C-Ring

Secondary Containment System
Installation and Storage Instructions

Original 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: 198805 R6
Revised: November 2018

New in this Manual

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

Description	Section
Updated Safety Decal Locations	2.6. Safety Decal Locations and Details on page 8
Updated the hardware usage chart.	Section 6.3. – Hardware Usage on page 47

CONTENTS

1. Introduction

This manual describes how to assemble a Westeel C-Ring.

Before assembling the C-ring, 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 Product Safety

YOU are responsible for the **SAFE** use and maintenance of your C-ring. **YOU** must ensure that you and anyone else who is going to work around the C-ring 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 C-ring owner, operator, and maintenance personnel's responsibility to read and understand **ALL** safety instructions, safety decals, and manuals and follow them when 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 C-ring. Untrained users/operators expose themselves and bystanders to possible serious injury or death.
- The C-ring is not intended to be used by children.
- Use the C-ring for its intended purposes only.
- Do not modify the C-ring 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 C-ring. Any unauthorized modification will void the warranty.

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.

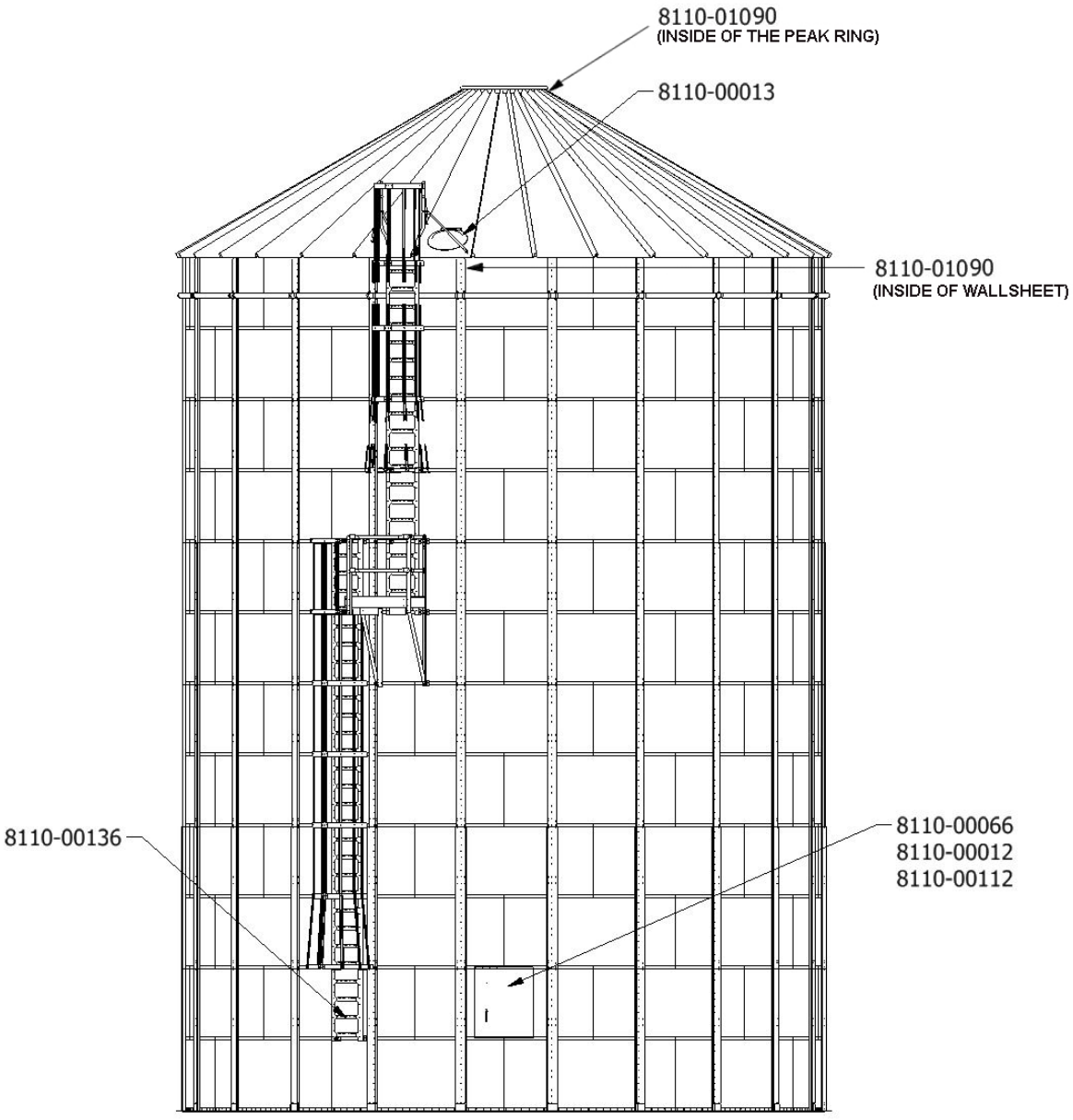
2.5. Decal Installation/Replacement

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 sign backing paper.

2.6. Safety Decal Locations and Details

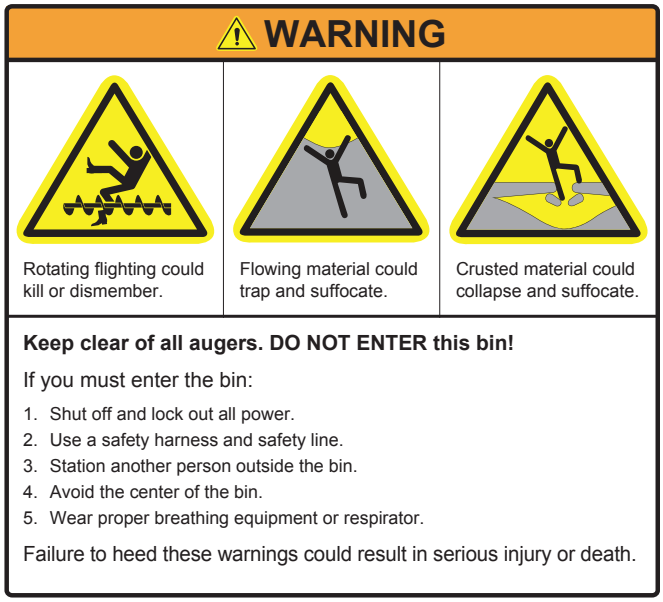
Replicas of the safety decals that are attached to the C-ring and their messages are shown in the figure(s) that follow. Safe operation and use of the C-ring requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as 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



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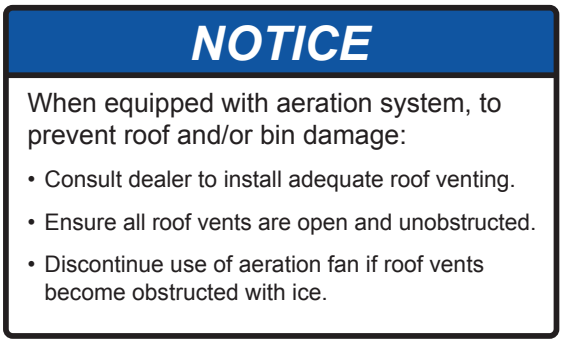
Part Number: 8110–00136



Part Number: 8110–00066

Part Number: 8110–01090

3. Before You Begin

3.1. Important Installation Notes

- Check with the local Authority Having Jurisdiction (AHJ) - local, state or provincial, and federal regulatory agencies such as the EPA, AEUB, etc., regarding this product and its intended application prior to installation. If installing outside of the continental United States or Canada, contact the appropriate local Department of Environment or equivalent. Correct installation—particularly of support posts—is **critical** to the performance of your system.
- Plan your site well in advance, including access, capacity, and layout. Containment capacity is based on level walls. If your site slopes, the actual capacity of the containment will be reduced. Have installed capacity confirmed by an engineer. Liquid fertilizer applications require additional capacity in some jurisdictions. The site must be sufficiently level to allow wall sheet assembly without distortion or unsafe assembly conditions, and should provide sufficient drainage around the outside of the ring to prevent standing water buildup without soil erosion. Standing water allowed to remain in the ring will reduce the effective capacity of your system. Regular inspection and specific disposal procedures may be required by local regulations. Local fire codes may require minimum clearances between the ring and tank(s).
- Steel secondary containment rings, as manufactured by Westeel, are designed for the horizontal containment of fluids only. Prevention of fluid loss through the ground area within the ring (vertical containment) to AHJ regulations will require the use of a suitable impermeable liner. Selection of the correct liner for your application depends on many factors. Consult your dealer, the liner manufacturer, and your local AHJ. Specific Westeel liner suggestions, if made, are based on common chemical properties. It is the owner/user's responsibility to ensure their suitability for a specific application. Testing services are available through liner manufacturer. Liner installation suggestions are outlined in this manual as guidelines only.
- Any modifications to the installation recommendations provided in this manual must be approved by a qualified professional engineer according to all governing regulations and sound engineering principles.

3.2. Important Product Design and Installation Details

3.2.1 Fluid Density

The standard design of this containment ring is based upon the containment of or external flooding by a gradual release of fluids with densities of 62.4 lbs/ft^3 (1,000 kg/m^3) or less, or specific gravity less than or equal to 1.00. Containment systems may also be used for denser applications such as liquid fertilizer, for liquid densities of up to 83 lbs/ft^3 (1,340 kg/m^3), or a specific gravity of 1.34.

Use of this product in these applications requires increased support post pier size. Details are as shown in Section 5.9.1 – Concrete Pier Details on page 28

3.2.2 Support Posts and Anchoring

All containment ring systems require support posts, anchors, or concrete braces to prevent wind damage and reinforce the containment walls against internal fluid pressure.

Divider walls installed within the ring must also be supported at standard post spacings, with posts alternately spaced on both sides of the wall.

3.2.3 Soils

Soil conditions and strengths vary widely in different regions. Guidelines are provided for support post piles under different loading and soils conditions, and must be met or exceeded or warranty may be void. Support post and pier recommendations are **not** designed for submerged soil conditions. It is the owner's responsibility to ensure that soil conditions are sufficiently stable to provide adequate support for support posts and the fluid loads which could bear on the enclosed area in the event of a fluid release. Consult a qualified professional engineer to certify the site soils as suitable, or to recommend remedial action as necessary. Check with local power, gas, & telephone authorities before drilling or excavating to ensure that there are no buried cables or pipes on the site.

3.2.4 Concrete Specifications

All concrete used for piles or pads must have a minimum 28–day compressive strength of 3500 psi (25 Mpa). In some soil conditions a high strength sulphate-resistant concrete may be required. Consult a qualified professional engineer. Reinforcing bar should be ASTM A615 GR. 40 / CSA G30M.12 (300 Mpa) minimum. Re-bar splice lengths should be 15" minimum.

3.3. Wall Penetrations

Any holes cut into the wall panels for service needs, etc. must not exceed 8" high x 12" wide. Install additional support posts on both sides of each opening. Seal thoroughly to maintain system integrity.

3.4. Liner Installation

General suggestions for sub-base, liner, and protective cover installation are shown in Section 5.8. – Site Planning on page 20. Confirm these with your local AHJ, and the liner installer and/or manufacturer. Liner material must be compatible with the product being stored. Liners must be protected from exposure to sharp objects and excessive loads from above and/or below the liner, and over all internal bolts and sharp edges that may come into contact with the liner, is recommended. Provision of adequate slack in the liner to allow for potential liner shrinkage due to thermal contraction in cold conditions is critical to liner performance. Ensure that this taken into account by your installer. These steps will help prevent damage to the liner seams and reduce the potential for product leakage.

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 Installation Equipment

⚠ CAUTION Some parts and equipment are heavy.

Use suitable lifting equipment to avoid injury.

- Transit
- Carpenter's Level
- Concrete Finishing Tools (if required)
- Shovel
- 9/16" wrenches and sockets
- Wrench Set
- Tape Measure - 100'
- TEKS® Screw gun w/ 3/8" bit
- Mineral spirits and rags
- Back-Hoe (for panels set into grade)
- Post Hole Digger — 12” or 16” depending on application
- Front End Loader
- Industrial Grade Drill
- Set of Drill Bits (carbide tipped)
- Impact Wrench (air or electric) w/ 9/16" socket
- Sharp Industrial Scissors
- Sufficient material to provide temporary supports

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 C-ring.
- 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. General Assembly

Before assembling the containment system:

1. Verify that all parts are present.
2. Read the following instructions carefully.
   a. Locate the material list for your system. It can be found on the packing list included with the shipment.
   b. Replace or order, any shortages or damaged parts immediately to ensure that your installation is not held up by missing parts.
3. Review the contents of this manual.
4. Refer to any site-specific drawings for additional information relevant to your installation.
5. Consult your dealer with any questions.

Important

Failure to follow assembly instructions may compromise the integrity of your containment ring installation and may void warranty.

5.3. Assembly Procedure

1. Referring to Section 5.8. – Site Planning on page 20, prepare the site for assembly as follows:
   a. If embedding the ring, excavate as required to provide for the desired depth of embedment of the ring. (See Section 5.5. – Embedment Detail on page 18.)
   b. Level and pack the site carefully to maintain capacity and avoid assembly problems.
   c. Prepare the inner area for liner installation following the manufacturer's specifications.

      For general suggestions, see Section 5.11. – Liner Installation on page 32.
   d. Locate, mark and drill post holes as detailed in Section 5.8. – Site Planning on page 20 and Section 5.9. – Support Post Specifications on page 26.

