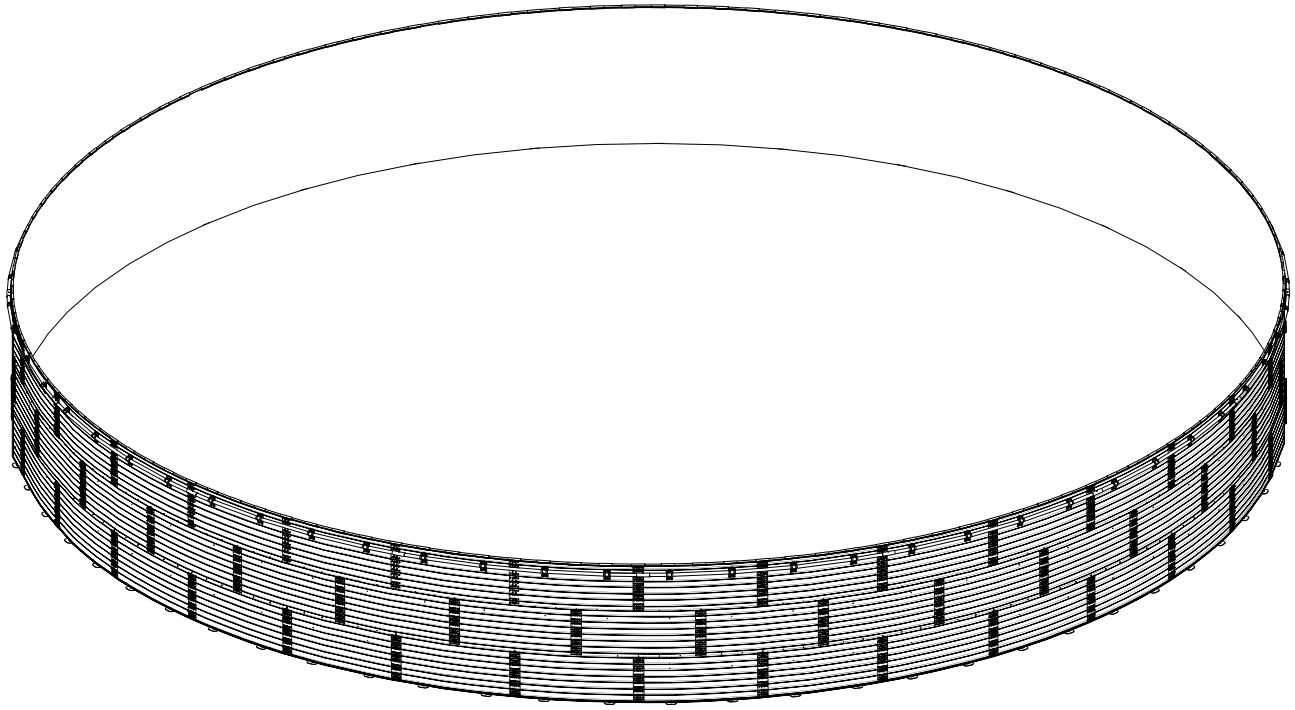
WESTEEL

Aboveground Water Storage System (AWSS) Standard Design

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: 199518 R7
Revised: December 2016

AGI AG GROWTH INTERNATIONAL

CONTENTS

1. Introduction

This manual describes how to assemble a Westeel Aboveground Water Storage System (AWSS) — Standard Design.

Before assembling the above ground water storage system, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly.

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

The safety information in the safety section of this manual applies to all safety practices. Specific safety information (such as Operation Safety), can be found in the appropriate section.

YOU are responsible for the **SAFE** use and maintenance of your above ground water storage system. **YOU** must ensure that you and anyone else who is going to work around the above ground water storage system understands all procedures and related **SAFETY** information contained in this manual.

Remember, **YOU** are the key to safety. Good safety practices not only protect you, but also the people around you. Make these practices a working part of your safety program. All accidents can be avoided.

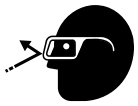
- It is the above ground water storage system owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when assembling, operating, or maintaining the equipment.
- Owners must give instructions and review the information initially and annually with all personnel before allowing them to operate the above ground water storage system. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- The above ground water storage system is not intended to be used by children.
- Use the above ground water storage system for its intended purposes only.
- Do not modify the above ground water storage system in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety, and could affect the life of the above ground water storage system. Any unauthorized modification of the above ground water storage system will void the warranty.

2.3. Personal Protective Equipment

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

Safety Glasses

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



Coveralls

- Wear coveralls to protect skin.

Hard Hat

- Wear a hard hat to help protect your head.

Steel-Toe Boots

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

Work Gloves

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

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.

2.5. Decal Installation/Replacement

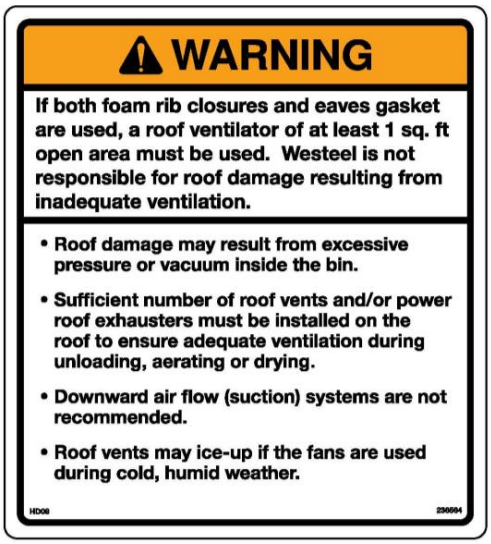
1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining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

2.6. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the above ground water storage system and their messages are shown in the figure(s) that follow. Safe operation and use of the above ground water storage system 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



3. Before You Begin

3.1. Tank Design and Capacity

1. Standard Westeel Primary Containment Tanks are designed for the primary containment of liquids with a specific gravity of less than or equal to 1.00. Designs for higher specific gravities are possible under special consideration. The Westeel steel structure provides the structural integrity, while the containment of the liquid is achieved through the use of an integral liner, which is the responsibility of other manufacturers.
2. Westeel Primary Containment Tanks are an engineered product and the structural design is conducted by professional engineers employed by Westeel. The tanks are designed to be in compliance with relevant national codes, most notably the National Building Code (NBC – 2010 Edition). In addition CSA-S16-09 (Design of Steel Structures - 2009) and CSA-S136-07 (North American Specification for the Designation of Cold-Formed Steel Structural Members - 2007), which are compatible with the NBC, are utilized as appropriate. Recently the designs have been enhanced by utilizing relevant sections of ANSI/AWWA D103-09 (American Water Works Association - Factory Coated Bolted Carbon Steel Tanks for Water Storage – 2009) particularly for seismic and wind loading applications.
3. Standard Westeel Primary Containment Tanks are designed to withstand maximum horizontal wind speeds of 94 mph (150 km/h).
4. Zero seismic activity. Note: Seismic resistance in 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.
5. There is little structural interaction between the Westeel Primary Containment Tank and the supporting soils. The site should be firm and level, and free of abrasive elements or other features that could harm the liner. The site must also be capable of supporting the loads imposed by the empty water tank, and by the fluids being contained. Such considerations are the responsibility of others.
6. Standard Westeel Primary Containment Tanks are not site specific. Any specific site requirements, and the adherence to local jurisdictional requirements, are the responsibility of others.

3.2. 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:

- Tank location and tank siting
- Soil conditions and corresponding foundation requirements (note that the examples provided in manuals are for specifically stated soil conditions)
- 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 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.

3.3. Methods of Installation

Recommendations for installing Westeel Aboveground Water Storage Systems (AWSS) must be closely followed to achieve the full strength of the AWSS and to achieve rapid trouble free assembly. Warranty is void if the recommendations are not followed. This includes, but is not limited to:

1. If wall sheets that are not specified for a given tier are used.
2. If foundations are found to be inadequate or out-of-level.
3. If anchor bolts (cast-in-place, drill-in, chemical type or other) are found to be inadequate.

3.4. 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 above ground water storage system installation.
2. Design and build foundations with the necessary strength for the loads they must support, and for local soil conditions. Westeel foundation guidelines are based on specific stated conditions and may not be applicable to local 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 above ground water storage system 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.

3.5. Product Storage

Rust on Galvanized Parts

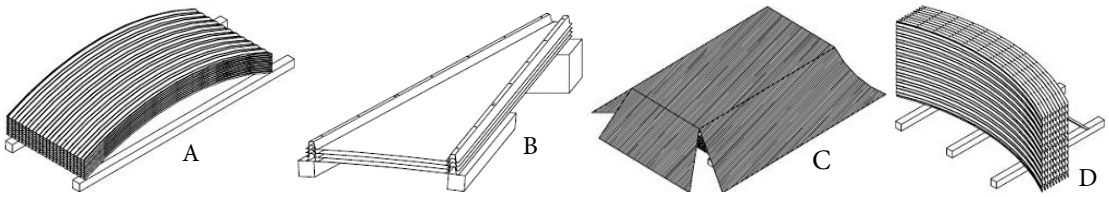
1. White rust forms when moisture is allowed to collect on galvanized surfaces that have yet to develop the durable zinc oxide layer. This zinc oxide layer naturally occurs as the surface interacts with carbon dioxide, and is characterized over time by the dull grey appearance that weathered galvanized 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” – 8” off the ground on wood blocks or timbers. (See Figure 2 on page 11 Detail A)
- Store curved wall sheets ‘hump-up’. (See Figure 2 on page 11 Detail A).
- All other bundles material should be placed so that they are well sloped to promote good drainage. (See Figure 2 on page 11 Detail B).
- Roof sheets must be elevated at least 12” at the small end of the sheet.s (See Figure 2 on page 11 Detail B).
- Temporary storage can be provided by erecting a simple framework supporting a waterproof tarp. (See Figure 2 on page 11 Detail C)
- All 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 goods become submerged or wet, the bundles should be opened as soon as possible, sheets or material separated and dried. Keep separated until assembly.

   Brace goods properly so as to avoid damage or injury from material falling when in storage. (See Figure 2 on page 11 Detail D).
2. Any boxed goods 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.

3.6. Important Notes

1. 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 ends pointing upwards.

2. Contact local power officials for minimum power line clearance.
3. See the Tank Design and Capacity section of this manual for information about materials that can be stored in these vessels.
4. Tighten all bolts to the recommended torque setting (see Recommended Bolt Torques in the related installation layout document).

Note

Consistent with Westeel's policy of continued research and development of our products, we reserve the right to modify or change information contained in this publication without notice.

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 the delivering carrier, followed by a confirming letter requesting inspection by the carrier, if required. Order any replacement parts immediately to ensure that assembly will not be held up by missing parts. All parts will be charged for and credit will be issued by party at fault. No credit will be issued if freight bills are signed as received in good condition.

4.2. Recommended Tools

- Two (2) cordless impact drivers – one on the inside to spin bolts into tight fitting holes and one on the outside to drive nuts
- One (1) drill may be required at certain locations to create new bolt holes or to enlarge existing ones
- At least two (2) long tapered punches with pry bar at one end

Figure 3. Tapered Punch

Note

Everyone on site should have a punch. They serve many useful functions (e.g. carrying wall sheets, positioning wall sheets, aligning bolt holes, reaming bolt holes, etc). Ready access to a punch can be a significant time saver.

- A flat bed picker truck compatible with the site and loads being handled
- Graded lifting slings
- Scissor lift
- Scaffolding &/or zoom boom
- Large fork lift
- Large tape measure
- Center pin for scribing
- Marking (spray paint) site (sheet layout and curvature)
- Bolt and tool aprons
- Hack saw and blades or powered chop saw
- Tag line with hook for guidance when lifting panels

- Rubber mallet

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.

4.4. Tank Roundness

1. Make sure the tank is assembled as perfectly round as possible.
2. Use a string anchored and centered on the concrete foundation to scribe a circle.
3. Refer to Table 1 on page 14 for the appropriate calculated scribe radius for the tank.

   Note

   These radiuses are 3/4" smaller than the wall sheet radius at the bottom, so that the scribed circle can be seen during assembly. A perfectly placed ring of sheets should be 3/4" on the outside of this line all the way around. This should be the first step in assembling a tank. The maximum amount that a tank can be out of round is 3/4" on the radius, when measured from the center of the tank. In addition the wall sheets must form a smooth circle with no flat or elongated portions.

4. Before anchoring the tank to the foundation, ensure again that the tank is round, within tolerance.

Table 1. Aboveground Water Storage System Specifications

MODEL #	DIAMETER		RADIUS		SCRIBE RADIUS		TIERS	HEIGHT		CAPACITY			BARREL TANK EQUIV.	
	METERS	FEET	METERS	FEET	METERS	FT		METERS	FEET	CUBIC METERS	US GALLONS	BARRELS	400	500
246-02	74.98	246	37.29	122.35	37.27	122.29	2	2.24	7.3	9,766	2,579,845	61,425	154	123
168-03	51.21	168	25.47	83.56	25.45	83.49	3	3.35	11.0	6,832	1,804,817	42.972	107	86
138-03	42.06	138	20.92	68.64	20.90	68.57	3	3.35	11.0	4,610	1,217,791	28,995	72	58
138-02	42.06	138	20.92	68.64	20.90	68.57	2	2.24	7.3	3,073	811,861	19,330	48	39
126-04	38.40	126	19.10	62.67	19.08	62.60	4	4.47	14.7	5,124	1,353,613	32,229	81	64
114-03	34.75	114	17.28	56.70	17.26	56.64	3	3.35	11.0	3,146	831,045	19,787	49	40
114-02	34.75	114	17.28	56.70	17.26	56.64	2	2.24	7.3	2,097	554,030	13,191	33	26
96-03	29.26	96	14.55	47.75	14.53	47.68	3	3.35	11.0	2,231	589,328	14,032	35	28
96-02	29.26	96	14.55	47.75	14.53	47.68	2	2.24	7.3	1,487	392,885	9,354	23	19

Note

Table lists most common AWSS sizes. To calculate the scribe radius for other size diameter tanks, multiply nominal diameter by 0.49736, then subtract 0.0625:

- Scribe radius = (0.49736 * nominal diameter) - 0.0625

4.5. Site Selection and Support of Tank

Note

The AWSS must be supported around its perimeter in a consistent and uniform manner. Make sure the site is level, free of humps, depressions and stones, and provide an adequate foundation.

