

24' –108' Grain Bin

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



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

Part Number: 198894 R17

Revised: August 2021

Original Instructions

New in this Manual

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

Description	Section
Added Boxed Upright Cap Plate	Boxed Upright Cap Plate on page 44
Updated Wall Sheet and Bottom Angle Assembly	Section 5.4 – Wall Sheet and Bottom Angle Assembly on page 25
Updated Bin Hardware	Table 11 on page 58

CONTENTS

- 1. Introduction 5**
- 2. Safety..... 6**
 - 2.1 Safety Alert Symbol and Signal Words..... 6
 - 2.2 General Safety 6
 - 2.3 Personal Protective Equipment..... 7
 - 2.4 Safety Decals 7
 - 2.5 Decal Installation/Replacement 7
 - 2.6 Safety Decal Locations and Details 8
- 3. Before You Begin 11**
 - 3.1 Bin Design and Capacity 11
 - 3.1.1 Roof Design Capacities for Non-Structural Roofs 12
 - 3.1.2 Roof Design Capacities for Structural Roofs 13
 - 3.1.3 Roof Snow Load vs. Ground Snow Load 13
 - 3.2 Guidelines for Supporting Catwalks and other External Loads on Westeel..... 14
 - 3.3 Foundation Design and Loads 15
 - 3.4 Site and Assembly 15
 - 3.5 Methods of Installation 15
 - 3.6 Cutting Openings in Wide-Corr® Grain Bins 16
 - 3.7 Critical Assembly Requirements 17
 - 3.8 Product Storage..... 18
 - 3.9 Grain Bin Use 19
 - 3.10 Important Notes 19
- 4. Preparation 20**
 - 4.1 Check Shipment..... 20
 - 4.2 List of Tools and Equipment..... 20
 - 4.3 Order Optional Equipment..... 20
- 5. Assembly 21**
 - 5.1 Assembly Safety 21
 - 5.2 Anchor Bolt Radius 22
 - 5.3 Bin Roundness 24
 - 5.4 Wall Sheet and Bottom Angle Assembly 25
 - 5.5 Centurion Wall Sheet Part Number Matrix 26
 - 5.6 Light Gauge Wall Sheet Caulking Detail (Imperial) 27
 - 5.7 Light Gauge Wall Sheet Caulking Detail (Metric)..... 28
 - 5.8 Heavy Gauge Wall Sheet Seam Caulking Details (Imperial) 29
 - 5.9 Heavy Gauge Wall Sheet Seam Caulking Details (Metric) 30
 - 5.10 Laminated Wall Sheet Assembly (Imperial) 31
 - 5.11 Laminated Wall Sheet Assembly (Metric)..... 32
 - 5.12 One-Tier Light Duty Door (15' – 27') Installation..... 33
 - 5.13 One-Tier Light Duty Door Installation 34
 - 5.14 One-Tier Medium Duty Door Installation 35
 - 5.15 One Tier Heavy Duty Door Installation 36
 - 5.16 One Tier Super Heavy Duty Door Installation..... 37
 - 5.17 Commercial Bin Upright Assembly..... 38
 - 5.17.1 Connection of the Upright Connectors to the Grain Bin for the Goal Posts 44

5.17.2 Base Assembly 233013 (Laminate Sections).....	46
5.17.3 Base Assembly 233012 (Laminate Sections).....	47
5.17.4 Base Assembly 233012 (Boxed Uprights)	48
5.17.5 J, K, L and 24” Make-Up Section	49
5.18 Wind Ring Assembly.....	50
6. Specifications	52
6.1 Centurion Commercial Grain Bin Specifications	52
7. Appendix	58
7.1 Hardware Usage	58
7.2 Recommended Bolt Assembly	60
8. Limited Warranty: Westeel Grain Bin Products	61

1. Introduction

Before assembling, please read this manual. Familiarize yourself with the process and the necessary precautions for efficient and safe assembly of this Westeel 24' –108' Grain Bin.

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.



Indicates a hazardous situation that, if not avoided, could result in serious injury or death.



Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.



Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

2.2. General Safety

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 Westeel if you need assistance or additional information.
- Always follow applicable local codes and regulations.

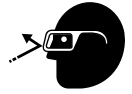


2.3. Personal Protective Equipment

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 Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory as applicable.

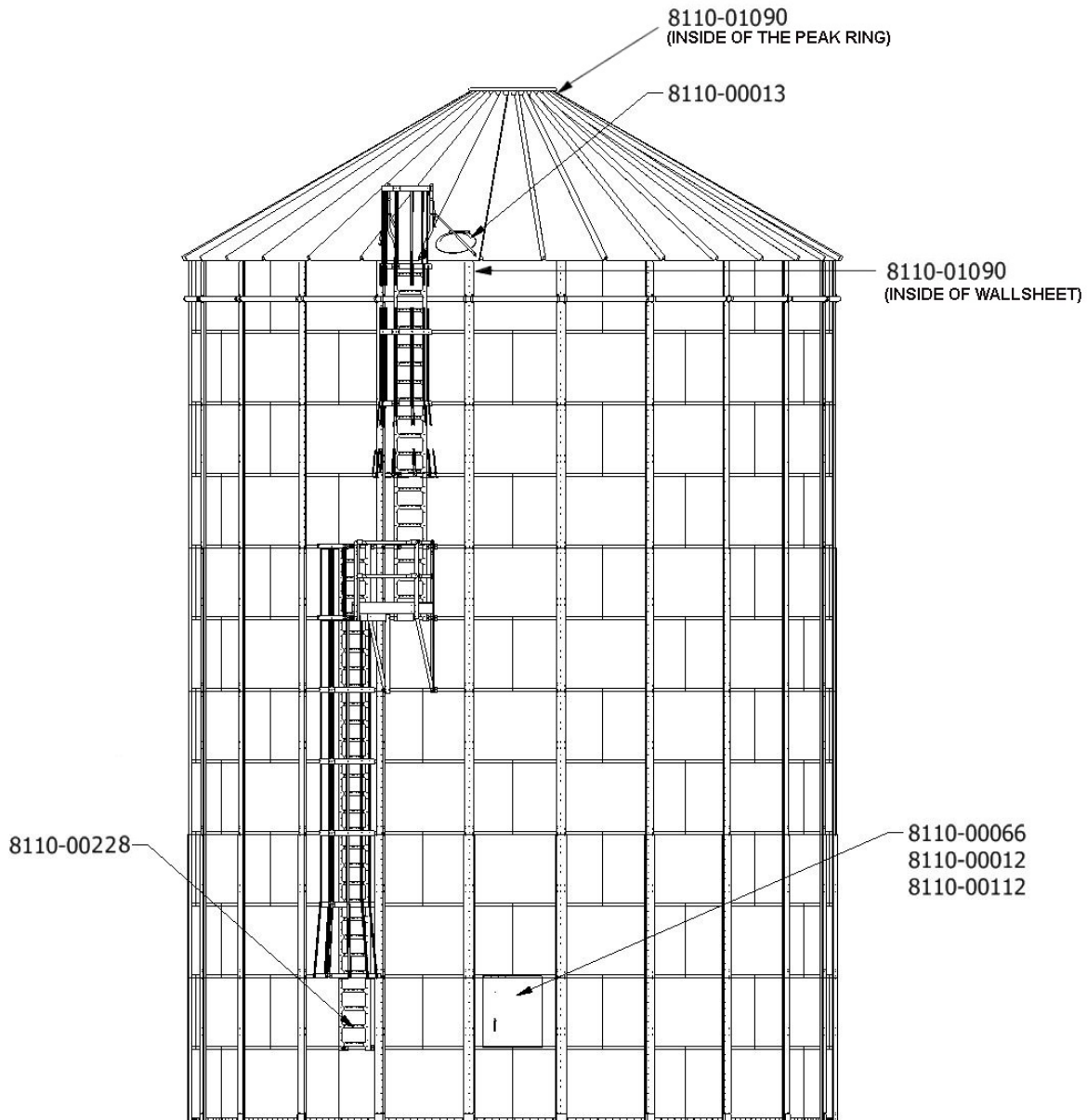
2.5. Decal Installation/Replacement




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

2.6. 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.

Figure 1. Safety Decals







 WARNING	
	
SAFETY INSTRUCTIONS	
<ul style="list-style-type: none"> • 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. 	

Part Number: 8110-00012


 WARNING	
	
ENTRAPMENT HAZARD	
<p>Never enter the bin when loading or unloading grain.</p> <p>If you must enter the bin:</p> <ol style="list-style-type: none"> 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. <p>Failure to heed these warnings could result in serious injury or death.</p>	

Part Number: 8110-00013

 WARNING		
		
Rotating flighting could kill or dismember.	Flowing material could trap and suffocate.	Crusted material could collapse and suffocate.
Keep clear of all augers. DO NOT ENTER this bin!		
<p>If you must enter the bin:</p> <ol style="list-style-type: none"> 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. <p>Failure to heed these warnings could result in serious injury or death.</p>		

Part Number: 8110-00112

WARNING



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.

Part Number: 8110-00228

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.

Part Number: 8110-00066



**FALL RESTRAINT
ANCHOR POINT
MAX WORKING LOAD:
1,000 lb [453 kg]**

SEE MANUFACTURER ROOF MANUAL FOR
DETAILED INSTRUCTIONS REGARDING
ANCHOR POINT LOCATIONS

Part Number: 8110-01090

3. Before You Begin

3.1. Bin Design and Capacity

Standard Westeel Grain Bins are designed for:

1. Non-corrosive free-flowing materials up to 55 lbs/ft³ (880 kg/m³) average compacted bulk density.
2. Maximum horizontal wind pressure based on 94 mph (151 km/h) as per NBCC 2015 and 105 mph (169 km/h) as per ASCE 7-16.
3. Zero seismic activity.

Note

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

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

Table 1. Peak Loads for Various Roofs

Size	Type of Roof	Load (lbs)	Load (kg)
15' to 24'	non-structural	4000 lbs	1814 kg
27' to 48'	non-structural	5000 lbs	2268 kg
51' & 54'	non-structural	8000 lbs	3629 kg
48' to 108'	structural	20,000 lbs	9072 kg

- 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.

3.1.1 Roof Design Capacities for Non-Structural Roofs

Table 2. Maximum Roof Snow Load at STANDARD Peak Load

Bin Series	Std Peak Load	Standard Roof		Plus Upgrade 1		Plus Upgrade 2	
	lbs (kN)	psf	kPa	psf	kPa	psf	kPa
15	4000 (17.8)	45	2.15	n/a		n/a	
16		45	2.15				
18		45	2.15				
21		30	1.44	49	2.35		
24		21	1.01	40	1.92		
27		24	1.15	39	1.87		
30	5000 (22.2)	20	0.96	32	1.53	40	1.92
33		23	1.10	33	1.58	44	2.11
36		24	1.15	30	1.44	38	1.82
39		22	1.05	27	1.29	36	1.72
42		19	0.91	24	1.15	34	1.63
45		16	0.77	23	1.10	32	1.53
48		21	1.01	26	1.24	33	1.58
51		8000 (35.6)	20	0.96	28	1.34	n/a
54	17		0.81	27	1.29		

Table 3. Maximum Roof Snow Load at UPGRADED Peak Load

Bin Series	Upgraded Peak Load	Standard Roof		Plus Upgrade 1		Plus Upgrade 2			
	lbs (kN)	psf	kPa	psf	kPa	psf	kPa		
15	8000 (35.6)	29	1.39	n/a		n/a			
16		29	1.39						
18		29	1.39						
21		24	1.15	40	1.92				
24		17	0.81	27	1.29				
27	10000 (44.5)	19	0.91	28	1.34	n/a			
30		15	0.72	24	1.15			33	1.58
33		18	0.86	24	1.15			36	1.72
36		18	0.86	23	1.10			31	1.48
39		16	0.77	21	1.01			30	1.44
42		14	0.67	19	0.91			27	1.29
45		13	0.62	18	0.86			25	1.20
48*		16	0.77	21	1.01			26	1.24
51*	12000 (53.4)	14	0.67	21	1.01	n/a			
54*		13	0.62	20	0.96				

Note

1. Standard roofs are adequate for many applications but additional capacity is available when optional upgrade packages are used.
2. Upgrade packages include roof stiffening rings and/or rib supports.
3. For peak load between standard and upgrade limits, a straight line interpolation can be used to determine maximum roof snow load.
4. *Structural roofs for 48' – 54' with rafters are available to support peak ring loads greater than loads on [Table 3](#).
5. Higher level upgrade kits include all components from lower level kit; only one upgrade kit needs to be ordered for any given bin.

3.1.2 Roof Design Capacities for Structural Roofs

Table 4. Maximum Roof Snow Load at STANDARD Peak Loads

Bin Series	Std Peak Load	Standard Roof	
	lbs (kN)	psf	kPa
48	20000 (89.0)	39	1.87
51		39	1.87
54		39	1.87
60		39	1.87
66		38	1.82
72		38	1.82
75		37	1.77
78		37	1.77
84		37	1.77
90		37	1.77
96		37	1.77
102		32	1.53
105		32	1.53
108		32	1.53

Table 5. Maximum Roof Snow Load at UPGRADED Peak Loads

Bin Series	Upgraded Peak Load	Standard Roof	
	lbs (kN)	psf	kPa
48	60000 (266.9)	38	1.82
51		38	1.82
54		38	1.82
60		38	1.82
66		37	1.77
72		37	1.77
75		36	1.72
78		36	1.72
84		36	1.72
90		34	1.63
96		34	1.63
102		31	1.48
105		31	1.48
108		31	1.48

Note

Standard capacities are provided. Additional capacity is available with optional upgrades.

3.1.3 Roof Snow Load vs. Ground Snow Load

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

- In the United States, for grain bins, $GSL = RSL \times 2$
- In Europe, for grain bins, $GSL = RSL \times 1.25$

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

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

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

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. Westeel 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 Westeel 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.
2. Westeel 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 Westeel 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 Westeel Engineering.

Connection to Peak Rings

1. The allowable vertical peak load to any Westeel 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 Westeel 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-Westeel peak support structure is used. A non-Westeel 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 Westeel 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 Westeel.

3.3. Foundation Design and Loads

The foundations for the stiffened bin models are based on 4000 lbs. per sq. ft. (192 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. Westeel 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. Site and Assembly

Unless otherwise specifically provided in writing, Westeel 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 (Westeel recommends the use of qualified bin installers. Contact Westeel for information on installers in your area.)
- Field modifications or equipment additions that affect the bin structure
- Interconnections with neighboring structures
- Compliance with all applicable safety standards, including but not limited to fall restraint systems (ladders or other systems). Local safety authorities should be contacted as standards vary between jurisdictions.

3.5. Methods of Installation

The recommendations for assembling and installing Westeel 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 55 lbs/ft³ (880 kg/m³).

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

3.6. 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 Westeel 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".

3.7. 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. Westeel 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.

