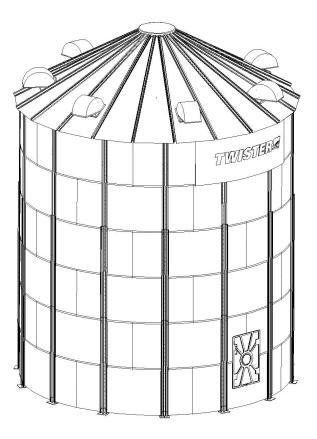


27' - 42' Grain Bins (Twister Domestic)

Wide-Corr® Centurion® Grain Bin Installation and Storage Instructions





Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: 198891 R17 Revised: May, 2025 Original Instructions The following changes have been made in this revision of the manual:

| Description | Section |
|-------------|--|
| New section | Section 5.8.1 – Base Assembly 233013 (WITHOUT Laminate Sections) on page 47 |
| Updated | Section 6.5 – Wall Sheet and Upright Layouts - CEN Series on page 63 |
| Updated | Section 7.1 – CEN Common Parts Box Listing (5 – 9 Tier Bins) on page 67 |
| Updated | Section 7.4 – CEN Non-Common Pail & Parts Box Listing (10 – 12 Tier Bins) on page 71 |
| Updated | Section 7.6 – Parts Identification (Bin) - Parts Box on page 73 |

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1. Introduction

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly of this AGI 27' - 42' Grain Bins.

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

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

2. Safety

2.1. Safety Alert Symbol and Signal Words



This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

Signal Words: Note the use of the signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

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

2.2. General Safety Information

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

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



- Do not modify the grain bin in any way or deviate from the instructions in this manual without written permission from the manufacturer. Unauthorized modification or methods may impair the function and/or safety. Any unauthorized modification will void the warranty.
- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.
- Contact your local representative or AGI if you need assistance or additional information.
- Always follow applicable local codes and regulations.

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.

2.4. Safety Equipment

The following safety equipment should be kept on site.

• First-Aid Kit



Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.

2.5. Auxiliary Equipment Safety

Unapproved auxiliary equipment could cause performance issues or structural failure, and is not covered by warranty.

- Do not install auxiliary equipment if the grain bin is not designed for use with it. Refer to the specific information provided in this manual for auxiliary equipment or check with AGI or your dealer for written approval, if necessary.
- Obtain, read, and understand the instructions and safety warnings of the auxiliary equipment manufacturer.
- Attach auxiliary safety decals to the grain bin as applicable.
- Store auxiliary operations/maintenance manuals in a safe place available for future use.

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.

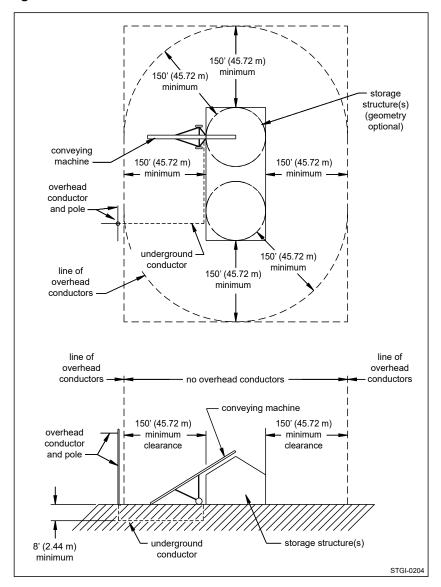
2.6. Working At Height Safety

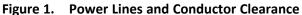
- Ensure that all work at height is properly planned, organized and carried out by a competent person.
- Use appropriate work equipment and make sure that they are inspected to ensure safety.
- Select collective measures to prevent falls (such as guard rails and working platforms) before other measures which may only reduce the distance and consequences of a fall (such as nets or air bags) or may only provide fall-arrest through personal protection equipment.
- Ensure that those persons working at height are trained in how to avoid falling and how to avoid or minimise any injuries should they fall.
- Check the weather condition. Postpone any work at height until there is no risk to the health and safety of any person working at height.
- Ensure that nothing is thrown or tipped from height if it is likely to injure a person.

2.7. Overhead Power Lines

• Keep grain bins a horizontal distance of at least 150 ft (45.7 m) from power lines. Increase distance to meet electrical code requirements where required.

- Do not load or unload the grain bin if there is a chance of any loading or unloading equipment contacting power lines.
- Do not locate grain bins on both sides of a power line or under a power line.
- Electrocution can occur without direct contact.







2.8. 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.

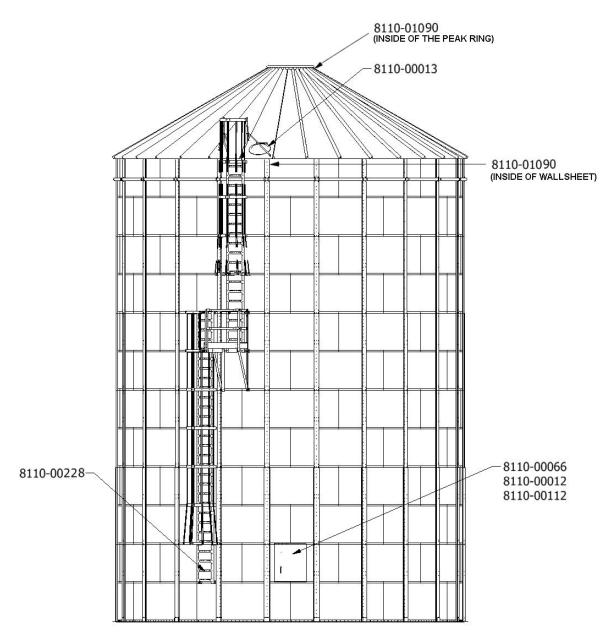
2.9. Decal Installation/Replacement

- 1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
- 2. Decide on the exact position before you remove the backing paper.
- 3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- 4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
- 5. Small air pockets can be pierced with a pin and smoothed out using the decal backing paper.

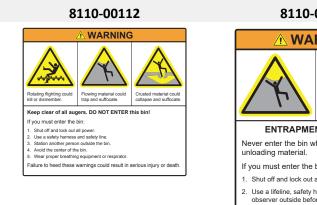
2.10. Safety Decal Locations and Details

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

Safety Decal Locations



Safety Decals and Part Numbers



8110-00228







3. Before You Begin

3.1. Bin Design and Capacity

Standard AGI Grain Bins are designed for:

- 1. Non-corrosive free-flowing materials up to 52 lbs/ft³ (833 kg/m³) average compacted bulk density.
- 2. Maximum horizontal wind pressure based on 94 mph (151 km/h) as per NBCC 2015 and 105 mph (169 km/h) as per ASCE 7-16.
- 3. Zero seismic activity

Note

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

- 4. Roof loading capabilities vary with diameter, peak load and snow load.
 - a. Peak Loads standard peak loads follow. Upgrades are available.

Table 1. Peak Loads for Various Roofs

| Size | Type of Roof | Load (lbs) | Load (kg) |
|------------|----------------|------------|-----------|
| 27' to 42' | non-structural | 5000 lbs | 2268 kg |

b. Roof Snow Loads (RSL) – at the above stated standard peak loads, standard RSLs vary with diameter and range from 20 psf (97.6 kg/m²) to 24 psf (117.1 kg/m²). *Upgrades are available*.

Note

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

c. For maximum roof snow load capacities for various sizes and types of roofs, refer to the Roof Design Capacities sections that follow.

3.1.1 Roof Design Capacities for Non-Structural Roofs

| Bin Series | Std Peak Load | Standa | rd Roof | Plus Up | grade 1 | Plus Up | ograde 2 |
|-------------|---------------|--------|---------|---------|---------|---------|----------|
| DIII Series | lbs (kN) | psf | kPa | psf | kPa | psf | kPa |
| 27 | | 24 | 1.15 | 39 | 1.87 | n | /a |
| 30 | | 20 | 0.96 | 32 | 1.53 | 40 | 1.92 |
| 33 | 5000 (22.2) | 23 | 1.10 | 33 | 1.58 | 44 | 2.11 |
| 36 | | 24 | 1.15 | 30 | 1.44 | 38 | 1.82 |
| 42 | | 19 | 0.91 | 24 | 1.15 | 34 | 1.63 |

Table 2. Maximum Roof Snow Load at STANDARD Peak Load - Canada

Table 3. Maximum Roof Snow Load at STANDARD Peak Load - United States

| Din Series | Std Peak Load | Standa | rd Roof | Plus Up | grade 1 | Plus Up | ograde 2 |
|------------|---------------|--------|---------|---------|---------|---------|----------|
| Bin Series | lbs (kN) | psf | kPa | psf | kPa | psf | kPa |
| 27 | | 22 | 1.05 | 36 | 1.72 | | |
| 30 | | 19 | 0.91 | 30 | 1.44 | 37 | 1.77 |
| 33 | 5000 (22.2) | 22 | 1.05 | 31 | 1.48 | 41 | 1.96 |
| 36 | | 23 | 1.10 | 28 | 1.34 | 36 | 1.72 |
| 42 | | 18 | 0.86 | 23 | 1.10 | 32 | 1.53 |

Table 4. Maximum Roof Snow Load at UPGRADED Peak Load - US and Canada

| Bin Series | Upgraded Peak Load | Standa | rd Roof | Plus Up | ograde 1 | Plus U | pgrade 2 |
|-------------|--------------------|--------|---------|---------|----------|--------|----------|
| DIII Series | lbs (kN) | psf | kPa | psf | kPa | psf | kPa |
| 27 | | 19 | 0.91 | 28 | 1.34 | r | n/a |
| 30 | | 15 | 0.72 | 24 | 1.15 | 33 | 1.58 |
| 33 | 10000 (44.5) | 18 | 0.86 | 24 | 1.15 | 36 | 1.72 |
| 36 | | 18 | 0.86 | 23 | 1.10 | 31 | 1.48 |
| 42 | | 14 | 0.67 | 19 | 0.91 | 27 | 1.29 |

Note

- 1. Standard roofs are adequate for many applications but additional capacity is available when optional upgrade packages are used.
- 2. Upgrade packages include roof stiffening rings and/or rib supports.
- 3. For peak load between standard and upgrade limits, a straight line interpolation can be used to determine maximum roof snow load.
- 4. Higher level upgrade kits include all components from lower level kit; only one upgrade kit needs to be ordered for any given bin

3.1.2 Roof Snow Load vs. Ground Snow Load

The Roof Design Capacity tables reflect roof snow load (RSL) values. These are design values. Often, comparisons are made to ground snow values (GSL). These are not the same. The conversion from GSL to RSL varies between jurisdictions and is governed by building codes:

- In the United States, for grain bins, GSL = RSL x 2
- In Europe, for grain bins, GSL = RSL x 1.25
- In Canada, for grain bins, the GSL/RSL conversion varies with every location across the country. However, for comparison purposes, the US conversion can be used as an approximation.

Therefore, when comparing against competitive GSL values in the US, double the above values. When comparing against competitive GSL values in Canada, double the above values for a reasonably close approximation.

3.2. Guidelines for Supporting Catwalks and other External Loads on AGI

Frequently catwalk and related equipment loads are supported on grain bins. Such connections are commonly made into the grain bin stiffeners and across the peak. A grain bin is a thin shell structure primarily designed to withstand the internal uniformly distributed loads inherent with the stored bulk material inside of the bin. Special considerations must be given to the manner in which external loads are supported. AGI has developed products which are compatible with these requirements and considerations. If a third party solution is provided, the provider assumes full responsibility of the structure, its load distribution, and the manner in which it is connected to the grain bin. The following guidelines must form part of the third party design considerations.

Connection to Stiffeners

- 1. The available catwalk support stiffeners in AGI stiffened bins are for 10,000 lb incremental catwalk loads and 20,000 lb incremental catwalk loads per upgraded stiffener. The actual loads subjected to a single stiffener by the mating catwalk support shall not exceed these maximum capacities.
- AGI recommends that the vertical load transfer between the catwalk supports and the stiffener occur over a minimum distance of 66" for 10,000 lb loads and 120" for 20,000 lb loads. Adequate connection strength must be provided.
- 3. The catwalk support stiffener in AGI bins are designed to provide vertical load support only. Any lateral loads subjected to the grain bin must be negligible.
- 4. There is a restriction of 2 upgraded catwalk support stiffeners per bin location. Therefore, the maximum supported load at the grain bin eave is 20,000 lbs (for two 10,000 lb upgrades) and 40,000 lbs (for two 20,000 lb upgrades). This can be repeated on the opposing side of the bin at a second location. Deviation from this must be approved by AGI Engineering.

Connection to Peak Rings

- 1. The allowable vertical peak load to any AGI bin roof is restricted to its published rated capacity. The load must be centered and evenly distributed into the peak ring. Any off-centre load and/or improper load distribution may cause roof failure.
- 2. A AGI structural roof requires the peak support loads to be transferred directly into the compression ring/ roof rafter system. This is accomplished with peak load support brackets that are included with the structural roof. They must be installed as shown in the structural roof manual, connecting the peak support structure to the compression ring. They are required even if a non-AGI peak support structure is used. A non-AGI peak support structure needs to be designed to be able to connect with the brackets. The required bolt pattern is shown in the structured roof manual.
- 3. A AGI non-structural roof that is supporting a catwalk requires six clips to be installed in order to attach the flat cap to the peak ring. These clips are available from AGI.

3.3. Foundation Design and Loads

The foundations for the stiffened bin models are based on 3000 lbs. per sq. ft. (144 kPa) soil bearing capacity. All foundation designs use 3000 lbs. per sq. in. (21 MPa) ultimate compressive strength (after 28 days) for concrete and 43,500 lbs. per sq. in. (300 MPa) re-bar. The foundation designs included in this manual are suggestions only, and will vary according to local soil conditions. AGI will not assume any liability for results arising from their use.

Important

Foundation should be uniform and level. Level should not vary by more than ¼" over a span of four feet under the bottom ring angle. Any variance from level must be shimmed under upright base assembly. If being utilized to support a full floor aeration system, this levelness requirement should extend across the complete floor area.

3.4. Lifting with Bin Jacks

Use bin jacks to lift the bin safely during assembly and help prevent strength and functionality problems later, including alignment, tolerance, bin roundness, distortion, and twisting issues.

- To prevent risk of serious injury or damage to the equipment:
 - Prior experience is required. Do not use bin jacks if you are not properly trained or have never used them.
 - Do not use bin jacks in windy conditions.
 - Do not exceed lifting capacity of a bin jack.
 - Powered bin jacks are recommended. If using manually operated chain jacks, lift carefully and evenly to prevent damage.

For important additional information, refer to:

- Specifications section in your manual, the sales order, or approval drawing of the bin's radius and total weight of the grain bin (including roof, fasteners, stiffeners, and all accessories).
- Bin jack manufacturer's instructions and bin jack lifting capacity.

Tools and Equipment

Use the following to lift the bin:

- bin jacks (internal or external)
- scaffolding/ladders
- lifting lugs
- drift pin
- socket/impact set
- wrench set

Additional tools and equipment may be required.

General Bin Jacking Instructions

Refer to the bin jack manufacturer's instructions in addition to the following to safely lift the bin during assembly:

- Use one bin jack per wall sheet.
- Confirm that the number of bin jacks can support at least 5X the weight of the bin.
- Fabricate lifting lugs to match the hole spacing on the bin.
- Assemble the top 1-2 wall sheet rings directly on the foundation.
- Layout and space the bin jacks evenly at each stiffener/seam according to the bin's radius.
- Anchor the bin jacks securely to the concrete.

- Connect the bin jacks securely to the stiffeners/seams.
- Lift using the bin jacks at an even and slow pace.
- Align the stiffener/seam holes with the wall sheet holes using a drift pin.
- When not actively assembling, lower the bin fully and secure it to the foundation to protect against wind gusts and other conditions.

