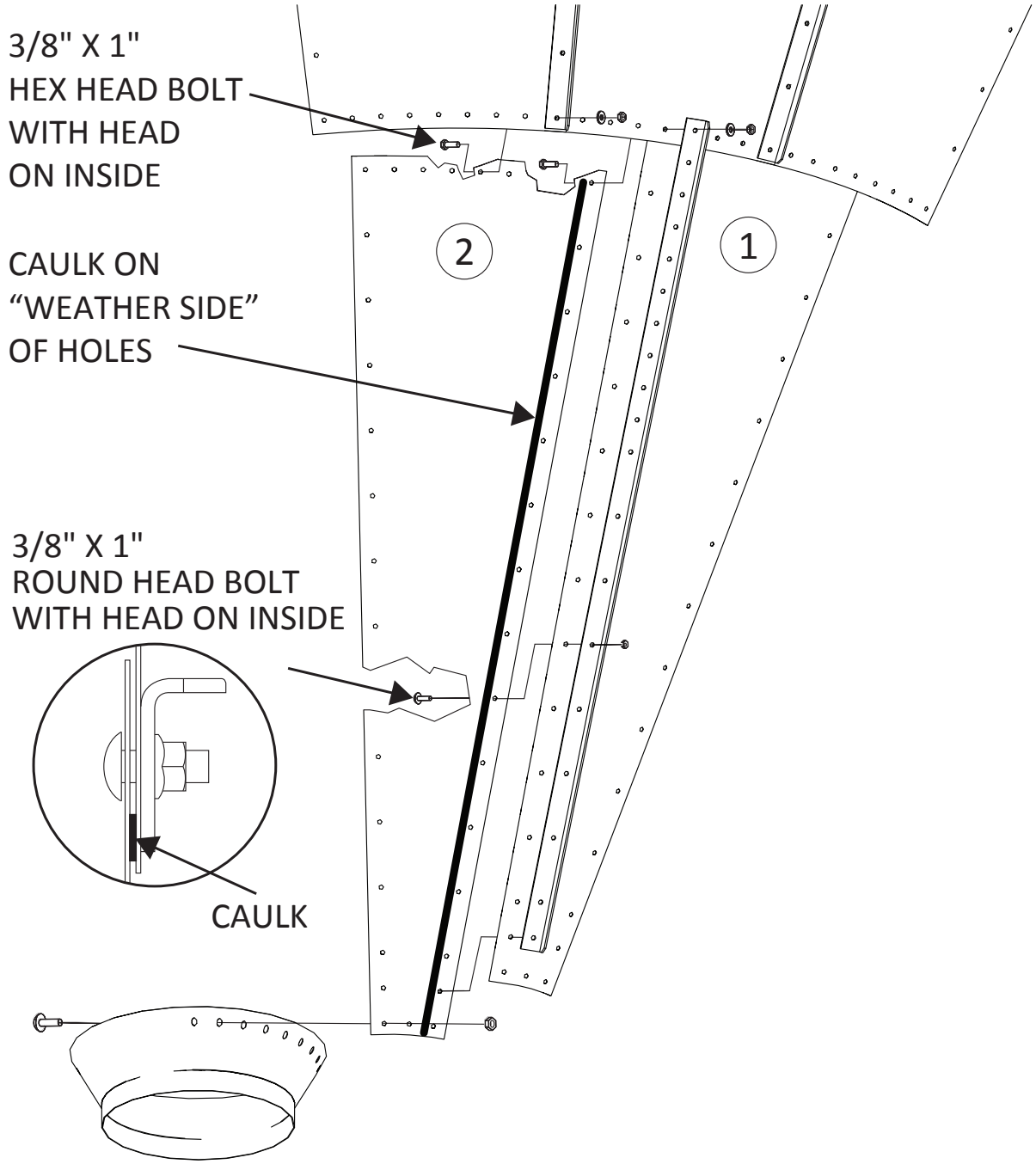


2. Select a position behind a hopper leg to install the first upper hopper cone sheet.
3. Hang the first upper hopper sheet (1) centred on the pre-installed bolt behind the leg position, such that the square timing hole in the hopper sheet is one hole position to the right or left of the bolt, and fasten the sheet in place with a nut. Use 3/8" x 1" hex bolts with the bolt heads inserted from the inside at all other locations on the top edge of the sheet.
4. Install the remaining upper sheets in a clockwise direction (as viewed from above the bin), using 3/8" x 1" round head bolts inserted from the inside. As each new sheet (2) is installed:
    a. Locate the bent edge along one side of the hopper sheet, and apply a continuous line of caulk down the full length of the outside edge, to ensure that the seam between the installed sheet and the next installed sheet is sealed on the “weather side”.

b. Install a reinforcing angle (240553) to the outside of each vertical hopper sheet seam while bolting the seams. The reinforcing angle is installed in the third bolt hole below the sidewall seam bolt hole. The bottom end stops above the discharge cone connection.

5. Run a continuous bead of caulk around the inside bottom edge of the upper cone sheets, just outside the bottom edge of the upper sheet bolt holes.
6. Install the first lower hopper sheet centred exactly on a seam between two upper sheets, with the lower sheet overlapping on the inside of the hopper cone.

Figure 31. Lower Hopper Sheet Details, 15’ Bins



7. Install the remaining lower hopper sheets in a clockwise direction:

a. Locate the bent edge along one side of the hopper sheet, and apply a continuous line of caulk down the full length of the outside edge, to ensure that the seam between the installed sheet and the next installed sheet is sealed on the “weather side”.

b. Install a reinforcing angle (240552) to the outside of each lower hopper sheet vertical seam. The top end of the reinforcement angle begins on the seam between the upper and lower hopper sheets, and the bottom end stops at the bolt hole above the discharge cone connection. The bottom hole in the reinforcing angle (240552) should be drilled out slightly to compensate for alignment issues that could block bolt insertion.

8. Install the discharge cone. See Installing the Discharge Cone on page 63 for more detail.

Note

To facilitate installation of the discharge cone on the inside, locate it inside before the final hopper sheet is installed.

Installing the Discharge Cone

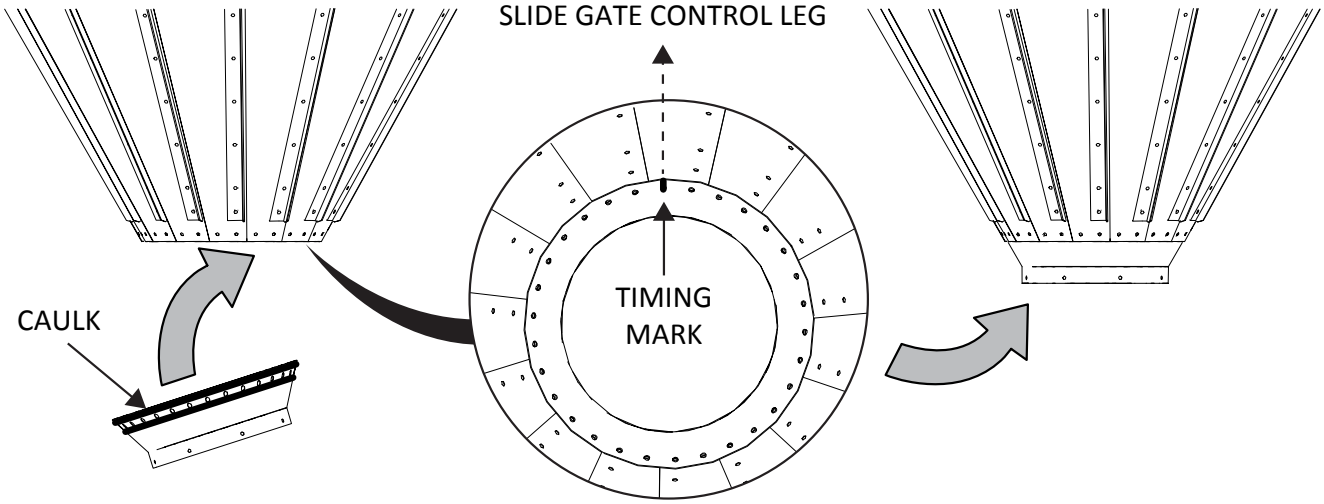
To facilitate installation of the discharge cone on the inside, locate it inside before the final hopper sheet is installed.

Note

If utilizing the rack and pinion shut off, consider the timing of the discharge cone to the rest of the hopper.