3.8. Product Storage

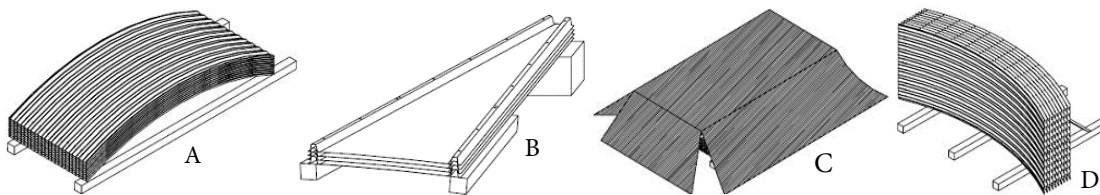
Rust on Galvanized Parts

1. White rust forms when moisture is allowed to collect on galvanized surfaces that have yet to develop the durable zinc oxide layer. This zinc oxide layer naturally occurs as the surface interacts with carbon dioxide, and is characterized over time by the dull grey appearance that weathered galvanized surfaces get.
2. Parts that are not well ventilated or well drained can collect water between surfaces and develop white rust.
3. White rust is not a structural concern if its development is stopped in the early stages. A light film or powdery residue can occur after a period of heavy rainfall or a short time of improper storage. If white rust has started to develop, separate parts and wipe off any moisture. Next, using a clean cloth, apply a thin layer of petroleum jelly or food-grade oil to the entire part.
4. If moisture is left on parts, this white rust can become more aggressive and turn into red rust. Red rust can cause degradation in the material and become a structural concern. Any parts that have red rust should be replaced immediately.

Storage Guidelines

- Keep all bundles dry before assembly of the bin.
- Start assembly as soon as possible.
- Do not lay bundles on the bare ground. Raise all bundles 6" to 8" off the ground on wood blocks or timbers. (See Detail A in [Figure 2 on page 18.](#))
- Store curved wall sheets 'hump-up'. (See Detail A in [Figure 2 on page 18.](#))
- All other bundles material should be placed so they are well sloped to promote good drainage. (See Detail B in [Figure 2 on page 18.](#))
- Roof sheets must be elevated at least 12" at the small end of the sheets. (See Detail B in [Figure 2 on page 18.](#))
- Temporary storage can be provided by erecting a simple framework supporting a waterproof tarp. (See Detail C in [Figure 2 on page 18.](#))
- All bin boxes, ladder boxes and hardware boxes should be stored inside. These are not waterproof, and will deteriorate in normal weather conditions, allowing moisture to contact the parts inside.

Figure 2. Product Storage



If Parts Become Wet

1. If parts become submerged or wet, the bundles should be opened as soon as possible, sheets or material separated and dried. Keep separated until assembly.

Brace parts properly so as to avoid damage or injury from material falling when in storage. (See Detail D in [Figure 2 on page 18.](#))

2. Any boxed parts that become wet should be dried and stored in a new box that is free of moisture.

3. In addition to wiping down wall sheets, a food-grade oil can also be applied with a clean, lint-free cloth. This will assist in preventing any further moisture from contacting the galvanizing on the steel. Due to safety concerns with installation and use, Westeel does not recommend the use of oil on other parts such as roof sheets and safety ladders.

3.9. Grain Bin Use

- 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.

3.10. Important Notes

- Westeel 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 3.7 – Critical Assembly Requirements on page 17](#) 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 Westeel .
- 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 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.

5. Assembly



Before continuing, ensure you have completely read and understood this manual's Safety section, in addition to the safety information in the section(s) below.

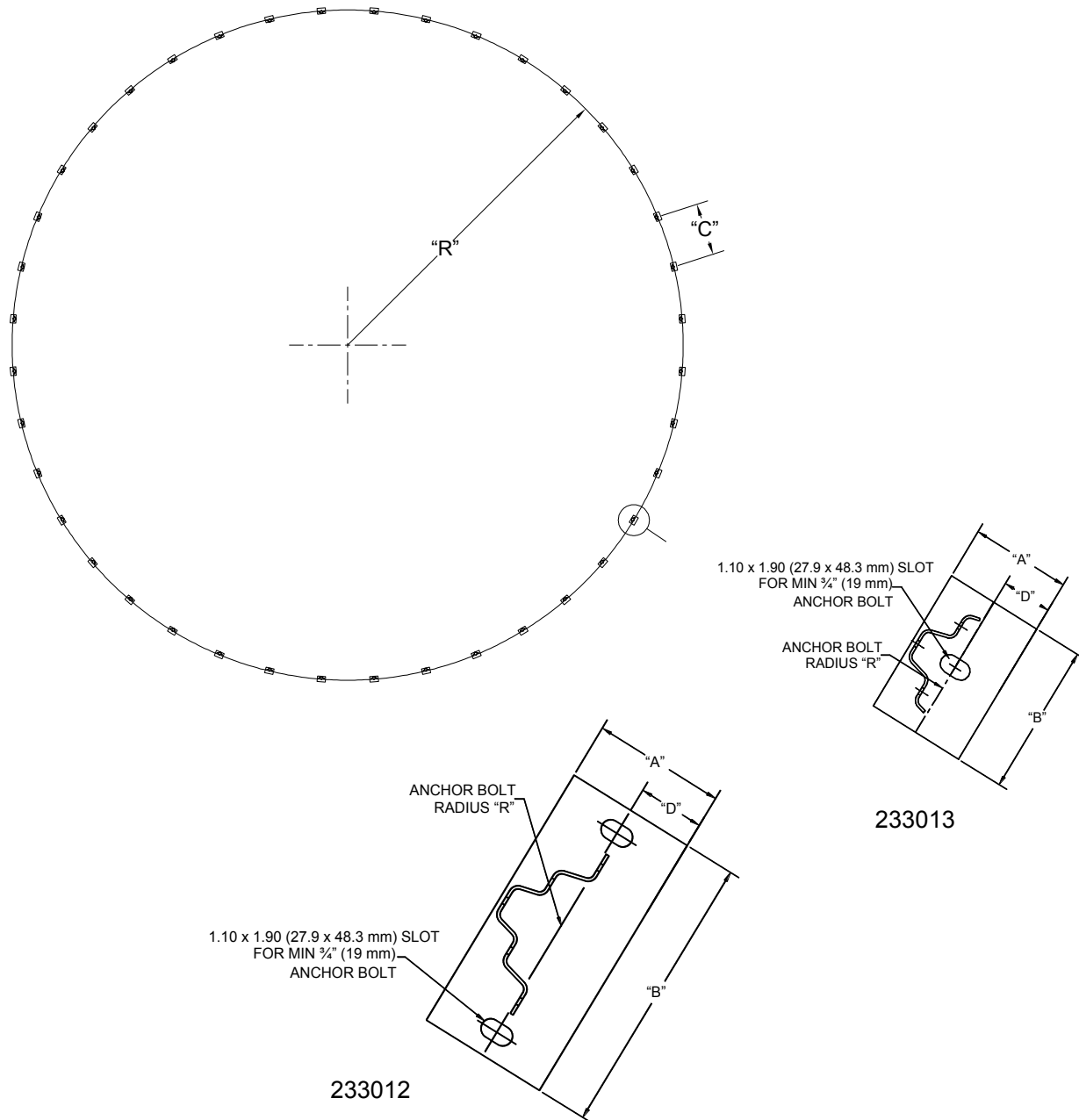
5.1. Assembly Safety

WARNING

- Do not take chances with safety. The components can be large, heavy, and hard to handle. Always use the proper tools, rated lifting equipment, and lifting points for the job.
- Carry out assembly in a large open area with a level surface.
- Always have two or more people assembling the 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 3. Anchor Bolt Radius



Base Plate			
Part Number	A	B	D
233013	6"	9"	3"
233012	7.5"	16"	3.75"

Table 6. Anchor Bolt Radius

Bin Model	BASE PLATE	Anchor Bolt Radius "R"		Anchor Bolt Cord "C"		No. of ANCHOR BOLTS
		Inch	mm	Inch	mm	
6 01	233013	39.0	991	55.15	1468	4
9 01	233013	56.9	1445	56.90	1445	6
12 01	233013	74.8	1900	57.25	1454	8
15 01	233013	92.7	2355	57.29	1455	10
15 18	233012	93.5	2375	57.79	1468	20
18 01	233013	110.6	2809	57.25	1454	12
18 18	233012	111.4	2830	57.66	1465	24
21 01	233013	128.6	3266	57.23	1454	14
21 18	233012	129.3	3284	57.54	1462	28
24 01	233013	146.5	3721	57.16	1452	16
24 18	233012	147.2	3739	57.43	1459	32
27 01	233013	164.4	4176	57.10	1450	18
27 17	233012	165.1	4194	57.34	1456	36
30 01	233013	182.3	4630	57.04	1449	20
30 16	233012	183.0	4648	57.26	1454	40
33 01	233013	200.2	5085	56.98	1447	22
33 17	233012	200.9	5103	57.18	1452	44
36 01	233013	218.1	5540	56.94	1446	24
36 17	233012	218.9	5560	57.14	1451	48
39 01	233013	236.0	5994	56.89	1445	26
39 18	233012	236.8	6015	57.09	1450	52
42 01	233013	253.9	6449	56.86	1444	28
42 18	233012	254.7	6469	57.03	1449	56
45 01	233013	271.8	6904	56.82	1443	30
45 18	233012	272.6	6924	56.99	1448	60
48 01	233013	289.7	7358	56.79	1442	32
48 18	233012	290.5	7379	56.95	1447	64
51 01	233013	307.6	7813	56.76	1442	34
51 17	233012	308.4	7833	56.91	1446	68
54 01	233013	325.5	8268	56.74	1441	36
54 17	233012	326.3	8288	56.88	1445	72
60 01	233013	361.4	9180	56.71	1440	40
60 16	233012	362.1	9197	56.82	1443	80
66 01	233013	397.2	10089	56.67	1439	44
66 16	233012	398.0	10107	56.77	1442	88
72 01	233013	433.0	10998	56.64	1439	48
72 16	233012	433.8	11019	56.74	1441	96
75 01	233013	450.9	11453	56.62	1438	50
75 16	233012	451.7	11473	56.72	1441	100
78 01	233013	468.8	11908	56.61	1438	52
78 15	233012	469.6	11928	56.71	1440	104
84 01	233013	504.6	12817	56.59	1437	56
84 15	233012	505.4	12837	56.68	1440	112
90 01	233013	540.5	13729	56.58	1437	60
90 15	233012	541.2	13746	56.65	1439	120
96 01	233013	576.3	14638	56.56	1437	64
96 14	233012	577.1	14658	56.63	1439	128

Table 6 Anchor Bolt Radius (continued)

Bin Model	BASE PLATE	Anchor Bolt Radius "R"		Anchor Bolt Cord "C"		No. of ANCHOR BOLTS
		Inch	mm	Inch	mm	
102 01	233013	612.1	15547	56.54	1436	68
102 14	233012	612.9	15568	56.61	1438	136
105 01	233013	630.0	16002	56.53	1436	70
105 14	233012	630.8	16022	56.60	1438	140
108 01	233013	647.9	16457	56.52	1436	72
108 14	233012	648.7	16477	56.59	1437	144

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.

Correcting for roundness becomes much more difficult the longer you wait.

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 7. Scribe Radius – 24' to 108' Bins

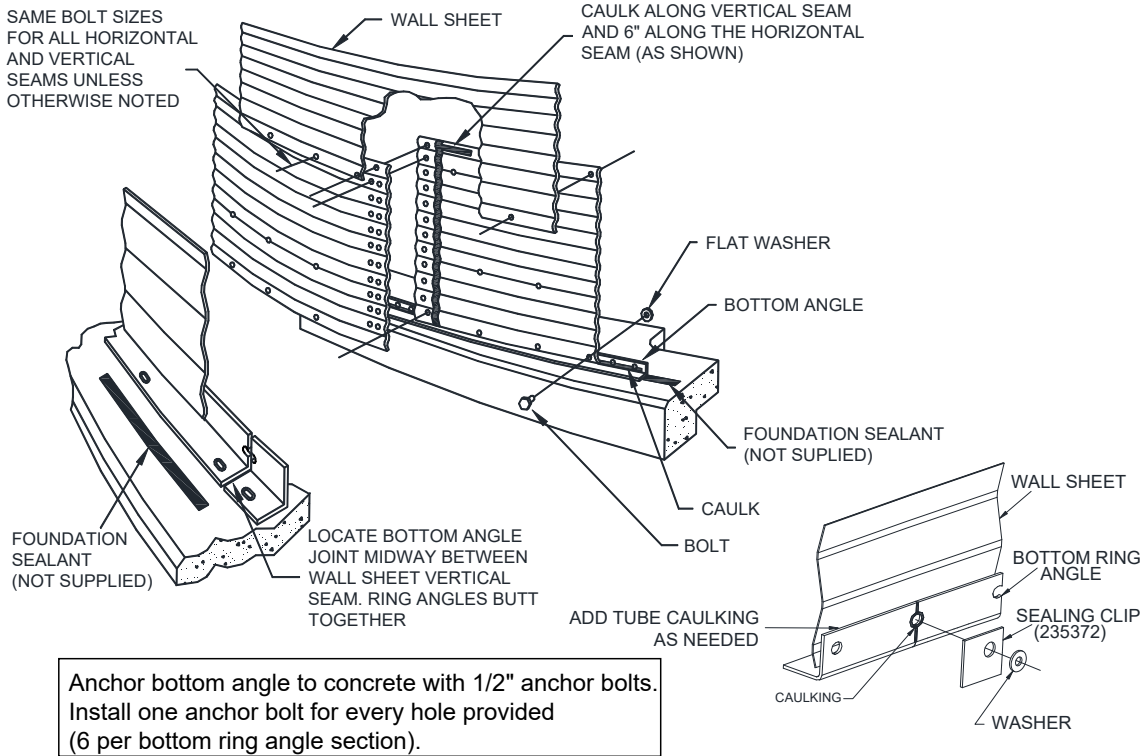
Nominal Bin Diameter (ft)	Scribe Radius (ft in)	Nominal Bin Diameter (ft)	Scribe Radius (ft in)	Nominal Bin Diameter (ft)	Scribe Radius (ft in)
24	11'10-1/2"	45	22'3-13/16"	78	38'8-3/4"
27	13'4-3/8"	48	23'9-3/4"	84	41'8-9/16"
30	14'10-5/16"	51	25'3-5/8"	90	44'8-3/8"
33	16'4-3/16"	54	26'9-9/16"	96	47'8-3/16"
36	17'10-1/8"	60	29'9-5/16"	105	52'1-7/8"
39	19'4"	66	32'9-1/8"	108	53'7-13/16"
42	20'9-15/16"	72	35'8-15/16"		

5.4. Wall Sheet and Bottom Angle Assembly

Note

For wall sheet hardware specification, refer to [Table 11 on page 58](#).

