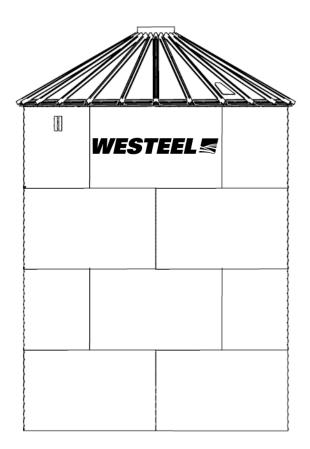


# 12' Bin for Hopper

# Wide-Corr® Farm Series Installation and Storage Instructions





Part Number: 198938 R12

Revised: September, 2024

**Original Instructions** 

### **New in this Manual**

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

Description	Section
Updated	Section 3.1 – Bin Design and Capacity on page 12
Updated	Section 3.2 – Foundation Design and Loads on page 12
New section	Section 2.5 – Auxiliary Equipment Safety on page 6
New section	Section 2.6 – Working At Height Safety on page 7
New section	Section 4.4 – Pre-Plan Assembly on page 19
Updated	Section 2.7 – Overhead Power Lines on page 8
Added new wall sheet layout	Section 5.5 – Wall Sheet Assembly (with AGI Stencil) on page 26

# **CONTENTS**

1. Introduction	4
2. Safety	5
2.1 Safety Alert Symbol and Signal Words	
2.2 General Safety Information	
2.3 Personal Protective Equipment	
2.4 Safety Equipment	
2.5 Auxiliary Equipment Safety	6
2.6 Working At Height Safety	7
2.7 Overhead Power Lines	8
2.8 Safety Decals	9
2.9 Decal Installation/Replacement	9
2.10 Safety Decal Locations and Details	10
3. Before You Begin	12
3.1 Bin Design and Capacity	
3.2 Foundation Design and Loads	
3.3 Site and Assembly	
3.4 Methods of Installation	
3.5 Cutting Openings in Wide-Corr® Grain Bins	
3.6 Critical Assembly Requirements	
3.7 Product Storage	
3.8 Grain Bin Use	
3.9 Important Notes	
4. Preparation	18
4.1 Check the Shipment	
4.2 List of Tools and Equipment	
4.3 Order Optional Equipment	
4.4 Pre-Plan Assembly	
4.4.1 Pre-Planning: Side Draw Discharge, Aeration, and Unload Equipment	
5. Assembly	21
5.1 Assembly Safety	
5.2 Roof Assembly	
5.3 Bin Roundness	
5.4 Wall Sheet Assembly (with Westeel Stencil)	
5.5 Wall Sheet Assembly (with AGI Stencil)	
5.6 Hopper Cone to Bin Installation	
6. Appendix	20
6.1 Hardware Usage	
6.2 Recommended Bolt Assembly	
5.2 Recommended bott Assembly	
7 Mossochi	21

# 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 12' Bin for Hopper.

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.

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 bin for hopper 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.

#### Steel-Toe Boots



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

#### Work Gloves



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

# 2.4. Safety 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 bin for hopper 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 bin for hopper as applicable.
- Store auxiliary operations/maintenance manuals in a safe place available for future use.

# 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.

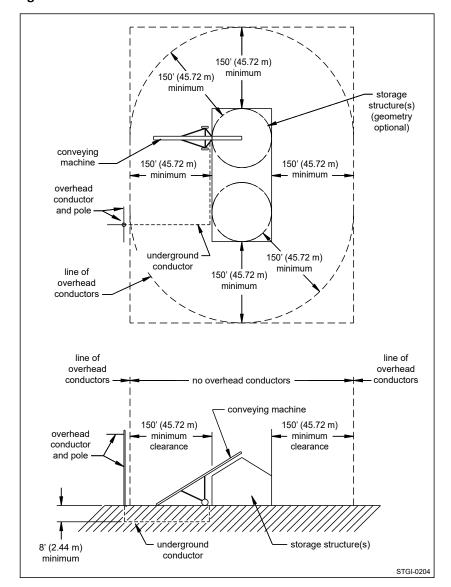
198938 R12

## 2.7. Overhead Power Lines

#### **⚠ WARNING**

- Keep bin for hoppers 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 bin for hopper if there is a chance of any loading or unloading equipment contacting power lines.
- Do not locate bin for hoppers 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