1. Before installing the discharge cone caulk on both sides of the mating holes.
2. Line up the discharge cone timing mark with the cone sheet bottom slotted hole that points toward the leg that the rack and pinion handle will be mounted to.
3. Install using 3/8" x 1" round head bolts with the bolt heads on the inside.

Figure 32. Installing the Discharge Cone



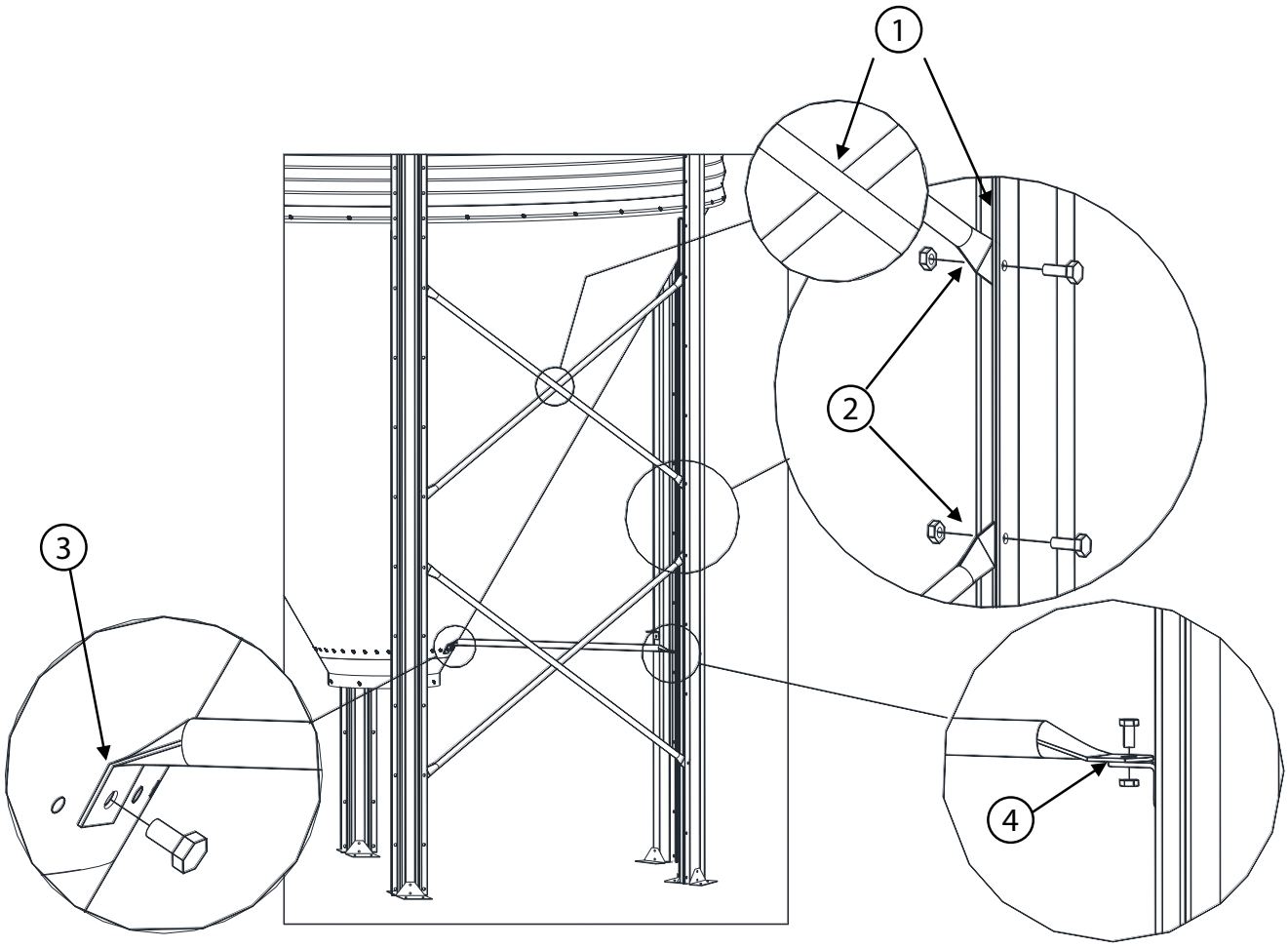
5.10. Leg Brace Assembly

Install cross braces between legs and lateral braces between the leg and cone as illustrated in Figure 33 on page 64.

Leg Brace Assembly

1. Bolt lateral braces between the hopper discharge cone and the brace clips previously installed on the inside of the legs. (See Details 3 & 4 in Figure 33 on page 64.)
   a. Use ⅜" x 1" bolts.

Figure 33. Installing braces



Detail	Description
1	Cross-bracing to legs details — connect to inside of legs
2	Inside of leg detail
3	Lateral brace to discharge cone detail
4	Lateral brace to leg detail

2. Install cross bracing between adjacent legs as illustrated in Figure 33 on page 64.
   a. Use ⅜" x 1 ½" bolts at all cross brace connections.

Note

All diagonal brace lengths have been sized for attachment to the inside surface of the upright legs. The diagonals are too short to be attached to the outside of the leg. If mating cross-braces are consistently mounted and rotated correctly, there will be no interference at the crossover point. (See Details 1 & 2 in Figure 33 on page 64.)

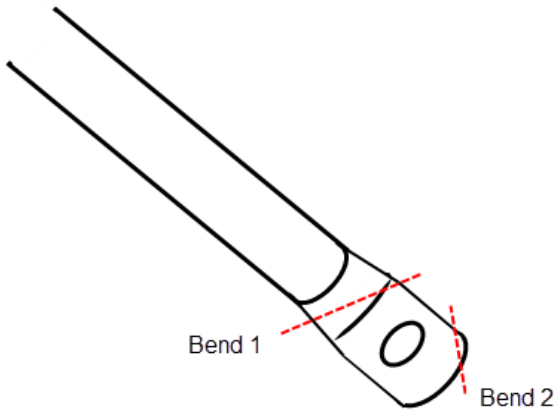
b. If the cross braces do not fit precisely into the legs, use the adjustable wrench to bend them to fit the hole in the legs.

Suggestion:

Connect one end of the tube to the leg, then bend the other end to fit the hole on the adjacent leg. (See Bend 1 in Figure 34 on page 65.)

The flat portion of the tube end may also need to be bent because it is too long, which interferes with the web edge of the leg. (See Bend 2 in Figure 34 on page 65.)

Figure 34. Tube bending



5.11. Bolt On Ladders, Cages and Pass-Through Rails

If required, bolt on ladders, cages and pass through rails as shown in Figure 35 on page 66.

1. Bolt the ladder components on from top to bottom as the bulk feed tank is assembled.
2. Note that corrugated hopper ladder braces span between supporting legs at 44" centers.
3. Secure using 3/8" x 1" hardware.
4. Ladder clips bolt on as normal.
5. Drill holes as necessary.

Note 1: (see Figure 36 on page 67.)

- For 7' and 12' BFTs, the distance between the bottom cage and the next cage is 44" (normal).
- For 6', 9' and 15' BFTs, the distance between the bottom cage and next cage is 30".
- For 9' BFTs, the distance between the bottom cage and the bottom of the third cage is 60".

Note 2:

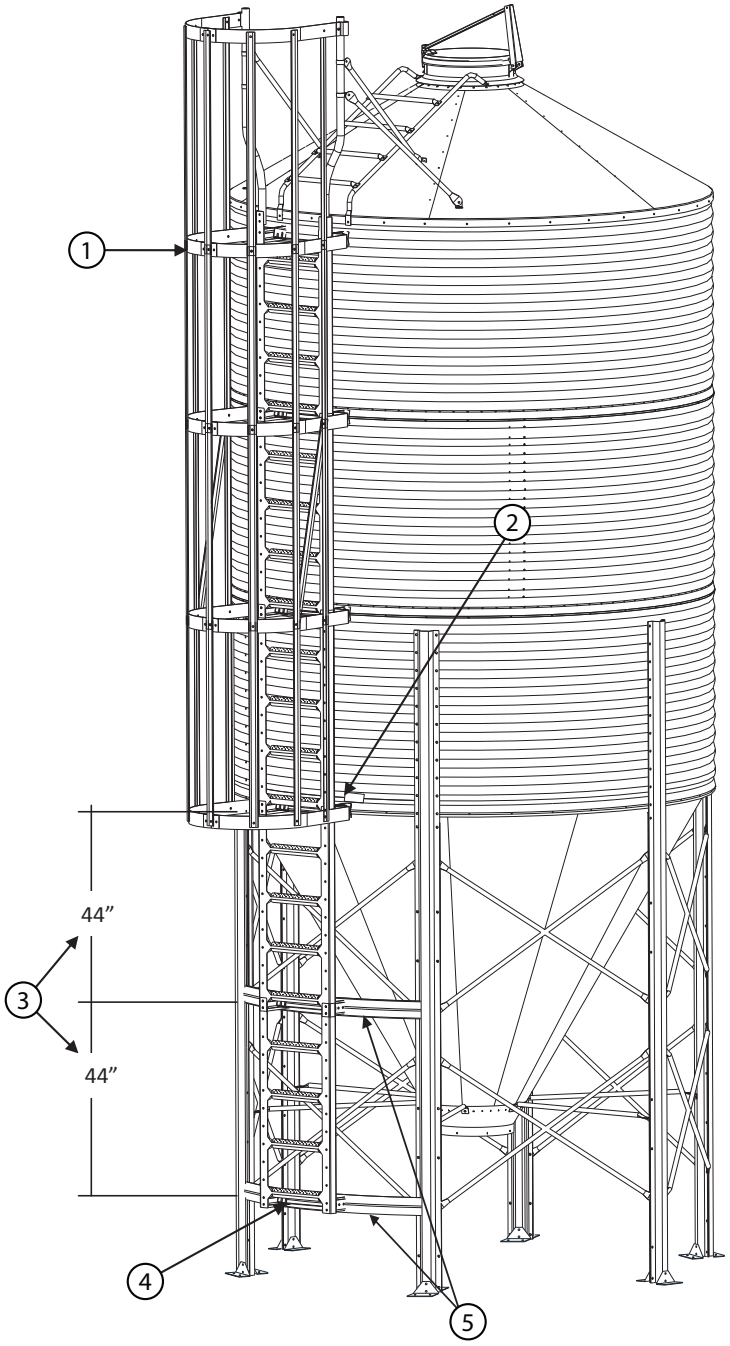
- For 6' BFTs, the connection between the bottom cage and the wall sheet is made using two SC clips (234541). The two holes are drilled in the peak of wall sheet.

- For 9' BFTs, the connection between the second from the bottom cage and the wall sheet is made using two SC clips (234541). The two holes are drilled in the peak of the wall sheet

Note 3:

- Use 3/8" x 1–1/2" hardware to secure the ladder support bands and legs.

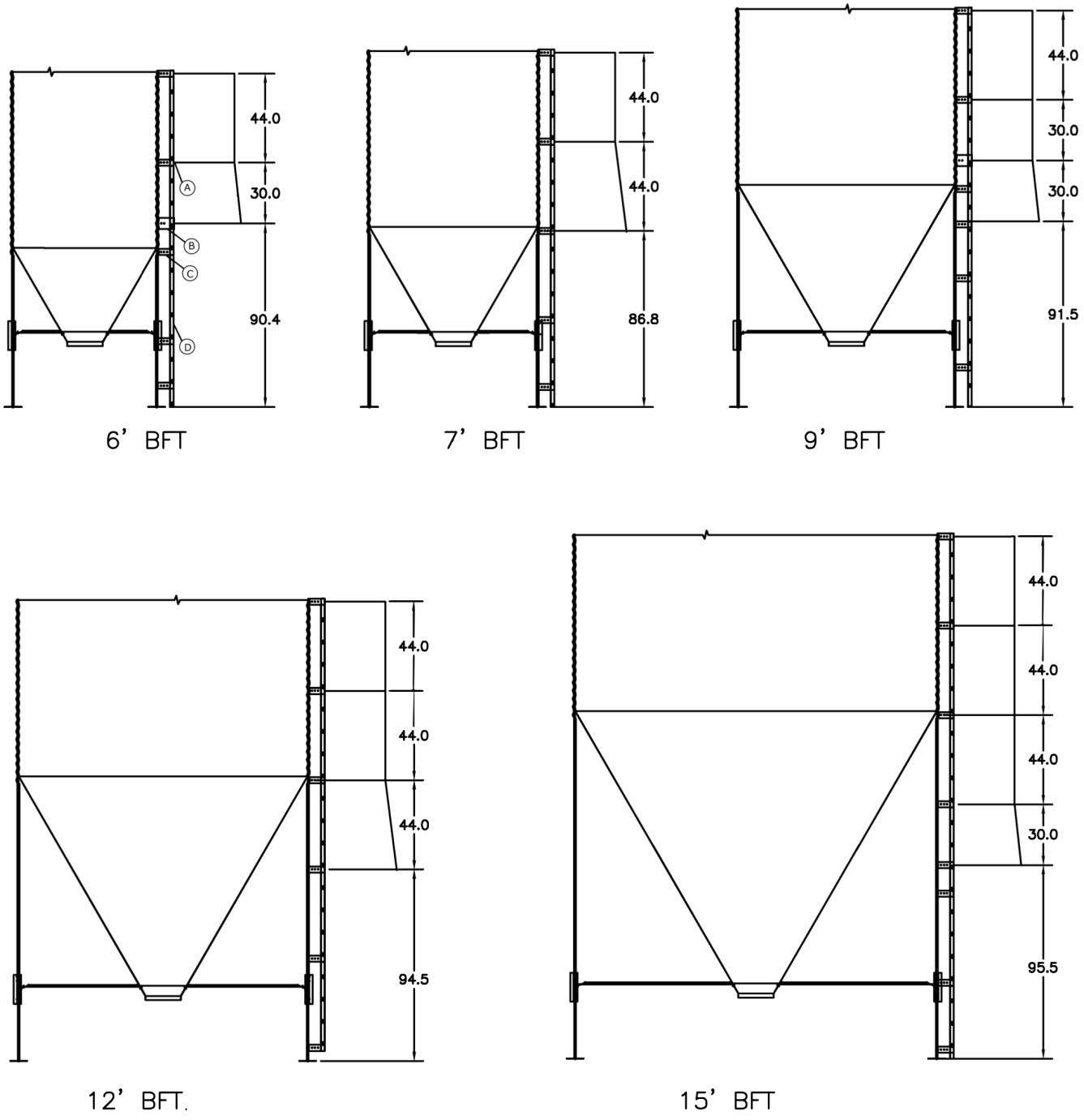
Figure 35. Ladder Details



Detail	Description
1	Locate the sidewall ladder directly in line with the roof ladder
2	Locate the decal in a visible area on the wall sheet, just above the hopper attachment location.

Detail	Description
3	Ladder support bands are installed at 44" increments across the legs below the wall sheets for ladder installation. When ladder cages are installed extra ladder support bands may be required. Secure with 3/8" x 1" hardware to the outside of the sheets.
4	Ladder clips attach to the hopper ladder braces using 3/8" x 1" hardware. Drill holes as required.
5	Ladder support bands

Figure 36. Ladder and Cage Dimensions



Detail	Description
A	Ladder hoop cage
B	SC ladder clip 234541
C	WC ladder clip 234501
D	Ladder section