Figure 4. Wall Sheet and Bottom Angle Assembly Detail



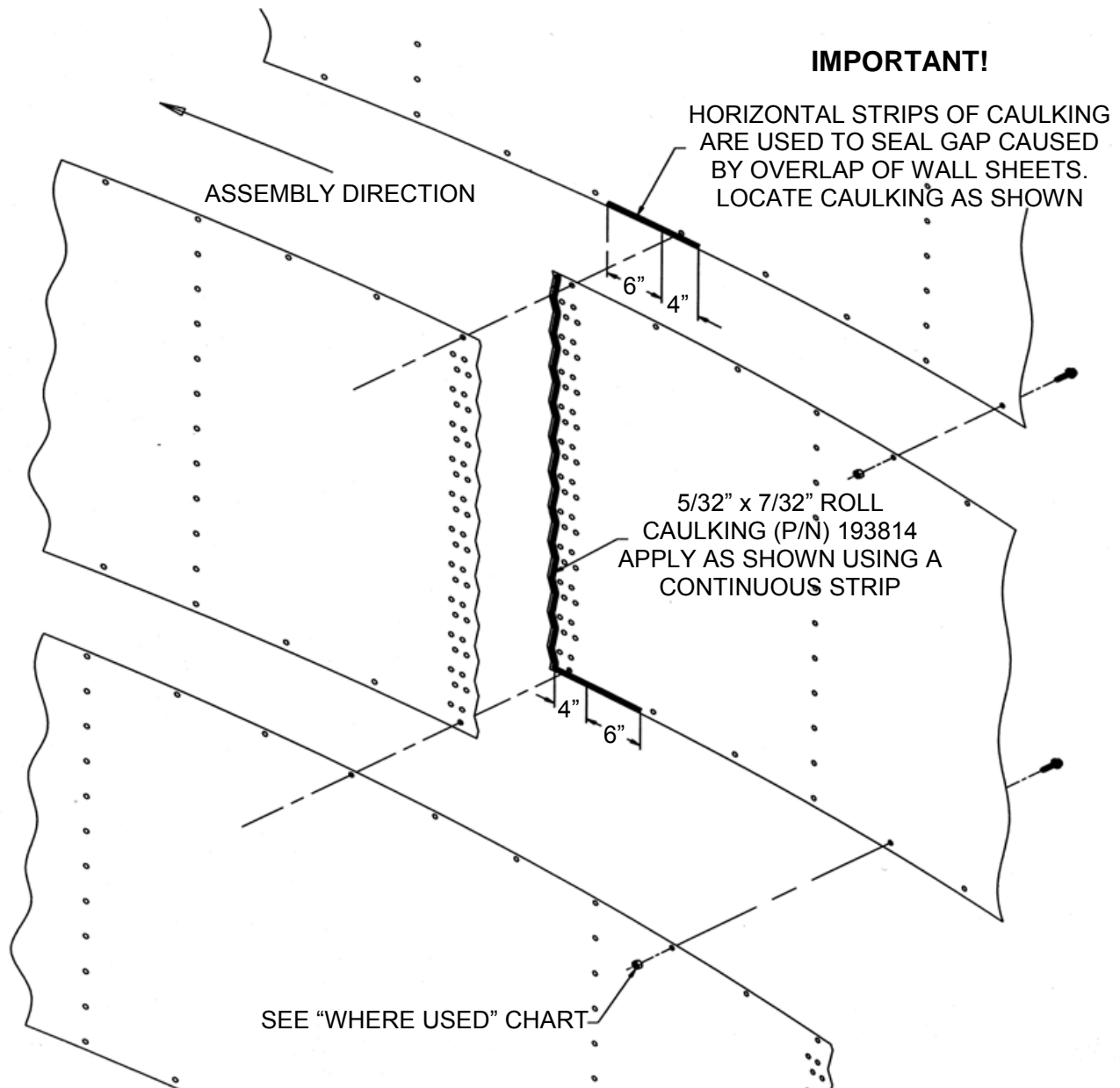
5.5. Centurion Wall Sheet Part Number Matrix

Table 8. Wall Sheet Part Number Table

Corrugated Wall Sheets					Punched Wall Sheets			
Thickness nom (min)	Gauge	Label Colour	Weight lbs	Length (overall)	Flat	Regular	Bottom	Top
.050 (.045)	18	Orange	72.8	117.0"	194655	194661 Stencil		
					194658	194664 Stencil		
					194680	194731	194771	194720
.057 (.052)	17	Red	83.0		194681	194732	194772	194721
.066 (.061)	15	Pink	97.7		194682	194733	194773	194722
.076 (.070)	14	Lime	112.2		194656	194662		
					194659	194665		
					194683	194734	194774	194723
.096 (.088)	13	Green	141.1		194684	194735	194774	194724
.116 (.107)	12	Blue	171.4		194685	194736	194776	
.126 (.117)	11	Purple	189.0	194606	194737	194777		
.139 (.130)	10	Black	209.4	194607	194738	194778		
.168 (.159)	8	Tan	252.1	194608	194739	194779		
Laminated Wall Sheets – 7/16" bolts								
.096 (.088)	13	Green	141.7	117.0	194604	194740	194745	
.116 (.107)	12	Blue	172.1		194605	194741	194746	
.126 (.117)	11	Purple	191.0	118.25"	194616	194742		
.139 (.130)	10	Black	211.6		194617	194743		
.168 (.159)	8	Tan	254.8		194618	194744		
Bottom wall sheets are punched for full floor aeration flashing. Use bin bolts provided to plug unused holes if a full floor aeration system is not being used.								

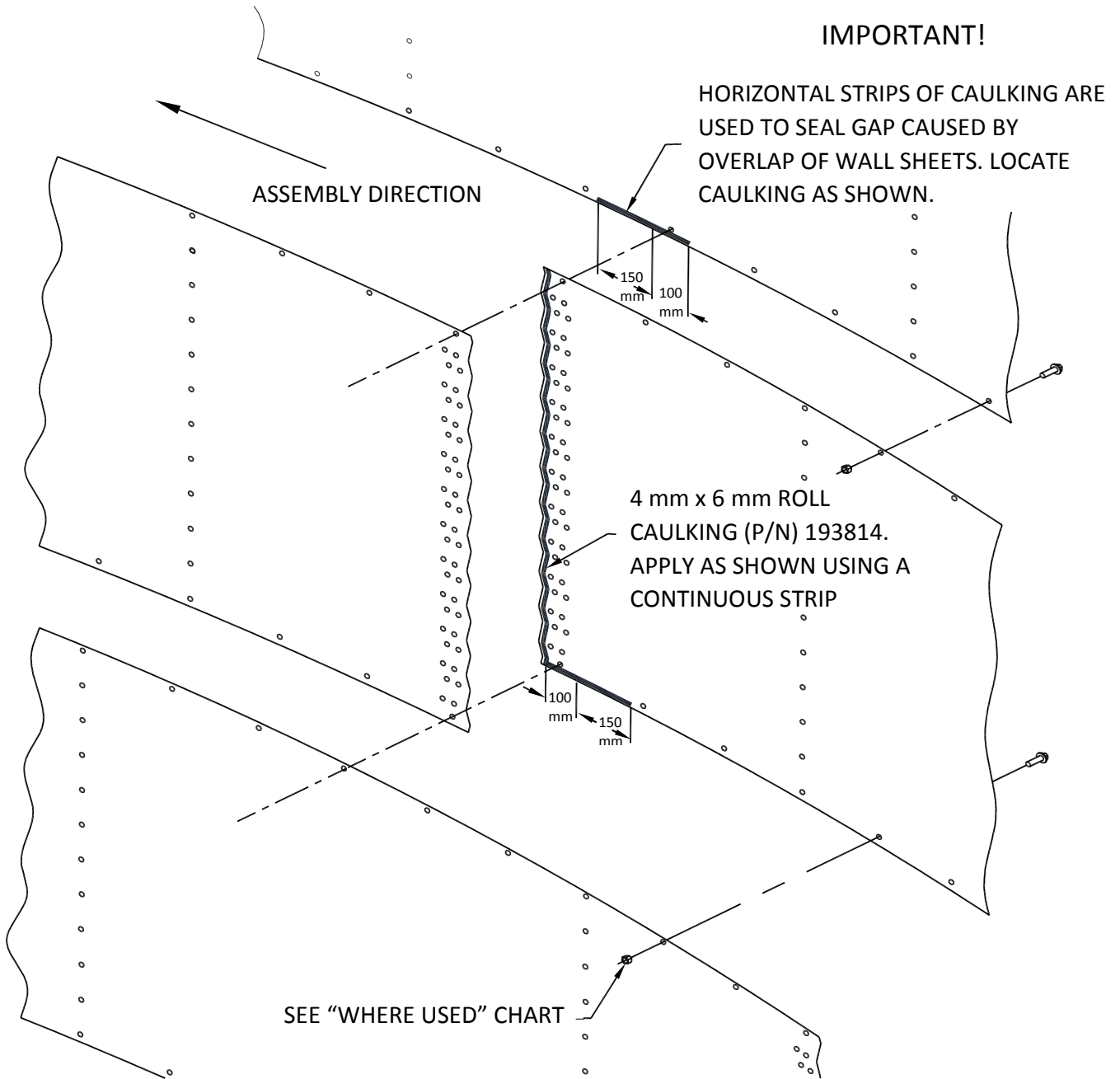
5.6. Light Gauge Wall Sheet Caulking Detail (Imperial)

Figure 5. Light Gauge Wall Sheet Caulking Detail (inside view) — Imperial



5.7. Light Gauge Wall Sheet Caulking Detail (Metric)

Figure 6. Light Gauge Wall Sheet Caulking Detail (inside view) — Metric



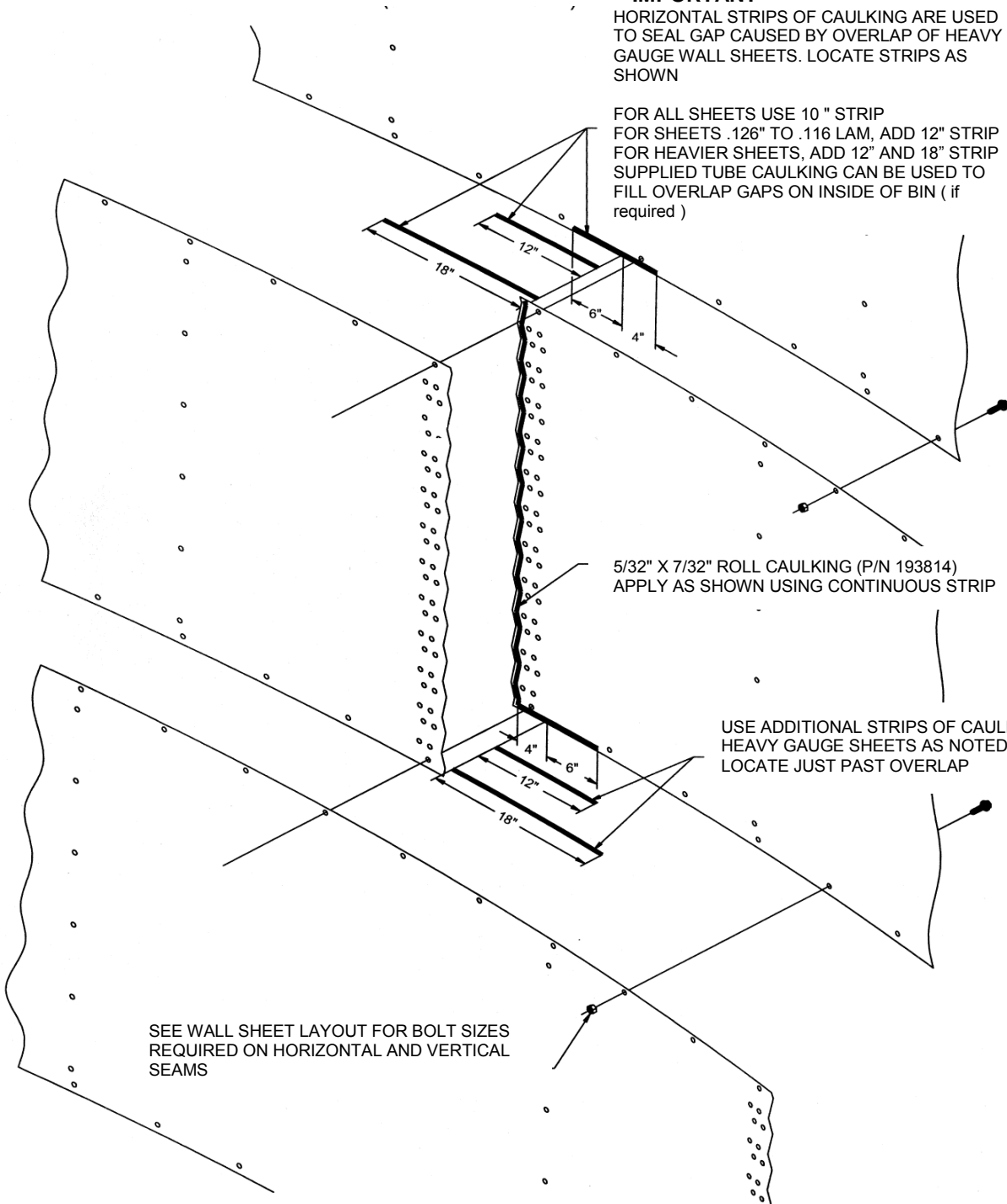
5.8. Heavy Gauge Wall Sheet Seam Caulking Details (Imperial)

Figure 7. Heavy Gauge Wall Sheet Seam Caulking Details (inside view) — Imperial

IMPORTANT

HORIZONTAL STRIPS OF CAULKING ARE USED TO SEAL GAP CAUSED BY OVERLAP OF HEAVY GAUGE WALL SHEETS. LOCATE STRIPS AS SHOWN

FOR ALL SHEETS USE 10 " STRIP
FOR SHEETS .126" TO .116 LAM, ADD 12" STRIP
FOR HEAVIER SHEETS, ADD 12" AND 18" STRIP
SUPPLIED TUBE CAULKING CAN BE USED TO FILL OVERLAP GAPS ON INSIDE OF BIN (if required)



