CONSTRUCTION MANUAL

For 15’, 18’, 21’, 24’, and 27’ Corrugated Hopper Bins

A Division of Venlaw Manufacturing Ltd.

Revised November 2026



Venlaw Manufacturing Ltd.

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P.O. Box 456,
Watson SK S0K 4V0

Mon-Fri 8:30AM – 4:30PM
(CST)

Ph: 1-639-800-2898
Email: Info@venlaw.ca
venlaw.ca

Please enter your product information:

Dealer's Name: _____ **Ph:** _____

Builder's Name: _____ **Ph:** _____

Purchase Date: _____ **Ph:** _____

Installation Date: _____ **Ph:** _____

Write down the serial numbers of your bin(s) below:

Serial numbers:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

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Limited Warranty

VENLAW MANUFACTURING LTD.

O/A VENLAW AG & YLD AG

CORRUGATED BINS WARRANTY

I. General Warranty and Duration

Venlaw Manufacturing Ltd. ("Venlaw") warrants that its corrugated bins (the "Goods"), which Venlaw has manufactured and/or that are branded with its name or the name YLD Ag, will be free from defects in materials and workmanship under normal conditions, use, service, and maintenance for the period(s) of time as set forth herein.

A. Warranty for Structural Components: Venlaw warrants the structural components of the Goods for a period of five (5) years from the date of purchase. For the purposes of this section, the terms "structural components" shall include the following components:

i. structural walls;
ii. structural roof;
iii. structural doors,

B. Warranty for Non-Structural Components: Venlaw warrants all non-structural components of the Goods for a period of two (2) years from the date of purchase. For the purposes of this section, the term "non-structural components" shall include all components not specifically listed in the preceding paragraph and shall include service parts.

II. Warranty Conditions and Limitations

A. Exclusive Warranty & Remedies

Within the warranty periods set forth herein, Venlaw will repair and/or replace the components of the Goods which are found to be defective. The warranties contained herein are the sole and exclusive warranties given by Venlaw with respect to the Goods. Venlaw makes no warranties whatsoever, either express or implied, oral or written, in fact or by operation of law or otherwise, except as expressly stated herein.

B. Limitation of Liability

IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (including without limitation any claim in tort or breach of contract), SHALL VENLAW'S LIABILITY TO THE PURCHASER EXCEED THE PURCHASE PRICE OF THE GOODS.

IN NO EVENT SHALL VENLAW'S LIABILITY EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES. For the purposes of this section, the term "consequential damages" shall include, but not be limited to, loss of anticipated profits, loss of use, loss of revenue, failure to meet government/administrative requirements, clean-up costs, cost of capital, and damage or loss to other goods, property or equipment.

C. Non-Transferable and Registration

This warranty is non-transferable and applies only to the original purchaser. As such, this warranty does NOT cover any Goods that are sold or otherwise transferred to any third party following its delivery to the original purchaser.

III. Claim Procedure and Customer Responsibility

1. Notice Procedure: In order to make a valid warranty claim, a written notice of the claim must be submitted within 30 days of discovery of a warrantable nonconformance. to Venlaw, within the warranty periods specified herein. Warranty claims may be submitted by mail addressed to Venlaw, PO Box 456, Watson, SK S0K 4V0. The written notice shall include the following information: i) The purchaser's name and address; ii) a description of the Goods; iii) the location of the Goods; iv) date of purchase of the Goods; and v) a brief summary of the problem with respect to which warranty coverage is claimed.

2. Assessment: The purchaser must complete all information required by Venlaw to properly assess or investigate the claim. Venlaw shall be given a reasonable opportunity to inspect and test the Goods in question.

3. Purchaser Costs: Any warranty-related expenses incurred on behalf of or by the purchaser without the prior written consent of Venlaw shall be the sole responsibility of the purchaser and will not be reimbursed. Expenses relating to travel, customs or import duties and tariffs, equipment rental, and any costs associated with accessing the Goods are the sole responsibility of the purchaser. Venlaw is not responsible for labor charges for removing or installing defective parts, transportation charges, or shipping charges.

IV. Exclusions (What Voids the Warranty)

The warranty shall be void in the event the Goods are returned or disposed of without the written consent of Venlaw. This warranty does not extend to any losses or damages due to, and will be voided by:

• **Improper Use/Neglect:** Misuse, negligent use, abuse, alteration, accident, neglect, or use of a kind and/or to a degree not reasonably expected to be made of the Goods

• **Capacity/Condition:** Use beyond rated capacity, materials stored that are not free-flowing or have a compacted bulk density greater than 55 lbs/ft^3.

• **Maintenance/Installation:** Improper storage (both prior to and after purchase), inadequate ventilation, improper/inadequate maintenance, or improper installation/application.

• **Unauthorized Modifications:** Any field modifications or substitutions to original Goods, unauthorized modification or alteration, or modifications to products not specifically delineated in the manual accompanying the product at initial sale.

• **Third-Party Damage:** Damage caused by, or in the course of, installation or assembly, construction defects, or any equipment attached to or used in conjunction with the Goods.

• **Environmental/Cosmetic Issues:** Acts of God (including but not limited to seismic activity and lightning), normal wear and tear (including corrosion and cosmetic issues), or component damage incurred during shipping and handling.

• **Inconsistent Use:** Any use of the goods which is not an intended use as specified in Venlaw's published product literature or otherwise specified by Venlaw in writing or use or installation inconsistent with Venlaw's Standard Disclaimers.

V. Indemnification

To the fullest extent permitted by law, the purchaser, on behalf of itself, its suppliers, their agents, employees or any entity or person for which the purchaser is or may be responsible ("Indemnitors") shall fully indemnify, save and hold Venlaw harmless from and against all liability, damage, loss, claims, demands, actions and expenses which arise out of or are connected with:

• Any negligent act, error, or omission by any Indemnitor in the performance of this agreement.

• The failure of the Indemnitor to comply with the laws, statutes, ordinances or regulations of any governmental authority.

• The material breach of any term or condition of this agreement by any of the Indemnitors. The indemnity shall include all liability on account of personal injury, death or property loss to any third party and shall survive any termination of this agreement.

VI. Disclaimers and Critical Requirements (Mandatory Usage Instructions)

FAILURE TO ADHERE TO THESE REQUIREMENTS WILL VOID THIS WARRANTY.

A. Foundation Design

The foundation is NOT included in the scope of Venlaw's supply. The purchaser is responsible for providing a foundation designed by a Professional Engineer to withstand the loads specified by Venlaw in the standard design specifications and to meet all applicable building codes.

B. Method of Erection

The erection of the Goods is NOT included in the scope of Venlaw's supply. The purchaser is responsible for the erection of the Goods in strict adherence to Venlaw's latest installation manual and drawings for the specific product model and application. The use of a qualified and experienced erector is mandatory. Any deviation from the installation manual voids the warranty.

C. Design

Venlaw's Goods are designed in accordance with National Building Code of Canada (NBCC), CSA S16:24 Design and construction of steel structures, and ASABE standards (as required by the NBCC). based on specific loads, including wind speed, snow load, and seismic activity specified at the time of purchase. The purchaser is responsible for ensuring the specified loads meet or exceed the requirements for the specific installation site.

D. Site and Assembly

Prior to installation, the purchaser bears all responsibility to comply with federal, state (U.S.)/provincial (Canada), and local codes which apply to the location and installation of the products. The purchaser must ensure that all components and parts are present and undamaged prior to assembly, and that all foundation and anchor bolt layouts are correct according to Venlaw's drawings.

E. Grain Bin Use

The grain bin is designed solely for the purpose of storage of free-flowing granular products. The warranty is void if the bin is used to store materials that are not free-flowing or have a compacted bulk density greater than 55 lbs/ft^3.

F. Product Storage

The purchaser must strictly adhere to the following conditions when storing product in the bin:

- **Capacity:** Do not exceed the rated storage capacity of the bin.
- **Moisture:** Grain must be stored at a safe moisture content.
- **Temperature:** Grain must be cooled to a safe temperature for long-term storage.
- **Leveling:** The grain must be leveled within the bin to prevent side-wall damage and uneven loading.
- **Aeration/Ventilation:** The bin must be provided with adequate ventilation and/or aeration to prevent condensation, spoilage, and corrosion.

G. Proper Storage and Transport of Corrugated Bins

Improper storage of corrugated bin sheets and components can result in the formation of white rust due to moisture. YLD bin packages leave the factory “bump up” meaning the peak of the curve is up so that moisture can not sit on the sheets and can not get in between the sheets. We strongly recommend keeping them stored in this same manner for the purpose of keeping the steel dry. It is recommended that all bin packages are stored in a dry warm place when possible. Do not store bin packages in places where water runs (in front of downspouts, near a ditch or swale) or in low spots where water pools. Do not place tarps, plastic, or other coverings over top of the sheets as this can trap condensation and cause the formation of white rust. In order to prevent rust or damage during transportation we advise loads are tarped during transportation.

VI. Applicable Laws

This warranty has been issued, accepted and entered into by Venlaw and the purchaser in the province of Saskatchewan (Canada) and shall be governed and construed in accordance with the laws of the Province of Saskatchewan. Any legal action or proceeding with respect to the Goods or this warranty shall be brought only in the he Court of King’s Bench for Saskatchewan. Thank you for your purchase of YLD grain bins. Please contact your dealer with any issues that may arise.

Safety

WARNING

Failure to follow proper safety and assembly procedures may result in injury and/or death as well as it could void product warranty. Anyone who is to be involved with the construction or operation of this grain bin must read and follow this manual and the operation manual in their entirety.

General

YLD grain bins are engineered for maximum strength and safety. However, there are many hazards to be aware of when working on, in, or around them.

- When constructing YLD bins, ensure there are no unauthorized persons or children in the work area.
- Stop all work if anybody enters the work site unauthorized as this puts them in danger.
- Keep a first aid kit readily available along with a fire extinguisher in case of emergencies.
- Be sure to install all guards and safety mechanisms to prevent injury to the construction crew as well as the purchaser(s).

Safety Alert symbols

DANGER	Indicates an imminently hazardous situation. Failure to follow warnings may lead to injury or death.
WARNING	Indicates a potentially hazardous situation. Failure to follow warnings may lead to injury, death, structural damage, or collapse of a bin.
CAUTION	Indicates a potentially hazardous situation. If not avoided, may lead to minor or moderate injury. Also used to alert against unsafe practices.
NOTICE	Instructions that must be followed to ensure proper installation and operation of equipment.
Important	Used to point out important information to the reader.

The safety alert symbols are used throughout this manual to highlight, warn, and indicate important notes and safety hazards. They also serve the purpose of understanding the safety stickers on the equipment being installed on your property.

PPE and Construction Safety

IMPORTANT

Before beginning any construction, it is the responsibility of the installation crew to ensure they have all required safety measures and permits in place. All equipment used during this process must meet all federal and/or provincial standards and regulations. If unsure, check with Occupation Health & Safety (**OH&S)** for your local requirements. It is also the crews' responsibility to ensure that all employees/workers have the required safety gear and PPE and are trained in its proper usage before they participate in construction. Standard PPE includes but is not limited to:

- Steel toe boots
- Hard hats
- Eye Protection
- Ear protection
- Reflective vest, jacket, or suspenders
- Cut resistant gloves
- Fall arrest systems
- Electrical lockout systems
- Respirator or filtered mask when airborne particles are present



Working at Heights

- Properly plan and organize all work being done at heights
- Inspect and utilize the appropriate fall protection equipment
- Use guard rails and platforms for working at heights as well as fall protection PPE
- Ensure people working at heights are properly trained on how to minimize the risk of falls as well as how to minimize injuries should they fall
- Check weather before starting any work at heights. The dangers of working at heights are much higher in heavy winds or slippery conditions

- Do not ever purposefully throw or drop anything from heights as they can injure people or cause damage on the ground



All electrical work to be done on any grain bin construction site MUST be done by a licensed electrician. All work completed must meet your countries national electrical code (CEC in Canada). Maintenance to electrical components must also be done by a licensed electrician following proper lockout tagout procedure.

Safety Decals

- Ensure that all safety decals stay intact and legible on equipment and moving parts
- Replace safety decals that are missing or become illegible
- Parts that are replaced must display the same safety decals as the previous part

Flowing Grain

Entering a bin during the process of unloading presents the danger of getting pulled into the downflow of grain. As the grain empties out the bottom of the bin it is creating a rapidly moving column of grain flowing at nearly the rate of the unload auger. This can pull a person down toward the outlet causing entrapment or suffocation.

Once a person is pulled into the flow of grain, it is impossible to escape. The person will be quickly pulled down into the grain and rescue is dangerous as pulling up on a trapped person risks damage to their spinal column once they are deeper than their waist.

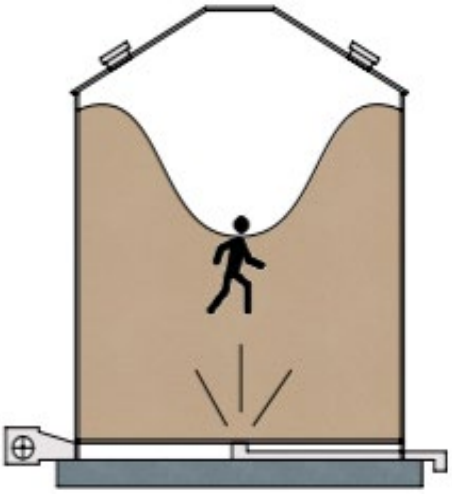


Figure 1 Never enter a bin while unloading. You will be pulled down into the flow of grain.

DANGER

Never enter a bin where the contents are currently flowing. Failure to follow this warning will result in injury or death.

Flowing Grain Safety Precautions

1. If you must enter a bin, turn off all augers and use lockout/tagout procedures to ensure nobody can turn the auger back on while someone is inside the bin.
2. Follow all confined space entry procedures. Owner/operators are responsible to make sure they have the proper site entry plans/permits in place. If you are unsure what is needed, visit the OH&S regulations on the government of Canada website. (Or equivalent organization for your country if you are located outside Canada). https://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.html
3. Always have at least two people present when entering a grain bin in case of an emergency.
4. Use a gas meter before entering to ensure the atmosphere is safe.
5. Wear a respirator or filter mask to prevent breathing in airborne particles.
6. Always use a safety harness when entering a bin.

Crusted and Bridged Grain

When grain has a high moisture content, mold, or is poor condition, it can form a crust on the top. Once some grain has been emptied from the bin, this crust remains unmoved, creating a "bridge". This means there is a hollow cavity underneath it. It may appear fine to walk on, but it will often collapse instantly when weight is applied. The result is someone will be buried in the cavity below the crust. At this point, it would be extremely difficult to locate the individual for a safe rescue.

Bridged grain can also cause harmful gases to be trapped under the crust in the cavity. If the crust is broken, these gases will be released, reducing the amount of oxygen available in the bin.

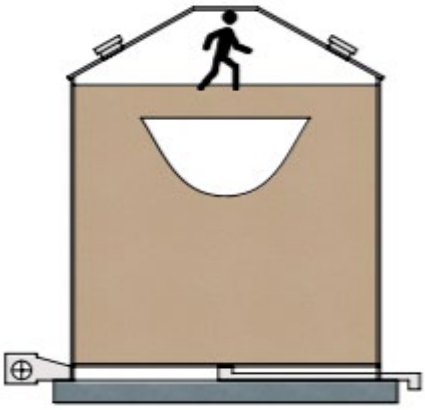


Figure 2 Do not walk on bridged grain as you are likely to fall through and become trapped.

WARNING

Do not enter a bin to attempt to break loose bridged grain or attempt to stand on the grain. Grain may collapse resulting in entrapment, death or serious injury.



Figure 3 Falling through the bridged Grain

Crusted and Bridged Grain Safety Precautions

1. When pulling out grain in poor condition, stop the auger and look for a funnel shape in the grain. If the surface looks untouched, the grain has bridged and created a cavity beneath the surface.
2. Never enter the bin to break the bridge. Use a long pole or similar to break the bridge.
3. Always use appropriate fall protection equipment to prevent falling into the bin. Secure tools and equipment to the top of the bin to prevent them from falling into the bin.

Vertical Mass Grain

Grain can accumulate in a large mass to the side of the bin wall or in other formations as well. This is normally caused by improper storage, or the grain is in poor condition. If a person were to attempt to break loose the mass, it would come crashing down, crushing or burying that person.

After a collapse, no rescue attempts can be made until the remaining grain has been stabilized. If this step is not taken, there is a risk of the remaining grain crushing or burying the rescuers.

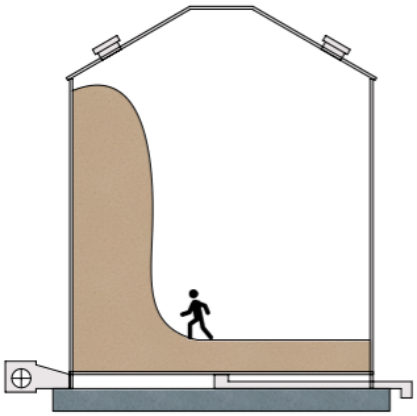
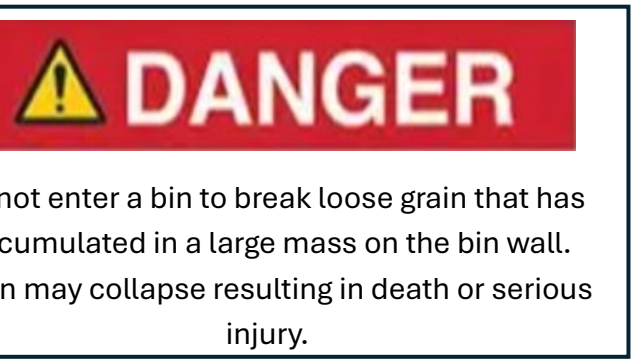


Figure 4 Attempting to Break loose a vertical mass.