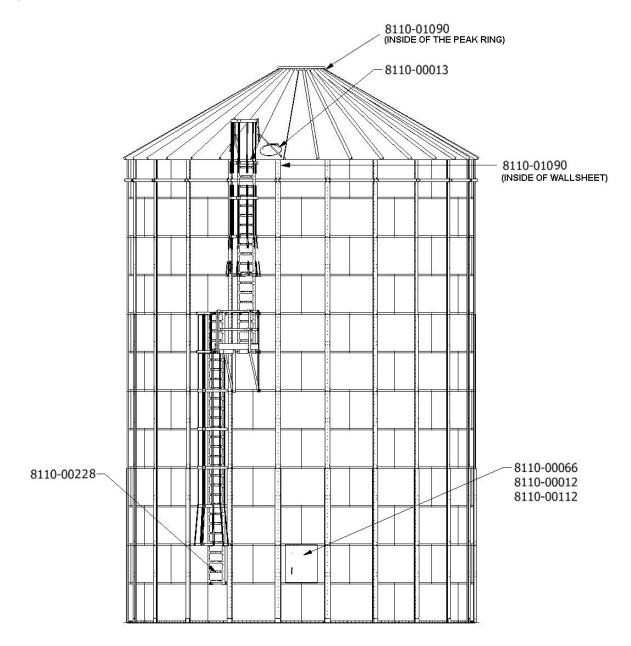
- 1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
- 2. Decide on the exact position before you remove the backing paper.
- 3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
- 4. Slowly peel back the remaining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

198938 R12

# 2.10. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the bin for hopper and their messages are shown in the figure(s) that follow. Safe operation and use of the bin for hopper requires that you familiarize yourself with the various safety decals and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.

**Safety Decal Locations** 



#### Safety Decals and Part Numbers

#### 8110-00013

# **♠ WARNING**

#### **ENTRAPMENT HAZARD**

Never enter the bin when loading or unloading grain.

- 1. Shut off and lock out all power
- 2. Use a lifeline, safety harness, and have an observer outside before entering the bin.
- 3. Wear proper breathing equipment or a respirator.
- 4. Avoid the center of the bin.

Failure to heed these warnings could result in serious injury or death.

#### 8110-00112

# WARNING

#### Keep clear of all augers, DO NOT ENTER this bin!

- If you must enter the bin

- 1. Shut off and lock out all power.
  2. Use a safety harness and safety line.
  3. Station another person outside the bin.
  4. Avoid the center of the bin.
  5. Wear proper breathing equipment or respirator.

Failure to heed these warnings could result in serious injury or death

#### 8110-00012



#### SAFETY INSTRUCTIONS

- Read operator's manual and all safety decals before assembling, using, or servicing bin.
- Close/latch all access doors when not in use.
- · Do not alter or modify bin structure
- Replace any damaged components only with factory made components.
- This bin should only be used to store free flowing, granular material, unless specifically designed and marked otherwise.
- · When filling, use top filler cap and direct material to center of bin.
- Do not over-fill bin. Material should not be in contact with or place pressure on roof sheets.
- · Unload grain only from the center of the bin. If equipped with an approved binsweep or sidedraw, refer to its instructions for proper use.

#### 8110-00228



#### **FALLING HAZARD**

To prevent serious injury or death:

- Do not climb ladder if damaged, wet, icy, greasy, or slippery.
- Maintain good balance by having at least three points of contact at all times. Face the ladder while climbing.
- Safe working load is 350 lb (160 kg). Do not overload.
- · Do not carry items while climbing.