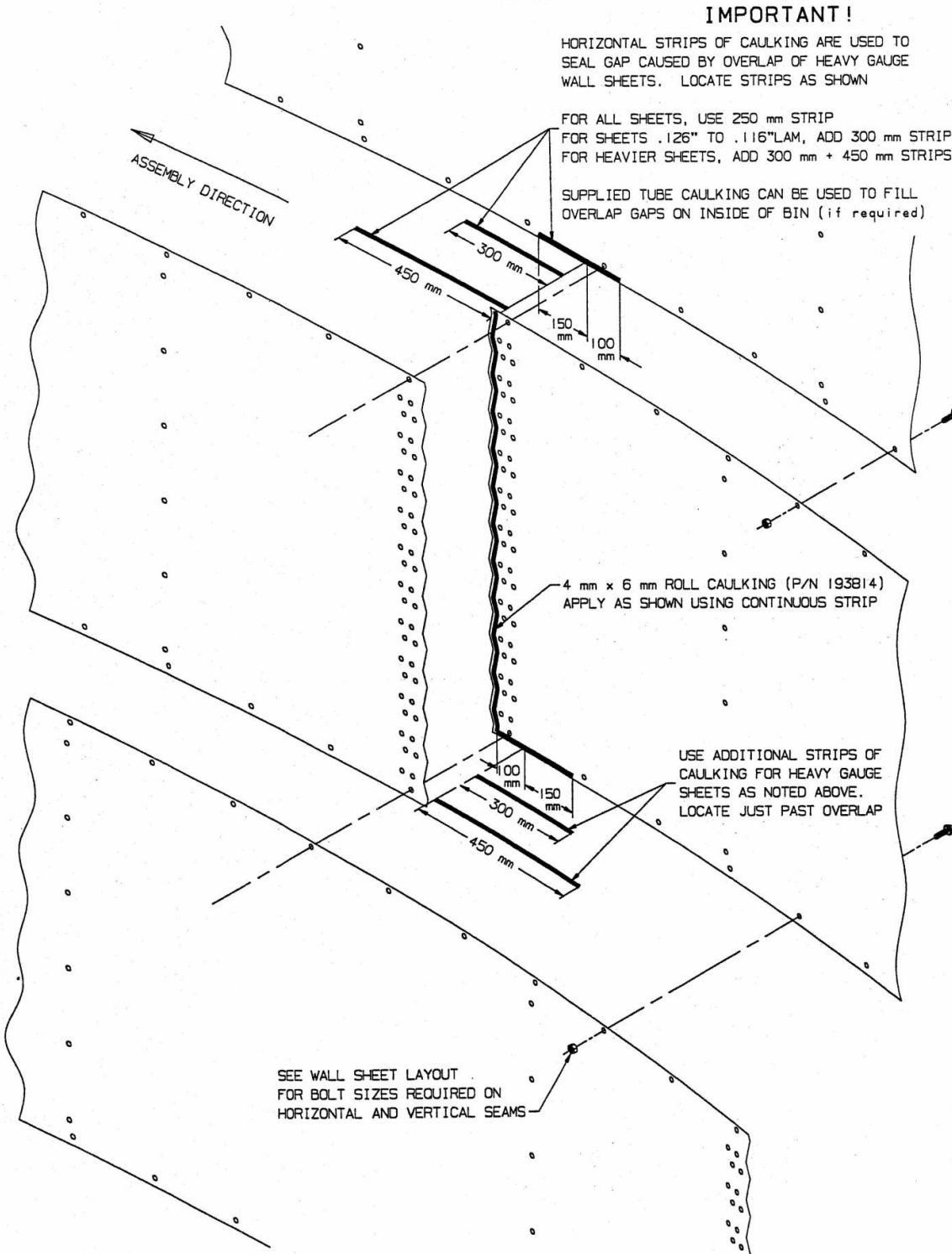
5/32" X 7/32" ROLL CAULKING (P/N 193814)
APPLY AS SHOWN USING CONTINUOUS STRIP

USE ADDITIONAL STRIPS OF CAULKING FOR HEAVY GAUGE SHEETS AS NOTED ABOVE. LOCATE JUST PAST OVERLAP

SEE WALL SHEET LAYOUT FOR BOLT SIZES REQUIRED ON HORIZONTAL AND VERTICAL SEAMS

5.9. Heavy Gauge Wall Sheet Seam Caulking Details (Metric)

Figure 8. Heavy Gauge Wall Sheet Seam Caulking Details (inside view) — Metric



5.10. Laminated Wall Sheet Assembly (Imperial)

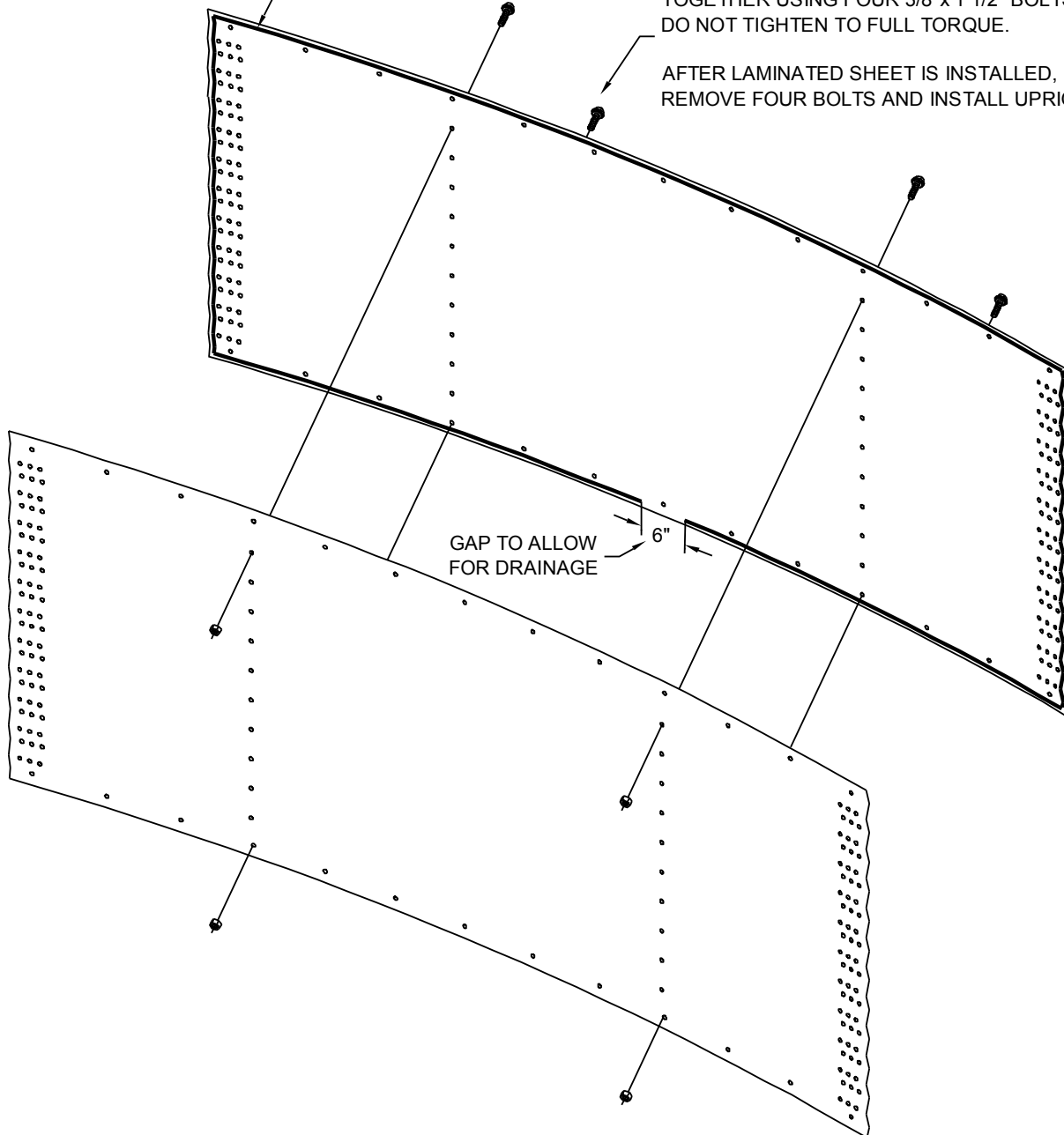
Figure 9. Laminated Wall Sheet Assembly (inside view) — Imperial

3/32" x 13/32" ROLL CAULKING (P/N 193812)

APPLY CONTINUOUSLY AROUND INSIDE EDGE OF OUTER SHEET BEFORE BOLTING SHEETS TOGETHER. STAY OUTSIDE OF ALL PERIMETER BOLT HOLES

AFTER CAULKING, LAMINATE WALL SHEETS TOGETHER USING FOUR 3/8"x 1 1/2" BOLTS. DO NOT TIGHTEN TO FULL TORQUE.

AFTER LAMINATED SHEET IS INSTALLED, REMOVE FOUR BOLTS AND INSTALL UPRIGHTS



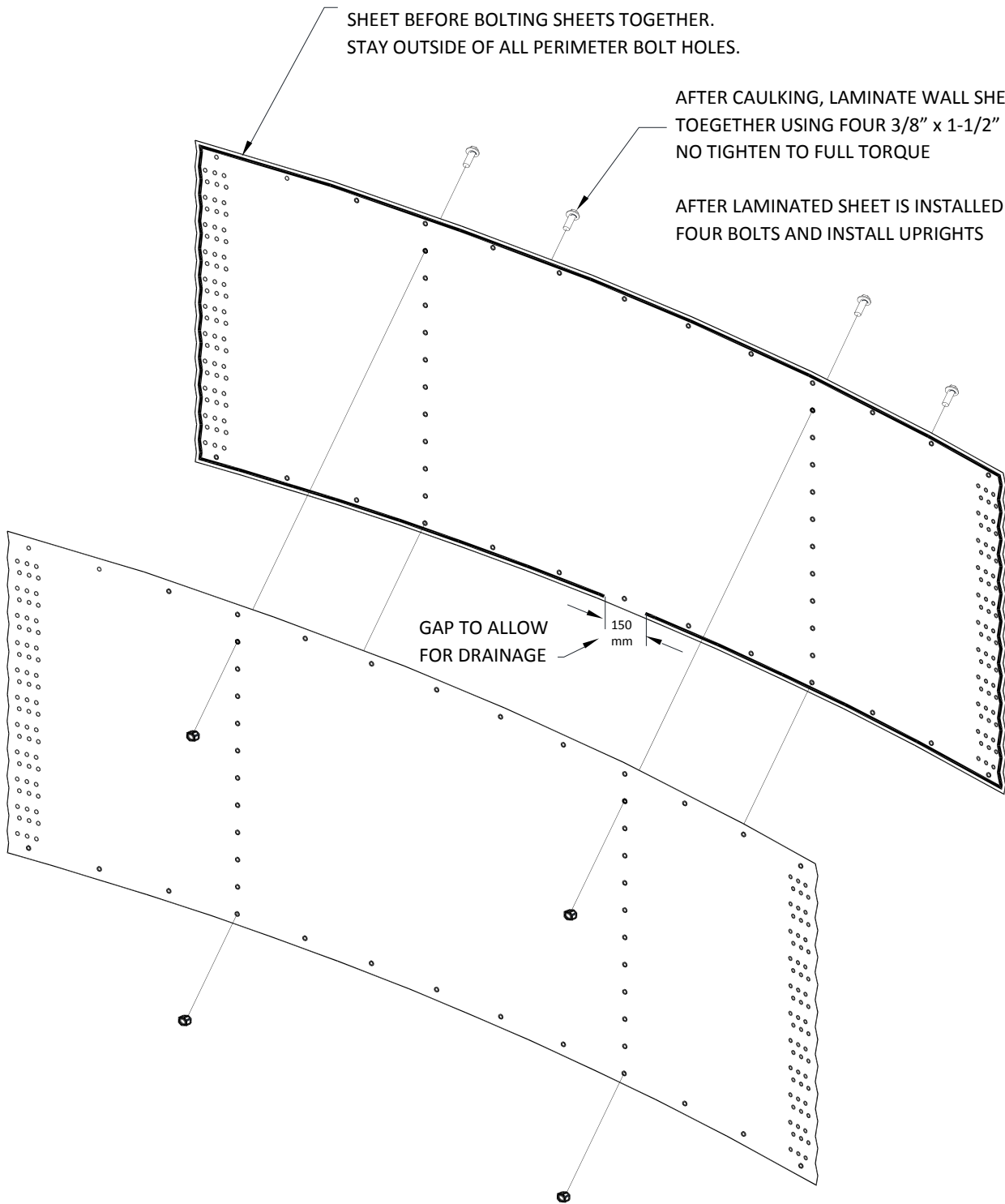
5.11. Laminated Wall Sheet Assembly (Metric)

Figure 10. Laminated Wall Sheet Assembly (inside view) — Metric

2 mm x 10 mm ROLL CAULKING (P/N 193812)
APPLY CONTINUOUSLY AROUND EDGE OF OUTER
SHEET BEFORE BOLTING SHEETS TOGETHER.
STAY OUTSIDE OF ALL PERIMETER BOLT HOLES.

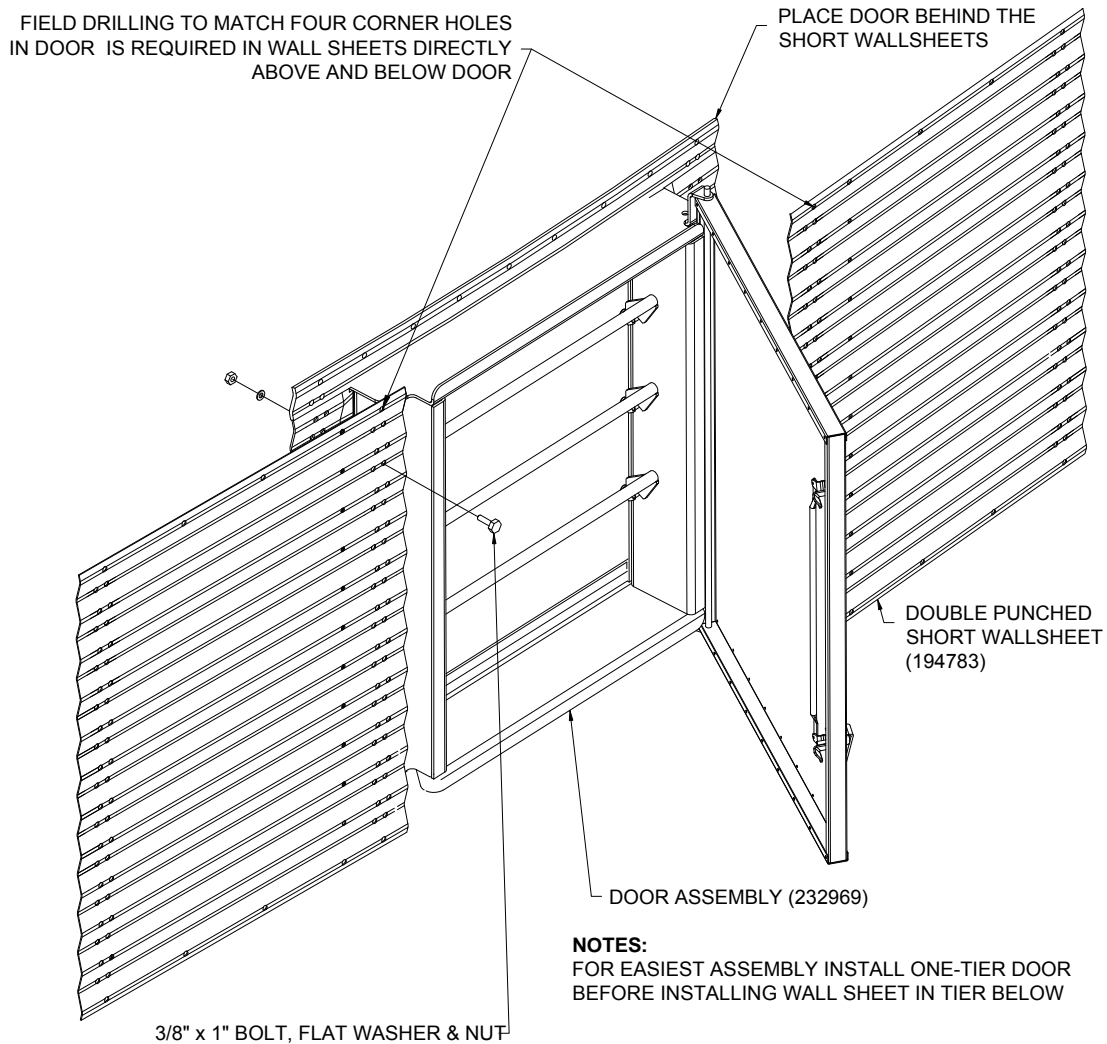
AFTER CAULKING, LAMINATE WALL SHEETS
TOGETHER USING FOUR 3/8" x 1-1/2" BOLTS. DO
NO TIGHTEN TO FULL TORQUE