Do not enter a bin to break loose grain that has accumulated in a large mass on the bin wall. Grain may collapse resulting in death or serious injury.

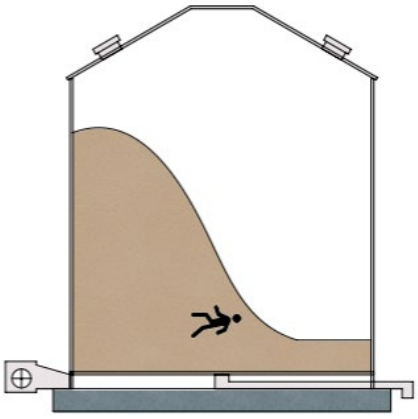


Figure 5 Vertical Mass falls trapping the person in the grain.

Vertical Mass Grain Safety Precautions

1. Prevent grain from accumulating on the bin wall by storing grain that is in good condition.
2. Do not enter a bin to attempt to break a mass from the bin wall. Attempt to break the mass from the top of the bin.
3. Expect and be prepared for the grain mass to break free and come down fast.
4. Try to improve the condition of grain by drying, aerating, and turning wet grain if possible, prior to long term storage.

IMPORTANT

Venlaw Manufacturing will not be held liable for any incidents on grain bin construction sites or where injury or death occurs due to failure to comply with safety procedures and/or instructions. Again, it is the responsibility of the construction crew and the purchaser to ensure all safety measures are being implemented properly to ensure everyone makes it home safe each day.

Rescue Procedures

If someone is ever trapped inside a bin, follow these steps:

1. Shut off the auger and all unloading equipment.
2. Contact an emergency rescue team or fire department.
3. Ensure the safety of rescuers:
    - Attach them to safety lines.
    - Use respiratory protection as it will likely be dusty.
4. If the victim is completely submersed:
    - Cut at least two V-shaped holes on opposite sides in the bin to drain it.
    - Three or four holes are recommended, sometimes more for larger bins.
    - Make the holes as low as possible if you are unsure where the victim is.
    - Use an air chisel, power saw, cutting torch, or zip cut.



5. Ventilate the bin with the aeration system if there is one. Do not activate a heat source.
6. Avoid adding any additional pressure to the victim
    - Stay away from the area around the victim and keep unnecessary personnel out of the bin.
7. If the surrounding grain slope is above the victim's head, construct a retaining wall to keep any grain from rushing down into the victim's head.
    - Plywood, sheet metal, large trash cans with the bottom removed all are options to put around the victim's head.
    - Add braces to these objects to ensure they won't move.
8. Remove grain from around the victim.
    - Attach a harness to them to prevent further submersion. Don't try to lift them until they are no longer submerged or surrounded in grain. If you try lifting them before they are clear of the grain, injury may occur.
9. Provide for the victim.
    - Assist the victim's breathing with oxygen, respirator, or filter mask.
    - Maintain body temperature.
    - Communicate with the victim about their condition and the rescue efforts taking place.

Moving Parts

Grain bin augers present serious entanglement and amputation hazards. This includes, reclaim augers, sweep augers, fill augers, and stirring augers.

1. Make sure no children or unauthorized persons enter the work area surrounding the grain bin.
2. If unauthorized persons enter the work area, the worker should immediately shut down the augers and equipment until those persons leave the work area.
3. Keep hands and feet away from moving parts and ensure that loose clothing is secured to prevent becoming entangled in moving parts and causing injury or death.
4. Always keep all guards and shields in place while operating. Replace damaged or missing guards or shields with original manufacturers parts.
5. Do not adjust or perform maintenance while the auger is running.







Grain Auger Hazards

Reclaim auger – built into the bins floor to pull grain from the center of a flat bottom bin to outside the bin. When left uncovered, a worker's foot can easily become entangled in the screw.

Sweep auger – a horizontal auger that rotates around the entire floor of a flat bottom bin to pull the grain towards the center sump to be removed by the reclaim auger. Do not work inside a bin when the sweep auger is operating.

Collection Augers –

Fill Auger – used to fill a bin and can be either permanent or portable/PTO driven. If guards or safety shields are not in place, serious injury or death can occur. An unguarded PTO can

easily catch loose clothing or loose objects and can wrap a person onto it in less than 1 second.

Stirring Auger – used in a drying bin to turn over grain and shorten drying time. A stirring auger is completely unguarded and can easily catch loose clothing and entangle the person. Never enter a bin when a stirring auger is in use.

Falls and Obstructions

Falls from grain bins can cause injury at any height. Rain or snow can cause ladders to become slippery or icy in poor weather. Slippery or broken ladder rungs and loose ladder hand-holds can cause falls.

Safety precautions

- Maintain 3-point contact when ascending or descending a bin ladder.
- Never carry items when ascending or descending a bin ladder.
- Repair loose ladder rungs and handholds as soon as they are discovered. Follow maintenance guidelines in this manual to prevent injury.
- Ensure there are no obstructions near ladder rungs which could cause fall.

Before Construction

WARNING

Venlaw reccomends that that all site preparation and bin construction be done by experienced, properly equipped crews.

Site Preparation

NOTICE

It is crucial to ensure your bin site has been properly prepared to withstand your new grain bin(s). Make sure your site pad is level and hard packed after doing proper excavation and backfilling and/or before pouring your concrete pads. Make sure your site is higher than the surrounding area and away from any water drainage routes to ensure the ground does not develop any soft spots.

Before construction begins, decide on the direction you would like your bin to face based on the following aspects:

- Chute handle location
- Ladder/staircase entry point
- Fan/power source location
- The angle at which an unload/sweep must be placed to properly accommodate transport trucks

Also ensure you strategically place your new bin site in a way that augers, transport trucks, and other machinery will not come into contact with power lines, trees, outbuildings, etc. during the handling of grain products.

Note: Failure to do proper groundwork for a solid foundation that results in the loss or damage of your bins will void all warranty.

Power Requirements

Ensure you have confirmed the phase and voltage of the power supply in the place you are to be constructing your new bins. If you plan to add YLD aeration fans to your bins, your dealer will need to know this information. Always make sure the power supply is locked and tagged out before doing any electrical work around your bins. ALWAYS have a certified and licensed electrician perform all electrical work to be done on any farm site. All electrical work must meet the Canadian Electrical Code (CEC) or the equivalent in countries outside of Canada. Refer to electrical safety on the previous page.

Pre Construction Material Storage

YLD grain bins are manufactured using galvanized steel with a zinc coating that is corrosion resistant to red rust. However, improper storage of these parts can result in the formation of white rust due to moisture. YLD bin packages leave the factory “bump up” meaning the peak of the curve is up so that moisture can not sit on the sheets and can not get in between the sheets. We strongly recommend keeping them stored in this same manner for the purpose of keeping the steel dry. It is recommended that all bin packages are stored in a dry warm place when possible. Do not store bin packages in places where water runs (in front of downspouts, near a ditch or swale) or in low spots where water pools .

Moisture

If moisture ever appears to be present, pull the sheets apart and wipe them. Allow them to dry fully before spraying with a light oil and putting them back into a stacked order. Do not



White or red rust has the potential to be a structural concern. Failure to replace material with red rust can result in collapse of a bin. Failure to protect materials from moisture and its effects will result in warranty being voided.

Check Your Delivery

Upon Delivery of all components for your YLD grain bins, check the shipment to ensure that all parts are accounted for. All shipments from our factory are checked before leaving however, it is best to let your dealer know if anything is missing before construction begins.

Foundation Requirements

IMPORTANT

The following are guidelines for preparing the bin foundation and do not represent engineering specifications. Due to the high variability in possible site and soil conditions, local requirements may differ from those outlined in this section. The suitability of the foundation remains the sole responsibility of the installer. However, the design outlined here represents the minimum standards which must be followed for bin warranty applicability.

Review by a qualified person is needed to assure that the foundation design is compatible with the local soil and environmental conditions at the bin location. A qualified geotechnical engineer should approve the foundation used, including anchor bolts. A minimum soil bearing capacity of 3,500 pounds per square foot is required. Failure to do so may result in bin collapse resulting in serious injury or death.

Suggested foundation preparation:

A. Strip topsoil and all uncontrolled fill material to their full depths; Ensure all organic material is removed.

B. Proof roll site to identify and soft areas. If soft areas are encountered, they are to be excavated min. 12” and replaced with suitable engineered fill compacted to 98% standard proctor density.

C. All fill materials to be placed in horizontal layers not exceeding 6” and shall be compacted to a minimum 98% standard proctor density.

D. The top 12” of fill material is to be compacted to 100% proctor density.

E. Provide a minimum 8” layer of washed granular base material with no fines compacted to 100% standard proctor density.

F. Bottom of concrete to be a minimum of 6” above surrounding grade. This will ensure drainage and reduce risk of frost issues.

G. Concrete must have a minimum compressive strength of 30MPA after 28 days.

H. Surface of slab must be level. With a maximum deviation of 0.25” in any 10’ span and 0.5” between any two points on the slab. Deviations greater than this may be accommodated by using shims to level the mounting surface.

Bin Size (ft)	"A" Foundation Diameter	"B" Outer Ring	"C" Mid Ring	"D" Inner Ring	Min. Fill (compacted) (cu. M)	Est. Concrete (cu. M)
15	15' 11"	15' 5"	14' 5"	13' 5"	7.6	7.5
18	19' 1"	18' 7"	17' 7"	16' 5"	11.5	10.0
21	22' 3-1/2"	21' 9-1/2"	20' 9-1/2"	19' 9-1/2"	16.4	12.8
24	25' 5-1/2"	24' 11-1/2"	23' 11-1/2"	22' 11-1/2"	22.0	15.7
27	28' 7-1/2"	28' 1-1/2"	27' 1-1/2"	26' 1-1/2"	28.5	19.0

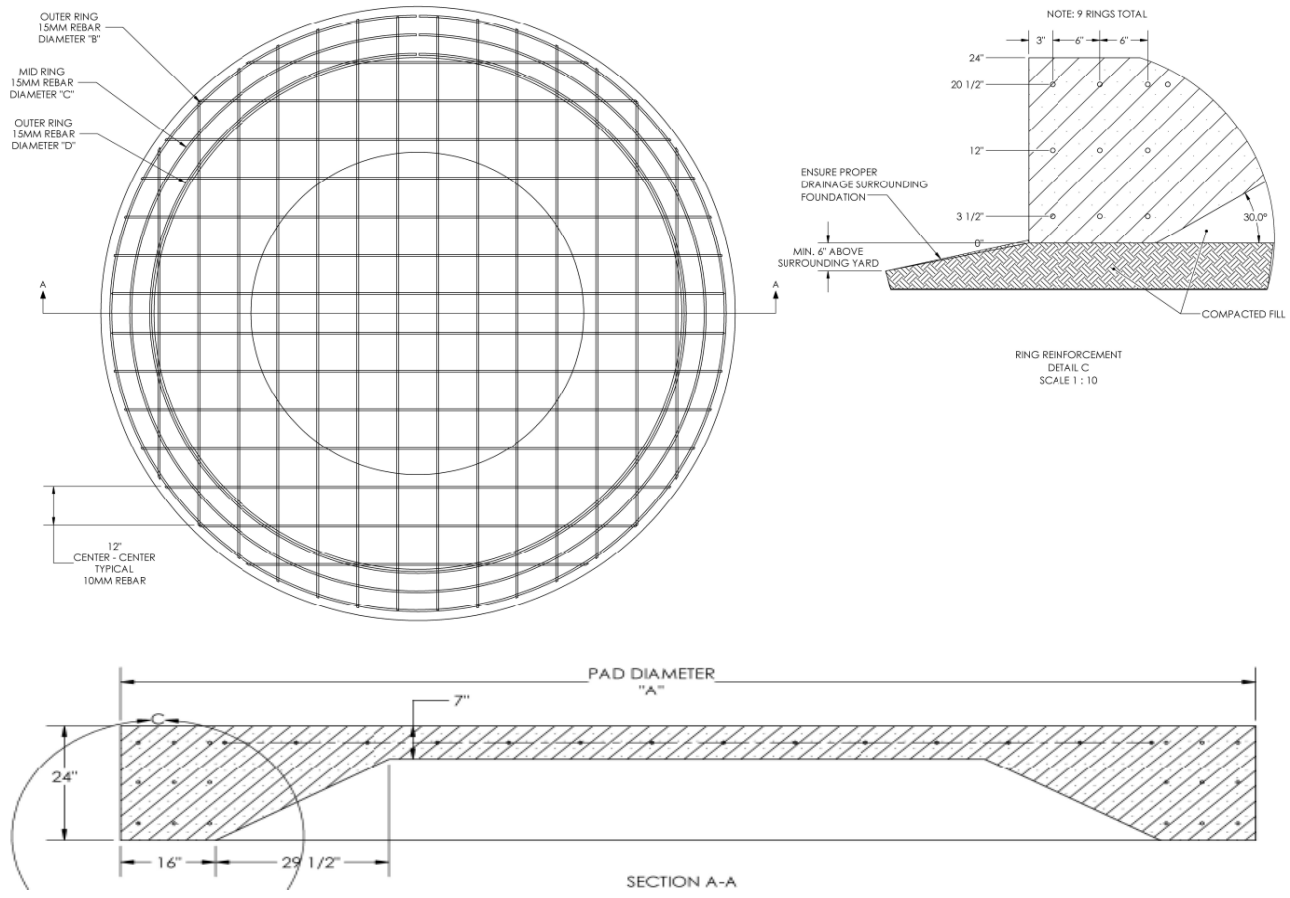


Figure 6 Concrete Pad Foundation Guideline

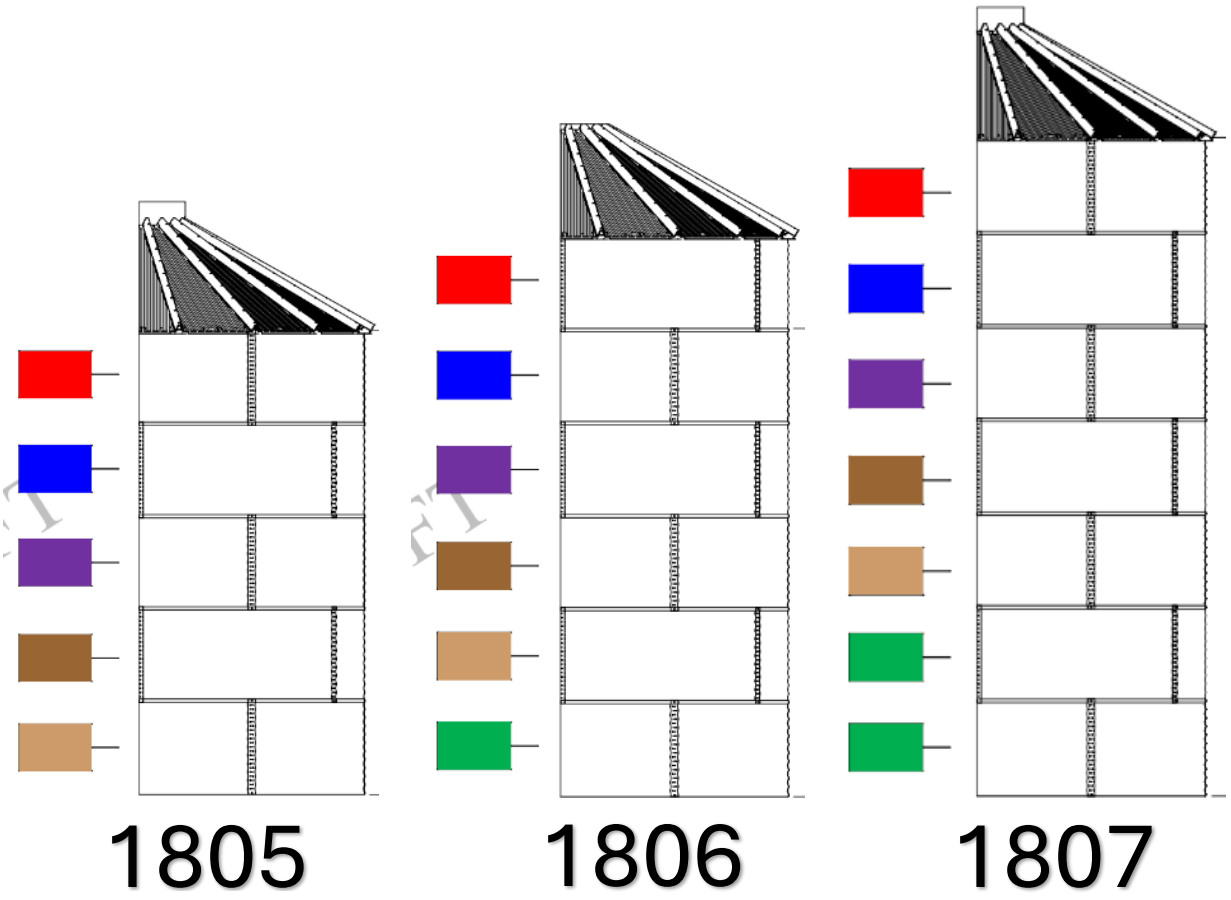
Sidewall Sheet Specifications

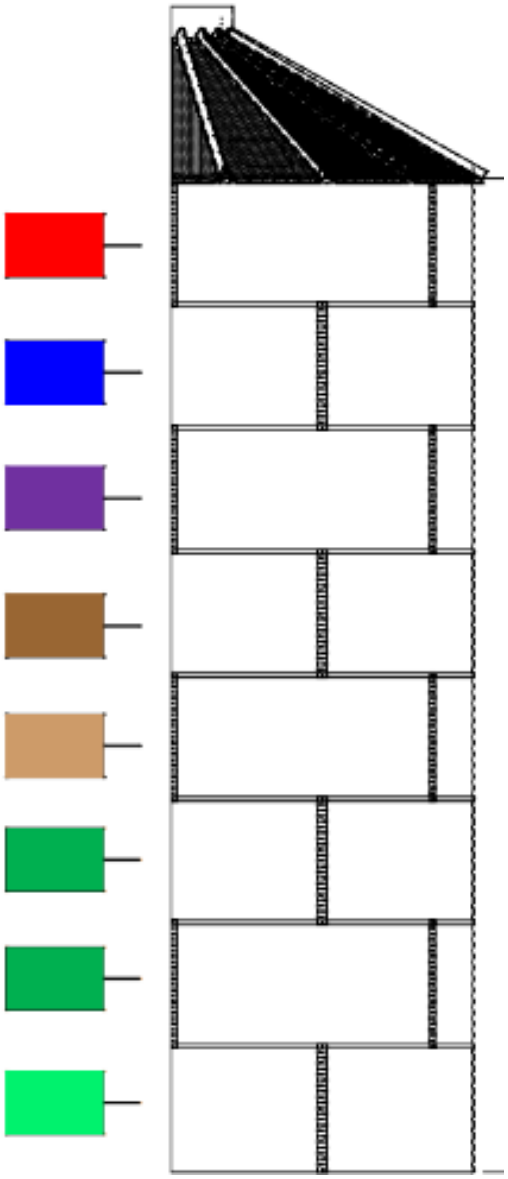
Find in the following pages, the exact bin in which you are building to see the correct sheet layout. Each gauge Is color coded and there is a chart for each bin we manufacture to show the proper gauge steel for each ring. Each bin pack will have its sheets color coded by stickers on each ring that will correspond to this chart.

