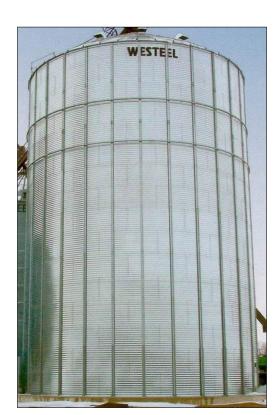


15'-60' Grain Bins

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

s:

This manual applies to mode
1513 – 1514
1813 – 1816
2113 – 2116
2413 – 2416
2713 – 2716
3013 – 3016
3613 – 3616
3913 – 3916
4213 – 4216
4513 – 4516
4813 – 4816
5111 – 5116
5410 – 5416





6008 - 6016

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: 198893 R36 Revised: May, 2025 Original Instructions

New in this Manual

Description	Section
New section	Section 5.18.2 – Base Assembly 233013 (WITHOUT Laminate Sections) on page 64
Updated	Section 5.3.1 – Curb Footing Specifications — 15' to 27' Series on page 30
Updated	Section 5.4.1 – T-Footing Specifications – 15' to 27' Series on page 36
Updated	Section 6.1 – Centurion Commercial Grain Bin Specifications on page 69
New section	Section 5.5 – Stencil and Short Sheet Placement on page 40
Added walk-in door - 236810	Section 5.11 – One and Half Tier Door Installation on page 49
Updated	Section 7.1 – Parts Identification (Bin) - Parts Box on page 96
Updated	Section 7.2 – Bin Hardware on page 97
Updated	Section 6.3 – Wall Sheet and Upright Layouts on page 77

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

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6.

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8.

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 15'-60' 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.

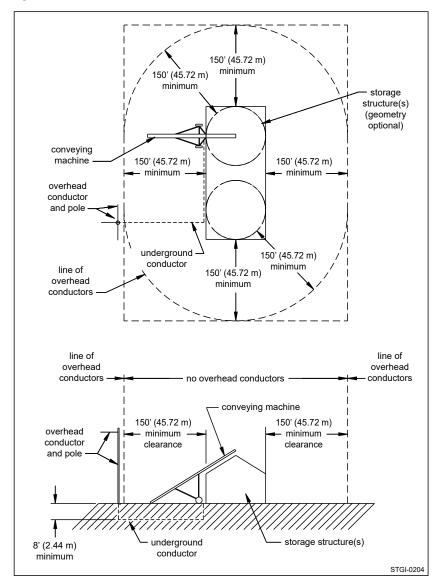


Figure 1. Power Lines and Conductor Clearance



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.

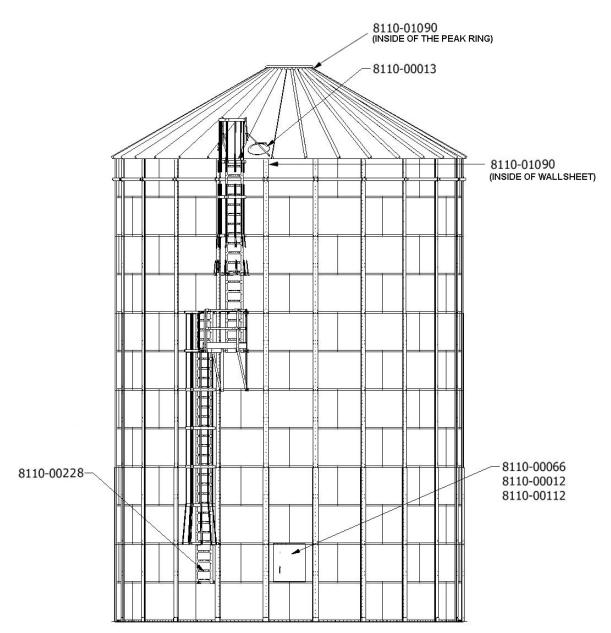
2.9. Decal Installation/Replacement

- 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.

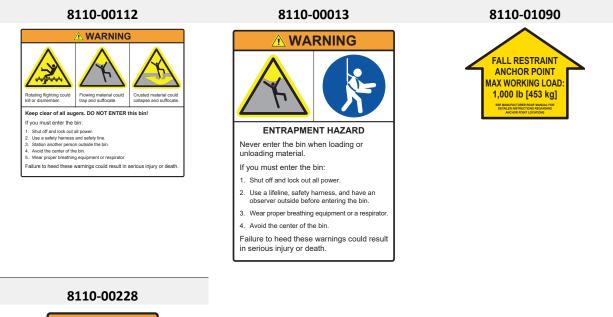
2.10. Safety Decal Locations and Details

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





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.

Size	Type of Roof	Load (Ibs)	Load (kg)
15' to 24'	non-structural	4000 lbs	1814 kg
27' to 48'	non-structural	5000 lbs	2268 kg
51' to 60'	non-structural	8000 lbs	3629 kg
48' to 108'	structural	20,000 lbs	9072 kg
135'	structural	100,000 lbs	45359 kg

Table 1. Peak Loads for Various Roofs

b. Roof Snow Loads (RSL) – at the above stated standard peak loads, standard RSLs vary with diameter and range from 16 psf (78 kg/m²) to 45 psf (220 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.

3.2. 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.

WARNING 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. 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.

3.6. 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).
- 5. 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.

3.7. 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".

3.8. 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.
- 2. 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.

3.9. 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.

Place the curved wall sheets with the hump facing up.	
Elevate the roof sheets at least 12" at the small end of the sheets.	
Place all the other bundles so they are well-sloped.	

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.

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.

3.10. 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.

3.11. 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 3.8 Critical Assembly Requirements on page 18 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

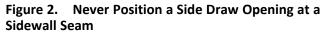
Installation of accessories or equipment on grain systems equipment/structures that overstresses the bin in any manner will void the warranties.

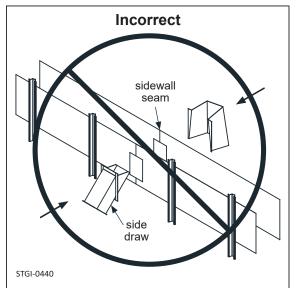
In cases where additional loading is involved, if you do not already have specific recommendations from AGI, contact AGI engineering department before installation begins.

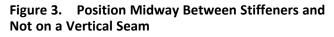
Do not install 15'-60' Grain Bins controls or the like near anything having a strong electromagnetic field such as large power transmission lines or transformers.

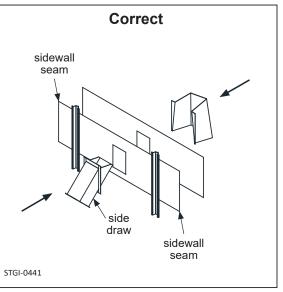
4.4.1 Pre-Planning: Side Draw Discharge, Aeration, and Unload Equipment

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.

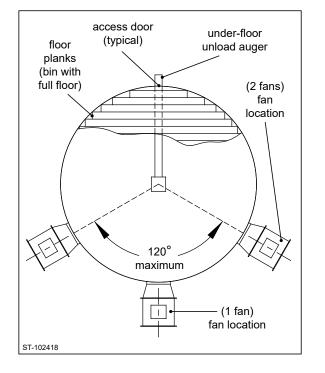


Figure 4. Example Fan and Unload Equipment Layout

5. Assembly

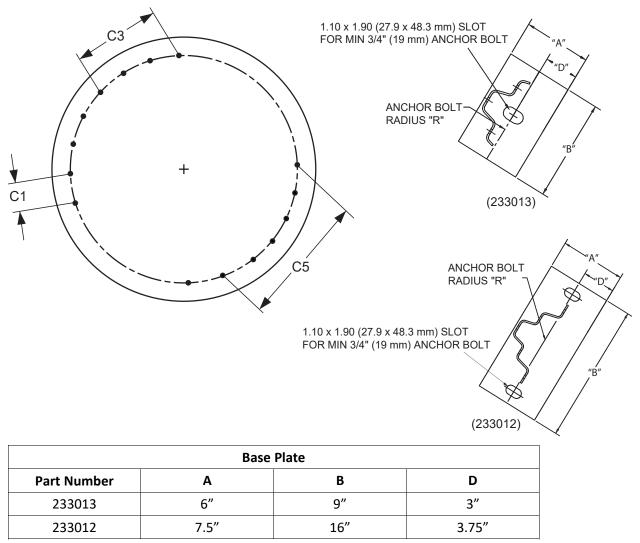
5.1. Assembly Safety

• 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. Anchor Bolt Radius

Figure 5. Anchor Bolt Radius



Important

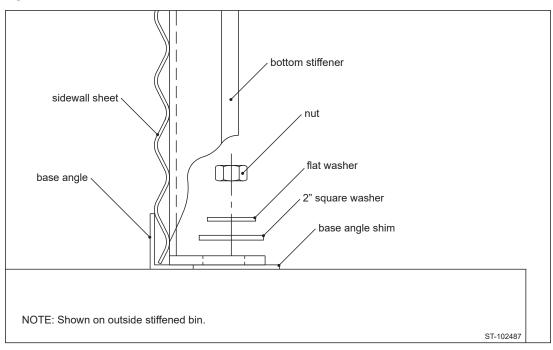
If the anchor bolt diameter is greater than 1" (2.54 cm) contact AGI. The anchor bolt patterns in this manual will not apply in those situations.

					Anchor Bolt Cord							
Bin	Number of	Dana Diata	Anchor Bolt	Radius "R"	"C1"		"C3"		"C5"		No. of Anchor	
Model	Tiers	Tiers Base Plate	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Bolts	
15	13–14	233013	92-11/16"	2355	57-9/32"	1455	-	-	-	-	10	
18	13–16*	233013	110-5/8"	2809	57-1/4"	1454	156-7/16"	3973	-	-	12	
21	13–16	233013	128-1/2"	3266	57-3/16"	1454	160-1/4"	4071	-	-	14	
24	13–16	233013	146-7/16"	3721	57-1/8"	1452	162-11/16"	4132	-	-	16	
27	13–16	233013	164-5/16"	4176	57-1/16"	1450	164-5/16"	4174	-	-	18	
30	13–15	233013	182-1/4"	4630	57-0"	1449	165-15/32"	4203	257-23/32"	6546	20	
3016	16	233012	183-0"	4648	57–1/4"	1454	166-5/32"	4220	257-25/32"	6573	40	
33	13–16	233013	200-1/8"	5085	56-31/32"	1447	166-9/32"	4223	262-1/8"	6658	22	
36	13–16	233013	218-1/16"	5540	56-29/32"	1446	166-7/8"	4239	265-15/32"	6743	24	
39	13–16	233013	235-15/16"	5994	56-7/8"	1445	167-11/32"	4250	268-1/16"	6809	26	
42	13–16	233013	253-7/8"	6449	56-27/32"	1444	167-11/16"	4259	270-1/8"	6861	28	
45	13–16	233013	271-3/4"	6904	56-13/16"	1443	167-31/32"	4266	271-3/4"	6903	30	
48	13–16	233013	289-11/16"	7358	56-25/32"	1442	168-5/32"	4271	273-3/32"	6936	32	
51	11–16	233013	307-9/16"	7813	56-3/4"	1442	168-11/32"	4276	274-3/16"	6964	34	
54	10–16	233013	325-1/2"	8268	56-23/32"	1441	168-15/32"	4279	275-3/32"	6988	36	
60	8–15	233013	361-1/4"	9180	56-11/16"	1440	168-11/16"	4284	276-1/2"	7023	40	
6016	16	233012	362-0"	9197	56-13/16"	1443	169-1/32"	4293	277-3/32"	7038	80	

Table 2. 15'-60' (4.57 m - 18.29 m) Diameters - 2 anchors per sidewall sheet

*For 1816 bin, both bottom angle anchor bolt kit 231601 and 233013 base plate anchors are required.

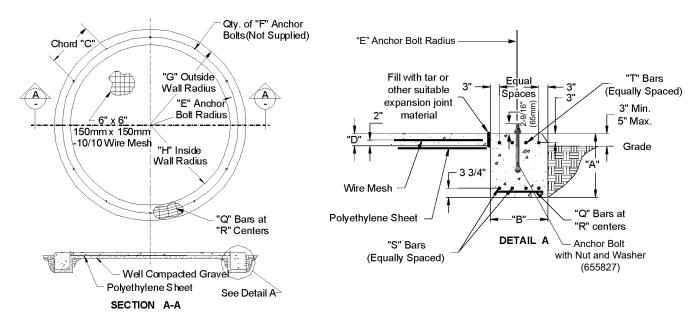
Figure 6. Stiffener to Anchor Bolt Connections — Detailed View



5.3. 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 7. 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 5.18 Commercial Bin Upright Assembly on page 56.)
- 5. Locate anchor bolts as shown in Figure 7, 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.
- 8. 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.

5.3.1 Curb Footing Specifications — 15' to 27' Series

		r		1		1					
BIN M	IODEL	1513 1514	1813 1814	1815 1816	2113 2114	2115 2116	2413	2414 2415 2416	2713	2714 2715 2716	
A	A		2'4"		2'0"		2'0"	2'0"	2'0"	2'0"	
В			2'8"		2'10"	-	3'0"	4'2"	3'2"	4'6"	
(2		4'9-1/4"		4'9-1/4"		4'9-5/32"	4'9-5/32"	4'9-1/8"	4'9-1/8"	
C)		6"		6"		6"	6"	6"	6"	
E			9'2-5/8"		10'8-5/8"		12'2-1/2"	12'2-1/2"	13'8-7/16"	13'8-7/16"	
F	:		12		14		16	16	18	18	
0	5		10'7"		12'2"		13'8"	14'3"	15'3"	15'11"	
F	1	-	7'11"	-	9'4"	-	10'8"	10'1"	12'1"	11'5"	
0	Metric ¹		39 - 10M		45 - 10M		54 - 10M	51 - 15M	69 - 10M	58 - 15M	
Q	Imperial	ed	41 - #3	Be Determined	58 - #3	Be Determined	77 - #3	51 - #5	94 - #3	58 - #5	
2	Metric (mm c/c)	Determined	432		356		301	457	279	457	
R	Imperial (in. c/c)	Be Det	17	17	e Det	14	e Det	12	18	11	18
S	Metric ¹	ToB	6 - 10M	To B	6 - 10M	LO B	6 - 10M	4 - 15M	6 - 10M	5 - 15M	
5	Imperial		5 - #4	H	5 - #4		5 - #4	4 - #5	5 - #4	5 - #5	
т	Metric ¹		6 - 10M		5 - 10M		6 - 10M	4 - 15M	6 - 10M	4 - 15M	
I	Imperial		4 - #4		4 - #4		4 - #4	4 - #5	5 - #4	4 - #5	
Reinforcing	M (kgs.)		188		203		252	383	291	481	
Rod	I (lbs.)		383		457		532	833	668	1049	
Wire Mesh (sq. ft.)			197		274		358	320	459	410	
Concrete	Footing	1	13.4	1	14.2	1	17.0	23.6	20.2	28.7	
(3000 psi) Cubic Yards	Slab		3.7		5.1		6.7	6.0	8.5	7.6	

Table 3. Curb Footing Specifications — 15' to 27' (externally stiffened)

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

- 1. 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.3.2 Curb Footing Specifications — 30' to 39' Series

Table 4. Curb Footing Specifications — 30' to 39' (externally stiffened)