AFTER LAMINATED SHEET IS INSTALLED REMOVE
FOUR BOLTS AND INSTALL UPRIGHTS



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

Figure 11. One-Tier Light Duty Door (15' – 27') Detail

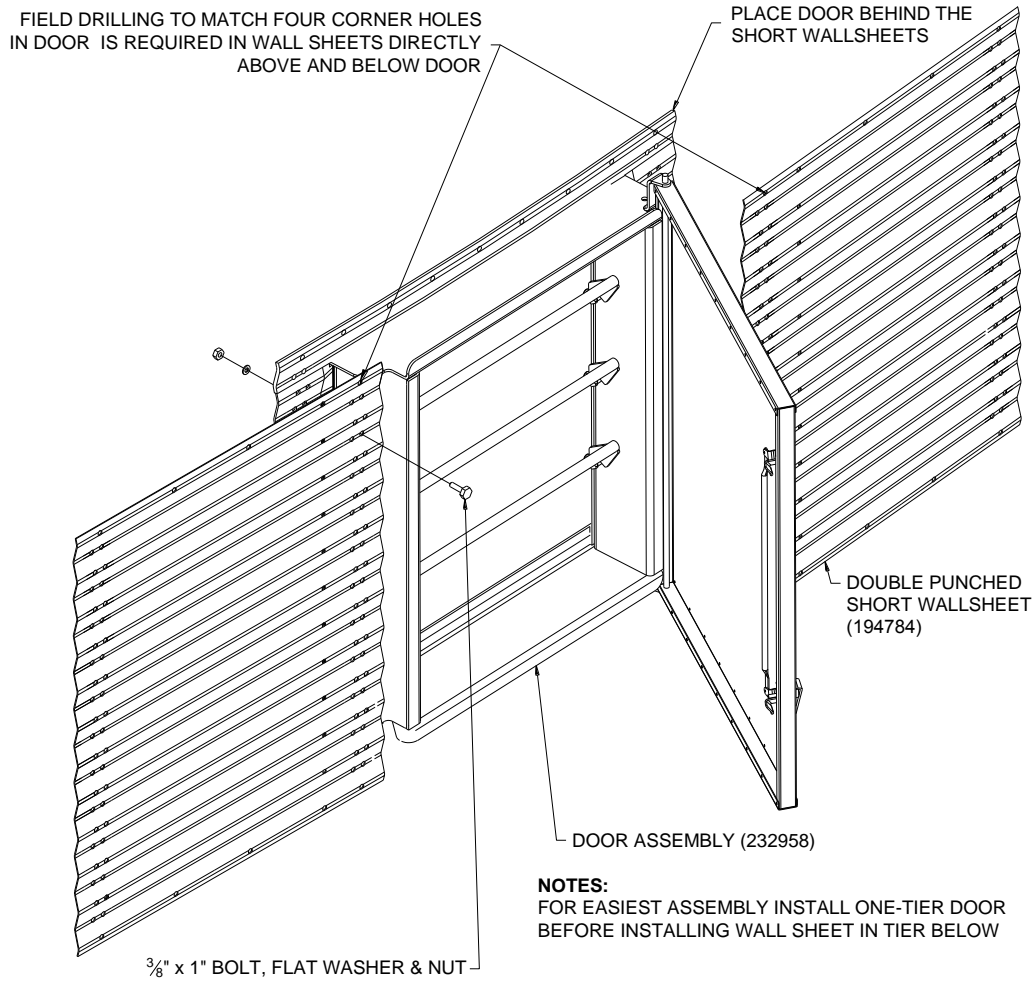


Important

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.

5.13. One-Tier Light Duty Door Installation

Figure 12. One-Tier Light Duty Door Detail

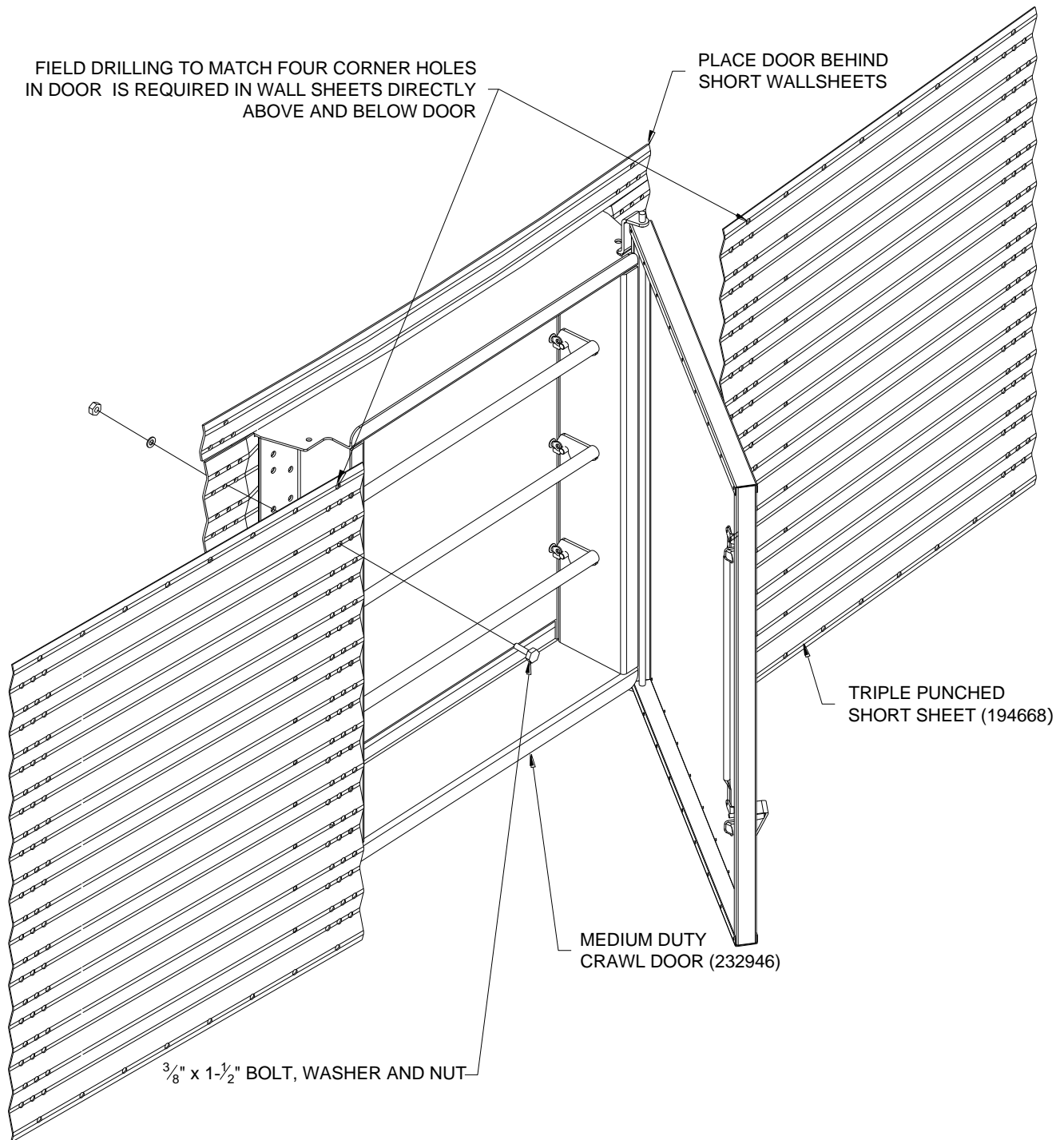


Important

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 13. One-Tier Medium Duty Door Detail

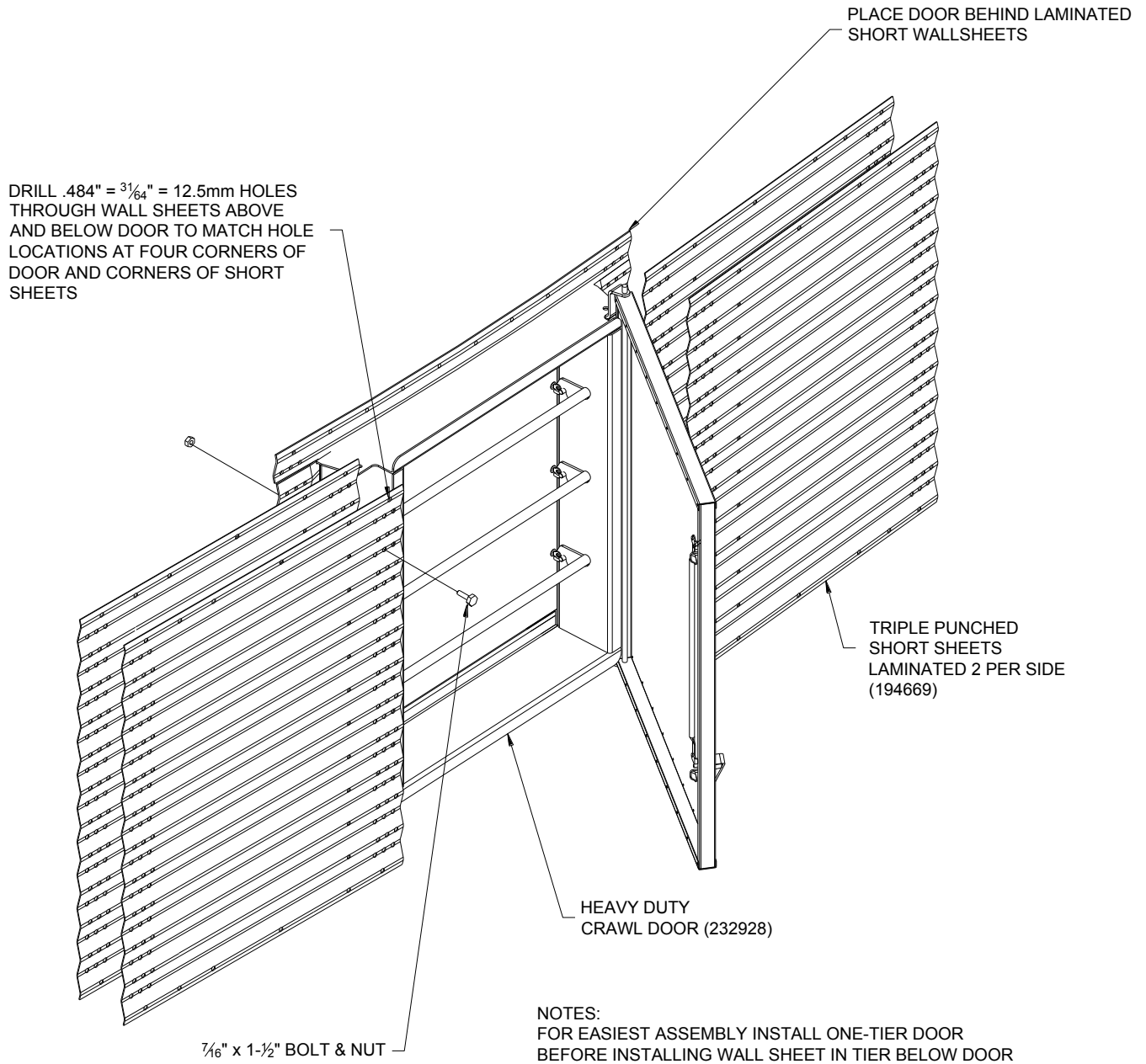


Important

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. One Tier Heavy Duty Door Installation

Figure 14. One Tier Heavy Duty Door Installation

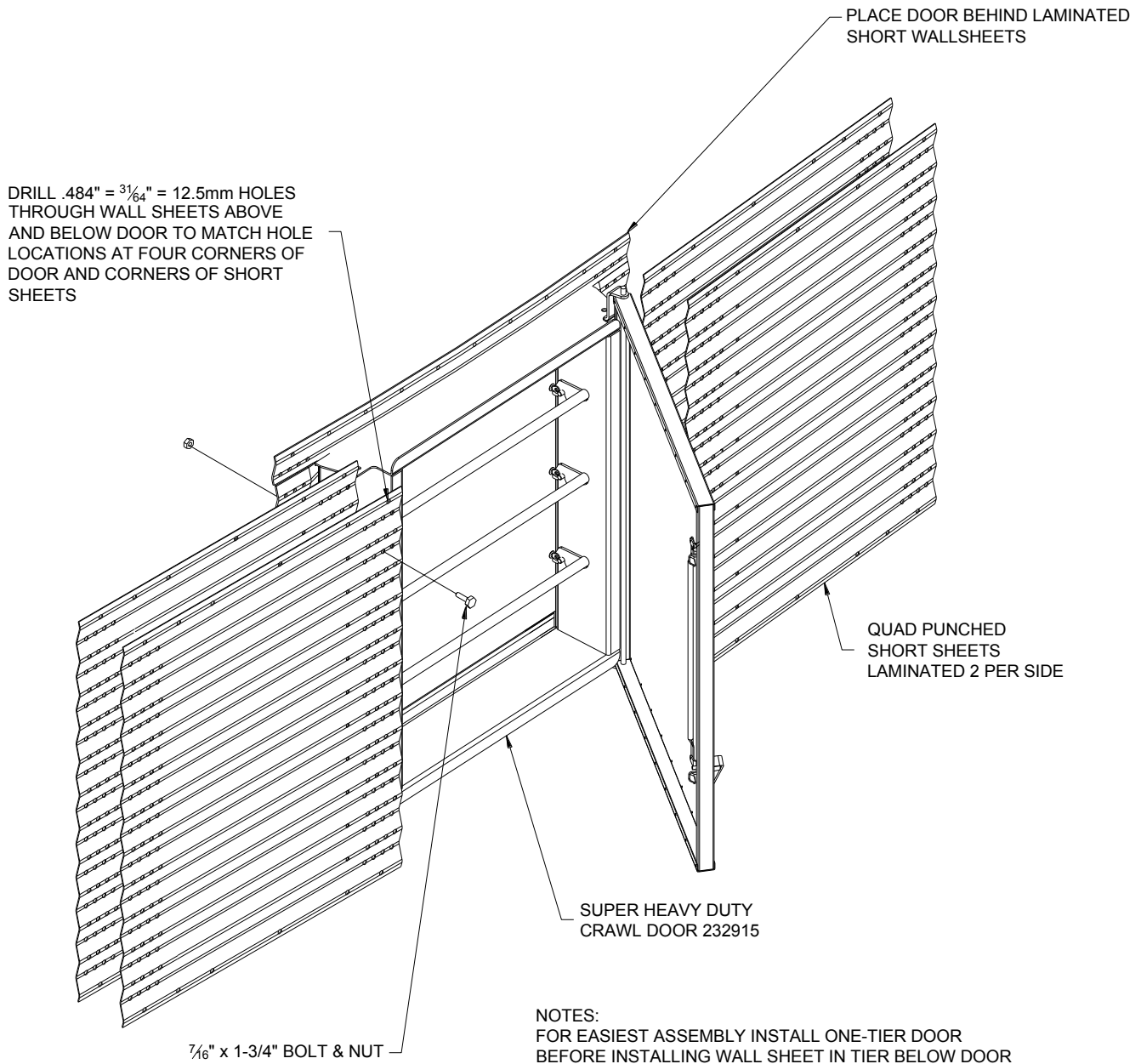


Important

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

5.16. One Tier Super Heavy Duty Door Installation

Figure 15. One Tier Super Heavy 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 the bin is filled without properly closing the inner door board.

5.17. Commercial Bin Upright Assembly

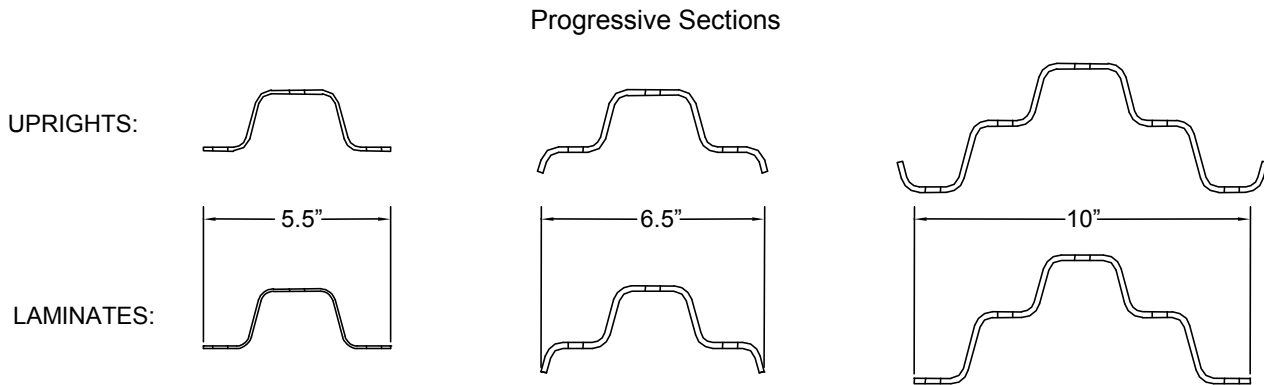
This section provides information needed to assemble uprights for commercial bins.