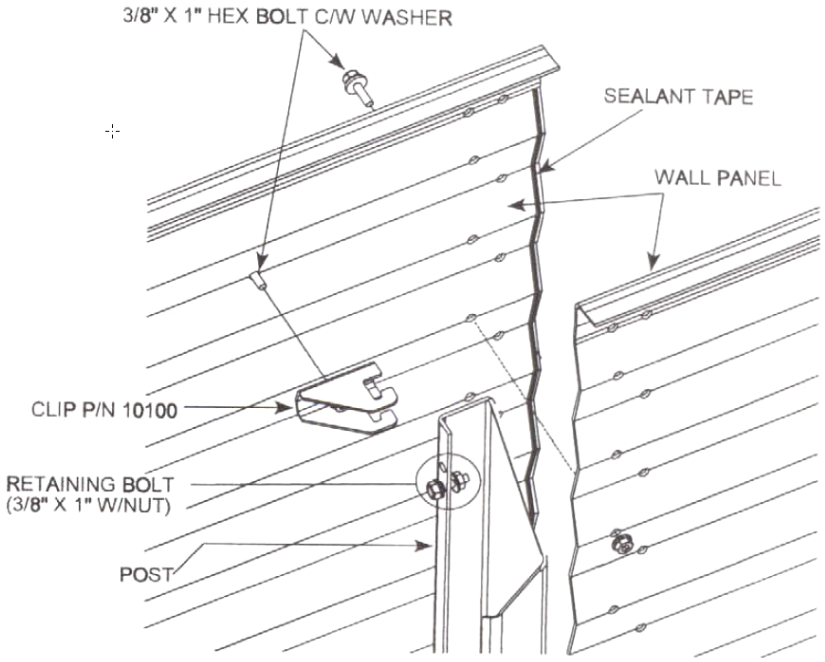
      OR
   e. Locate and drill post holes after the ring is in place, as follows:
      i. Loosely assemble panels without sealant.
      ii. Locate post holes from punched panel holes.
      iii. Move panels away.
      iv. Drill post holes.
      v. Re-assemble panels.

         Note

         Pre-assembly of the wall panels flat on the ground is recommended.
   f. Install re-bar, if required.
   g. **Do not place concrete in post holes until C-Ring is fully assembled.**
   h. If the C-Ring is to be mounted on a concrete slab, refer to Section 5.10. – Concrete Brace Details on page 31.
   i. Also see Step 8 on page 17.

2. Begin assembly of the C-Ring by loosely assembling the wall panels in place.
   a. Wipe any oil off the sealing surface and install a sealant strip on each panel as shown in Figure 2 on page 16.

Figure 2. Assembling and sealing wall panels



   b. Install 3/8" x 1" bolts loosely, with the heads on the inside.
   c. Do not tighten bolts until all panels and posts are in place, levelled, and shimmed (if necessary).
   d. For oblong C-Rings, start assembly where the straight portion of your wall meets the curved portion.
   e. Install curved panels 'inside' straight panels for best fit.
   f. On rectangular C-Rings, begin assembly at a corner.

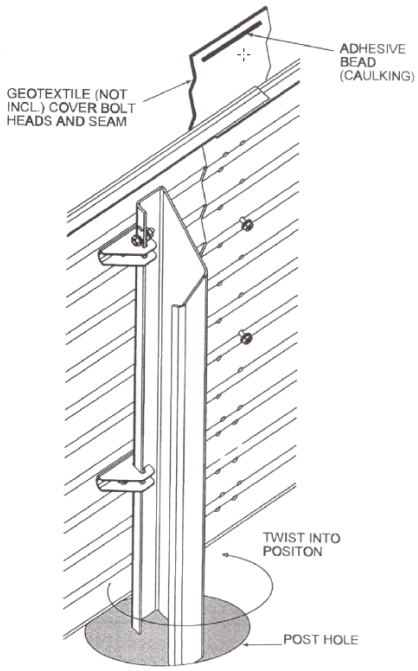
      See Section 5.6. – Corner Assembly Detail on page 19.
   g. Before completing the perimeter, place the liner and geotextile inside the ring through an open area to avoid lifting over the ring later.
3. For round and oblong applications, drill post clip holes in the panels as shown in Section 5.4. – Wall Panel Post Clip Hole Detail on page 18.
4. Install post clips (C10100) loosely with 3/8" x 1" bolts, with the hook facing to the right from outside the ring.
   a. Check post hole alignment and adjust the ring to suit.

      Post centers are 1- 3/4" to the right of the clip bolt.
   b. Systems with reinforced piers may require posts and re-bar to be installed in the post holes before installing clips.
5. Pre-assemble the posts with a 3/8" x 1" retainer bolt and nut in the second hole as shown in Figure 2 on page 16.

   This prevents the post from falling into the post hole while the concrete is fluid.
   a. Make sure the tapered post end is at the top of the wall sheet (flange edge).

b. Install posts by placing the bottom (square) end into the hole, rotating the post to engage the flange with the clip hook, and twisting the post into the clips (Figure 3 on page 17).

Figure 3. Installing the posts into the hole



c. **Verify that the retaining bolt is sitting on top of the uppermost clip.**

d. Level the posts and tighten the clip bolts.

e. Once all posts are in place, double check the alignment and level of your system.

f. Install temporary bracing to hold the ring in place and prevent the posts from moving.

6. Place concrete in the post holes (see Section 3.2.4 – Concrete Specifications on page 12).

   a. Use a concrete vibrator to ensure full filling and contact, but avoid over-vibrating.

   b. Double check post alignment, level, and ring position **before** the concrete sets.

   c. **Relocate the retainer bolt to the top hole after concrete hardens.**

7. Embedding or backfilling as shown below is strongly recommended to reinforce the C-Ring against wind, product and external flood loads. Height of backfill should be approximately 1/3 of ring height or higher - i.e. 11” to 12" for 33" ring.

8. When installing a C-Ring flush to a concrete slab, follow the layout and wall panel assembly instructions above.

   a. Once the ring is in place, level, and square.

   b. Attach the concrete braces to the wall panels with 3/8" x 1" bolts as shown in Section 5.10. – Concrete Brace Details on page 31.

   c. Drill and set the concrete anchors.

9. Before installing the liner:

   a. Allow the concrete to cure

   b. Cover all bolt heads, panel seams and sharp edges with a strip of geotextile material to prevent liner damage. (See Figure 3 on page 17.)

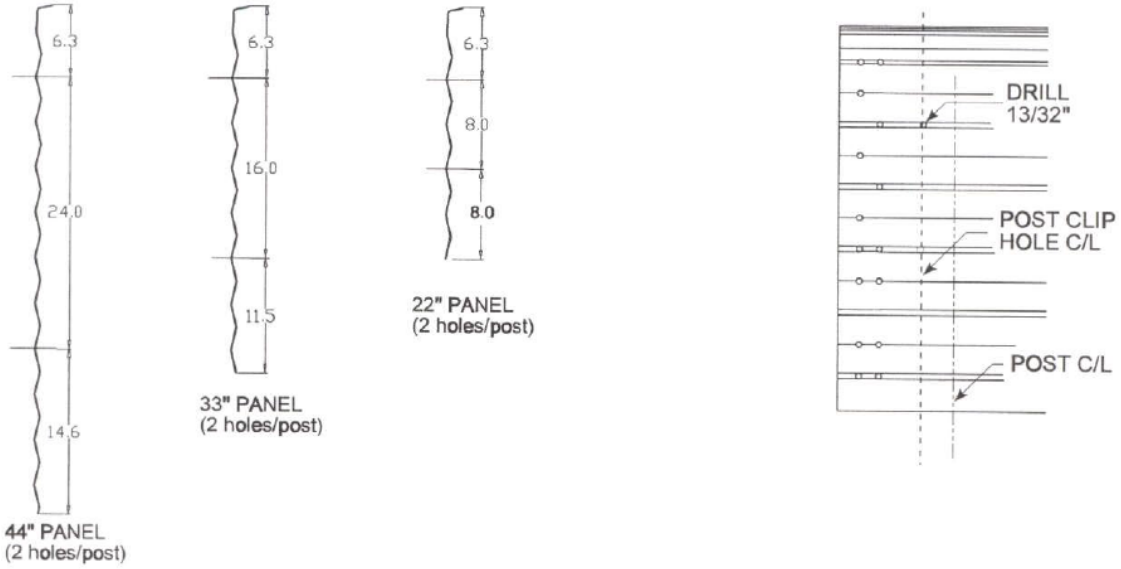
c. Make sure that the geotextile is not placed behind a base-mount clamp, or leakage will result.

5.4. Wall Panel Post Clip Hole Detail

Note

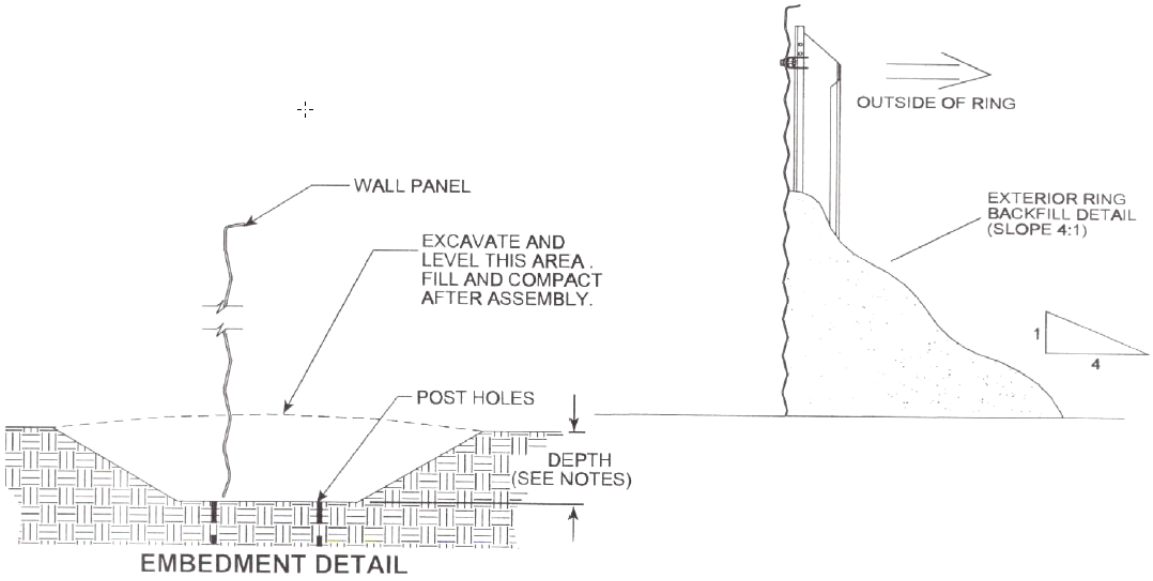
Clip hole drilling is required for round system anchors and end posts on oblong straight sections.

Figure 4. Dimensions for drilling holes



5.5. Embedment Detail

Figure 5. Embedment and exterior ring backfill detail



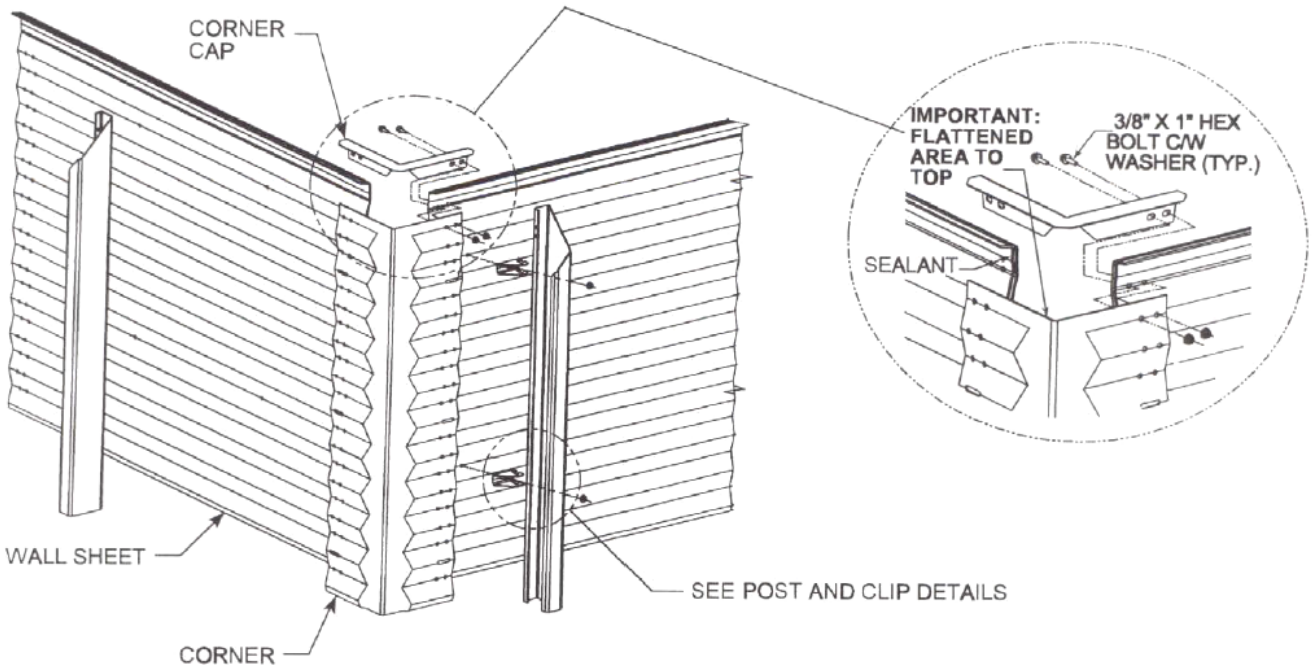
Note

Four-inch minimum embedment recommended for applications with liners.