When sizing and locating a tank, assess local environmental conditions (primarily wind and seismic), local soil conditions, and local jurisdictional requirements. Personnel assembling this product are responsible for obtaining all necessary expertise related to local conditions and requirements, including the suitability of the selected site, foundation, anchoring and installation.

Give careful consideration to:

- Foundation requirements – Determine whether a concrete foundation is required. If so, the related design is dependent on many things, including intended use, length of service, and soil conditions
- Soil considerations:
  - Ultimately the soil must bear all associated loads, which includes the weight of the tank, plus the weight of the contents. The weight of the tank is distributed around the perimeter of the tank in a very narrow band. Base plates are supplied to distribute the load over a larger area and to prevent the tank wall sheets from cutting or sinking into the supporting soil. Determine whether or not base plates are required, as well as the number required, and their distribution. Additional base plates are available, if required.
  - If utilizing ground anchors, the soil must be compatible with the style of anchor being used and the anticipated loads.
- Compliance considerations – Requirements vary from jurisdiction to jurisdiction. Local codes, or consultation with the local authority having jurisdiction should form part of early considerations.

4.6. Pre-Build

(The following steps are adapted for reuse with permission from the Layfield Group of Companies.)

A typical liner installation on open type AWSS involves the liner overhang secured around the outside perimeter of the AWSS. This installation guide describes the steps required to install a single lined system.

Step 1 — Delivery and Handling of Geomembrane Liner on Site

1. The prefabricated geomembrane liners are packaged and shipped on an open trailer and supported during transportation to eliminate external damage.
2. Upon arrival to site, the liner package must be carefully inspected for damage. Any damage or distress to the outside wrapper of the liner should be investigated and any damage claimed against the carrier.
3. Shipping documents and liner documentation should be secured and set aside for future reference.
4. Verification of fabricated geomembrane panel numbers matching the shipping documents is required and will be signed off by the installer.
5. Each roll of geomembrane delivered to the site will have a label and shall clearly state the manufacturer's name, product identification, thickness, length, width, panel number and panel specific deployment directions.
6. All geomembrane materials arriving on site are to be inspected for damage prior to deployment.
7. Store geomembrane panels on a flat, dry, smooth surface, such as clean pallets or rig mats to prevent damage to the material.

Handle geomembrane panels using slings or on pallets to prevent damage.

Step 2 - Sub Grade Preparation and Inspection

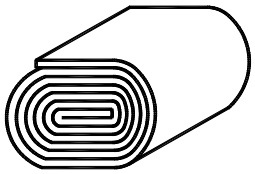
1. The prepared surface should be uniform, well compacted, and free of sharp rock fragments, large stones and other deleterious matter such as tree roots, construction debris and metallic objects. The surface should not have any natural or foreign object that protrudes above the surface of the subgrade.

2. A subgrade inspection is required by Directive 055 and must address:
   a. Subgrade stability and bearing capacity
   b. Slope and grade
   c. The adequacy of surface conditions
   d. The requirement for a geotextile cushion
3. For winter installations enough snow and ice must be removed so that the subgrade can be adequately inspected.
4. The liner can be placed on level snow up to 4” thick however the snow must be cleared within 4 ft of the perimeter where the liner meets the tank wall. A non-woven geotextile cushion is recommended when placing a liner over snow.
5. Additional liner protection can be achieved by using locally available sand over the subgrade or by using a LP 10 non-woven geotextile.
6. A subgrade inspection form is included at the end of this documentation package. This form should be signed prior to liner installation.

Step 3 - Deployment of Geomembrane

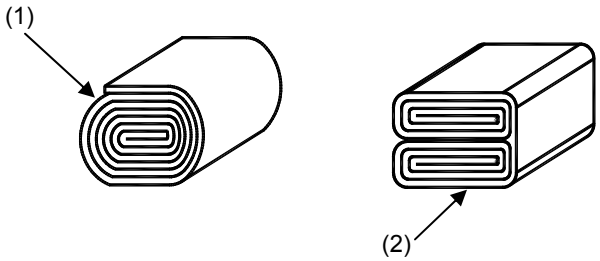
1. Once the subgrade is ready for liner deployment, mark the AWSS perimeter on the ground (or on the geotextile if used). Leave the wrapper on the panel until it is placed in the proper position for unrolling.

Figure 4. Prefabricated Panel



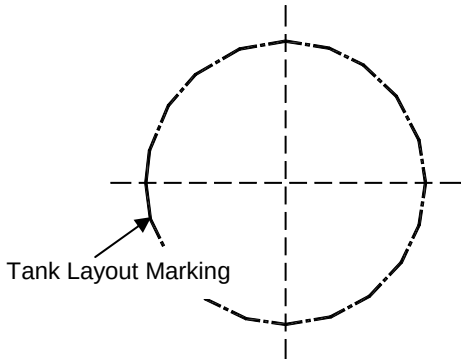
2. Note the unfolding instructions on the geomembrane panel label. There are two types of rolled panels: **normally folded panels** and **butterfly folded panels**.
   - **Normally folded panels** unroll from a corner while butterfly folded panels unroll from the center.
   - **Butterfly folded panels** are typically made in a stepped configuration.

Figure 5. Normal Panel (1) and Butterfly Panel (2)



3. The prefabricated panel of geomembrane (Figure 4 on page 16) is placed in the appropriate position on the marked surface. The prefabricated panel should be placed outside of the laid out area a distance equal to the wall height plus attachment length. (See Figure 6 on page 17)

Figure 6. Tank Layout Marking



4. Unroll across the marked area shown in Figure 6 on page 17. Take the top of the panel and deploy over the marked area. The normal panel is deployed in one step; the butterfly panel is pulled out half at a time. Once the panel is unrolled and unfolded, adjust the location to fit the AWSS.

Figure 7. Deployment of a Normal Panel (a & b)

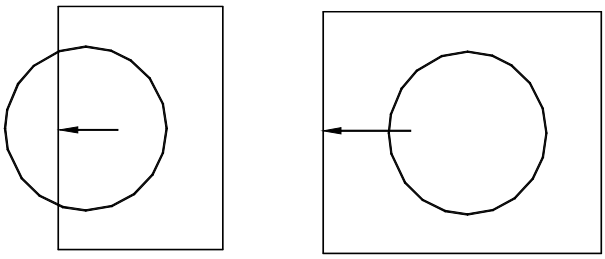
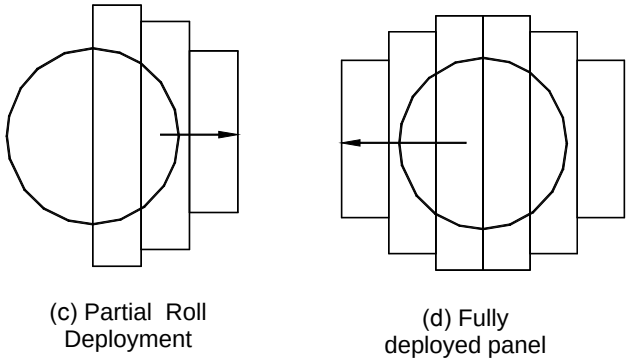


Figure 8. Deployment of a Butterfly Panel (c & d)

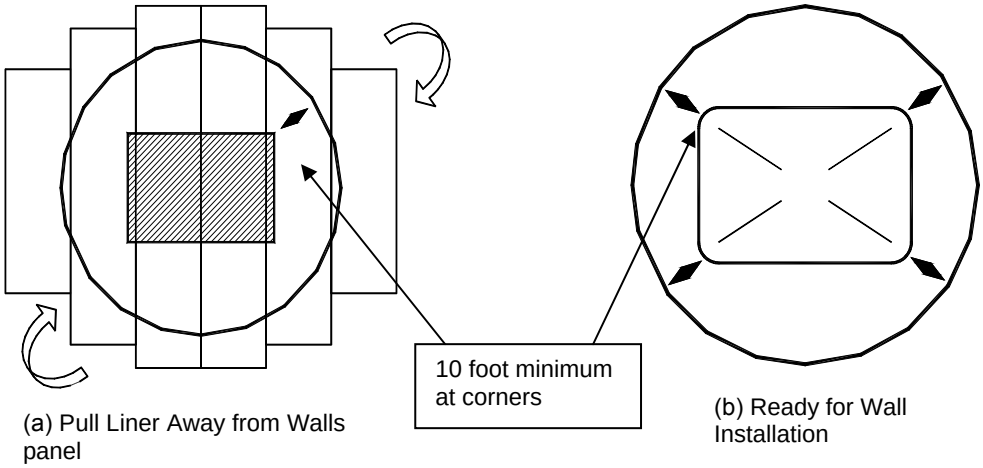


5. Once the liner is spread out to its full dimensions the geomembrane should be inspected for defects that may have occurred from shipping or handling. Repair all defects before proceeding to the next step.

Step 4 - Re-Folding Liner

1. Fold the liner away from the marked perimeter to allow the steel wall to be erected.
2. Make sure the folded liner is well within the marked area.
3. If a nonwoven geotextile is used, it will help pull the liner away from the walls.

Figure 9. Re-folding the liner

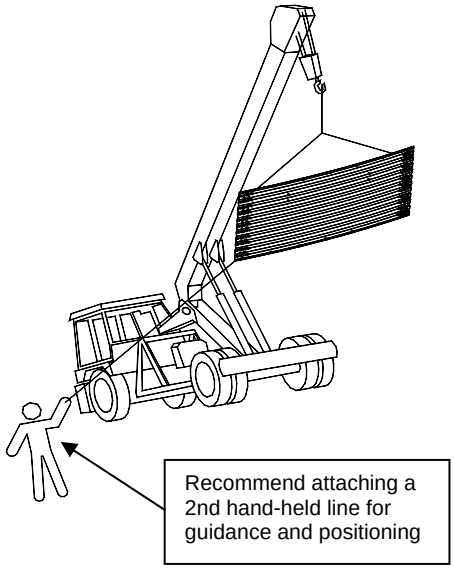


Step 5 - AWSS Wall Erection

1. Use a (suitable) picker truck and a sling to lift vertical wall sheets into place.
2. Attach hooks at the ends of the sling to holes at the top of the wall sheet for lifting.

   An open hook is preferable, but a small clevis will suffice. Distribute the weight equally in both planes on the sling so the sheets hang straight and upright. (See Figure 10 on page 18).

Figure 10. Lifting wall sheets using a sling



3. Use a second hand-held line for guidance and positioning.

   Note

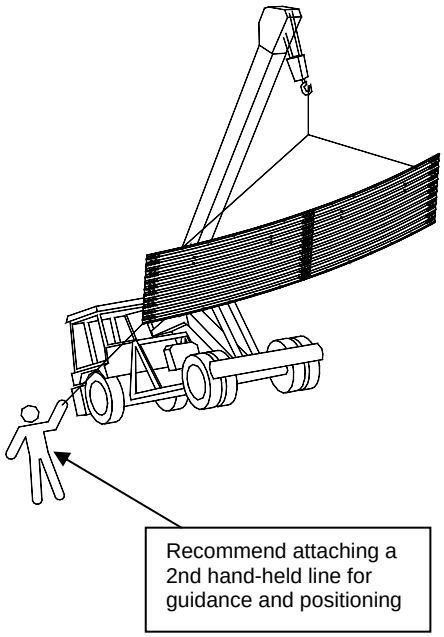
   On larger systems, the bottom wall sheets may be two sheets bolted together back to back (laminated) for extra strength.

4. Consider the elements for the bottom tier before assembly.

   If soil conditions require it, support pads (264289) may be necessary (2 per sheet supplied).

5. For ease of entry and exit through the tank wall during install, installation of an egress door (232915) is recommended. (This is an extra accessory.)
6. One anchor bracket (199232) is provided for each wall sheet for applicable systems.. The brackets should be used with an anchor and cable, as needed for ground site conditions.

Figure 11. Lifting two wall sheets using a sling



Note

For the initial assembly, consider having a secondary crew pre-assembling two wall sheets together beforehand, if it is feasible to do so. This cuts the number of lifts by half.

Note

A rated wall sheet sling is available from Westeel (199522)

Step 6 — Installing the Geomembrane over the Corrugated Steel Wall

1. Once the steel walls are erected, inspect the steel for any bolts that are protruding from the surface, sharp edges, and missing hardware.
2. Inspect the perimeter of the wall area to make sure:
   a. no loose fasteners have been dropped where they will be underneath the liner
   b. the subgrade has not been disturbed
3. Unfold the geomembrane and lift it over the walls with a crane or boom forklift
4. Leave enough slack in the liner to allow for filling and to ensure no tension is put on the liner once filling begins.

Step 7 - Attaching Liner to Top of the Ring Wall

1. Make sure the rim of the top of the tank does not have any rough or sharp edges that could damage the liner.
2. Use appropriate methods to avoid damage to the liner.