3.5. Lifting Wide-Corr[®] Bins with Cranes

The table below lists the maximum height and weight limits for each diameter of bin which AGI approves for lifting by the roof using a crane. These limits assume that the total lifted load is evenly distributed around the peak ring, through the use of a lifting tripod or similar device of adequate strength. Any bin exceeding EITHER the height or weight limit MUST be lifted using jacks or similar method which supports the wall sheets directly.

These limits are critical. Failure during lifting carries the risk of serious injury or death.

Table 5. Lifting Weights for Various Bin Sizes

| Bin Diameter | Scribe Radius | Maximum Tier Height | Approximate Weight |
|--------------|------------------------|---------------------|--------------------|
| 27' | 13' 4-3/8" (4.074 m) | 8 | 11,000 lbs |
| 30' | 14' 10-5/16" (4.529 m) | 8 | 13,000 lbs |

Important Safety Notes

- Limits above are based on safe lifting of the bin only. They are not based on design factors for lifting people or objects over people. Adequate safety blocks or supports must be used when working under or near the bin wall.
- Extreme caution must be used when lifting bins more than a few inches, as occurs when mounting bins on hoppers. "Bouncing" of the load and/or wind gusts can add significantly to the loads on the roof and could cause overloading and/or failure.
- Please refer to any additional capacity information, lifting instructions, and safety information provided by the crane manufacturer.

3.6. Site and Assembly

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

- Bin location and bin siting
- Soil conditions and corresponding foundation requirements (Note that the examples provided in manuals are for specifically stated soil conditions.)
- Bin assembly (AGI recommends the use of qualified bin installers. Contact AGI for information on installers in your area.)
- Field modifications or equipment additions that affect the bin structure
- Interconnections with neighboring structures
- Have the builder make all non-bin equipment in excess of AGI's recommendations. All such equipment including: LEGS, WALKWAYS, SPOUTING, and CONVEYORS must be self supporting.

• Compliance with all applicable safety standards, including but not limited to fall restraint systems (ladders or other systems). Contact local safety authorities as the standards vary between jurisdictions.

3.7. Methods of Installation

The recommendations for assembling and installing AGI grain bins must be closely followed to achieve the full strength of the bin and to achieve adequate weather sealing. The product warranty is void if:

- 1. Wall sheets and/or uprights not specified for a given tier are used.
- 2. Foundations are found to be inadequate or out-of-level.
- 3. Anchor bolts (cast-in-place, drill-in, chemical type or other) are found to be inadequate.
- 4. Off-center loading or unloading is used. (This does not apply to the use of approved side unloading systems).
- Materials stored are not free-flowing or have a compacted bulk density greater than 52 lbs/ft³ (833 kg/m³).

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

3.8. Cutting Openings in Wide-Corr® Grain Bins

This section provides instructions for cutting openings to accommodate fan transitions, unloading augers and roof vents.

General Rules for Cutting openings

- 1. Never cut any uprights, roof ribs, or wall sheet bolted vertical seams to create an opening.
- 2. Openings shall be located so equipment being installed won't interfere with any bin components/ accessories.
- 3. Openings shall be minimized as much as possible for structural integrity of grain bins.
- 4. Corners in openings shall be cut with minimum radius of 1/8" to reduce stress concentration.
- 5. Openings shall be sealed all the way around for all weather conditions.
- 6. Instructions shall be followed closely to avoid damage to bin structure.
- 7. Except cutting openings described below, any other modification to AGI bins shall be approved by a professional engineer.

Openings for Fan Transitions of Aeration Floors

- 1. Consult aeration floor installation instructions for information on Planning floor layout.
- 2. Openings shall be centered to a wall sheet in horizontal direction.
- 3. Opening shall be cut as tight as it can be for the transition to go through and shall have no more than 1/4" gap on any side to the section of a fan transition going through a bin wall.
- 4. Opening height for fan transition shall be limited to 12.5" inches from bottom edge of a bottom wall sheet.
- 5. Opening width shall not exceed 46.5" for stiffened bins and 72.5" for unstiffened bins.
- 6. Vertical support shall be required to support load above opening.

7. Bottom angles may be cut flush to the sides of an opening to form part of opening.

Openings for Unloading Augers of Wide-Corr® Bins with Full Floor Aeration

- 1. Consult aeration floor installation instructions for information on Planning floor layout.
- 2. Openings shall be centered to a wall sheet in horizontal direction.
- 3. Openings shall be cut as tight as it can be for unloading auger to go through and shall have no more than 1/4" gap to auger flange section on any side.
- 4. Opening height for any auger shall be limited to 12.5" from the bottom edge of a bottom wall sheet.
- 5. Vertical flange of a bottom angle may be cut flush to sides of an opening to form part of opening.

Openings for Roof Vents in Roof Sheets

- 1. Openings shall be centered between roof ribs and have 2.5" minimum distance between edge of opening and base of a roof rib.
- 2. Openings can be square, rectangular, or round.
- 3. Openings shall be the same size as the inlet opening of a vent being installed.
- 4. Any side of a square/rectangular opening shall have a maximum length of 18" and a circular opening shall have a maximum diameter of 24".

3.9. Critical Assembly Requirements

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

- 1. Comply with all local code and jurisdictional requirements applicable to your grain bin installation.
- Design and build foundations with the necessary strength for the loads they must support, and for local soil conditions. AGI foundation guidelines are based on specific stated conditions and may not be applicable to local conditions.
- 3. Your foundation must provide uniform and level support to the structure being supported. Surface imperfections causing gapping must be remedied. This may involve, but not be limited to a) grouting under the bottom ring of a non-stiffened bin or tank, and b) shimming under the uprights of a stiffened bin or tank, or under the legs of a hopper.
- 4. Make sure that the proper hardware is utilized for all bolted connections. If a shortage occurs, do not substitute. Take the necessary steps to obtain the proper hardware. Make sure nuts are tightened to the required torque values as specified in the appropriate assembly manual.
- 5. Comply with all assembly instructions provided in the appropriate assembly manual to make sure your whole grain bin is constructed safely. Important: Do not deviate from the wall sheet and upright layouts provided.
- 6. Before anchoring your structure to its foundation, make sure the structure is round. The maximum variation from perfect roundness is 3/4" on the radius. Locate anchor bolts toward the outside of the anchor bolt holes (away from the circle) to permit the incremental expansion that can occur with the initial filling.
- 7. When installing roof stiffening rings, if it is necessary to shorten the stiffening ring tubes, shorten them as little as possible. Initially the nuts on the expanders should be centered and as close together as possible. When tightening, share the amount of take-up between expanders such that the nuts remain centered, and the amount of engagement between all expanders on the same ring is equalized.

- 8. If extending an existing bin or tank, ensure that the foundation is adequate for the increased loads it must support.
- 9. If installing an existing bin on a hopper, make sure the bin is designed for a hopper application, and that the foundation is capable of withstanding the substantial point loads that the hopper legs apply. If uprights are present, make sure that they are supported.
- 10. Make sure that an integral end-to-end connection exists between all mating uprights. Successive uprights must not overlap.
- 11. Vertical tolerances between uprights and wall sheets are tight. This can be affected by "jacking" techniques, which can allow the tolerance to grow or shrink depending on the technique used. The gapping between successive uprights must be monitored to ensure that upright holes align with wall sheet holes.
- 12. If catwalks are being installed on the structure, upright catwalk upgrades are likely required. The upgraded stiffeners must be installed in the correct locations to support the intended catwalk loads. Also, the structure must be properly oriented to ensure the eventual correct alignment between the catwalks and the supporting uprights. Finally, the connectors that tie into the uprights and support the catwalks are best installed during assembly of the structure. See the catwalk assembly manual for additional details.

3.10. Product Storage

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

Note

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

NOTICE Red rust causes permanent structural damage.

Do not assemble any part containing red rust.

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

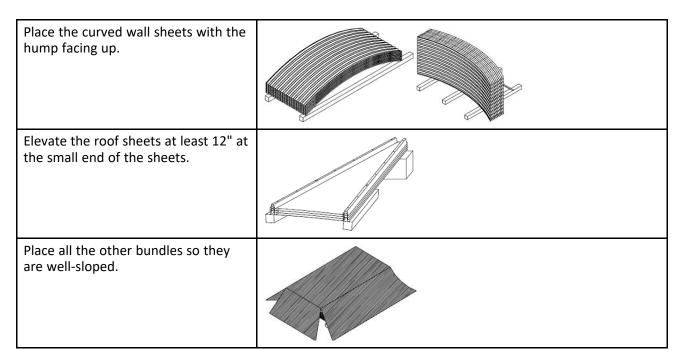
Storing Bin Bundles and Boxes Outdoors

Required Materials:

- Wood blocks
- Waterproof tarp

Storage Procedure:

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



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

Note

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

If Parts Become Wet

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

A WARNING Risk of injury or damage.

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

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

Note

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

WARNING Risk of slipping.

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

3.11. Grain Bin Use

- Fill the bin through the center roof opening only.
- Do not overfill the bin roof area! This may cause roof damage or failure.
- Do not off-center unload a grain bin. It is imperative to unload from the center of the bin first, until as much grain as possible has been removed, and only then proceed to unload from the next closest unload gate to

the center. Continue utilizing the unload gates in succession from the center towards the outside. Gate control mechanisms should be clearly marked and interconnected to prevent an external gate from being opened first.

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

3.12. Important Notes

- AGI does not provide a foundation design for this product, and is not liable for any damages or injuries related to inadequately designed or constructed foundations. Customers must contract professional services for all foundation design and construction work.
- In order to maintain your wall sheets in good condition separate sheets and allow air circulation between them. Store sheets in a dry place. Do not store sheets with sheet ends pointing upwards.
- To keep an even pressure on walls, the bin must always be unloaded from the center.
- Contact local power officials for minimum power line clearance.
- See Section 3.9 Critical Assembly Requirements on page 19 for mandatory siting and assembly requirements.
- Store only non-corrosive, free-flowing materials up to 55 lbs/ft³ (880 kg/m³) average compacted density in AGI.
- Tighten all bolts to the recommended torque settings.
- Do not locate grain bins close to high buildings, which might cause snow to fall onto or build up on the roof
 of the grain bin. Consider future expansion and allow space for loading and unloading of the bin. Your dealer
 and local government agricultural consultants can help you plan your storage system for maximum
 efficiency.

4. Preparation

4.1. Check the Shipment

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

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

4.2. List of Tools and Equipment

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

Tools

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

Minimum Recommended Safety Equipment

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

4.3. Order Optional Equipment

Optional equipment such as unloading augers, aeration equipment, anchor bolts, foundation sealant, external ladders, safety cage and platforms, etc., should all be on site and checked before assembly starts. Plan your installation in advance. For details, see assembly instruction supplied with optional equipment.

4.4. Pre-Plan Assembly

Before assembling:

- 1. Read and understand this manual.
- 2. Develop an assembly plan, with consideration given to the layout of accessories and auxiliary equipment.
- 3. Predetermine the locations for access doors, anchor bolts, ladders, manways, side draws, roof steps, roof vents, fans, and other auxiliary equipment.
- 4. Plan your construction in accordance with your assembly and layout plan.

Important

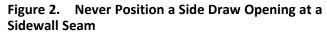
Installation of accessories or equipment on grain systems equipment/structures that overstresses the bin in any manner will void the warranties.

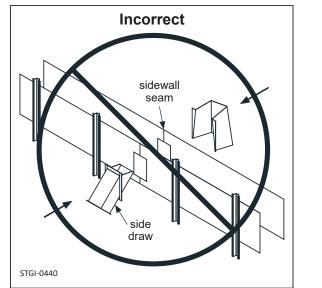
In cases where additional loading is involved, if you do not already have specific recommendations from AGI, contact AGI engineering department before installation begins.

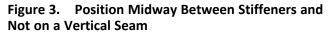
Do not install 27' - 42' Grain Bins controls or the like near anything having a strong electromagnetic field such as large power transmission lines or transformers.

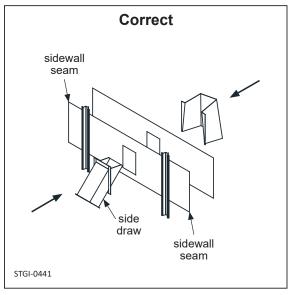
4.4.1 Pre-Planning: Side Draw Discharge, Aeration, and Unload Equipment

Side draw discharge pre-planning: Make certain side draw discharge does not fall on a vertical sidewall seam.









The following Figure 4 is one suggested guide for locating aeration fans and floor unload equipment.

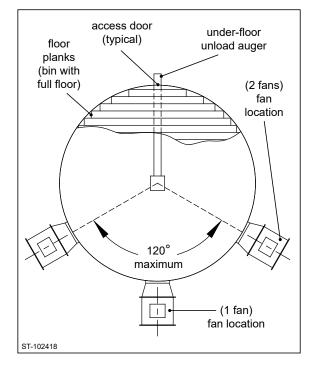


Figure 4. Example Fan and Unload Equipment Layout

5. Assembly

5.1. Assembly Safety

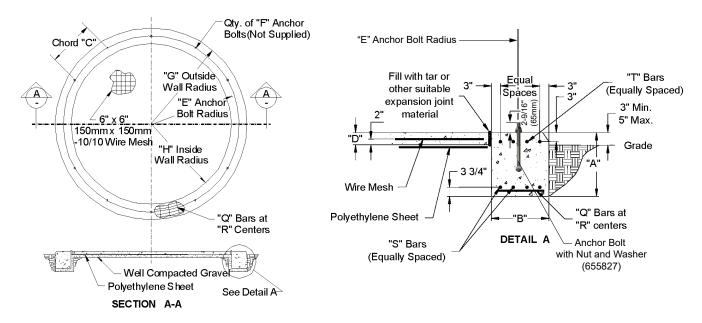
• Do not take chances with safety. The components can be large, heavy, and hard to handle. Always use the proper tools, rated lifting equipment, and lifting points for the job.

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

5.2. Curb Footing — Floating Slab Foundation

- 1. Choose a site that is well drained, and has a minimum soil-bearing capacity of 3000 lbs/ft² (21 MPa). If soilbearing capacity is not known, consult a local engineering representative.
- 2. Use minimum 4" to 6" (100 mm to 150 mm) of well-compacted coarse granular material below slab and curb footing.
- 3. Concrete strength shall be minimum 3000 psi [21 MPa] compressive strength.

Figure 5. Curb Footing Foundation Layouts



Note

For dimensions for specific bin sizes, refer to the tables in the following sections.

- 4. The foundation must be level to within 1/4" over a span of 4 feet [6 mm over 1200 mm]. Any variance from level must be shimmed under an upright. (See Section 5.8 Commercial Bin Upright Assembly on page 41.)
- 5. Locate anchor bolts as shown in Figure 5, using the dimensions provided in the following Curb Specifications tables, to ensure bin roundness.
- 6. Re-bar end laps are not included. Add 15" [380mm] for each lap. To estimate weight of end lap: add 0.5 lbs. for #3 and 1.0 lbs. for #4, 0.3 kg for 10M and 0.6 kg for 15M.
- 7. Concrete slump for reinforced wall to be 5" (130 mm) maximum and 2" (50 mm) minimum.
- Reinforcing bars for concrete reinforcement shall conform to Grade 40, 40000 psi (280 MPa) or Grade 60, 60000 psi (420 MPa) as called for in the following: ASTM² A615, A616, or A617.
- 9. Welded wire mesh for concrete reinforcement shall conform to ASTM² A185, or A497.

¹ American Concrete Institute

² American Society for Testing Materials

Anchor bolts need to be properly located, based on the information provided, to keep the bin round, and to ensure structural integrity of the bin while guaranteeing effective transfer of wall forces down to the foundation.