GAUGE	THICKNESS
20	0.0359"
19	0.0418"
18	0.0478"
17	0.0538"
16	0.0598"
15	0.0673"
14	0.0747"
13	0.0897"
12	0.1046"
11	0.1196"
10	0.1345"
9	0.1495"
8	0.1644"

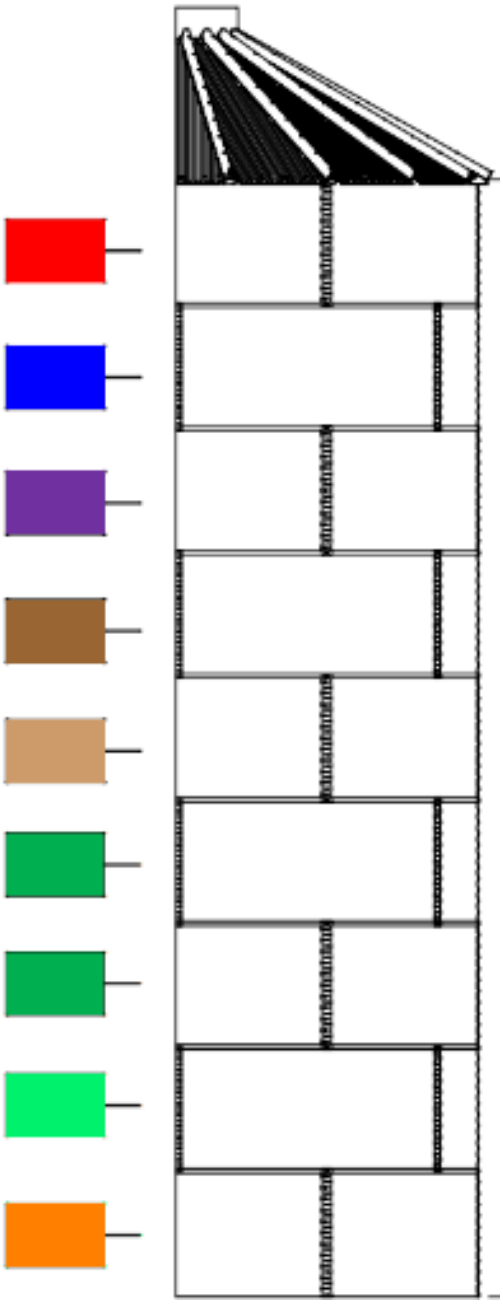
This is a breakdown of each color and the gauge of steel it represents corresponding to all diagrams over the next few pages.

18’ Diameter Bins



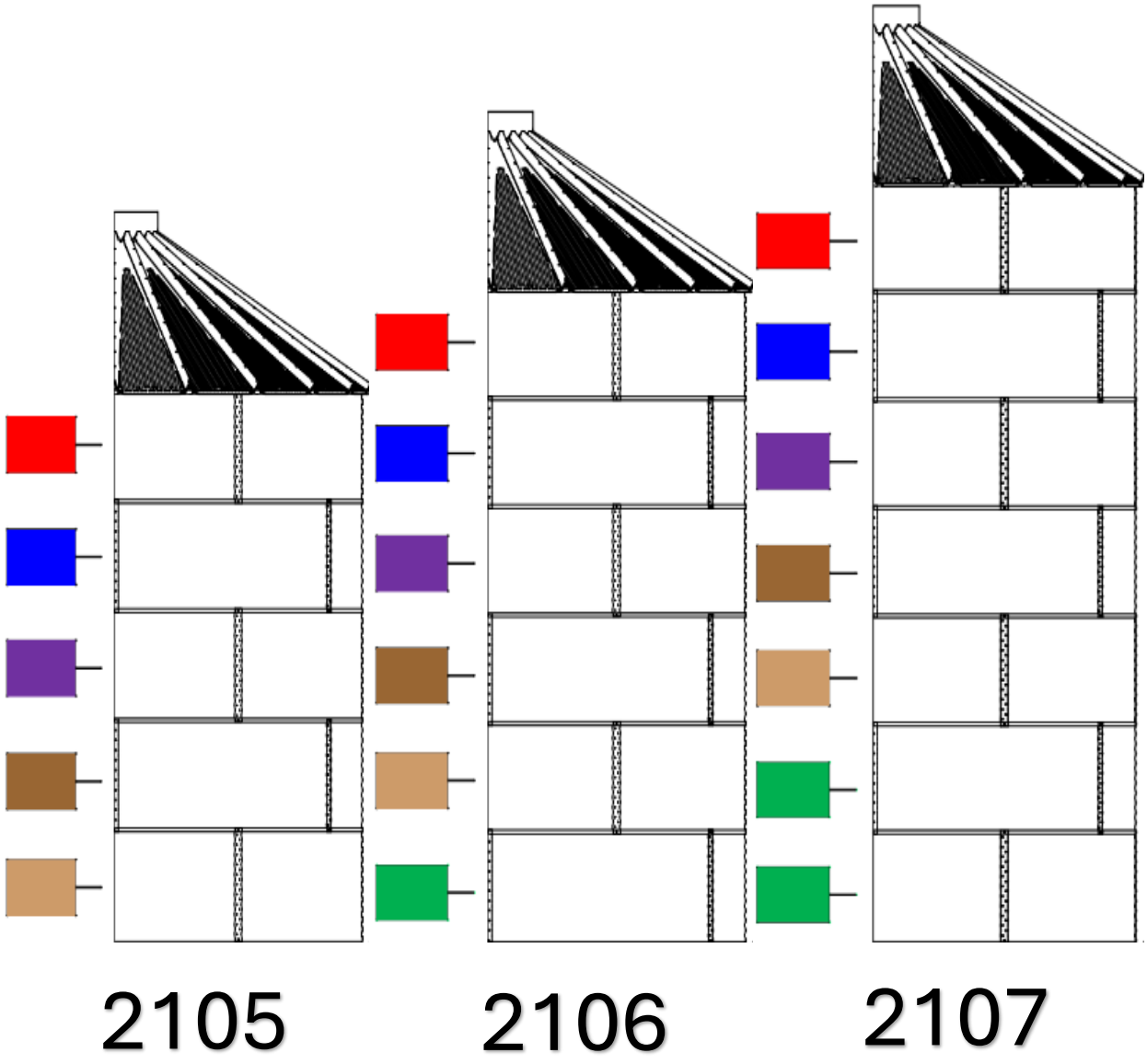


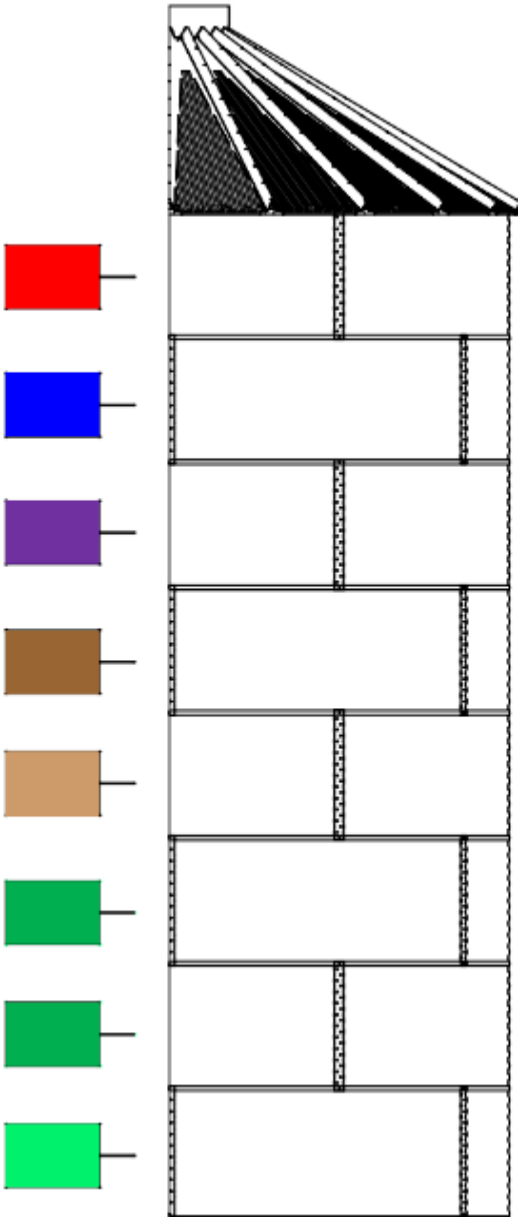
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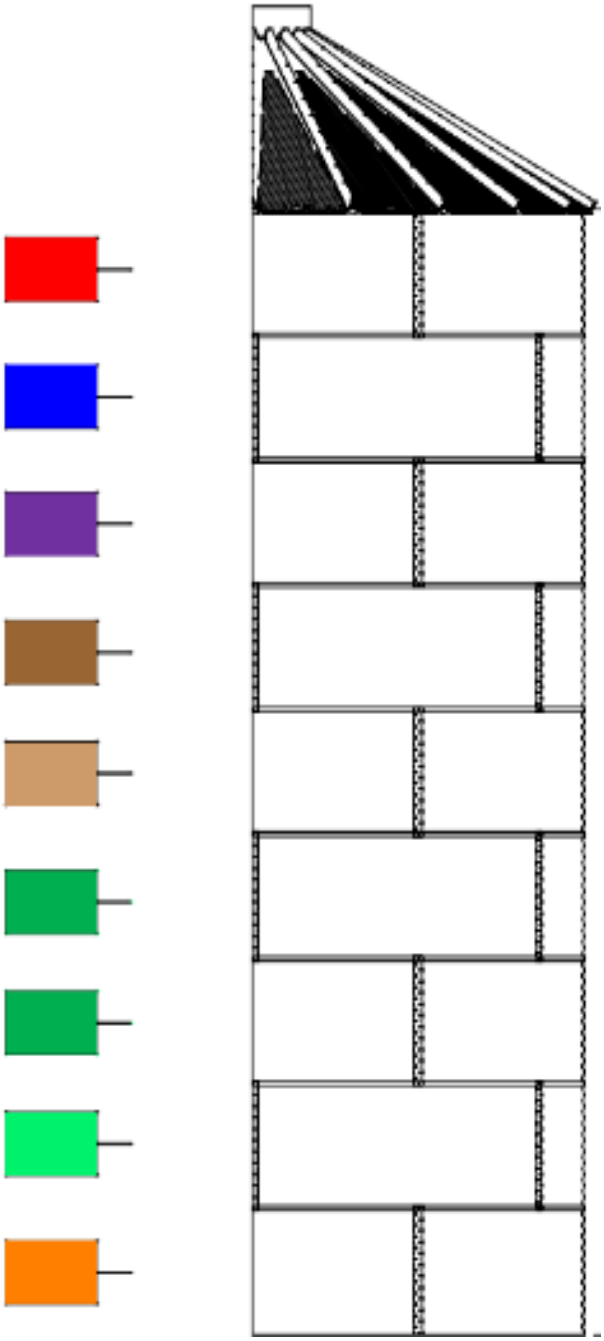
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21’ Diameter Bins