BIN M	IODEL	3013	3014 3015	3016	3313	3314 3315 3316	3613	3614 3615 3616	3913	3914 3915 3916
A	4	2'0"	2'0"	2'0"	2'0"	2'0"	2'0"	2'0"		
E	3	3'4"	4'8"	4'8"	3'6"	4'10"	3'8"	5'2"		
(2	4'9"	4'9"	4'9.6"	4'9"	4'9"	4'8-15/16"	4'8-15/16"		
D		6"	6"	6"	6"	6"	6"	6"		
E	<u>=</u>	15'2-5/16"	15'2-5/16"	15'3"	16'8-3/16"	16'8-3/16"	18'2-1/8"	18'2-1/8"		
F	=	20	20	40	22	22	24	24		
(3	16'10"	17'6"	17'6"	18'5"	19'1"	20'0"	20'9"		
ŀ	1	13'6"	12'10"	12'10"	14'11"	14'3"	16'4"	15'7"		
0	Metric ¹	82 - 10M	68 - 15M	68 - 15M	97 - 10M	84 - 15M	115 - 10M	92 - 15M		b a
Q	Imperial	115 - #3	68 - #5	68 - #5	140 - #3	84 - #5	153 - #3	92 - #5		in
D	Metric (mm c/c)	254	432	432	229	381	229	381		Determined
Q –	Imperial (in. c/c)	10	17	17	9	15	9	15		Be De
C C	Metric ¹	7 - 10M	6 - 15M	6 - 15M	7 - 10M	5 - 15M	7 - 10M	5 - 15M		ToE
S	Imperial	5 - #4	5 - #5	5 - #5	5 - #4	5 - #5	6 - #4	5 - #5		F
т	Metric ¹	6 - 10M	4 - 15M	4 - 15M	6 - 10M	4 - 15M	6 - 10M	5 - 15M		
Т	Imperial	4 - #5	4 - #5	4 - #5	5 - #4	4 - #5	5 - #4	5 - #5		
Reinforcing	M (kgs.)	353	547	547	396	626	443	752		
Rod	l (lbs.)	760	1191	1191	858	1363	1021	1639		
Wire Mes	sh (sq. ft.)	573	518	518	700	638	839	763		
Concrete	Footing	23.6	33.0	33.0	27.2	37.5	31.0	43.7		
(3000 psi) Cubic Yards	Slab	10.7	9.6	9.6	13.0	11.9	15.6	14.2		

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

- 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.3.3 Curb Footing Specifications – 42' to 51' Series

			4214		4514		4814	5111	5114
BIN MODEL		4213	4215	4513	4515	4813	4815	5112	5115
	<u>\</u>	2'0"	4216 2'0"	2'0"	4516 2'0"	2'0"	4816 2'0"	5113	5116
A		-		-					
E		3'10"	5'6"	3'6"	4'10"	4'0"	5'8"		
(4'8-13/16"	4'8-13/16"	4'8-13/16"	4'8-13/16"	4'8-3/4"	4'8-3/4"		
C)	6"	6"	6"	6"	6"	6"		
E	=	21'1-15/	21'1-15/	22'7-13/	22'7-13/	24'1-11/	24'1-11/		
		16"	16"	16"	16"	16"	16"		
F		28	28	30	30	32	32		
G	6	23'1"	23'11"	18'5"	19'1"	26'2"	27'0"		
F	4	19'3"	18'5"	14'11"	14'3"	22'2"	21'4"	-	-
Q	Metric ¹	145 - 10M	123 - 15M	97 - 10M	84 - 15M	183 - 10M	152 - 15M		
ų	Imperial	114 - #4	123 - #5	140 - #3	84 - #5	141 - #4	152 - #5		
P	Metric (mm c/c)	356	330	229	381	330	305	4 1 1	הפרפו ווווופמ
R	Imperial (in. c/c)	14	13	9	15	13	12		ם
S	Metric ¹	7 - 10M	5 - 15M	7 - 10M	5 - 15M	8 - 10M	6 - 15M	(H	2
3	Imperial	6 - #4	5 - #5	5 - #4	5 - #5	6 - #4	6 - #5		
т	Metric ¹	7 - 10M	5 - 15M	6 - 10M	4 - 15M	7 - 10M	5 - 15M		
Т	Imperial	6 - #4	5 - #5	5 - #4	4 - #5	6 - #4	5 - #5		
Reinforcing	M (kgs.)	562	931	396	626	699	1175		
Rod	l (lbs.)	1320	2029	858	1363	1547	2562		
Wire Mesh (sq. ft.)		1165	1066	700	638	1544	1430		
Concrete	Footing	37.8	54.2	27.2	37.5	45.0	63.8		
(3000 psi) Cubic Yards	Slab	21.6	19.8	13.0	11.9	28.6	26.5		

Table 5. Curb Footing Specifications – 42' to 51' (externally stiffened)

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

- 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.3.4 Curb Footing Specifications — 54' to 60' Series

Table 6.	Curb Footing Specifications — 54' to 60' (externally stiffened)
----------	---

BIN M	IODEL	5410 5411 5412	5413	5414 5415 5416	6008 6009 6010	6011 6012	6013	6014 6015 6016			
A	A										
E											
(
C											
E											
F											
C											
ŀ											
Q	Metric ¹										
4	Imperial										
	Metric		To Be Determined								
R	(mm c/c)										
	Imperial (in. c/c)										
S	Metric ¹										
3	Imperial										
т	Metric ¹										
I	Imperial										
Reinforcing	M (kgs.)										
Rod	l (lbs.)										
Wire Mes											
Concrete	Footing										
(3000 psi) Cubic Yards	Slab										

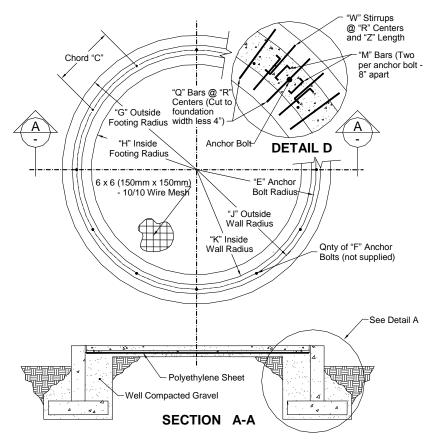
¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

- 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.4. T-Footing — Floating Slab foundation

- 1. Choose a site that is well drained, and has a minimum soil-bearing capacity of 4000 lbs. per sq. ft. (192 kPa). If soil-bearing capacity is not known, consult a local engineering representative.
- 2. Use minimum 4" to 6" (100 150mm) of well-compacted coarse granular material below slab and curb footing.





- 3. Concrete strength shall be minimum 3000 lbs/sq inch [21 MPa] compressive strength.
- 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 5.18 Commercial Bin Upright Assembly on page 56.)

The bin wall must have a uniform support to carry the wall loads. Weather-sealing the bottom is also made easier if the foundation is level. Camber the outside edge of the concrete to ensure that water drains off.

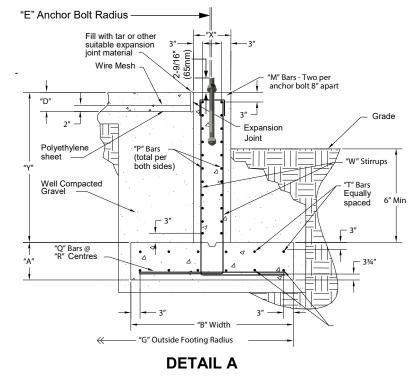
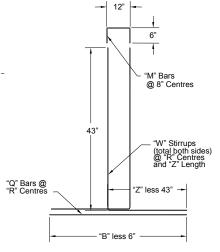


Figure 9. T-Footing Foundation Layout - Detail A

- 5. Locate anchor bolts as shown in Figure 8 on page 34 and specified in the following T-Footing Specification 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.

Figure 10. T-Footing Foundation Layout - Detail C (Re-bar)



DETAIL C (RE-BAR) (See Detail D for Bar Placement)

7. Concrete slump for reinforced wall to be 5" (130 mm) maximum and 2" (50 mm) minimum.

5.4.1 T-Footing Specifications – 15' to 27' Series

Table 7. T-Footing Specifications — 15' to 27' (externally stiffened)

BIN M	IODEL	1513 1514	1813	1814 1815 1816	2113	2114 2115 2116	2413	2414 2415 2416	2713	2714 2715 2716
ļ	4		2'0"		2'0"		2'0"	2'0"	2'0"	2'0"
E	В		2'10"	-	3'2"		3'4"	4'6"	3'6"	4'10"
С			4'9-1/4"		4'9-3/16"		4'9-1/8"	4'9-1/16"	4'9-1/16"	4'9-1/16"
D			6"		6"		6"	6"	6"	6"
E			9'2-9/16"		10'8-1/2"		12'2-3/8"	12'2-3/8"	13'8-5/16"	13'8-5/16"
F			12		14		16	16	18	18
G			10'7" 7'9"		12'3"		13'10"	14'5"	15'5"	16'1"
Н				9'1"	1	10'6"	9'11"	11'11"	11'3"	
J			9'11"		11'5"		12'11"	12'11"	14'5"	14'5"
К			8'5"		9'11"		11'5"	11'5"	12'11"	12'11"
Х			1'6"		1'6"		1'6"	1'6"	1'6"	1'6"
Y			2'0"		2'0"		2'0"	2'0"	2'0"	2'0"
М	Metric ¹	To Be Determined	24 - 10M	To Be Determined	28 - 10M	To Be Determined	32 - 10M	32 - 10M	36 - 10M	36 - 10M
	Imperial		24 - #3		28 - #3		32 - #3	32 - #3	36 - #3	36 - #3
Р	Metric ¹		6 - 10M		6 - 10M		6 - 10M	6 - 10M	6 - 10M	6 - 10M
	Imperial		8 - #3		8 - #3		8 - #3	8 - #3	8 - #3	8 - #3
Q	Metric ¹		0		0		0	51 - 10M	0	65 - 10M
	Imperial		0		0		0	54 - #3	0	65 - #3
R	Metric (mm c/c)		457		457		457	432	432	406
	Imperial (in. c/c)		18		18		18	17	17	16
S	Metric ¹		4 - 10M		4 - 10M		5 - 10M	6 - 10M	5 - 10M	7 - 10M
	Imperial		6 - #3		6 - #3		6 - #3	9 - #3	7 - #3	9 - #3
т	Metric ¹		4 - 10M		4 - 10M		4 - 10M	6 - 10M	4 - 10M	6 - 10M
	Imperial		5 - #3		6 - #3		6 - #3	8 - #3	6 - #3	9 - #3
w	Metric ¹		78 - 10M		96 - 10M		132 - 10M	102 - 10M	160 - 10M	130 - 10M
	Imperial		78 - #4		90 - #4		102 - #4	108 - #4	122 - #4	130 - #4
Z			5'3"	5'5"		5'6"	6'1"	5'7"	6'3"	
Reinforcing	M (kgs.)		303		364		465	542	540	670
Rod	I (lbs.)		704		851		974	1263	1161	1516
Wire Mes	Wire Mesh (sq. ft.)		223	3	309		410	410	524	524
Concrete	Footing		12.1		15.8		18.9	25.5	22.3	60.1
(3000 psi)	Wall		6.4		7.5		8.5	8.5	9.6	9.6
Cubic Yards	Slab		4.2		5.8		7.6	7.6	9.7	9.7

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

- 1. 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.4.2 T-Footing Specifications – 30' to 39' Series

Table 8. T-Footing Specifications — 30' to 39' (externally stiffened)

			2014		2214		2014		2014
BIN M	ODEL	3013	3014 3015 3016	3313	3314 3315 3316	3613	3614 3615 3616	3913	3914 3915 3916
A		2'0"	2'0"	2'0"	2'0"	2'0"	2'0"		
В		3'8"	5'0"	3'10"	5'4"	4'0"	5'6"		
C		4'9"	4'9"	4'8-15/16"	4'8-15/16"	4'8-15/16"	4'8-15/16"		
D)	6"	6"	6"	6"	6"	6"		
E		15'2-3/16"	15'2-3/16"	16'8-1/8"	16'8-1/8"	18'2"	18'2"		
F		20	20	22	22	24	24		
G	ì	17'0"	17'8"	18'7"	19'4"	20'2"	20'11"		
Н		13'4"	12'8"	14'9"	14'0"	16'2"	15'5"		
J		15'11"	15'11"	17'5"	17'5"	18'11"	18'11"		
К		14'5"	14'5"	15'11"	15'11"	17'5"	17'5"		
Х		1'6"	1'6"	1'6"	1'6"	1'6"	1'6"		
Y	,	2'0"	2'0"	2'0"	2'0"	2'0"	2'0"		
	Metric ¹	40 - 10M	40 - 10M	44 - 10M	44 - 10M	48 - 10M	48 - 10M		
M	Imperial	40 - #3	40 - #3	44 - #3	44 - #3	48 - #3	48 - #3	-	
	Metric ¹	6 - 10M	6 - 10M	8 - 10M	8 - 10M	8 - 10M	8 - 10M		
P	Imperial	8 - #3	8 - #3	10 - #3	10 - #3	10 - #3	10 - #3		
0	Metric ¹	64 - 10M	76 - 10M	70 - 10M	90 - 10M	76 - 10M	106 - 10M		
Q	Imperial	64 - #3	82 - #3	70 - #3	90 - #3	76 - #3	106 - #3	To Be Determined	
2	Metric (mm c/c)	457	356	457	356	457	330		
R	Imperial (in. c/c)	18	14	18	14	18	13		
c	Metric ¹	5 - 10M	7 - 10M	5 - 10M	7 - 10M	6 - 10M	8 - 10M		
S	Imperial	6 - #3	6 - #3	9 - #3	6 - #4	9 - #4	6 - #4		
т	Metric ¹	4 - 10M	4 - 10M	6 - 10M	7 - 10M	6 - 10M	7 - 10M		
T	Imperial	7 - #3	6 - #4	7 - #3	6 - #4	4 - #4	6 - #4		
W	Metric ¹	128 - 10M	152 - 10M	140 - 10M	180 - 10M	152 - 10M	212 - 10M		
vv	Imperial	128 - #4	164 - #4	140 - #4	180 - #4	152 - #4	212 - #4		
Z		5'8"	6'4"	4'9"	6'6"	5'10"	6'7"		
Reinforcing	M (kgs.)	607	765	721	955	819	1112		
Rod	I (lbs.) 1344 1850 1604 2142 1768 2512								
Wire Mesh (sq. ft.)		653	653	796	796	953	953		
Concrete	Footing	26.3	35.3	29.8	41.4	33.9	46.5		
(3000 psi)	Wall	10.6	10.6	11.7	11.7	12.7	12.7		
Cubic Yards	Slab	12.1	12.1	14.8	14.8	17.7	17.7		

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

Note

- 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.4.3 T-Footing Specifications – 42' to 51' Series

Table 9. T-Footing Specifications — 42' to 51' (externally stiffened)