1. Minimum recommended cast-in-place anchors for standard conditions shall be ASTM F1554 (Grade 55) 0.75" x 12" headed anchor bolt with nut and washer

- 2. Minimum recommended post-installed anchors for standard conditions shall be 0.75" x 8.5" wedge anchor with nut and washer.
- 3. A hex bolt with a flat washer, or an epoxy adhesive anchor of equivalent strength may be used. Check with anchor vendor or manufacturer for strength ratings and for proper installation instructions.

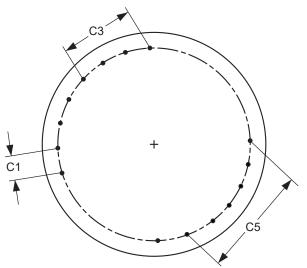
Important

The foundation details in this manual are to be considered general in nature and are intended only as a guide. The design is for standard external loading conditions described in the design section of this manual. The design is not for foundations and anchors that require consideration of seismic loads. It is the owner's responsibility to provide an appropriate site and foundation design for the adequate support of the grain bin. AGI assumes no responsibility for results arising from these suggestions.

5.2.1 Anchor Bolt Plan

This section provides layouts and specifications for positioning anchor bolts.

Figure 6. Anchor Bolt Plan Drawing

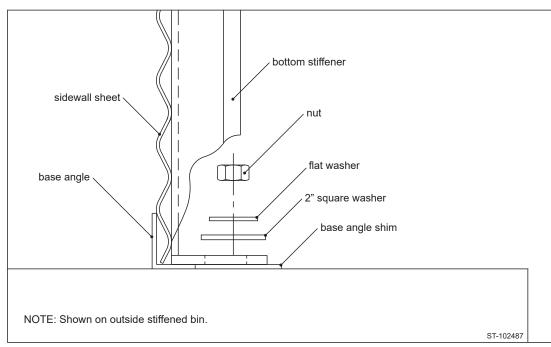


Important

If the anchor bolt diameter is greater than 1" (2.54 cm) contact AGI. The anchor bolt patterns in this manual will not apply in those situations.

| Bin Di | ameter | Bolt Circle | Radius | Anchor | | | | | Bolt Chorda | al Spacin | ng | | | | | | | | | | | | | | | | | |
|--------|--------|-------------|--------|----------|-------------|-------------|-----------|------|-------------|-----------|------------|------|----|--|----|--|----|--|----|--|----|--|-------|--|-------|--|----|--|
| non | ninal | "A" | laulus | Bolt | Bolt Dia | Bolt Dia | C1 | | C1 | | C1 | | C1 | | C1 | | C1 | | C1 | | C1 | | C1 C3 | | C1 C3 | | C5 | |
| (ft) | (m) | (in) | mm | Quantity | (in) | (mm) | (in) mm | | (in) | mm | (in) | mm | | | | | | | | | | | | | | | | |
| 27 | 8.23 | 164-5/16" | 4174 | 18 | 3/4 | 19 | 57-1/16" | 1450 | 164-5/16" | 4174 | | | | | | | | | | | | | | | | | | |
| 30 | 9.14 | 182-1/4" | 4629 | 20 | 3/4 | 19 | 57-0" | 1448 | 165-15/32" | 4203 | 257-23/32" | 6546 | | | | | | | | | | | | | | | | |
| 33 | 10.06 | 200-1/8" | 5083 | 22 | 3/4 | 19 | 56-31/32" | 1447 | 166-9/32" | 4223 | 262-1/8" | 6658 | | | | | | | | | | | | | | | | |
| 36 | 10.97 | 218-1/16" | 5538 | 24 | 3/4 | 19 | 56-29/32" | 1446 | 166-7/8" | 4239 | 265-15/32" | 6743 | | | | | | | | | | | | | | | | |
| 42 | 12.80 | 253-7/8" | 6448 | 28 | 3/4 | 19 | 56-27/32" | 1444 | 167-11/16" | 4259 | 270-1/8" | 6861 | | | | | | | | | | | | | | | | |

Table 6. Anchor Bolt Locations - 27'-42' (8.23 m - 12.80 m) Diameters - 2 anchors per sidewall sheet





5.2.2 Curb Footing Specifications – 27' and 30' Bins

Table 7. Curb Footing Specifications — 27' and 30' Bins

| BIN M | IODEL | 2705 2706 2707 | 2708 2709 | 2710 2711 | 2712 | 3005 3006 3007 | 3008 3009 | 3010 3011 | 3012 |
|---------------------------|-----------------------|----------------------|--------------|--------------|------------|----------------------|--------------|--------------|------------|
| ļ | Ą | 1'4" | 1'6" | 2'0" | 2'0" | 1'4" | 1'6" | 2'0" | 2'0" |
| E | 3 | 1'3" | 1'10" | 2'6" | 3'2" | 1'3" | 2'0" | 2'8" | 3'4" |
| (| 2 | 4'9-1/16" | 4'9-1/16" | 4'9-1/16" | 4'9-1/16" | 4'9" | 4'9" | 4'9" | 4'9" |
| [|) | 4" | 4" | 6" | 6" | 4" | 4" | 6" | 6" |
| E | | 13'8-5/16" | 13'8-5/16" | 13'8-5/16" | 13'8-5/16" | 15'2-3/16" | 15'2-3/16" | 15'2-3/16" | 15'2-3/16" |
| I | : | 18 | 18 | 18 | 18 | 20 | 20 | 20 | 20 |
| (| ĵ | 14'4" | 14'7" | 14'11" | 15'3" | 15'10" | 16'2" | 16'6" | 16'10" |
| ŀ | 4 | 13'1" | 12'9" | 12'5" | 12'1" | 14'7" | 14'2" | 13'10" | 13'6" |
| 0 | Metric ¹ | 29 - 10M | 58 - 10M | 58 - 10M | 69 - 10M | 32 - 10M | 64 - 10M | 64 - 10M | 82 - 10M |
| Q | Imperial | 29 - #3 | 58 - #3 | 58 - #3 | 94 - #3 | 32 - #3 | 64 - #3 | 68 - #3 | 115 - #3 |
| | Metric (mm c/c) | 914 | 457 | 457 | 279 | 914 | 457 | 432 | 254 |
| R | Imperial (in. c/c) | 36 | 18 | 18 | 11 | 36 | 18 | 17 | 10 |
| | Metric ¹ | 3 - 10M | 3 - 10M | 5 - 10M | 6 - 10M | 3 - 10M | 3 - 10M | 5 - 10M | 7 - 10M |
| S | Imperial | 4 - #3 | 4 - #3 | 4 - #4 | 5 - #4 | 4 - #3 | 4 - #3 | 4 - #4 | 5 - #4 |
| - | Metric ¹ | 3 - 10M | 3 - 10M | 4 - 10M | 6 - 10M | 3 - 10M | 3 - 10M | 5 - 10M | 6 - 10M |
| Т | Imperial | 4 - #3 | 4 - #3 | 4 - #4 | 5 - #4 | 4 - #3 | 4 - #3 | 4 - #4 | 5 - #4 |
| Reinforcing | M (kgs.) | 131 | 146 | 217 | 295 | 145 | 164 | 265 | 357 |
| Rod | l (lbs.) | 270 | 293 | 508 | 677 | 300 | 329 | 571 | 770 |
| Wire Mes | Wire Mesh (sq. ft.) | | 505 | 485 | 459 | 676 | 631 | 602 | 573 |
| Concrete | Footing | 5.3 | 8.8 | 16.0 | 20.2 | 5.9 | 10.6 | 18.9 | 23.6 |
| (3000 psi) Cubic Yards | Slab | 6.6 | 6.3 | 9.0 | 8.5 | 8.2 | 7.8 | 11.2 | 10.7 |

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.2.5 – Canadian Metric to European Conversion Table on page 32.

5.2.3 Curb Footing Specifications – 33' and 36' Bins

Table 8. Curb Footing Specifications — 33' and 36' Bins

| BIN MODEL | | 3305 3306 3307 | 3308 3309 | 3310 3311 | 3312 | 3604 3605 3606 3607 | 3608 3609 | 3610 3611 | 3612 |
|---------------------------|-----------------------|----------------------|--------------|--------------|------------|------------------------------|--------------|--------------|------------|
| 1 | Ą | 1'4" | 1'6" | 2'0" | 2'0" | 1'4" | 1'6" | 2'0" | 2'0" |
| E | В | 1'3" | 2'0" | 2'8" | 3'6" | 1'4" | 2'0" | 2'10" | 3'8" |
| (| С | 4'8-15/16" | 4'8-15/16" | 4'8-15/16" | 4'8-15/16" | 4'8-15/16" | 4'8-15/16" | 4'8-15/16" | 4'8-15/16" |
| [| D | 4" | 4" | 6" | 6" | 4" | 4" | 6" | 6" |
| I | E | 16'8-1/8" | 16'8-1/8" | 16'8-1/8" | 16'8-1/8" | 18'2" | 18'2" | 18'2" | 18'2" |
| l | F | 22 | 22 | 22 | 22 | 24 | 24 | 24 | 24 |
| (| G | 17'4" | 17'8" | 18'0" | 18'5" | 18'10" | 19'2" | 19'7" | 20'0" |
| H | Н | 16'1" | 15'8" | 15'4" | 14'11" | 17'6" | 17'2" | 16'9" | 16'4" |
| | Metric ¹ | 35 - 10M | 70 - 10M | 70 - 10M | 97 - 10M | 38 - 10M | 76 - 10M | 76 - 10M | 115 - 10M |
| Q | Imperial | 35 - #3 | 70 - #3 | 74 - #3 | 140 - #3 | 38 - #3 | 76 - #3 | 92 - #3 | 153 - #3 |
| | Metric (mm c/c) | 914 | 457 | 432 | 229 | 914 | 457 | 381 | 229 |
| R | Imperial (in. c/c) | 36 | 18 | 17 | 9 | 36 | 18 | 15 | 9 |
| | Metric ¹ | 3 - 10M | 3 - 10M | 5 - 10M | 7 - 10M | 3 - 10M | 3 - 10M | 5 - 10M | 7 - 10M |
| S | Imperial | 4 - #3 | 4 - #3 | 4 - #4 | 5 - #4 | 4 - #3 | 4 - #3 | 4 - #4 | 6 - #4 |
| _ | Metric ¹ | 3 - 10M | 3 - 10M | 5 - 10M | 6 - 10M | 3 - 10M | 3 - 10M | 5 - 10M | 6 - 10M |
| Т | Imperial | 4 - #3 | 4 - #3 | 4 - #4 | 5 - #4 | 4 - #3 | 4 - #3 | 4 - #4 | 4 - #4 |
| Reinforcing | M (kgs.) | 160 | 180 | 291 | 402 | 174 | 196 | 321 | 449 |
| Rod | I (lbs.) | 329 | 362 | 627 | 871 | 359 | 384 | 700 | 1036 |
| Wire Mesh (sq. ft.) | | 813 | 772 | 739 | 700 | 962 | 926 | 882 | 839 |
| Concrete | Footing | 6.5 | 11.7 | 20.7 | 27.2 | 7.6 | 12.7 | 24.0 | 31.0 |
| (3000 psi) Cubic Yards | Slab | 10.1 | 9.6 | 13.7 | 13.0 | 11.9 | 11.5 | 16.4 | 15.6 |

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.2.5 – Canadian Metric to European Conversion Table on page 32.

5.2.4 Curb Footing Specifications – 42' Bins

| Table 9. | Curb Footing Specifications — 42' Bins |
|----------|--|
|----------|--|

| | BIN MODEL | 4208 | 4210 | |
|---------------------------|-----------------------|-------------|-------------|--|
| А | | 1'6" | 2'0" | |
| В | | 2'0" | 2'10" | |
| | С | 4'8-13/16" | 4'8-13/16" | |
| | D | 4" | 6" | |
| | E | 21'1-13/16" | 21'1-13/16" | |
| | F | 28 | 28 | |
| | G | 22'2" | 22'7" | |
| | н | 20'2" | 19'9" | |
| 0 | Metric ¹ | 89 - 10M | 89 - 10M | |
| Q | Imperial | 89 - #3 | 123 - #3 | |
| R | Metric (mm c/c) | 457 | 330 | |
| | Imperial (in. c/c) | 18 | 13 | |
| S | Metric ¹ | 3 - 10M | 6 - 10M | |
| | Imperial | 4 - #3 | 5 - #4 | |
| Т | Metric ¹ | 3 - 10M | 5 - 10M | |
| | Imperial | 4 - #3 | 4 - #4 | |
| Reinforcing Rod | M (kgs.) | 229 | 405 | |
| | l (lbs.) | 459 | 919 | |
| Wire Mesh (sq. ft.) | | 1278 | 1226 | |
| Concrete | Footing | 14.8 | 28.0 | |
| (3000 psi) Cubic Yards | Slab | 15.8 | 22.7 | |

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.2.5 – Canadian Metric to European Conversion Table on page 32.

5.2.5 Canadian Metric to European Conversion Table

| Table 10. | Canadian Metric to European Standard EN 10080/BS 4449 Conversion |
|-----------|--|
| | |

| Canadian Metric | European Metric | Nominal Diameter (mm) |
|-----------------|-----------------|-----------------------|
| 10 M | 12,0 | 12 mm |
| 15 M | 16,0 | 16 mm |
| 20 M | 20,0 | 20 mm |
| 25 M | 25,0 | 25 mm |

5.3. Bin Roundness

It is imperative that the bin be as round as possible. The following steps describe how to ensure the bin is round.

- 1. Verify that the foundation meets all the requirements of the installation.
- 2. Scribe the bin circumference onto the foundation as follows:
 - a. Anchor a string to the exact center of the concrete foundation.
 - b. Consult the following table to find the scribe radius for the size of the bin being assembled.
 - c. Using the required string length, scribe the bin circumference onto the foundation.

The radius values given in the chart are 3/4–inch smaller than the wall sheet radius at the bottom. This ensures that the scribed circle can be seen during assembly. A perfectly placed ring of sheets should be 3/4 inch on the outside of this scribed circle.

- 3. After the first ring of wall sheets has been assembled, check the position and roundness of the ring:
 - a. Verify that the maximum amount that the bin is out of round is no more than 0.75" on the radius, when measured from the center of the bin.
 - b. Verify that the wall sheets form a smooth circle with no flat spots or cauliflower shaped curves.
 - c. Before anchoring the bin to the foundation, re-check to ensure that the bin is round and within tolerance.

Note

The longer you wait, the more it becomes difficult to correct the bin roundness.

- 4. Locate anchor bolts towards the outside of the anchor bolt slots (away from bin) to permit the incremental expansion that can occur with the initial filling of the bin.
- 5. When setting jacks, make sure they are also set round and that they are anchored to the concrete.

| Nominal Bin Diameter (ft) | Scribe Radius (ft in) |
|------------------------------|--------------------------|
| 27 | 13'4-3/8" |
| 30 | 14'10-5/16" |
| 33 | 16'4-3/16" |
| 36 | 17'10-1/8" |
| 42 | 20'9-15/16" |

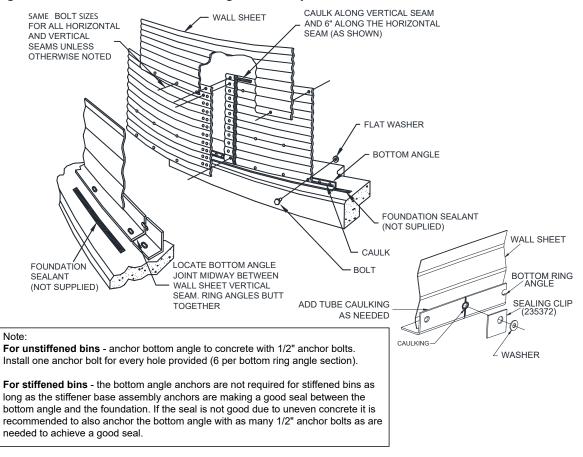
Table 11. Scribe Radius – 27' to 42' Bins

5.4. Wall Sheet and Bottom Angle Assembly

Note

For bin hardware specification, refer to Section 7.7 – Bin Hardware on page 74.