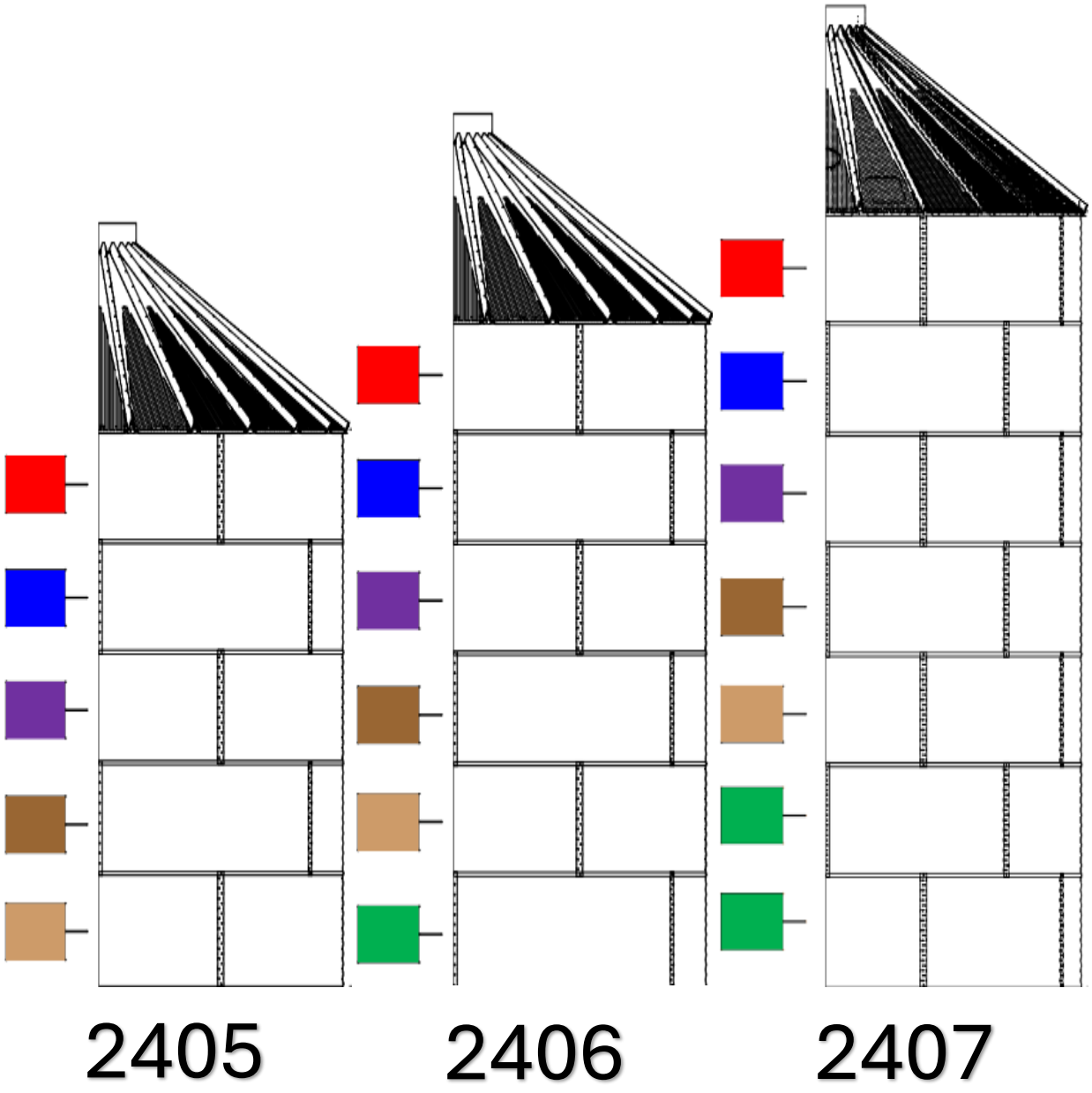


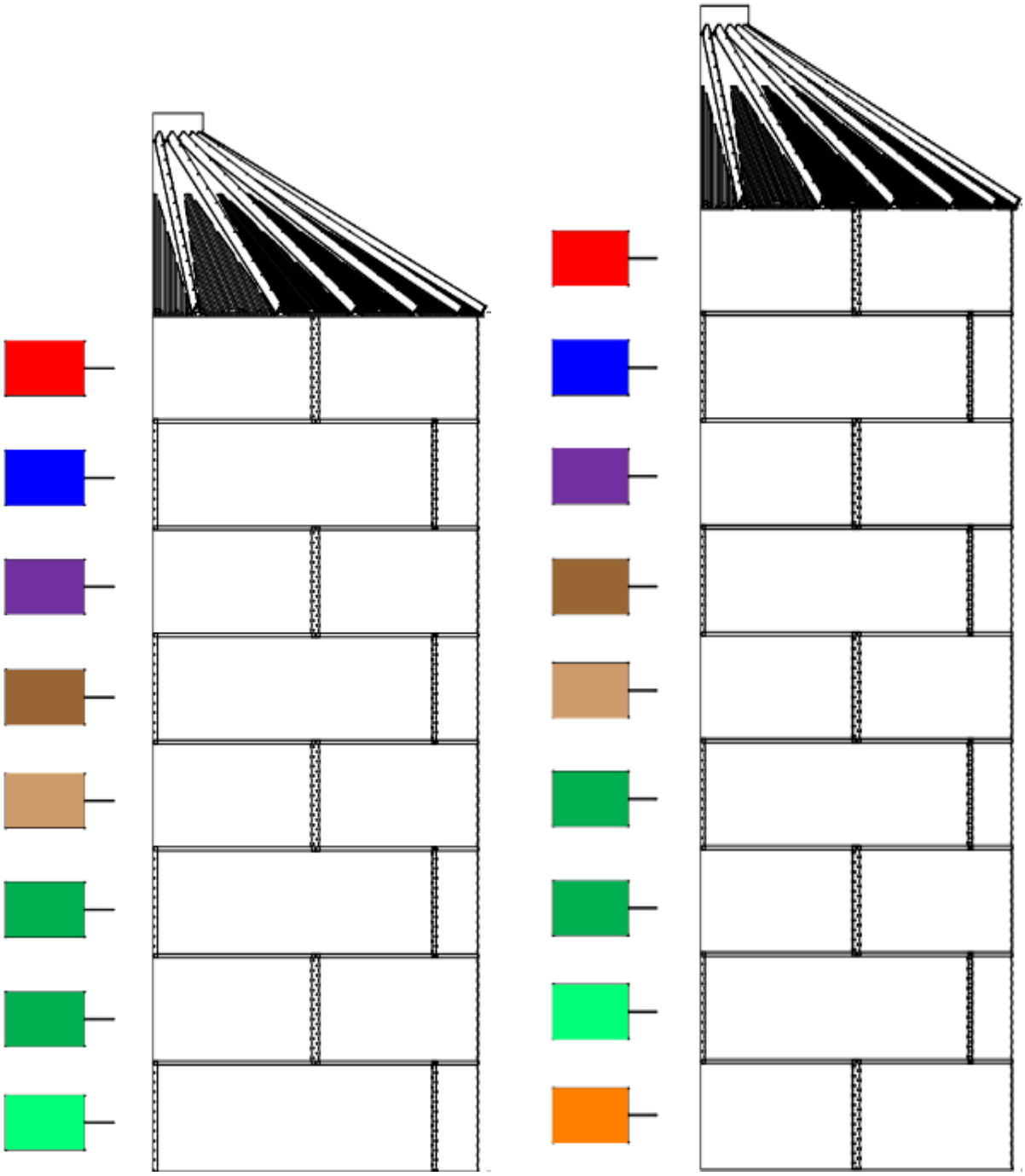
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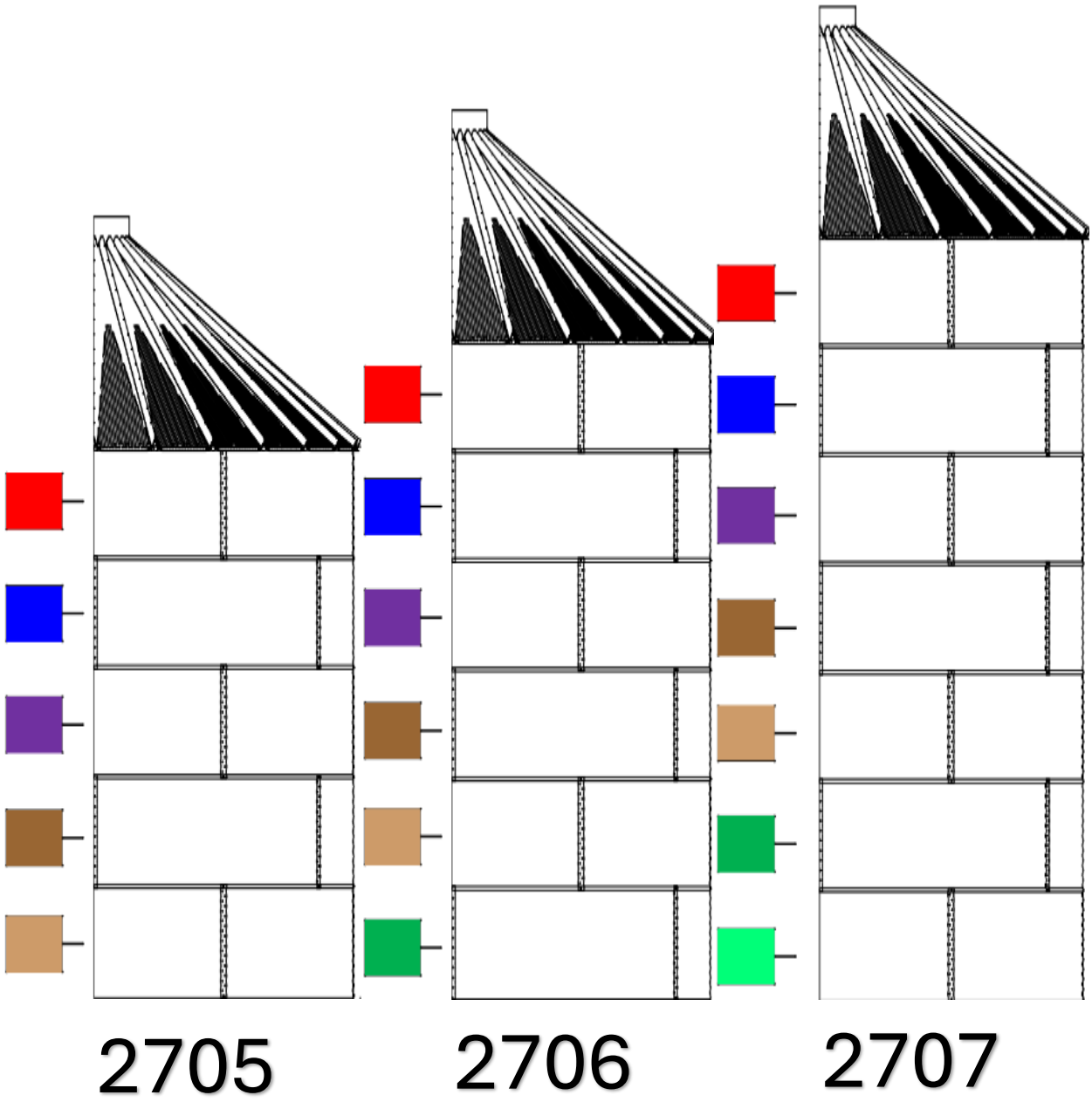
24’ Diameter Bins

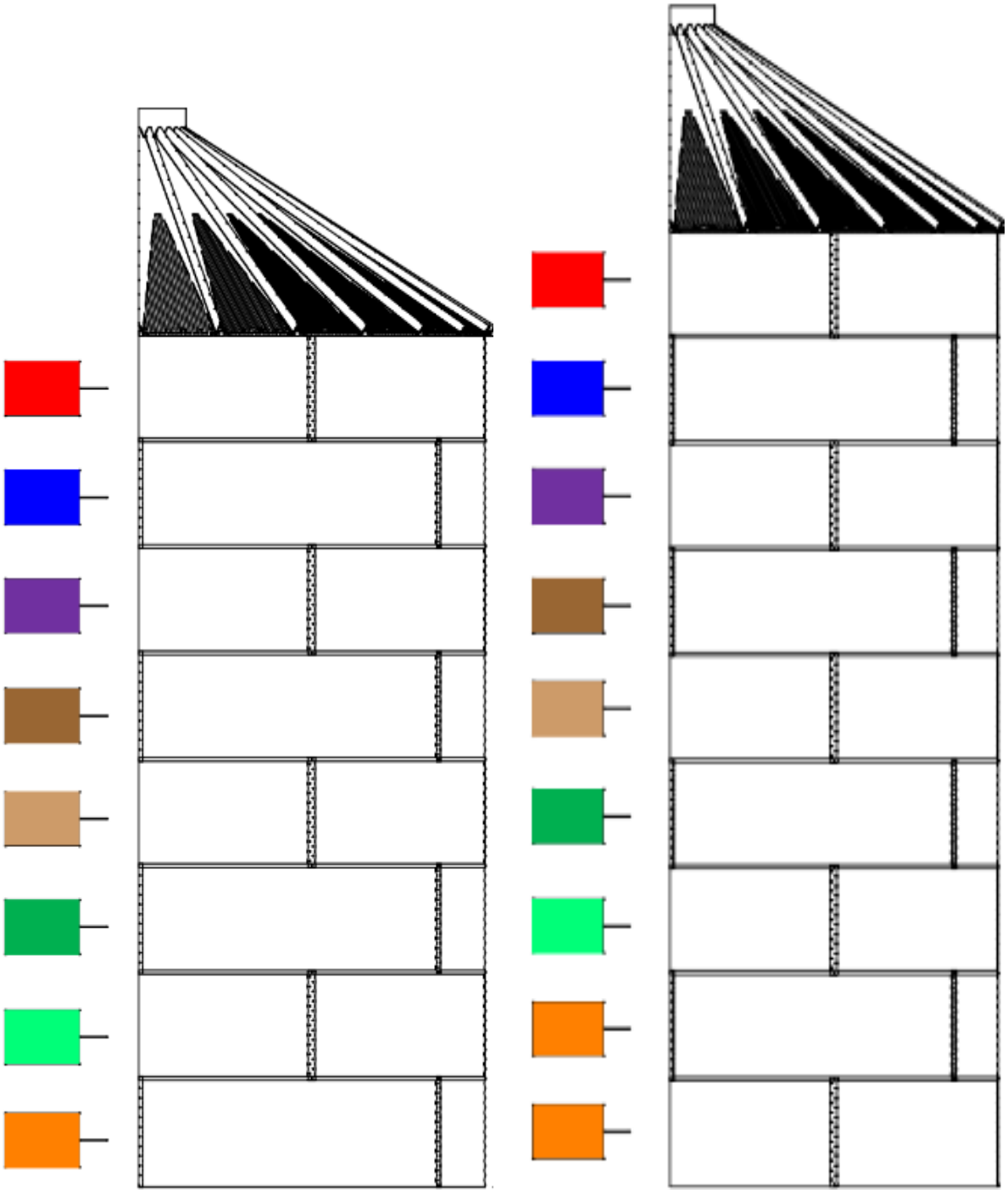




2408 2409

27’ Diameter Bins





2708 2709

Beginning Construction

Once you have read all the safety information and found the diagram representing the bin you are building, you are ready to begin construction.

NOTICE

Instructions provided in this manual are a general basis for the assembly of YLD bins. Due to every assembly site being different, Venlaw cannot provide a specific assembly checklist for each location. Owners/operators are responsible for creating specific procedures based on equipment, conditions and situations at their location.

Tools Needed

YLD grain bins utilize 3/8” fasteners for the entire build, making tool requirements simple. Aside from PPE listed in the safety section, you will need:

- 9/16 wrenches and sockets
- Drill
- 7/16” drill bit
- Impact driver
- Alignment punch
- Hammer
- Bin Lifting Jacks
- Lifting Brackets
- Caulking Gun

Using Bin Lifting Jacks

⚠WARNING

To prevent risk of serious injury or structural damage to the bin, ensure everyone is trained and comfortable using bin jacks. Do not use them in heavy wind conditions and do not exceed the lifting capacity of the bin jacks. Powered bin jacks are recommended.

- The number of lifting jacks and brackets needed varies based on bin size, ground compaction, wind velocity, design of jacks, etc. Always review the jack manufacturers specifications to determine the proper number of jacks needed.
- Ensure you have lifting lugs that match the hole spacing on the bin.
- Use one bin jack per sheet in a ring.
- Connect the bin jacks securely to the vertical seams.
- Lift the bin jacks at an even and slow pace.
- When not actively assembling the bin, lower it to the ground and anchor it when possible, to protect from wind gusts.

Identify Component Locations

Check with the purchaser where they would like certain components to be located as discussed in the site preparation section. This must all be decided before beginning top ring construction. Figure 6 is a suggested standard layout for a YLD bin.

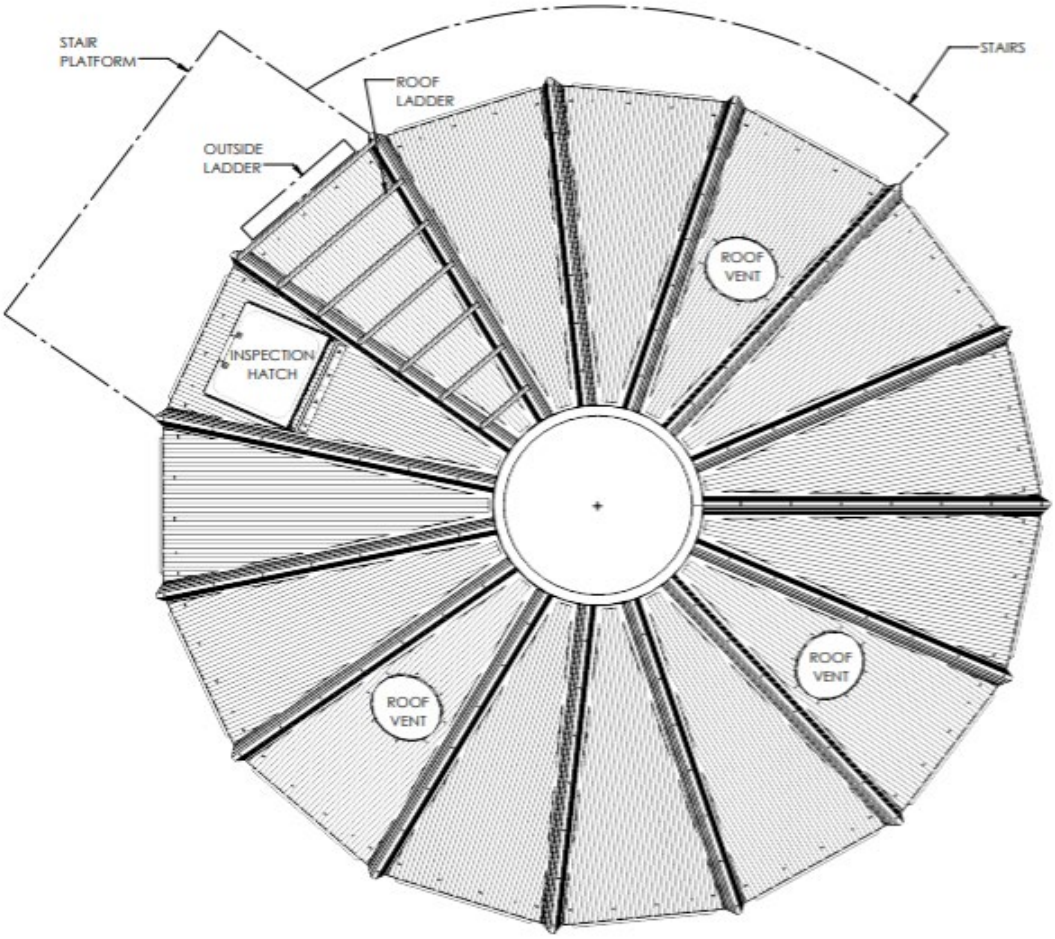


Figure 7

Top Ring Construction

Sidewall Sheet Assembly

Notice

NEVER TIGHTEN ANY BOLTS ON A RING UNTIL THE ENTIRE RING HAS BEEN ASSEMBLED. OTHERWISE, IMPROPER SHEET FITMENT MAY OCCUR.

- **Sidewall sheets can only be assembled one way. The bolt pattern is not reversible. It is very important that all sheets be assembled the same way.**
- **The logo sheet will be stacked in the same direction as all other sheets in the bin package. Use this to tell you which way the bolt pattern will go for the entire build.**
- **Be sure to wipe oil off sheets where caulk must be applied.**

1. Each ring of a bin is color coded with a sticker to represent a specific gauge of steel. Use the diagrams on the previous pages to find the size of bin you are constructing and the specific order of the rings in relation to the color-coded stickers on the sheets. Each bin must be built according to these diagrams to meet the engineering specifications and to ensure warranty is not voided.
2. Start with the logo sheet assembling all top ring sheets together loosely, applying the provided caulk (5) on the outside edge of each vertical seam (inside sheet). Do not put any bolts in the horizontal seam yet.
3. Using alignment punches, maneuver the sheets so you can get bolts in all holes on the vertical seems. Loosely bolt the sheets together by hand using 3/8” x 1” bin bolts (2) and 3/8” hex nuts (3).
4. Once all bolts are in for the whole ring, tighten the top, middle, and bottom bolts of each vertical seam. After that, tighten the rest of the bolts.

See **Figure 8** for top ring assembly.