3. Evenly distribute the excess material and attach liner to tank wall around the top.
4. Check that the liner is fit up against the ring wall without bridging or tension.
5. Complete attachment of the liner at the top of the wall. (See Section 6.1.1 – Liner Clamp Option 1 (Steel Liner Clamp) on page 29 and Section 6.1.2 – Liner Clamp Option 2 (Spring Steel Clamp) on page 30.

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 above ground water storage system.
- 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.

5.2. Wall Sheet Installation

Note

For maximum efficiency, it is essential that a crew establish a “rhythm” when assembling the structure. This involves every crew member knowing their role, and how it fits with the role of others. Good crew dynamics can be an essential time saving element.

Note

There are a number of tasks that “free” crew members can perform to keep the process moving efficiently:

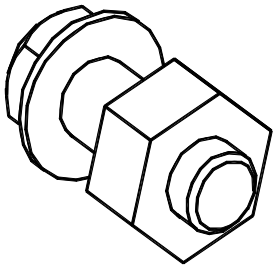
- Preassemble wall sheets into pairs, join laminate wall sheets, install wind ring brackets and clips, etc.
- Distribute hardware ahead of the assembly crew members such that they are ready at hand when needed.
- Install anchor brackets and secure with ground anchors.
- Make wind ring connections
- Tighten any loose hardware

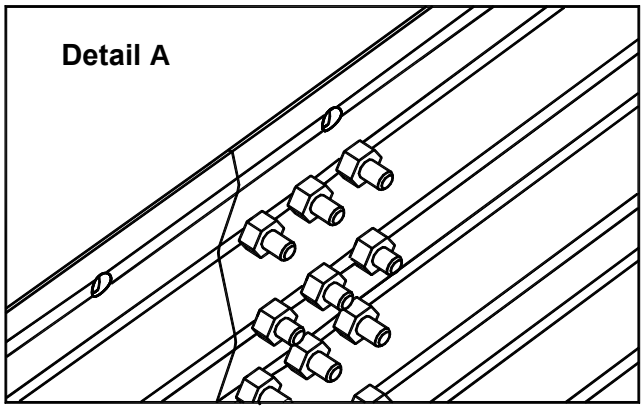
5.2.1 Using Bolts

1. For the first tier installation (the bottom), consistently overlap the second sheet over the first and connect together with bolts.

   Direction is not important (clockwise or counter clockwise).

Figure 12. Bolting together sheets





BOLT SIZES	
3/8" x 1"	150599
7/16" x 1 1/2"	193768
7/16" x 1 3/4"	193771

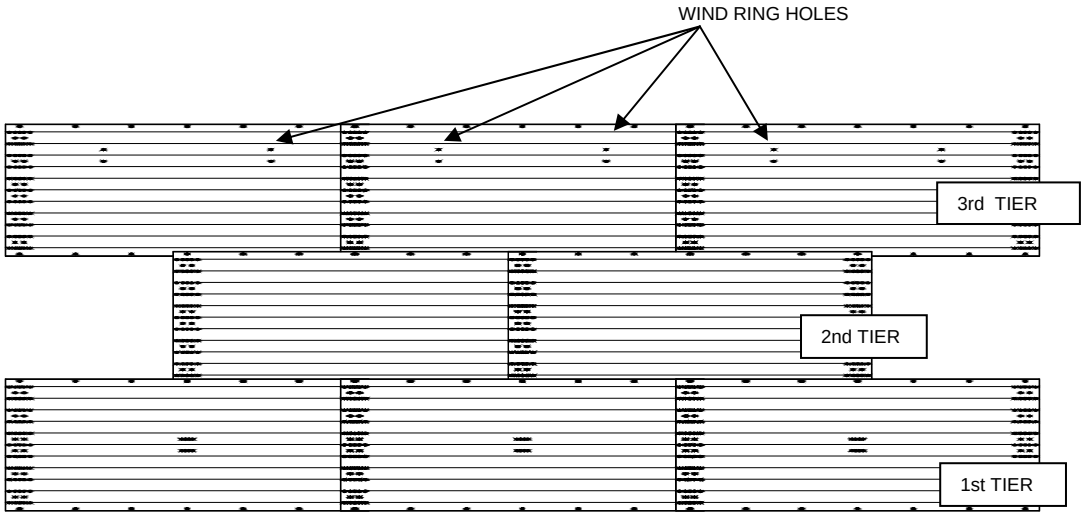
2. Use a single bolt inserted through every connection hole (head on the inside; nut on the outside).

   These wall sheets come with two, three and four columns (see Figure 12 on page 22) of pre-punched holdes for the overlap connections. The bolt diameter and length will vary with wall sheet gauge. (See Section 7.2. – Hardware Usage on page 44.)

5.2.2 Adding Tiers

1. Assemble subsequent tiers similarly to the first, with the upper wall sheets overlapping outside of the lower ones.
2. Stagger upper wall sheets with respect to the lower tiers, so that each vertical seam lines up with the center horizontal hole of the previous tier.

Figure 13. Wall Sheet Alignment



Note

Hole patterns may vary. Orientation of wall sheets is generally not an issue, except that wind ring holes in top tier must be at the top of the wall sheets.

Important

Wall sheets are carefully engineered in varying thicknesses to resist the internal and local environmental forces expected. Wall sheet arrangement proceeds from lightest gauge at the top of the Tank, to heaviest gauge at the bottom of the Tank. Exact layouts for each order are available from Westeel. **DO NOT VARY FROM THIS MODEL**

3. Use tapered punches to align or ream holes prior to attempting to bolt tiers together.
4. Leave all bolts loose until wall sheet has bolts in all locations.

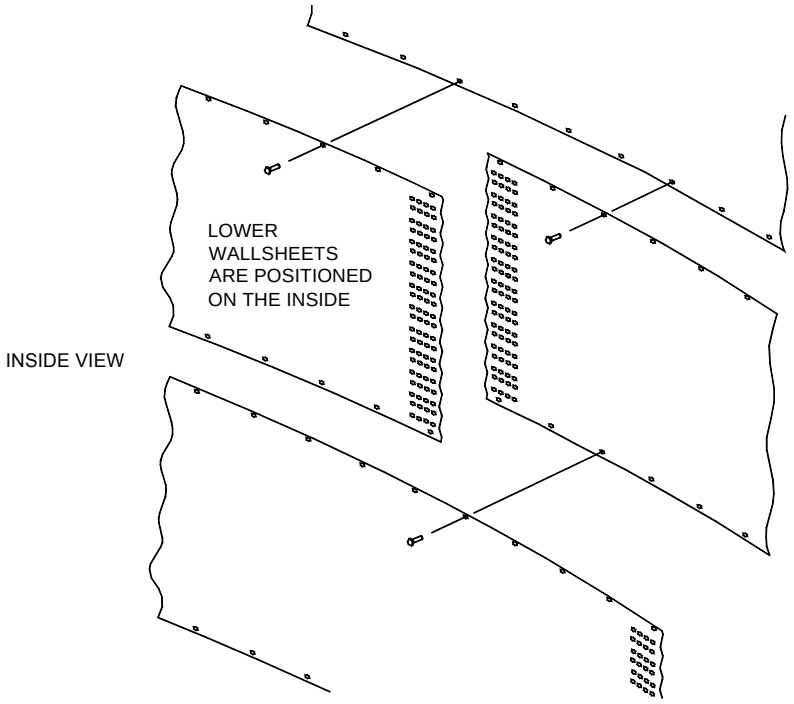
Note

When bolting multiple wall sheets together, the length of the sheets can grow and shrink slightly because of the tolerance in the bolt holes. While the slack in each hole is minimal, it can add up or shrink over an extended run and can work against you, if the bolts are being tightened as you go. Alternately, any slack can work for you. Be aware of the fit-up between the mating holes on successive tiers and use the slack in the bolt holes to correct developing problems before they become a real issue.

Note

Lower wall sheets are typically positioned on the inside. This is primarily for water shedding purposes and is usually not a concern with water tanks. If an assembly is running tight and placing the upper wall sheets on the inside helps with the hole alignment, then this is acceptable.

Figure 14. Wall Sheet Assembly Detail (inside view)



Note

Sometimes there are an odd number of wall sheets around the circumference of a cell. When distributing sheets during assembly there may be a single sheet somewhere in the circumference that is not able to be paired. If there is a "special" sheet somewhere in any given tier, then it should be selected as the single sheet. The egress door (232915) sheet in the bottom tier, or the top tier wall sheet that corresponds with the short Wind Ring are obvious examples. Once again, consideration should be given to pre-assembling two wall sheets together prior to lifting into place.

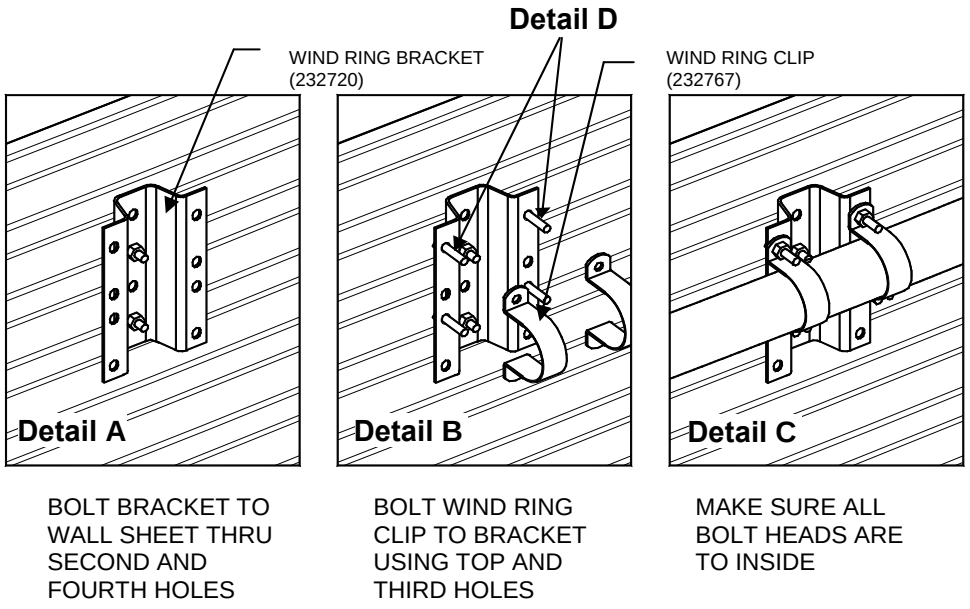
For Egress Door information, see Section 6.4. – Door Options on page 36.

5.3. Wind Ring Assembly

The top tier includes a wind ring installation. This involves mounting two mechanical elements per wall sheet bolted through the assembly holes near the top of each sheet.

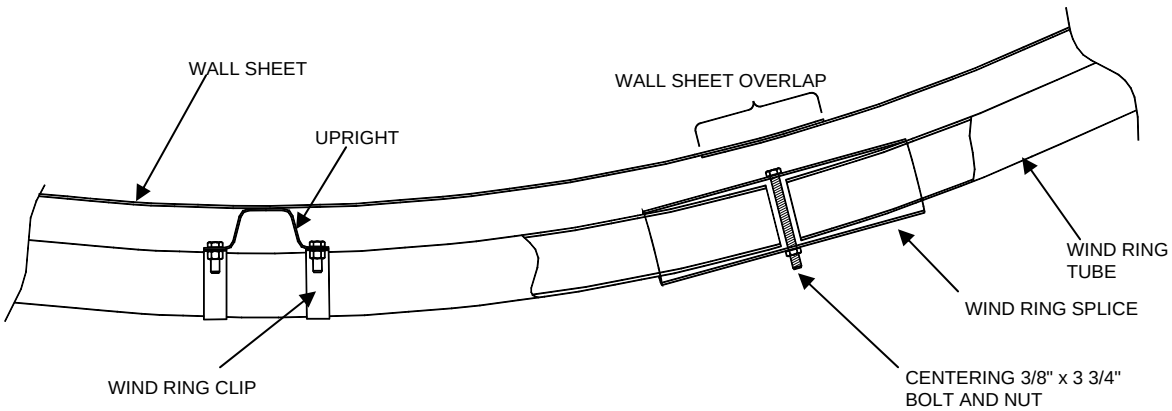
1. Attach two wind ring brackets (232720) to the outside of each wall sheet through the lowest hole in bracket and second hole above it. See Detail A in Figure 15 on page 25.)
   a. Use two 3/8" x 1-1/2" bolts (193797). (See Detail D in Figure 15 on page 25.)

Figure 15. Wind Ring Brackets and Clips



2. Make sure the bolt heads are inside the AWSS, with nuts on the outside.
3. Attach the two wind ring clips (232767) to the brackets using the same bolts, through the uppermost hole in bracket flange and the second hole below (See Detail B in Figure 15 on page 25.)
4. Align adjacent tubes and secure them to each other with wind ring splices (232769).
5. Install a 3/8” x 3¾” bolt (235949) through the splice to keep it centered on the connection.