#### 8110-00066

#### **NOTICE** When equipped with aeration system, to

prevent roof and/or bin damage:

- Use a minimum 1 square foot (0.1m²) opening for each 1000ft³/min (30m³/min) of air.
- Ensure all roof vents are open and unobstructed.
- · Discontinue use of aeration fan if roof vents become obstructed with ice.

#### 8110-01090



198938 R12 11

# 3. Before You Begin

## 3.1. Bin Design and Capacity

These AGI Grain Bins are designed for:

- 1. Non-corrosive free-flowing materials up to 52 lbs/ft<sup>3</sup> (833 kg/m<sup>3</sup>) 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.
- 4. Roof Snow Load of 24.0 lbs/ft<sup>2</sup> (1.15 kPa).

# 3.2. 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.

# 3.3. 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.

#### 3.4. 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.

# 3.5. 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.

198938 R12

#### 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".

# 3.6. 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 bin for hopper 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 bin for hopper 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.

## 3.7. 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.



Red rust causes permanent structural damage.

Do not assemble any part containing red rust.

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

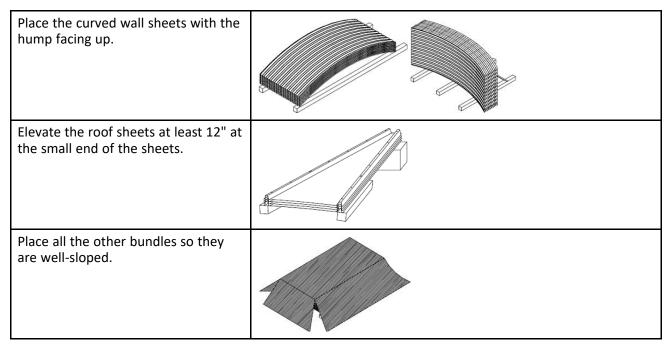
#### **Storing Bin Bundles and Boxes Outdoors**

**Required Materials:** 

- Wood blocks
- Waterproof tarp

Storage Procedure:

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



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

#### Note

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

#### If Parts Become Wet

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

# A WARNING Risk of injury or damage.

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

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

#### Note

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

# WARNING Risk of slipping.

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

## 3.8. 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

16 198938 R12 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.

## 3.9. 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 3.6 Critical Assembly Requirements on page 14 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 in Grand Island, NE (USA) before installation begins.

Do not install 12' Bin for Hopper 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.

Figure 2. Never Position a Side Draw Opening at a Sidewall Seam

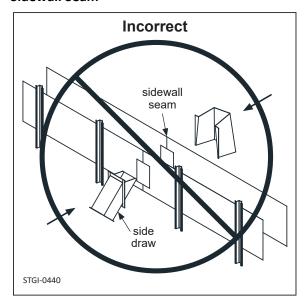
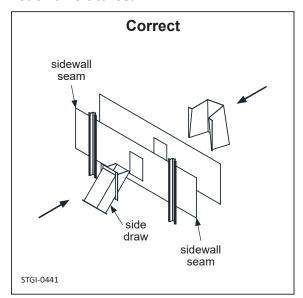
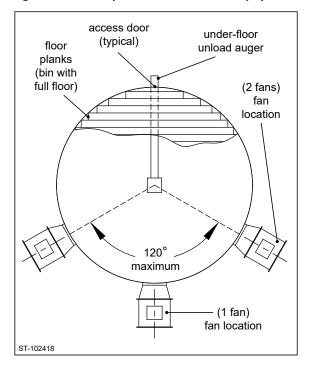