BIN M	IODEL	4213	4214 4215 4216	4513	4514 4515 4516	4813	4814 4815 4816	5113	5114 5115 5116
A	4	2'0"	2'0"			2'0"	2'0"		
E	3	4'2"	5'10"			4'4"	6'2"		
(2	4'8-13/16"	4'8-13/16"			4'8-3/4"	4'8-3/4"		
E)	6"	6"			6"	6"		
E		21'1-3/16"	21'1-3/16"			24'1-5/8"	24'1-5/8"		
F	:	28	28			32	32		
6	6	23'3"	24'1"			26'4"	27'3"		
ŀ	1	19'1"	18'3"			22'0"	21'1"		
J	ļ	21'11"	21'11"			24'11"	24'11"		
k	(20'5"	20'5"			23'5"	23'5"		
>	(1'6"	1'6"			1'6"	1'6"		
١	(2'0"	2'0"			2'0"	2'0"		
М	Metric ¹	56 - 10M	56 - 10M			64 - 10M	64 - 10M		
IVI	Imperial	56 - #3	56 - #3			64 - #3	64 - #3		
Р	Metric ¹	8 - 10M	10 - 10M			10 - 10M	10 - 10M		
F	Imperial	8 - #4	8 - #4			8 - #4	10 - #4		
Q	Metric ¹	89 - 10M	133 - 10M			102 - 10M	166 - 10M		
Q	Imperial	89 - #3	133 - #3	To Be De	termined	102 - #3	166 - #3	To Be De	termined
R	Metric (mm c/c)	457	305			457	279		
ĸ	Imperial (in. c/c)	18	12			18	11		
S	Metric ¹	6 - 10M	7 - 10M			6 - 10M	8 - 10M		
5	Imperial	5 - #4	6 - #4			5 - #4	7 - #4		
т	Metric ¹	5 - 10M	8 - 10M			6 - 10M	8 - 10M		
	Imperial	4 - #3	6 - #4			4 - #4	6 - #4		
W	Metric ¹	178 - 10M	266 - 10M			204 - 10M	332 - 10M		
vv	Imperial	178 - #4	266 - #4			204 - #4	332 - #4		
Z		5'11"	6'9"			6'0"	6'11"		
Reinforcing	M (kgs.)	962	1454			1216	1750		
Rod	l (lbs.)	2396	3285			2738	4269		
Wire Mes	sh (sq. ft.)	1310	1310			1723	1723		
Concrete	Footing	41.1	57.5			48.8	69.4		
(3000 psi)	Wall	14.8	14.8			16.9	16.9		
Cubic Yards	Slab	24.3	24.3			31.9	31.9		

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

Note

- 1. 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.4.4 T-Footing Specifications – 54' to 60' Series

Table 10. T-Footing Specifications — 54' to 60' (externally stiffened)

BIN N	NODEL	5410 5411	5412	5413	5414 5415 5416	6008 6009 6010	6011 6012 6013	6014 6015 6016
	A							
	В							
	С							
	D							
	E							
	F							
	G							
	Н							
	J							
	К							
	Х							
	Y							
М	Metric ¹							
	Imperial							
Р	Metric ¹							
	Imperial							
Q	Metric ¹			То П	e Determii	and		
	Imperial			TOE	be Determin	leu		
	Metric (mm c/c)							
R	Imperial							
	(in. c/c)							
	Metric ¹							
S	Imperial							
_	Metric ¹							
Т	Imperial							
	Metric ¹							
W	Imperial							
	Z							
Reinforcing	M (kgs.)							
Rod	l (lbs.)							
Wire Me	sh (sq. ft.)							
Concrete	Footing							
(3000 psi)	Wall							
Cubic Yards	Slab							

¹For Canadian Metric to European Standard EN 10080/BS 4449 conversion, see Section 5.4.5 – Canadian Metric to European Conversion Table on page 40.

Note

- 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 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.
- 2. It is suggested that 1/2" x 3" embedded anchor bolts are used through each slot in the bottom ring angle (6 per angle) to insure bin roundness, for sealing purposes, and for additional lateral stability.

5.4.5 Canadian Metric to European Conversion Table

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

Table 11. Canadian Metric to European Standard EN 10080/BS 4449 Conversion

5.5. Stencil and Short Sheet Placement

For all bin diameters except 54', if a top-tier wind ring is required for a stiffened bin, it will pass through the "WESTEEL" Stencil. If the customer wishes, the stencil sheet(s) can be positioned in the 2nd tier from the top in order to keep it clear of the wind ring.

Note

For AGI sign sheet, the sign sheet always needs to be installed externally in stiffened bins.

Even Tiered Bins:

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

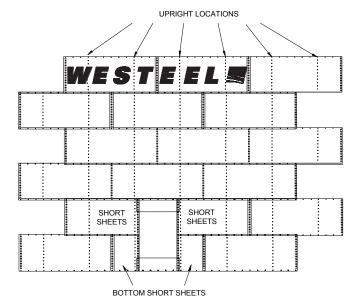


Figure 11. Stencil and Short Sheet Placement — Even Tiered Bins

Odd 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 — Odd Tiered Bins

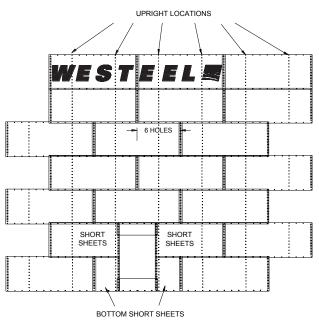


Table 12. Short Sheet Part Numbers

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

Table 13. Bottom Short Sheet Part Numbers

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

5.6. External Sign Sheet Installation (For Stiffened Bin)

Example Sign Sheet

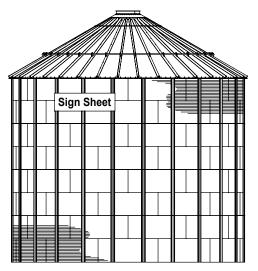


Selecting the Sign Sheet Location

Note

Choose a location to install the sign sheet somewhere in the top three rings.





Note

It may not be possible to locate the sign sheet on this bin in the exact location shown in Figure 13. Possible sign sheet locations will vary based on available sign bracket mounting hole locations.

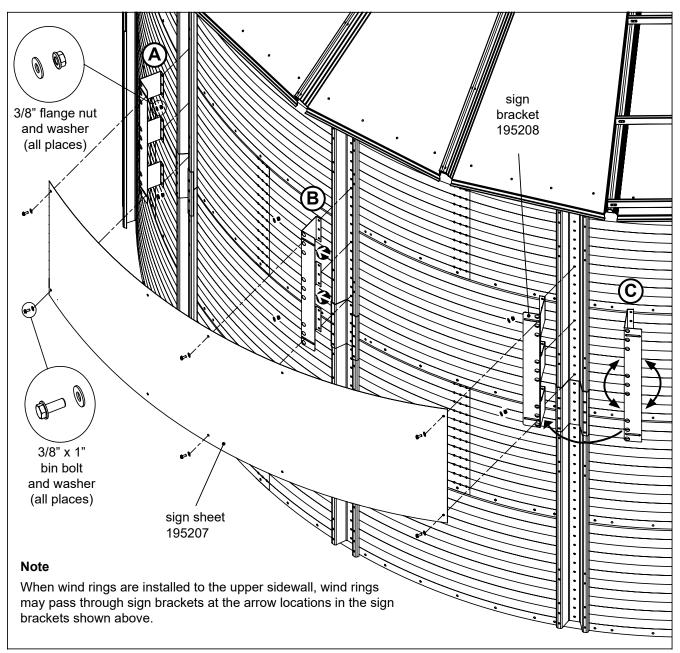
Installing the Sign Sheet

- 1. Install the sign brackets to the stiffeners.
- 2. Make certain to use the correct intermediate stiffener bolt pattern no matter which location is selected for sign brackets installation.

Each bracket is exactly the same. Brackets A and B flanges face right.

- 3. Install bracket C with the flanges facing either right or left depending on which orientation enables connection to the sign sheet.
- 4. Use the supplied stiffener bolts, nuts, and flat washers to make the connection.
- 5. Install the sign sheet to the sign brackets slotted holes.
- 6. Use the 3/8" x 1" bin bolts, 3/8" flat washers, and 3/8" flange nuts supplied with the sign sheet.
- 7. Install flat washers on the both the bolt and nut sides. Tighten all bolts.

Figure 14. Sign Sheet Installation



5.7. 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)
15	7'4-3/4"
18	8'10-11/16"
21	10'4-9/16"
24	11'10-1/2"
27	13'4-3/8"
30	14'10-5/16"
33	16'4-3/16"
36	17'10-1/8"

Table 14. Scribe Radius – 15' to 60' Bins

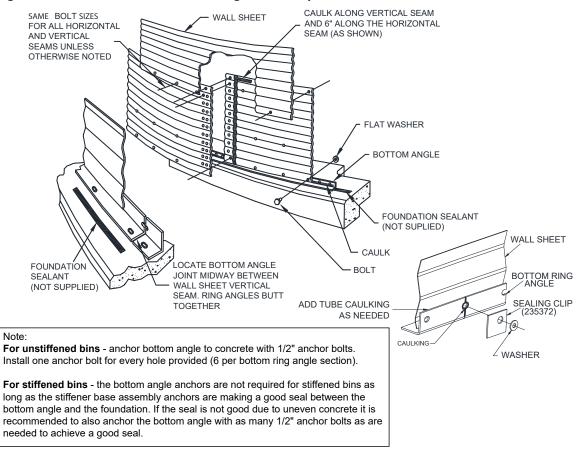
Nominal Bin Diameter (ft)	Scribe Radius (ft in)
39	19'4"
42	20'9-15/16"
45	22'3-13/16"
48	23'9-3/4"
51	25'3-5/8"
54	26'9-9/16"
60	29'9-5/16"

5.8. Wall Sheet and Bottom Angle Assembly

Note

For bin hardware specification, refer to Section 7.2 – Bin Hardware on page 97.

Figure 15. Wall Sheet and Bottom Angle Assembly Detail

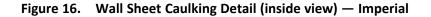


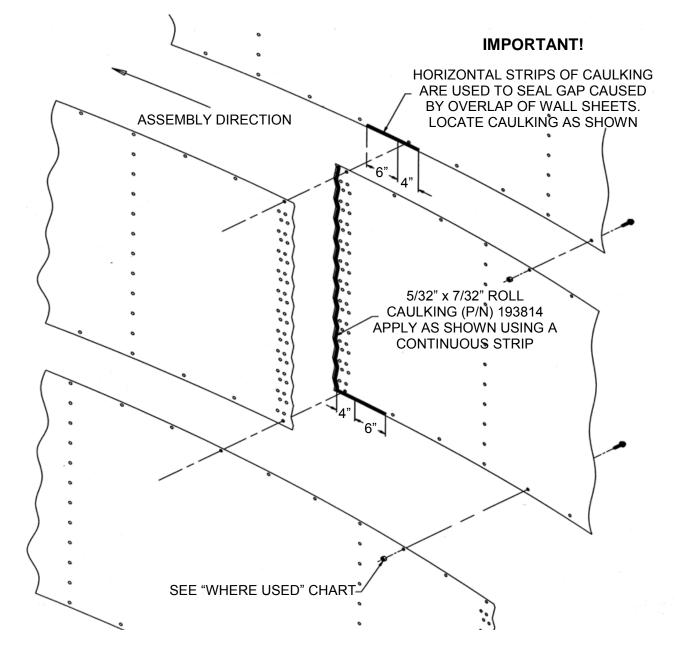
5.9. Centurion Wall Sheet Part Number Matrix

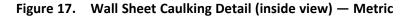
Corrugated Wall Sheets						Punched Wall Sheets	
hickness nom (min)	Gauge	Label Colour	Weight lbs	Length (overall)	Flat	Regular	Bottom
					194654	194660 Stencil	
.040 (.036)	20	Yellow	58.3		194657	194663 Stencil	
					194679	194730	
					194655	194661 Stencil	
.050 (.045)	18	Orange	72.8		194658	194664 Stencil	
					194680	194731	194771
.057 (.052)	17	Red	83.0	116.5"	194681	194732	194772
.066 (.061)	15	Pink	97.7		194682	194733	194773
					194656	194662	
.076 (.070)	14	Lime	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	117.0"	194606	194737	194777
.139 (.130)	10	Black	209.4	117.0	194607	194738	194778
		S	hort Sheets Insta	alled Beside the Door			
.057 (.052)	47	Ded	66.3	93.0"		194780	
.057 (.052)	17	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)	10	Dhuo	136.8	93.0"		194782	
.110 (.107)	12	Blue	54.1	36.8"			194785

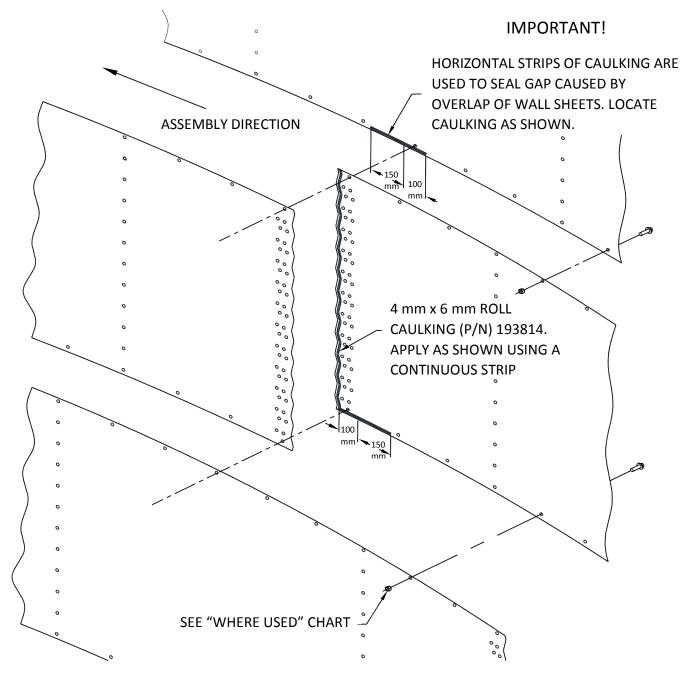
Table 15. Wall Sheet Part Number Table

5.10. Wall Sheet Caulking Detail





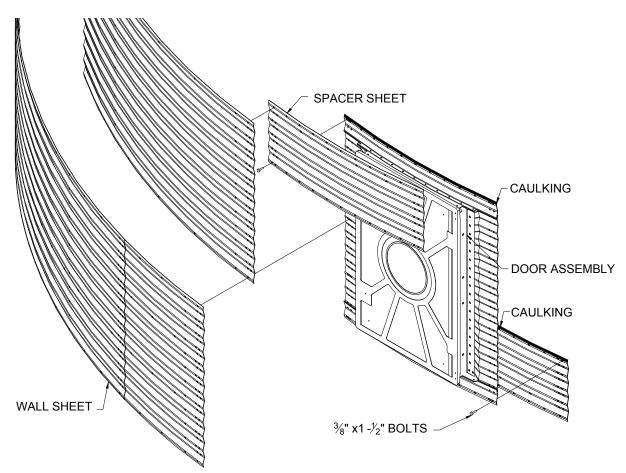




5.11. One and Half Tier Door Installation

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.