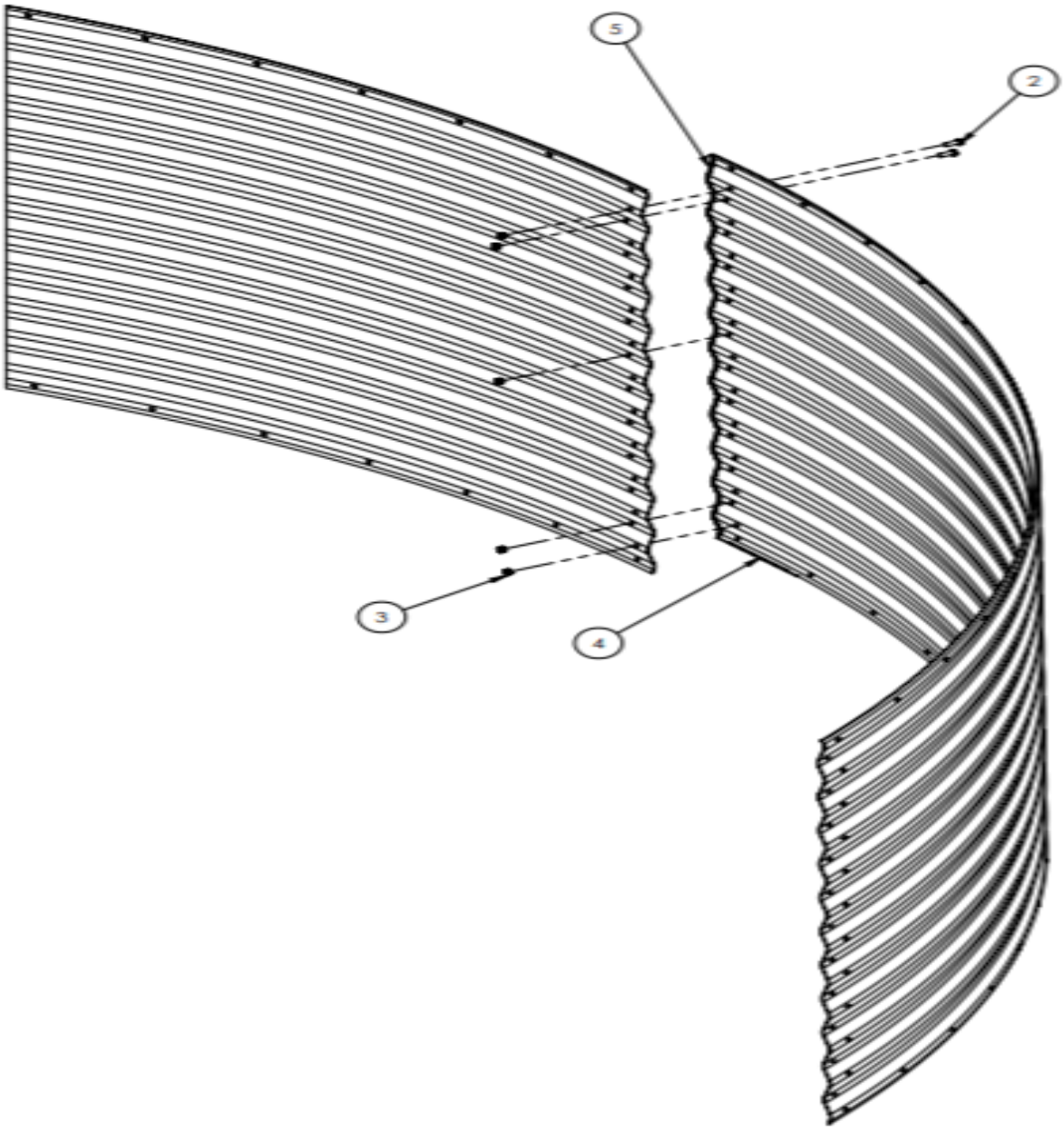


Figure 8 Top Ring Sidewall Assembly

Item No.	Description
2	3/8” x 1’ Bin Bolt
3	3/8” Hex Nut
4	Roll Caulk – 10’

5	Roll Caulk – 57’

Eave Angle Installation

Eave angles are installed on the inside of the top ring sidewall sheets.

1. Start by assembling your first eave angle at the spot where you want your roof ladder and sidewall ladder (or staircase platform) to be. This will ensure that they lineup properly. **Note: The sidewall and roof ladder normally go right beside the inspection hatch. See Figure 4.**
2. Install the eave angles (4) to the top ring using 3/8” x 1” bin bolts (2) and 3/8” hex nuts (3).
3. Each piece of eave angle you add must overlap the previous piece, sharing a bolt at the overlap. YLD Eave angles are notched to fit together perfectly when tightened.
4. Once they have all been installed, ensure all bird clips are at a 90 degree angle to the eave angle, closing off the opening in the roof panel ribs.

See **Figure 9** for eave angle assembly.

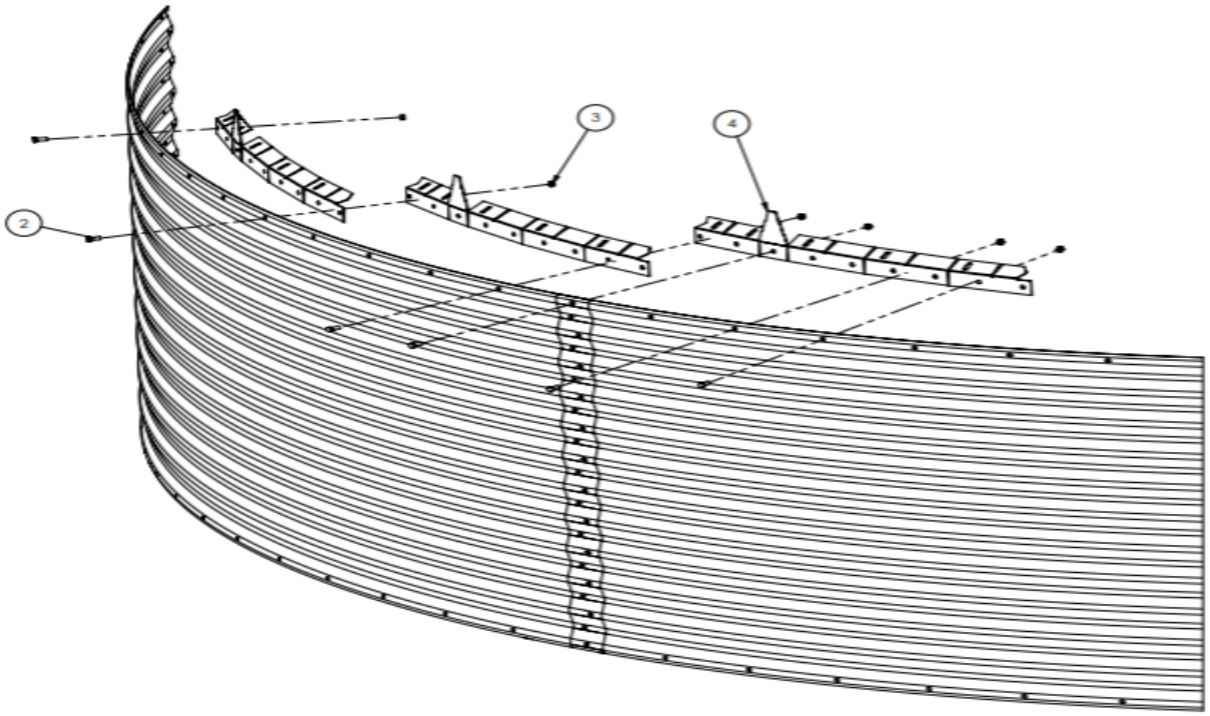


Figure 9 Eave Angle Installation

Item No.	Description
1	Wall Panel

2	3/8” x 1” Bin Bolt
3	3/8” Hex Nut
4	Eave Angle

YLD Staircase Installation

(If purchased)

If the customer has purchased a staircase for their YLD bins, you will need to begin the assembly of this while you are working on the top ring.

1. See staircase Installation Manual provided in the staircase crate.

Outside Ladder

1. Always make sure that you plan your ladder position on the bin. Ensure that the sidewall ladder will line up perfectly with the roof ladder and is positioned beside the inspection hatch.
2. On the first ladder section, the top two mounting clips must be moved down to the first hole below the slip-on joint so that it will not be in contact with the overhang of the roof sheets. Mounting clips must be assembled with the flat side facing in.
3. Bolt the top two clips to the ladder in the spot specified in step 2 using 3/8” x 1” hex bolts (2) and 3/8” hex nuts (3). The top two mounting clips will only have one bolt from the ladder to the bracket because it has been moved down. Do not drill holes or bolt to the bin yet.
4. Assemble the left and right transition rungs (7 & 8). (These are left and right specific). Bolt the bottom sides to the top two holes of the ladder using 3/8” x 1” hex bolts (2) and 3/8” hex nuts (3). The top side of the transition rungs will bolt to the bottom holes on the roof ribs **underneath the first roof rung. See figure 10.**
5. Put a 3/8” x 1” hex bolt through the first roof rung (the longest one) then through the transition rungs, then through the roof ribs. Tighten with 3/8” hex nuts (3). Ensure roof rungs are mounted open-side down so they won’t hold water.
6. Now that the top of the ladder is secured and positioned correctly, drill a 7/16” hole in the sidewall of the bin through the top two mounting clips from step 3. Secure the brackets to the bin with 3/8” x 1” hex bolts (2) and 3/8” hex nuts (3) and tighten.
7. Once the 2nd ring is assembled Slip the next ladder section up into the first section. Add a mounting clip to each of the joints and bolt on the clips with 3/8” x 1” hex bolts (2) and 3/8” hex nuts (3).
8. Secure these two mounting brackets to the bin using the existing holes on the horizontal seam of rings 1 and 2.
9. Repeat steps 7 and 8 for each ring of the bin.

See **Figures 10, 11, 12** for sidewall ladder assembly.

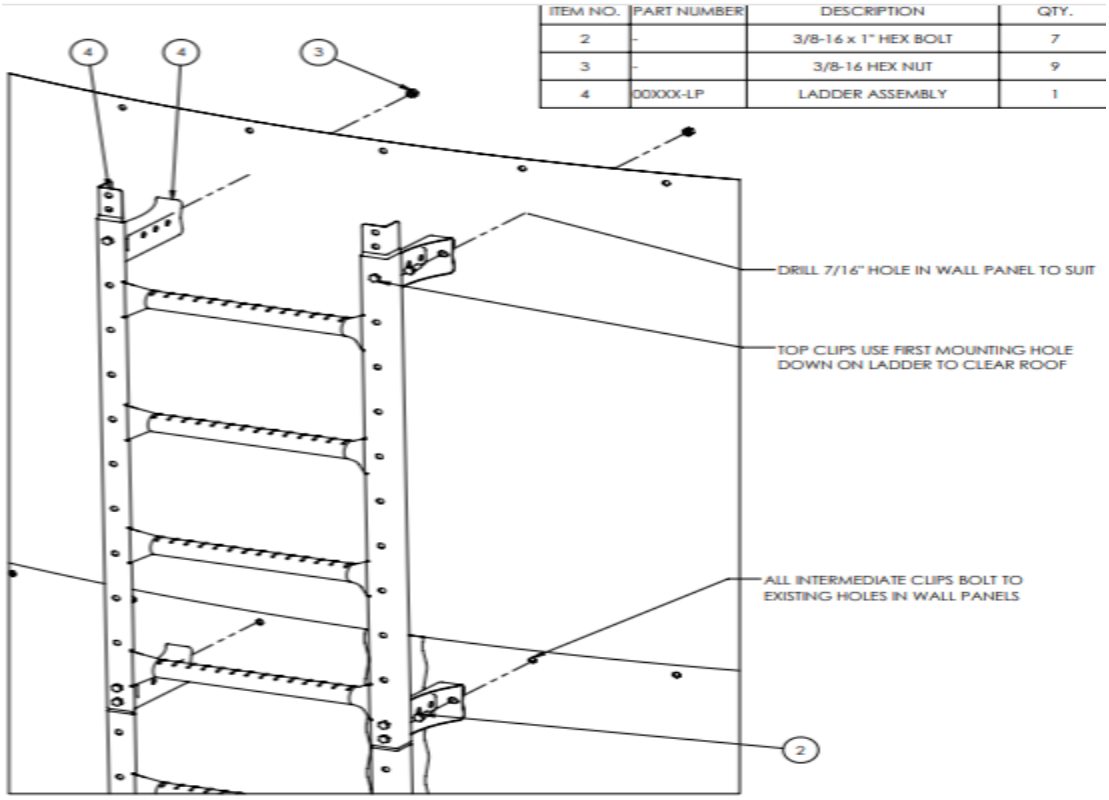


Figure 10 Mounting Sidewall Ladder

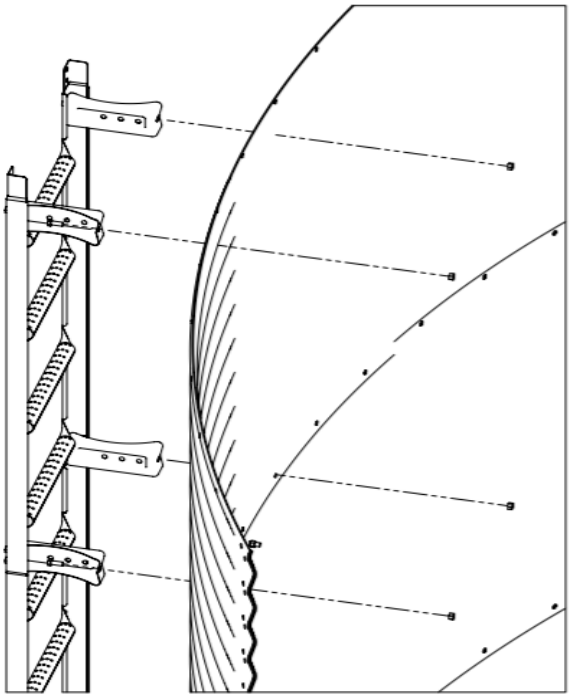


Figure 11 Inside View Sidewall Ladder

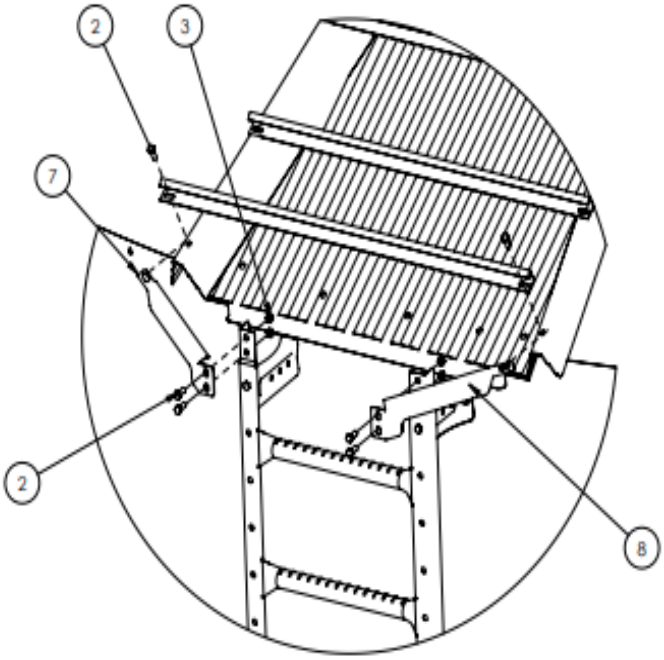


Figure 12 Ladder Transition Rungs

Roof Assembly

Roof Vents Installation

NOTICE

Roof Vents Must be Installed Prior to Beginning Roof Assembly. This is crucial to ensuring the roof sheets do not get bent or mis-shaped.

1. Apply a strip of roll caulk around the pre-punched vent hole in the roof sheet.
2. Lay the vent down on top of the pre-punched vent hole in the roof sheet, lining the bolt holes up as you set it down.
3. Put 3/8” x 1” bin bolts (3) in all the bolt holes and secure them using 3/8” serrated Flange Nuts (4). Tighten down until tight and caulk has been squished all the way around.

See **Figure 13.**

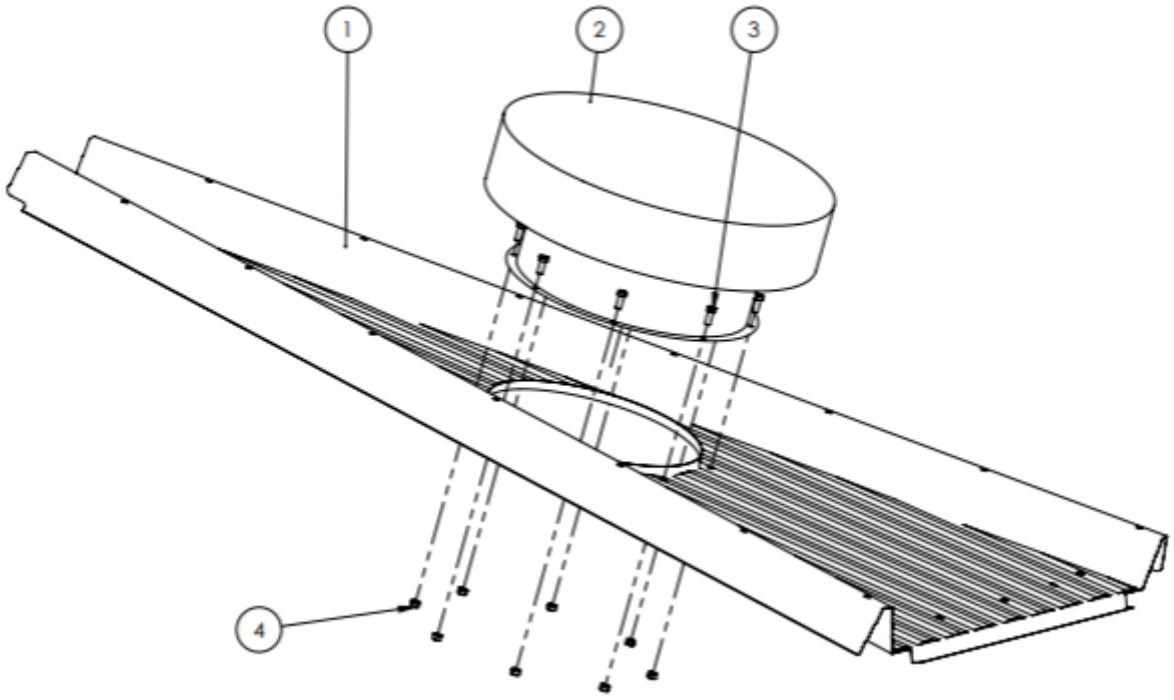


Figure 13 Roof Vents Installation

Item No.	Description
1	Roof Panel
2	Roof Vent
3	3/8” x 1” Bin Bolt
4	3/8” Serrated Flange Nut

Apply Peak Ring Seal

1. Apply the peak ring seal to the peak ring just above where the top of the roof panels bolt to the peak ring. **Leave ¾” of space above where the roof panels sit on the peak ring. If this is not done, the top of the roof panels will not be sealed.**
2. When installing the roof panels, they will butt into the foam seal, sealing the roof rib opening at the peak ring.