Figure 3. Position Midway Between Stiffeners and Not on a Vertical Seam



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

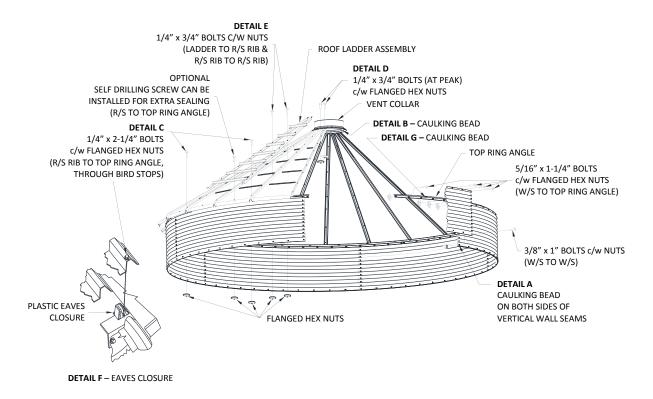
- Always use the proper tools, rated lifting equipment, and lifting points for the job.
  - Do not stand on, under, or near any component that is not secured.
  - Carry out assembly in a large open area with a level surface.
  - Always have two or more people assembling the bin for hopper.
  - Make sure 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
  - 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.

198938 R12 21

# 5.2. Roof Assembly

- 1. Assemble the top tier of wall sheets as per Section 5.4 Wall Sheet Assembly (with Westeel Stencil) on page 25 and Figure 5 on page 22.
  - a. Use 3/8" x 1" bolts and 3/8" nuts.

Figure 5. 12' Roof Assembly Detail



2. Caulk the vertical seams. (See Detail A in Figure 5 on page 22.)

#### Note

Careful use of drift pins will ease assembly.

#### Note

Do not tighten any nuts throughout the entire roof assembly until Step 14 on page 23 (unless otherwise specified).

- 3. Attach the top ring angles to the top corrugation of the top tier of wall sheets with the seams coinciding.
  - a. Apply caulking as shown in Details G and H in Figure 5 on page 22.
  - b. Make the bin as round as possible.
- 4. Caulk the underside of the vent collar. (See Detail B in Figure 5 on page 22.)
- 5. Place the roof sheets on the top ring angle and under the vent assembly, to shed water.
  - Roof sheets have a large rib and a small rib for nesting.
- 6. Place the large rib on top. (See Figure 6 on page 23.)

Figure 6. Roof Sheet Laps



Description	Roof Sheet	Top Ring Angle	Vent Assembly	Ladder	Eaves Closure
P/N for 12' Bin	235600	212243	236070	235615	235651

- 7. Position the vent assembly with the latch at ninety degrees to the roof sheet on which the roof ladder will be located.
- 8. Install a 1/4" x 2 1/4" bolt through the common hole of the roof sheets, the roof ladder and the top ring angle at the eaves. (See Detail C in Figure 5 on page 22.)
  - a. Use 1/4" x 2 1/4" bolts for all roof rib / top ring angle connections.
  - b. Use a 1/4" flange nut on the inside of the top ring angle
- 9. Install one 1/4" x 3/4" bolt at the vent cap using a 1/4" flanged hex nut. (See Detail D in Figure 5 on page 22.)
- 10. Install 1/4" x 3/4" bolts using regular 1/4" hex nuts along the roof ribs. (See Detail E in Figure 5 on page 22.)
- 11. Proceed with installing the remaining roof sheets in a similar fashion.

#### Note

It may be necessary to slide the ring of wall sheets in or out, or to raise or lower the vent assembly to get the vent to sit horizontally and in the best location for the erection of the remainder of the roof sheets. If the weight of the roof tips the vent assembly too much, a sheet or two on the opposite side can be installed to balance the load.

12. After all roof sheets are in place, tighten the nuts around the vent collar.

If ventilation is not required at the eaves, they may be sealed off by inserting eaves closures from the inside of the bin between the top ring angle and the roof rib. (See Detail F - Eaves Closure in Figure 5 on page 22.)

- 13. Tighten the nuts at the eaves after inserting closures.
- 14. Tighten the remaining nuts along roof ribs and in wall sheets.