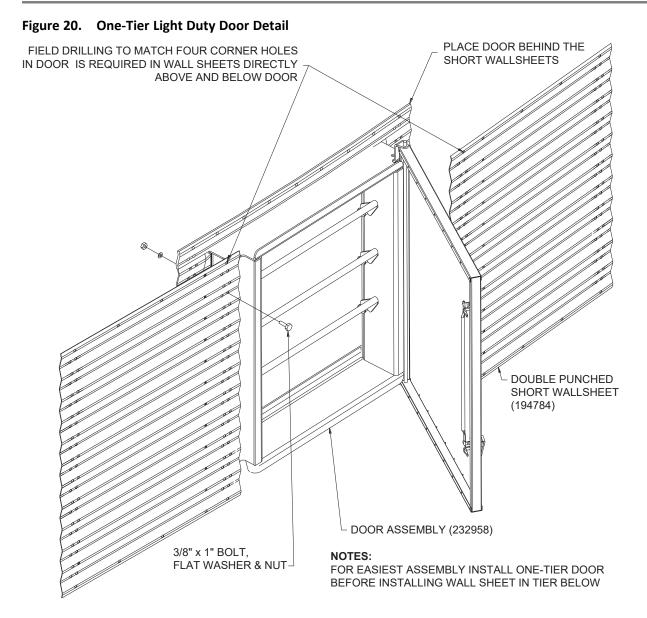
5.12. One-Tier Light Duty Door (15' – 27') Installation

Figure 19. One-Tier Light Duty Door (15' – 27') Detail PLACE DOOR BEHIND THE FIELD DRILLING TO MATCH FOUR CORNER HOLES SHORT WALLSHEETS IN DOOR IS REQUIRED IN WALL SHEETS DIRECTLY ABOVE AND BELOW DOOR DOUBLE PUNCHED SHORT WALLSHEET (194783) DOOR ASSEMBLY (232969) NOTES: FOR EASIEST ASSEMBLY INSTALL ONE-TIER DOOR BEFORE INSTALLING WALL SHEET IN TIER BELOW 3/8" x 1" BOLT, FLAT WASHER & NUT

Important

The inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if the bin is filled without properly closing the inner door board.

5.13. One-Tier Light Duty Door Installation

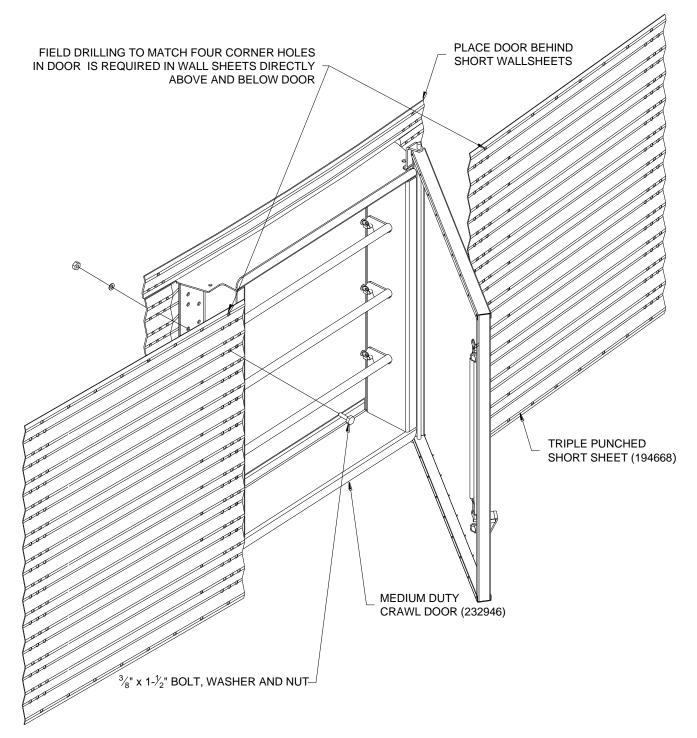


Important

Inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if bin is filled without properly closing inner door board.

5.14. One-Tier Medium Duty Door Installation

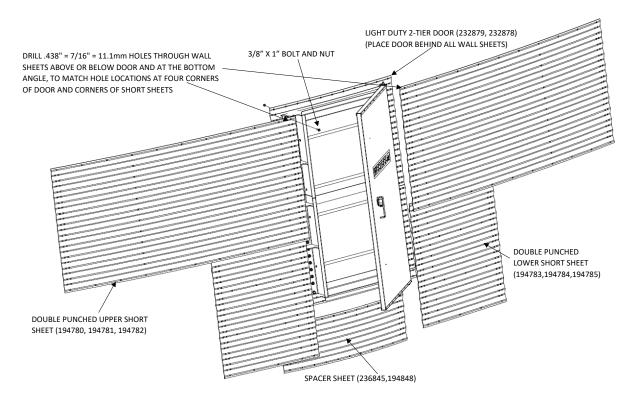
Figure 21. One-Tier Medium Duty Door Detail



Important

The inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if the bin is filled without properly closing the inner door board.

5.15. Two Tier Light Duty Door Installation



Note

- Spacer sheet (236845,194848) can be placed below the light duty 2-tier door (232879) to accommodate AGI floors.
- Spacer sheet (236845,194848) can be placed above the light duty 2-tier door (232879) to accommodate no floor application.

Important

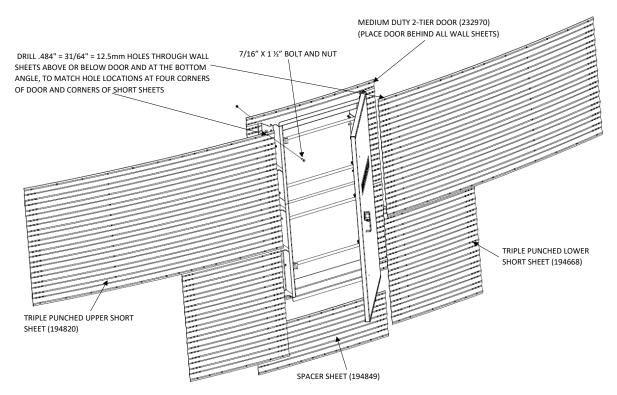
Inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if bin is filled without properly closing inner door board.

Door P/N	Applicable Bin Size
232879	15' to 54'
232878	60' to 78'

SPECIAL SHEET	BIN RANGES WHERE USED
194780 (0.057)	1505-2716, 3005-3014, 3305-3314, 3605-3613, 3905-3910, 4205-4209, 4505-4508, 4805-4807, 5105-5106, 5405-5406
194781 (0.076)	2717-2718, 3015-3020, 3315-3319, 3614-3617, 3911-3917, 4210-4217, 4509-4514, 4808-4812, 5107-5111, 5407-5409, 6008
194782 (0.116)	3320-3323, 3618-3623, 3918-3923, 4218-4223, 4515-4521, 4813-4821, 5112-5121, 5410-5419, 6009-6014, 6608-6612, 7208-7210, 7508-7509, 7808
194783 (0.057)	1505-2716, 3005-3014, 3305-3314, 3605-3612, 3905-3909, 4205-4208, 4505-4507, 4805-4806, 5105, 5405
194784 (0.096)	2717-2718, 3015-3020, 3315-3323, 3613-3623, 3910-3919, 4209-4219, 4508-4519, 4807-4818, 5106-5115, 5406-5413, 6008- 6010, 6608- 6609
194785 (0.116)	3920-3923, 4220-4223, 4520-4521, 4819-4821, 5116-5121, 5414-5419, 6011-6014, 6610-6612, 7208-7210, 7508-7509, 7808
236845 (0.116)	1505-4223,4505-4521, 4805-4821, 5105-5121, 5405-5419
194848 (0.116)	6008-6014, 6608-6014, 7208-7210, 7508-7509, 7808

5.16. Two Tier Medium Duty Door Installation

Figure 22. Two Tier Medium Duty Door



Note

- Spacer sheet (194849) can be placed below the medium duty 2-tier door (232970) to accommodate AGI floors.
- Spacer sheet (194849) can be placed above the medium duty 2-tier door (232970) to accommodate no floor application.

Important

Inner door board must be closed and latches completely engaged before filling. Failure and collapse of the bin could result if bin is filled without properly closing inner door board.

SPECIAL SHEET	BIN RANGES WHERE USED
194820 (0.168)	
194668 (0.168)	4522-4523, 4822-4823, 5122-5123, 5420-5423, 6015-6023, 6613-6623, 7211-7219, 7510-7517, 7809-7816, 8408-8414, 9008- 9012, 9608-9610, 10208-10209, 10508-10509, 10808
194849 (0.168)	

5.17. 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

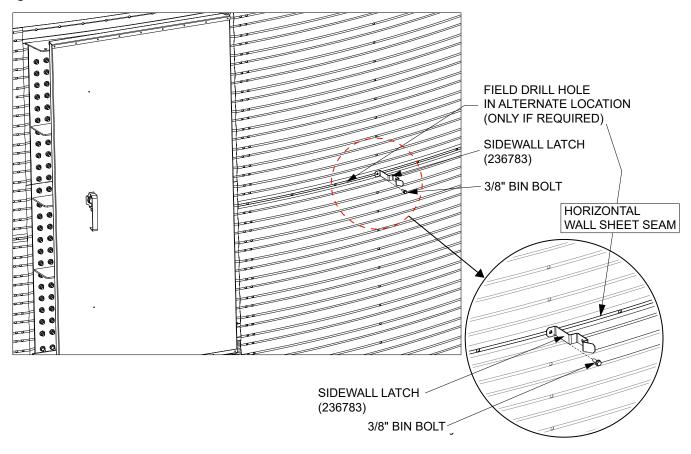
The door cover should snap shut and sit within the channel on the latch once installation is complete.

Figure 23. Door Sidewall Latch (236783)

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



Figure 24. Install the Sidewall Latch



5.18. Commercial Bin Upright Assembly

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

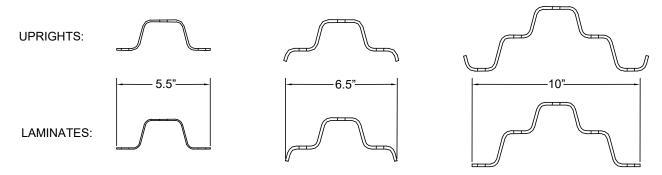
Introduction

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 25. 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.

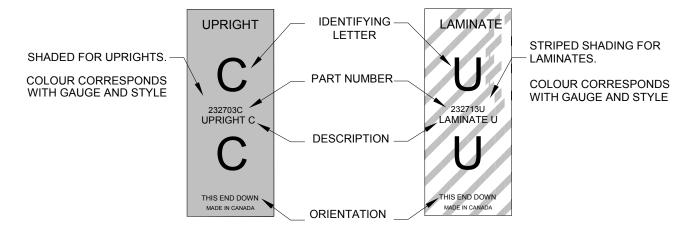
Upright labels have solid colours and laminate labels are striped. For both uprights and laminates, the colour corresponds with gauge and style.

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 26).

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 26. 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 27).

Тір

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

Figure 27. Upright Orientation Detail

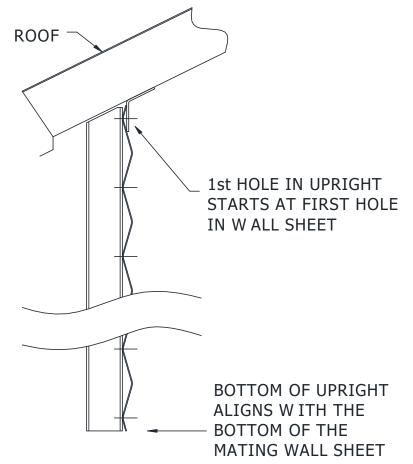
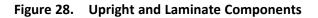


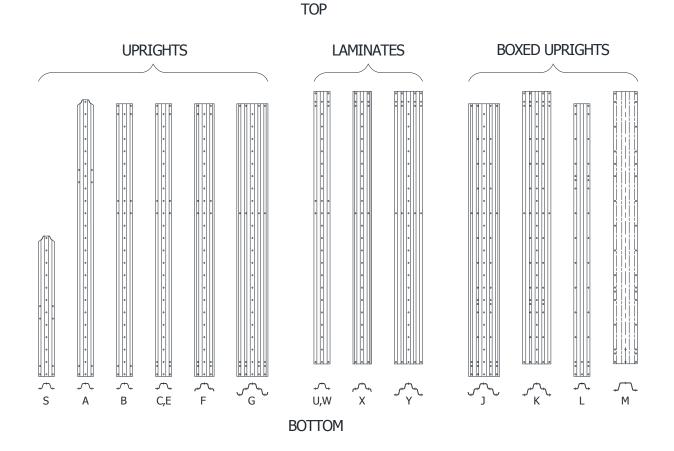
Table 16. Upright/Laminate Identification Table

	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"
	В	232702B	Upright B .076" x 5.5"	14	Light green	5.5"
Uprights	С	232703C	Upright C .116" x 5.5"	12	Blue	5.5"
	Е	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"
I	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.

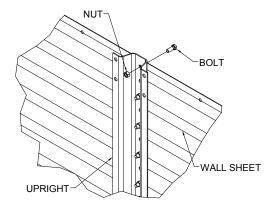
Bolt/Nut Orientation

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.

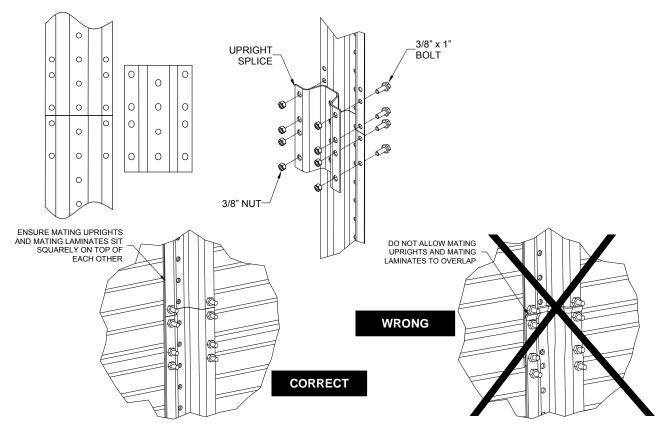
Figure 29. Upright / Wall Sheet Bolt and Nut Orientation



Тір

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





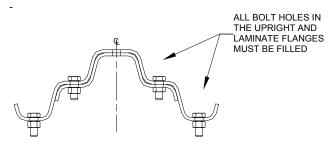
Upright and Laminate Assembly

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.

Upright/Laminate Pre-assemblies

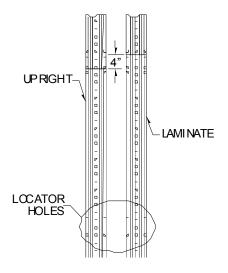
Laminates nest inside of uprights and are offset 4" above the uprights.

Figure 31. 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 32. 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 preassembled, both labels should remain visible.

Note

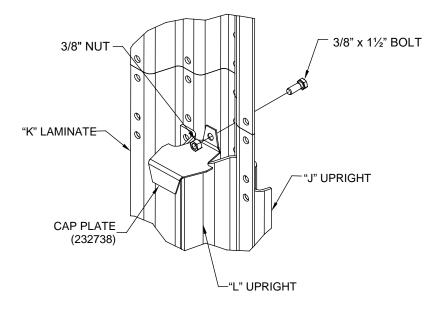
Once completely assembled onto the bin, all visible holes in the upright and laminate flanges must be filled. All mating wall sheet/upright holes must be filled.

Boxed Upright Cap Plates

Important

To prevent water from damming in the boxed section, install the cap plate (232738) as shown.