Figure 16. Installing Wind Rings



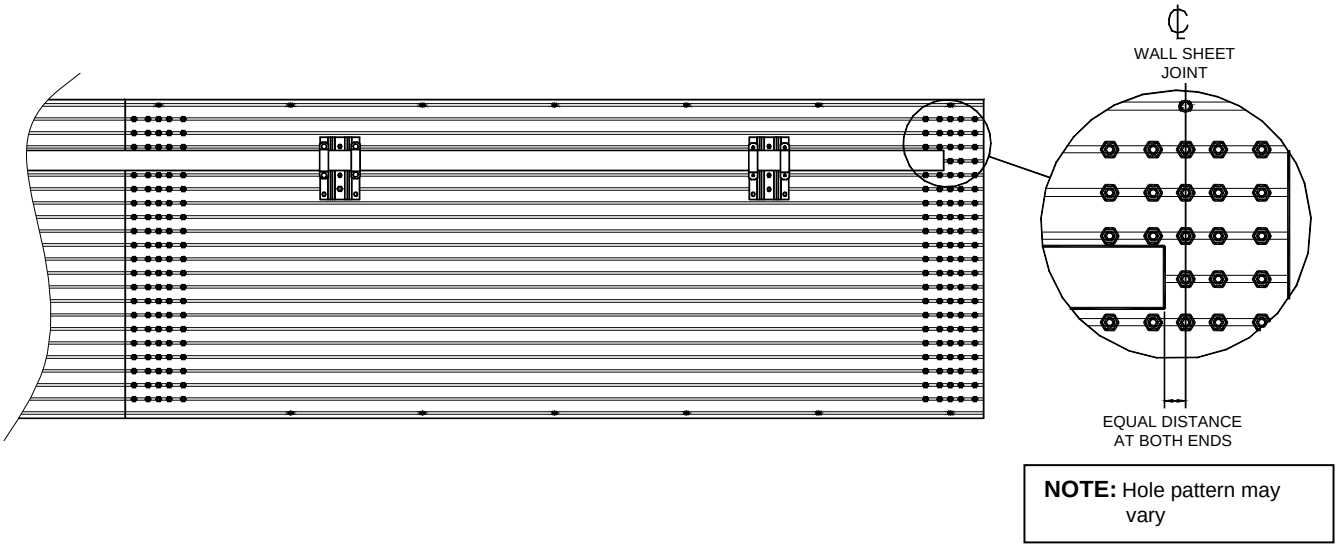
Note

Position the end of the wind ring tube to line up the centering bolt with the center of the wall sheet overlap (horizontal hole).

Note

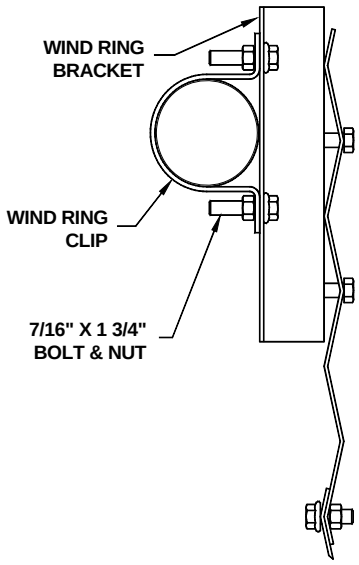
It is advisable to align the end of the wind ring tubes relative to a vertical seam (ie. wall sheet overlap) on the wall sheets, as shown in Figure 17 on page 26. This is especially the case if there is an intent to disassemble and relocate the AWSS at some point in the future, as the wall sheet connections can be broken at these seams and the wind rings left in place for stacking and transport. The tubes are slightly shorter than the distance between the center line of the connection across two wall sheets. Position the end of the tubes such that the distance between the tube end and the center of the joint is the same at both ends

Figure 17. Align the end of the wind ring tubes relative to a vertical seam



6. The final wind ring tube in the circle should only need to be cut to length if the tank has an odd number of wall sheets. The tubes have been optimized for large diameters. If cutting is required, secure one end of the last tube in the previously installed wind ring splice as described above.
   a. Hold the tube in place and mark the cut-line relative to the previously installed tube at the other end.
   b. Make sure that allowance is made for the 3/8” diameter bolts.
   c. Once the tube has been cut, install one end of the tube as described above.
   d. On the other end slide the wind ring splice completely onto the free end.
   e. Position this end relative to the previously installed tube, and slide the splice onto the second tube until it is centered.
   f. Insert the centering bolt.
   g. Install all wind ring clips.
   h. Tighten all bolts.

Figure 18. Wind Ring Clip Detail



Note

When tightening wind ring clips, always tighten in sequence starting at the spliced end of the tube, which has already been secured, and work toward the free, and as yet un-spliced, end.

Note

If the wind ring tubes are inserted into all the supporting clips across two wall sheets, and the clips are left loose, there is a tendency for the tubes to roll inwards, especially when the assembly is being slung or moved. This can lead to misalignment between mating tubes. Before tightening the clips, ensure that the tube is seated such that the curvature of the tube is in the horizontal plane.

Note

Applying the wind ring brackets, clips and wind ring tubes at ground level may prove to be a real time saver.

5.4. Anchoring Considerations

- Generally speaking a tank that is at least partially filled all of the time is protected from wind loading, which is a function of local wind conditions and exposure. However if a tank is expected to be sitting empty, or minimally filled, then it must be anchored. This also applies to the period between when the tank is first assembled and when it is first filled.
- Anchorage against a tank tipping over is also a consideration on tall, narrow tanks.
- There are different anchorage options available depending on the foundation (see Section 6.2. – Anchoring on page 31). If utilizing ground anchors then the selection of the anchors, their holding capability, the number required, etc are all a function of local soil conditions, and the anticipated loading requirements.
- Another option that has been successful employed is to place larger concrete blocks around the outside perimeter of the tank and cable to the base plates and/or wind rings.

5.5. Liner Installation

Install the liner as per the manufacturer's recommendations. (See Section 4.6. – Pre-Build on page 15.)

Also see Section 6. – Options and Accessories on page 29 for recommendations on attaching the liner.

5.6. Disassembly and Storage

The following are field-proven suggestions for quick disassembly and eventual reassembly of an AWSS wall system. Other methods may be just as practical depending on the local situation.

For potential cleaning and recycling, refold the liner and underlay.

When dissembling the top tier:

1. Break the seams that align with the wind ring joints and leave the wind rings in place.

   Since wind rings are two wall sheets in length, it is possible to leave two adjacent wall sheets bolted together and lifting them all together as a single entity.

2. Stack the wind ring segments (hump up) but rotate every second pair 180 degrees so that the stack remains secure.
3. The remaining tiers can be disassembled the same way.

   It may be preferable (if feasible and convenient) to leave two adjacent wall sheets bolted together so that they can be lifted away together and stacked as one. This single, partially completed assembly saves lifting repetitions.

4. When stacking, pile the sheets in a "hump up" configuration and block up the centers such that the curvature is roughly maintained.
5. Before dismantling the entire assembly, consider replacing any part labels, if a new crew is reusing the equipment and instructions, or otherwise mark the sheets for reassembly.

5.6.1 Removing and Reusing Parts

1. Collect all extra hardware, liner, gaskets and liner clamps, etc., that can be reused for the next site.
2. Re-package in the crates and boxes that the product arrived in.
3. Before reinstalling, check that the parts are in serviceable condition.
4. Replace all damaged parts and hardware.

It is advisable to carry an inventory of spare replacement parts

Note

It may be feasible to have crew members remove some of the vertical and horizontal seam bolts ahead of the disassembly operation. Leave sufficient hardware in place to maintain the integrity of the empty cell. Remember that if you are leaving two wall sheets together, you only pre-break every second seam, and that these are carefully "timed" with the stacking team members.

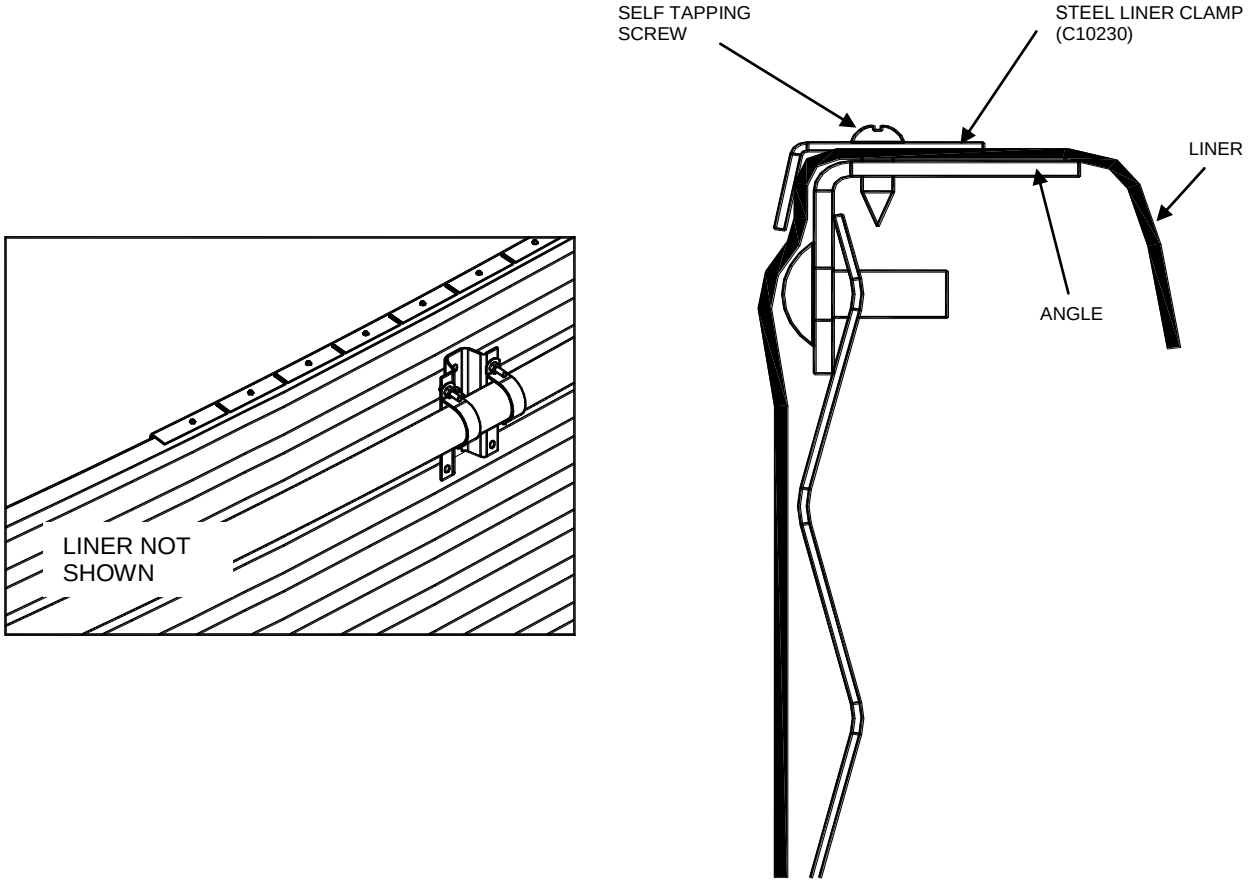
6. Options and Accessories

6.1. Liner Clamp Options

6.1.1 Liner Clamp Option 1 (Steel Liner Clamp)

One method of securing the liner is to use a metal angle bolted through the holes in the top of the wall sheet. (See Figure 19 on page 29.)

Figure 19. Securing the liner with a steel liner clamp



After all the tank wall elements have been installed and the angle is bolted to the top edge, fit the liner to the walls.

1. Unfold the liner and geotextile cushion (if used) across the exposed base.
2. Drape the liner over the angle and secure it with a metal liner clamp (C10230) and self-tapping screw.

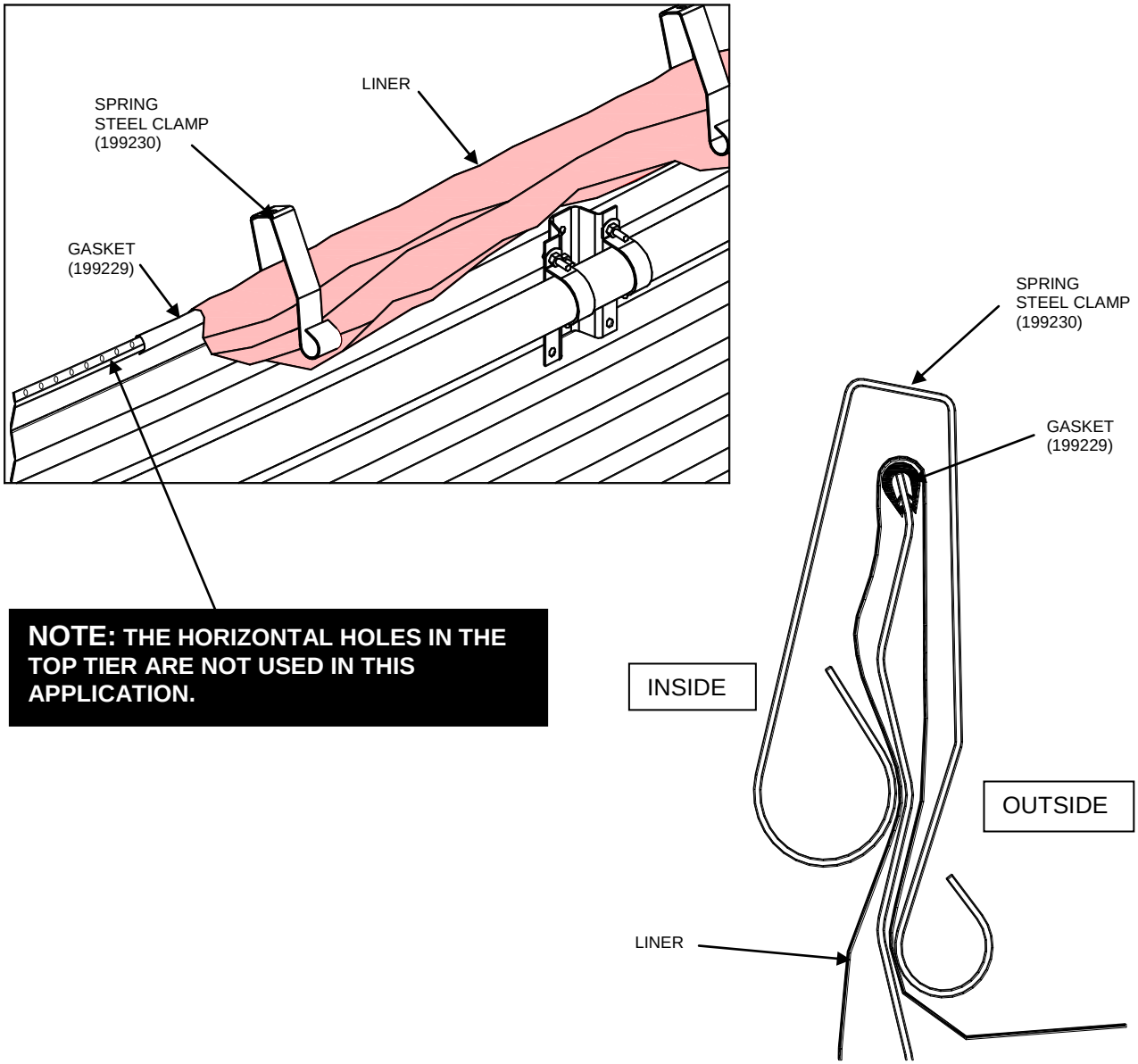
   See also:

   - Step 6 — Installing the Geomembrane over the Corrugated Steel Wall on page 19
   - Step 7 - Attaching Liner to Top of the Ring Wall on page 19

6.1.2 Liner Clamp Option 2 (Spring Steel Clamp)

An alternative method of securing the liner to the wall is to use a spring steel clamp. (See Figure 20 on page 30)

Figure 20. Securing the liner with a spring steel clamp



1. Line the top edge of the wall sheets with the gasket (199229)

   The gasket will help protect the liner from the sharp edge of the wall.
2. Unfold the liner and geotextile cushion (if used) across the exposed base.
3. Drap the liner over the gasket.
4. Secure the liner with several spring steel liner clamps.

   Use two per wall sheet, or as required.

Note

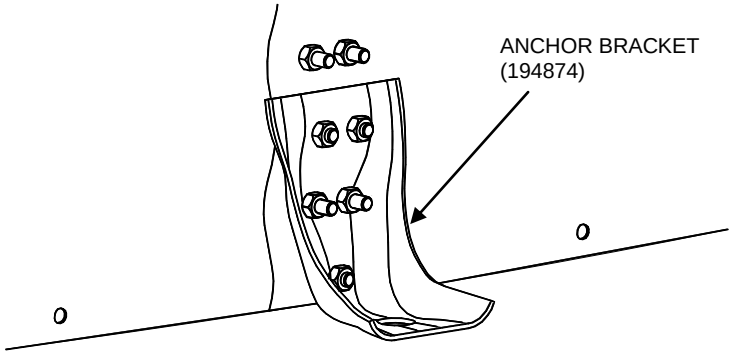
The clamp is designed large enough to accommodate spots that have folds of bunched-up liner. The clamp will just sit higher on the wall sheet, as needed.

6.2. Anchoring

6.2.1 Wall Sheet Anchoring Option 1 (Anchor Bracket)

This option is generally reserved for smaller water tanks that utilize a double bolt hole pattern on the lower tier wall sheet seams. Anchoring is achieved by use of a bracket attached at the bottom wall sheet vertical seams (as shown). Attachment to a pad or to the ground is by customer-supplied hardware. Anchoring must be sufficient to secure tanks against the local environmental loading. Additional anchor brackets may need to be installed at locations other than vertical wall seams. If so, place the anchor against the wall sheet at the desired location and mark hole locations. Drill holes and install anchor brackets utilizing wall sheet hardware.

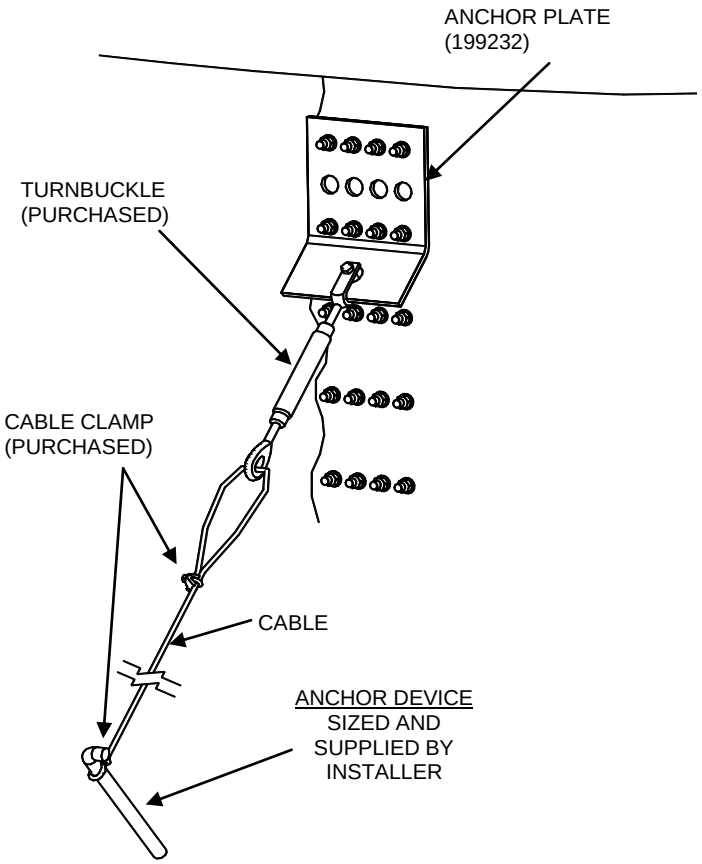
Figure 21. Anchor Bracket



6.2.2 Wall Sheet Anchoring Option 2 (Anchor Plate)

This option is generally recommended for larger water tank applications. For maximum anchoring, a plate and cable system is required. The plate is attached to the tank utilizing the vertical seam bolts of the lowest wall sheets. The cable is attached to the bracket by means of a turnbuckle for adjustment purposes. Cable clamps are required for creating loops in the cable that will bridge the space between the turnbuckle and the lower anchoring device. The installer must cut the cable and adjust the tension to conform to the application. Anchoring devices must be sized and supplied by the installer to suit the local soil conditions and anticipated environmental load conditions.

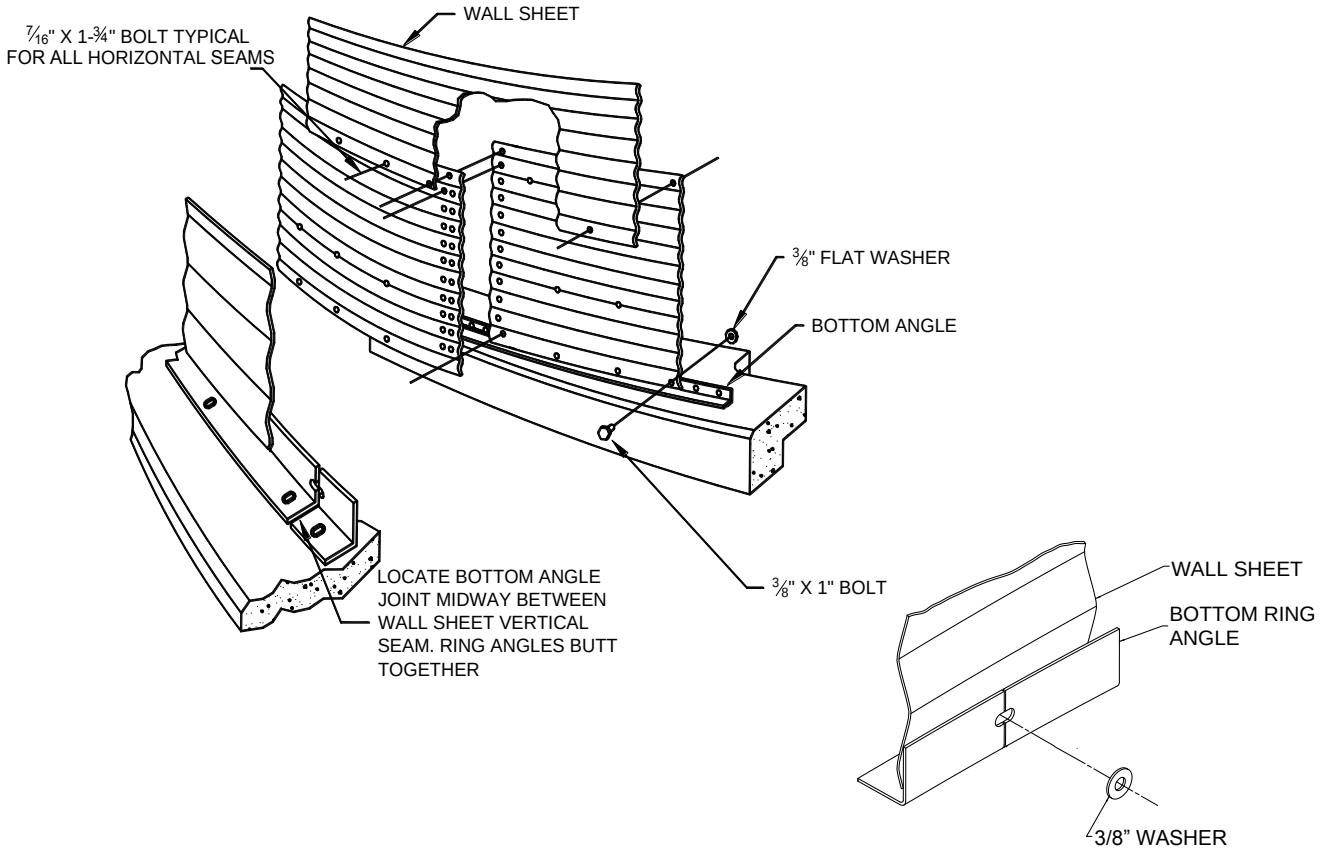
Figure 22. Anchor Plate



6.2.3 Wall Sheet Anchoring Option 3 (Bottom Angle)

Anchor the bottom angle to the concrete with 1/2" anchor bolts. Install one anchor bolt for every hole provided (6 per bottom ring angle section).

Figure 23. Bottom Angle



1.

6.3. Water Level Indicator Kit (199565)

The Water Level Indicator Kit (199565) is an option that will be supplied if ordered. It is mounted on a shelf near the ladder and is designed to provide a visual real time display of the current water level inside the tank. It comes with its own instruction manual. Some modification may be necessary to install the kit. (See Figure 26 on page 35.)