Figure 8. Wall Sheet and Bottom Angle Assembly Detail



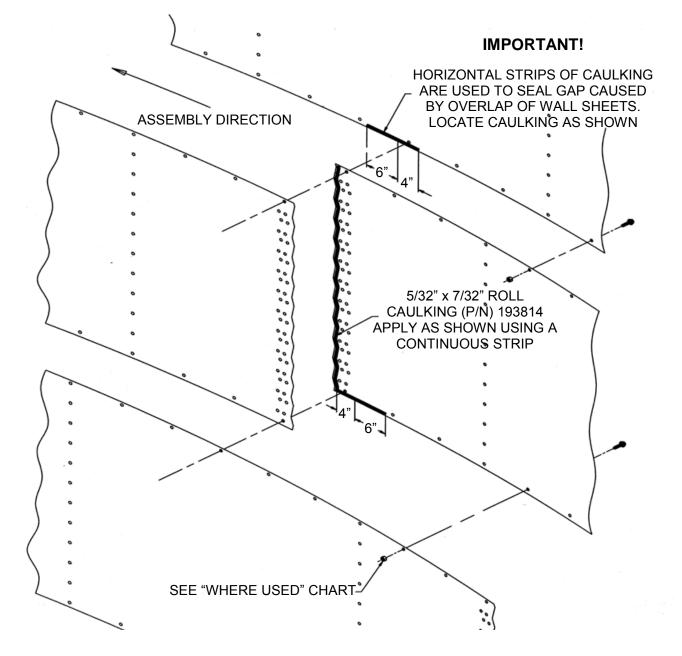
5.5. Centurion Wall Sheet Part Number Matrix

| Corrugated Wall Sheets | | | | | Punched Wall Sheets | | |
|------------------------|-------|--------------|-------------------|-----------------------|---------------------|----------------|--------|
| hickness nom (min) | Gauge | Label Colour | Weight lbs | Length (overall) | Flat | Regular | Bottom |
| .040 (.036) | 20 | Yellow | 58.3 | _ | 194654 | 194660 Stencil | |
| | | | | | 194657 | 194663 Stencil | |
| | | | | | 194679 | 194730 | |
| .050 (.045) | | Orange | 72.8 | | 194655 | 194661 Stencil | |
| | 18 | | | 116.5" | 194658 | 194664 Stencil | |
| | | | | | 194680 | 194731 | 194771 |
| .057 (.052) | 17 | Red | 83.0 | | 194681 | 194732 | 194772 |
| .066 (.061) | 15 | Pink | 97.7 | | 194682 | 194733 | 194773 |
| | | Lime | | | 194656 | 194662 | |
| .076 (.070) | 14 | | 112.2 | | 194659 | 194665 | |
| | | | | | 194683 | 194734 | 194774 |
| .096 (.088) | 13 | Green | 141.1 | | 194684 | 194735 | 194775 |
| .116 (.107) | 12 | Blue | 171.4 | | 194685 | 194736 | 194776 |
| .126 (.117) | 11 | Purple | 189.0 | 447.0" | 194606 | 194737 | 194777 |
| .139 (.130) | 10 | Black | 209.4 | 117.0" | 194607 | 194738 | 194778 |
| | | S | hort Sheets Insta | alled Beside the Door | | | |
| .057 (.052) | 17 | Ded | 66.3 | 93.0" | | 194780 | |
| | | Red | 26.2 | 36.8" | | | 194783 |
| .076 (.070) | 14 | Lime | 89.6 | 93.0" | | 194781 | |
| .096 (.088) | 13 | Green | 44.6 | 36.8" | | | 194784 |
| .116 (.107) | 12 | Blue | 136.8 | 93.0" | | 194782 | |
| | | | 54.1 | 36.8" | | | 194785 |

Table 12. Wall Sheet Part Number Table

5.6. Wall Sheet Caulking Detail





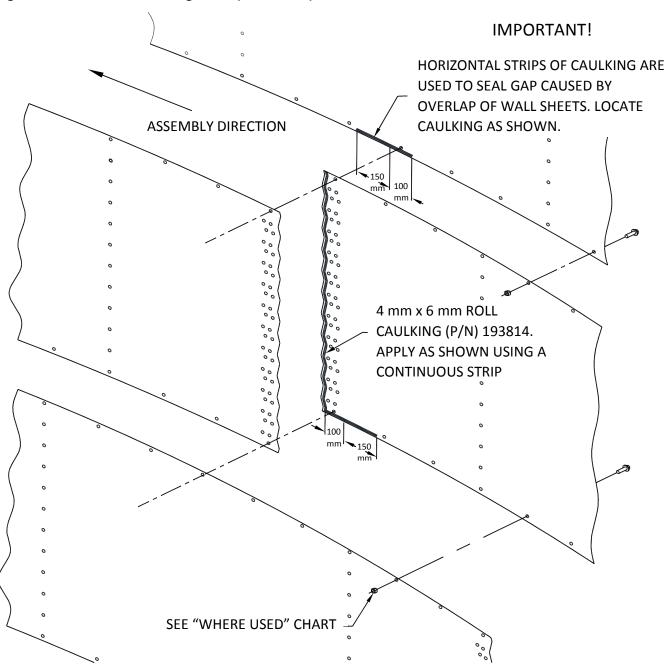


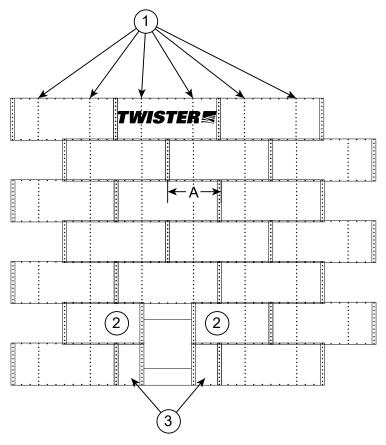
Figure 10. Wall Sheet Caulking Detail (inside view) — Metric

5.7. Stencil and Short Sheet Placement

Odd Tiered Bins:

To align the stencil sheets above the walk-in door as shown, stagger the wall sheets normally as shown below.

Figure 11. Stencil and Short Sheet Placement — Odd Tiered Bins

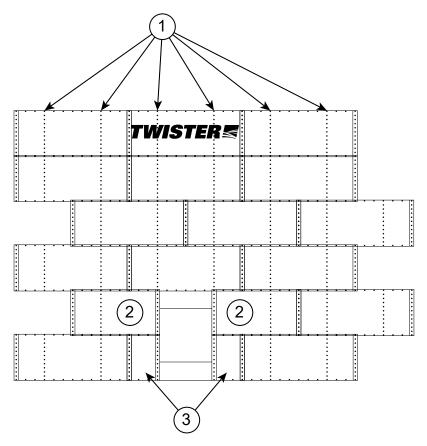


| Item | Description |
|------|---------------------|
| 1 | Upright locations |
| 2 | Short sheets |
| 3 | Bottom short sheets |
| А | 6 holes |

Even Tiered Bins:

To center the stencil above the walk-in door, stagger the wall sheets normally at the bottom and near the middle and coincide the seams in the top two tiers as shown below.

Figure 12. Stencil and Short Sheet Placement — Even Tiered Bins



| Item | Description |
|------|---------------------|
| 1 | Upright locations |
| 2 | Short sheets |
| 3 | Bottom short sheets |

Table 13. Short Sheet Part Numbers

| Part Number | Used With |
|-------------|-----------------|
| 194780 | 194679 - 194681 |
| 194781 | 194682 - 194683 |
| 194782 | 194684 - 194685 |

Table 14. Bottom Short Sheet Part Numbers

| Part Number | Used With |
|-------------|-----------------|
| 194783 | 194679 - 194681 |
| 194784 | 194682 - 194684 |
| 194785 | 194685 |

5.8. Commercial Bin Upright Assembly

This section provides information needed to assemble uprights for commercial bins.

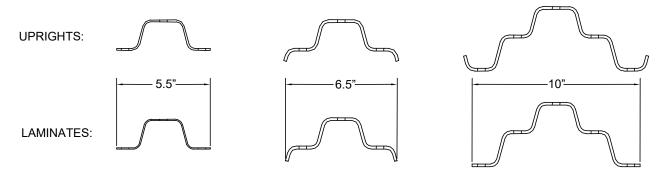
Introduction

The AGI Commercial upright system consists of uprights and laminates. Single uprights, joined by splice plates, are used at the top of bins. Laminate sections are introduced when vertical load requirements dictate. Once introduced the laminates continue to be utilized for the balance of the assembly.

A unique feature of the AGI upright system is the progressive section. Not only do the uprights and laminates increase in gauge from the top to the bottom of the bin, they also increase in section.

Figure 13. Progressive Sections

Progressive Sections



NOT ALL SECTIONS ARE USED ON ALL BINS

Both upright and laminate sections measure 88" long. In the center of each there are vertical holes spaced at 4" centers. This permits use on externally stiffened bins. There are two locations on each wall sheet for attachment of the uprights. The wall sheet holes that mate with the uprights are spaced at 4" centers. All center upright holes must be filled with bolts.

Upright/Laminate Identification

In order to properly erect the bin it is necessary to distinguish uprights from laminates, it is necessary to determine the gauge of the part, and it is necessary to determine the width of the section. The various combinations are provided in the upright/ laminate table. It is also necessary to determine the orientation of the parts as there is a distinct top and bottom. All the information that is required for assembly is contained on the label.

The label, is the easiest means of identification. It contains all of the necessary information. For assembly purposes, the label is placed on the bottom of both uprights and laminates.

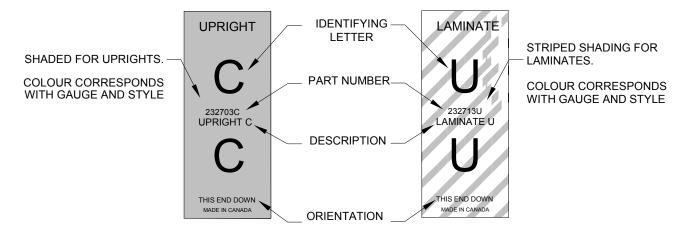
Upright labels have solid colours and laminate labels are striped. For both uprights and laminates, the colour corresponds with gauge and style.

Each upright and laminate has a unique identifying letter. This is prominently displayed on the label, and corresponds with the respective assembly charts provided (see Figure 14).

Тір

For error free installation, make sure that the identifying letter on the label coincides with the wall sheet/upright layout for the bin being assembled, and that the labels on both uprights and laminates remain on the bottom. There is a definite top and bottom orientation for uprights and laminates. It is imperative that they are oriented correctly.

Figure 14. Upright and Laminate Labels



Short Upright

There is one short upright measuring 44" long for use in odd tier bins. The alpha character for this part is "S". There is no corresponding laminate as it is used at the top of the bin before the laminates are introduced. The short upright always goes in the top tier.

Тір

The short "S" upright is located in the top tier of odd-tiered bins.

Upright/Laminate Assembly

Use the wall sheet/upright layout provided for the bin in question, to determine the proper order of the various upright and laminate components. The identifying letter on the label is the easiest means of identification. In addition to the identifying letter, every upright and laminate is also identified by gauge and width. If for some reason the label is missing from a part, the following table contains information that will aid in the identification of the various parts.

Тір

In all cases laminates nest inside uprights. The uprights are placed against the bin wall sheets and the laminates are away from the wall sheets.

It is important to get the first uprights started correctly. The top hole in the top upright bolts into the top horizontal wall sheet seam (see Figure 15).

Тір

For proper upright orientation align the bottom of the first upright with the bottom edge of a wall sheet.

Figure 15. Upright Orientation Detail

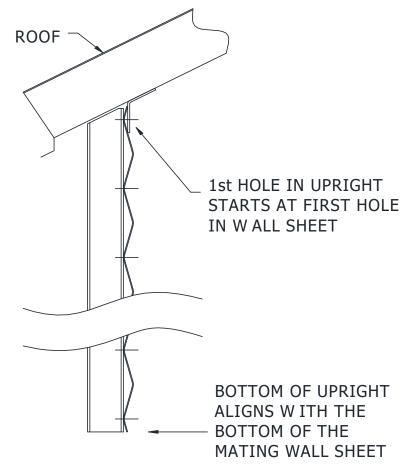


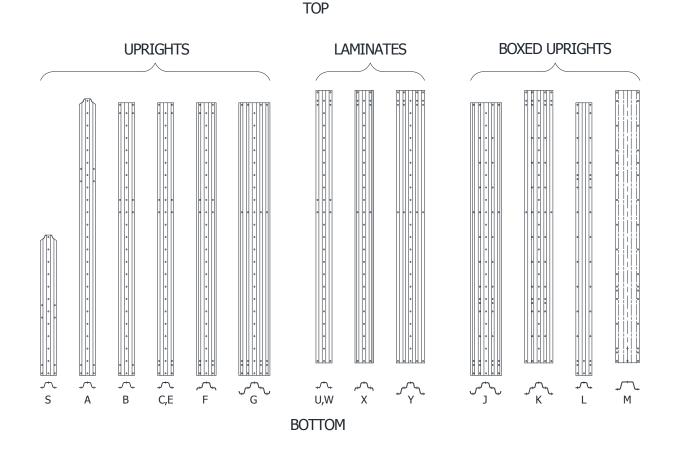
Table 15. Upright/Laminate Identification Table

| | Identifying Letter | Part Number | Description | Gauge | Label Colour | Width of Section (in) |
|-----------|-----------------------|----------------|-------------------------------|-------|----------------|--------------------------|
| | S | 232700S | Upright S .076" Short | 14 | Light green | 5.5" |
| | А | 232701A | Upright A .076" x 5.5" | 14 | Yellow | 5.5" |
| Uprights | В | 232702B | Upright B .076" x 5.5" | 14 | Light green | 5.5" |
| | С | 232703C | Upright C .116" x 5.5" | 12 | Blue | 5.5" |
| | E | 232705E | Upright E .168" x 5.5" | 8 | Brown | 5.5" |
| | F | 232706F | Upright F .168" x 6.5" | 8 | Silver | 6.5" |
| | G | 232707G | Upright G .168" x 10" | 8 | Gold | 10" |
| | U | 232713U | Laminate U .116" x 5.5" | 12 | Blue striped | 5.5" |
| | W | 232715W | Laminate W .168" x 5.5" | 8 | Brown striped | 5.5" |
| Laminates | Х | 232716X | Laminate X .168" x 6.5" | 8 | Silver Striped | 6.5" |
| | Y | 232717Y | Laminate Y .168" x 10" | 8 | Gold striped | 10" |
| | J | 232709J | Upright Boxed J .168" x 10" | 8 | Red | 10" |
| Boxed | K | 232710K | Laminate Boxed K .168" x 10" | 8 | Red Striped | 10" |
| | L | 232711L | Laminate Boxed L .168" x 5.5" | 8 | Red Striped | 5.5" |

Note

Not all sections are used on all bins.





Catwalk Support Uprights

The upright/laminate requirements under catwalk support locations are likely different from the normal upright/laminate order. Consult your AGI representative for specifications.

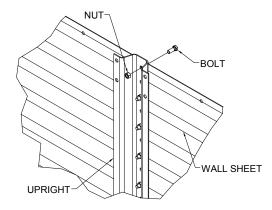
Bolt/Nut Orientation

To allow for a good seal install the bolts from the inside of the bin as shown for externally stiffened bins.