Introduction

The Westeel 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 Westeel 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 16. 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.

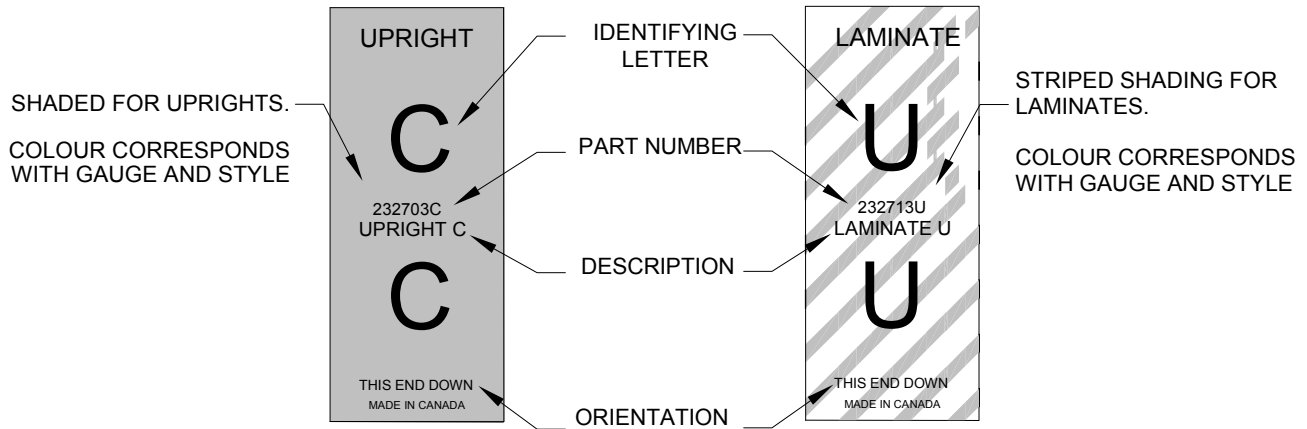
The label, is the easiest means of identification. It contains all of the necessary information. For assembly purposes, the label is placed on the bottom of both uprights and laminates.

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 17](#)).

Tip

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 17. 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.

Tip

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.

Tip

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 18](#)).

Tip

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

Figure 18. Upright Orientation Detail

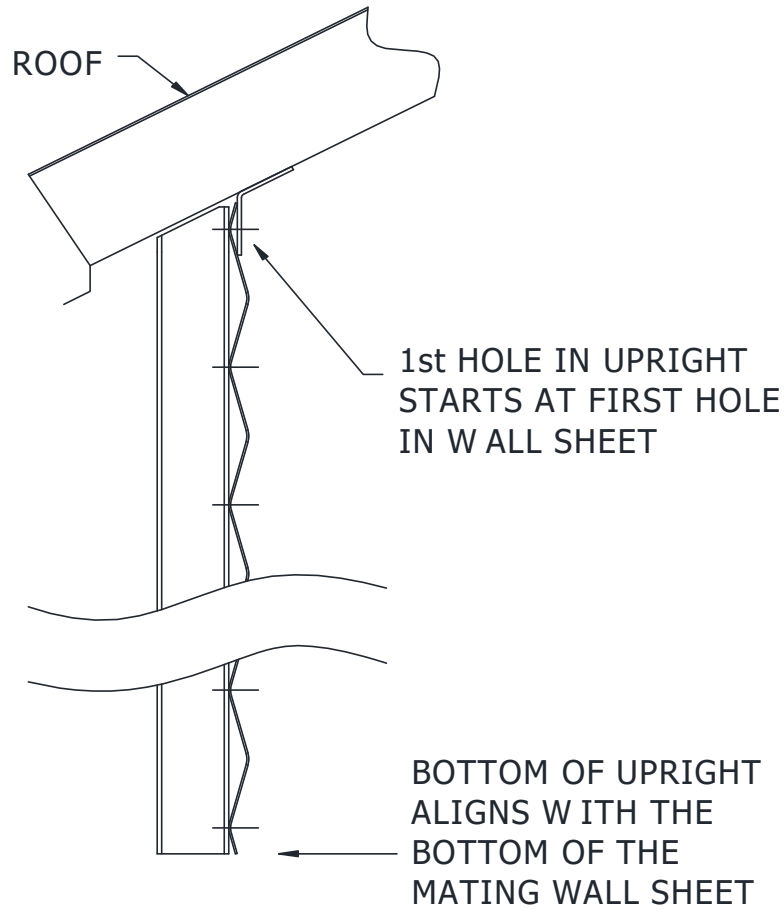
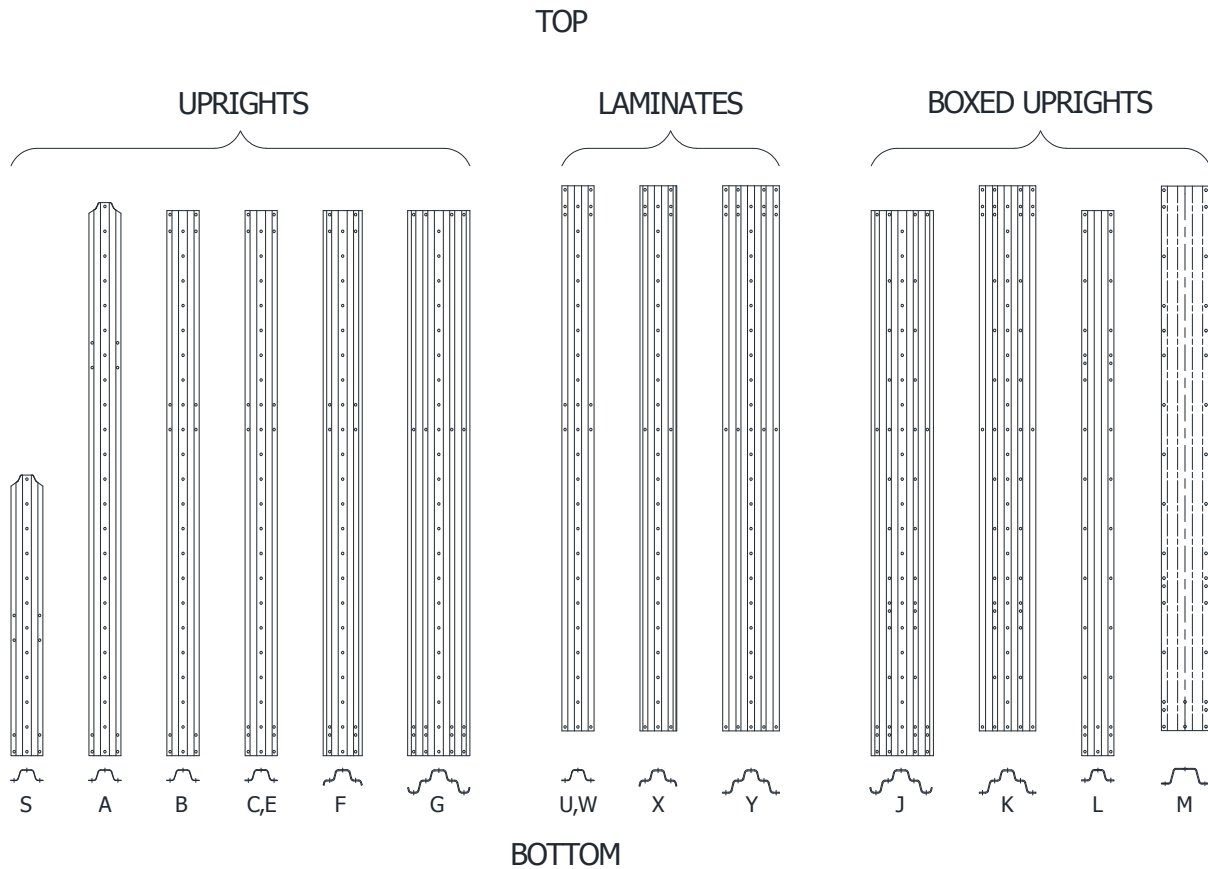


Table 9. Upright/Laminate Identification Table

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

Figure 19. Upright and Laminate Components**Catwalk Support Uprights**

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

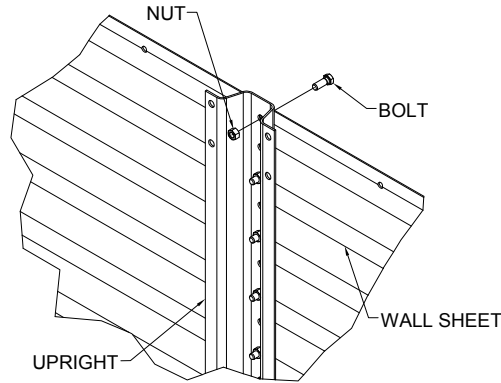
Bolt/Nut Orientation

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.

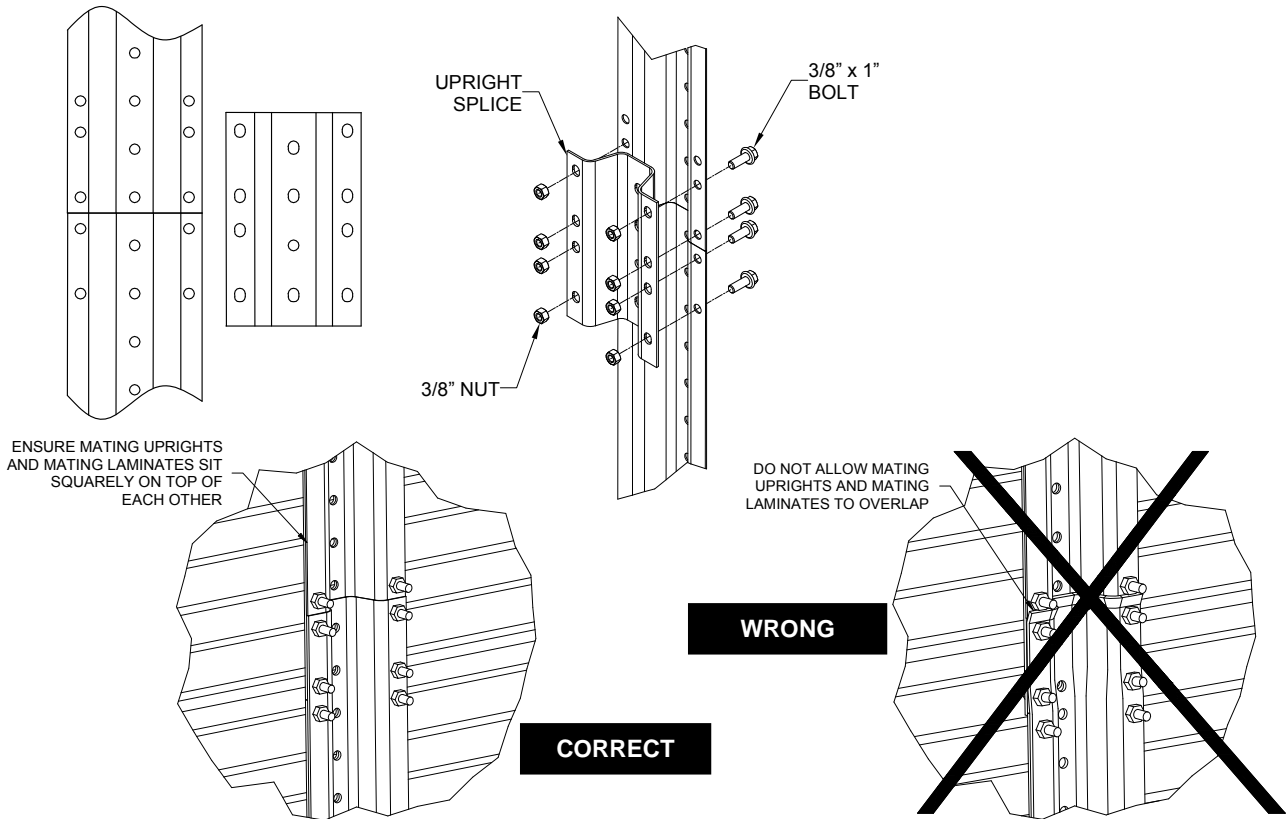
Figure 20. Upright / Wall Sheet Bolt and Nut Orientation



Tip

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

Figure 21. Pre-Assembling Uprights/Splices



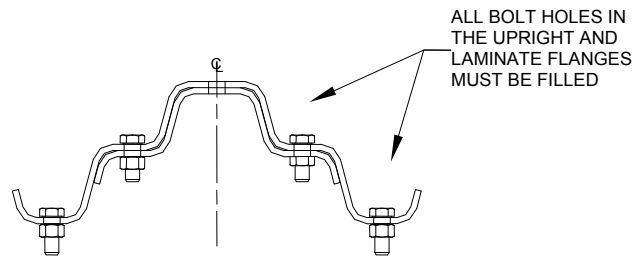
Upright and Laminate Assembly

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

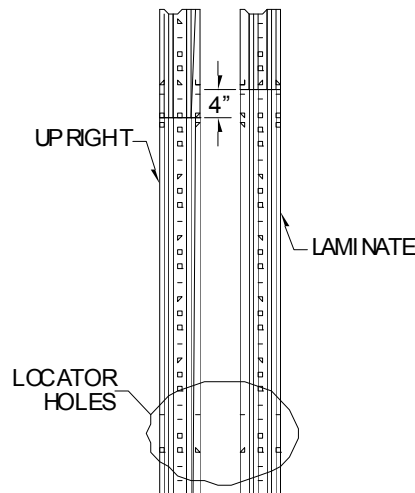
Laminates nest inside of uprights and are offset 4" above the uprights.

Figure 22. 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 23. Upright/Laminate Orientation



When properly assembled, both the upright label and the laminate label will remain visible during the pre-assembly 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.

Tip

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

Note

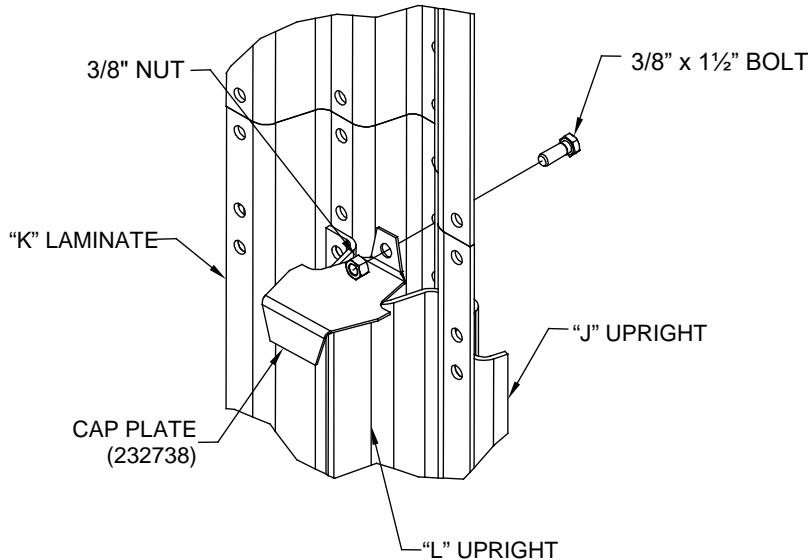
Once completely assembled onto the bin, all visible holes in the upright and laminate flanges must be filled. All mating wall sheet/upright holes must be filled.