Figure 24. Water Level Indicator Housing

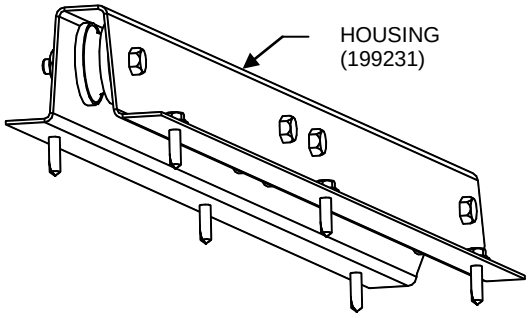


Figure 25. Water Level Indicator Float and Weight Assembly

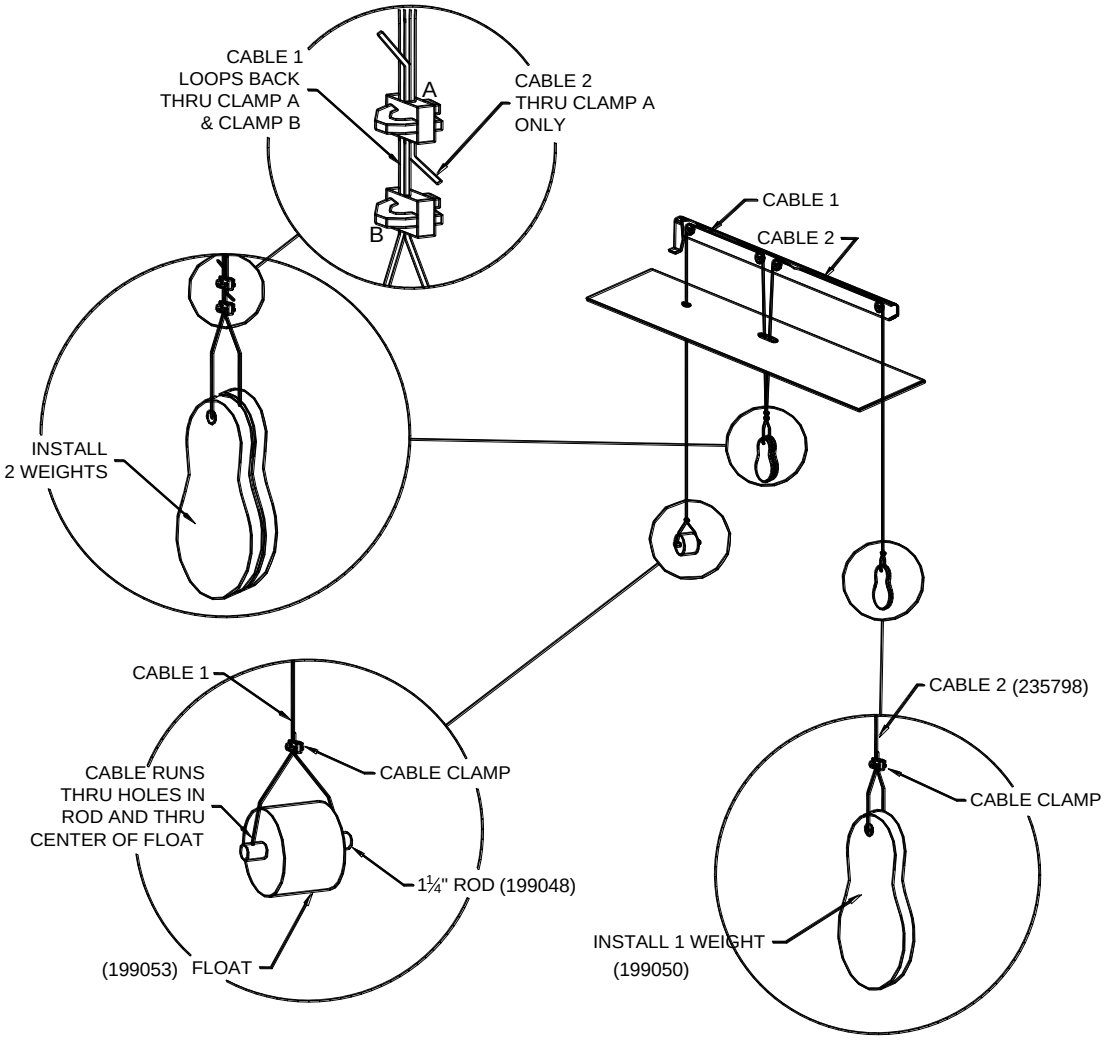
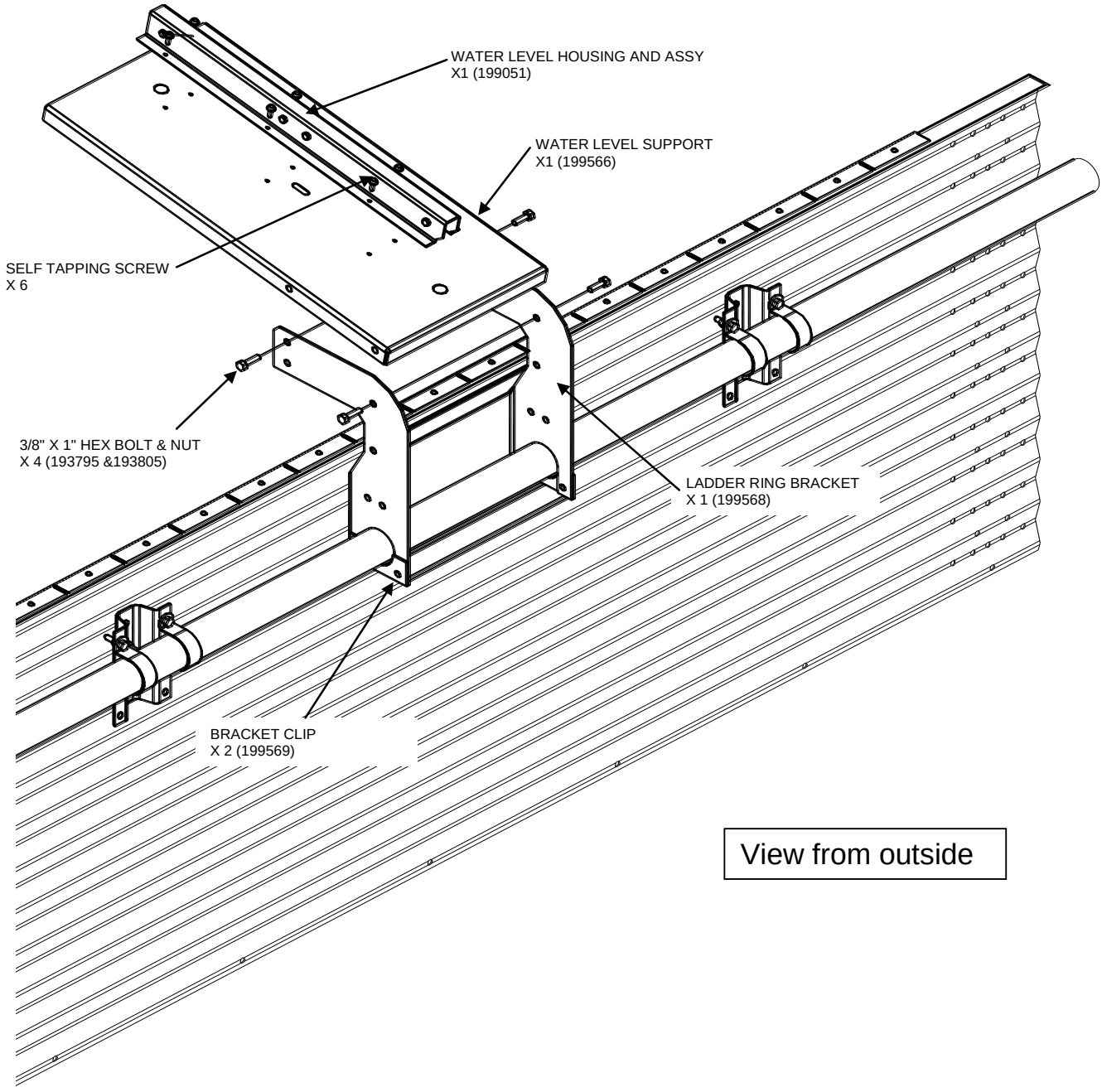


Figure 26. Water Level Indicator Installation

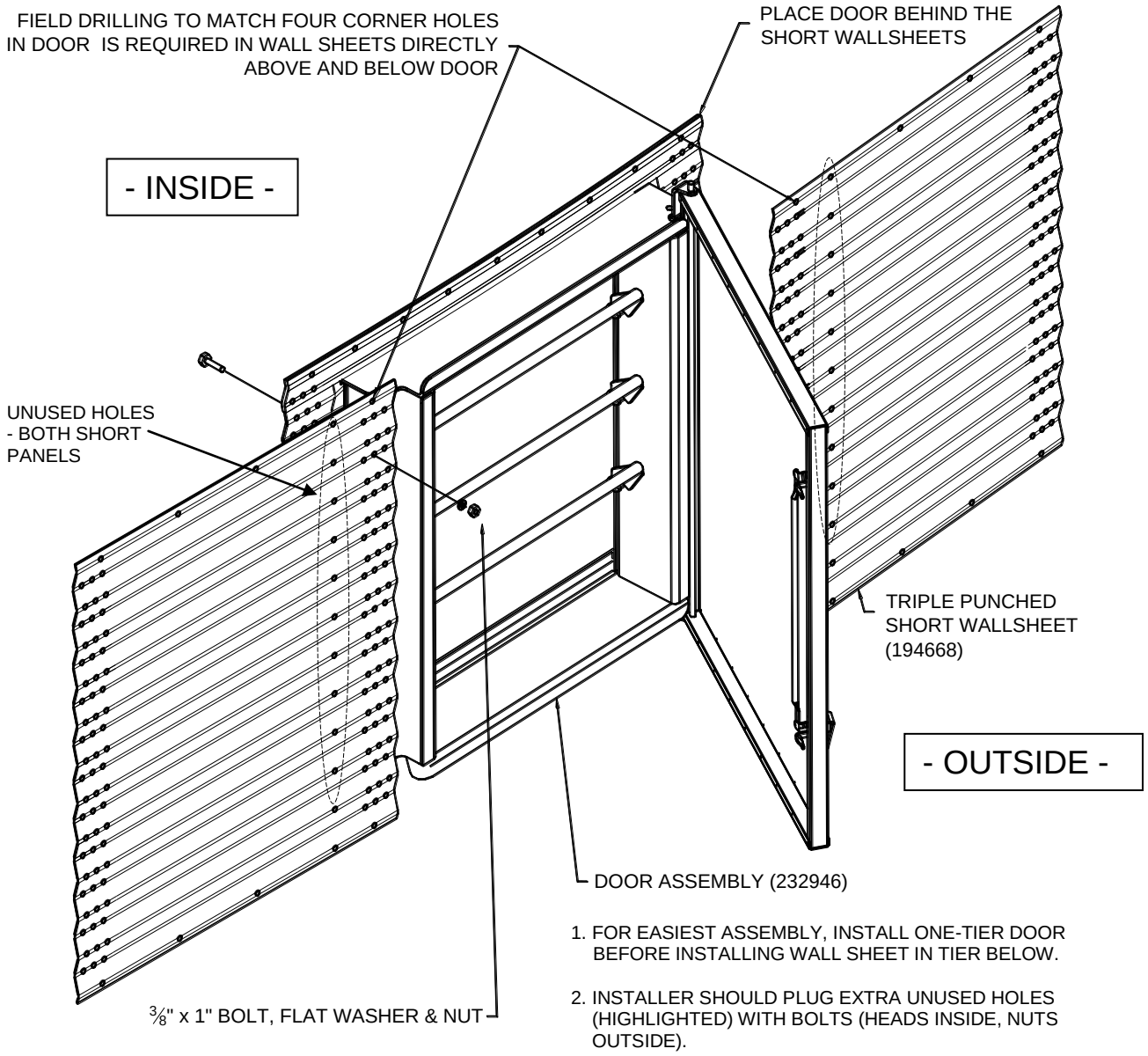


1.

6.4. Door Options

6.4.1 Egress Door Option (Medium Duty)

Figure 27. Egress Door Option (Medium Duty)

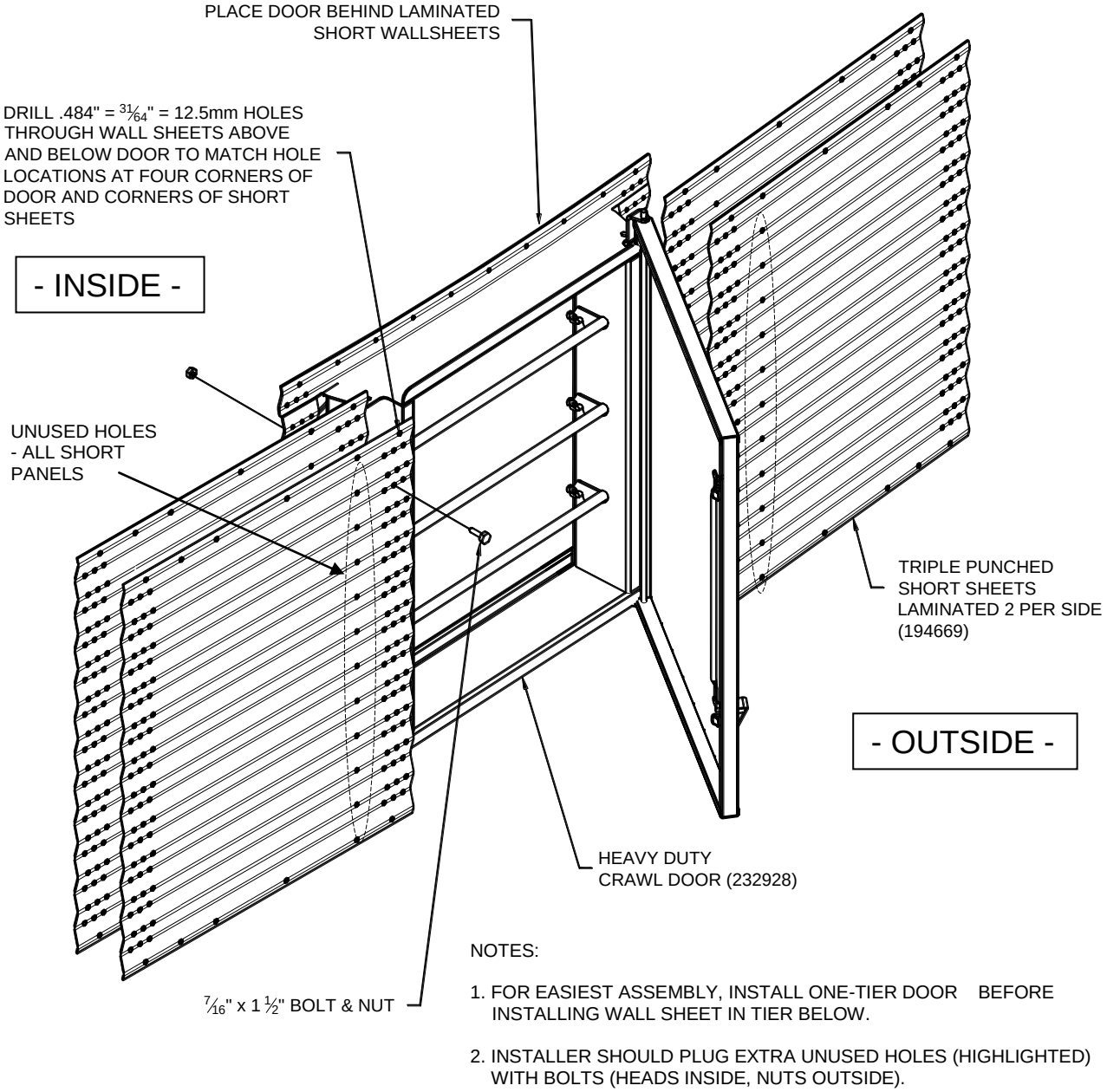


An Egress Door is available on request. The model of door required is dependent on the Tank diameter and height. It is useful for passing into the interior of the AWSS after the first tier has been erected. Padding protection should be added to inside of the door before installing the liner. Once the liner has been pulled up the sides, however, access to the interior is only available by going over the wall. Never cut the liner around the door. The door is not water tight.