5.12. Position on Foundation and Anchor

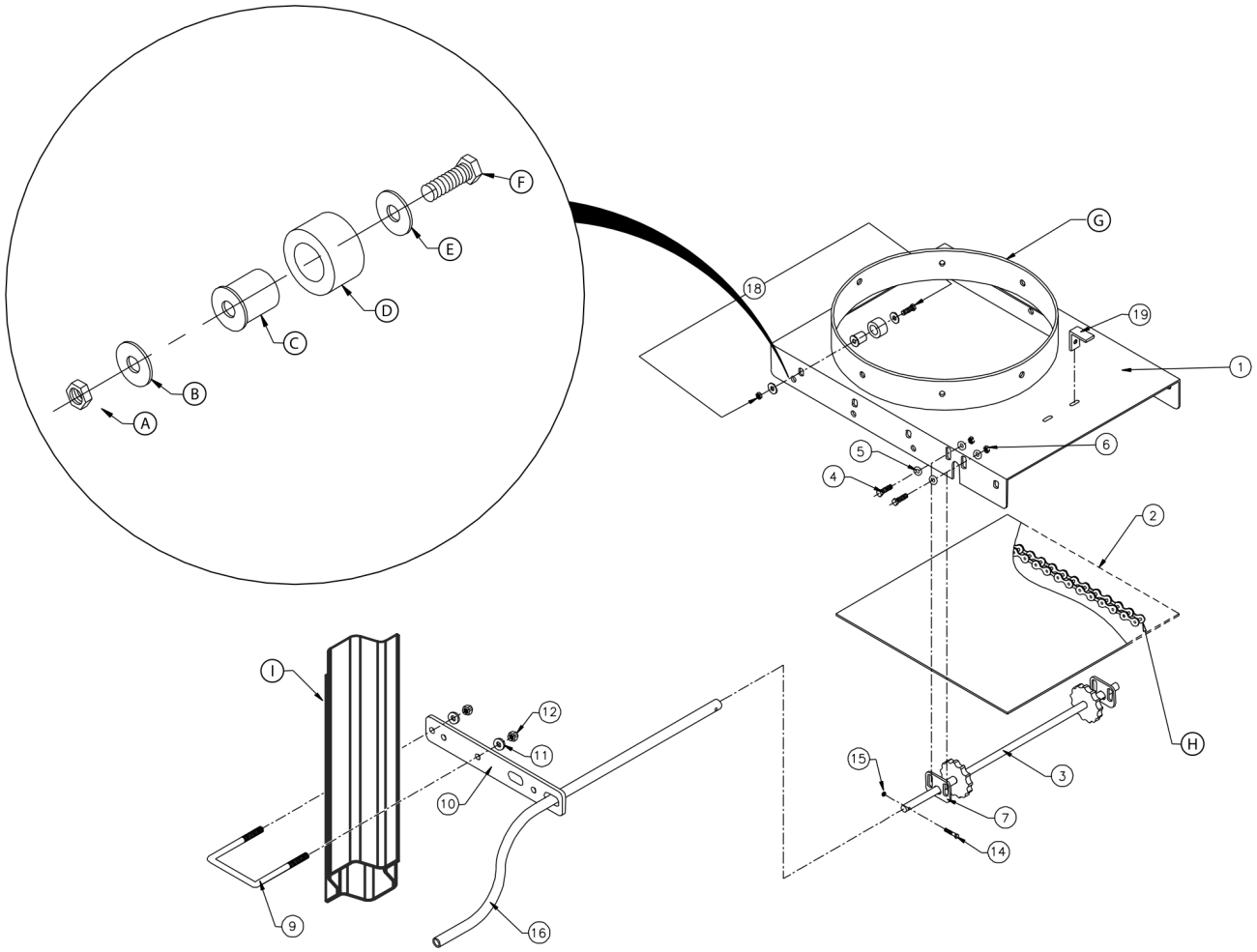
1. Position the completed bulk feed tank on its foundation.
2. Anchor the feed tank to the foundation as required.

5.13. Rack and Pinion Slide Gate Assembly

The rack and pinion gate must be field installed. The following procedure is recommended. For clarification as to proper orientation of parts refer to Figure 37 on page 69.

1. Turn the shut-off mount (1) upside down and rest it on a flat surface.
2. Place the sliding plate (2) inside the shut-off mount, chain side up and all the way to the flanged end, so that it completely covers the 17" opening.
3. Fasten the roller assemblies (18) to the shut-off mount (1) in the 7/16" x ¾" slots (in 8 places) as shown in Figure 37 on page 69.
4. When installing the two roller assemblies near the open end of the shut-off mount, slide the plate underneath the slots to correctly set the roller height.
5. Adjust the roller assemblies so that when the assembly is turned right side up (as shown in diagram) the sliding plate is flush to the shut-off mount yet slides back and forth freely.
6. Position the gear assembly (3) so that it engages the sprocket teeth into the chain.
7. When positioning the gear assembly, ensure that it remains square to the chains and that the two gear teeth are straddling a chain roller.
8. Once the gear assembly is positioned, tighten the mounting tabs (7).
9. Check that the slide plate moves freely and is not binding on the gear assembly.
10. If the slide plate is sticking, back the gear assembly slightly away from the chain and retighten.

Figure 37. Rack and Pinion Slide Gate Assembly



Detail	Description
1	Shut-off mount
2	Sliding plate
3	Gear assembly
4	3/8" x 1" cap screw
5	3/8" flat washer
6	3/8" lock nut
7	Mounting tabs
9	U-bolt
10	Handle support
11	1/2" flat washer
12	1/2" nut
14	5/16 x 1½" bolt
15	5/16" lock nut
16	Handle
18	Roller assembly (see details A — F)
19	Locking tab

Detail	Description
A	3/8" flat nut
B	3/8" flat washer
C	Bushing
D	Roller
E	3/8" flat washer
F	3/8" x 2" cap screw
G	17" ring
H	Chain (on bottom of plate)
I	Hopper leg

11. In order for the handle to line up with the hopper leg, the slide gate assembly must be correctly positioned when being attached to the hopper cone adapter.

12. Find the hole on the 17" ring that points in the same direction as the gear shaft.
13. Line up this hole with the marked hole on the hopper discharge cone.
14. Attach with 3/8" x 1" bolts and washers.
15. Attach the U-bolt (9) to the hopper leg (I) that the gear shaft points to.
16. Position the U-bolt around the leg and through the handle support (10) such that the handle hole lines up with the gear shaft.
17. Snug up the U-bolt nuts to hold the handle support in place.

    The handle support has two slots for the handle (16) to slide through. Either slot will be used depending on the hopper sheet connection to wall sheet (square hole alignment).
18. Slide the handle (16) through the hole on the support bracket and mate to the gear shaft.
19. Secure with a 5/16" x 1½" bolt (14).
20. Make any necessary height adjustments of the handle support on the leg to ensure the handle is horizontal.
21. Make sure all bolts have been tightened.

Note

There are two slots on the top surface of the shut-off mount (1) that accept the locking tab (19). When the rack and pinion gate is closed, drop the locking tab through either of the holes as shown. A standard padlock (not supplied) can be inserted through the hole in the locking tab.

5.14. Roof Inspection Hatch (Option)

Options

There are several options available for roof inspection hatches for various size BFTs.

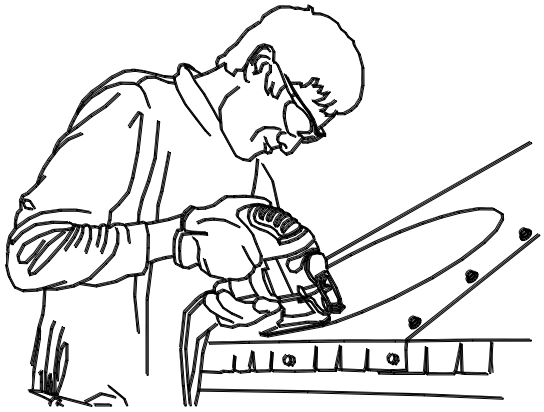
- For 6' and 7' BFTs, use the 16" inspection hatch (pn 199579)
- For 9' BFTs, use the 24" inspection hatch (pn 199580)
- For 12' BFTs, there is no roof inspection hatch option
- For 15' BFTs, use the standard roof inspection sheet (pn 212015H)

Inspection Hatch Installation (6', 7' and 9' BFTs)

This section provides instructions for installing inspection hatch collars on 6', 7' and 9' bulk feed tanks (BFT). The instructions are the same for all collars.

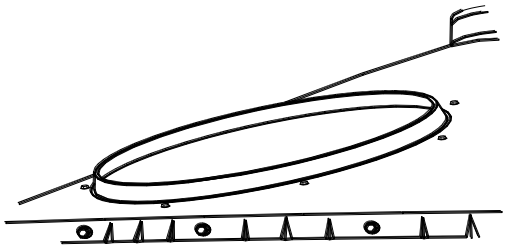
1. Use the collar as a template to draw the cutout and bolt holes onto the roof sheet.
2. Cut out the opening:
    - If the collar is to be installed from the outside, cut the hole to the size of the traced hole.
    - If the collar is to be installed from the inside, cut the hole slightly larger than the flanged collar.

Figure 38. Cutting out the collar opening



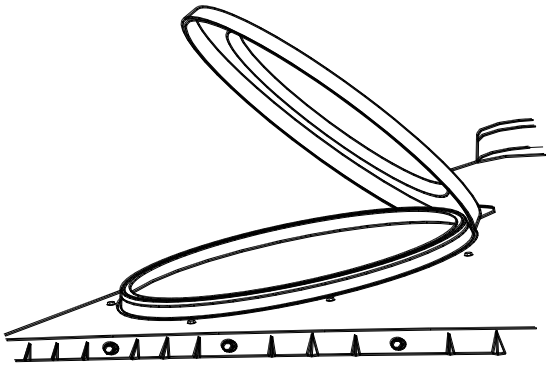
3. Place the collar on top or underneath the roof panel.
4. Install .313 bolts using the holes in the collar.