Boxed Upright Cap Plates

Important

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

Figure 24. Installing Cap Plates on Boxed Uprights



5.17.1 Connection of 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 1/2" hex bolts). For this reason, **the best time to attach the upright connectors is at the same time the uprights are bolted to the bin.**

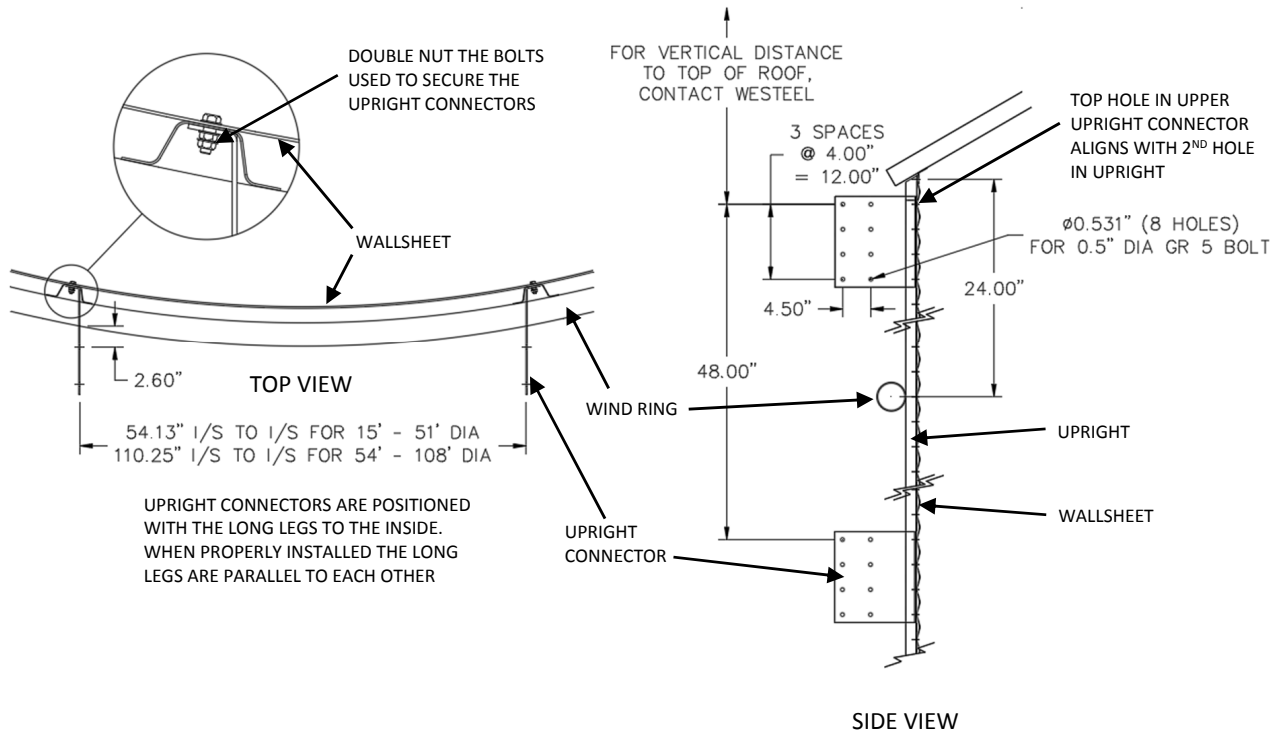
Note

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.

Figure 25. Placement of upright connectors



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. Westeel goal posts are fully braced. If non-Westeel 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 25 on page 45](#)). 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.

5.17.2 Base Assembly 233013 (Laminate Sections)

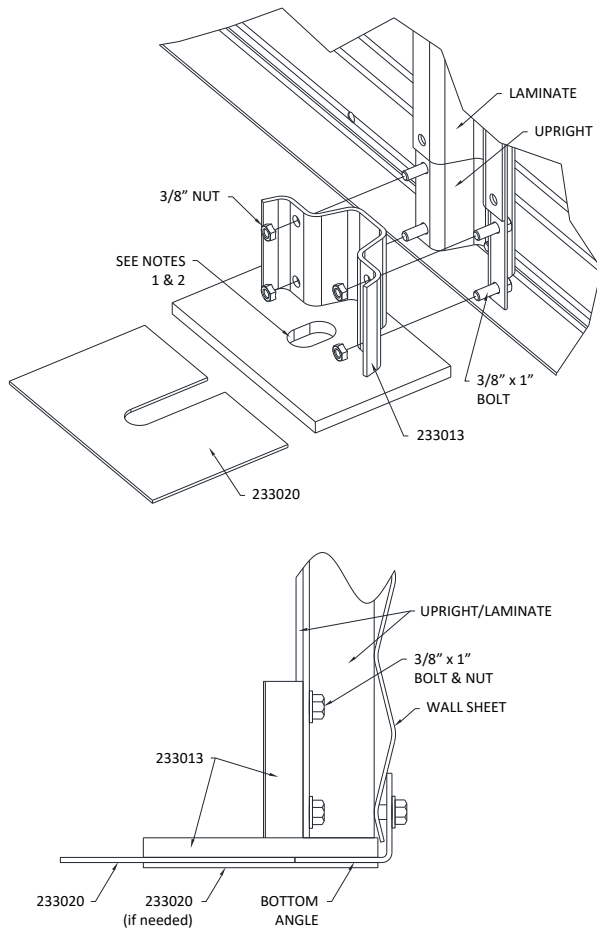
233013 — Base Assembly for Uprights with Laminate Sections

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

Tip

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

Figure 26. 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.

5.17.3 Base Assembly 233012 (Laminate Sections)

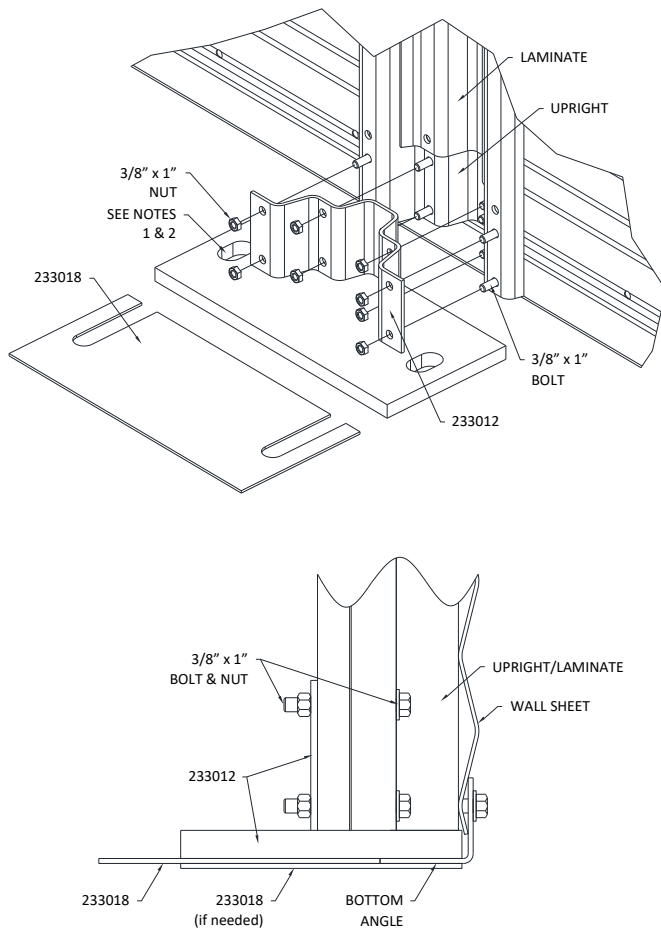
233012 – Base Assembly for Uprights (G or larger) with Laminate Sections

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.

Tip

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

Figure 27. Base Assembly 233012 for uprights with laminate sections



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" x 1.90" anchoring slots provided in the base plate. The base plate should not be able to pull up over the nuts.

5.17.4 Base Assembly 233012 (Boxed Uprights)

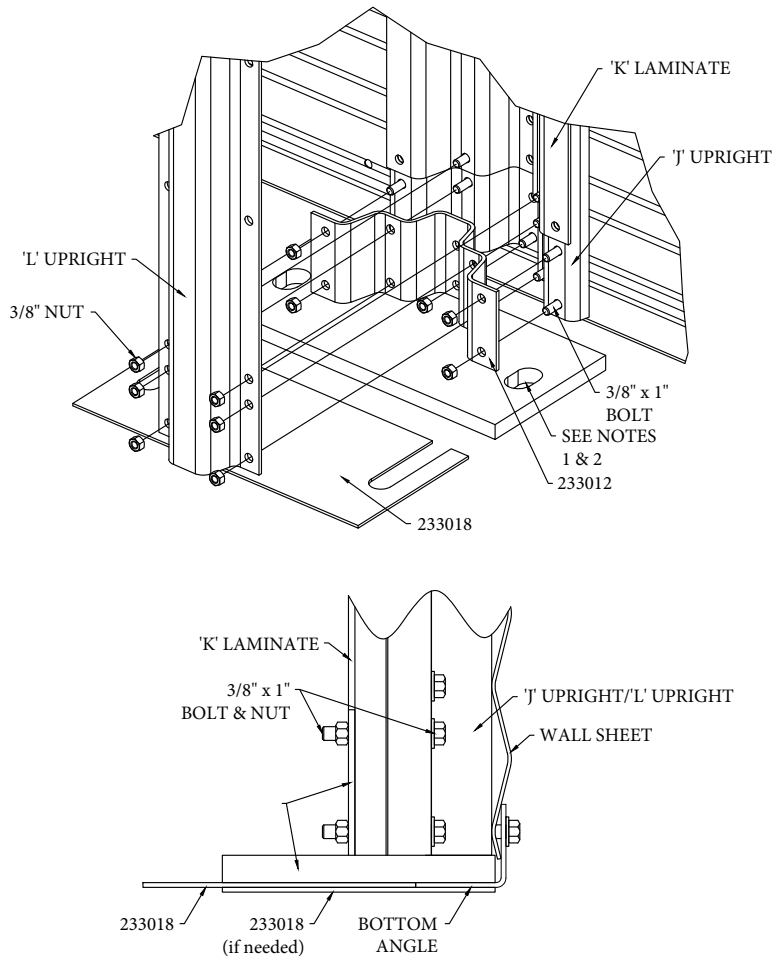
233012 – Base Assembly for Boxed Uprights

At the bottom of an assembled bin that has boxed uprights, 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.

Tip

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

Figure 28. Base Assembly 233012 for Boxed Uprights



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" x 1.90" anchoring slots provided in the base plate. The base plate should not be able to pull up over the nuts.

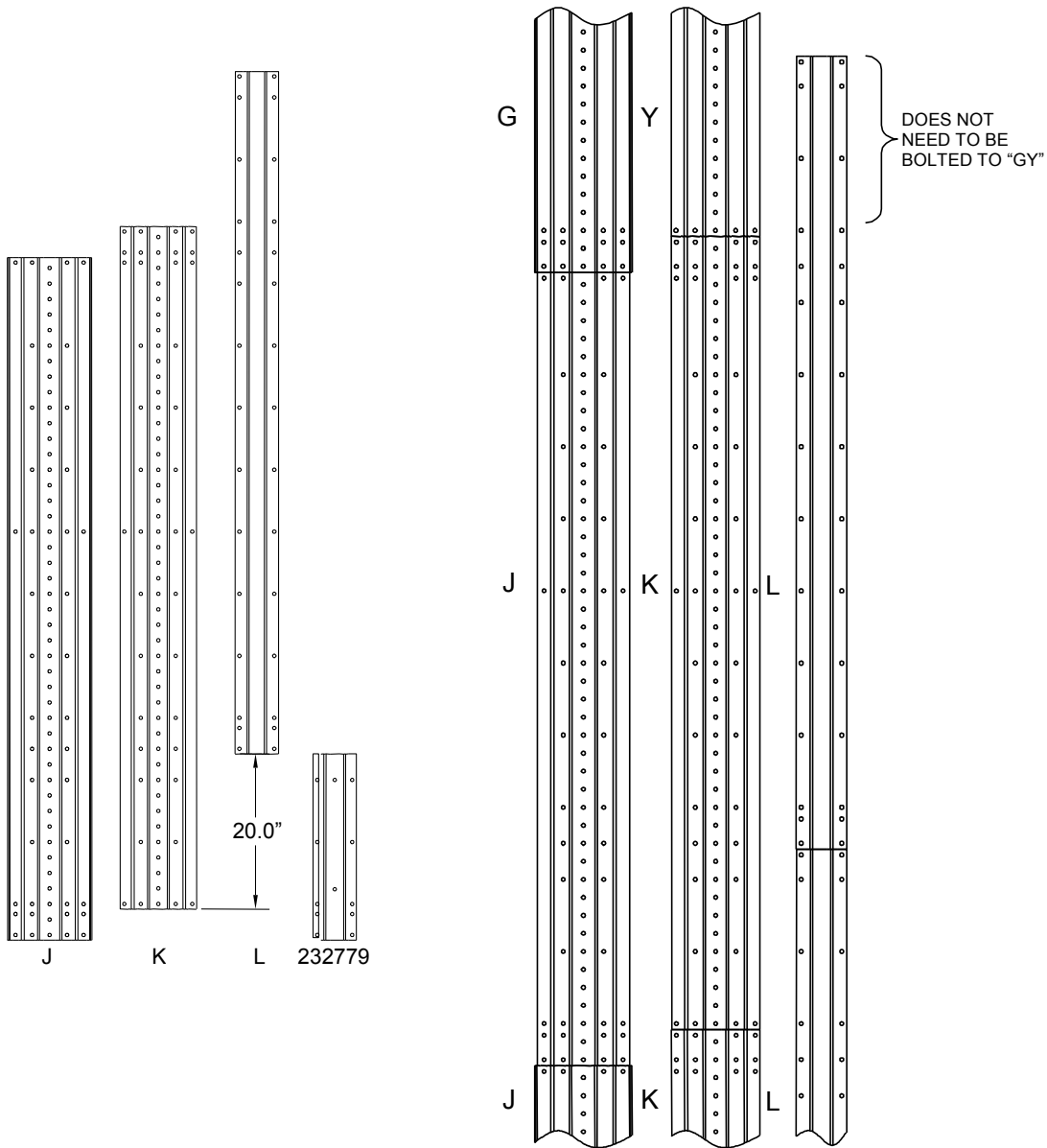
5.17.5 J, K, L and 24" Make-Up Section

If more than one set of J, K and L boxed uprights are used (check wall sheet and upright layout), a 24" laminate make-up section #232779 is inserted below the bottom L laminate. This allows easier access to connect and disconnect the bin jack lifting lug to the uprights when boxed uprights are used. See base assembly diagram on previous page for details on how the 24" make-up section is installed. When using the 24" make-up section #232779, note that the L laminate is offset 24" higher than the corresponding uprights.

Note

When using the 24" make-up section, some bolt holes on the GY, JK and L uprights do not line up. These holes do not need to be field drilled. Where the L laminate overlaps the GY combination the top of the L laminate does not need to be bolted, as shown below.