Figure 33. Installing Cap Plates on Boxed Uprights



5.18.1 Connecting the Upright Connectors to the Grain Bin for the Goal Posts

Goal posts connect into the grain bin uprights using upright connectors which bolt into the center section of the upright hat sections utilizing the same hardware that connects the uprights to the grain bin walls (3/8" x 1 ½" hex bolts). For this reason, <u>the best time to attach the upright connectors is at the same time the uprights are bolted to the bin</u>.

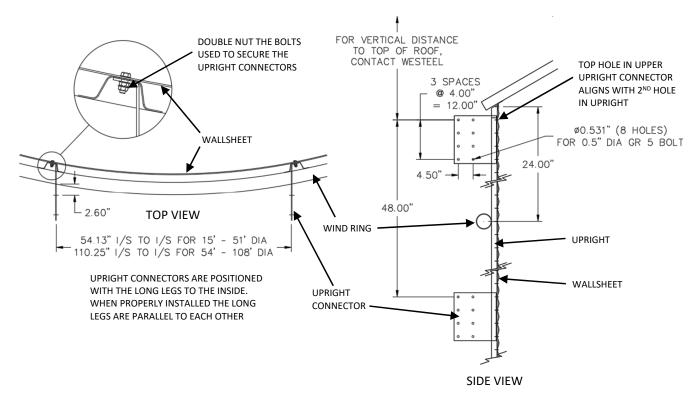
Note

If retrofitting an existing bin, the appropriate connection points will need to be disassembled to facilitate the addition of the upright connectors. Ensure the bin structure is capable of supporting the loads.

Upright connectors are angled to match the curvature of the bin so there are unique connectors for every bin diameter. Make sure the connector part numbers match the bin diameter in question.

The timing and location of upright connectors is also important. Since the upright connectors are potentially being installed well in advance of any subsequent catwalk considerations, consult the site layouts to ensure that later repositioning of the connectors is averted.





Important

Goal Posts need to be fully braced laterally between the left and right upright connectors. This is typically done with horizontal and diagonal bracing. AGI goal posts are fully braced. If non-AGI goal posts are used, bracing needs to be incorporated into the design.

For 44.5 kN (10,000 lb) capacity connections there are two upright connectors per upright (See Figure 34). The top hole in the upper upright connector aligns with the 2nd bolted hole in the mating upright as illustrated. The next upright connector is then positioned 48" lower (measured from top of connector to top of connector) on the upright and bolted in.

Note

All bolts used to make the upright connector connections should be double nutted such that the outer nut serves as a jam nut.

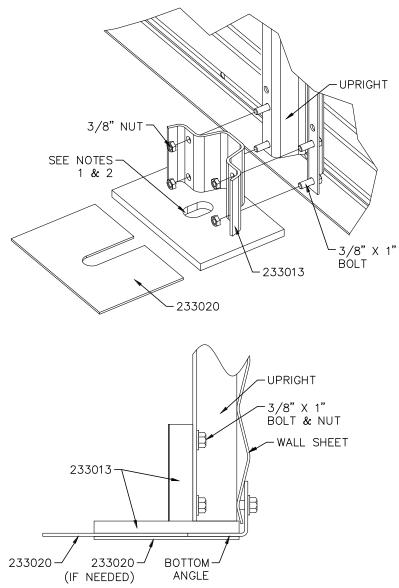
5.18.2 Base Assembly 233013 (WITHOUT Laminate Sections)

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 35. 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.

5.18.3 Base Assembly 233013 (Laminate Sections)

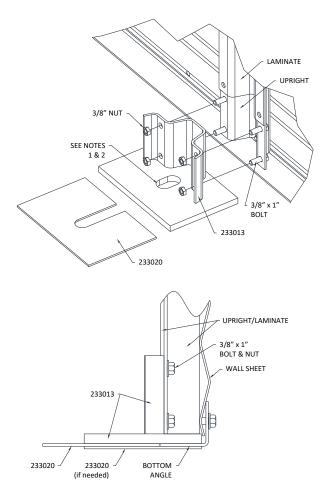
233013 — Base Assembly for Uprights with Laminate Sections

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 36. 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.

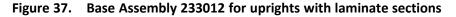
5.18.4 Base Assembly 233012 (Laminate Sections)

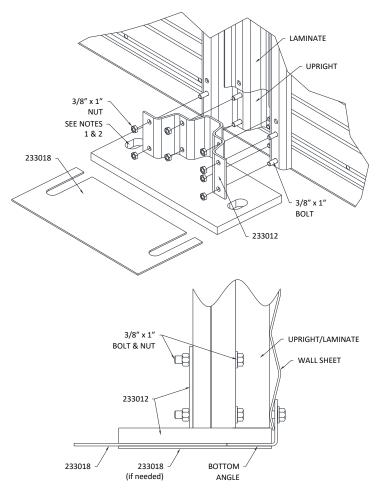
233012 - Base Assembly for Uprights (G or larger) with Laminate Sections

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.





Important

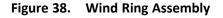
1) When positioning anchor bolts, locate them as far forward (away from the bin) as possible within the slots.

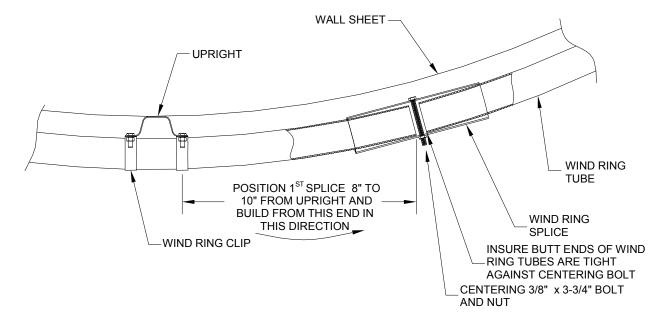
2) The anchor bolts at the upright locations should be chosen so that they can handle the loads imposed on them and that the head, either alone or with large diameter heavy washers, is large enough to sufficiently cover the $1.20'' \times 1.90''$ anchoring slots provided in the base plate. The base plate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

5.19. Wind Ring Assembly

Wind rings fulfill their function when the bin is empty or partially filled. In high winds, the wind rings provide extra stiffness and help keep the bin round. Not all bins require wind rings. Bin diameter and height determine the location and the quantity of wind rings required.

Wind ring locations are identified by an O placed beside the relevant uprights within the wall sheet and upright layouts for the bin in question. At these locations wind ring tubes are secured to the upright flanges with a series of clips that bolt into the upright locator holes that are located in the flanges of the 5.5" wide upright and upright/laminate combinations. Adjacent tubes are aligned and secured to each other with wind ring splices. A 3/8" x 3-3/4" bolt through the splice keeps it centered on the connection.



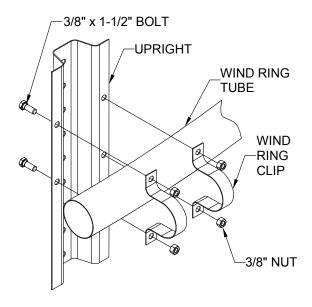


Externally Stiffened Bins

Once the uprights have been secured to the bin walls, position the first wind ring tube and secure it to the upright using the wind ring clips provided. Two clips are required per upright, one on each flange. Position the wind ring such that a wind ring splice (with bolt inserted) can be slipped onto the end of the tube without interfering with the upright or the wind ring clips. The splice should be orientated such that the bolt is horizontal.

Insert the end of the next wind ring tube into the open end of the wind ring splice. Insure that the ends of both tubes are tight against the centering bolt. Secure the wind ring tube to the uprights with the wind ring clips. Continue around the bin.

Figure 39. Wind Ring Mounting Detail (externally stiffened bins)



All wind ring splice connections should be made in the space between uprights, and should not encroach into the area where the wind ring clips are securing the wind ring tube to the uprights. To avoid interference with uprights and the need to make multiple cuts, position an end of the first tube relatively close to an upright, such that the space between the end of the tube and the next upright is maximized, and build from that end. Insure that both ends of the tube are far enough away from the closest uprights to avoid interference with the splice. When progressing around the bin, this space between the end of the tube and the next uprights may shrink with each additional tube that is installed. On large diameter bins, if this space shrinks to the point where the wind ring splice interferes with the upright, then the tube will need to be cut. Make the cut such that the space that is created between the end of the tube and the next upright is similar to the identical space on the first tube that was installed. In this manner, there will not be a shortage of tube.

Note

Assembly Tip: When putting the first wind ring tube in place, locate one end close to an upright with a 8" to 10" overhang, and continue building from that end. This will reduce the need for multiple cuts.

The final wind ring tube in a circle will need to be cut to length. Secure one end of the last tube in the previously installed wind ring splice as described above. Hold the tube in place and mark the cut-line relative to the previously installed tube at the other end. Insure that allowance is made for the 3/8" diameter bolt. Once the tube has been cut, install one end of the tube as described above. On the other end slide the wind ring splice completely onto the free end. Position this end relative to the previously installed tube, and slide the splice onto the second tube until it is centered. Insert the centering bolt. Install all wind ring clips. Tighten all bolts.

Note

Assembly Tip: When tightening wind ring clips, always tighten in sequence starting at the spliced end of the tube, which has already been secured, and work towards the free, and as yet unspliced, end.

6. Specifications

6.1. Centurion Commercial Grain Bin Specifications

				N	HEIGHT						
MODEL	BIN DIAME- TER	CAPACITY			EAVES			OVERALL			
WODEL		bu	m ³	Tonnes (Compact)	ft	ft - in	m	ft	ft - in	m	
1513	14' 11"-	7310	243	198	47.8	47' 10"	14.58	51.8	51' 10"	15.80	
1514	4.55 m	7860	262	213	51.5	51' 6"	15.70	55.5	55' 6"	16.92	
1813		10580	352	287	47.8	47' 10"	14.58	52.7	52' 8"	16.06	
1814	17' 11"-	11370	379	308	51.5	51' 6"	15.70	56.4	56' 4"	17.18	
1815	5.46 m	12160	405	330	55.2	55' 2"	16.82	60.0	60' 0"	18.30	
1816		12940	431	351	58.8	58' 10"	17.93	63.7	63' 8"	19.42	
2113		14480	482	393	47.8	47' 10"	14.58	53.6	53' 7"	16.33	
2114	20' 11"-	15550	518	422	51.5	51' 6"	15.70	57.2	57' 3"	17.44	
2115	6.37 m	16620	553	451	55.2	55' 2"	16.82	60.9	60' 11"	18.56	
2116		17690	589	480	58.8	58' 10"	17.93	64.6	64' 7"	19.68	
2413		19010	633	516	47.8	47' 10"	14.58	54.4	54' 5"	16.59	
2414	23' 10"-	20410	680	553	51.5	51' 6"	15.70	58.1	58' 1"	17.71	
2415	7.28 m	21800	726	591	55.2	55' 2"	16.82	61.8	61' 9"	18.82	
2416		23200	773	629	58.8	58' 10"	17.93	65.4	65' 5"	19.94	
2713		24180	806	656	47.8	47' 10"	14.58	55.3	55' 3"	16.85	
2714	26' 10"- 8.19 m	25950	864	704	51.5	51' 6"	15.70	59.0	58' 11"	17.97	
2715		27720	923	752	55.2	55' 2"	16.82	62.6	62' 7"	19.09	
2716		29490	982	800	58.8	58' 10"	17.93	66.3	66' 3"	20.20	
3013		30000	1000	814	47.8	47' 10"	14.58	55.7	55' 8"	16.98	
3014	29' 10"-	32180	1072	873	51.5	51' 6"	15.70	59.4	59' 4"	18.09	
3015	9.1 m	34370	1145	932	55.2	55' 2"	16.82	63.0	63' 0"	19.21	
3016		36560	1218	992	58.9	58' 10"	17.94	66.7	66' 9"	20.33	
3313		36470	1216	989	47.8	47' 10"	14.58	56.6	56' 7"	17.24	
3314	32' 10"-	39120	1304	1061	51.5	51' 6"	15.70	60.2	60' 3"	18.36	
3315	10.01 m	41760	1392	1133	55.2	55' 2"	16.82	63.9	63' 11"	19.47	
3316		44410	1480	1204	58.8	58' 10"	17.93	67.6	67' 7"	20.59	
3613		43620	1455	1183	47.8	47' 10"	14.58	57.4	57' 5"	17.50	
3614	35' 10"-	46770	1559	1269	51.5	51' 6"	15.70	61.1	61' 1"	18.62	
3615	10.91 m	49910	1664	1354	55.2	55' 2"	16.82	64.7	64' 9"	19.74	
3616		53060	1768	1439	58.8	58' 10"	17.93	68.4	68' 5"	20.85	
3913		51450	1716	1395	47.8	47' 10"	14.58	58.3	58' 3"	17.76	
3914	38' 10"-	55140	1839	1496	51.5	51' 6"	15.70	61.9	61' 11"	18.88	
3915	11.82 m	58830	1962	1596	55.2	55' 2"	16.82	65.6	65' 7"	20.00	
3916		62520	2084	1696	58.8	58' 10"	17.93	69.3	69' 3"	21.12	
4213		59960	2001	1626	47.8	47' 10"	14.58	59.1	59' 2"	18.03	
4214	41' 9"-	64240	2143	1742	51.5	51' 6"	15.70	62.8	62' 10"	19.14	
4215	12.73 m	68520	2285	1859	55.2	55' 2"	16.82	66.5	66' 6"	20.26	
4216		72810	2428	1975	58.8	58' 10"	17.93	70.1	70' 2"	21.38	
4513	44' 9"-	69160	2308	1876	47.8	47' 10"	14.58	60.0	60' 0"	18.29	
4514	13.64 m	74080	2472	2009	51.5	51' 6"	15.70	63.7	63' 8"	19.41	

	DUV	CAPACITY			HEIGHT						
MODEL	BIN DIAME-	\MF.			EAVES			OVERALL			
WODEL	TER	bu	m ³	Tonnes (Compact)	ft	ft - in	m	ft	ft - in	m	
4515		79000	2635	2143	55.2	55' 2"	16.82	67.3	67' 4"	20.52	
4516		83910	2799	2276	58.8	58' 10"	17.93	71.0	71' 0"	21.64	
4813		79070	2640	2145	47.8	47' 10"	14.58	60.9	60' 10"	18.55	
4814	47' 9"-	84670	2826	2296	51.5	51' 6"	15.70	64.5	64' 6"	19.67	
4815	14.55 m	90260	3012	2448	55.2	55' 2"	16.82	68.2	68' 2"	20.79	
4816		95850	3198	2600	58.8	58' 10"	17.93	71.9	71' 10"	21.90	
5111		77060	2576	2090	40.5	40' 6"	12.35	54.2	54' 2"	16.52	
5112		83380	2785	2262	44.2	44' 2"	13.46	57.9	57' 10"	17.64	
5113	50' 9"-	89690	2995	2433	47.8	47' 10"	14.58	61.5	61' 6"	18.75	
5114	15.46 m	96010	3205	2604	51.5	51' 6"	15.70	65.2	65' 2"	19.87	
5115	-	102320	3415	2775	55.2	55' 2"	16.82	68.9	68' 10"	20.99	
5116		108640	3625	2947	58.8	58' 10"	17.93	72.5	72' 6"	22.11	
5410		79800	2669	2164	36.8	36' 10"	11.23	51.4	51' 5"	15.66	
5411		86880	2904	2356	40.5	40' 6"	12.35	55.1	55' 1"	16.78	
5412		93960	3140	2549	44.2	44' 2"	13.46	58.7	58' 9"	17.90	
5413	53' 9"- 16.37 m	101040	3375	2741	47.8	47' 10"	14.58	62.4	62' 5"	19.02	
5414	10.37 111	108120	3610	2933	51.5	51' 6"	15.70	66.1	66' 1"	20.13	
5415		115200	3846	3125	55.2	55' 2"	16.82	69.7	69' 9"	21.25	
5416		122280	4081	3317	58.8	58' 10"	17.93	73.4	73' 5"	22.37	
6008		81760	2741	2218	29.5	29' 6"	8.99	45.9	45' 11"	14.01	
6009		90500	3031	2455	33.2	33' 2"	10.11	49.6	49' 7"	15.12	
6010		99240	3322	2692	36.8	36' 10"	11.23	53.3	53' 3"	16.24	
6011		107980	3612	2929	40.5	40' 6"	12.35	56.9	56' 11"	17.36	
6012	59' 8"- 18.19 m	116720	3903	3166	44.2	44' 2"	13.46	60.6	60' 7"	18.48	
6013	10.19 m	125460	4193	3403	47.8	47' 10"	14.58	64.3	64' 3"	19.59	
6014]	134200	4484	3640	51.5	51' 6"	15.70	67.9	67' 11"	20.71	
6015		142940	4774	3877	55.2	55' 2"	16.82	71.6	71' 7"	21.83	
6016]	151730	5066	4116	58.9	58' 10"	17.94	75.3	75' 4"	22.95	

Note

1. Capacities shown include 28° roof cone.

2. Based on 1.244 ft per bushel and 6% compaction in cylinder

3. Based on bulk density - 770 kg/m³ (= 48 lb/ft³) and and 6% compaction in cylinder

6.2. 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.