Figure 39. Installing the collar



5. If there is any warping and the collar needs to be secured further, add TEK screws as necessary.
6. Apply caulking (not supplied) to seal any gaps.

Figure 40. Installing the lid assembly

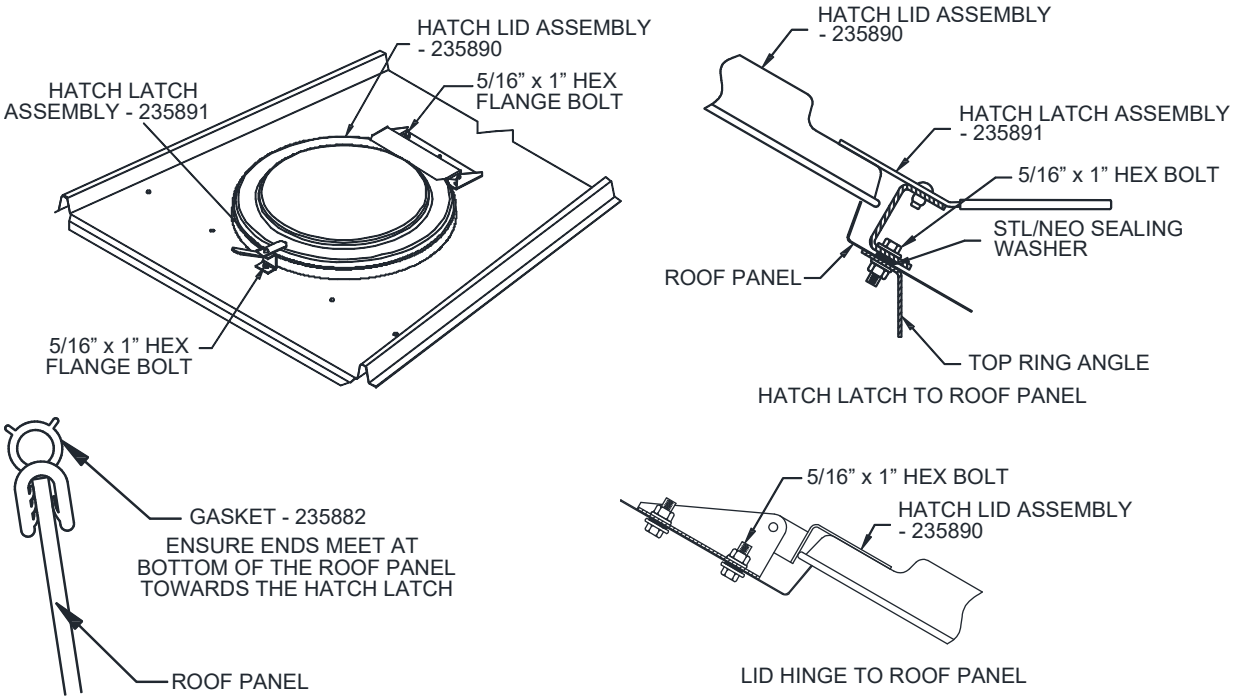


Inspection Hatch Installation (15' BFTs)

1. Place the inspection hatch gasket (235882) around the lip of the inspection hatch opening. Trim the gasket to fit if necessary.

2. Bolt on the hatch lid assembly (235890) with 5/16" x 1" bolts provided for the roof. For best sealing results, the bolt heads should be on the underside of the roof panel, with the sealing washers pressed against the roof panel.
3. Bolt on the latch assembly (235891) as shown below. The latch is positioned on the center hole of the roof panel and bolts through the top ring angle as shown.

Figure 41. Inspection Hatch Details



6. Appendix

6.1. Inspection Hatch Parts Boxes

Table 7. 16" Inspection Hatch Parts Box (199579)

Used on 6-ft and 7-ft bulk feed tank

PART #	DESCRIPTION
185010	CARTON 37 X 37 X 9
199278	16" HATCH COLLAR
199279	16" INSPECTION HATCH ASSY
235882	GASKET 76" INSPECTION HATCH
235891	WC HATCH LATCH ASSY
235915	.313 X 1" BOLTS GR 8.2 (50)
235925	.313" NUTS (50)
235151	.25 X 1" TEC SCREWS (7)
199594	INSPECTION HATCH MANUAL

Table 8. 24" Inspection Hatch Parts Box (199580)

Used on 9-ft bulk feed tank

PART #	DESCRIPTION
185010	CARTON 37 X 37 X 9
199457	HATCH COLLAR 24"
235890	WC HATCH LID ASSY
125882	GASKET 76" INSPECTION HATCH
235891	WC HATCH LATCH ASSY
235915	.313 X 1" BOLTS GR 8.2 (50)
235925	.313" NUTS (50)
235151	.25 X 1" TEK SCREWS (7)
199594	INSPECTION HATCH MANUAL

6.2. BFTS Parts List

Table 9. Parts List - Standard BFTs 602, 603, 604, 605

Item	Part Number	Description	Unit WT (lbs)	Bin Model and Part Number			
				240301	240302	240303	240304
				602 BFT	603 BFT	604 BFT	605 BFT
1	236053	VENT CAP ASSY - NONPAINTED	15.1	1	1	1	1
2	235514	REMOTE VENT CAP OPENER	4.6	1	1	1	1
3	240027	ROOF SHEET (6')	7.8	6	6	6	6
4	W602BFT	WALL SHEET BUNDLE - 602	233.2	1	—	—	—
5	W603BFT	WALL SHEET BUNDLE - 603	378.8	—	1	—	—
6	W604BFT	WALL SHEET BUNDLE - 604	544.8	—	—	1	—
7	W605BFT	WALL SHEET BUNDLE - 605	740.2	—	—	—	1
8	240500	HOPPER SHEET (6')	17.3	6	6	6	6
9	240241	TRANSITION CONE (6' & 9')	10.5	1	1	1	1
10	240501	LEG - 6' OUTER	18.1	4	4	4	4
11	240502	LEG - 6' INNER	11.5	4	4	4	4
12	240503	HORIZONTAL BRACE TO HOPPER (6')	1.7	4	4	4	4
13	240504	DIAGONAL BRACE (6')	3.9	16	16	16	16
14	232850	HARDWARE PAIL 3/8" X 1" BOLTS (700)	48.0	1	1	1	1
15	240505	HARDWARE - STD 6' & 7' BFT	69.3	1	1	1	1

Table 10. Parts List - Standard BFTs 702, 703, 704, 705

Item	Part Number	Description	Unit WT (lbs)	Bin Model and Part Number			
				240307	240308	240309	240310
				702 BFT	703 BFT	704 BFT	705 BFT
1	236053	VENT CAP ASSY - NONPAINTED	15.1	1	1	1	1
2	235514	REMOTE VENT CAP OPENER	4.6	1	1	1	1
3	240028	ROOF SHEET (7')	10.6	6	6	6	6
4	W702BFT	WALL SHEET BUNDLE - 702	270.8	1	—	—	—
5	W703BFT	WALL SHEET BUNDLE - 703	439.8	—	1	—	—
6	W704BFT	WALL SHEET BUNDLE - 704	605.8	—	—	1	—
7	W705BFT	WALL SHEET BUNDLE - 705	798.2	—	—	—	1
8	240519	HOPPER SHEET (7')	24.5	6	6	6	6
9	240254	TRANSITION CONE (7' & 12')	10.5	1	1	1	1
10	240547	LEG - 7' OUTER	30.5	4	4	4	4
11	240548	LEG - 7' INNER	20.2	4	4	4	4
12	240520	HORIZONTAL BRACE TO HOPPER (7')	2.1	4	4	4	4
13	240521	DIAGONAL BRACE (7')	4.4	16	16	16	16
14	240113	ROOF LADDER (7')	7.3	1	1	1	1
15	232850	HARDWARE PAIL 3/8" X 1" BOLTS (700)	48.0	1	1	1	1
16	240505	HARDWARE - STD 6' & 7' BFT	69.3	1	1	1	1