Heavy door panel with mounting frame and locking handles must be on the inside of the tank in order for it to successfully resist the load imposed by an AWSS full of water.

6.4.2 Egress Door Option (Heavy Duty)

Figure 28. Egress Door Option (Heavy Duty)



NOTES:

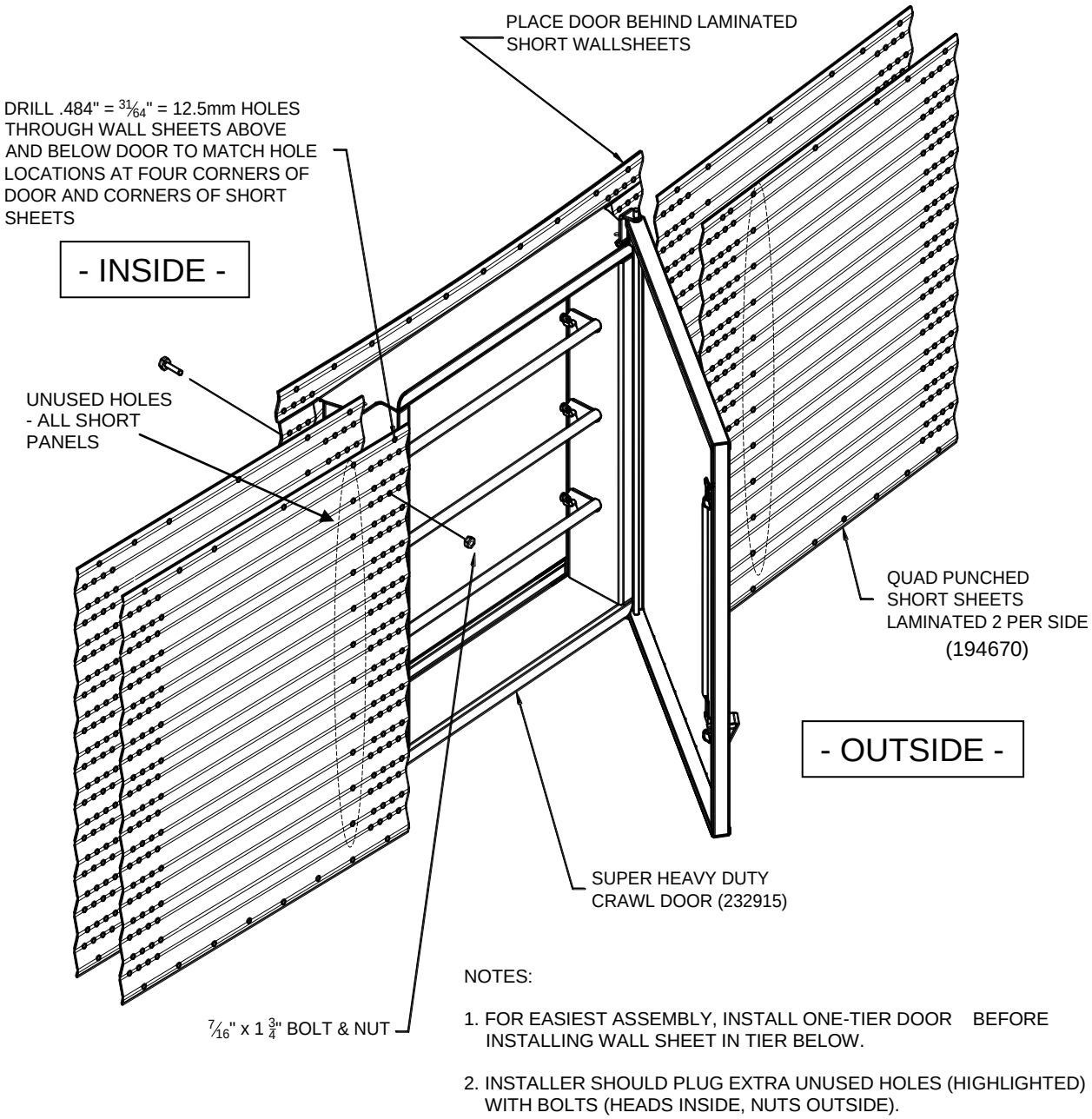
1. FOR EASIEST ASSEMBLY, INSTALL ONE-TIER DOOR BEFORE INSTALLING WALL SHEET IN TIER BELOW.
2. INSTALLER SHOULD PLUG EXTRA UNUSED HOLES (HIGHLIGHTED) WITH BOLTS (HEADS INSIDE, NUTS OUTSIDE).

An Egress Door is available on request. The model of door required is dependent on the Tank diameter and height. It is useful for passing into the interior of the AWSS after the first tier has been erected. Padding protection should be added to inside of the door before installing the liner. Once the liner has been pulled up the sides, however, access to the interior is only available by going over the wall. Never cut the liner around the door. The door is not water tight.

Heavy door panel with mounting frame and locking handles must be on the inside of the tank in order for it to successfully resist the load imposed by an AWSS full of water.

6.4.3 Egress Door Option (Super Heavy Duty)

Figure 29. Egress Door Option (Super Heavy Duty)



An Egress Door is available on request. The model of door required is dependent on the Tank diameter and height. It is useful for passing into the interior of the AWSS after the first tier has been erected. Padding protection should be added to inside of the door before installing the liner. Once the liner has been pulled up the sides, however, access to the interior is only available by going over the wall. Never cut the liner around the door. The door is not water tight.

Heavy door panel with mounting frame and locking handles must be on the inside of the tank in order for it to successfully resist the load imposed by an AWSS full of water.

6.5. Ladder Installation

Figure 30. Ladder Installation Detail

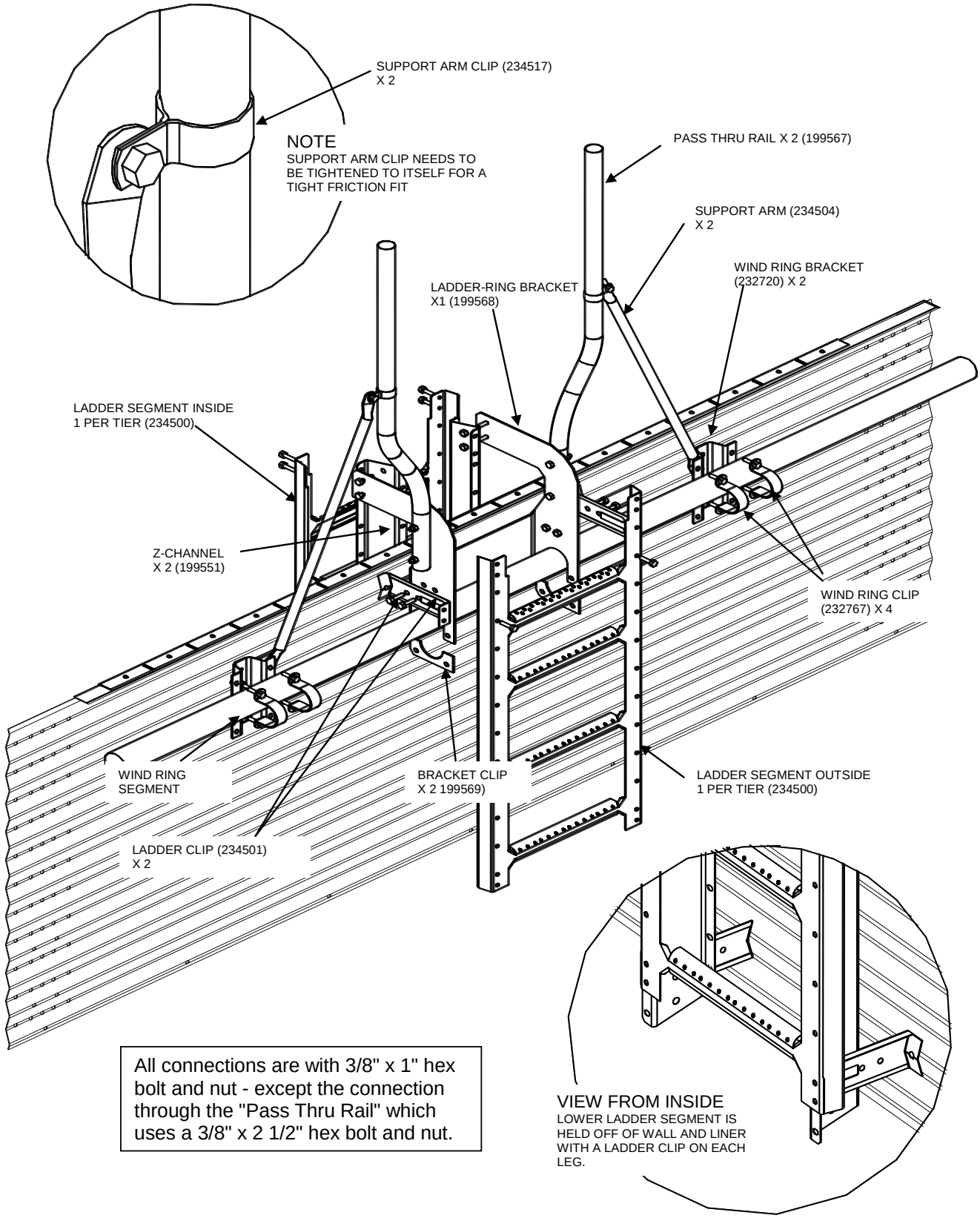
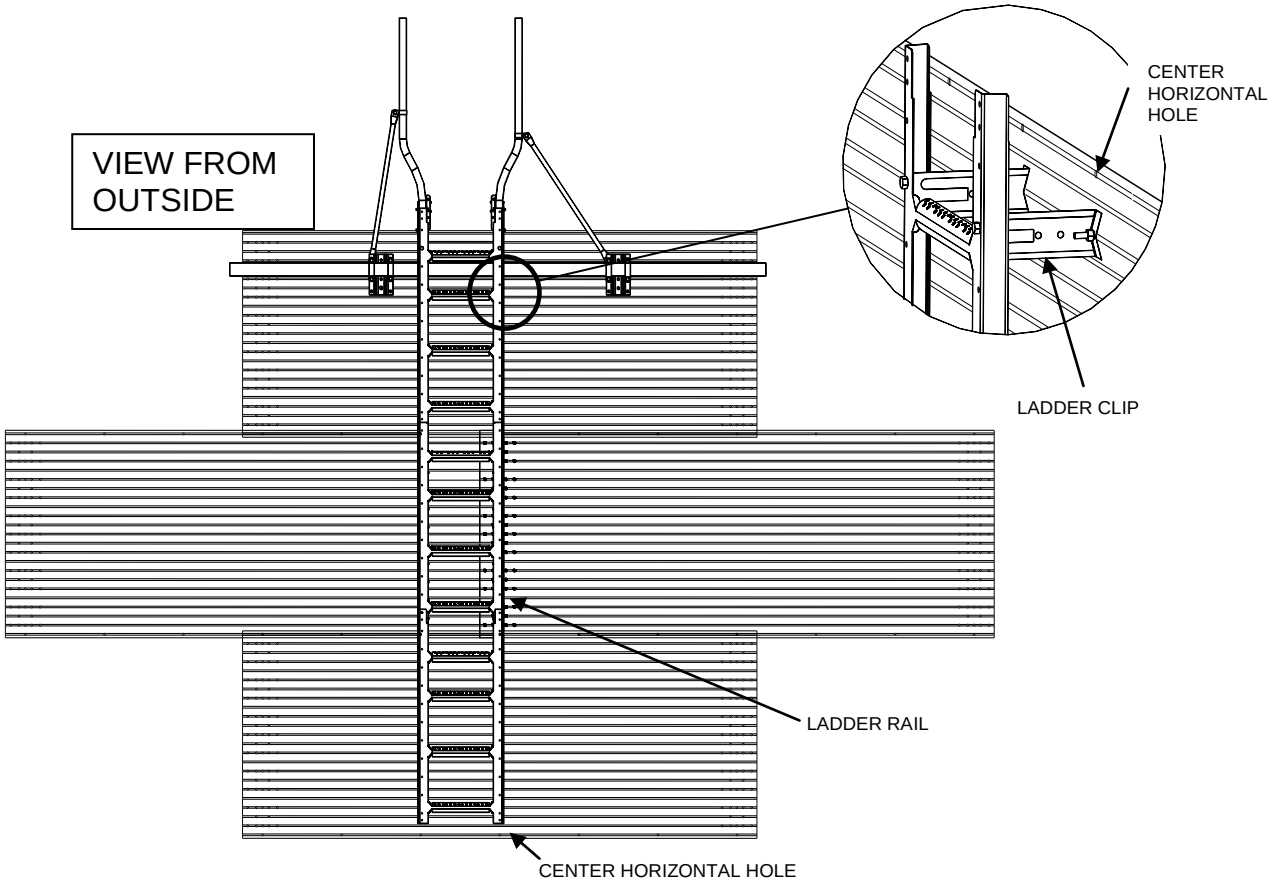


Figure 31. Ladder Installation Detail — Outside View



The outside ladder uses existing horizontal wall sheet seam holes as anchoring points for the ladder clips. Due to these constraints and restrictions with the pass thru support arm connections, there is only one location for the ladder onto a wall sheet. One of the vertical ladder rails must be centered on the center-most horizontal hole on the top and bottom of the wall sheet. This unfortunately results in some ladder clips on the second wall sheet (if two or more tiers are used) being located over the vertical bolted wall-sheet-to-wall-sheet connections on the second tier. These non-connectable ladder clips should be left as free floating (only bolted to ladder, not wall sheet).