#### 5.3. Bin Roundness

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

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

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

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

#### Note

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

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

Table 1. Scribe Radius – 12' Bins

Nominal Bin Dia. in feet	Scribe Radius	
12	5'10-7/8"	

# 5.4. Wall Sheet Assembly (with Westeel Stencil)

- 1. Assemble wall sheets as shown in Figure 7 on page 25.
- 2. To shed water on the outside of the bin, overlap the sheets to the outside, so that the bottom edge of the upper wall sheet is always on the outside of the wall sheet immediately below it.
- 3. Caulk all vertical seams.
- 4. Do not tighten bolts on the wall sheet vertical seams of the last tier (ring).

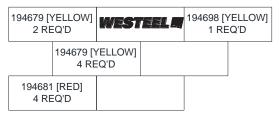
This will ease the installation on the hopper.

The following diagram shows the sheet numbers as required for each progressive tier.

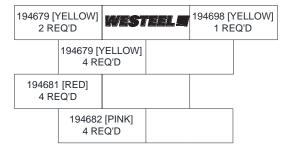
5. Attach bin to hopper using 3/8" x 1 1/4" bolts.

Figure 7. Wall Sheet Layout

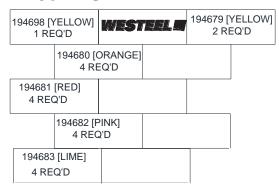
#### 1203 EFS



#### 1204 EFS



#### 1205 EFS



#### Note

- · Colors match part number label and indicate wall sheet thickness
- Stencil sheet is 194651 [yellow]

# 5.5. Wall Sheet Assembly (with AGI Stencil)

- 1. Assemble wall sheets as shown in Figure 8 on page 26.
- 2. To shed water on the outside of the bin, overlap the sheets to the outside, so that the bottom edge of the upper wall sheet is always on the outside of the wall sheet immediately below it.
- 3. Caulk all vertical seams.
- 4. Do not tighten bolts on the wall sheet vertical seams of the last tier (ring).

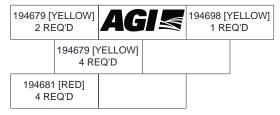
This will ease the installation on the hopper.

The following diagram shows the sheet numbers as required for each progressive tier.

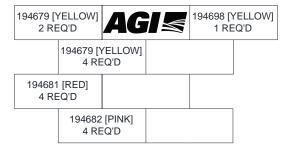
5. Attach bin to hopper using 3/8" x 1 1/4" bolts.

Figure 8. Wall Sheet Layout

#### 1203 EFS



#### 1204 EFS



#### 1205 EFS



#### Note

- · Colors match part number label and indicate wall sheet thickness
- · Stencil sheet is 194894 [yellow]

# 5.6. Hopper Cone to Bin Installation

#### **New Bin Application**

Use only AGI Hopper Cones which are specifically designed to suit AGI Wide-Corr® Bins. When installing a hopper cone to a new bin installation refer to the following instructions:

- 1. Pour the foundation as per instructions provided with your hopper.
  - Ensure the foundation has fully cured before continuing the assembly of your bin.
  - If a AGI skid base is used, a compacted gravel base can be used instead of a concrete foundation.
- 2. Assemble the bin as per the instructions in Section 5. Assembly on page 21.
- 3. Position hopper cone on foundation and align hopper with bin as shown in Figure 9 on page 28.
  - Ensure all bottom holes on the bottom wall sheets are clear of bolts.
- 4. Use of a bin crane to lift your bin is recommended.
  - Ensure the crane and all other lifting devices have adequate capacity to handle the maximum bin weight safely.
  - Lift the bin by placing a round support or 'tripod' inside the bin, directly under the vent collar.
- 5. Leave the vertical seam bolts loose on the bottom tier only for easy assembly.
- 6. Align the bin with the cone as shown in Figure 9 on page 28.
- 7. Fasten the bin to hopper cone with  $3/8" \times 1\%"$  bolts, nuts and washers.
- 8. Insert one bolt on one side, the next bolt on the opposite side of bin, then the next two bolts at right angles to the first two.