Table 11. Parts List - Standard BFTs 902, 903, 904, 905

Item	Part Number	Description	Unit WT (lbs)	Bin Model and Part Number			
				240313	240314	240315	240316
				902 BFT	903 BFT	904 BFT	905 BFT
1	236053	VENT CAP ASSY - NONPAINTED	15.1	1	1	1	1
2	235514	REMOTE VENT CAP OPENER	4.6	1	1	1	1
3	240029	ROOF SHEET (9')	17.3	6	6	6	6
4	W902BFT	WALL SHEET BUNDLE - 902	349.8	1	—	—	—
5	W903BFT	WALL SHEET BUNDLE - 903	568.2	—	1		—
6	W904BFT	WALL SHEET BUNDLE - 904	817.2	—	—	1	—
7	W905BFT	WALL SHEET BUNDLE - 905	1,110.3	—	—	—	1
8	240042	HOPPER SHEET (9')	30.6	9	9	9	9
9	240241	TRANSITION CONE (6' & 9')	10.5	1	1	1	1
10	240243	LEG - 9' OUTER	35.4	6	6	6	6
11	240244	LEG - 9' INNER	25.1	6	6	6	6
12	240245	HORIZONTAL BRACE TO HOPPER (9')	3.1	6	6	6	6
13	240246	DIAGONAL BRACE (9')	4.6	24	24	24	24
14	240114	ROOF LADDER (9')	9.0	1	1	1	1
15	232850	HARDWARE PAIL 3/8" X 1" BOLTS (700)	48.0	1	1	1	1
16	240264	HARDWARE - STD 902 & 903 BFT	92.6	1	1	—	—
17	240265	HARDWARE - STD 904 BFT	101.3	—	—	1	—
18	240266	HARDWARE - STD 905 BFT	110.6	—	—	—	1

Table 12. Parts List - Standard BFTs 1202, 1203, 1204, 1205

Item	Part Number	Description	Unit WT (lbs)	Bin Model and Part Number			
				240319	240320	240321	240322
				1202 BFT	1203 BFT	1204 BFT	1205 BFT
1	236053	VENT CAP ASSY - NONPAINTED	15.1	1	1	1	1
2	235514	REMOTE VENT CAP OPENER	4.6	1	1	1	1
3	235600	ROOF SHEET (12')	6.0	24	24	24	24
4	212243	TOP RING ANGLE (12')	16.0	4	4	4	4
5	W1202BFT	WALL SHEET BUNDLE - 1202	524.4	1	—	—	—
6	W1203BFT	WALL SHEET BUNDLE - 1203	856.4	—	1	—	—
7	W1204BFT	WALL SHEET BUNDLE - 1204	1188.4	—	—	1	—
8	W1205BFT	WALL SHEET BUNDLE - 1205	1579.2	—	—	—	1
9	240247	HOPPER SHEET (12')	41.7	12	12	12	12
10	240254	TRANSITION CONE (7' & 12')	10.5	1	1	1	1
11	240250	LEG - 12' INNER	48.0	8	8	8	8
12	240251	LEG - 12' UPPER OUTER	28.0	8	8	8	8
13	240252	LEG - 12' LOWER OUTER	35.1	8	8	8	8
14	240253	LEG SPLICE (12')	3.1	8	8	8	8
15	240249	HORIZONTAL BRACE TO HOPPER (12')	5.1	8	8	8	8
16	240240	DIAGONAL BRACE (12')	6.5	32	32	32	32
17	235615	ROOF LADDER (12')	13.2	1	1	1	1
18	232850	HARDWARE PAIL 3/8" X 1" BOLTS (700)	48.0	1	1	2	2
19	240260	HARDWARE - STD 1202 & 1203 BFT	150.4	1	1	—	—
20	240261	HARDWARE - STD 1204 & 1205 BFT	133.0	—	—	1	1

Table 13. Parts List - Standard BFTs 1502, 1503, 1504, 1505

Item	Part Number	Description	Unit WT (lbs)	Bin Model and Part Number			
				240325	240326	240327	240328
				1502 BFT	1503 BFT	1504 BFT	1505 BFT
1	235740	WC ROOF PARTS BOX - 15' FARM SERIES	138.7	1	1	1	1
2	212015	ROOF KIT 15' W/O HDWE & LID	423.4	1	1	1	1
3	W1502BFT	WALL SHEET BUNDLE - 1502	655.5	1	—	—	—
4	W1503BFT	WALL SHEET BUNDLE - 1503	1070.5	—	1	—	—
5	W1504BFT	WALL SHEET BUNDLE - 1504	1559.0	—	—	1	—
6	W1505BFT	WALL SHEET BUNDLE - 1505	2120.0	—	—	—	1
7	240530	UPPER HOPPER SHEET (15')	37.3	15	15	15	15
8	240531	TRANSITION CONE (15')	10.5	1	1	1	1
9	240532	LEG - 15' INNER	58.5	10	10	10	10
10	240251	LEG - 12' & 15' UPPER OUTER	28.0	10	10	10	10
11	240533	LEG - 15' LOWER OUTER	45.7	10	10	10	10
12	240539	LEG - 15' INNER - LAMINATE	58.5	10	10	10	10
13	240540	LEG - 15' UPPER OUTER - LAMINATE	30.3	10	10	10	10
14	240541	LEG - 15' LOWER OUTER - LAMINATE	43.4	10	10	10	10
15	240542	LOWER HOPPER SHEET (15')	18.2	15	15	15	15
16	240534	HORIZONTAL BRACE TO HOPPER (15')	6.6	10	10	10	10
17	240535	DIAGONAL BRACE (15')	7.3	40	40	40	40
18	232850	HARDWARE PAIL 3/8" X 1" BOLTS (700)	48.0	1	1	2	2
19	240536	`HARDWARE - STD 1502 & 1503 BFT	225.9	1	1	—	—
20	240537	HARDWARE - STD 1504 & 1505 BFT	211.5	—	—	1	1

6.3. Hardware Boxes

Table 14. Hardware Box 6' & 7' BFT Standard

Item	Part Number	Description	Unit WT (lbs)	Quantity
				240505
1	235901	1/4" x 3/4" BOLT GR 8.2 (75)	1.4	1
2	235907	1/4" FLANGED NUT (50)	0.5	1
3	235915	5/16" X 1" BOLT GR 8.2 (50)	1.7	2
4	235925	5/16" FLANGED NUT (50)	0.7	2
5	235959	3/8" X 1" ROUND HEAD C/W SLOT BOLT GR 8.2 (300)	14.8	1
6	235946	3/8" X 1 1/2 BOLT GR 8.2 (100)	6.2	1
7	235954	3/8" FLANGED NUT (300)	5.7	1
8	154107	BLT HC 1/2"-13 X 5 1/2" ZN GR5	0.336	10
9	154201	NUT HX FLLK 1/2"-13 JS500 GR2	0.045	10
10	234518	CLIPS FOR HOPPER BRACE	0.2	4
11	193814	CAULKING – 40' ROLL	1.0	7
12	170445	CAULKING TUBE	1.0	2
13	240546	BASE PLATE	1.6	8
14	199588	WASHER - 3/8" BOLT RETAINER (10)	0.1	1
15	240263	MANUAL - STANDARD BFT	0.1	1
16	185010	CARTON 37 X 37 X 9	9.4	1
17	240549	ROOF PEAK RING BULB GASKET 75"	0.6	1

Table 15. Hardware Box 9' BFT Standard

Item	Part Number	Description	Unit WT (lbs)	Quantity		
				902 & 903	904	905
				240264	240265	24266
1	235901	1/4" x 3/4" BOLT GR 8.2 (75)	1.4	1	1	1
2	235907	1/4" FLANGED NUT (50)	0.5	1	1	1
3	235915	5/16" X 1" BOLT GR 8.2 (50)	1.7	2	2	2
4	235925	5/16" FLANGED NUT (50)	0.7	2	2	2
5	235959	3/8" X 1" ROUND HEAD C/W SLOT BOLT GR 8.2 (300)	14.8	1	1	1
6	235946	3/8" X 1 1/2" BOLT GR 8.2 (100)	6.2	1	1	1
7	235954	3/8" FLANGED NUT (300)	5.7	1	1	1
8	234518	CLIPS FOR HOPPER BRACE	0.2	6	6	6
9	193814	CAULKING – 40' ROLL	1.0	8	10	11
10	170445	CAULKING TUBE	1.0	3	3	3
11	240546	BASE PLATE	1.6	12	12	12
12	199588	WASHER - 3/8" BOLT RETAINER (10)	0.1	1	1	1
13	235943	3/8" X 1" BOLT GR 8.2 (50)	2.6	—	2	4
14	235950	3/8" NUT GR 5 (300)	4.8	—	—	1
15	235951	3/8" NUT GR 5 (100)	1.6	—	1	—
16	154107	BLT HC 1/2"-13 X 5 1/2" ZN GR5	0.336	15	15	15
17	154201	NUT HX FLLK 1/2"-13 JS500 GR2	0.045	15	15	15
18	240263	MANUAL - STANDARD BFT	0.1	1	1	1
19	185010	CARTON 37 X 37 X 9	9.4	1	1	1
20	240549	ROOF PEAK RING BULB GASKET 75"	0.6	1	1	1