Model (CEN)		1513	1514
Vertical dead load	kips/upr	0.77	0.83
Vertical grain load	kips/upr	47.50	55.39
Vertical roof snow load *	kips/upr	0.79	0.79
Vertical roof peak load	kips/upr	0.40	0.40
Bin floor pressure	kips/ft ²	1.01	1.03
Number of anchor bolts for uprights		10	10
Number of anchor bolts for bottom angle ring (Optional)		30	30
* Based on maximum snow load of 45 psf		•	

 Table 17. Foundation Loads — CEN Series 15' Bins (Imperial-Unfactored)

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

Model (CEN)		1813	1814	1815	1816
Vertical dead load	kips/upr	0.76	0.82	0.88	0.98
Vertical grain load	kips/upr	46.76	54.55	62.97	72.01
Vertical roof snow load *	kips/upr	0.94	0.94	0.94	0.94
Vertical roof peak load	kips/upr	0.33	0.33	0.33	0.33
Bin floor pressure	kips/ft ²	1.16	1.18	1.20	1.22
Number of anchor bolts for uprights		12	12	12	12
Number of anchor bolts for bottom angle ring (Optional)		36	36	36	36
* Based on maximum snow load of 45 psf					

Model (CEN)		2113	2114	2115	2116
Vertical dead load	kips/upr	0.79	0.85	0.94	1.03
Vertical grain load	kips/upr	49.84	55.65	62.13	71.07
Vertical roof snow load *	kips/upr	1.13	1.13	1.13	1.13
Vertical roof peak load	kips/upr	0.29	0.29	0.29	0.29
Bin floor pressure	kips/ft ²	1.29	1.32	1.35	1.37
Number of anchor bolts for uprights		14	14	14	14
Number of anchor bolts for bottom angle ring (Optional)		42	42	42	42
* Based on maximum snow load of 46 psf		-		-	

Table 19. Foundation Loads — CEN Series 21' Bins (Imperial-Unfactored)

Table 20. Foundation Loads — CEN Series 24' Bins (Imperial-Unfactored)

Model (CEN)		2413	2414	2415	2416
Vertical dead load	kips/upr	0.83	0.92	1.00	1.09
Vertical grain load	kips/upr	53.19	59.51	66.00	72.64
Vertical roof snow load *	kips/upr	1.09	1.09	1.09	1.09
Vertical roof peak load	kips/upr	0.25	0.25	0.25	0.25
Bin floor pressure	kips/ft ²	1.40	1.44	1.48	1.51
Number of anchor bolts for uprights		16	16	16	16
Number of anchor bolts for bottom angle ring (Optional)		48	48	48	48
* Based on maximum snow load of 39 psf					

Table 21. Foundation Loads — CEN Series 27' Bins (Imperial-Unfactored)

Model (CEN)		2713	2714	2715	2716
Vertical dead load	kips/upr	0.87	0.98	1.04	1.14
Vertical grain load	kips/upr	51.23	62.93	69.92	77.08
Vertical roof snow load *	kips/upr	1.23	1.23	1.23	1.23
Vertical roof peak load	kips/upr	0.28	0.28	0.28	0.28
Bin floor pressure	kips/ft ²	1.50	1.55	1.59	1.63
Number of anchor bolts for uprights		18	18	18	18
Number of anchor bolts for bottom angle ring (Optional)		54	54	54	54
* Based on maximum snow load of 39 psf		-		-	

Table 22. Foundation Loads — CEN Series 30' Bins (Imperial-Unfactored)

Model (CEN)		3013	3014	3015	3016
Vertical dead load	kips/upr	0.91	1.00	1.13	1.28
Vertical grain load	kips/upr	46.19	57.62	70.55	81.08
Vertical roof snow load *	kips/upr	1.40	1.40	1.40	1.40
Vertical roof peak load	kips/upr	0.25	0.25	0.25	0.25
Bin floor pressure	kips/ft ²	1.59	1.64	1.69	1.74
Number of anchor bolts for uprights		20	20	20	40
Number of anchor bolts for bottom angle ring (Optional)		60	60	60	60
* Based on maximum snow load of 40 psf					

Table 23. Foundation Loads — CEN Series 33' Bins (Imperial-Unfactored)

Model (CEN)		3313	3314	3315	3316
Vertical dead load	kips/upr	0.92	1.01	1.14	1.30
Vertical grain load	kips/upr	43.76	52.36	64.43	77.97
Vertical roof snow load *	kips/upr	1.69	1.69	1.69	1.69
Vertical roof peak load	kips/upr	0.23	0.23	0.23	0.23
Bin floor pressure	kips/ft ²	1.67	1.73	1.79	1.84
Number of anchor bolts for uprights		22	22	22	22
Number of anchor bolts for bottom angle ring (Optional)		66	66	66	66
* Based on maximum snow load of 44 psf		-	-	-	

Table 24. Foundation Loads — CEN Series 36' Bins (Imperial-Unfactored)

Model (CEN)		3613	3614	3615	3616
Vertical dead load	kips/upr	0.97	1.05	1.15	1.28
Vertical grain load	kips/upr	45.37	51.01	58.95	71.64
Vertical roof snow load *	kips/upr	1.59	1.59	1.59	1.59
Vertical roof peak load	kips/upr	0.21	0.21	0.21	0.21
Bin floor pressure	kips/ft ²	1.74	1.81	1.87	1.93
Number of anchor bolts for uprights		24	24	24	24
Number of anchor bolts for bottom angle ring (Optional)		72	72	72	72
* Based on maximum snow load of 38 psf		-	-	-	-

Model (CEN)		3913	3914	3915	3916
Vertical dead load	kips/upr	1.04	1.11	1.21	1.31
Vertical grain load	kips/upr	46.87	52.73	58.81	65.93
Vertical roof snow load *	kips/upr	1.64	1.64	1.64	1.64
Vertical roof peak load	kips/upr	0.19	0.19	0.19	0.19
Bin floor pressure	kips/ft ²	1.81	1.88	1.95	2.01
Number of anchor bolts for uprights		26	26	26	26
Number of anchor bolts for bottom angle ring (Optional)		78	78	78	78
* Based on maximum snow load of 36 psf		-		-	

Table 25. Foundation Loads — CEN Series 39' Bins (Imperial-Unfactored)

Table 26. Foundation Loads — CEN Series 42' Bins (Imperial-Unfactored)

Model (CEN)		4213	4214	4215	4216
Vertical dead load	kips/upr	1.08	1.16	1.26	1.36
Vertical grain load	kips/upr	48.28	54.34	60.64	67.16
Vertical roof snow load *	kips/upr	1.66	1.66	1.66	1.66
Vertical roof peak load	kips/upr	0.18	0.18	0.18	0.18
Bin floor pressure	kips/ft ²	1.87	1.94	2.02	2.09
Number of anchor bolts for uprights		28	28	28	28
Number of anchor bolts for bottom angle ring (Optional)		84	84	84	84
* Based on maximum snow load of 34 psf					

Table 27. Foundation Loads — CEN Series 45' Bins (Imperial-Unfactored)

Model (CEN)		4513	4514	4515	4516
Vertical dead load	kips/upr	1.12	1.22	1.33	1.44
Vertical grain load	kips/upr	49.62	55.86	62.36	69.10
Vertical roof snow load *	kips/upr	1.68	1.68	1.68	1.68
Vertical roof peak load	kips/upr	0.17	0.17	0.17	0.17
Bin floor pressure	kips/ft ²	1.92	2.01	2.08	2.16
Number of anchor bolts for uprights		30	30	30	30
Number of anchor bolts for bottom angle ring (Optional)		90	90	90	90
* Based on maximum snow load of 32 psf		-	-	-	-

Table 28. Foundation Loads — CEN Series 48' Bins (Imperial-Unfactored)

Model (CEN)		4813	4814	4815	4816
Vertical dead load	kips/upr	1.26	1.38	1.47	1.62
Vertical grain load	kips/upr	50.89	57.30	63.99	70.93
Vertical roof snow load *	kips/upr	2.18	2.18	2.18	2.18
Vertical roof peak load	kips/upr	0.63	0.63	0.63	0.63
Bin floor pressure	kips/ft ²	1.97	2.06	2.14	2.22
Number of anchor bolts for uprights		32	32	32	32
Number of anchor bolts for bottom angle ring (Optional)		96	96	96	96
* Based on maximum snow load of 39 psf		-			

Table 29. Foundation Loads — CEN Series 51' Bins (Imperial-Unfactored)

Model (CEN)		5111	5112	5113	5114	5115	5116
Vertical dead load	kips/upr	1.09	1.21	1.30	1.44	1.53	1.67
Vertical grain load	kips/upr	39.25	45.18	51.43	57.98	64.81	71.91
Vertical roof snow load *	kips/upr	2.32	2.32	2.32	2.32	2.32	2.32
Vertical roof peak load	kips/upr	0.59	0.59	0.59	0.59	0.59	0.59
Bin floor pressure	kips/ft ²	1.82	1.92	2.01	2.11	2.19	2.27
Number of anchor bolts for uprights		34	34	34	34	34	34
Number of anchor bolts for bottom angle ring (Optional)		102	102	102	102	102	102
* Based on maximum snow load of 39 psf		-	-	•	-	-	•

Table 30. Foundation Loads — CEN Series 54' Bins (Imperial-Unfactored)

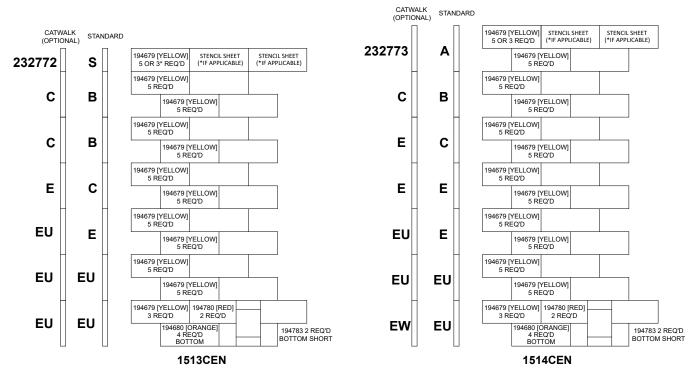
Model (CEN)		5410	5411	5412	5413	5414	5415	5416
Vertical dead load	kips/upr	1.38	1.47	1.58	1.67	1.81	1.93	2.06
Vertical grain load	kips/upr	34.39	40.10	46.16	52.55	59.24	66.23	73.51
Vertical roof snow load *	kips/upr	2.45	2.45	2.45	2.45	2.45	2.45	2.45
Vertical roof peak load	kips/upr	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Bin floor pressure	kips/ft ²	1.74	1.85	1.96	2.06	2.15	2.24	2.33
Number of anchor bolts for uprights		36	36	36	36	36	36	36
Number of anchor bolts for bottom angle ring (Optional)		108	108	108	108	108	108	108

Model (CEN)		6008	6009	6010	6011	6012	6013	6014	6015	6016	
Vertical dead load	kips/upr	1.29	1.37	1.48	1.59	1.71	1.84	1.96	2.09	2.24	
Vertical grain load	kips/upr	25.12	30.27	35.82	41.74	48.03	54.67	61.64	68.92	76.51	
Vertical roof snow load *	kips/upr	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	2.66	
Vertical roof peak load	kips/upr	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	
Bin floor pressure	kips/ft ²	1.55	1.68	1.81	1.92	2.03	2.14	2.24	2.34	2.43	
Number of anchor bolts for uprights		40	40	40	40	40	40	40	40	80	
Number of anchor bolts for bottom angle ring (Optional)		120	120	120	120	120	120	120	120	120	
* Based on maximum snow lo	* Based on maximum snow load of 38										

 Table 31.
 Foundation Loads — CEN Series 60' Bins (Imperial-Unfactored)

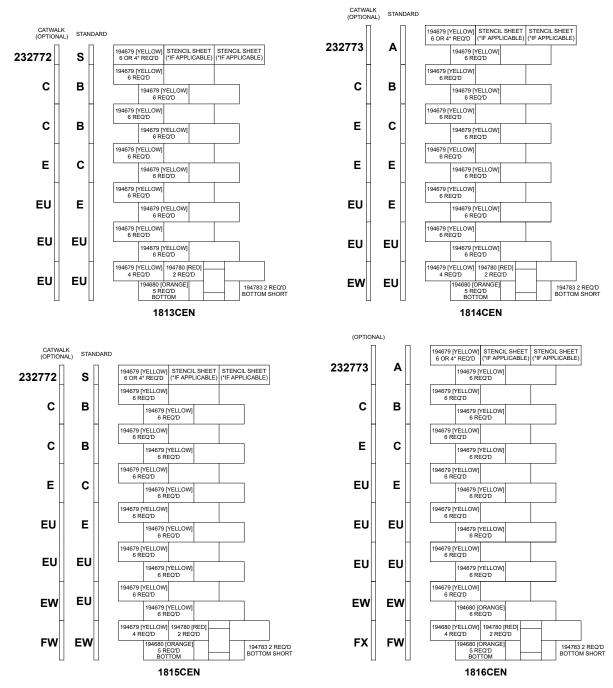
6.3. Wall Sheet and Upright Layouts

Figure 40. Model 1513 to 1514



- 1. Colors match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194654 and 194657 [YELLOW].
- 3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.