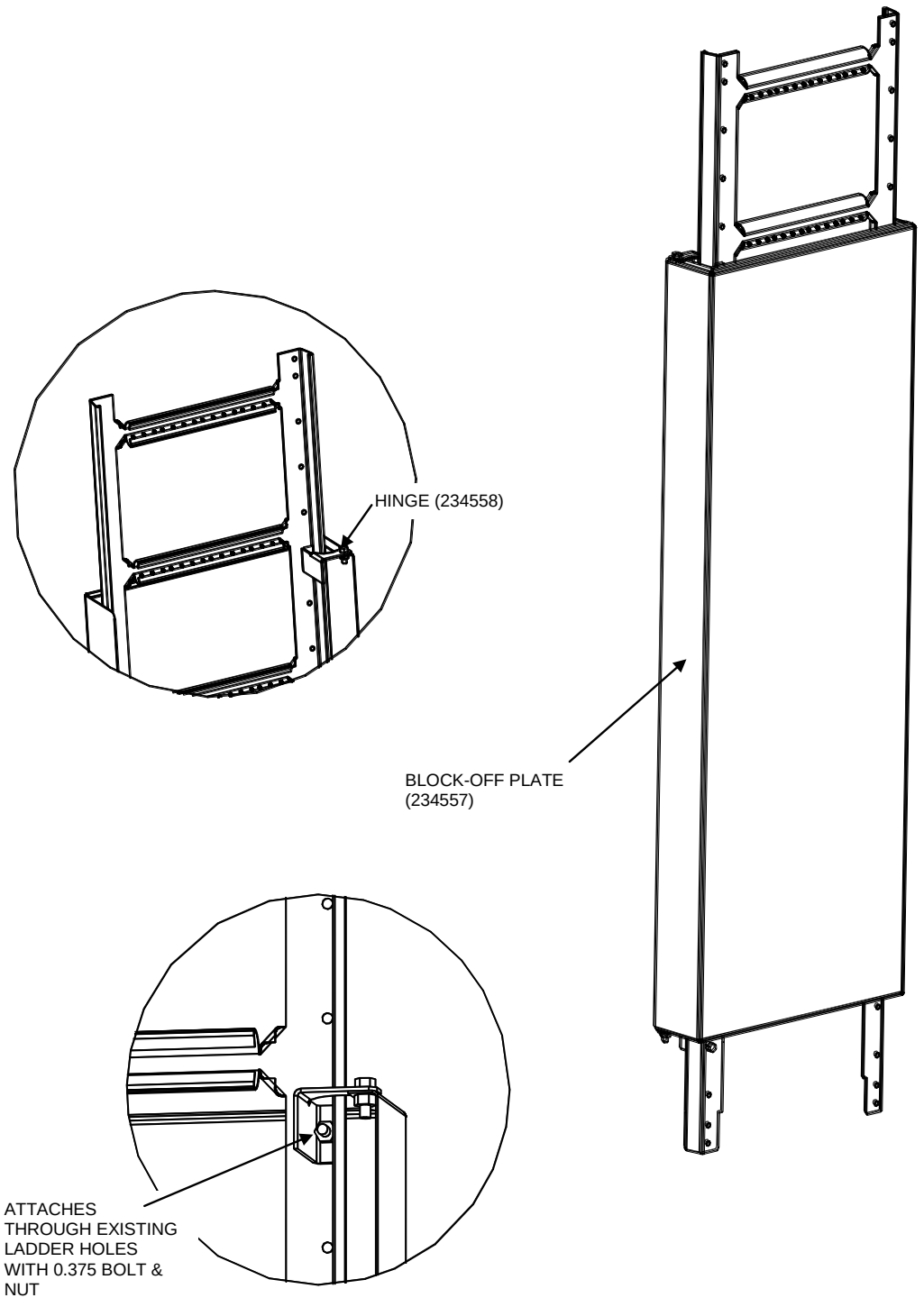
All outside ladder clips bolt to the wall sheet using existing horizontal seam holes in the wall sheet, except the top two clips. The wall sheet holes for these two clips are not available as they are covered by the liner clamp assembly. These two clips must be located further down, on the next available wall sheet peak via field-drilled 5/16" holes.

The inside ladder is reinforced with a Z-channel and only needs two clips at the bottom of the ladder. These two clips are free floating and only act as stand-offs. As such, they are not affixed to the wall sheet.

6.6. Ladder Block-Off Plate (234530)

The ladder block-off plate is availabe on request. It is a 63 3/4"-tall, formed panel that is attached to the optional outside ladder by two brackets. It can be locked into place and is designed to deter any authorized personnel from climbing into a AWSS that is full of water.

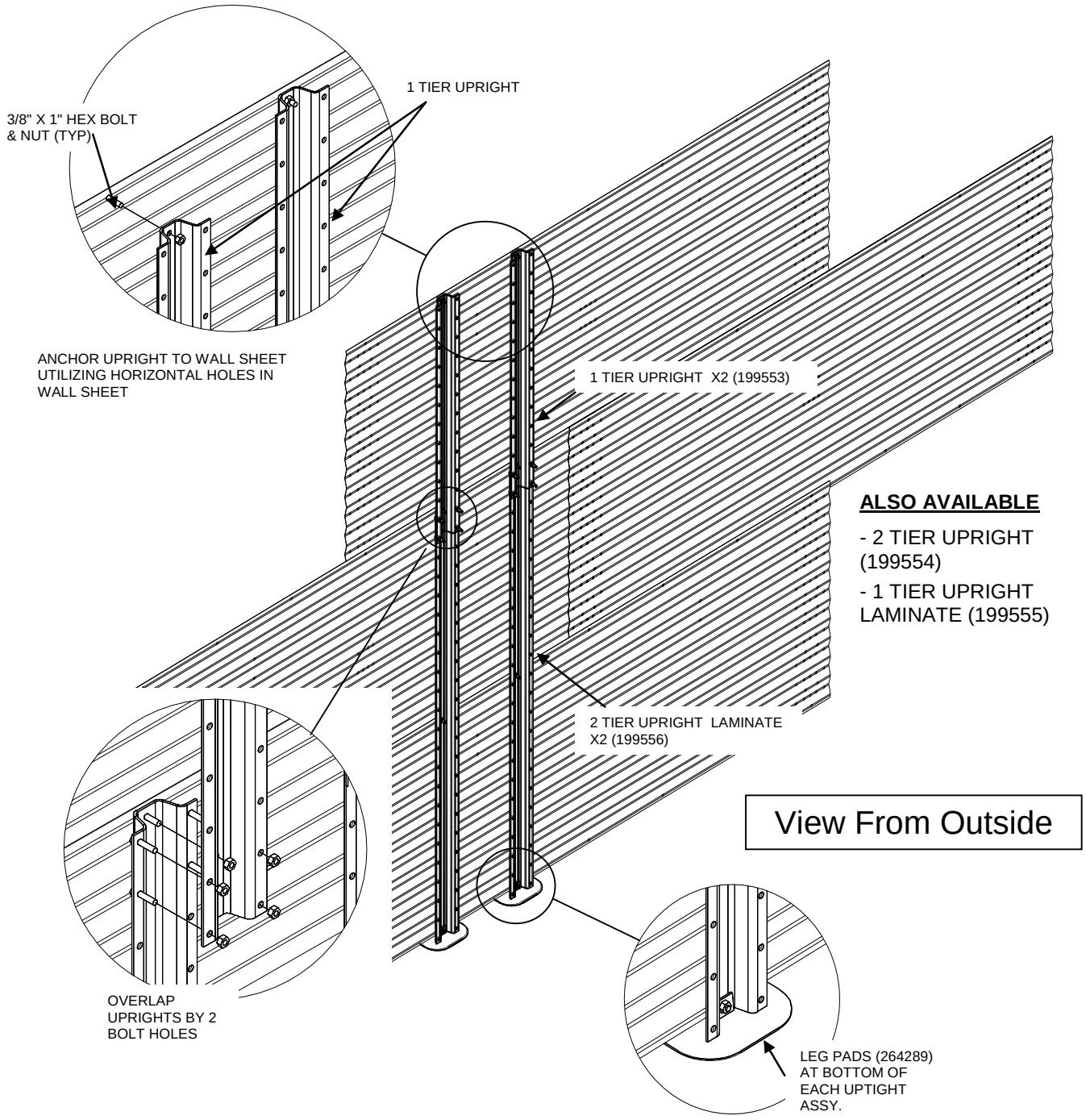
Figure 32. Ladder Block-Off Plate



6.7. Pipe Support Installation

Locate the pipe support assembly midway between vertical wall sheet seams. Attach using a single 3/8" x 1" hex bolt where the upright hole aligns with a horizontal wall sheet hole. Use four hex bolts to connect upper upright to lower upright. Add a leg pad to bottom of each assembly.

Figure 33. Pipe Support



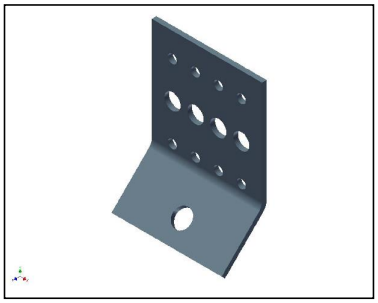
1.

7. Appendix

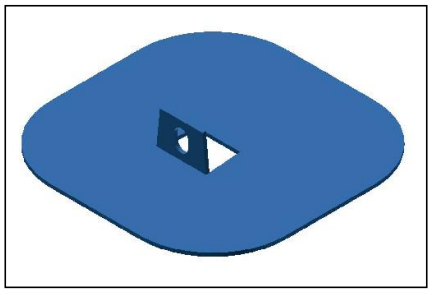
7.1. Accessories Parts Identification

Figure 34. Accessories Parts Identification

232769 - Wind Ring Splice

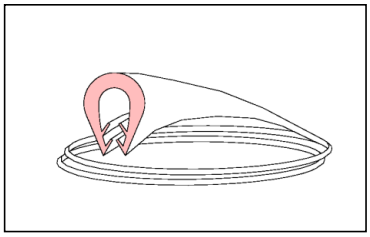


199232 - Anchor Plate

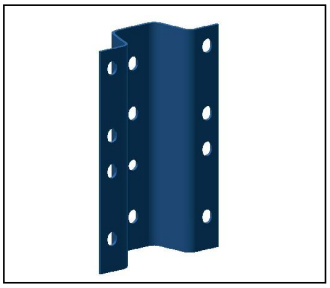


264289 - Support Pad

194874 Anchor Bracket

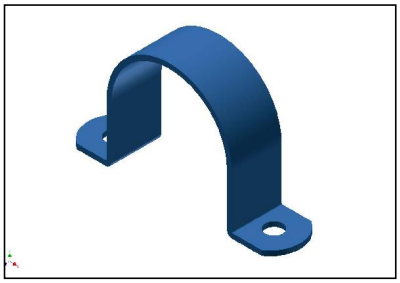


199229 Gasket



232720 Wind Ring Bracket

199230 Spring Steel Clamp



232767 Wind Ring Clip

7.2. Hardware Usage

Important

Use 3/8” x 2 1/2” bolts for the Ladder-Ring Bracket through Pass Thru Rail connection. Use 3/8” hardware at all other wall sheet connections and ladder, wind ring and water level indicator assemblies as shown below.

Table 2. Accessories Hardware

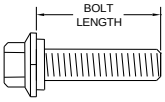
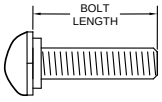
		3/8” x 2 1/2” bolt (washer)	3/8” x 1” Round Head Slot	3/8” x 1 1/2” bolt (washer)	3/8” x 1” Hex bolt (washer)
	BOLT Part #	150517	150599	193797	193795
	NUT Part #	193805	193805	193805	193805
Default accessories assembly			●		
Ladder-Ring Bracket to Pass Thru Rail		●			
Wind Ring Bracket to Wall Sheet				●	
Ladder installation					●

Table 3. Tank Hardware

	Single Sheets		Laminated Sheets (except.336")	(.336")	.
	3/8” x 1” round head bolt	3/8” nut	7/16” x 1 1/2” bolt	7/16” x 1 3/4” bolt	7/16” nut
	150594	193805	193768	193771	193770
Wall sheet to wall sheet	●	●	●	●	●

7.3. Recommended Bolt Assembly

⚠ IMPORTANT

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 4. 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.

8. Applicable Warranties

8.1. 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
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.

8.2. Limited Warranty: Westeel Water Tank Containment Systems

Westeel – Ag Growth International (“Westeel”) warrants products for Water Tank Containment Systems 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

The duration of the warranty is limited as follows:

- 10 years

The duration of the warranty will run from the date of purchase from a dealer or distributor authorized by Westeel (the "warranty period").

Exclusive Remedy — 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 that are not of Westeel's manufacture nor supplied by Westeel;
6. any field modifications or substitutions to original Water Tank Containment System components;
7. acidic environmental conditions affecting the structural integrity of the goods;
8. any other circumstance not in keeping with proper maintenance and/or use of the goods;
9. cosmetic changes such as white rust and scratches
10. Acts of God, accident, neglect or abuse of the goods by the purchaser and/or any other individual or entity; or
11. 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.

450 Desautels Street
P.O. Box 792
Winnipeg, Manitoba, R3C 2N5 Canada
Phone: (866) 299-4312
Fax: (204) 235-0796

Website: www.westeel.com
Email: info@westeel.com

Printed in Canada