5.6. Corner Assembly Detail

1. Set corners in place with the flattened area to the top.
2. Apply sealant tape on both wall panels and fasten the wall panels to the corner.
3. Leave top holes empty to fasten the corner cap (C10220, or C10222 for non-90 degree corners) to the inside of the wall panel.
4. Leave all bolts loose until the assembly is complete.

Figure 6. Corner Sheet Assembly Detail



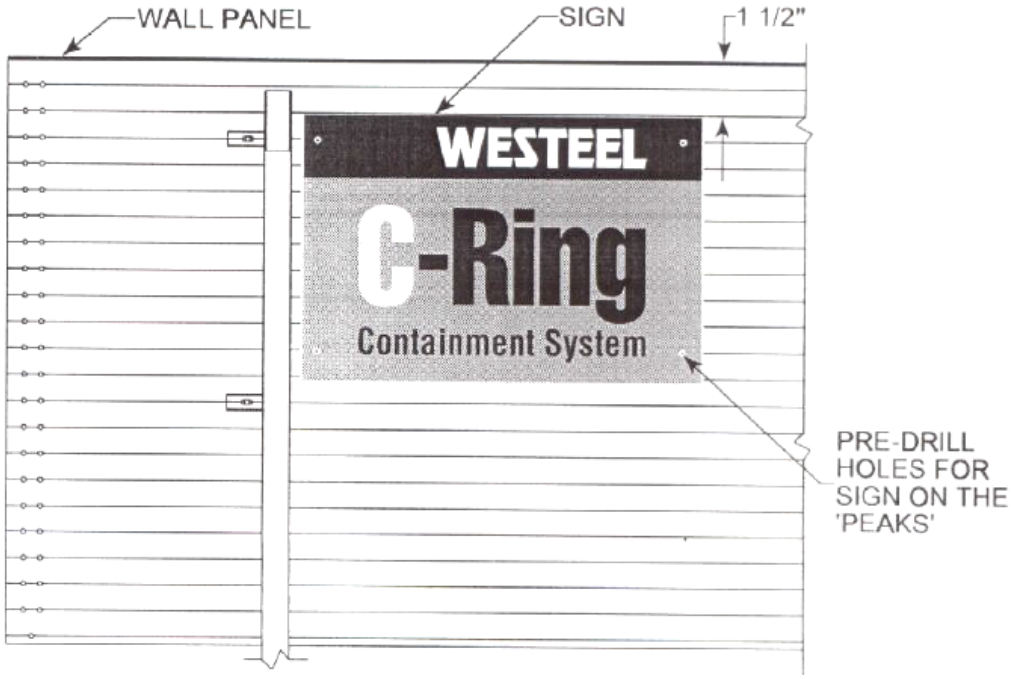
Note

- Special non-90° corners use C10222 two-piece corner caps (not shown). Install a TEKS screw through the hole in the right-hand part top flange at the corner to fasten the two halves together.
- Use suitable 4" to 6" wide geotextile strip over all internal bolt heads and seams which will be covered by the liner.
- Corners may have slots or extra holes (compared to wall panels) due to production requirements. Field drilling to match is **not** required

5.7. Nameplate Sign Installation Detail

1. Locate the sign in a high visibility area.
2. Wipe wall panel to remove oil.
3. Mark holes on the panel on the 'peaks'.
4. Pre-drill the holes.
5. Attach the sign to the wall panel using 3/8" x 3/4" bolts.

Figure 7. Nameplate sign on a wall panel



Note

Sign must be installed to identify the product and validate warranty.

5.8. Site Planning

5.8.1 Round System Installation Guidelines

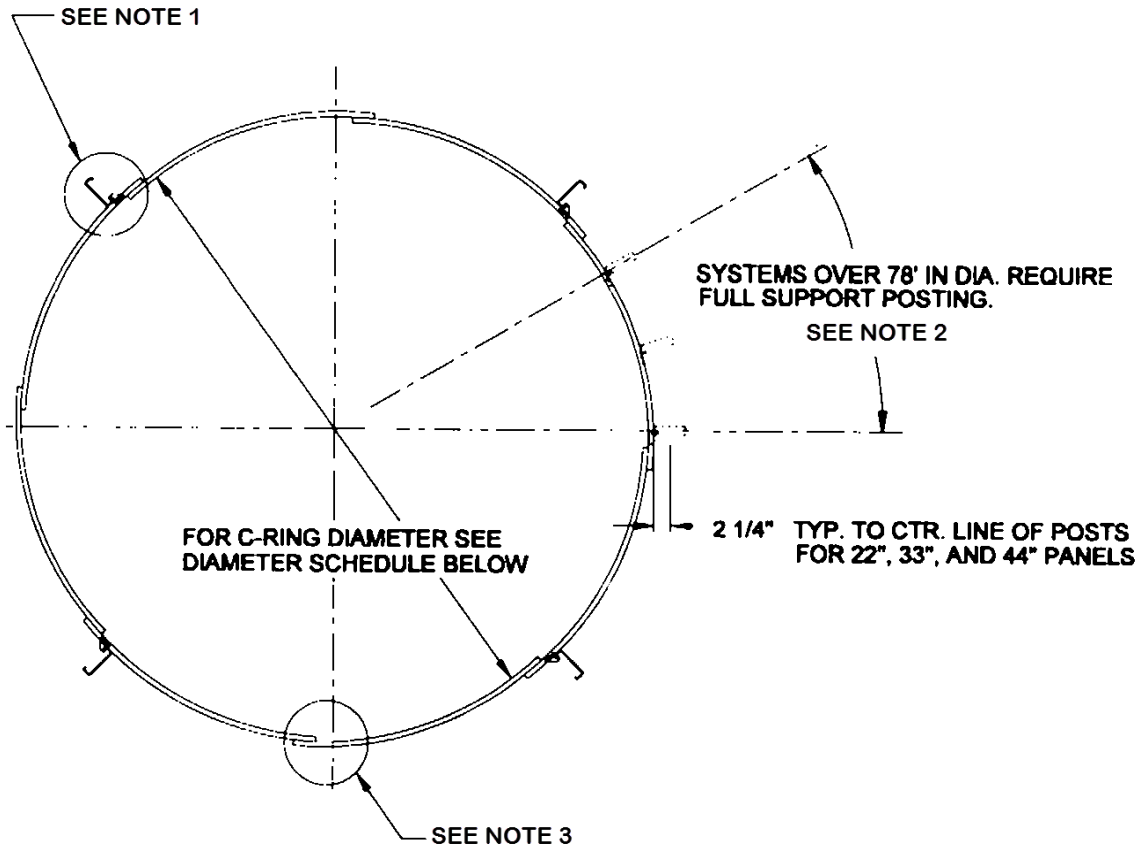
Table 1. Diameter Schedule for Round Secondary Containment System

Nominal Diameter (ft)	Actual Diameter (in)	Number of Panels
6’	71-5/8”	2
9’	107-3/8”	3
15’	179”	5
18’	214-3/4”	6
21’	250-5/8”	7
24’	286-1/2”	8
27’	322-1/4”	9
30’	358”	10
31.5’	376”	10.5
33’	393-7/8”	11
36’	429–3/4”	12
42’	501-3/8”	14
43.5’	519-1/4”	14.5
48’	573”	16
49.5’	590-7/8”	16.5
54’	644-1/2”	18
60’	716-1/4”	20

Table 1 Diameter Schedule for Round Secondary Containment System (continued)

Nominal Diameter (ft)	Actual Diameter (in)	Number of Panels
66’	787-3/4”	22
72’	859-3/8”	24
78’	931”	26

Figure 8. Round Secondary Containment System Layout



Note

Layout shown is general only, refer to site-specific drawing for your application.

Note

1. For post to sheet assembly information refer to Section 5.4. – Wall Panel Post Clip Hole Detail on page 18.
2. For full support bracing refer to Section 5.8.3 – Rectangular System Installation Guidelines on page 25.
3. For panel seam detail refer to Section 5.3. – Assembly Procedure on page 15.

Important

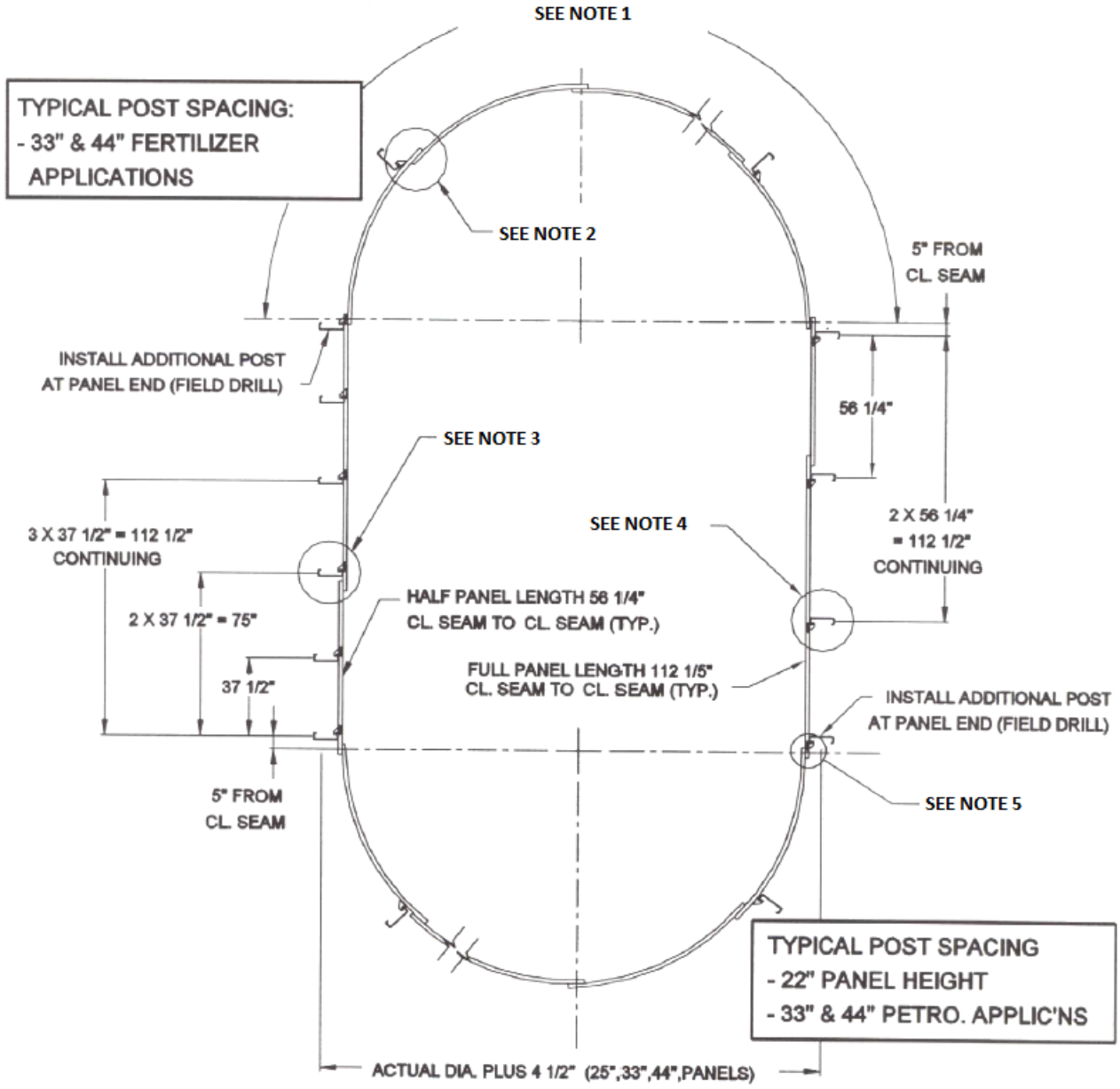
- If embedding C-Ring, see Section 5.5. – Embedment Detail on page 18.
- A minimum of four posts are required to anchor round systems up to 15’ in diameter or larger. Equally space posts on the diameter, as shown. Anchor kits (containing four pads, four braces, and hardware) are available from Westeel.
- Round C-Ring systems require full support bracing if the diameter exceeds 78 ft. Use the pad spacing specified for the straight panels in Section 5.8.3 – Rectangular System Installation Guidelines on page 25 for the specific wall height.
- Curved panels are not pre-punched and must be field drilled for post clips. Refer to Section 5.4. – Wall Panel Post Clip Hole Detail on page 18.

Wellhead Systems

- Six-foot and nine-foot diameter wellhead systems are made up of 21.5” high panels.
- Assemble as per procedures in Section 5.3. – Assembly Procedure on page 15.
- Anchor braces and posts are not required if a minimum 4” embedment is used.