Figure 41. Model 1813 to 1816



Notes:

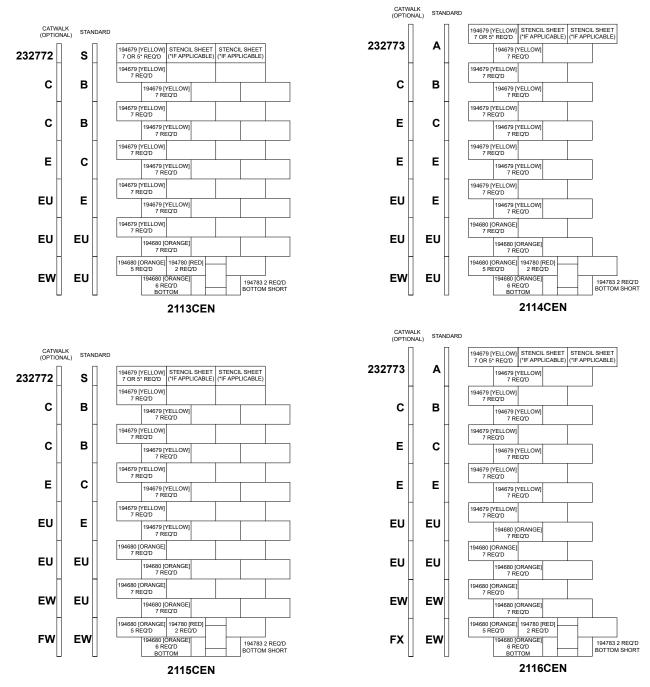
1. Colors match part number label and indicate wall sheet thickness.

2. (If applicable) Stencil sheets are 194654 and 194657 [YELLOW].

3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

4. Walk-in door 236810 (supplied with 2 door boards) for all models.





Notes:

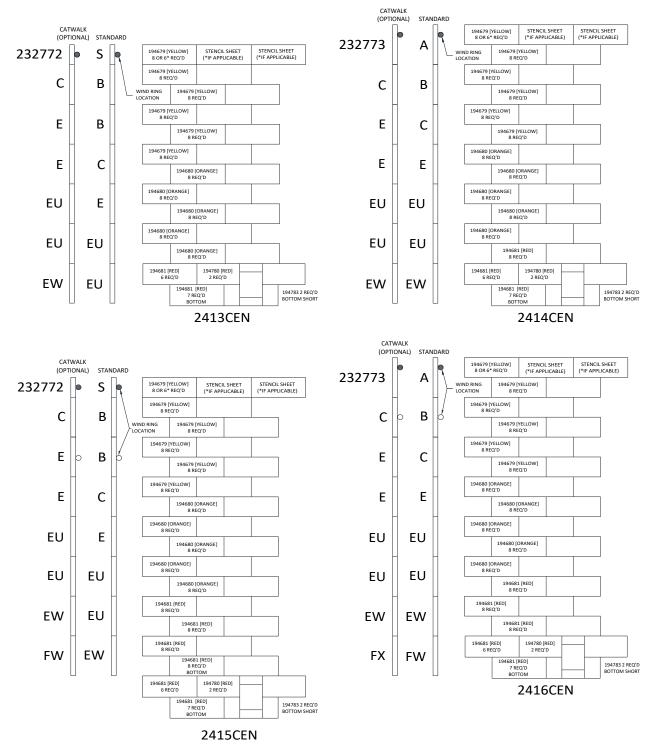
1. Colors match part number label and indicate wall sheet thickness.

2. (If applicable) Stencil sheets are 194654 and 194657 [YELLOW].

3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

4. Walk-in door 236810 (supplied with 2 door boards) for all models.





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

- 2. (If applicable) Stencil sheets are 194654 and 194657 [YELLOW]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring
- if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.
- 5. — Indicates standard wind ring placement.
 - — Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

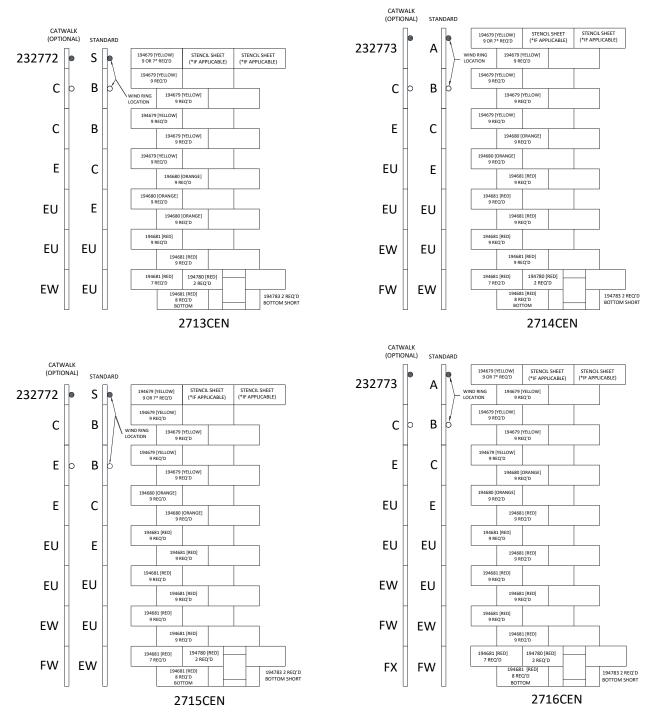
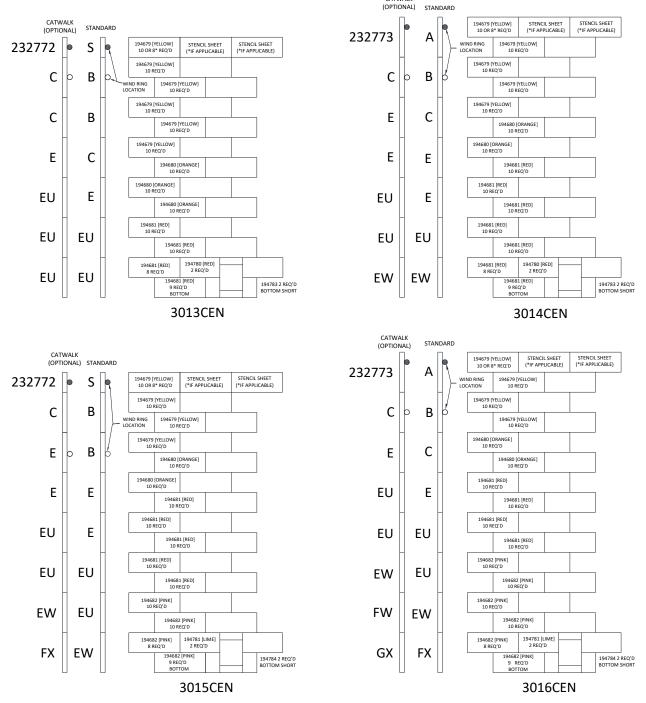


Figure 44. Model 2713 to 2716

- Colors match part number label and indicate wall sheet thickness. 1.
- (If applicable) Stencil sheets are 194654 and 194657 [YELLOW]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring 2. if desired. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 3.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.
- o Indicates standard wind ring placement. 5.
 - - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).





CATWALK

- Colors match part number label and indicate wall sheet thickness. 1.
- 2. (If applicable) Stencil sheets are 194654 and 194657 [YELLOW]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring if desired. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 3.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.
- Indicates standard wind ring placement. 5.
 - - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

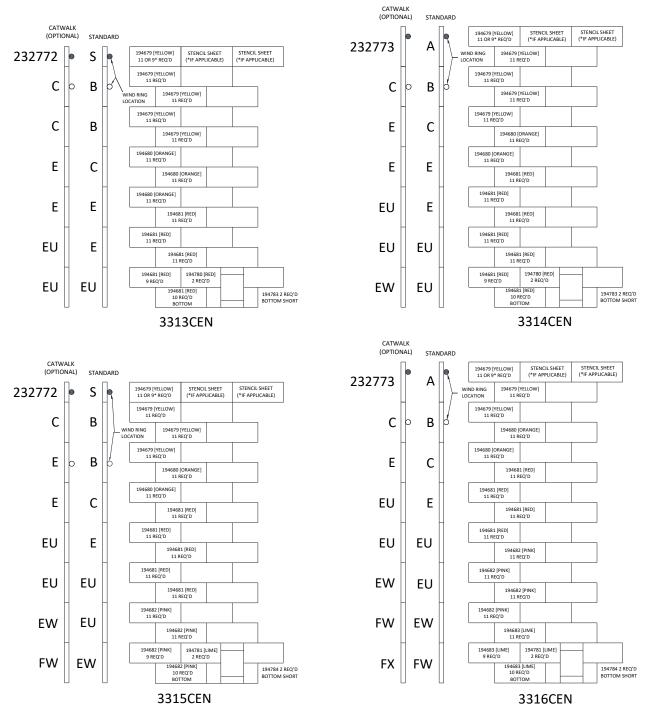
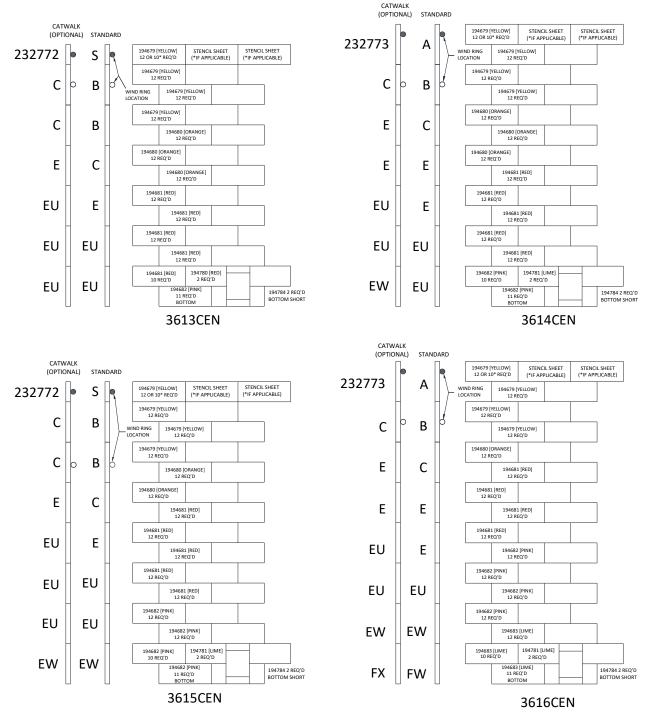


Figure 46. Model 3313 to 3316

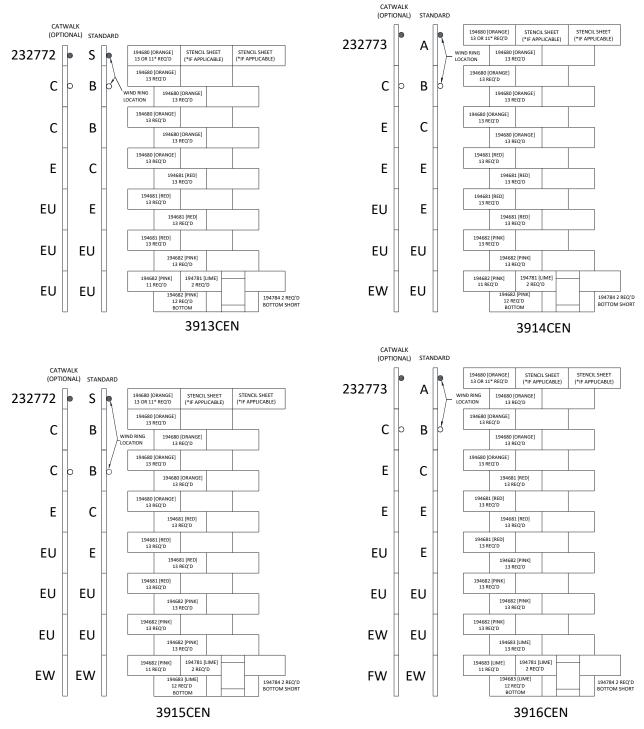
- 1. Colors match part number label and indicate wall sheet thickness.
- (If applicable) Stencil sheets are 194654 and 194657 [YELLOW]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.
- 5. \circ Indicates standard wind ring placement.
 - - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately)...

Figure 47. Model 3613 to 3616



- 1. Colors match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194654 and 194657 [YELLOW]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring if desired
- if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.
- 5. — Indicates standard wind ring placement.
 - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).





Notes:

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

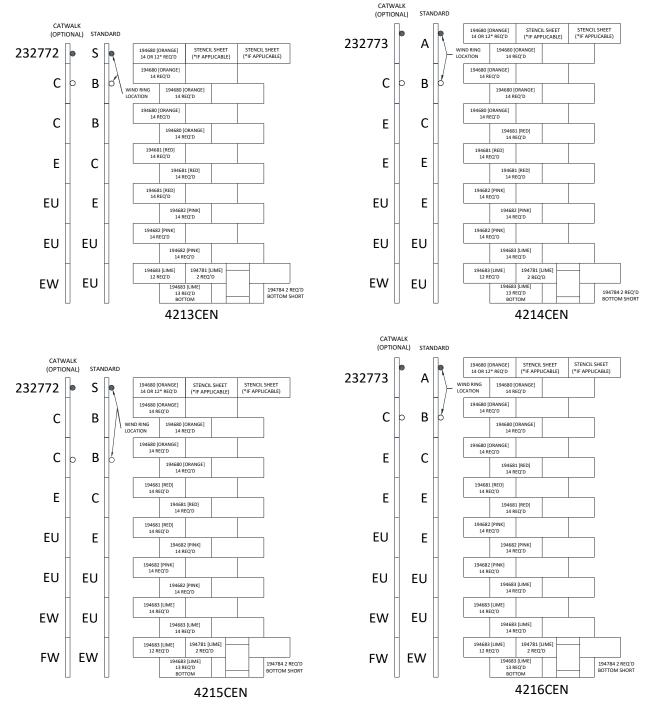
(If applicable) Stencil sheets are 194655 and 194658 [ORANGE]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring 2. If desired. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long. 3.

Walk-in door 236810 (supplied with 2 door boards) for all models. 4.

• — Indicates standard wind ring placement. 5.