Table 16. Hardware Box 12' BFT Standard

Item	Part Number	Description	Unit WT (lbs)	Quantity	
				1202 & 1203	1204 & 1205
				240260	240261
1	235900	1/4" X 3/4" BOLT GR 8.2 (150)	2.9	1	1
2	235903	1/4" X 2-1/4" BOLT GR 8.2 (25)	0.9	1	1
3	235907	1/4" FLANGED NUT (50)	0.5	3	3
4	235946	3/8" X 1 1/2" BOLT GR 8.2 (100)	6.2	1	1
5	235954	3/8" FLANGED NUT (300)	5.7	2	2
6	193814	CAULKING – 40' ROLL	1.0	11	15
7	170445	CAULKING TUBE	1.0	4	4
8	199588	WASHER - 3/8" BOLT RETAINER (10)	0.1	1	1
9	235941	3/8" X 1" BOLT GR 8.2 (325)	16.6	1	—
10	235950	3/8" NUT GR 5 (300)	4.8	1	—
11	235959	3/8" X 1" ROUND HEAD C/W SLOT BOLT GR 8.2 (300)	14.75	2	2
12	234518	CLIPS FOR HOPPER BRACE	0.2	8	8
13	240546	BASE PLATE	1.6	16	16
14	235651	EAVES CLOSURE (24)	0.63	1	1
15	154107	BLT HC 1/2"-13 X 5 1/2" ZN GR5	0.336	20	20
16	154201	NUT HX FLLK 1/2"-13 JS500 GR2	0.045	20	20
17	240263	MANUAL - STANDARD BFT	0.1	1	1
18	185010	CARTON 37 X 37 X 9	9.4	1	1
19	240549	ROOF PEAK RING BULB GASKET 75”	0.6	1	1

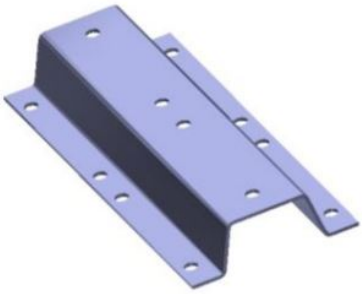
Table 17. Hardware Box 15' BFT Standard

Item	Part Number	Description	Unit WT (lbs)	Quantity	
				1502 & 1503	1504 & 1505
				240536	240537
1	235946	3/8" X 1 1/2" BOLT GR 8.2 (100)	6.2	6	6
2	235954	3/8" FLANGED NUT (300)	5.7	5	5
3	193814	CAULKING – 40' ROLL	1.0	24	31
4	170445	CAULKING TUBE	1.0	5	5
5	199588	WASHER - 3/8" BOLT RETAINER (10)	0.1	1	1
6	235941	3/8" X 1" BOLT GR 8.2 (325)	16.6	1	—
7	235943	3/8" X 1" BOLT GR 8.2 (50)	2.6	3	3
8	235950	3/8" NUT GR 5 (300)	4.8	2	1
9	235959	3/8" X 1" ROUND HEAD C/W SLOT BOLT GR 8.2 (300)	14.75	3	3
10	154107	BLT HC 1/2"-13 X 5 1/2" ZN GR5	0.336	25	25
11	154201	NUT HX FLLK 1/2"-13 JS500 GR2	0.045	25	25
12	234518	CLIPS FOR HOPPER BRACE	0.2	10	10
13	240546	BASE PLATE	1.6	20	20
14	240263	MANUAL - STANDARD BFT	0.1	1	1
15	185010	CARTON 37 X 37 X 9	9.4	1	1
16	240549	ROOF PEAK RING BULB GASKET 75"	0.6	1	1

6.4. BFT Part Identification

234518 — Cross Brace Bracket

236053 – Vent Collar

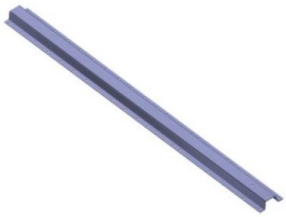


240253 – Leg Splice

240250 – Leg 12' Inner (136.3")

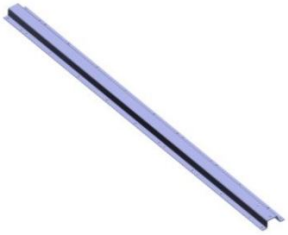
240532 – Leg 15' Inner (167.3")

240539 – Leg 15' Inner - Laminate (167.3")



240251 – Leg 12' Upper Outer (79.5")

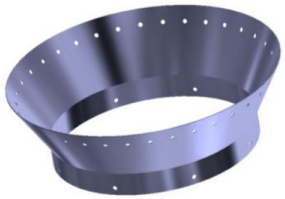
240540 – Leg 15' Upper Outer - Laminate (86")



240252 – Leg 12' Lower Outer (99.8")

240533 – Leg 15' Lower Outer (130.8")

240541 – Leg 15' Lower Outer - Laminate (124.3")



240241 – Transition Cone 6' & 9'

240254 – Transition Cone 7' & 12'

240531 – Transition Cone 15'

240501 – Leg 6' Outer (117.3")

240547 – Leg 7' Outer (127.6")

240243 – Leg 9' Outer (148.3")

240502 – Leg 6' Inner (74.3")

240548 – Leg 7' Inner (84.6")

240244 – Leg 9' Inner (105.3")

240503 – Horizontal Brace 6'

240520 – Horizontal Brace 7'

240245 – Horizontal Brace 9'

240249 – Horizontal Brace 12'

240534 – Horizontal Brace 15'

240504 – Leg Diagonal Brace 6'

240521 – Leg Diagonal Brace 7'

240246 – Leg Diagonal Brace 9'

240240 – Leg Diagonal Brace 12'

240535 – Leg Diagonal Brace 15'

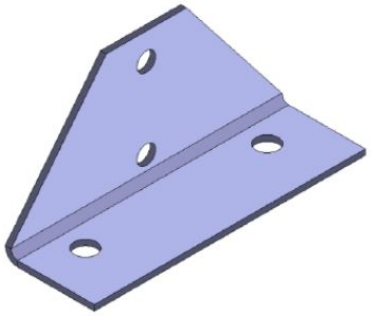
240506 – Ladder Support Band 6'

240507 – Ladder Support Band 7'

240255 – Ladder Support Band 9'

240256 – Ladder Support Band 12'

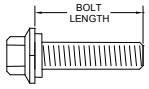
240508 – Ladder Support Band 15'



240546 – Base Plate

6.5. Hardware Usage

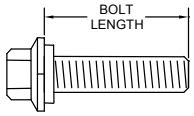
Table 18. Roof Hardware

	1/4" x 3/4" Flanged Hex Bolt (Washer)	1/4" x 2-1/4" Flanged Hex Bolt (Washer)	1/4" Flanged Lock Nut	5/16" x 1" Flanged Hex Bolt (Washer)	5/16" x 1-1/4" Flanged Hex Bolt (Washer)	5/16" Flanged Lock Nut	5/16" STL/NEO Sealing Washer	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" Hex Nut	3/8" Flat Washer
	235900 (150) 235901 (75)	235903 (25)	235907 (50)	235914 (250) 235915 (50)	235916 (80) 235917 (50)	235923 (250) 235925 (50)	235973 (25)	232850 (700) 235941 (325) 235943 (50)	235946 (100)	235950 (300) 235951 (100)	235957 (75)
6', 7', AND 9' ROOF											
ROOF SHEET to WALL SHEET				●		●					
ROOF SHEET to ROOF SHEET				●		●					
VENT COLLAR to ROOF SHEET	●		●								
ROOF LADDER RUNGS to ROOF LADDER SIDE RAILS									◆	●	
ROOF LADDER ASSEMBLY to ROOF SHEET (see notes)	●		●	●		●					
12' ROOF											
TOP RING ANGLE to WALL SHEET								●		●	
TOP RING ANGLE JOINTS to WALL SHEET								●		●	
VENT COLLAR to ROOF SHEET	●		●								
ROOF SHEET RIB to ROOF SHEET RIB	●		●								
ROOF SHEET RIB to BIRD STOP to TOP RING ANGLE		●	●								
ROOF LADDER ASSEMBLY to ROOF SHEET RIB	●		●								
15' ROOF											
TOP RING ANGLE to WALL SHEET					●	◆					
ROOF SHEET to PEAK RING				●		◆					
ROOF SHEET to TOP RING ANGLE				●		◆					
ROOF SHEET RIB to ROOF SHEET RIB				●		◆					
LADDER RUNG to ROOF SHEET RIB					●	◆	◆				
ROOF VENT to ROOF SHEET VENT CUTOUT				●		◆					
INSPECTION HATCH LID ASSEMBLY to ROOF SHEET HATCH CUTOUT				●		◆					
INSPECTION HATCH LATCH to ROOF SHEET				●		◆	◆				
BIRD STOP to TOP RING ANGLE				●		◆					

Note

- Use 1/4" x 3/4" hex bolts at peak and 5/16" x 1" hex bolts at eave for connecting the roof ladder assembly to the roof sheet on 6', 7', and 9' BFTs.
- Both 3/8" flanged hex nuts and regular hex nuts are provided. There are a few locations where the flanged nuts must be used for design integrity, or ease of assembly. These are shown above as (◆). Either nut type can be used for the other locations, shown above as (●).