5.8.2 Oblong System Installation Guidelines

Figure 9. Oblong Secondary Containment System Layout



Note

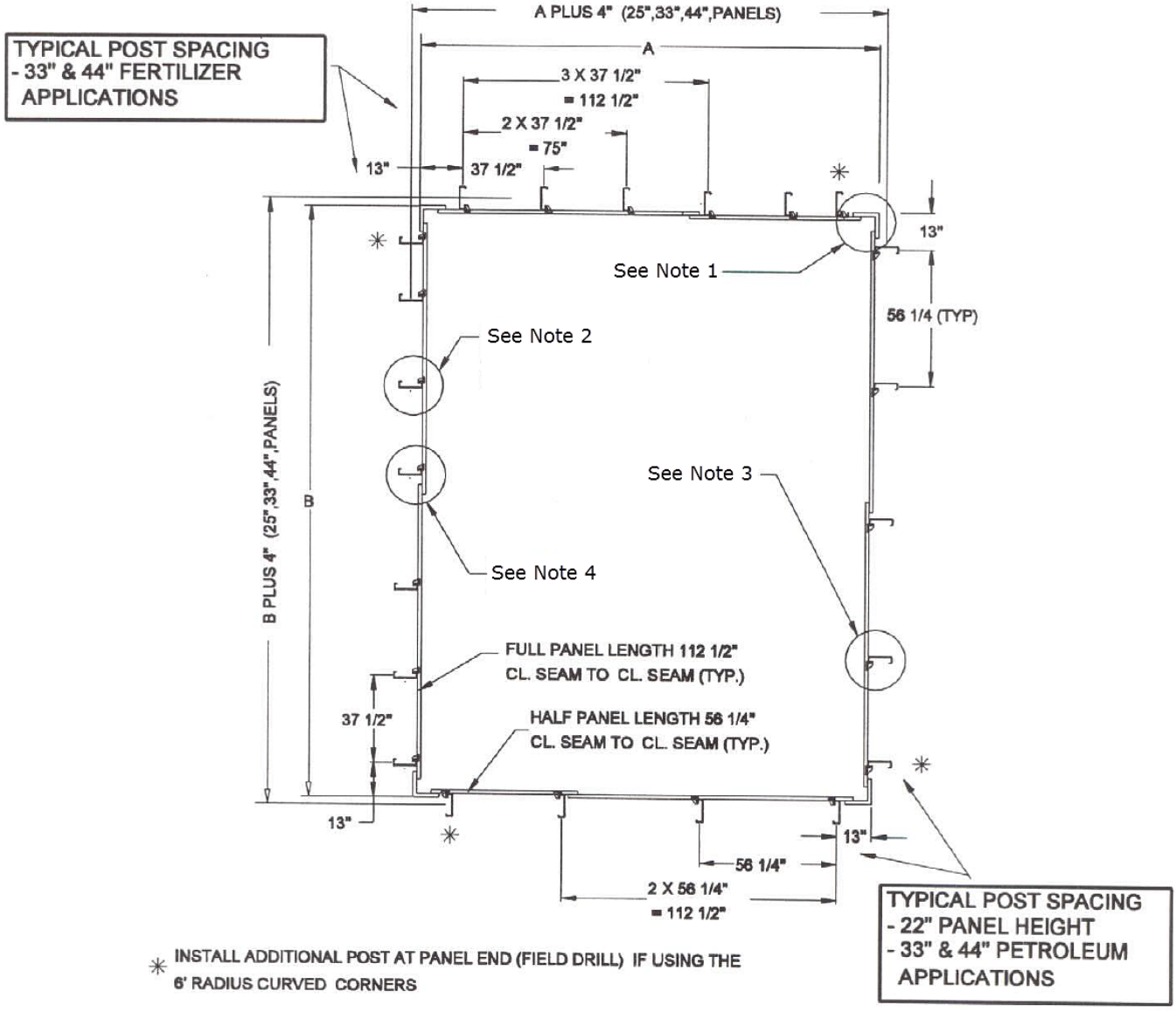
Layout shown is general only, refer to site-specific drawing for your application.

Note

1. Post placement on oblong system ends:
   - Require full support bracing if the diameter exceeds 78 ft.
   - Use spacing shown in Figure 9 on page 23
   - For systems 78 ft and less, in diameter, 2 posts per end are required. These braces should be located at 45 degrees from the end of the curved portion.
2. For panel assembly detail refer to Section 5.3. – Assembly Procedure on page 15.
3. For post footing details refer to Section 5.9. – Support Post Specifications on page 26.
4. For post to sheet assembly details refer to Section 5.3. – Assembly Procedure on page 15.
5. For best fit and appearance, install curved panels inside straight panels as shown in Figure 9 on page 23.
6. Post placement on straight panels:
   - Post locations are referenced from the right end of the panel when viewed from outside the ring.
   - Straight panels for petroleum applications (s.g. < 1.0) and 22” fertilizer applications (s.g. </= 1.34) use a 56¼” spacing (2 posts/full panel).
   - Straight panels for 33” and 44” fertilizer applications (s.g. </=1.34) use a 37½” spacing (3 posts/ full panel).
7. Some diameters (15', 21', 27', & 33') require a half-panel on each end to complete the semi-circle.
8. Curved panels are not pre-punched and must be field drilled for posts. Refer to Section 5.4. – Wall Panel Post Clip Hole Detail on page 18 for hole locations.

5.8.3 Rectangular System Installation Guidelines

Figure 10. Rectangular Secondary Containment System Layout



Note

Layout shown is general only, refer to site-specific drawing for your application.

Note

1. For corner assembly detail refer to Section 5.6. – Corner Assembly Detail on page 19.
2. For post footing details refer to Section 5.9. – Support Post Specifications on page 26.
3. For post to sheet assembly details refer to Section 5.3. – Assembly Procedure on page 15.
4. For panel seam detail refer to Section 5.3. – Assembly Procedure on page 15.
5. For panel assembly detail refer to Section 5.3. – Assembly Procedure on page 15.
6. Post placement on straight panels:
   - Post locations are referenced from the right end of the panel when viewed from outside the ring.
   - Straight panels for petroleum applications (s.g. < 1.0) and 22” fertilizer applications (s.g. </= 1.34) use a 56¼” spacing (2 posts/full panel).
   - Straight panels for 33” and 44” fertilizer applications (s.g. </=1.34) use a 37½” spacing (3 posts/ full panel).
   - Post location can also be done after the ring is in place.
     a. Loosely assemble panels without sealant.
     b. Locate post holes from punched panel holes.
     c. Move panels away.
     d. Drill post holes.
     e. Re-assemble panels.

Note

The layout shown is general only. Refer to a site-specific drawing for your application.

Overall Length Calculations

See Figure 10 on page 25 for the locations of width (A) and length (B).

- A — WIDTH = Number of Wall Panels x Bolted Length (112.5 full / 56.25 half) + 144” (both curved corner panels) or + 16” (90° Corners)
- B — LENGTH = No. of Wall Panels x Bolted Length (112.5 full / 56.25 half) + 144” (both curved corner panels) or + 16” (90° Corners)

5.9. Support Post Specifications

General Information

- **Round Systems:** a minimum of four support posts (or concrete braces for direct-to slab installation) are required to anchor round systems less than 78' in diameter against wind and potential flood loads.
- Six-foot and nine-foot diameter wellhead rings do not require support posts if embedded at least 4".
- **Rectangular systems, oblong straight sections, and rounds/oblong ends over 78' in diameter:** All require post or brace spacings as shown in Section 5.8. – Site Planning on page 20. For details on brace installation refer to Section 5.10. – Concrete Brace Details on page 31.
- Proper anchoring of the support posts or braces for the C-Ring is essential to ensure that the wall panels will not fail by buckling outward (thus allowing fluids to escape) or inward due to potential flood loads.

Westeel posts and concrete braces are designed for materials of up to 83 lbs/cu ft (1,340 kg/cu) at full wall height when installed as recommended. Transfer of these loads to the ground requires correctly sized concrete piers.

Pier sizing depends on three main variables .

- Soil type and load capacity
- Wall height
- Density (specific gravity) of the contained fluid

Soils are generally classified into two groups:

- Cohesive, where the material has substantial internal strength
- Non-cohesive, where the weight of the soil provides most of the resistance. Non-cohesive soils require larger piers to restrain a given load. High density fluids such as liquid fertilizer increase the potential loads

Before finalizing the site layout:

- Consult with a qualified professional engineer concerning soils conditions at your site. Soils test may be required to determine exact characteristics. Key factors are: soil type; shear or compressive strength for cohesive soils; and soil density and angle of internal friction for non-cohesive soils.
- "Frost jacking" of support posts can be a problem in some areas. Excessive post lift can cause the ring itself to lift; potentially damaging the liner. Eliminating this requires extending the post piers down to below the frost line, generally from 5 to 8 ft. total depth. Consult an Engineer or piling specialist familiar with local soils.
- Using the information in Section 5.9.1 – Concrete Pier Details on page 28, determine the appropriate pier type and depth for your application based on soil type, wall height, and the product to be contained. Pier specifications shown are based on the following two general soil types and minimum specifications:
  - **Cohesive soils:** Unsaturated material with minimum un-drained shear strength of 1,000 lbs / sq ft (48 kPa); (Minimum unconfined compressive strength of 2,000 lbs / sq ft / 96 kPa)
  - **Non-cohesive soils:** Unsaturated material with density greater than 110 lbs/ cu. ft (17.2 Kn/m^3) and an internal angle of friction of not less than 33 degrees.
- If your site soils do not meet these minimum criteria, have the pier specifications revised by a qualified professional engineer according to sound engineering principles and local codes.

Detailed Specifications by Application

- 22" and 33" systems use a common pier size for all soils and applications. See Section 5.9.1 – Concrete Pier Details on page 28.
- 33" and 44" petroleum applications (SG < 1.0) use two posts per full panel. Fertilizer and other heavier liquids (1.0< S.G.<1.34) require three posts/full panel.
- 44" systems use the Standard Pier type for petroleum applications (See Standard Pier Detail on page 28) For high specific gravity applications (1.0< S.G.<1.34) such as liquid fertilizer containment, larger diameter piers with steel reinforcement are required. (See Reinforced Pier Detail on page 30.)
- For round ring systems less than 78' diameter, use four piers at the depth shown for petrochemical use.

Approximate Concrete Requirements

Table 2. Approximate Concrete Required Per Post

Approximate Concrete Required Per Post	22" (48" Pier)	33" (56" Pier)	44" (63" Pier)
Concrete / Post, Cu Yds (cu m) 12" Dia. (300 mm) Standard Piers	0.12 (0.09)	0.14 (0.11)	0.15 (0.12)
Concrete / Post, Cu Yds (cu m) 16" Dia. (400 mm) Reinforced Piers	n/a	n/a	0.27 (0.21)

Note

For reinforcing bar quantities for 16" diameter reinforced piers see Table 4 on page 30.

5.9.1 Concrete Pier Details

General Notes

1. Use these pier designs only when soils meet minimum specifications outlined in Before finalizing the site layout: on page 27.
2. Concrete must have a minimum 28 day compressive strength of 3500 psi (25 Mpa). In some soil conditions a high strength sulphate-resistant concrete may be required. Rebar should be ASTM A615 GR.40 / CSA G30M.12 (300 Mpa) minimum.
3. Vertical bars should be approximately 3” shorter than pier depth. 10” diameter hoop ties are available from Westeel under part number C10381.

Standard Pier Detail

Use for all 22” and 33” systems, and for 44” petroleum applications.

Figure 11. Standard Pier Detail

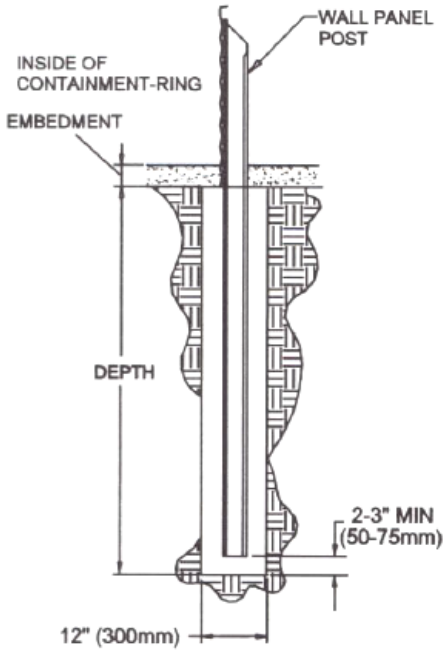


Table 3. Required Pier Depth, Tie Quantities & Approximate Rebar per Post

Panel Height	Pier Depth
22" (All applications)	53" (1346 mm)
33" (All applications	58" (1473 mm)
44" Petroleum applications	65" (1671 mm)

Reinforced Pier Detail

Use for 44” fertilizer (High SG) applications.