Upright/Splice Pre-Assemblies

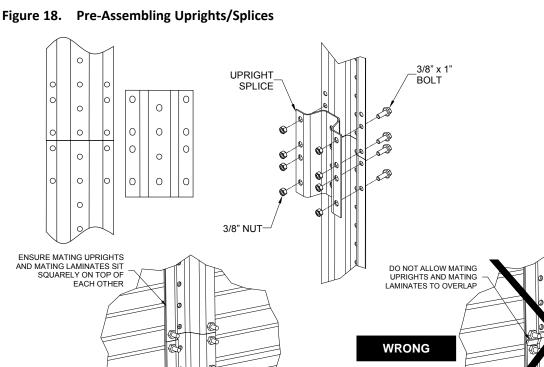
At the top of a bin, laminates are not utilized and a splice is required to make the connection between mating uprights. The splice nests inside the upright similar to a laminate. When pre-assembling uprights to splices, insure that the splice goes on the top end of the upright, such that the label on the bottom of the upright remains visible. Keeping the label visible will help prevent subsequent errors. This practice will also prevent ground interference when adjusting jack locations.

Figure 17. Upright / Wall Sheet Bolt and Nut Orientation



Tip

It may be advantageous to conduct pre-assemblies during the installation process. This can be a real time saver.



Upright and Laminate Assembly

¢

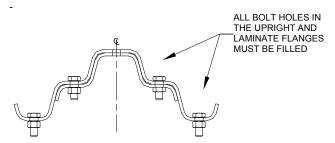
Uprights and laminates are designed to transfer vertical loads through an end to end, butt connection. Ensure that mating uprights sit squarely on top of each other and do not overlap. Ensure that mating laminates sit squarely on top of each other and do not overlap. Secure the joints with the nuts and bolts provided. Failure to do so can result in structural failure.

CORRECT

Upright/Laminate Pre-assemblies

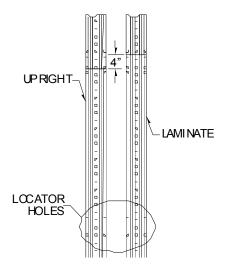
Laminates nest inside of uprights and are offset 4" above the uprights.

Figure 19. Nesting Laminates and Uprights



For proper orientation, ensure that the labels on the upright and laminate are both towards the bottom and that the locator holes in the middle portion of the upright and laminate line up. Bolts can be placed in these locator holes to create a pre-assembly. All locator holes, located in the middle of the upright and laminate flanges, need to be filled with bolts. These include holes in flanges that may only have one thickness of material.

Figure 20. Upright/Laminate Orientation



When properly assembled, both the upright label and the laminate label will remain visible during the preassembly phase. Once assembled on the bin the upright label will be covered.

In the assembly layouts, the combination of an upright and a laminate is called an assembly. For example, the combination of a "C" upright and a "U" laminate would be called a "CU Assembly". Both the "C" on the upright label and the "U" on the laminate label, would remain visible, and would therefore remain distinguishable from other pre-assemblies.

Тір

When creating pre-assemblies, ensure that the labels on both the upright and the laminate are on the same end, and that the locator holes align with each other in the middle of the parts. Once pre-assembled, both labels should remain visible.

Note

Once completely assembled onto the bin, all visible holes in the upright and laminate flanges must be filled. All mating wall sheet/upright holes must be filled.

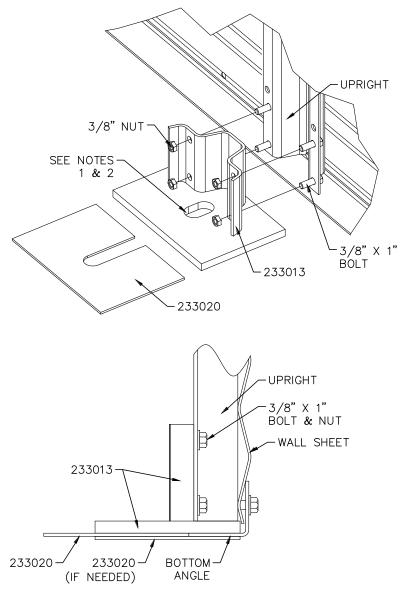
5.8.1 Base Assembly 233013 (WITHOUT Laminate Sections)

On smaller bins without laminates, use the combination of base assemblies and shims to secure the bin to the foundation, as shown below.

Тір

Depending on the assembly procedure, it may be convenient to bolt on the anchor brackets when creating the upright/laminate pre-assemblies.

Figure 21. Base Assembly 233013 for Uprights WITHOUT Laminate Sections



Important

1) When positioning anchor bolts, locate them as far forward (away from the bin) within the slot as possible.

2) The anchor bolts at the upright locations should be chosen so that they can handle the loads imposed on them and that the head, either alone or with large diameter heavy washers, is large enough to sufficiently cover the 1.20" x 1.90" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.

5.8.2 Base Assembly 233013 (Laminate Sections)

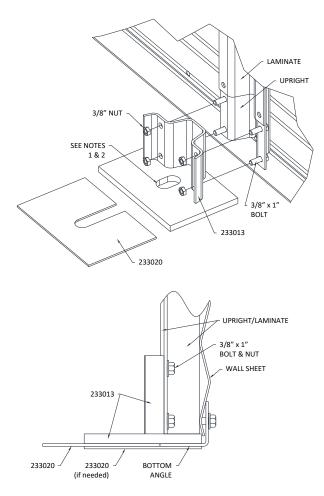
233013 — Base Assembly for Uprights with Laminate Sections

At the bottom of an assembled bin that has laminates, there will be a 4" gap between the bottom laminate and the base plate. It is imperative that this area is filled with the 4" laminate section that protrudes from the base assembly. Use the combination of base assemblies and shims to secure the bin to the foundation, as shown below.

Тір

Depending on the assembly procedure, it may be convenient to bolt on the base assemblies when creating the upright/laminate pre-assemblies.

Figure 22. Base Assembly 233013 for Uprights with Laminate Sections



Important

1) When positioning anchor bolts, locate them as far forward (away from the bin) within the slot as possible.

2) The anchor bolts at the upright locations should be chosen so that they can handle the loads imposed on them and that the head, either alone or with large diameter heavy washers, is large enough to sufficiently cover the 1.20" x 1.90" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.

5.8.3 Base Assembly for Hopper Bins

For AGI Hoppers

At the bin to hopper connection use anchor bracket 232735 provided in the parts box. The diagrams below represents the wall sheet to upright to anchor bracket configuration. All Centurion Hoppers (CEH) are externally stiffened only. The hopper must mate to this configuration. The distance from the wall sheet and upright interface to the anchor bracket holes is 2.63". Make the upright connection to hopper using two ½" Grade 8 bolts per upright (hardware not supplied).

Important

AGI's warranty only covers the bins that are installed on AGI Hopper cones.

For Non-AGI Hoppers

The following should be taken into consideration. The bottom wall sheet horizontal hole spacing for the CEH bin line is a constant 9-3/8". The position of the uprights to the bin remains consistent at two evenly spaced per wall sheet or an upright every 6 horizontal holes. The relative dimensions between the bin wall sheets and the uprights, and the preferred method of attaching the uprights to the hopper structure are provided on the diagrams below. It is the responsibility of the hopper installer to insure that the bin is properly supported and anchored. The anchor bracket is supplied with the CEH parts box as are the shims. Shim if necessary.

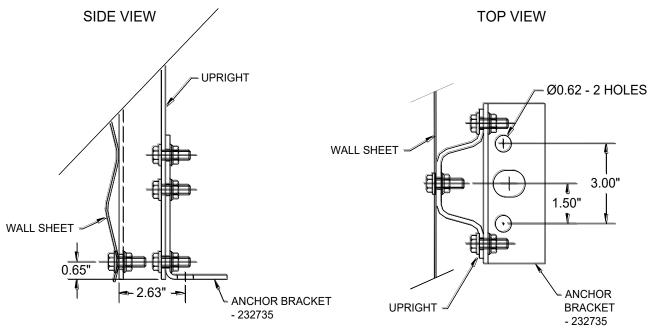
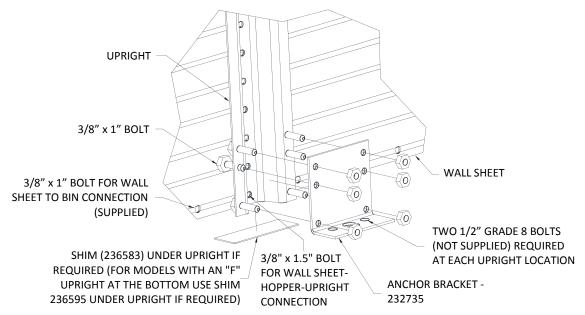
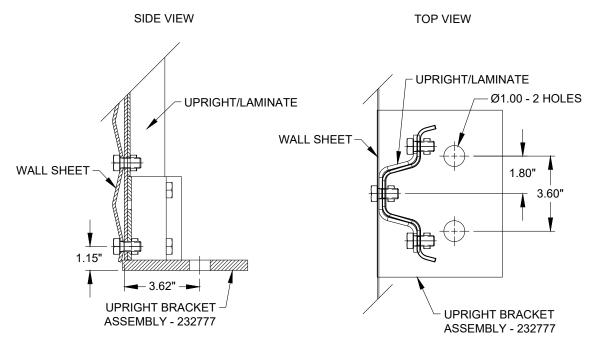


Figure 23. Relative Dimensions Between the Bin Wall Sheets and the Uprights (232735)









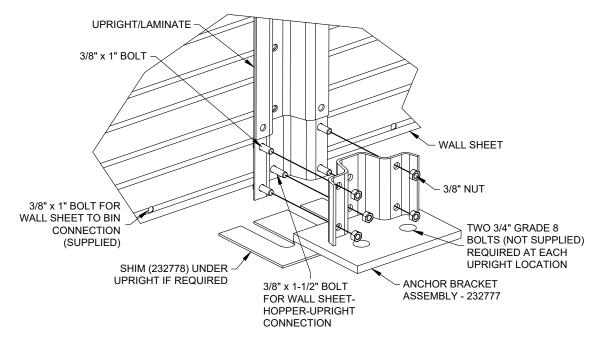
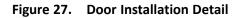
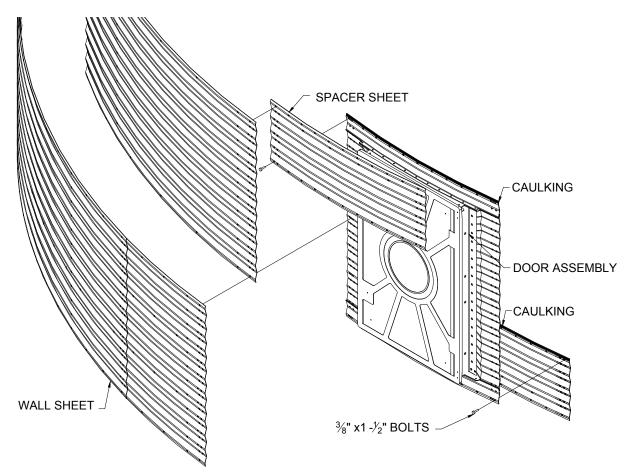


Figure 26. Upright, Wall Sheet and Anchor Bracket Assembly (232777)

5.9. One and Half Tier Door Installation

Install the door from the inside of the bin using $3/8" \times 1-\frac{1}{2}"$ bolts. The door should overlap the top spacer sheet as shown below. Place caulking on the top spacer sheet above and below the row of holes where it will meet with the door frame. The bottom spacer sheet overlaps the door from the inside as shown. Place caulking above and below the row of holes where it will meet the door frame. <u>Both spacer sheets must be installed below the</u> <u>door if auger chute and full floor aeration are used</u>. Locate door tie-back to secure door in open position.





| | Standard c/w Two Door Boards – 236810 | | | | | | | Standard | | er Chute – 840* | 236830 + | |
|------|---------------------------------------|------|------|------|------|------|------|----------|------|--------------------|----------|------|
| | 1505 | 1506 | 1507 | 1508 | 1509 | 1510 | 1511 | 1512 | 1505 | 1506 | 1507 | |
| | 1805 | 1806 | 1807 | 1808 | 1809 | 1810 | 1811 | 1812 | 1805 | 1806 | 1807 | |
| | 2105 | 2106 | 2107 | 2108 | 2109 | 2110 | 2111 | 2112 | 2105 | 2106 | 2107 | 2108 |
| | 2405 | 2406 | 2407 | 2408 | 2409 | 2410 | 2411 | 2412 | 2405 | 2406 | 2407 | |
| | 2705 | 2706 | 2707 | 2708 | 2709 | 2710 | 2711 | 2712 | 2705 | | | |
| | 3005 | 3006 | 3007 | 3008 | 3009 | 3010 | 3011 | 3012 | | | | |
| | 3305 | 3306 | 3307 | 3308 | 3309 | 3310 | 3311 | 3312 | | | | |
| 3604 | 3605 | 3606 | 3607 | 3608 | 3609 | 3610 | 3611 | 3612 | | | | |
| | 3905 | 3906 | 3907 | 3908 | 3909 | 3910 | 3911 | 3912 | | | | |
| | 4205 | 4206 | 4207 | 4208 | 4209 | 4210 | 4211 | 4212 | | | | |
| | 4505 | 4506 | 4507 | 4508 | 4509 | 4510 | 4511 | 4512 | | | | |
| | 4805 | 4806 | 4807 | 4808 | 4809 | 4810 | 4811 | 4812 | | | | |
| | 5105 | 5106 | 5107 | 5108 | 5109 | 5110 | | | | | | |
| | 5405 | 5406 | 5407 | 5408 | 5409 | | | | | | | |

Table 16. Door Types

*For the standard door with Auger Chute both 236830 and 236840 need to be ordered

- Entries that are bordered must use 236869 Support Kit if using Auger Chute. For all others it is optional. -

5.10. Door Cover Sidewall Latch Installation

Install the door cover sidewall latch (236783) on the swing side of the door cover.

- When possible, re-use the bin bolt on the horizontal wall sheet seam that lines up with the door cover.
- If existing bin bolt cannot be used, drill a 7/16" hole on top of a wall sheet corrugation approximately halfway up the door cover and install latch with a 3/8" bin bolt and nut. Use the door cover swing to help position the field drill hole.

Important

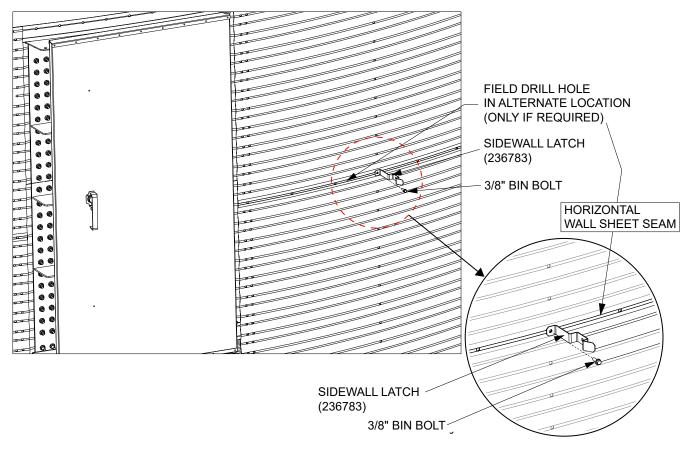
The door cover should snap shut and sit within the channel on the latch once installation is complete.

Figure 28. Door Sidewall Latch (236783)

(Supplied with the door frame and not included in the parts box.)