Table 19. Bin and Hopper Hardware

	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1" Round Head Bolt c/w Slot	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Bolt Retainer	1/2" x 5-1/2" Flanged Hex Bolt	1/2" Flanged Lock Nut
	232850 (700) 235941 (325) 235943 (50)	235959 (300)	235946 (100)	235954 (300)	235950 (300) 235951 (100)	199588 (10)	154107	154201
WALL SHEET to WALL SHEET	●				●			
OUTER LEG to WALL SHEET	●				●			
INNER LEG to HORIZONTAL BRACE CLIP	●				●			
LEG ASSEMBLY to BRACE PLATES							◆	◆
INNER LEG to OUTER LEG (see notes)	●		●		●			
DIAGONAL CROSS BRACES to LEG ASSEMBLY			●		●			
WALL SHEET to HOPPER SHEET	●				●			
WALL SHEET to HOPPER SHEET CENTERED ON LEGS	●				●	◆		
HOPPER SHEET to HOPPER SHEET		◆		◆				
HOPPER SHEET to TRANSITION CONE		◆		◆				
HORIZONTAL BRACE to HORIZONTAL BRACE CLIP	●				●			
HORIZONTAL BRACE to TRANSITION CONE		●			●			

Note

- Use 3/8" x 1-1/2" hex bolts for inner leg to outer leg connections on 15' BFT.
- Both 3/8" flanged hex nuts and regular hex nuts are provided. There are a few locations where the flanged nuts must be used for design integrity, or ease of assembly. These are shown above as (◆). Either nut type can be used for the other locations, shown above as (●).

6.6. Recommended Bolt Assembly

When tightening bolts, tighten the nut on the bolt until a “snug-tightened condition” has been achieved. A “snug-tightened condition” is defined in *Specification for Structural Joints Using ASTM A325 or A490 Bolts* (Research Council on Structural Connections: June 2004), which states:

“*The snug-tightened condition 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.”*

A properly tightened bolt will compress the sealing washer noticeably. All assembly crew members must be made aware of this requirement, and must know how to achieve a snug-tightened condition using common bin-building tools.

It is important that the bolts in the vertical wall sheet seams are tightened enough to squeeze the caulking and bring the wall sheet surfaces into firm contact with each other. This is especially important to monitor when installing bolts in temperatures approaching -10°C (14°F).

The following table shows the minimum impact gun torque capacity necessary to achieve a snug-tightened condition for bolts used in the assembly process.

Table 20. Recommended Impact Gun Torque Values Capacity to Achieve Snug-Tightened Bolts

Bolt Diameter	Bolt Grade	Grade Mark	Recommended Torque Capacity		
			in-lb	ft-lb	N-m
1/4”	Grade 8.2		75	6	8
5/16"	Grade 8.2		215	18	24
3/8"	Grade 8.2		370	31	42
7/16"	Grade 8.2		600	50	68
1/2”	Grade 8.2		960	80	108
5/8”	Grade 8.2		1800	150	203
3/4”	Grade 5		3230	269	365

For proper sealing, do not overtighten the wall seam connections. Sealing is not critical on upright splice connections; these connections should be tightened securely to prevent loosening.

Hold the bolt head securely when tightening the nut to prevent damage to the sealing washer.

Important

Always tighten the nut, not the bolt.

Avoid bin assembly at temperatures below -10°C (14°F) if possible. Erection in low temperatures does not ensure strong, well sealed connections. Do not substitute bolts in place of those supplied by Westeel.

7. Limited Warranty: Westeel Grain Bin Products

Westeel – Ag Growth International ("Westeel") warrants products that it has manufactured and/or that are branded with its name (the "goods") subject to the following terms and limitations, (the "warranty"):

Duration of Warranty

This warranty will run from the date of purchase from the dealer or distributor, authorized by Westeel. The duration of the warranty is limited as follows:

Galvanized Bins	5 years
EasyFlow2	24 months
Westeel Fans	36 months
Floors	12 months
Catwalk	12 months
Bulk Feed Tanks	24 months
SeedStor-K Cones	
Paint	12 months
Structural	30 months
Elite Cones	
Paint	30 months
Structural	10 years
WESTEEL cones	
Paint	No Warranty
Structural	12 months
Smooth Wall Bins	
Paint	60 months
Structural	10 years
Commercial Smooth Wall Bins	
Paint	12 months
Structural	10 years

Limitation of Remedies Replacement

Within the warranty period, Westeel will replace the goods and/or original manufactured components thereof which are found, to Westeel's satisfaction, to be defective. Westeel is not responsible for direct, indirect, special, consequential, or any other damages of any kind, including personal injury to any individual, howsoever caused, including caused by transportation of the goods for repair or replacement.

Procedure for Obtaining Service

In the event of a warranty claim, the purchaser must complete any and all information required by Westeel in order to properly assess or investigate the claim. Westeel will not be responsible for the removal of any of the goods found to be defective, or transportation charges to and from Westeel's authorized dealer or distributor, or for installation of any replacement goods and/or parts furnished under the warranty.

Limitations as to Scope of Warranty

The warranty does not extend to defects or damage caused, in whole or in part, by:

1. use of a kind and/or to a degree not reasonably expected to be made of the goods;
2. improper storage of the goods both prior to and after purchase;
3. damage caused by, or in the course of, installation or assembly;
4. any use of the goods which is not an intended use as specified in Westeel's published product literature, or otherwise specified by Westeel in writing;
5. any equipment attached to or used in conjunction with the goods;
6. any field modifications or substitutions to original bin components;
7. inadequate ventilation or any other circumstance not in keeping with proper maintenance and/or use of the goods;
8. Acts of God, accident, neglect or abuse of the goods by the purchaser and/or any other individual or entity; or
9. Any use or installation inconsistent with Westeel's Standard Disclaimers.

Limitations as to Manufacturer

The warranty does not cover products sold by Westeel that are not manufactured by Westeel. In those circumstances, the purchaser is referred to the manufacturer of those products.

Limitation of Implied Warranties and Other Remedies

To the extent allowed by law, neither Westeel nor its dealers, nor any company affiliated with Westeel makes any warranties, representations, or promises as to the quality, performance, or freedom from defect of any Product covered by this Warranty.

WESTEEL HEREBY DISCLAIMS, TO THE EXTENT APPLICABLE, ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. A PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THIS WARRANTY ARE THOSE SET FORTH IN THIS WARRANTY. IN NO EVENT WILL WESTEEL, ITS DEALERS, OR ANY COMPANY AFFILIATED WITH WESTEEL BE LIABLE FOR INCIDENTIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES.

Some jurisdictions do not allow waivers of certain warranties, so the above waivers may not apply to you. In that event, any implied warranties are limited in duration to ninety (90) days from delivery of the products. You may also have other rights which vary from jurisdiction to jurisdiction.

Exclusive Warranty

This warranty is the only warranty provided by Westeel and all other warranties and/or commitments, whether express or implied and no matter by whom made, statutory or otherwise, are subsumed and replaced by it and are of no legal effect. If any provision of the warranty is held by a court of

competent jurisdiction to be void or unenforceable, in whole or in part, such provision shall be deemed severable and will not affect or impair the legal validity of any other provision of the warranty.

Westeel is an AGI Brand.

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.

Westeel Head Office Box 792, Winnipeg, Canada R3C 2N5
P 888.WESTEEL (937.8335) or 204.233.7133 | **E** customerservice.winnipeg@westeel.com | westeel.com

AGGROWTH.COM aggrowthintl

If you have any comments or questions on this manual, or find an error, email us at comments@aggrowth.com.
Please include the part number listed on the cover page in your message.