Figure 12. Reinforced Pier Detail

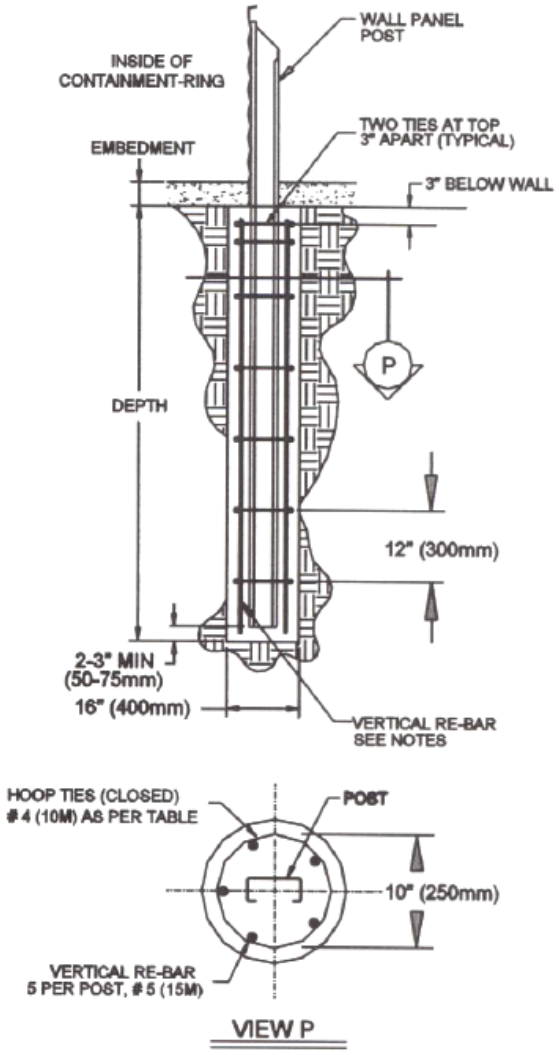


Table 4. Required Pier Depth, Tie Quantities & Approximate Rebar per Post

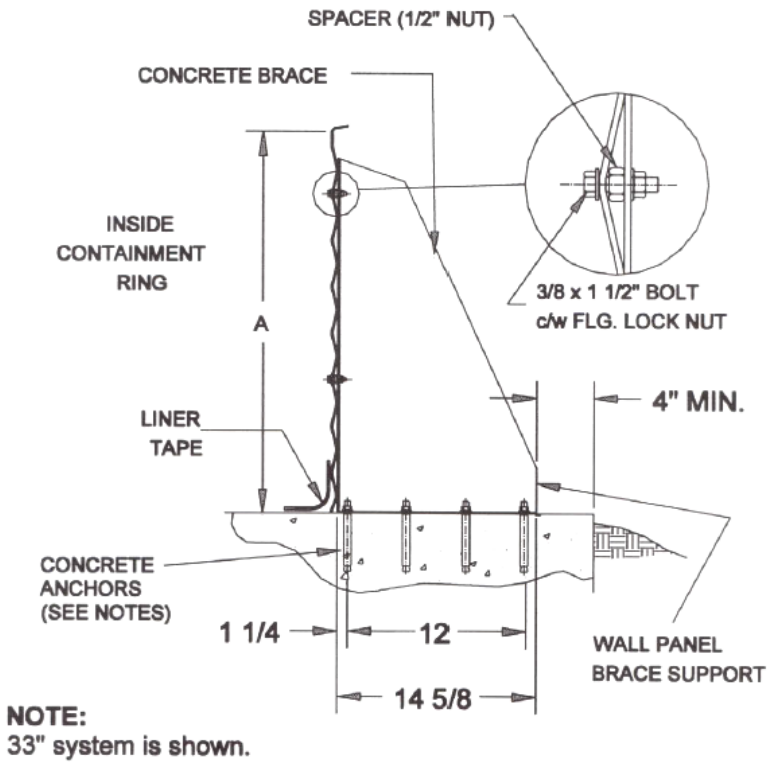
Pier Depth	Tie Quantity *	#4 (10M) Rebar	#5 (15M) Rebar
44`Panels — 63" depth (1600 mm)	6	18 ft	27ft

* Rebar required for ties is included in #4 (10M) rebar quantities at 3 ft per tie. Not required if Westeel hoop ties are used.

5.10. Concrete Brace Details

Use concrete braces when mounting direct to a concrete slab. Spacing and layout information is the same as for support posts, as outlined in Section 5.8. – Site Planning on page 20. Anchor bolts are not included.

Figure 13. Concrete Brace Details

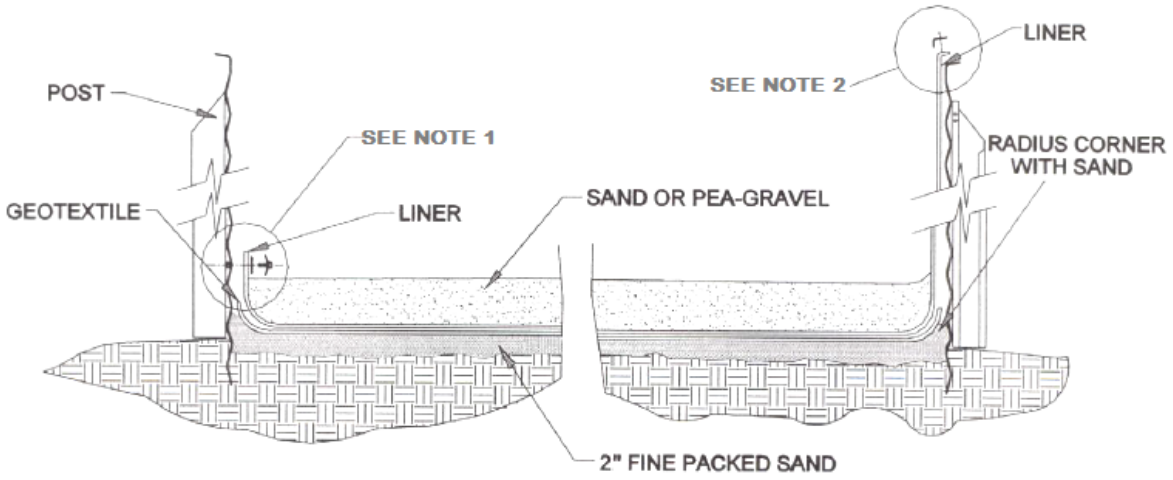


Note

1. For brace location and quantity refer to Section 5.8. – Site Planning on page 20.
2. Each of the braces (22", 33", 44") requires four anchor bolts.
3. The anchors are three spacings @ 4" = 12".
4. Design based on minimum concrete strength of 3,500 psi (25 Mpa) and rated anchor ultimate capacities of 8,500 lbs. in tension and 10,400 lbs. in shear using a design factor of 4. Use anchors of this capacity or higher - eg: 1/2" dia x 3-3/4" "Power-Bolt" #6932 at 3" embedment or equivalent.

5.11. Liner Installation

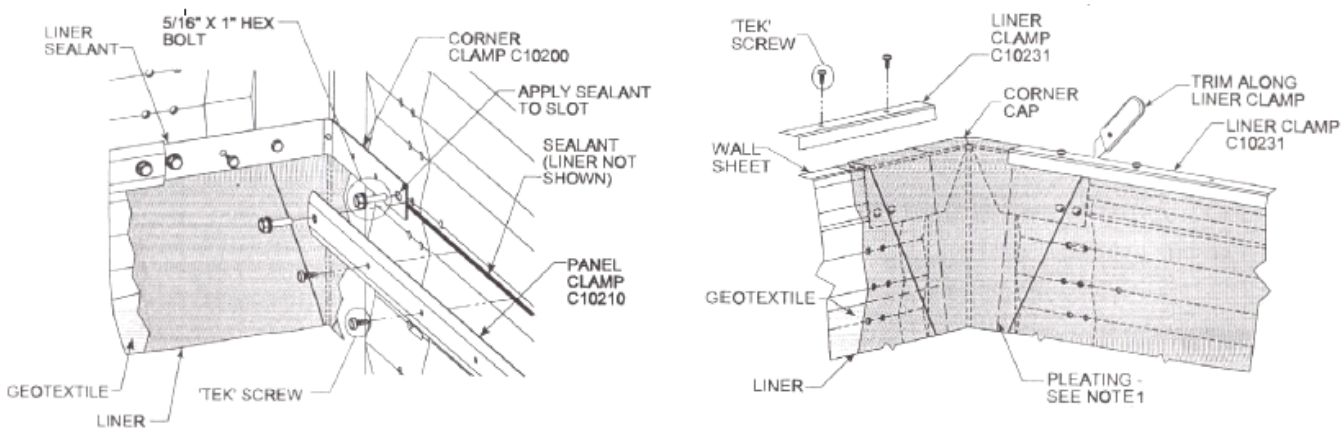
Figure 14. Liner Installation Detail



Note

1. For additional detail see Figure 19 on page 36.
2. For additional detail see Figure 20 on page 36.

Figure 15. Clamp Detail — Base Mount and Top Mount



Note

1. For additional detail see Section 5.11.1 – Liner Folding and Pleating on page 34.

Installation Guidelines

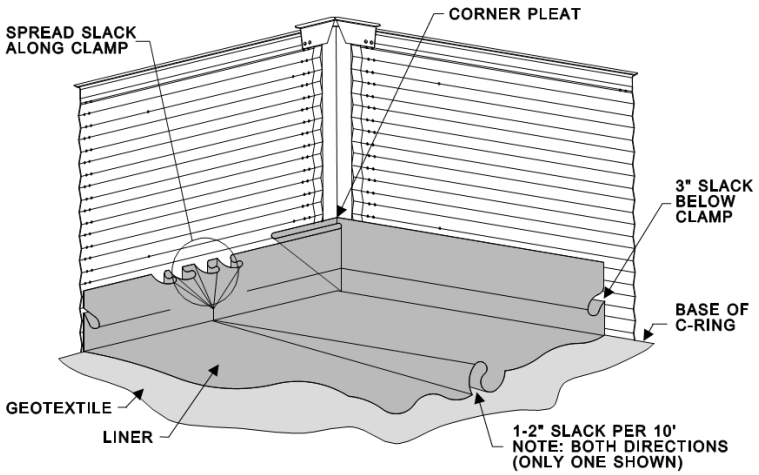
1. Leak-free liner installation is critical to the performance of your containment system. Specific liner types require special installation techniques. Consult your dealer and the liner manufacturer for specific installation instructions and liner sealant recommendations for your application. The suggestions outlined in this section are appropriate for most flexible liner materials up to 30 mil.
2. The use of a protective geotextile is recommended wherever the potential for liner damage due to sharp or irregular base or backfill material exists, or where heavy loads may be applied from above. Such loads may include bobcats, tanks, or truck traffic. Common practice is to use two geotextile layers - one below the liner, and one above. Consult your dealer or the manufacturer of your liner for specific recommendations.

3. Prior to placing any liner or geotextile, ensure that the subgrade (base) surface is level, well compacted, and free of any large or sharp rocks, dropped screws, tree stumps, clay lumps, etc. A thin lift of fine sand can be used to help provide a smooth base. Sumps, if used, should use a 5:1 slope in all directions to allow the liner to easily conform to the surface. Adding a 'cove' of sand in the bottom corner as shown above can help in fitting the liner. Place the below-liner geotextile (if using) on top of the base and 'centre' in the ring. Trim the geotextile off at the base of the ring.
4. Before placing the liner, double check that there are no sharp objects or irregularities in the sub grade or base. Pre-fabricated liners will generally show unfolding information. Use caution in windy conditions, as the liner can take off. Place carefully to ensure adequate trim and slack allowances all around. Push the liner firmly into the bottom corner of the ring. Do not leave a gap here as this can result in liner tearing when backfill is placed.
5. Once placed, adjust the liner to provide adequate slack for thermal contraction. See Figure 16 on page 33. Allow approximately 1” to 2" of slack per 10 ft. of liner in both directions.

Important

Westeel provides these liner installation suggestions for reference only. No warranty is expressed or implied as to their suitability or completeness; for damages that may occur as a result of their use; or for patent infringement.

Figure 16. Base Mount Pleat Detail



6. Base mount installations: (For concrete applications see Figure 20 on page 36.
   a. Install the nameplate decal (Section 5.7. – Nameplate Sign Installation Detail on page 19) before installing the liner clamps.
   b. Pleat the corners (for rectangular systems) as shown in Figure 18 on page 35. This is critical to ensure a leak-free seal. Allow an additional 3" slack just below the clamp as shown.
   c. Clamps must be installed on the peak of a corrugation when viewed from inside the C-Ring. Place a strip of sealant tape along the peak, between the liner and the ring. Use extra sealant in corners and at wall panel seams. Spread the slack out along the clamps to avoid bunching - i.e, use 4 - 1/2" wrinkles rather than one large 2" wrinkle.
   d. Ensure that there is no geotextile in the clamp area, as this will wick liquid through itself and cause leaks.
   e. Install corner clamps first using the panel seam holes to pull into position tight into corner. Install self-drilling screws to hold in position, then install 3/8" x 1" bolts at ends through the panel hole closest to the corner.
   f. Install C10210 panel clamps using TEKS self-drilling screws. Clamps are designed for installation with the center of the clamps on a panel seam using 3/8" x 1" bolts. Use half length pieces at corners that join to

a full panel. Overlap the cut end over the corner clamp, using a 3/8" X 1" bolt through the wall panel hole furthest away from the corner.

g. Trim away excess liner material and seal along the top of the liner with suitable liner sealant (not supplied). SIKA 1A caulking works well with most liner materials.

Note

Avoid installing TEKS screws through into support posts; move the screw slightly to the left or right.

7. Once the liner is in place and all clamps secured, double check the liner for damage. If leak-testing is desired, do this before backfilling. Fill the ring with water to a level about 1" above the clamps (for base-mount), and observe the exterior.
8. Place the above-liner geotextile (if used) and carefully backfill liner. Note that the liner materials cannot withstand the loads of bobcats, etc., without 6" to 8" of backfill on top to spread the load. Hand-backfill access paths before using equipment. The use of at least 6" backfill is recommended in all applications to protect the liner. Fine sand works well, especially when used with a thin layer of pea gravel (or fine crush) on top to prevent the wind from blowing the sand away. Gravel backfills should not be used directly over the liner without a geotextile layer.
9. Any planned compaction of the backfill should first be tested outside the containment area to ensure that the liner will not be damaged.
10. Extra care and more backfill is required in areas that will take higher loads, such as under tanks. In these areas, an extra layer of geotextile topped with an additional 6" to 8" of gravel is suggested.