Figure 14 Peak Ring Foam Seal Application

Peak Ring Height

1. Refer to the table to find the proper peak ring height to start assembling the roof. (height is from the bottom of the top ring to the bottom of the peak ring.
2. Using an adjustable center tower, raise the peak ring to the proper height as found in the table.
3. Support the peak ring in 4 locations to prevent shifting during construction.

Diameter	Height
18’	7’ 11”
21’	8’ 9”
24’	9’ 8”
27’	10’ 6”

See **Figure 15.**

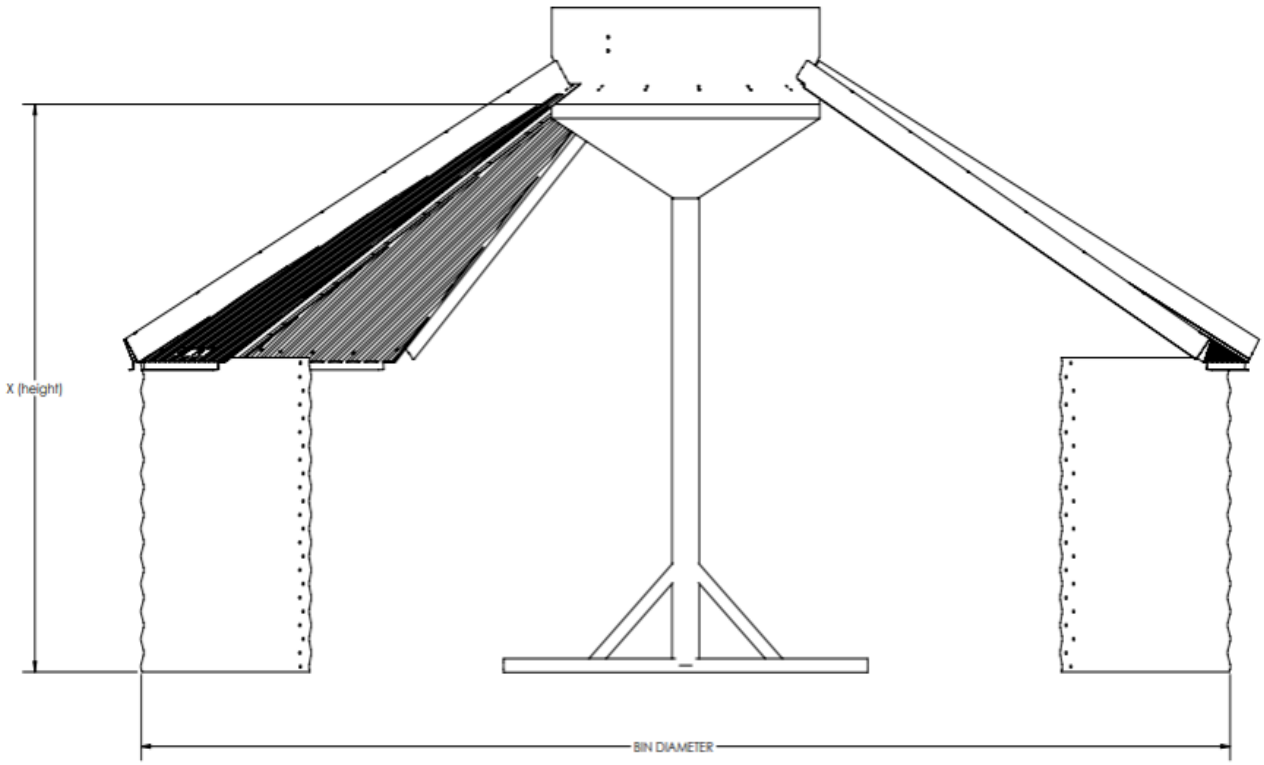


Figure 15 Peak Ring Heights

Identify Vent, Inspection hatch, and Roof Ladder locations

Double check the site plan to ensure you build the roof with all components in the proper placement according to the purchasers wants/needs.

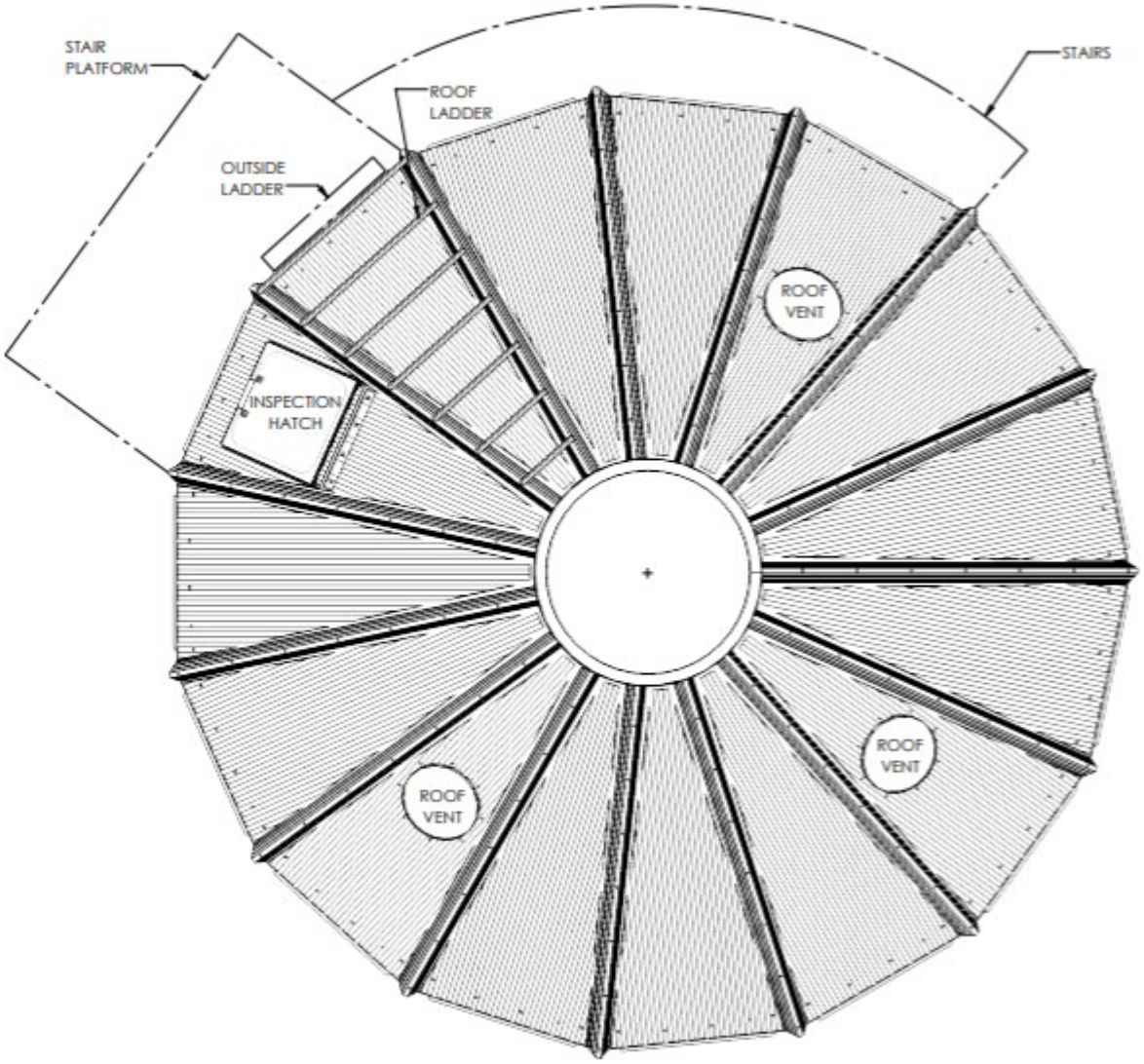


Figure 16 Example Layout for Vents, Ladder/Staircase, Inspection Hatch

Roof Panel Installation

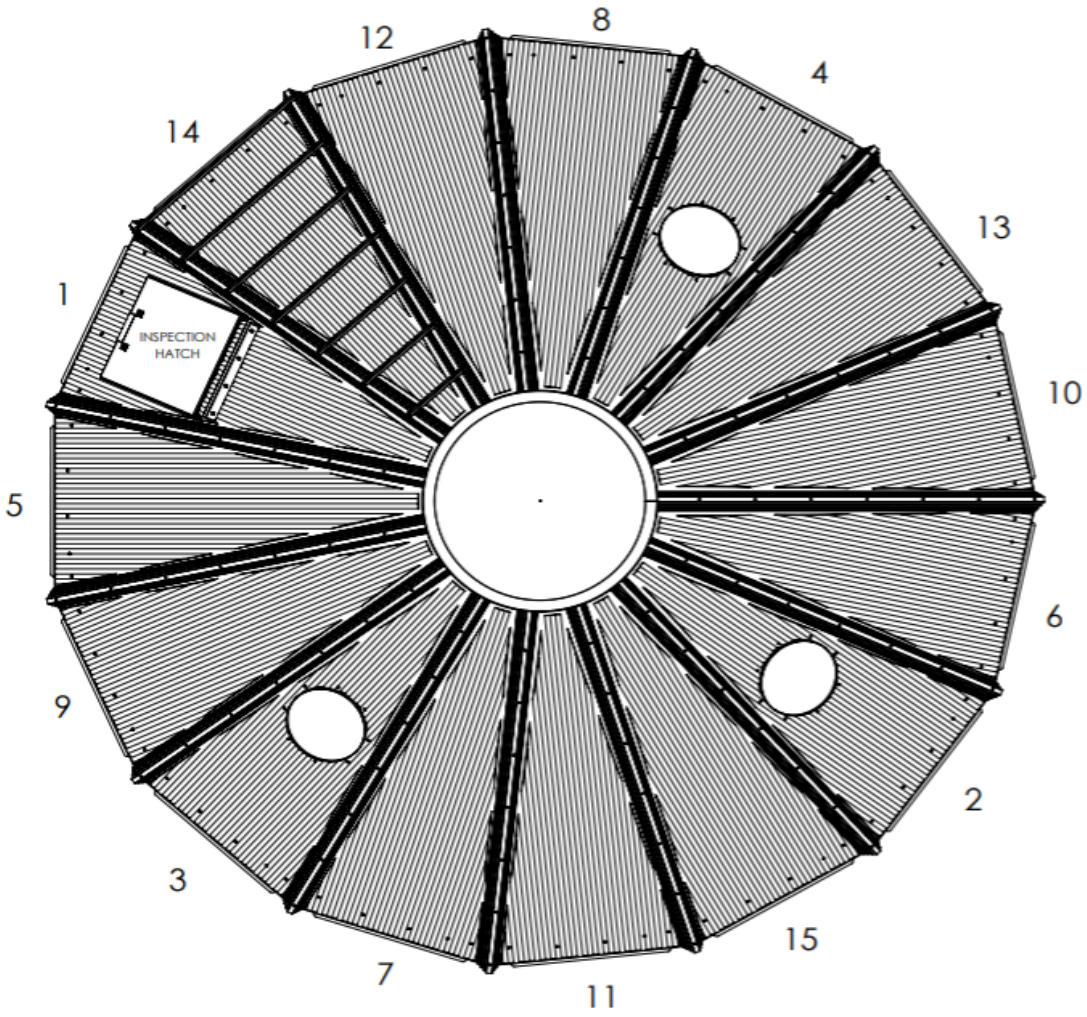


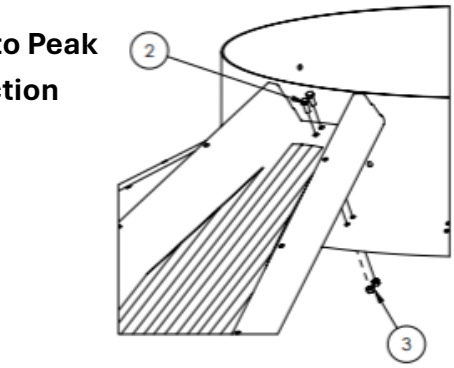
Figure 17 Order of Installation for building the Roof.

WARNING

It is important that the roof is quartered and installed in a counter clockwise manner to keep the weight balanced during building. Failure to do so may result in improper roof fitment, structural damage or roof collapse.

1. Start with the inspection hatch panel (panel 1), slide the panel up into the peak ring foam seal and loosely bolt the top to the peak ring using 3/8” x 1-1/2” bin bolt (2) and 3/8” hex nuts.
2. Loosely bolt the bottom of the inspection hatch panel to the eave angles that are already attached to the top ring. Use the same bolts and nuts as in step 1.
3. Install the Vent panels next (if using vents) in a way that quarters the roof. (Install 2nd panel directly across from the 1st and then the 3rd and 4th across from each other half ways between the 1st and 2nd.
4. Continue adding the remaining panels counterclockwise in the same pattern you installed the first 4 panels. On roof panel overlaps, you must use 3/8” x 1” bin bolts (5) and 3/8” serrated flange nuts.
5. When installing the last panel of each section, be sure to underlap the panel to seal the roof.
6. After all roof panels have been loosely installed, align the top and bottom holes of the roof ribs with a punch and loosely bolt together.
7. Check that the peak ring is still level. Once confirmed, tighten all bolts securing the tops of the roof panels to the peak ring.
8. Tighten all bolts securing the bottoms of the roof panels to the eave angles.
9. Install the roof ladder (instructions in the next section).
10. Bolt and tighten all remaining holes in the roof ribs.

Figure 18 Roof to Peak Ring Connection



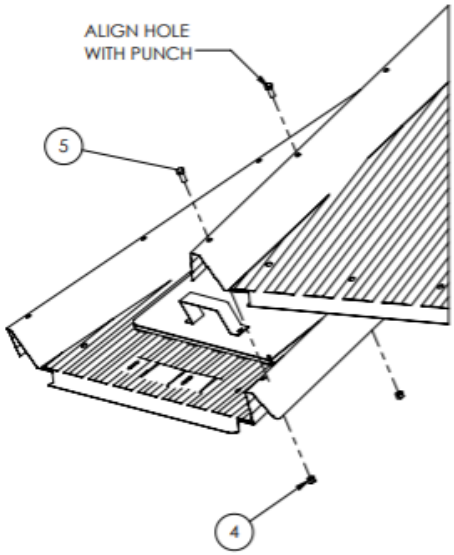


Figure 19 Securing the Roof Ribs

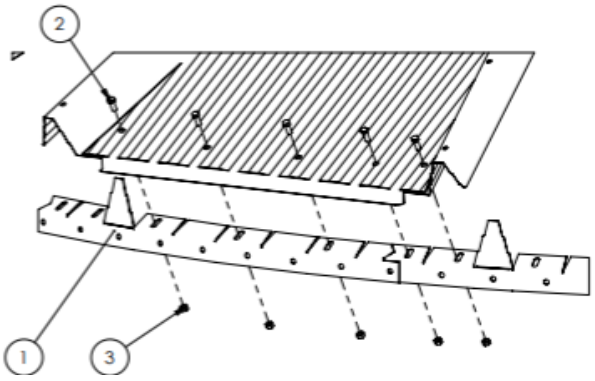


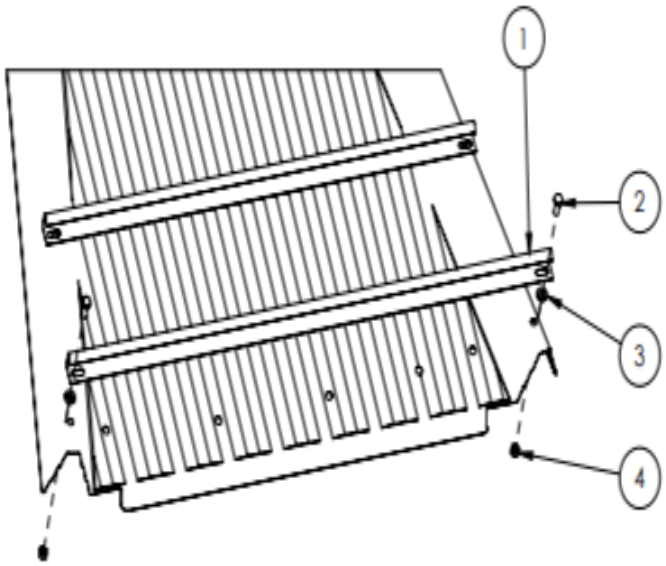
Figure 20 Roof to Eave Angle Connection

Item	Description
1	Eave Angle
2	3/8” x 1-1/2” Bin Bolt
3	3/8” Hex Nut
4	3/8” Serrated Flange Nut
5	3/8” x 1” Bin Bolt

Roof Ladder Installation

The diameter of the bin will determine how many roof steps are needed for the bins roof. The longest step goes at the bottom, with the steps progressively getting smaller as you go up.