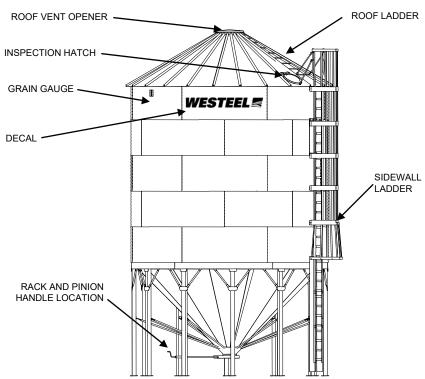
This will position the bin on the hopper properly.

9. Once the bin is in place, insert all other bolts and tighten the loose bolts.

#### **Important**

- Use only lifting devices of adequate rated capacity.
- Make sure the hopper cone is level and all load points contact the foundation.
- Make sure all fasteners are tightened as per torque instructions in Section 6.2 Recommended Bolt Assembly on page 30.

Figure 9. Hopper Cone to Bin Installation



# 6. Appendix

# 6.1. Hardware Usage

Table 2. Roof Hardware

BOLT	1/4" x 3/4" Flanged Hex Bolt (Washer)	1/4" x 2-1/4" Flanged Hex Bolt (Washer)	1/4" Flanged Lock Nut	1/4" Hex Nut	5/16" x 1-1/4" Flanged Hex Bolt (Washer)	5/16" Flanged Lock Nut
	235900 (150)	235903 (25)	235907 (50)	235905 (125)	235917 (50)	235925 (50)
TOP RING ANGLE to WALL					•	
SHEET					•	•
VENT COLLAR to ROOF SHEET	•		•			
ROOF SHEET RIB to ROOF	•			•		
SHEET RIB				•		
ROOF SHEET RIB to BIRD STOP			•			
to TOP RING ANGLE		•				
ROOF LADDER ASSEMBLY to	•					
ROOF SHEET RIB						

Table 3. Bin Hardware

BOLT	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1-1/4" Flanged Hex Bolt (Washer)	3/8" Hex Nut	3/8" Flat Washer
	235941 (325) 235943 (50)	235944 (100)	235950 (300)	235957 (75)
WALL SHEET to WALL SHEET	•		•	
BIN WALL to HOPPER ASSEMBLY		•	•	•

## 6.2. Recommended Bolt Assembly

When tightening bolts, tighten the nut on the bolt until a "snug-tightened condition" has been achieved. A "snug-tightened condition" is defined in *Specification for Structural Joints Using ASTM A325 or A490 Bolts* (Research Council on Structural Connections: June 2004), which states:

"The snug-tightened condition is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench to bring the connected plies into firm contact."

A properly tightened bolt will compress the sealing washer noticeably. All assembly crew members must be made aware of this requirement, and must know how to achieve a snug-tightened condition using common bin-building tools.

It is important that the bolts in the vertical wall sheet seams are tightened enough to squeeze the caulking and bring the wall sheet surfaces into firm contact with each other. This is especially important to monitor when installing bolts in temperatures approaching -10°C (14°F).

The following table shows the minimum impact gun torque capacity necessary to achieve a snug-tightened condition for bolts used in the assembly process.

Table 4. Recommended Impact Gun Torque Values Capacity to Achieve Snug-Tightened Bolts

Bolt Diameter Bolt Grade		Grade Mark	Recommended Torque Capacity		
Boit Diameter	Boil Grade	Grade Mark	in-lb	ft-lb	N-m
1/4"	Grade 8.2		75	6	8
5/16"	Grade 8.2		215	18	24
3/8"	Grade 8.2		370	31	42
7/16"	Grade 8.2		600	50	68
1/2"	Grade 8.2	<b>P</b>	960	80	108
5/8"	Grade 8.2	~	1800	150	203
3/4"	Grade 5	€\$	3230	269	365

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

# 7. 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 Smoo	thwall Bins			
Paint	1 Year			
Structural	10 Year			
Commercial Sn	noothwall 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 A	ccessories			
Plenum	5 Year			
Controls	1 Year			
Blower Heater	1 Year			
1				

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

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

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