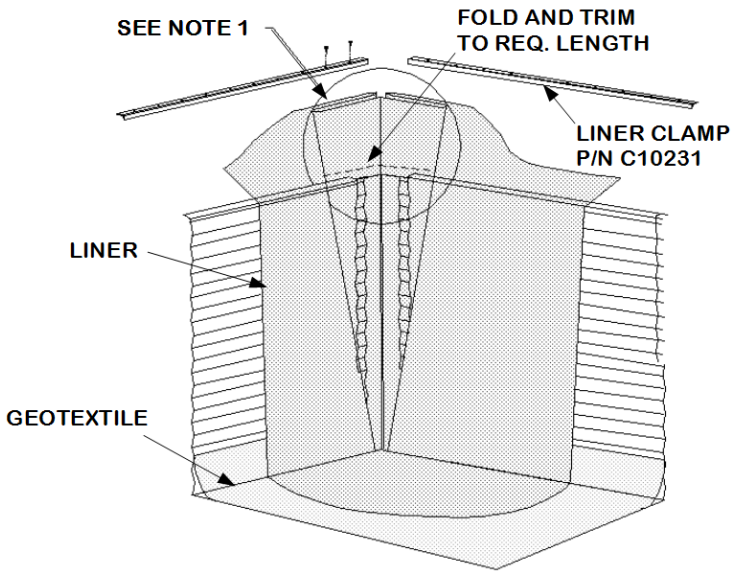
Important

Westeel provides these liner installation suggestions for reference only. No warranty is expressed or implied as to their suitability or completeness; for damages that may occur as a result of their use; or for patent infringement.

5.11.1 Liner Folding and Pleating

It may be necessary to fold and pleat the liner in order for it to conform to the C-Ring corner or curvature. To insure the liner does not pull away and cause excessive stress while the sand cover is added, hold the liner against the bottom of the wall when pleating. Pleating details may not pertain to installations with seam welded liner seams.

Figure 17. Rectangular System Pleat Detail



Note

For pleating detail see Figure 18 on page 35

Figure 18. Pleat Detail

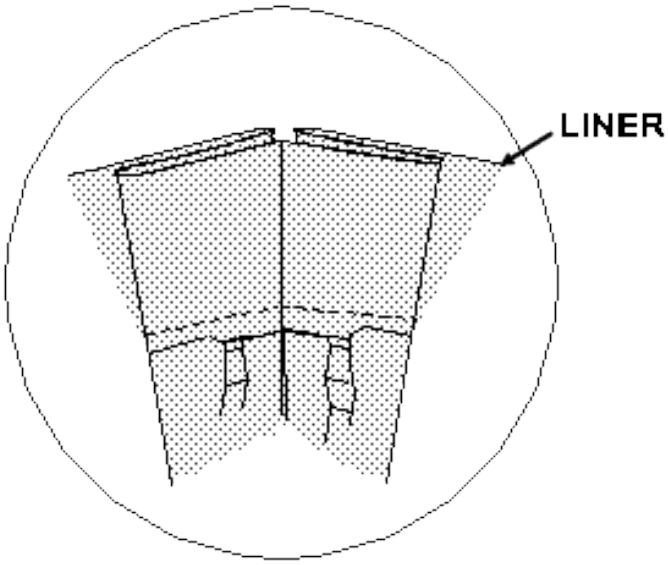


Figure 19. Round System Pleat & Clamp Detail

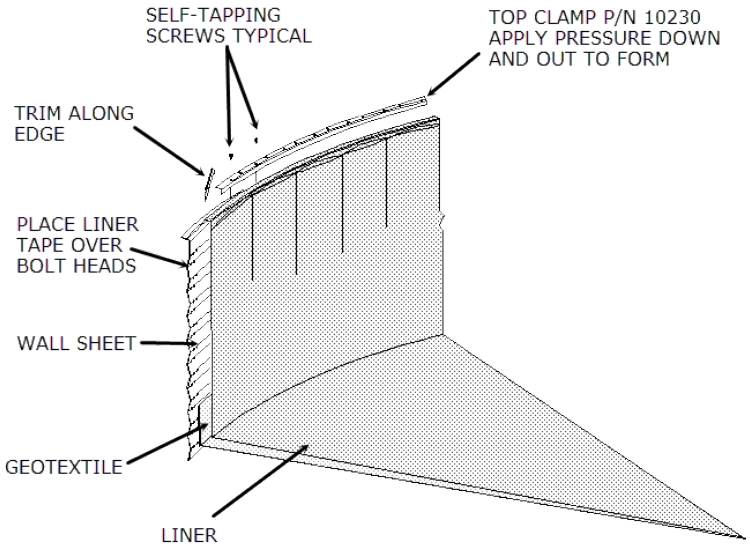
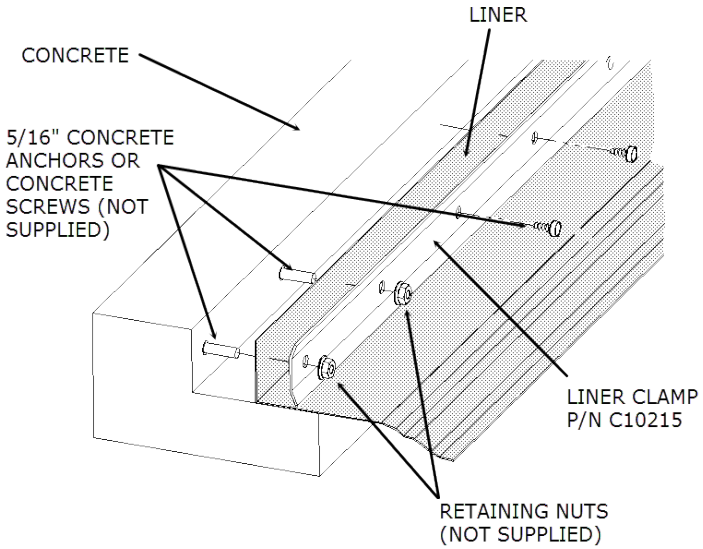


Figure 20. Concrete Liner Clamp Detail



Important

Westeel provides these liner installation suggestions for reference only. No warranty is expressed or implied as to their suitability or completeness; for damages that may occur as a result of their use; or for patent infringement.

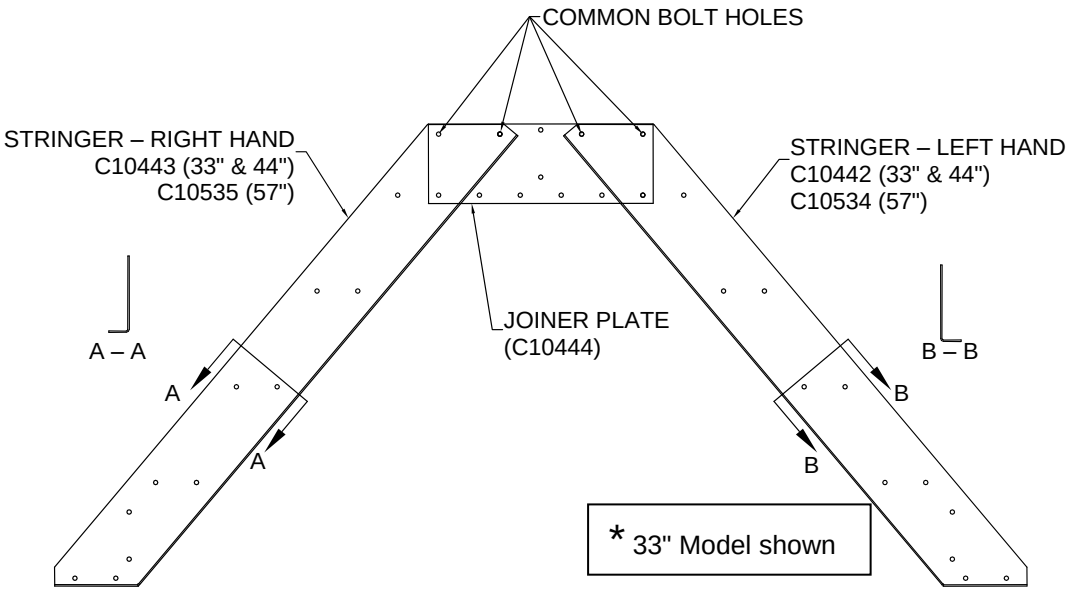
Note

Consult your dealer or the manufacturer of your liner for specific installation instructions for your application.

5.12. Crossover Stairs Assembly Instructions - 15" Platform

1. Assemble one stringer (RH or LH) to a joiner plate using the two bolt hole locations that are uniquely common to these two parts. (See).

Figure 21. Assemble stringers to joiner plate



   a. Whenever appropriate, put the bolt head on the inside of the stairs and the nut on the outside.

   b. Add the opposing stringer to the other side of the joiner plate, again using the common bolt hole locations.

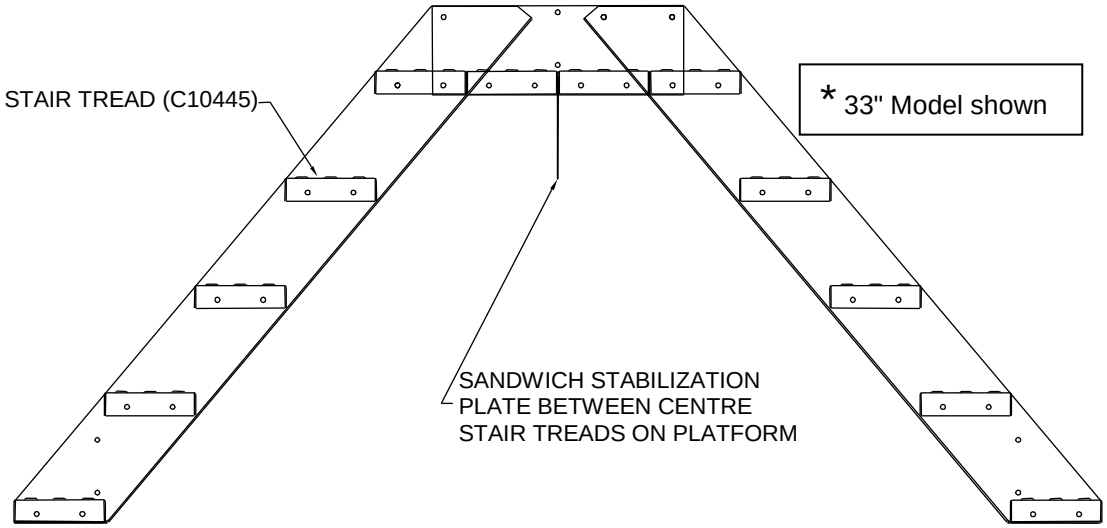
   c. Repeat this with the similar parts on the other side of the stairs.

   Note

   Note that the flanges on the stringers point outwards and that the joiner plate only fits on the inside.

2. Stand the assemblies up and either support in place with a temporary stand, or have somebody hold the assemblies in position.

Figure 22. Stand up the assemblies



a. The flanges on the stringers are on the outside of the stairs.

b. Bolt in four stair treads to create the top platform.

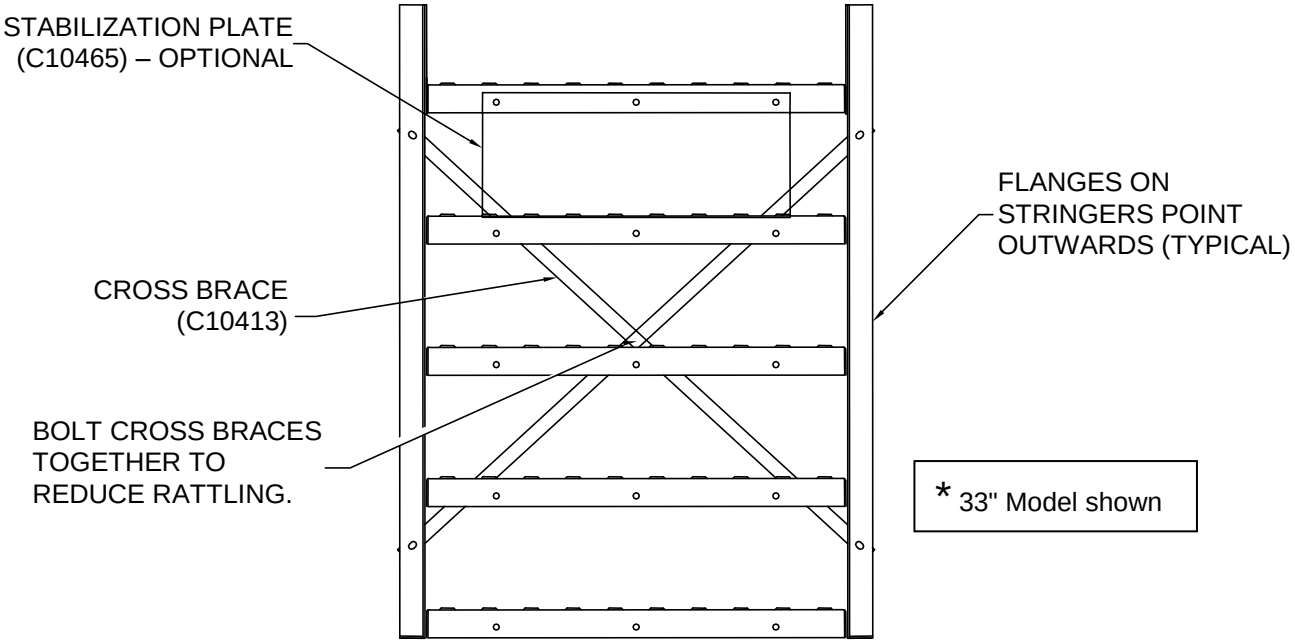
c. Bolt in the stabilization plate (if desired) at this time.