Figure 29. Install the Sidewall Latch



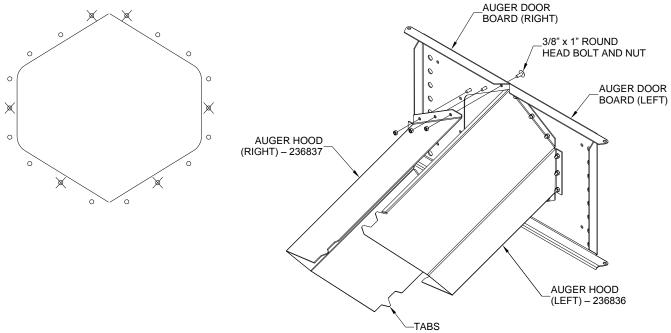
5.11. Auger Chute Installation

Bolt the auger chute hood to the auger door board, as shown below using the 3/8" x 1" round head bolts (150594) provided with the door. Install the auger hood pieces with the door board closed. Before tightening the nuts, position the two auger hoods such that the tabs near the back of the auger hoods fit snugly together and such that the top seam where the left and right chutes come together is sealed tight. Tighten nuts.

Note

If planning to use an auger hood block-off plate, use $3/8" \times 1-\frac{1}{2}"$ bolts as illustrated below at the six locations marked with an "X".

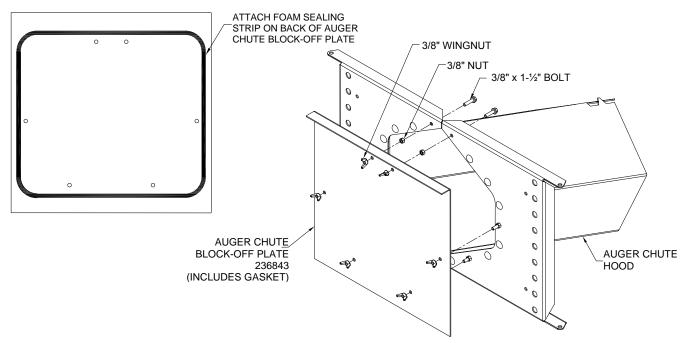




5.12. Auger Chute Block-Off Plate Installation

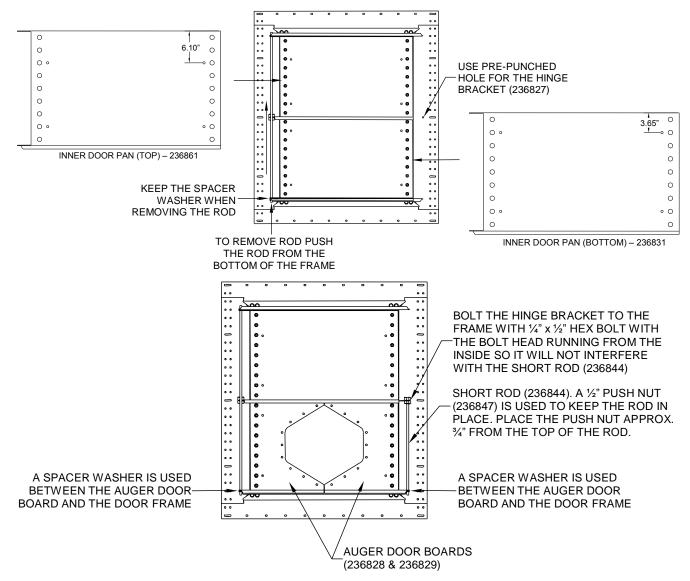
Bolt the auger chute block-off plate to the auger door boards using $3/8" \times 1-12"$ bolts, 3/8" nut and 3/8" wing nut as shown below and remove the corresponding round head bolts. To remove the plate, remove the wing nuts.





5.13. Door Conversion

Figure 32. Door Conversion Detail



To convert a standard door configuration to an auger hood version:

- 1. Remove the lower door board by pushing up the long hinge rod sufficiently to clear the door board. Save the spacer washer at the bottom of the door board.
- 2. Insert the proper auger door board as shown. Reinsert the long rod and spacer washer.
- 3. Bolt the hinge bracket to the frame using ¼" x ¾" hex bolts. Put the head of the bolt on the inside of the door. Orient the hinge bracket similar to the other hinge bracket on the other side.
- 4. Put the ½" push nut on one end of the short hinge rod. Push it down about ¾".
- 5. Position the second auger door board and insert the short rod through the hinge bracket, through the auger door board and through the door frame at the bottom. Remember to insert the spacer washer as shown.
- 6. Bolt on the auger chutes as provided elsewhere.

To convert an auger hood door version to a standard door configuration:

- 1. Remove the two auger door boards by pulling the hinge rods sufficiently to clear them. The short rod can be removed completely. Save the spacer washer.
- 2. Insert the lower door board and reinsert the long hinge rod. Remember to insert the spacer washer.
- 3. Be sure that the top and bottom door boards are positioned properly with respect to each other. This can be determined by the handle location on the door as shown above (6.1" from the top on the top door board and 3.65" from the top on the bottom door board). Another check is to insure that the handles align with the mating studs on the door frame.

6. Specifications

6.1. Centurion-CEN Grain Bin Specifications

| | | | | | HEIGHT | | | | |
|-------|-------------------|-------|----------------|--------|--------|-------|------|-------|--|
| MODEL | BIN DIAMETER | IMA | | AGITT | EAV | 'ES | OVE | RALL | |
| | | bu | m ³ | Tonnes | ft | m | ft | m | |
| 2708W | 26' 10" (8.19 m) | 15320 | 511 | 416 | 29.5 | 8.99 | 37.1 | 11.30 | |
| 3007W | 29' 10" (9.1 m) | 16880 | 564 | 458 | 25.8 | 7.87 | 33.9 | 10.32 | |
| 3008W | 23 10 (3.1 11) | 19070 | 637 | 517 | 29.5 | 8.99 | 37.5 | 11.44 | |
| 3307W | | 20610 | 689 | 559 | 25.8 | 7.87 | 34.7 | 10.58 | |
| 3308W | 32' 10" (10.01 m) | 23250 | 777 | 631 | 29.5 | 8.99 | 38.4 | 11.70 | |
| 3309W | | 25900 | 865 | 702 | 33.2 | 10.11 | 42.1 | 12.82 | |
| 3609W | | 31030 | 1036 | 842 | 33.2 | 10.11 | 42.9 | 13.08 | |
| 3610W | 35' 10" (10.91 m) | 34180 | 1141 | 927 | 36.8 | 11.23 | 46.4 | 14.15 | |
| 3611W | | 37330 | 1246 | 1012 | 40.5 | 12.35 | 50.1 | 15.27 | |
| 4208W | 41'9" (12.73 m) | 38540 | 1289 | 1045 | 29.5 | 8.99 | 41.0 | 12.49 | |
| 4210W | | 47110 | 1574 | 1278 | 36.8 | 11.23 | 48.1 | 14.67 | |

Capacities shown include 28° roof cone.

1. Based on 1.244 cu. Ft. Per bushel and 6% compaction in cylinder

2. Based on 770 kg/m3 and 6% compaction in cylinder (below eaves line)

Note

Upgraded stir or cir bins should be used with stirring or recirculating devices.

6.2. Centurion-CEH Grain Bin Specifications

| | | N | laximum Capa | city | Height (Not Including Hopper) | | | | |
|---------|-----------------|--------------|--------------|----------------|-------------------------------|---------------|-------|-------|-------|
| Model | No. of Tiers | Bin Diameter | | | | Eaves Overall | | erall | |
| | | | bu | m ³ | Tonnes | ft | m | ft | m |
| 2709CEH | 9 | 27' | 17100 | 570 | 464 | 33.2 | 10.11 | 40.7 | 12.41 |

Capacities shown include 28° roof cone.

1. Based on 1.244 cu. Ft. Per bushel and 6% compaction in cylinder

2. Based on 770 kg/m³ and 6% compaction in cylinder (below eaves line)

Note

Upgraded stir or cir bins should be used with stirring or recirculating devices.

6.3. Foundation Loads — Grain Bin Series CEN

Important

- Grain Bin Anchoring: Adequate anchoring is critical to a successful bin installation. The anchoring of the bin is dependent on local wind loading conditions and forms part of the site specific design requirements. The anchor bolt details must form part of the site specific foundation design.
- For stiffened bins the primary anchor bolt locations are through the base plates at each and every upright location. The anchor bolt design, plus connection details to the base plate, must accommodate the total shear and uplift loads that can occur due to wind loading at the site in question.
- In addition AGI suggests the use of 1/2" x 3" embedment anchor bolts through the bottom ring angle to insure bin roundness, for sealing purposes, and for additional localized lateral stability.

 Table 17. Foundation Loads — CEN Series 27' Bins (Imperial-Unfactored)

| Model (CEN) | | 2708 |
|--|----------------------|-------|
| Vertical dead load | kips/upr | 0.48 |
| Vertical grain load | kips/upr | 18.67 |
| Vertical roof snow load * | kips/upr | 1.23 |
| Vertical roof peak load | kips/upr | 0.28 |
| Bin floor pressure | kips/ft ² | 1.17 |
| Number of anchor bolts for uprights | | 18 |
| Number of anchor bolts for bottom angle ring | | 54 |
| * Based on maximum snow load of 39 psf | 1 | • |

Table 18. Foundation Loads — CEN Series 30' Bins (Imperial-Unfactored)

| Model (CEN) | | 3007 | 3008 |
|--|----------------------|-------|-------|
| Vertical dead load | kips/upr | 0.48 | 0.52 |
| Vertical grain load | kips/upr | 15.71 | 19.46 |
| Vertical roof snow load * | kips/upr | 1.40 | 1.40 |
| Vertical roof peak load | kips/upr | 0.25 | 0.25 |
| Bin floor pressure | kips/ft ² | 1.13 | 1.22 |
| Number of anchor bolts for uprights | | 20 | 20 |
| Number of anchor bolts for bottom angle ring | | 60 | 60 |
| * Based on maximum snow load of 40 psf | | | |

Table 19. Foundation Loads — CEN Series 33' Bins (Imperial-Unfactored)

| Model (CEN) | | 3307 | 3308 | 3309 |
|--|----------------------|-------|-------|-------|
| Vertical dead load | kips/upr | 0.51 | 0.56 | 0.63 |
| Vertical grain load | kips/upr | 16.31 | 20.19 | 24.38 |
| Vertical roof snow load * | kips/upr | 1.69 | 1.69 | 1.69 |
| Vertical roof peak load | kips/upr | 0.23 | 0.23 | 0.23 |
| Bin floor pressure | kips/ft ² | 1.17 | 1.27 | 1.36 |
| Number of anchor bolts for uprights | | 22 | 22 | 22 |
| Number of anchor bolts for bottom angle ring | | 66 | 66 | 66 |
| * Based on maximum snow load of 44 psf | | | | |

| Model (CEN) | | 3609 | 3610 | 3611 |
|--|----------------------|-------|-------|-------|
| Vertical dead load | kips/upr | 0.65 | 0.73 | 0.81 |
| Vertical grain load | kips/upr | 25.23 | 29.86 | 34.78 |
| Vertical roof snow load * | kips/upr | 1.59 | 1.59 | 1.59 |
| Vertical roof peak load | kips/upr | 0.21 | 0.21 | 0.21 |
| Bin floor pressure | kips/ft ² | 1.41 | 1.50 | 1.59 |
| Number of anchor bolts for uprights | | 24 | 24 | 24 |
| Number of anchor bolts for bottom angle ring | | 72 | 72 | 72 |
| * Based on maximum snow load of 38 psf | | | | |

Table 20. Foundation Loads — CEN Series 36' Bins (Imperial-Unfactored)

Table 21. Foundation Loads — CEN Series 42' Bins (Imperial-Unfactored)

| Model (CEN) | | 4208 | 4210 |
|--|----------------------|-------|-------|
| Vertical dead load | kips/upr | 0.66 | 0.82 |
| Vertical grain load | kips/upr | 22.19 | 31.71 |
| Vertical roof snow load * | kips/upr | 1.66 | 1.66 |
| Vertical roof peak load | kips/upr | 0.18 | 0.18 |
| Bin floor pressure | kips/ft ² | 1.39 | 1.60 |
| Number of anchor bolts for uprights | | 28 | 28 |
| Number of anchor bolts for bottom angle ring | | 84 | 84 |
| * Based on maximum snow load of 34 psf | | | L |

6.4. Foundation Loads — Grain Bin Series CEH

Important

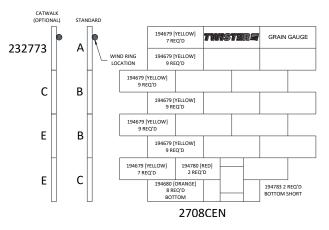
- Grain Bin Anchoring: Adequate anchoring is critical to a successful bin installation. The anchoring of the bin is dependent on local wind loading conditions and forms part of the site specific design requirements. The anchor bolt details must form part of the site specific foundation design.
- For stiffened bins the primary anchor bolt locations are through the base plates at each and every upright location. The anchor bolt design, plus connection details to the base plate, must accommodate the total shear and uplift loads that can occur due to wind loading at the site in question.
- In addition AGI suggests the use of 1/2" x 3" embedment anchor bolts through the bottom ring angle to insure bin roundness, for sealing purposes, and for additional localized lateral stability.

Specification 2709 Units Vertical dead load kips/upright 0.54 Vertical grain load kips/upright 22.52 1.23 Vertical roof snow load * kips/upright Vertical roof peak load kips/upright 0.28 Bin floor pressure kips/ft2 1.25 Number of anchor bolts for uprights 18 n/a Number of anchor bolts for bottom angle ring 54 n/a * Based on maximum snow load of 39 psf

Table 22. Foundation Loads — CEH Series 27' Bins (Imperial-Unfactored)

6.5. Wall Sheet and Upright Layouts - CEN Series

Figure 33. Model 2708CEN



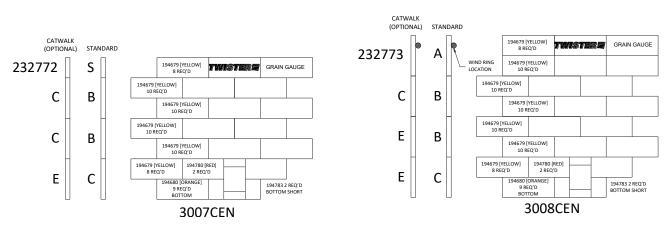
Notes:

1. Colors match part number label and indicate wall sheet thickness.

- 2. Stencil sheet is 194081 [YELLOW].
- 3. Walk-in door 236810 (supplied with 2 door boards); 236830 (for use with auger chute) + 236840 Auger Chute optional for 2705CEN 2707CEN.
- 4. The catwalk uprights shown are an optional upgrade and can take 10,000 lbs. of catwalk load per upright. Typically 4 uprights are ordered with the catwalk option.

5. • - Indicates additional wind ring (must be ordered separately) required if using AGI side draw system.





Notes:

1. Colors match part number label and indicate wall sheet thickness.

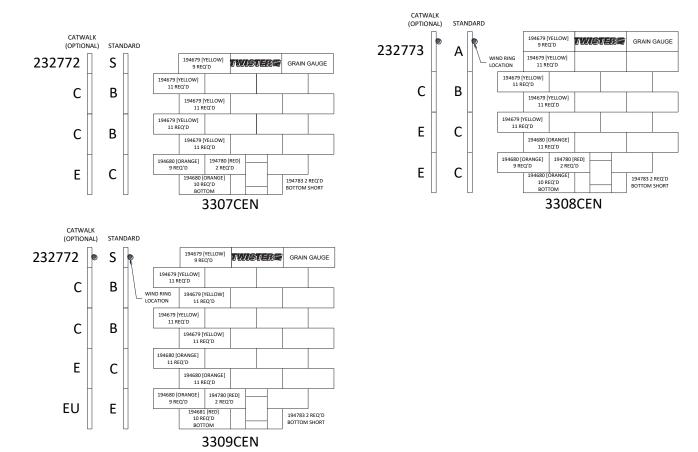
2. Stencil sheet is 194081 [YELLOW].