1. Place a 3/8” x 1-1/2” bin bolt (2) through each end of the step and then place a vinyl washer (3) onto the bolt **under** the step (1).
2. Insert the bolts into the roof rib holes and secure from the underside with 3/8” serrated flange nuts (4).



Item No.	Description
1	Roof Step
2	3/8” x 1-1/2” Bin Bolt
3	Vinyl Washer
4	3/8” Serrated Flange Nut

Figure 21 Roof Steps Installation

Wind Ring Installation

(Optional on Hopper Bins)

The size of the bin will determine the number of brackets, the roof ring pipes required, and install location. It is important that these steps are followed to avoid damage to the bin.

1. The lower half of the roof ring bracket should be installed on the roof panels during roof panel installation, at the location indicated in the Wind Ring Chart, below. Roof ring brackets should be attached to every roof rib using two 3/8”x1” bolts and 3/8” serrated flange nuts. (figure 22)

2. Begin wind ring installation by setting a Roof Ring Pipe into the saddles provide by the roof ring brackets, with one end of the pipe roughly centered on a roof panel.

3. Continue by setting another Roof Ring Pipe into the saddles. Install an expansion bolt between the two pipes as shown in Figure 23, with the expansion nut placed as far as possible onto the bolt (second image). **Do not expand the expansion bolt yet.**

4. Repeat step 3 for the remaining Roof Ring Pipes. The last pipe installed will need to be trimmed to suit (figure 22)

5. Loosely secure the Roof Ring Pipes by attaching the top half of the roof ring bracket to all the brackets the Pipes are sitting in, using two 3/8”x1” bolts and 3/8” serrated flange nuts. **Do not tighten these bolts yet.**

6. Once all Roof Ring Pipes have been installed, with expansion bolts at every joint. Expand the expansion joints evenly by turning the nuts on the expansion bolts, until there is a slight arc in the roof ribs. (figure 23)

7. Lock the expansion bolts by inserting and tightening a 3/8”x1” bolt (locking bolt) in the provided hole in the expansion nut. (figure 23)

8. Tighten all roof ring brackets by pushing down on the upper end of the top bracket piece to clamp the pipe in place while tightening the upper 3/8” bolt. Then tighten the lower bolt.

9. Confirm that lock bolts are in place and tighten all expansion bolts.

WARNING

- **OFFSET ALL WIND RING JOINTS BY TWO OR MORE ROOF PANELS**
- **DO NOT POSITION TEMPERATURE CABLE SUPPORTS ON A ROOF SHEET THAT HAS A ROOF RING JOINT**
- **DO NOT POSITION ROOF RING JOINTS ON A ROOF SHEET THAT HAS A LADDER RUNG**
- **DO NOT POSITION MORE THAN ONE ROOF RING JOINT ON THE SAME ROOF SHEET**

Bin Size	18'	21'	24'	27'
Ring Pipe Qty	4	5	5	6
Pipe Chord Length (in)	96	102.5	110	102
Bracket Hole Location	5	5	6	7
Bracket Qty	18	21	24	27
Expansion Bolt Qty	4	5	5	6

Wind Ring Chart - bracket hole location is counted from the bottom of the roof sheet and indicates where the bottom of the bracket is mounted

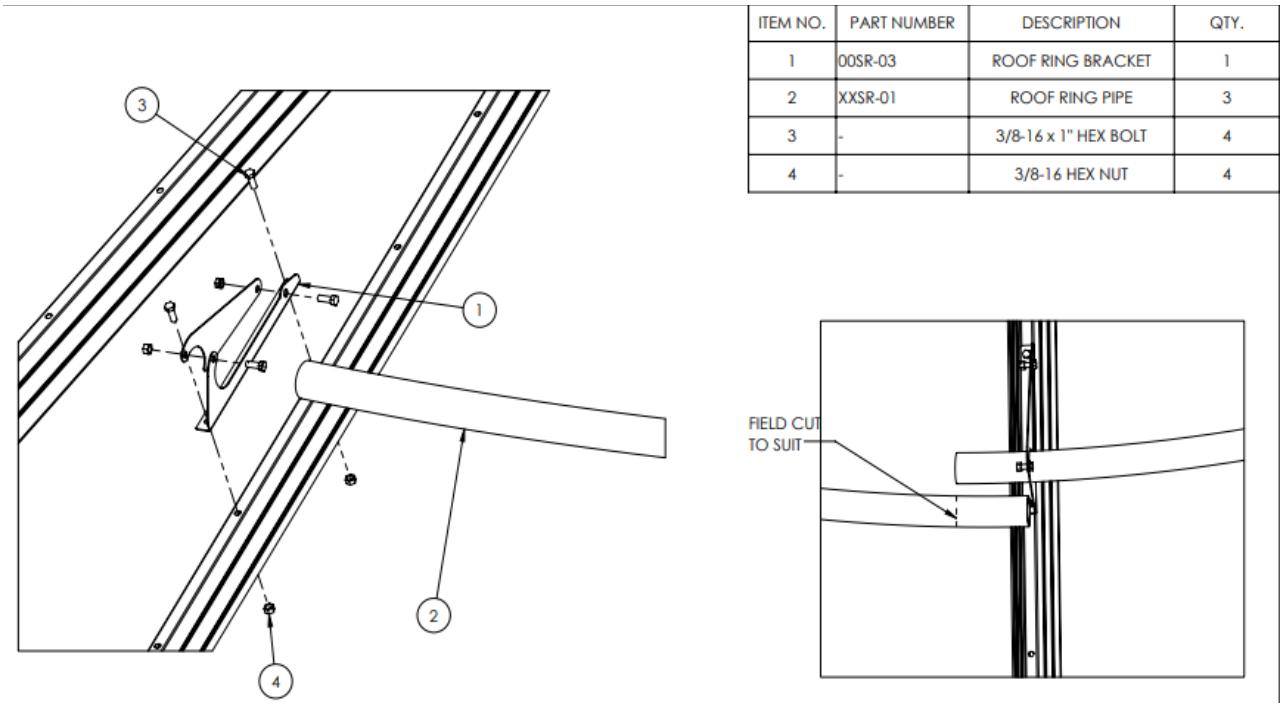


Figure 22 Wind Ring Installation to Roof

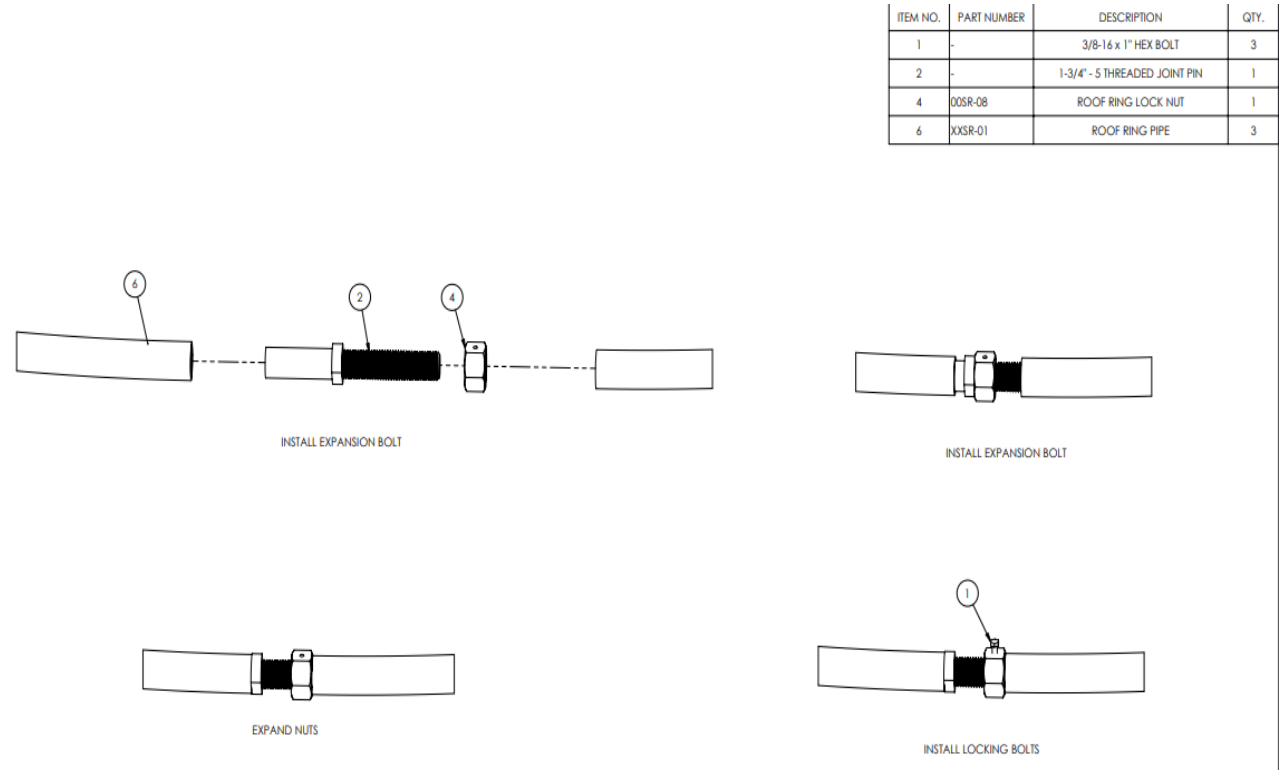


Figure 23 Connect Wind Ring Pipes Together

Peak Lid Installation

1. Place the springs on both the left and right spring arms as shown in **Figure 21**, hooking the springs (8) on the Hinge Mounts (3) before inserting the arms into the springs. Do not yet hook the springs on the arms. Secure the arms to the hinge mounts using 3/8” x 1-1/2” bin bolts (2).
2. Insert the bolts into the roof rib holes and secure from the underside with 3/8” serrated flange nuts (4).
3. Fasten Hinge Mounts (3 & 7) to peak ring using 3/8” x 1” bin bolts (2) and 3/8” nuts (1) as shown in Figure 22. Note that the hinge mounts are asymmetric and must be used on the sides shown.
4. Attach the Plastic Slider (6) to the peak ring using 3/8” x 1” bin bolts (2) and 3/8” nuts (1) as shown in Figure 22.
5. Attach the Lid Hinge Mounts to the spring arms using 3/8” x 1” bin bolts (2) as shown in **Figure 23** detail A**. You must remove the neoprene washer from the bolt before inserting the bolt.** Note that the mounts are not symmetrical and must be used on the correct side with LD06 on the left and LD16 on the right.
6. The Lid may now be placed between the Lid Hinge Mounts and the peak ring as shown and the Lid Hinge Mounts may be bolted to the lid using 3/8” x 1” bin bolts (2) and 3/8” nuts (1).
7. Fasten the arm to the lid using five 3/8” x 1” bin bolts (2) and 3/8” nuts (1).
8. Using a pry bar or similar tool the springs can now be hooked over the top of the spring arms. Use caution during this step not to place any body part where the spring might contact if it slips off the prying tool.
9. As shown in **Figure 24** use the 3/8” x 3” bolts to assemble the Eave Pulley and mount the Lid Wheel.
10. Loop the wire rope over the provided thimble (7) and use a wire rope clamp (8) to form a loop of wire rope around the thimble. Tighten the clamp. The third 3” bolt should be threaded through the lid arm and thimble to connect the wire rope to the lid. See **Figure 23** detail B.
11. Secure the loop again with a second wire rope clamp.
12. Thread the wire rope over top of the Eave Pulley and through the slotted hole in the eave pulley assembly.

13. Using a ½" drill bit, drill a hole in the roof panel that aligns with the lid arm. The hole should be centered on the roof panel between the bin sidewall and the eave of the roof panel (**Figure 25 & 26).**
14. Thread the wire rope through this drilled hole.
15. Using the pulley base as a template drill holes and mount the pulley so that the slotted hole is centered over the drilled hole. Use 3/8" x 1" bin bolts and hex nuts for this.
16. Mount the winch using the provided **self-tapping screws** directly below the pulley at the desired elevation upon completion of the bin.
17. Using provided instructions from the winch manufacturer secure the wire rope to the winch.
18. Open the lid using the winch to the desired opening point. The remaining wire rope clamp should be clamped to the rope directly above the winch. This will act as a stopper so that the winch cannot be overtightened damaging the lid or roof.

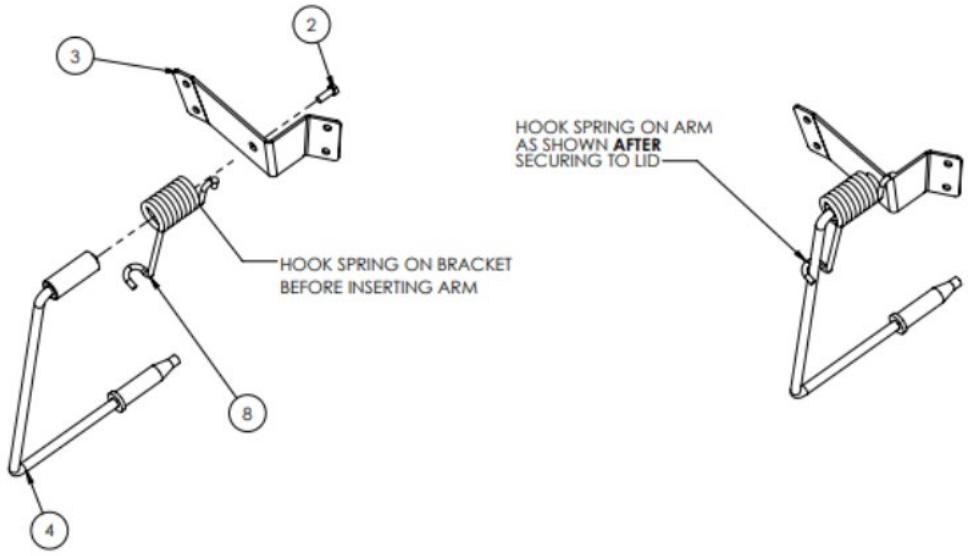
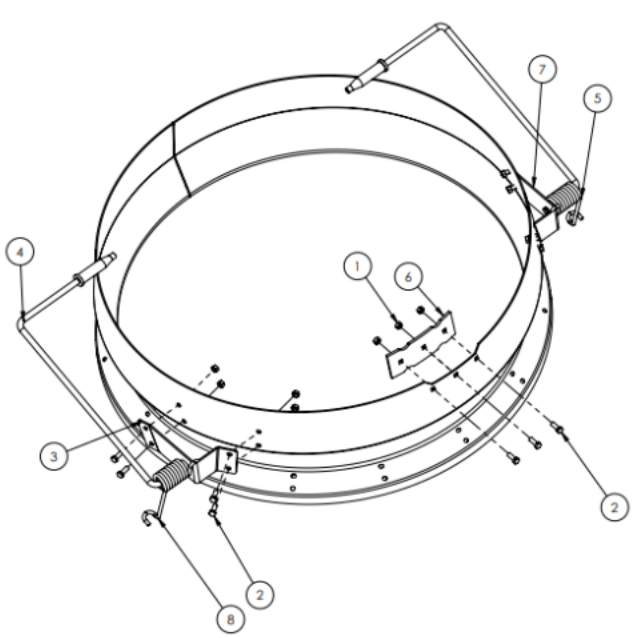
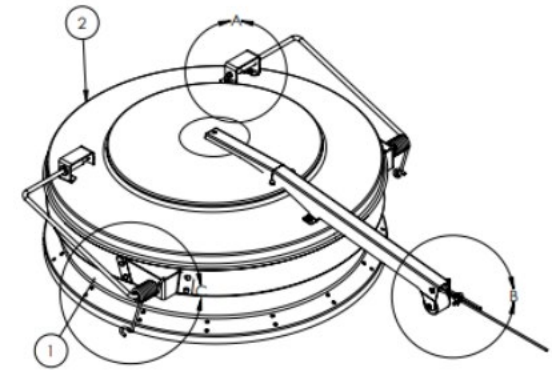


Figure 21

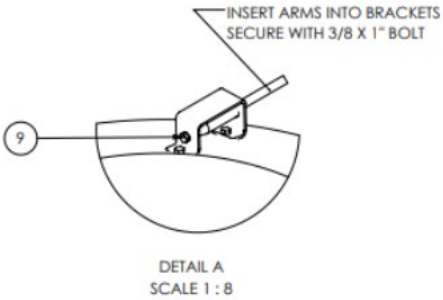


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	3_8-16 HEX NUT-manuals	3/8-16 HEX NUT	11
2	3_8-16x1 BOLT-manuals	3/8-16 x 1" HEX BOLT	13
3	LD01	HINGE MOUNT	1
4	LD02	HINGE BAR	2
5	LD03	SPRING RIGHT	1
6	LD13	PLASTIC SLIDER	1
7	LD14	HINGE MOUNT	1
8	LD15	SPRING LEFT	1