   The stabilization plate is sandwiched between the two center stair treads and hangs below the platform. When the cross-over stairs are eventually installed over a C-Ring wall, the stabilization plate can be secured to the C-Ring wall sheets using TEK screws (not supplied) and will provide extra stability. The use of the stabilization plate is optional.

3. Bolt on the remaining stair treads to opposing stringers.

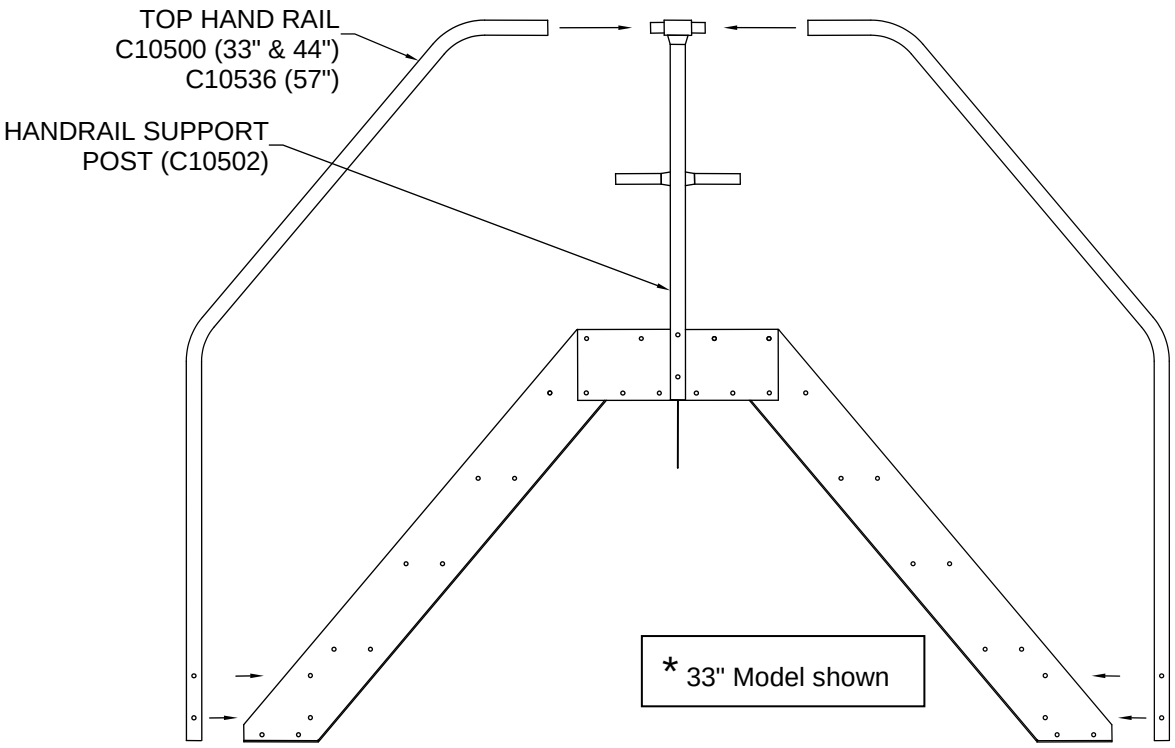
4. Bolt on cross braces to the underside of each stair. Bolting through cross brace center holes will help reduce rattling.

Figure 23. Bolt on cross braces



5. Bolt the handrail support posts to the joiner plate as shown in Figure 24 on page 39.

Figure 24. Bolt on handrail support posts and top rails



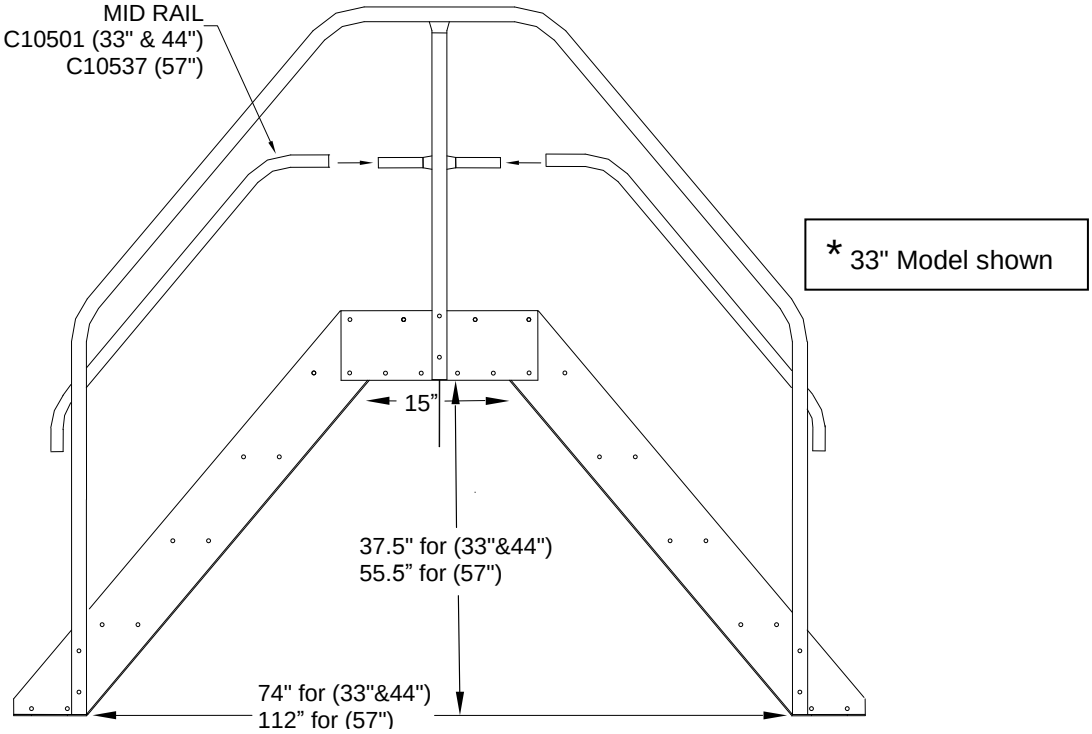
   a. Add the top rails by first sliding the one end into the top of the support post and then bolting the other end to the stringers.

   b. Use 3/8” x 2½” bolts at all of these locations.

6. Bolt on mid rails as shown in Figure 25 on page 40.

   The end slides over the tube on the support post and the other end is secured to the top rail using 3/8” x 3¾” bolts.

Figure 25. Bolt on mid rails



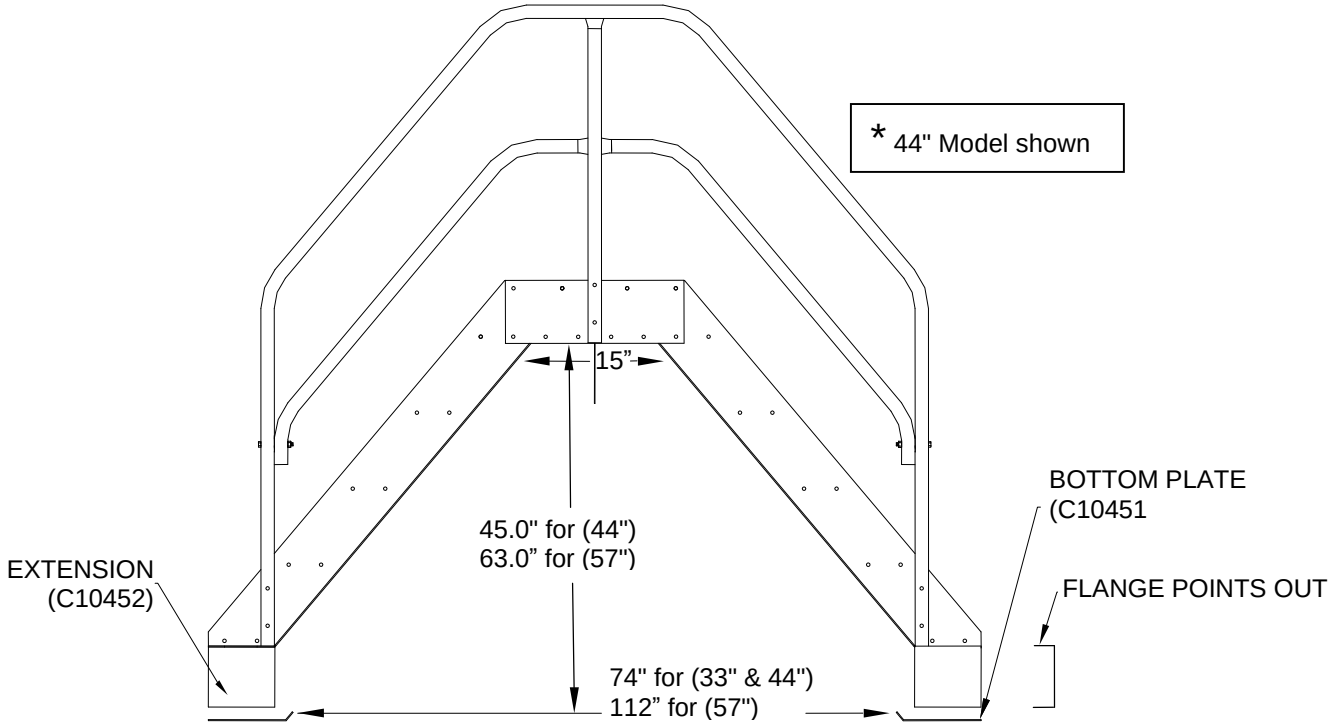
7. (For 44” & 57" stairs only) Bolt on the extensions as shown in Figure 26 on page 41.

   The flanges point outwards and match the bottom flange of the stringers.

8. Bolt on the bottom plates.

   The flange goes on the inside and points upward as shown Figure 26 on page 41. The bottom plate works with 33”, 44” and 57" stair configurations.

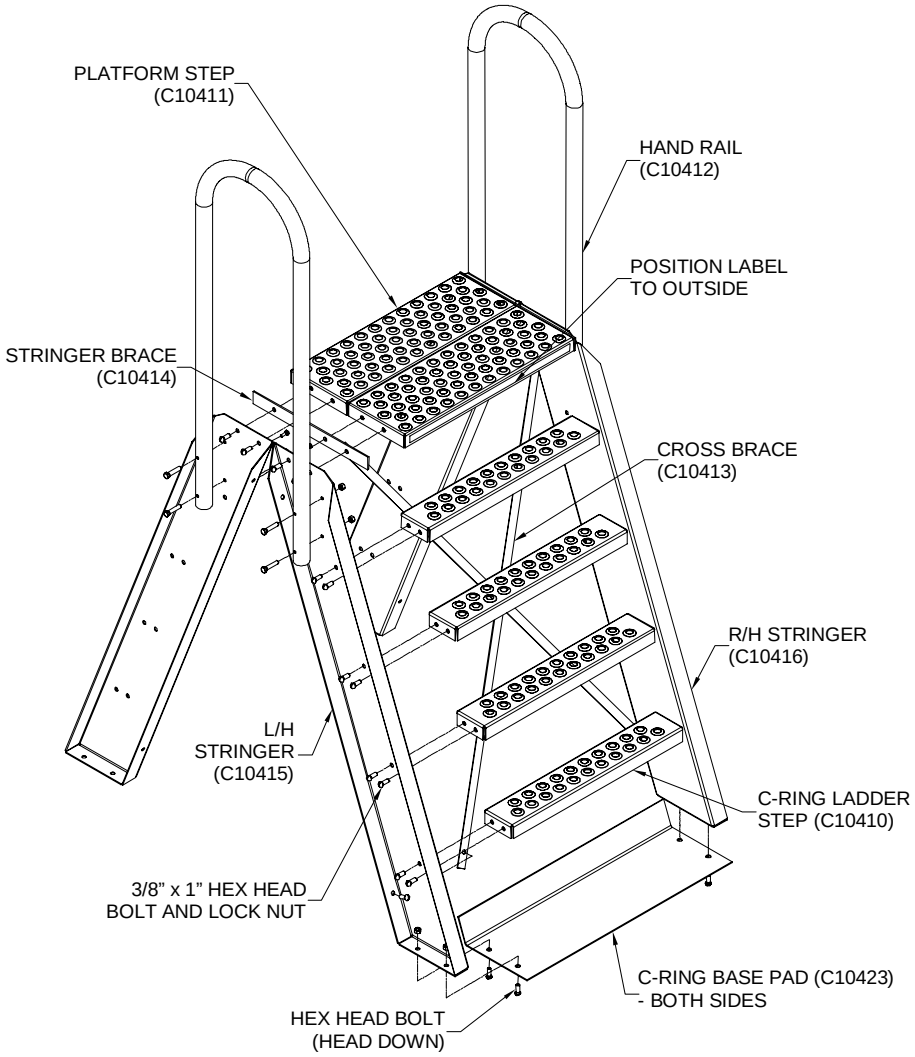
Figure 26. Bolt on the bottom plates



5.13. C-Ring Ladder Assembly Instructions

1. Assemble ladder steps (C10410) and base pads (C10423) to one side of each half-stringer (C10415 and C10416).
2. Attach opposing side stringers (C10415 and C10416) and add cross braces (C10413).
3. Join the halves.
4. Install the platform steps (C10411) and stringer braces (C10414).
5. Position the label on the platform steps (C10411) to the outside.
6. Attach the hand rails (C10412).
7. Make sure the bottom of the rails rest against the head of a bolt.
8. Install, level and anchor the stairs.