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

Figure 49. Model 4213 to 4216



- 1. Colors match part number label and indicate wall sheet thickness.
- (If applicable) Stencil sheets are 194655 and 194658 [ORANGE]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. Walk-in door 236810 (supplied with 2 door boards) for all models.
- 5. — Indicates standard wind ring placement.
 - — Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

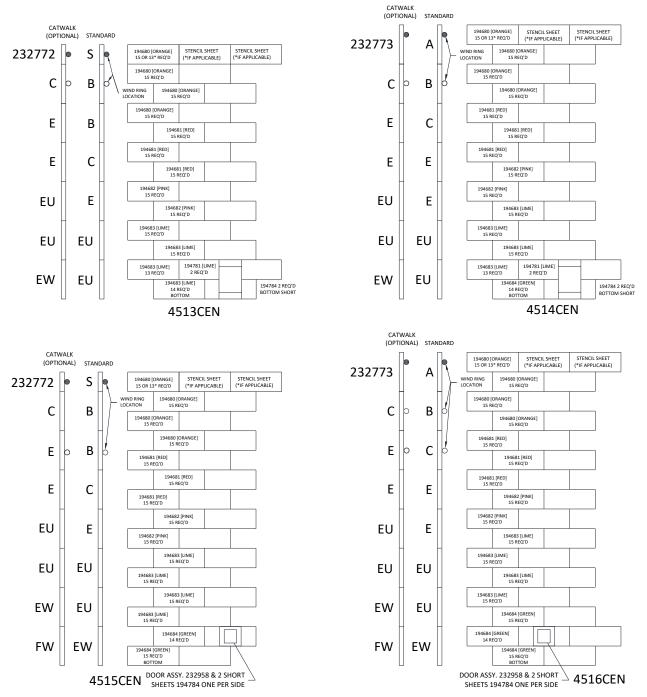


Figure 50. Model 4513 to 4516

Notes:

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

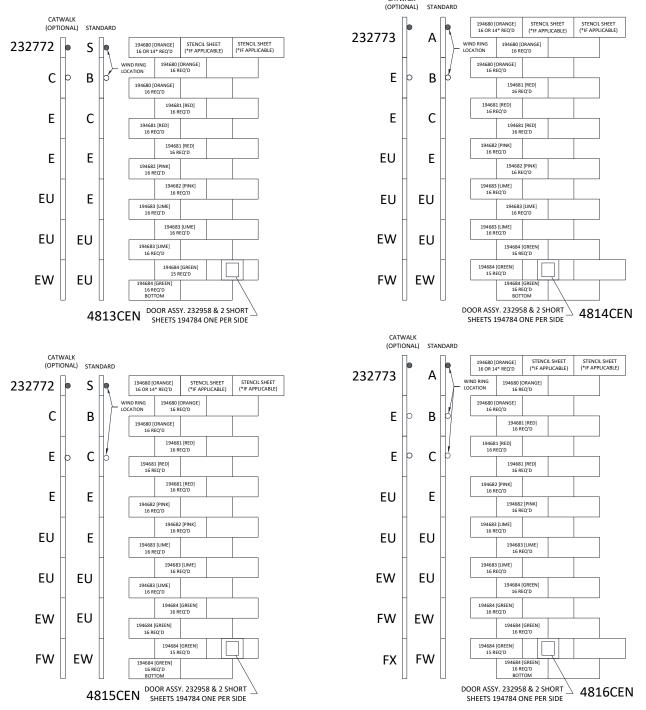
(If applicable) Stencil sheets are 194655 and 194658 [ORANGE]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

- An uprights except for the top is and 232772 catwark upright are 2 tiers to
 Walk-in door 236810 (supplied with 2 door boards) for 4513 4514.
- 5. One tier door 232958 standard for 4515-4516.
- One tier door 232930 standard for 4315-4516
 One tier door 232930 standard for 4315-4516
 One tier door 232930 standard for 4315-4516

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

CATWALK

Figure 51. Model 4813 to 4816



Notes:

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

2. (If applicable) Stencil sheets are 194655 and 194658 [ORANGE]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring

if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

4. One tier door 232958 for all models.

5. • — Indicates standard wind ring placement.

• — Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

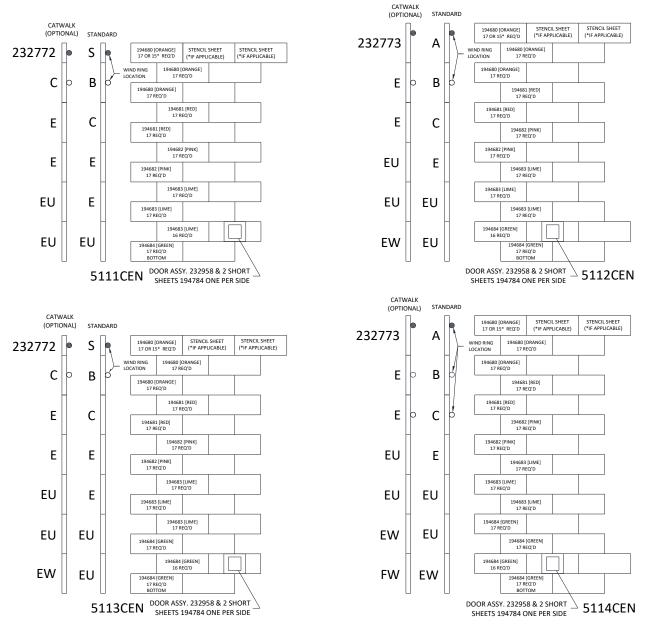


Figure 52. Model 5111 to 5116

Notes:

5.

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

- 2. (If applicable) Stencil sheets are 194655 and 194658 [ORANGE]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring
- if desired.
 All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

4. One tier door 232958 for all models.

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

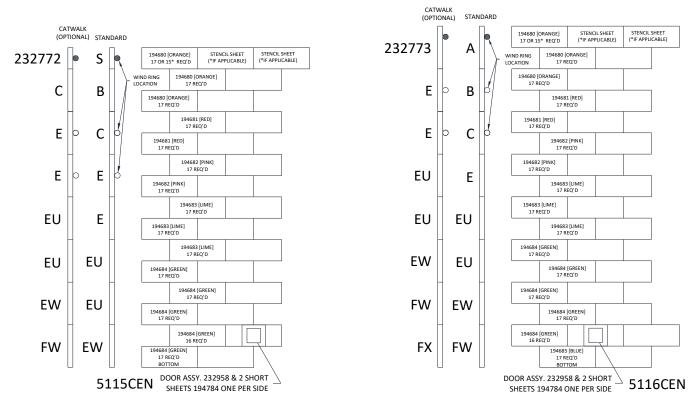


Figure 52 Model 5111 to 5116 (continued)

Notes:

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

2. (If applicable) Stencil sheets are 194655 and 194658 [ORANGE]. They can be positioned in the 2nd tier from the top in order to keep them clear of the wind ring

a. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

4. One tier door 232958 for all models.

5. • — Indicates standard wind ring placement.

• — Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

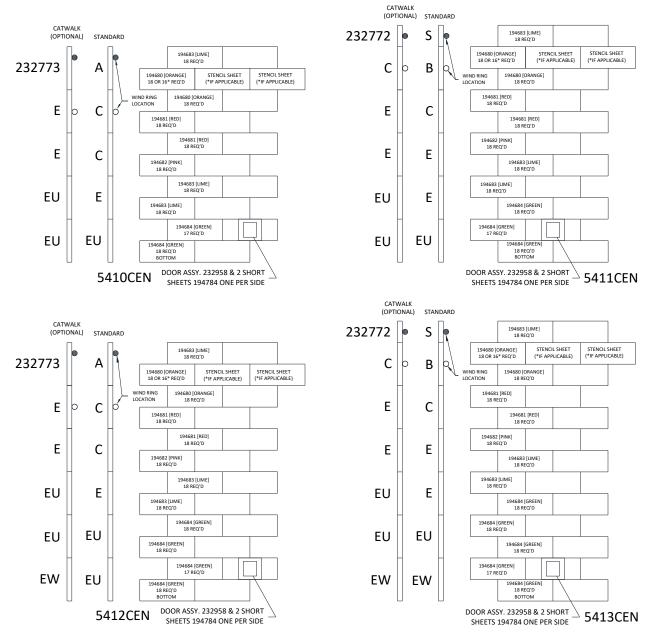


Figure 53. Model 5410 to 5416

Notes:

5.

- 1. **Colors** match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194655 and 194658 [ORANGE].
- 3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.

4. One tier door 232958 for all models.

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

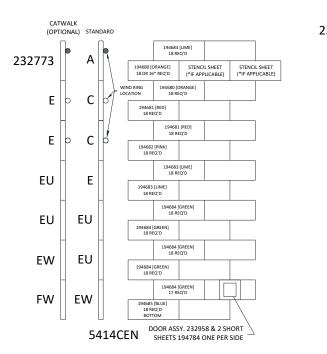
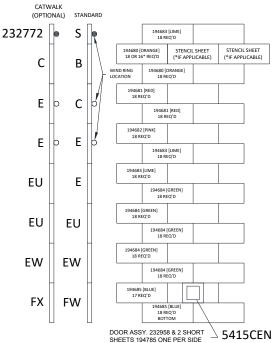
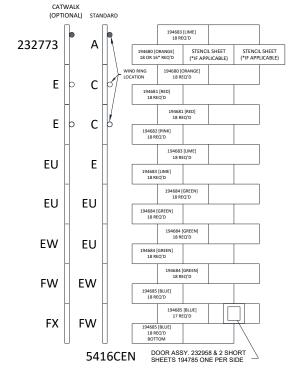


Figure 53 Model 5410 to 5416 (continued)



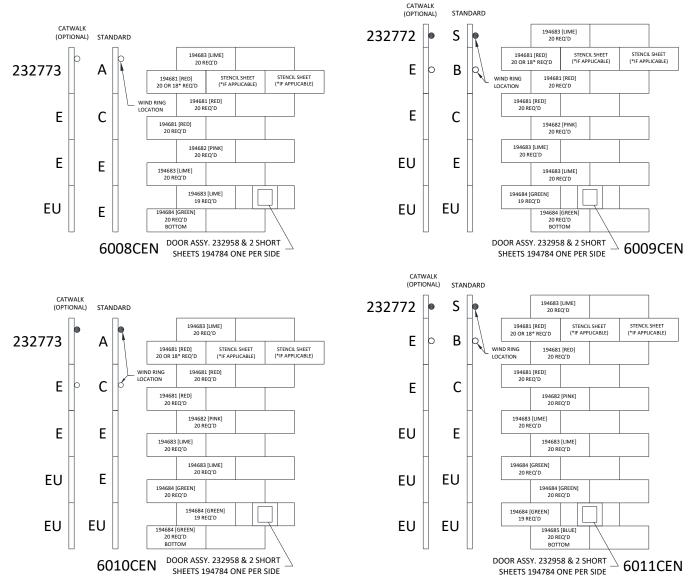


Notes:

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194655 and 194658 [ORANGE].
- 3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. One tier door 232958 for all models.
 - Indicates standard wind ring placement.
 - - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

5.





Notes:

5.

- 1. Colors match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194656 and 194659 [LIME].
- 3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. One tier door 232958 for all models.
 - Indicates standard wind ring placement.
 - — Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

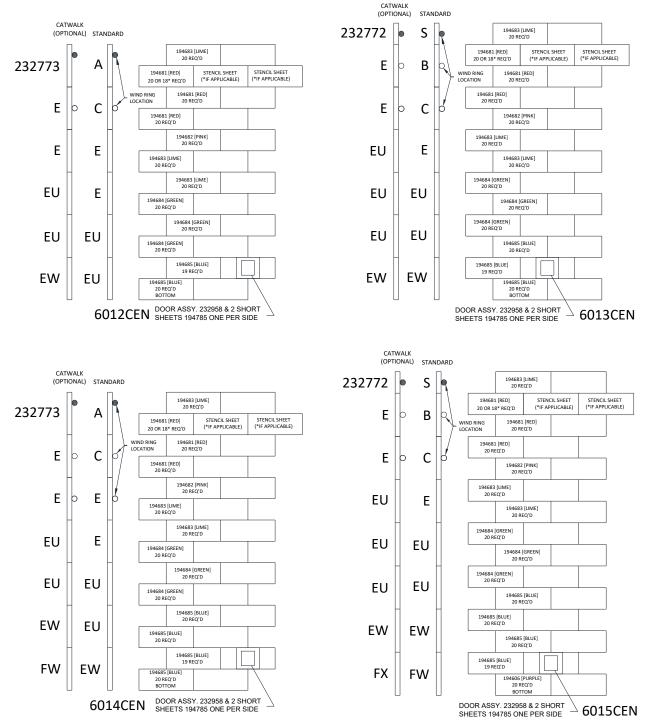


Figure 54 Model 6008 to 6016 (continued)

Notes:

- 1. **Colors** match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194656 and 194659 [LIME].
- 3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. One tier door 232958 for all models.
 - — Indicates standard wind ring placement.
 - - Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

5.

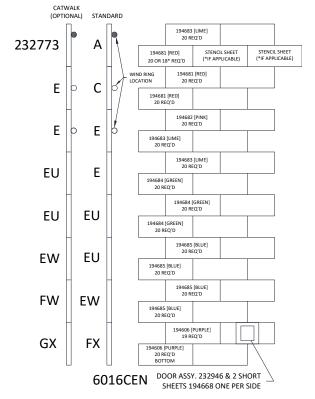


Figure 54 Model 6008 to 6016 (continued)

- 1. **Colors** match part number label and indicate wall sheet thickness.
- 2. (If applicable) Stencil sheets are 194656 and 194659 [LIME].
- 3. All uprights except for the top "S" and 232772 catwalk upright are 2 tiers long.
- 4. One tier door 232946.
- 5. — Indicates standard wind ring placement.
 - — Indicates additional wind ring placement if using AGI side draw system (must be ordered separately).

7. Appendix

7.1. Parts Identification (Bin) - Parts Box



194120 - Grain Gauge



235372 – Bottom Angle Sealing Clip

7.2. Bin Hardware

Table 32. Bin Hardware

BOLT	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 1- 3/4" Flanged Hex Bolt (Washer	3/8" x 3- 3/4" Hex Bolt	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Wingnut	3/8" Flat Washer	3/8" STL/NEO Sealing Washer	7/16" x 1- 1/2" Flanged Hex Bolt (Washer)	3/4" Flanged Hex Bolt	7/16" x 2" Flanged Hex Bolt (Washer)	7/16" x 2- 1/4" Flanged Hex Bolt (Washer)	7/16" Hex Nut	1/2" Flat Washer
	232850 (700) 235941 (325) 235943 (50)	150594	232852 (500) 235946 (100)	232832	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)	232833	232834	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")			•				•		Φ							
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	•						٠									
UPRIGHT to LAMINATE	•						•									
UPRIGHT to LAMINATE to BOXED UPRIGHT			•				•									
WALL SHEET to UPRIGHT to LAMINATE to CAP PLATE (FOR BINS WITH BOXED UPRIGHTS)			•				•									

	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 1- 3/4" Flanged Hex Bolt (Washer	3/8" x 3- 3/4" Hex Bolt	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Wingnut	3/8" Flat Washer	3/8" STL/NEO Sealing Washer	7/16" x 1- 1/2" Flanged Hex Bolt (Washer)	3/4" Flanged Hex Bolt	7/16" x 2" Flanged Hex Bolt (Washer)	7/16" x 2- 1/4" Flanged Hex Bolt (Washer)	7/16" Hex Nut	1/2" Flat Washer
	232850 (700) 235941 (325) 235943 (50)	150594	232852 (500) 235946 (100)	232832	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)	232833	232834	232855 (400) 232856 (300)	154981
			•				•									
WIND RING SPLICE					٠		•									
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 CHUTE BLOCK-OFF PLATE to AUGER DOOR BOARD			•				•	•								
BIN WALL to HOPPER ASSEMBLY			•				•		•							

Table 32 Bin Hardware (continued)

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).

 \bullet — Use washers only at wall sheet to bottom ring angle.

7.3. 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.

Bolt Diameter	Bolt Grade	Grade Mark	Recommended Torque Capacity		
			in-lb	ft-lb	N-m
1/4"	Grade 8.2		75	6	8
5/16"	Grade 8.2		215	18	24
3/8"	Grade 8.2	84 8	370	31	42
7/16"	Grade 8.2	æ	600	50	68
1/2"	Grade 8.2	Alton	960	80	108
5/8"	Grade 8.2	83	1800	150	203
3/4"	Grade 5	$\langle \cdot \rangle$	3230	269	365

Table 33. 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.

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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.

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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