3. Walk-in door 236810 (supplied with 2 door boards).

4. The catwalk uprights shown are an optional upgrade and can take 10,000 lbs. of catwalk load per upright. Typically 4 uprights are ordered with the catwalk

option.
- Indicates additional wind ring (must be ordered separately) required if using AGI side draw system.

Figure 35. Models 3307CEN – 3309CEN



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW].
- 3. Walk-in door 236810 (supplied with 2 door boards).
- 4. The catwalk uprights shown are an optional upgrade and can take 10,000 lbs. of catwalk load per upright. Typically 4 uprights are ordered with the catwalk
- option.
 Indicates additional wind ring (must be ordered separately) required if using AGI side draw system.

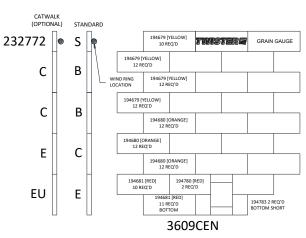
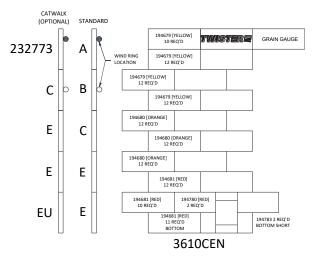


Figure 36. Models 3609CEN – 3611CEN



CATWALK (OPTIONAL) STANDARD 194679 [YELLOW] 10 REQ'D 232772 S TWISTERE GRAIN GAUGE 194679 [YELLOW] 12 REQ'D С В b WIND RING 194679 [YELLOW] 12 REQ'D 194679 [YELLOW] 12 REQ'D С В 194680 [ORANGE] 12 REQ'D 194680 [ORANGE] 12 REQ'D Е С 194680 [ORANGE] 12 REQ'D 194681 [RED] 12 REQ'D ΕU Ε 194681 [RED] 12 REQ'D 194681 [RED] 10 REO'D 194780 [RED] 2 REQ'D EU EU 194681 [RED] 11 REQ'D BOTTOM 194783 2 REQ'D BOTTOM SHORT 3611CEN

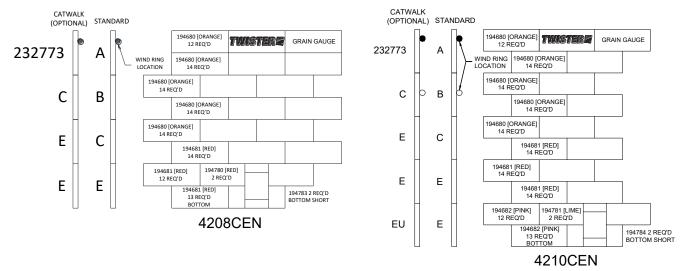
Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW].
- 3. Walk-in door 236810 (supplied with 2 door boards).
- 4. The catwalk uprights shown are an optional upgrade and can take 10,000 lbs. of catwalk load per upright. Typically 4 uprights are ordered with the catwalk

option.
o — Indicates standard wind ring placement.

Indicates additional wind ring placement if using Twister side-draw system (must be ordered separately).

Figure 37. Model 4208CEN and 4210CEN

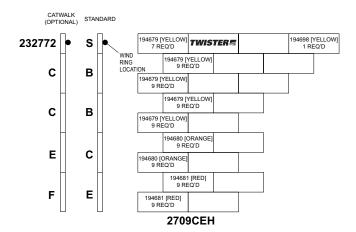


Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194085 [ORANGE].
- 3. Walk-in door 236810 (supplied with 2 door boards).
- 4. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 5. The catwalk uprights shown are an optional upgrade and can take 10,000 lbs. of catwalk load per upright. Typically 4 uprights are ordered with the catwalk
- 6. option. \circ — Indicates standard wind ring placement.
 - - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

6.6. Wall Sheet and Upright Layouts - CEH Series

Figure 38. Model 2709CEH



Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. Stencil sheet is 194081 [YELLOW].
- 3. The catwalk uprights shown are an optional upgrade and can take 10,000 lbs. of catwalk load per upright. Typically 4 uprights are ordered with the catwalk
- option.
 Indicates additional wind ring (must be ordered separately) required if using AGI side draw system.

7. Appendix

7.1. CEN Common Parts Box Listing (5 – 9 Tier Bins)

| Part Number | Description | Unit Weight (Ibs) | 27' | 30' | 33' | 36' | 42' |
|----------------|--------------------------------------|-------------------------|-----|-----|-----|-----|-----|
| 185010 | CARTON 37x37x9 for BIN PARTS 15-27 | 9.4 | 1 | - | - | - | - |
| 234808 | ROOF CAP 15-27 | 21.5 | 1 | - | - | - | - |
| 212201 | PEAK RING 15 | 30.7 | - | - | - | - | - |
| 195149 | PEAK RING BULB GASKET 105" | 0.9 | 1 | - | - | - | - |
| 212228 | PEAK RING FOAM for 15-27, 51-54 | 0.4 | 1 | - | - | - | - |
| 212740 | FALL RESTRAINT BRACKET | 0.3 | 2 | 2 | 2 | 2 | 2 |
| 234810 | RCO PIVOT ARM 15-27 | 3.01 | 1 | - | - | - | - |
| 234814 | RCO PIVOT ARM BRACKET 15-27 | 0.85 | 2 | - | - | - | - |
| 234812 | RCO ROPE ARM 15–60 | 4.12 | 1 | 2 | 2 | 2 | 2 |
| 235219 | RCO ROPE ARM SUPPORT 15-27 | 0.26 | 1 | - | - | - | - |
| 212404 | RCO CABLE GUIDE | 3.5 | 1 | - | - | - | - |
| 235798 | RCO CABLE 9/32 x 45' GALV | 0.75 | 1 | - | - | - | - |
| 212400 | RCO SLIDE ROD 15-27 | 2.45 | 1 | - | - | - | - |
| 212402 | RCO SLIDE ROD ANGLE | 2.15 | 1 | 1 | 1 | 1 | 1 |
| 234804 | RCO HARDWARE PACKAGE 15- 27 | 4.70 | 1 | - | - | - | - |
| 193077 | LADDER RUNG 38.5 (36.0 CTR) | 4.6 | 1 | 1 | 1 | 1 | 1 |
| 193073 | LADDER RUNG 30.5 (28.0 CTR) | 3.6 | 1 | - | - | 1 | 1 |
| 193070 | LADDER RUNG 24.5 (22.0 CTR) | 1.7 | - | 1 | - | 1 | - |
| 193066 | LADDER RUNG 16.5 (14.0 CTR) | 1.1 | - | 1 | 1 | - | - |
| 235890 | INSPECTION HATCH LID | 7.48 | 1 | 1 | 1 | 1 | 1 |
| 235891 | INSPECTION HATCH LATCH | 0.81 | 1 | 1 | 1 | 1 | 1 |
| 235882 | INSPECTION HATCH BULB GASKET 76" | 0.5 | 1 | 1 | 1 | 1 | 1 |
| 212230 | BIRD STOP | 0.127 | 27 | 30 | 33 | 36 | 42 |
| 212231 | FOAM ROOF RIB CLOSURE (12) | 0.06 | 3 | 3 | 3 | 3 | 4 |
| 194120 | GRAIN GAUGE | 0.3 | 1 | 1 | 1 | 1 | 1 |
| 194125 | REFLECTIVE STRIP .75 x 8.2 | 0.001 | 1 | 1 | 1 | 1 | 1 |
| 212789 | RUBBER PAD | 0.06 | 2 | 2 | 2 | 2 | 2 |
| 232720 | UPRIGHT SPLICE | 2.14 | 1 | 1 | 1 | 1 | 1 |
| 212731 | LOAD SPREADER TUBE 15 | 8.6 | - | - | - | - | - |
| 235372 | SEALING CLIP for BOTTOM ANGLE | 0.12 | 9 | 10 | 11 | 12 | 14 |
| 235914 | BOLT HFS .313 x 1.00 GR8.2 - BAG 250 | 8.5 | 2 | 2 | 3 | 3 | 4 |
| 235916 | BOLT HFS .313 x 1.25 GR8.2 - BAG 80 | 3.04 | 1 | 2 | 2 | 1 | 2 |
| 235923 | HEX FLANGE NUT .313 - BAG 250 | 3.5 | 3 | 3 | 4 | 4 | 6 |
| 235925 | HEX FLANGE NUT .313 - BAG 50 | 0.7 | - | 1 | - | 3 | - |
| 235973 | WSHR SEAL .313 STL/NEO - BAG 25 | 0.1 | 1 | 1 | 1 | 1 | 2 |
| 235955 | HEX FLANGE NUT .375 GR5 - Bag 50 | 0.95 | 3 | 3 | 3 | 3 | - |
| 212203 | PEAK RING 18 | 30.7 | - | - | - | - | - |
| 193074 | LADDER RUNG 32.5 (30.0 CTR) | 3.9 | - | 1 | 1 | 1 | - |
| 193071 | LADDER RUNG 26.5 (24.0 CTR) | 3.2 | 1 | - | 1 | - | 1 |
| 193068 | LADDER RUNG 20.5 (18.0 CTR) | 1.4 | - | 1 | - | 1 | 1 |

| 42' |
|-----|
| 1 |
| - |
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| - |
| |

| Part Number | Description | Unit Weight (Ibs) | 27' | 30' | 33' | 36' | 42' | | |
|----------------|------------------------------|-------------------------|-----|-----|---|-----|-----|--|--|
| 212739 | LOAD SPREADER TUBE 48-54 | 8.6 | - | - | - | - | - | | |
| VARIES | PEAK RING (30' - 51') | | - | | TOO LARGE FOR PARTS BOX, SHIPPED INDIVIDUALLY | | | | |
| 198891 | MANUAL - CENTURION-W | 0.3 | 1 | 1 | 1 | 1 | 1 | | |
| 212454 | MANUAL - ROOF NON-STRUCTURAL | 0.3 | 1 | 1 | 1 | 1 | 1 | | |
| * Shipped ir | a separate case | · | | | | | | | |

7.2. CEN Non-Common Pail & Parts Box Listing

| | HARDW | ARE PAIL | | SHIPPED IN PARTS BOX | | | | | | | | | | |
|-------|-------------------------------------|--------------------------------------|-------------------|----------------------|---|------------------------------|------------------------------|-------------------------------------|------------------------------------|------------------------|---|----------|------------------------------|--|
| | 232850 | 232852 | 232767 | 235941 | 235943 | 235950 | 235951 | 235956 | 235957 | 193814 | 235954 | 235955 | 170445 | |
| MODEL | 3/8" x 1" bolt & nut pail 700 | 3/8" x 1½" bolt & nut pail 500 | WIND RING CLIP | | BOLT HFS .375 x 1.0 GR8.2 - BAG 50 | HEX NUT .375 - BAG 300 | HEX NUT .375 - BAG 100 | FLAT WASHER .375 - BAG 200 | FLAT WASHER .375 - BAG 75 | CAULKING - 40' ROLL | HEX FLANGE NUT .375 GR5 - Bag 300 | NUT .375 | CAULKING - 300 ml TUBE | |
| 2708 | 8 | 1 | 2 | 2 | - | 2 | 1 | - | 2 | 13 | - | 3 | 2 | |
| 3007 | 8 | 1 | 2 | 2 | - | 2 | - | - | 2 | 13 | - | 3 | 2 | |
| 3008 | 9 | 1 | 2 | 2 | - | 2 | 1 | - | 2 | 14 | - | 3 | 2 | |
| 3307 | 9 | 1 | 2 | 1 | 5 | 2 | - | - | 2 | 14 | - | 3 | 2 | |
| 3308 | 11 | 1 | 2 | - | - | - | - | - | 2 | 16 | - | 3 | 2 | |
| 3309 | 12 | 1 | 2 | 1 | 3 | 1 | 2 | - | 2 | 17 | - | 3 | 2 | |
| 3609 | 13 | 1 | 2 | 1 | 5 | 2 | - | - | 2 | 19 | - | 3 | 2 | |
| 4208 | 14 | 1 | 2 | - | 3 | - | 2 | - | 2 | 20 | 1 | - | 2 | |

7.3. CEN Common Parts Box Listing (10 – 12 Tier Bins)

| Part Number | Description | Unit weight (lbs) | 36' | 42' |
|----------------|--------------------------------------|-------------------|-----|-----|
| 212740 | FALL RESTRAINT BRACKET | 0.3 | 2 | 2 |
| 193077 | LADDER RUNG 38.5 (36.0 CTR) | 4.6 | 1 | 1 |
| 193073 | LADDER RUNG 30.5 (28.0 CTR) | 3.6 | 1 | 1 |
| 193070 | LADDER RUNG 24.5 (22.0 CTR) | 1.7 | 1 | - |
| 235890 | INSPECTION HATCH LID | 7.48 | 1 | 1 |
| 235891 | INSPECTION HATCH LATCH | 0.81 | 1 | 1 |
| 235882 | INSPECTION HATCH BULB GASKET 76" | 0.5 | 1 | 1 |
| 212230 | BIRD STOP | 0.127 | 36 | 42 |
| 212231 | FOAM ROOF RIB CLOSURE (12) | 0.06 | 3 | 4 |
| 194120 | GRAIN GAUGE | 0.3 | 1 | 1 |
| 194125 | REFLECTIVE STRIP .75 x 8.2 | 0.001 | 1 | 1 |
| 212789 | RUBBER PAD | 0.06 | 2 | 2 |
| 232720 | UPRIGHT SPLICE | 2.14 | 1 | 1 |
| 235372 | SEALING CLIP for BOTTOM ANGLE | 0.12 | 12 | 14 |
| 235914 | BOLT HFS .313 x 1.00 GR8.2 - BAG 250 | 8.5 | 3 | 4 |
| 235916 | BOLT HFS .313 x 1.25 GR8.2 - BAG 80 | 3.04 | 1 | 2 |
| 235923 | HEX FLANGE NUT .313 - BAG 250 | 3.5 | 4 | 5 |
| 235925 | HEX FLANGE NUT .313 - BAG 50 | 0.7 | 3 | 3 |
| 235973 | WSHR SEAL .313 STL/NEO - BAG 25 | 0.1 | 1 | 2 |
| 235955 | HEX FLANGE NUT .375 GR5 - Bag 50 | 0.95 | 3 | - |
| 212738 | LOAD SPREADER TUBE 39-45 | 8.5 | - | 1 |
| 193074 | LADDER RUNG 32.5 (30.0 CTR) | 3.9 | 1 | - |
| 193068 | LADDER RUNG 20.5 (18.0 CTR) | 1.4 | 1 | 1 |
| 193065 | LADDER RUNG 14.5 (12.0 CTR) | 1 | 1 | 1 |
| 193075 | LADDER RUNG 34.5 (32.0 CTR) | 4.1 | - | 1 |
| 193072 | LADDER RUNG 28.5 (26.0 CTR) | 3.4 | - | 1 |
| 193071 | LADDER RUNG 26.5 (24.0 CTR) | 3.2 | - | 1 |
| 193064 | LADDER RUNG 14.5 (10.0 CTR) | 1 | - | 1 |
| 235917 | BOLT HFS .313 x 1.25 GR8.2 - BAG 50 | 1.9 | 2 | 1 |
| 193067 | LADDER RUNG 18.5 (16.0 CTR) | 1.3 | 1 | 1 |
| 235915 | BOLT HFS .313 x 1.00 GR8.2 - BAG 50 | 1.7 | 2 | 1 |
| 193063 | LADDER RUNG 14.5 (8.0 CTR) | 1 | 1 | 1 |
| 185011 | CARTON 53x27x7 for BIN PARTS 30-54 | 8.3 | 1 | 1 |
| 195150 | PEAK RING BULB GASKET 168" | 1.44 | 1 | 1 |
| 212229 | PEAK RING FOAM for 30-48 | 0.5 | 1 | 1 |
| 193076 | LADDER RUNG 36.5 (34.0 CTR) | 4.4 | 1 | 1 |
| 212737 | LOAD SPREADER TUBE 33-36 | 8.6 | 1 | - |
| 235954 | HEX FLANGE NUT .375 GR5 - Bag 300 | 5.7 | - | 1 |
| 195063 | STIFFENING RING BRACKET | 0.31 | 36 | 42 |
| 195080 | STIFFENING RING GASKET - BAG 50 | 0.05 | 1 | 1 |
| 195074 | STIFFENING RING SPLICE 1.375 | 1.35 | 3 | 3 |
| 195085 | STIFFENING RING EXPANDER 1.375 | 4.66 | 2 | 2 |
| 232798 | STIFFENING RING EXPANDER CLIP | 0.125 | 2 | 2 |
| 235151 | SELFDRILL SCREW .25 x 1.0 - BAG 7 | 0.13 | 1 | 1 |

| Part Number | Description | Description Unit weight (lbs) 36' | | 42' | |
|----------------|-----------------------------------|-----------------------------------|-------------------------|-----|--|
| 234157 | U-BOLT, ROUND .312 x 1.75W x 2.8L | 0.12 36 | | 42 | |
| 235974 | WSHR SEAL .375 STL/NEO - BAG 25 | 0.16 | 1 | 1 | |
| VARIES | PEAK RING (30' - 51') | | TOO LARGE FOR PARTS BOX | | |
| 198891 | MANUAL - CENTURION-W | 0.3 | 1 | 1 | |