Figure 27. C-Ring Ladder



5.14. C-Ring Access Door Installation Instructions

1. With the access cover doors removed, position the access door between the braces or posts as shown in Figure 28 on page 43.
   a. To correctly mark the square cut-out onto the sheet, install a 3/8 x 2" bolt through each corner hole as shown in Figure 29 on page 43 (items 5 & 6).
   b. Position the door so that all ends of all four corner bolts line up either on the peaks or on the valleys of the corrugations.
   c. Holding the door in position, trace the outline of the square cut-out with a marker onto the wall panel.

Figure 28. Positioning the access door

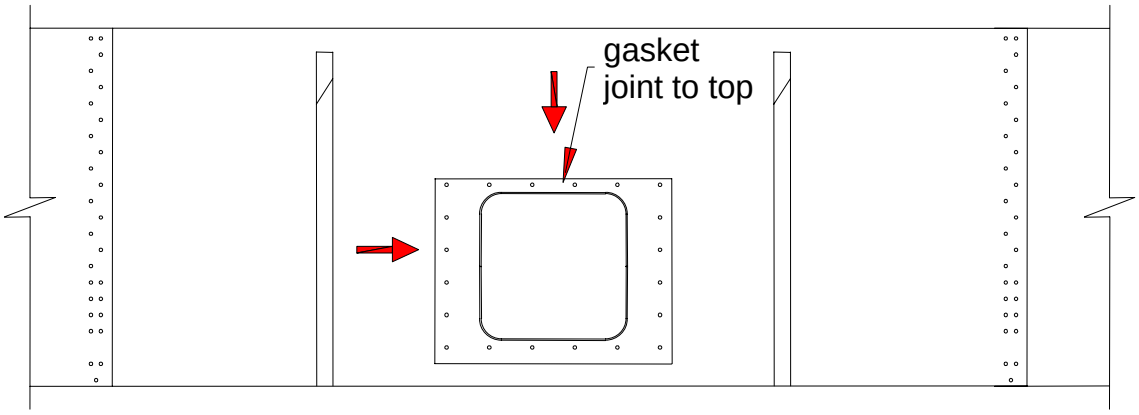


Figure 29. Marking the cutout

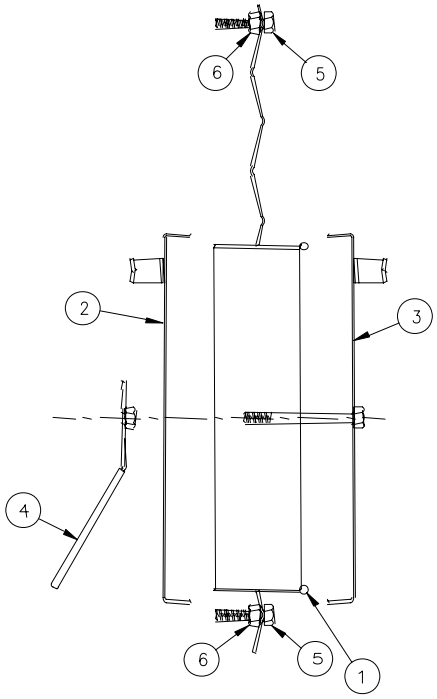


Table 5. C-Ring Access Door Parts List

No.	Part No.	Description	Qty.
1	C10497	70” Bulb Gasket	1
2	C10494	Cover Door A	1
3	C10493	Cover Door B	1
4	C10434	Handle	1
5	193789	3/8 x 2” Hex Flange Bolt c/w Washer	4
6	154193	3/8” Hex Flange Nut	25
7	C10491	Access Door Collar Assembly	1
8	170810	30’ Butyl Tape	1
9	193795	3/8 x 1” HF Bolt c/w Washer	25

2. Cut the square out of the wall panel.

a. Be sure to cut about a half-inch to the outside of the marked outline to ensure that the access door collar will fit through.

b. Do not remove excessive material, especially at the bottom of the panel.

3. Remove the four corner 3/8 x 2” bolts.

a. Put the access door through the cut hole and line it up to the corrugations on the wall panel.

b. If the corrugations are not nesting together, turn the access door around.

c. Once the access door is in position, hold it in place and mark the four corner bolt holes onto the wall panel using a marker.

4. Drill the 4 corner holes with a 7/16” drill bit.

a. Attach the door.

b. Using as a template, drill out the other 16 holes.

c. File down any burrs.

5. Install butyl tape around the perimeter of the 20 holes on the wall panel so that the contained liquid cannot reach the bolts.

a. If you install the access door on the inside of the C-ring, install around the outside of the holes.

b. If you install the access door on the outside of the C-ring, install around the inside of the holes.

6. Put the access door into position, lining up the 20 perimeter holes.

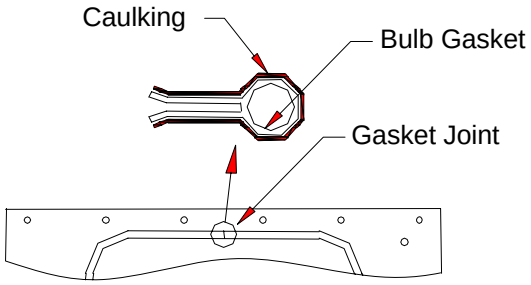
a. Bolt to the C-ring sheet with the 3/8 x 1” bolts found in the hardware package.

b. **Important: Install the bolts with the heads on the inside of the containment ring**

7. Install the 70” gasket onto the lip of the access door collar lip on the inside of the C-ring.

a. Seal where the ends come together with silicone caulking (not included).

Figure 30. Caulking and Gasket



8. Install the cover doors, putting cover door B (the one with the welded bolt) to the inside of the C-ring.

6. Appendix

6.1. Crossover Stairs Parts List

Table 6. 33" Cross-Over Stairs Parts Package (C10463)

Part Number	Description	Quantity
C10413	CROSS BRACE	4
C10442	STRINGER – LEFT	2
C10443	STRINGER – RIGHT	2
C10444	JOINER PLATE	2
C10451	BOTTOM PLATE	2
C10453	CROSS-OVER STAIRS HARDWARE PACKAGE	1
C10465	STABILIZATION PLATE	1
C10466	STAIR TREAD PACKAGE	1
C10500	HAND RAIL – TOP	4
C10501	HAND RAIL – MIDDLE	4
C10502	HAND RAIL SUPPORT POST ASSEMBLY	2

Table 7. 33" Cross-Over Stair Tread Package (C10466)

Part Number	Description	Quantity
C10445	STAIR TREAD	12

Table 8. Cross-Over Stairs Hardware Package (C10453)

Part Number	Description	Quantity
150044	3/8” NYLON LOCK NUT	110
150477	3/8” X 3.75” HEX HEAD BOLT GRADE 2	4
150517	3/8” X 2.5” HEX HEAD BOLT GRADE 2	12
235933	3/8” X 1.0” HEX FLANGE BOLT GRADE 2 (BAG OF 55)	2
198923	GALVANIZED C-RING CROSS-OVER STAIR INSTRUCTIONS	1

Table 9. 33” to 44" Extension (C10464)

Part Number	Description	Quantity
C10452	STAIR EXTENSION	4

6.2. C-Ring Ladder Parts List

Table 10. C-Ring Ladder Package (C10417)

Part Number	Description	Quantity
C10415	Left Hand Stringer	2
C10416	Right Hand Stringer	2
C10421	Step Bundle	1
C10411	Platform Step	2
C10414	Stringer Brace	2
C10412	Hand Rail	2
C10413	Cross Brace	4
C10422	C-Ring Ladder Hardware Package	1
C10423	C-Ring Base Pad	2

Table 11. Hardware Package (C10422)

Part Number	Description	Quantity
150594	3/8" x 1" Round Head Bolt	70
154193	3/8" Flange Nut	80
150517	3/8” x 2½” Hex Head Bolt	8
C10420	Assembly Instructions	1

Table 12. Step Bundle (C10421)

Part Number	Description	Quantity
C10410	C-Ring Ladder Step	8

6.3. Hardware Usage

Table 13. Hardware Usage/Quantity

ITEM DESCRIPTION	193795	193797	193805	154201	170810	C10100	157044
	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" Hex Nut	1/2" Flanged Lock Nut	Sealant Tape (ft. from 30' roll)	Post Clip	1/4" x 1-1/2" Self Drilling Screw
	Bag P/N 232850 (700) 235941 (325) 235943 (50)	Bag P/N 232852 (500)	Bag P/N 232850 (700) 235950 (300) 235951 (100)	Bag P/N 235967 (50)	Bag P/N 235872 (12)		Bag P/N C10304 (100) C10305 (50)
WALL PANEL - 22" x 56.25" and 22" x 112.5"	14		14		2		
WALL PANEL - 33" x 56.25" and 33" x 112.5"	20		20		3		
WALL PANEL - 44" x 56.25" and 44" x 112.5"	27		27		4		
FORM SHEET - 8" x 112.5" (14 Ga.)	4		4				
WALL PANEL - 22" x 112.5" (16 Ga. WELLHEAD ONLY)	20		20		2		
CORNER - 22" Radius or 90 Deg.	14		14		2		
CORNER - 33" Radius or 90 Deg.	20		20		3		
CORNER - 44" Radius or 90 Deg.	27		27		4		
SUPPORT POST - 22" PANEL (CP2270)	3		3			2	
SUPPORT POST - 33" PANEL (CP3386)	3		3			2	
SUPPORT POST - 44" PANEL (CP44104)	3		3			2	
CONCRETE BRACE - 22" PANEL (CBRACE2233)		2	2	2			
CONCRETE BRACE - 33" PANEL (CBRACE2233)		2	2	2			
CONCRETE BRACE - 44" PANEL (CBRACE44)		2	2	2			
LINER CLAMP - 5' TOP MOUNT CURVED (C10230)							10
LINER CLAMP - 5' TOP MOUNT STRAIGHT (C10231)							10
LINER CLAMP - 10' BASE MOUNT (C10210)							20
LINER CLAMP - CORNER BASE MOUNT (C10200)							5

6.4. 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 14. 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.

Figure 31. Bolt Torque Illustrations

7. Limited Warranty: Westeel Containment Rings

Westeel – Ag Growth International warrants the steel components of Containment Rings of its manufacture (the "goods", “system” or C-Rings) to be free from defects in materials and workmanship for a period of 24 months, for systems of 13 gauge or lighter panel material, from the date of purchase from its authorized dealer or distributor, provided that the goods have been installed in accordance with Westeel's instructions and subject to normal use and service. Westeel will replace any goods or parts thereof found to be defective to Westeel's satisfaction, under the terms of this warranty.

This warranty does not extend to defects or damage caused by:

1. improper storage of the goods prior to use
2. installation or assembly not in accordance with Westeel instructions
3. improper installation or assembly
4. misuse of the goods
5. equipment attached to or used in conjunction with the goods
6. Acts of God, accident, neglect or abuse

Westeel will not be responsible for the cost or expense of removal of any goods found to be defective, for transportation charges for defective goods to and from its authorized dealer or distributor, or for installation costs of any replacement goods furnished hereunder. Westeel shall not be liable for direct, indirect, special, consequential, or any other damages, losses, or claims; or for personal injury however caused.

There are no warranties for intended use other than those specified in Westeel's published product literature or otherwise specified by Westeel in writing. Westeel warranty does not cover products, goods, or equipment sold by it that are not of its manufacture.

The foregoing warranty is exclusive and in lieu of all other warranties or conditions, whether expressed or implied, statutory or otherwise, and if any provision of this warranty be void or unenforceable in whole or in part it shall be severable and shall be deemed not to affect or impair the validity of any other provision.

Liability under this Warranty is limited, and subject to the specific disclaimers below.

General

It is the responsibility of the owner / user to ensure the suitability and completeness of any containment system for their particular application through consultation with appropriate engineering resources and the local Authority Having Jurisdiction.

Method of Installation

Strict adherence to the site planning guidelines, support brace and pad specifications, and installation instructions is mandatory for satisfactory performance of your C-Ring system. Deviation in any manner can result in unsatisfactory results or failure. Ensuring liquid-tightness of containment sheet seams and teks screws connections is the responsibility of the end user and Westeel shall not be held liable for

any leakage through these areas. Westeel recommends that Westeel Certified Installers perform all C-Ring installations. Modifications and alterations made to the system may void the warranty

Liners

Westeel does not warrant membrane or other liners which may be used in conjunction with Containment Ring systems, or guarantee their suitability for specific applications. Liner installation suggestions and instructions are provided as guidelines only and are subject to change according to any specific installation recommendations as advised or provided by the liner and/or sealant manufacturer or by the local Authority Having Jurisdiction. Alterations or modifications from Westeel or the liner manufacturers' recommendations are done at the risk of the owner and / or contractor.

Corrosion

Westeel is not liable for corrosion or deterioration of components due to storage under wet conditions or contact with corrosive materials, chemicals, gases or liquids, etc. Store panels in a dry area to avoid "white rusting". If panels become wet: separate them, wipe to remove water, and apply a light coat of oil.

Service Limitations

In the event of a failure of the primary tank(s) within the C-Ring, some liquid may spill over the top of the containment ring. Westeel will not be liable for damage in this event. This containment system is not designed for medium or long-term storage of product. Any product spill or standing water within the ring should be pumped out as soon as possible. In some jurisdictions this is a regulatory requirement with specific time limits. Periodic inspection may also be required. Consult with your local Authority Having Jurisdiction. Westeel warranty coverage and liability does not extend to damages due to Acts of God, including but not limited to damage from lightning, extreme winds, or external flooding.

Nameplate Sign

The "C-Ring" logo sign supplied with your system must be installed per the instructions provided to identify your system and validate the warranty.

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