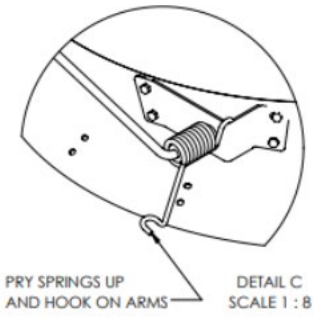
Figure 22



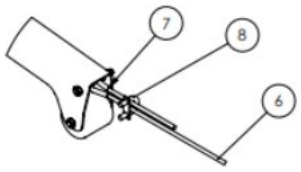
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	00LD01		1
2	00LD02		1
3	00LD03		1
6	1_4 ROPE	1/4" WIRE ROPE	1
7	1_4 THIMB	1/4" WIRE ROPE THIMBLE	1
8	1_4 CLAMP	1/4" WIRE ROPE CLAMP	1
9	3_8-16x1 BOLT-manuals	3/8-16 x 1" HEX BOLT	2



DETAIL A
SCALE 1 : 8



DETAIL C
SCALE 1 : 8



DETAIL B
SCALE 1 : 8

Figure 23

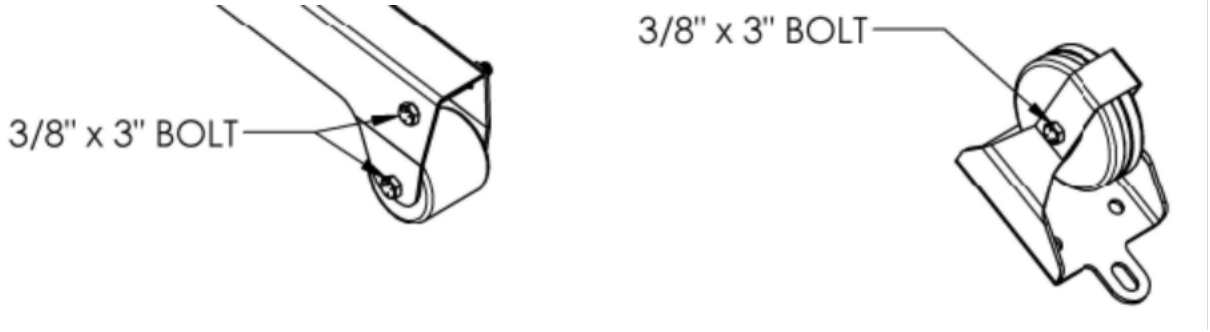


Figure 24

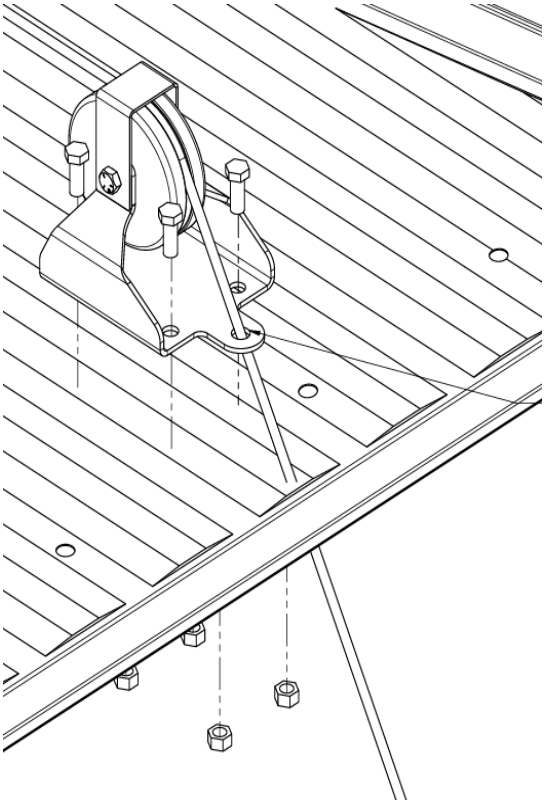


Figure 25

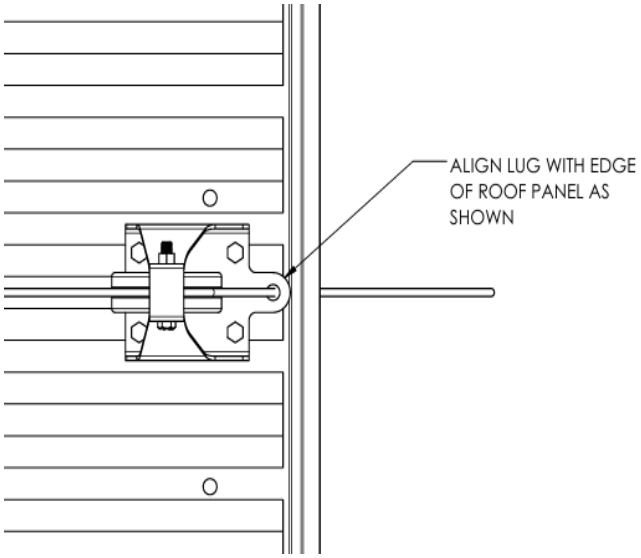


Figure 26

Inspection Hatch Cover Assembly & Installation

Refer to **figure 27.**

Assembly

1. Lay the inspection hatch Lid (7) on a flat surface.
2. Put a 3/8” x 1” bolt (4) through each side of the handle and through the lid.
3. Put 3/8” hex nuts (3) on the handle bolts inside of the cover and tighten.
4. Line the inspection hatch lid (7) tabs up with the hinge (5) tabs and put a 3/8” x 1” bolt (4) on either side then fasten with two 3/8” hex nuts (3) on each side. The double nut allows the bolt to be secured while not over-tightening the hinge.

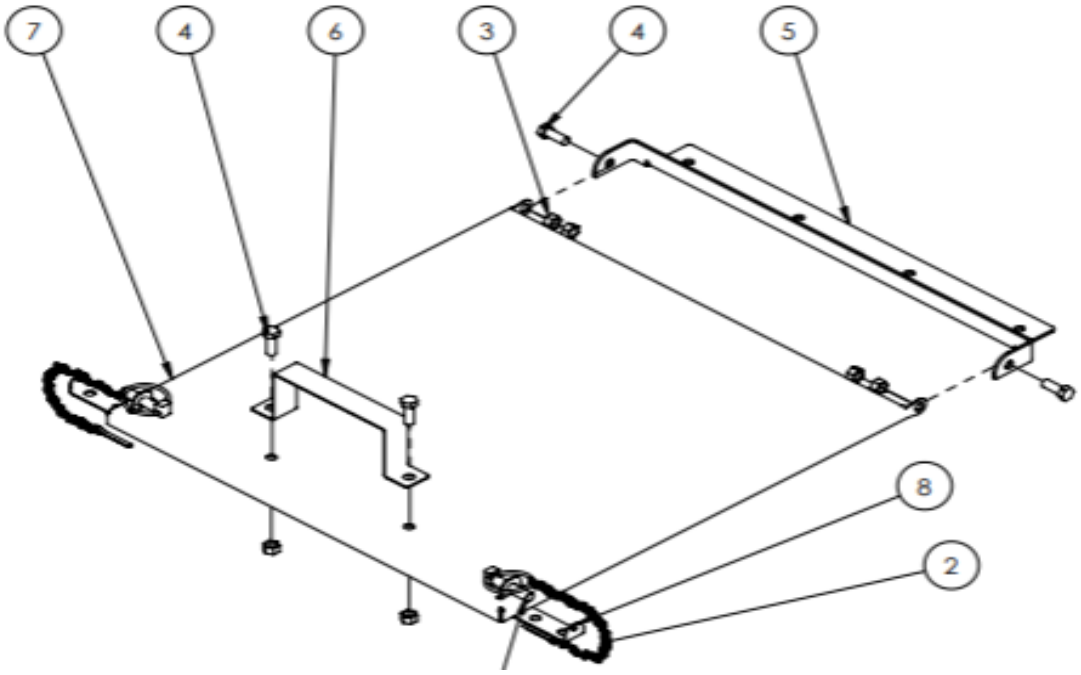


Figure 27 Inspection Hatch Cover Assembly

Item No.	Description
1	Rubber Push-On Seal
2	Steel Linch Pin
3	3/8” Hex Nut
4	3/8” x 1” Hex Bolt
5	Hinge
6	Hatch Handle
7	Hatch Lid
8	Latch Pin Plate

Installation

Refer to **Figure 28.**

1. On the roof panel with the precut hole for the inspection hatch, apply the inspection hatch push on seal (1) around the hole with the seam at the bottom of the hole.
2. Bolt the latch pin plates to the roof sheet using 3/8” x 1” hex bolts and 3/8” hex nuts.
3. Place the assembled inspection hatch cover over the inspection hatch hole. Make sure the cover is seated properly with the gasket.
4. Place a strip of roll caulking under the top side of the hinge. This will seal the hinge and divert water to the outside.
5. Insert 3/8” x 1” bolts (4) through the hinge into the precut holes on the roof panel.
6. From underneath, secure the hinge bolts with 3/8” serrated flange nuts (3).
7. Insert a linch pin (2) into each latch pin plate (8) to latch it shut.

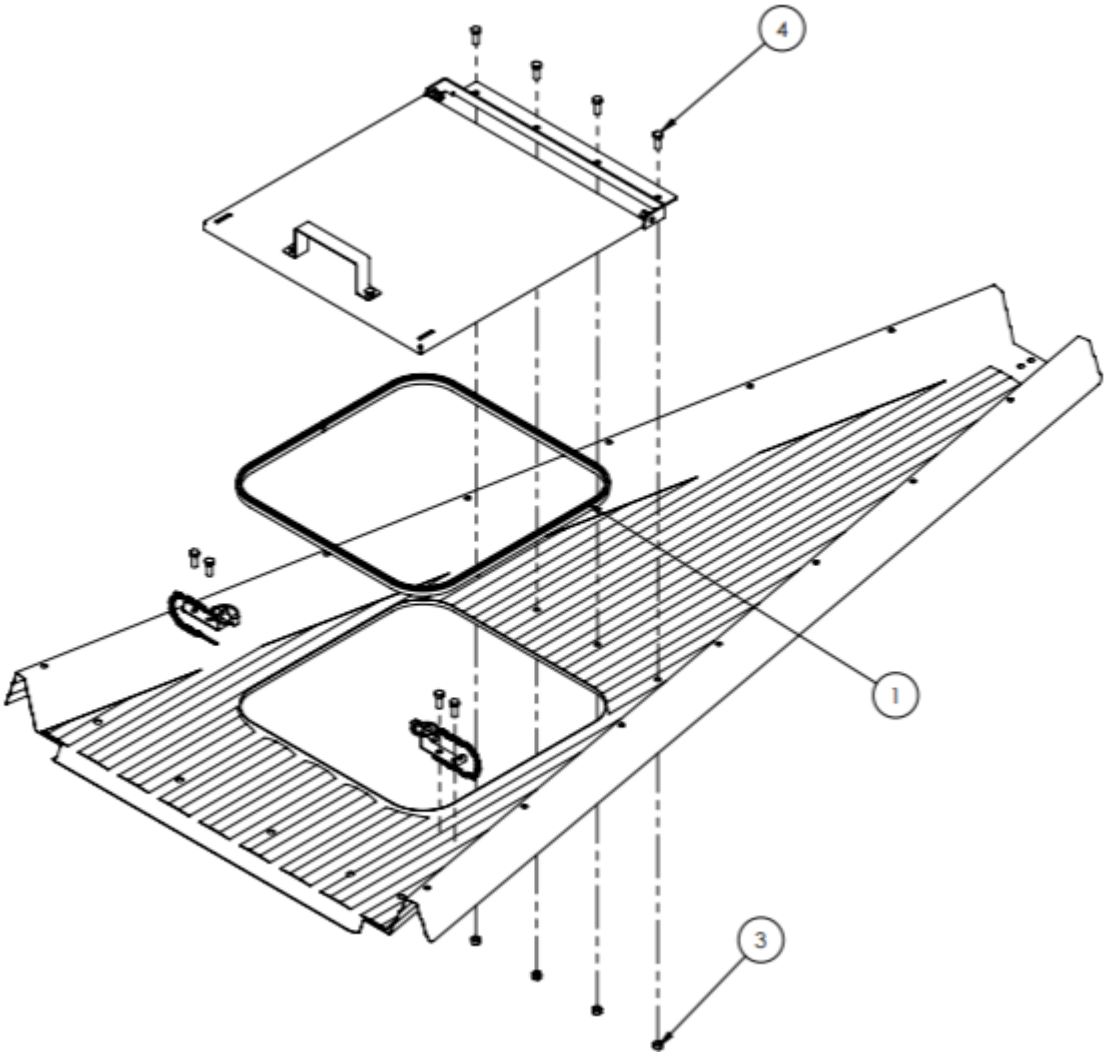


Figure 28 Inspection Hatch Installation

Sidewall Sheet Assembly

There is no top or bottom to sidewall sheets (except the YLD Logo sheet). Assemble the rings clockwise or counterclockwise with the caulking to the inside. **Whichever direction you assemble the top ring is the direction you must assemble all following rings.** All vertical overlaps on alternating rings must be the same.

1. Wipe oil off sheets where the caulking is to be applied.
2. Apply a 7” piece of roll caulking (1) from the vertical seam clockwise and from the middle of the sheet counterclockwise.
3. Using alignment punches, loosely bolt the sheets together by hand using 3/8” x 1” bin bolts (2) and 3/8” hex nuts (3). Start by placing bolts in the top, middle and bottom sections of the vertical seam and several along the horizontal seam to

secure the sidewall to sheet before putting the rest of the bolts along the seams. Do not tighten bolts yet.

4. Once all sidewall sheets have been loosely assembled to form a ring, tighten the bolts as follows:
    i. Start with vertical seams. Tighten the top, middle and bottom bolts first.
    ii. Tighten all bolts on the horizontal seams.
    iii. Tighten remaining bolts in the vertical seams.

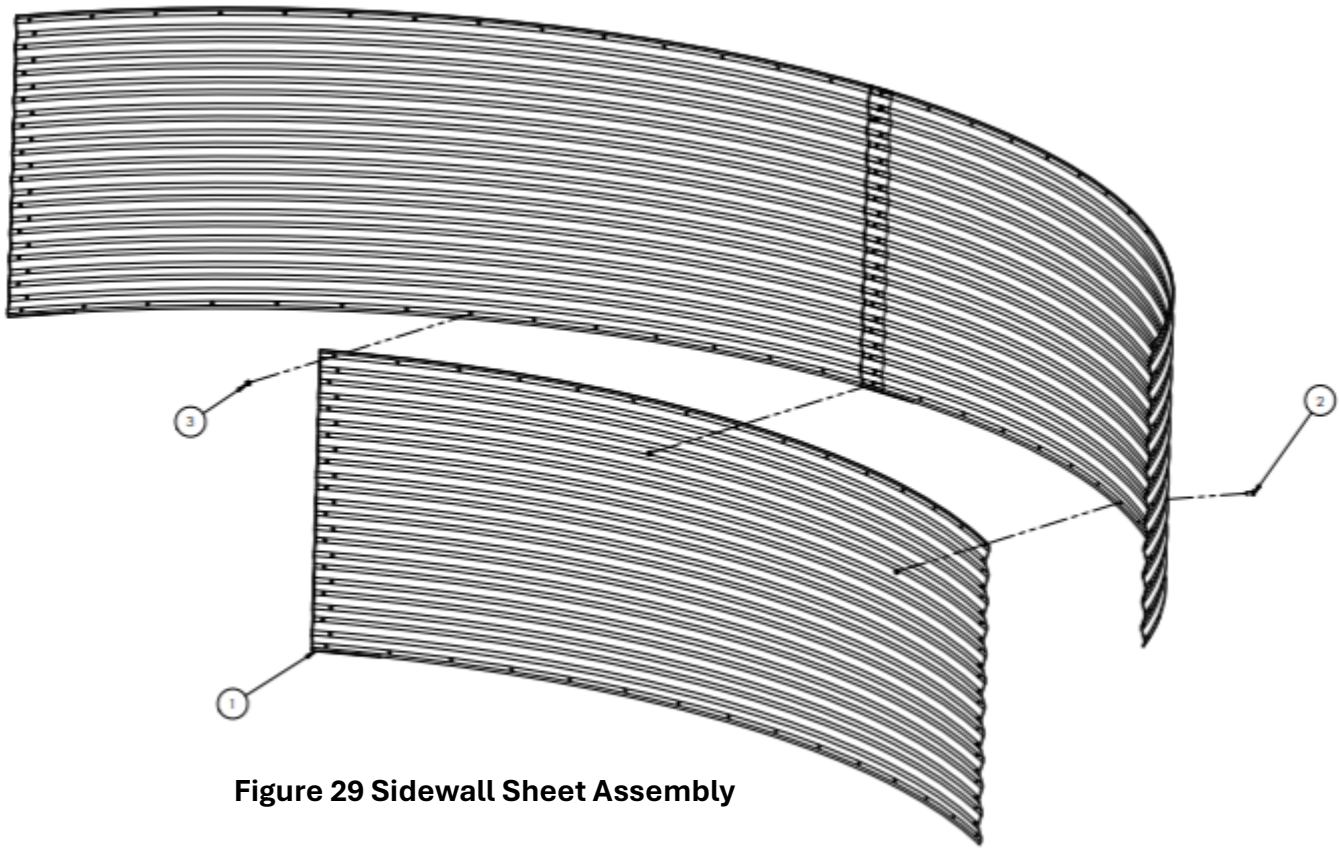


Figure 29 Sidewall Sheet Assembly

Item No.	Description
1	Roll Caulking
2	3/8” x 1” Bin Bolt
3	3/8” Hex Nut