7.4. CEN Non-Common Pail & Parts Box Listing (10 – 12 Tier Bins)

| | H/ | ARDWARE PA | NL | SHIPPED IN PARTS BOX | | | | | | | | | |
|-------------|-------------------------------|------------|------------------------|----------------------|--|---|--|------------------------------|------------------------------|------------------------------------|-------------------------------------|------------------------------|--|
| | 232850 | 232852 | 193814 | 232767 | 235941 | 235943 | 235949 | 235950 | 235951 | 235957 | 235956 | 170445 | |
| | 3/8"x1" bolt/ nut pail 700 | | CAULKING - 40' ROLL | WIND RING CLIP | BOLT HFS .375 x 1.0 GR8.2 - BAG 325 | BOLT HFS .375 x 1.0 GR8.2 - BAG 50 | BOLT HEX .375 x 3.75 GR5 - BAG 10 | HEX NUT .375 - BAG 300 | HEX NUT .375 - BAG 100 | FLAT WASHER .375 - BAG 75 | FLAT WASHER .375 - BAG 200 | CAULKING - 300 ml TUBE | |
| 3610 | 14 | 2 | 21 | 53 | 1 | - | 1 | 1 | - | 2 | - | 2 | |
| 3611 | 16 | 2 | 22 | 53 | - | 4 | 1 | - | 2 | 2 | - | 2 | |
| 4210 | 17 | 2 | 26* | 61 | - | 2 | 1 | - | 1 | - | 1 | 2 | |
| * Shipped i | n a separate o | case | | | | | | | | | | | |

7.5. CEH Parts Box Listing (27' Bins)

| Part Number | Description | Unit Weight (Ibs) | 27' |
|-------------|------------------------------------|-------------------------|-----|
| 185010 | CARTON 37x37x9 for BIN PARTS 15-27 | 9.40 | 1 |
| 234808 | ROOF CAP 15-27 | 21.5 | 1 |
| 212206 | PEAK RING 27 | 30.70 | 1 |
| 195149 | PEAK RING BULB GASKET 105" | 0.90 | 1 |
| 212228 | PEAK RING FOAM for 15-27, 51-54 | 0.40 | 1 |
| 212740 | FALL RESTRAINT BRACKET | 0.30 | 2 |
| 234810 | RCO PIVOT ARM 15-27 | 3.01 | 1 |
| 234814 | RCO PIVOT ARM BRACKET 15-27 | 0.85 | 2 |
| 234812 | RCO ROPE ARM 15–60 | 4.12 | 1 |
| 235219 | RCO ROPE ARM SUPPORT 15-27 | 0.26 | 1 |
| 212404 | RCO CABLE GUIDE | 3.50 | 1 |
| 235799 | RCO CABLE 9/32 x 70' GALV | 1.14 | 1 |
| 212400 | RCO SLIDE ROD 15-27 | 2.45 | 1 |
| 212402 | RCO SLIDE ROD ANGLE | 2.15 | 1 |
| 234804 | RCO HARDWARE PACKAGE 15-27 | 4.70 | 1 |
| 193077 | LADDER RUNG 38.5 (36.0 CTR) | 4.60 | 1 |
| 193075 | LADDER RUNG 34.5 (32.0 CTR) | 4.10 | 1 |
| 193073 | LADDER RUNG 30.5 (28.0 CTR) | 3.60 | 1 |
| 193071 | LADDER RUNG 26.5 (24.0 CTR) | 3.20 | 1 |
| 193069 | LADDER RUNG 22.5 (20.0 CTR) | 1.50 | 1 |
| 193067 | LADDER RUNG 18.5 (16.0 CTR) | 1.30 | 1 |
| 193065 | LADDER RUNG 14.5 (12.0 CTR) | 1.00 | 1 |
| 193063 | LADDER RUNG 14.5 (8.0 CTR) | 1.00 | 1 |
| 235890 | INSPECTION HATCH LID | 7.48 | 1 |

| Part Number | Description | Unit Weight (Ibs) | 27' |
|----------------------------|--------------------------------------|-------------------------|-----|
| 235891 | INSPECTION HATCH LATCH | 0.81 | 1 |
| 235882 | INSPECTION HATCH BULB GASKET 76" | 0.50 | 1 |
| 212230 | BIRD STOP | 0.13 | 27 |
| 212231 | FOAM ROOF RIB CLOSURE (12) | 0.06 | 3 |
| 194120 | GRAIN GAUGE | 0.30 | 1 |
| 194125 | REFLECTIVE STRIP.75 x 8.2 | 0.00 | 1 |
| 232767 | WIND RING CLIP | 0.44 | 2 |
| 212789 | RUBBER PAD | 0.06 | 2 |
| 232720 | UPRIGHT SPLICE | 2.14 | 1 |
| 212735 | LOAD SPREADER TUBE 27 | 8.60 | 1 |
| 232735 | ANCHOR BRACKET - CEN / CEH / SSK | 1.90 | 18 |
| 236583 | SHIM 6 x 2.0 | 0.25 | 36 |
| 235914 | BOLT HFS .313 x 1.00 GR8.2 - BAG 250 | 8.50 | 2 |
| 235916 | BOLT HFS .313 x 1.25 GR8.2 - BAG 80 | 3.04 | 1 |
| 235917 | BOLT HFS .313 x 1.25 GR8.2 - BAG 50 | 1.90 | 1 |
| 235923 | HEX FLANGE NUT .313 - BAG 250 | 3.50 | 3 |
| 235925 | HEX FLANGE NUT .313 - BAG 50 | 0.70 | _ |
| 235973 | WSHR SEAL .313 STL/NEO - BAG 25 | 0.10 | 1 |
| 235941 | BOLT HFS .375 x 1.0 GR8.2 - BAG 325 | 16.58 | 1 |
| 235943 | BOLT HFS .375 x 1.0 GR8.2 - BAG 50 | 2.55 | 3 |
| 235977 | BOLT HFS .375 x 2.0 GR8 - BAG 125 | 3.13 | 1 |
| 235950 | HEX NUT .375 - BAG 300 | 4.80 | 2 |
| 235951 | HEX NUT .375 - BAG 100 | 1.60 | _ |
| 235956 | FLAT WASHER .375 - BAG 200 | 2.80 | _ |
| 235957 | FLAT WASHER .375 - BAG 75 | 1.05 | 2 |
| 235974 | WSHR SEAL .375 STL/NEO - BAG 25 | 0.16 | 1 |
| 193814 | CAULKING - 40' ROLL | 1.00 | 14 |
| 170445 | CAULKING - 300 ml TUBE | 1.00 | 9 |
| * Shipped in a separate ca | ase | · · · | |

7.6. Parts Identification (Bin) - Parts Box



236583 - SSK Shim (6" x 2")



236595 – Shim 7.5 x 3.4 for "F" Profile



235372 – Bottom Angle Sealing Clip



232735 – Anchor Bracket

7.7. Bin Hardware

| | | 1 | 1 | | | 1 | | 1 | | | | 1 | r | · |
|--|--|---------------------------------|---|--|---------------------------|-----------------------------------|--|---------------------|-----------------------------------|---------------------------------------|--|--|------------------------------------|------------------------|
| | 3/8" x 1" Flanged Hex Bolt (Washer) | 3/8" x 1" Round Head Bolt | 3/8" x 1-1/2" Flanged Hex Bolt (Washer) | 3/8" x 2" Flanged Hex Bolt (Washer) | 3/8" x 3-3/4" Hex Bolt | 3/8" Flanged Lock Nut | 3/8" Hex Nut | 3/8" Wing Nut | 3/8" Flat Washer | 3/8" STL/ NEO Sealing Washer | 7/16" x 1-1/2" Flanged Hex Bolt (Washer) | 7/16" x 1-3/4" Flanged Hex Bolt (Washer) | 7/16" Hex Nut | 1/2" Flat Washer |
| | 232850 (700) 235941 (325) 235943 (50) | 150594 | 232852 (500) 235946 (100) | 235977 (125) | 235949 (10) | 235954 (300) 235955 (50) | 232850 (700) 232852 (500) 235950 (300) 235951 (100) | 154208 | 235956 (200) 235957 (75) | 235975 (100) | 232855 (400) | 232856 (300) | 232855 (400) 232856 (300) | 154981 |
| INSIDE ROOF CONNECTOR UPRIGHT to WALL SHEET to OUTSIDE UPRIGHT (DOUBLE NUT) | | | • | | | • | • | | | • | | | | |
| WALL SHEETS 194679 to 194685, and 194606 to 194607 (0.040" to 0.139") WALL SHEET 194608 | • | | | | | | • | | •* | | | | | |
| (0.168") UPRIGHT to WALL SHEETS 194679 to 194685 (0.040" to 0.116") | • | | • | | | | • | | ●☆ | | | | | |
| UPRIGHT to WALL SHEETS 194606 to 194608, and 194604 to 194618 (0.126" to 0.168", AND 0.096" LAM to 0.139" LAM) | | | • | | | | • | | | | | | | |
| WALL SHEETS 194604 to 194605, and 194616 to 194617 (0.096" LAM to 0.139" LAM) | | | | | | | | | | | • | | • | •• |
| WALL SHEET 194618 (0.168" LAM) | | | | | | | | | | | | • | • | •• |
| UPRIGHT to WALL SHEET AT HORIZONTAL SEAMS | | | • | | | | • | | | | | | | |
| UPRIGHT tO LAMINATE tO CAP PLATE tO WALL SHEET (FOR BINS WITH BOXED UPRIGHTS ONLY) | | | • | | | | • | | | | | | | |
| UPRIGHT to UPRIGHT SPLICE | • | | | | | | • | | | | | | | |
| UPRIGHT to LAMINATE | • | | | | | | • | | | | | | | |
| UPRIGHT to LAMINATE to BOXED UPRIGHT | | | • | | | | • | | | | | | | |
| WALL SHEET to UPRIGHT to LAMINATE to CAP PLATE (FOR BINS WITH BOXED UPRIGHTS) WIND RING CLIP to | | | • | | | | • | | | | | | | |
| UPRIGHT | | | • | | | | • | | | | | | | |
| WIND RING SPLICE WALL SHEET to BOTTOM RING ANGLE | • | | | | • | • | • | | • | | | | | |
| DRYING FLOOR FLASHING HOLES IN BOTTOM WALL SHEET | • | | | | | | • | | | | | | | |
| WALL SHEET to DOOR | | | • | | | | • | | ●☆ | | | | | |
| DOOR TIE-BACK to WALL SHEET AUGER CHUTE HOOD to AUGER DOOR BOARD | • | • | | | | | • | | | | | | | |
| AUGER DOOR BOARD AUGER CHUTE BLOCK-OFF PLATE to AUGER DOOR BOARD | | | • | | | | • | • | | | | | | |
| BIN WALL to HOPPER ASSEMBLY (15' - 21') BIN WALL to HOPPER | | | • | | | | • | | • | | | | | |
| ASSEMBLY (24' - 33') | | | | • | | | • | | • | | | | | |

Note

Use washers only at wall sheet to bottom ring angle, non-laminated to laminated wall sheet horizontal seam and wall sheet vertical seams to door (non-laminated sheets only; 3/8" bolts).

• Use washers only at wall sheet to bottom ring angle.

7.8. 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 binbuilding 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.

| Balt Diamatar | Dalt Crada | Crede Mark | Recommended Torque Capacity | | | | | |
|---------------|------------|-------------------------|-----------------------------|-------|-----|--|--|--|
| Bolt Diameter | Bolt Grade | Grade Mark | 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 | (SPE) | 1800 | 150 | 203 | | | |
| 3/4" | Grade 5 | $\langle \cdot \rangle$ | 3230 | 269 | 365 | | | |

Table 23. Recommended Impact Gun Torque Values Capacity to Achieve Snug-Tightened Bolts

For proper sealing, do not overtighten the wall seam connections. Sealing is not critical on stiffener 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 AGI.

Important

Do not substitute any other bolts/fasteners for those supplied by the **AGI** factory.

8. Warranty

AGI Grain Bin Products

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

| Galvanized Bins | 5 Years |
|----------------------------|---------|
| SureTrack | 2 Years |
| Easyflow2 | 2 Years |
| Fans | 3 Years |
| Heaters | 1 Year |
| Side Draw | 5 Year |
| Transitions | 3 Years |
| Roof Exhauster | 1 Year |
| Floors | 5 Years |
| Catwalk | 1 Year |
| Bulk Feed Tanks | 2 Years |
| Hopper Tanks | 5 Year |
| SeedStor-K Cones | |
| Paint | 1 Year |
| Structural | 10 Year |
| Commercial HBB Hopper | |
| Paint | 1 Year |
| Structural | 10 Year |
| Welded Cone(s) | |
| Paint | 1 Year |
| Structural | 10 Year |
| Farm Smoothwall Bins | |
| Paint | 1 Year |
| Structural | 10 Year |
| Commercial Smoothwall Bins | |
| Paint | 1 Year |
| Structural | 10 Year |
| SMARTStir Accessories | |
| Trolley | 1 Year |
| Down Auger | 1 Year |
| Disconnected Box | 1 Year |
| Grain Spreader | 1 Year |
| EasyDry Accessories | |
| Plenum | 5 Year |
| Controls | 1 Year |
| Blower Heater | 1 Year |

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

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

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

THIS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY AGI WITH RESPECT TO THE GOODS AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS, OR OTHERWISE, AND WHETHER OR NOT AGI'S GOODS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY AGI FOR BUYER'S USE OR PURPOSE.

This limited warranty extends solely to Goods manufactured by AGI and does not cover any third-party parts, components, or materials. To the extent permitted by the manufacturer, AGI will pass on applicable warranties on third-party parts, components or materials to the end-user. This warranty does not extend to any losses or damages due to misuse, use of a kind and/or to a degree not reasonably expected to be made of the Goods, any use of the Goods which is not an intended use as specified in AGI's published product literature or otherwise specified by AGI in writing, accident, acts of God, abuse, neglect, normal wear and tear (including corrosion and cosmetic issues), any equipment attached to or used in conjunction with the Goods, any field modifications or substitutions to original Goods, component damage incurred during shipping and handling, modification or alteration, used beyond rated capacity, or improper installation, maintenance or application.

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

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

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

Westeel is an AGI Brand.

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



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