Figure 29. Uprights and laminates with make-up section

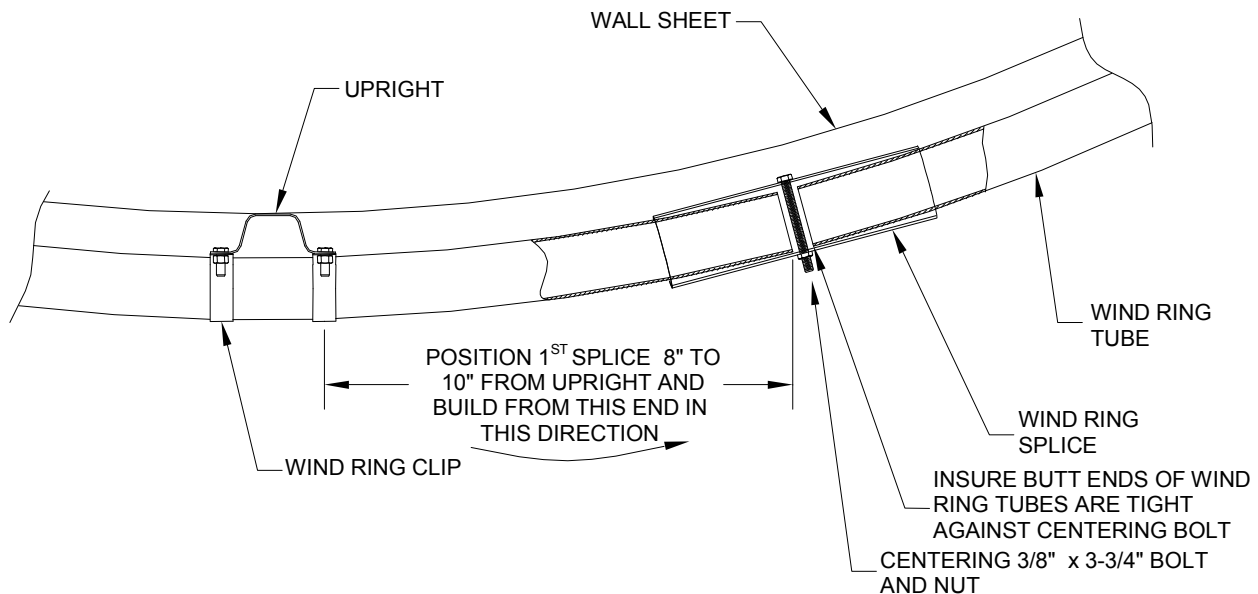


5.18. Wind Ring Assembly

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.

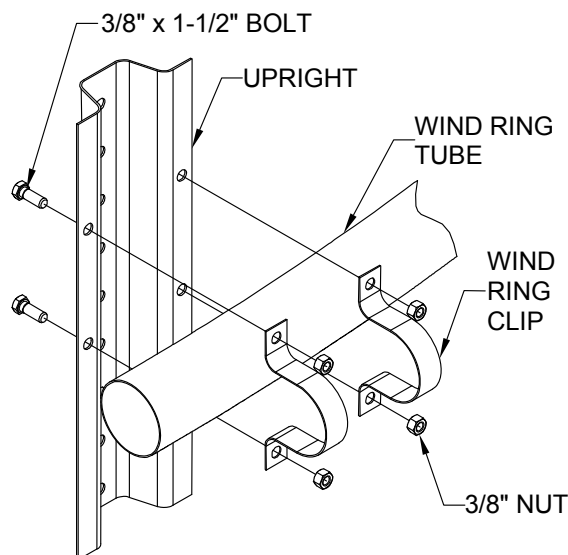
Figure 30. Wind Ring Assembly



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 31. 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

Table 10. Centurion Commercial Grain Bin Specifications

MODEL	BIN DIAMETER	CAPACITY			HEIGHT					
					EAVES			OVERALL		
		bu	m ³	Tonnes	ft	ft - in	m	ft	ft - in	m
2417	23'10"	24600	819	667	62.5	62'6"	19.05	69.1	69'1"	21.06
2418	7.28 m	26010	866	705	66.2	66'2"	20.17	72.8	72'9"	22.18
2717	26'10"	31270	1041	848	62.5	62'6"	19.06	70.0	70'0"	21.33
2718	8.19 m	33040	1100	896	66.2	66'2"	20.17	73.6	73'8"	22.45
3017	29'10" 9.10 m	38750	1291	1051	62.5	62'6"	19.06	70.4	70'5"	21.45
3018		40930	1363	1110	66.2	66'2"	20.17	74.0	74'1"	22.57
3019		43120	1436	1170	69.9	69'10"	21.29	77.7	77'9"	23.69
3020		45300	1509	1229	73.5	73'6"	22.41	81.4	81'5"	24.80
3317	32'10" 10.01 m	47070	1568	1277	62.5	62'6"	19.06	71.2	71'3"	21.71
3318		49710	1656	1348	66.2	66'2"	20.17	74.9	74'11"	22.83
3319		52350	1744	1420	69.9	69'10"	21.29	78.6	78'7"	23.95
3320		55000	1832	1492	73.5	73'6"	22.41	82.2	82'3"	25.07
3321		57640	1920	1563	77.2	77'2"	23.53	85.9	85'11"	26.19
3322		60290	2007	1635	80.9	80'10"	24.65	89.6	89'7"	27.30
3323		62930	2095	1707	84.5	84'6"	25.76	93.2	93'3"	28.42
3617	35'10" 10.91 m	56230	1874	1525	62.5	62'6"	19.06	72.1	72'1"	21.98
3618		59370	1978	1610	66.2	66'2"	20.17	75.8	75'9"	23.09
3619		62520	2083	1696	69.9	69'10"	21.29	79.4	79'5"	24.21
3620		65670	2187	1781	73.5	73'6"	22.41	83.1	83'1"	25.33
3621		68810	2292	1866	77.2	77'2"	23.53	86.8	86'9"	26.45
3622		71960	2396	1952	80.9	80'10"	24.65	90.4	90'5"	27.57
3623		75110	2501	2037	84.5	84'6"	25.76	94.1	94'1"	28.68
3917	38'10" 11.82 m	66220	2207	1796	62.5	62'6"	19.05	72.9	72'11"	22.23
3918		69930	2330	1897	66.2	66'2"	20.17	76.6	76'8"	23.36
3919		73620	2453	1997	69.9	69'10"	21.29	80.3	80'4"	24.47
3920		77320	2576	2097	73.5	73'6"	22.41	84.0	84'0"	25.59
3921		81010	2699	2197	77.2	77'2"	23.53	87.6	87'8"	26.71
3922		84700	2821	2298	80.9	80'10"	24.65	91.3	91'4"	27.83
3923		88400	2944	2398	84.5	84'6"	25.76	95.0	95'0"	28.95
4217	41'9" 12.73 m	77090	2570	2091	62.5	62'6"	19.05	73.8	73'10"	22.50
4218		81400	2713	2208	66.2	66'2"	20.17	77.5	77'6"	23.62
4219		85680	2855	2324	69.9	69'10"	21.29	81.2	81'2"	24.74
4220		89960	2998	2440	73.5	73'6"	22.41	84.8	84'10"	25.86
4221		94240	3140	2556	77.2	77'2"	23.53	88.5	88'6"	26.97
4222		98530	3282	2672	80.9	80'10"	24.65	92.2	92'2"	28.09
4223		102810	3425	2789	84.5	84'6"	25.76	95.8	95'10"	29.21
4517	44'9" 13.64 m	88830	2962	2409	62.5	62'6"	19.05	74.7	74' 8"	22.76
4518		93770	3126	2544	66.2	66'2"	20.17	78.4	78'4"	23.88
4519		98690	3290	2677	69.9	69'10"	21.29	82.0	82'0"	25.00
4520		103610	3453	2810	73.5	73'6"	22.41	85.7	85'8"	26.12

Table 10 Centurion Commercial Grain Bin Specifications (continued)

MODEL	BIN DIAMETER	CAPACITY			HEIGHT					
					EAVES			OVERALL		
		bu	m ³	Tonnes	ft	ft - in	m	ft	ft - in	m
4521	47'9" 14.55 m	108520	3616	2944	77.2	77'2"	23.53	89.4	89'4"	27.24
4522		113440	3780	3077	80.9	80'10"	24.65	93.0	93'0"	28.35
4523		118360	3943	3210	84.5	84'6"	25.76	96.7	96'8"	29.47
4817		101450	3383	2752	62.5	62'6"	19.05	75.5	75'6"	23.02
4818		107070	3570	2904	66.2	66'2"	20.17	79.2	79'3"	24.15
4819		112670	3756	3056	69.9	69'10"	21.29	82.9	82'11"	25.26
4820		118260	3942	3208	73.5	73'6"	22.41	86.5	86'7"	26.38
4821		123860	4128	3359	77.2	77'2"	23.53	90.2	90'3"	27.50
4822		129450	4314	3511	80.9	80'10"	24.65	93.9	93'11"	28.62
4823		135040	4500	3663	84.5	84'6"	25.76	97.5	97'7"	29.73
5117	50'9" 15.46 m	114990	3836	3119	62.5	62'6"	19.06	76.2	76'3"	23.23
5118		121310	4046	3290	66.2	66'2"	20.17	79.9	79'11"	24.35
5119		127620	4256	3462	69.9	69'10"	21.29	83.6	83'7"	25.47
5120		133940	4466	3633	73.5	73'6"	22.41	87.2	87'3"	26.58
5121		140250	4675	3804	77.2	77'2"	23.53	90.9	90'11"	27.70
5122		146570	4885	3975	80.9	80'10"	24.65	94.6	94'7"	28.82
5123		152880	5095	4147	84.5	84'6"	25.76	98.2	98'3"	29.94
5417		53'9" 16.37 m	129400	4317	3510	62.5	62'6"	19.06	77.1	77'1"
5418	136480		4553	3702	66.2	66'2"	20.17	80.7	80'9"	24.61
5419	143560		4788	3894	69.9	69'10"	21.29	84.4	84'5"	25.73
5420	150640		5023	4086	73.5	73'6"	22.41	88.1	88'1"	26.85
5421	157720		5259	4278	77.2	77'2"	23.53	91.7	91'9"	27.96
5422	164800		5494	4470	80.9	80'10"	24.65	95.4	95'5"	29.08
5423	171880		5729	4662	84.5	84'6"	25.76	99.1	99'1"	30.20
6017	59'8" 18.19 m	160470	5357	4353	62.5	62'6"	19.06	79.4	79'4"	24.19
6018		169210	5647	4590	66.2	66'2"	20.17	83.0	83'0"	25.31
6019		177960	5938	4827	69.9	69'10"	21.29	86.7	86'8"	26.43
6020		186700	6228	5064	73.5	73'6"	22.41	90.4	90'4"	27.54
6021		195440	6519	5301	77.2	77'2"	23.53	94.0	94'0"	28.66
6022		204180	6809	5538	80.9	80'10"	24.65	97.7	97'8"	29.78
6023		212920	7099	5775	84.5	84'6"	25.76	101.4	101'4"	30.90
6608	65'8" 20.01 m	100750	3380	2733	29.5	29'6"	8.99	48.1	48'1"	14.65
6609		111330	3731	3020	33.2	33'2"	10.11	51.7	51'9"	15.77
6610		121900	4083	3307	36.8	36'10"	11.23	55.4	55'5"	16.89
6611		132480	4434	3593	40.5	40'6"	12.35	59.1	59'1"	18.00
6612		143060	4786	3880	44.2	44'2"	13.46	62.7	62'9"	19.12
6613		153630	5137	4167	47.8	47'10"	14.58	66.4	66'5"	20.24
6614		164210	5489	4454	51.5	51'6"	15.70	70.1	70'1"	21.36
6615		174780	5840	4741	55.2	55'2"	16.82	73.7	73'9"	22.47
6616		185420	6194	5029	58.9	58'10"	17.94	77.4	77'5"	23.60
6617		196000	6545	5316	62.5	62'6"	19.06	81.1	81'1"	24.72
6618		206570	6896	5603	66.2	66'2"	20.17	84.8	84'9"	25.83
6619		217150	7248	5890	69.9	69'10"	21.29	88.4	88'5"	26.95
6620		227730	7599	6177	73.5	73'6"	22.41	92.1	92'1"	28.07
6621		238300	7951	6464	77.2	77'2"	23.53	95.8	95'9"	29.19
6622	248880	8302	6751	80.9	80'10"	24.65	99.4	99'5"	30.30	

Table 10 Centurion Commercial Grain Bin Specifications (continued)

MODEL	BIN DIAMETER	CAPACITY			HEIGHT						
					EAVES			OVERALL			
		bu	m ³	Tonnes	ft	ft - in	m	ft	ft - in	m	
6623	71'7" 21.83 m	259460	8654	7037	84.5	84'6"	25.76	103.1	103'1"	31.42	
7208		119870	4025	3251	29.5	29'6"	8.99	49.8	49'10"	15.18	
7209		132460	4443	3593	33.2	33'2"	10.11	53.5	53'6"	16.29	
7210		145050	4861	3934	36.8	36'10"	11.23	57.1	57'2"	17.41	
7211		157630	5280	4276	40.5	40'6"	12.35	60.8	60'10"	18.53	
7212		170220	5698	4617	44.2	44'2"	13.46	64.5	64'6"	19.65	
7213		182810	6116	4959	47.8	47'10"	14.58	68.1	68'2"	20.76	
7214		195400	6534	5300	51.5	51'6"	15.70	71.8	71'10"	21.88	
7215		207980	6953	5641	55.2	55'2"	16.82	75.5	75'6"	23.00	
7216		220640	7373	5985	58.9	58'10"	17.94	79.1	79'2"	24.12	
7217		233230	7792	6326	62.5	62'6"	19.06	82.8	82'10"	25.24	
7218		245810	8210	6667	66.2	66'2"	20.17	86.5	86'6"	26.36	
7219		258400	8628	7009	69.9	69'10"	21.29	90.1	90'2"	27.48	
7220		270990	9046	7350	73.5	73'6"	22.41	93.8	93'10"	28.59	
7221		283570	9465	7692	77.2	77'2"	23.53	97.5	97'6"	29.71	
7222		296160	9883	8033	80.9	80'10"	24.65	101.1	101'2"	30.83	
7223		308750	10301	8374	84.5	84'6"	25.76	104.8	104'10"	31.95	
7508		74'7" 22.74 m	131260	4408	3560	29.5	29'6"	8.99	50.7	50'8"	15.44
7509			144910	4862	3931	33.2	33'2"	10.11	54.3	54'4"	16.56
7510			158570	5316	4301	36.8	36'10"	11.23	58.0	58'0"	17.67
7511	172230		5770	4672	40.5	40'6"	12.35	61.7	61'8"	18.79	
7512	185890		6224	5042	44.2	44'2"	13.46	65.3	65'4"	19.91	
7513	199540		6678	5412	47.8	47'10"	14.58	69.0	69'0"	21.03	
7514	213200		7131	5783	51.5	51'6"	15.70	72.7	72'8"	22.14	
7515	226860		7585	6153	55.2	55'2"	16.82	76.3	76'4"	23.26	
7516	240590		8042	6526	58.9	58'10"	17.94	80.0	80'0"	24.39	
7517	254250		8496	6896	62.5	62'6"	19.06	83.7	83'8"	25.50	
7518	267910		8949	7267	66.2	66'2"	20.17	87.3	87'4"	26.62	
7519	281560		9403	7637	69.9	69'10"	21.29	91.0	91'0"	27.74	
7520	295220		9857	8008	73.5	73'6"	22.41	94.7	94'8"	28.86	
7521	308880		10311	8378	77.2	77'2"	23.53	98.3	98'4"	29.97	
7522	322540		10765	8749	80.9	80'10"	24.65	102.0	102'0"	31.09	
7523	336190		11219	9119	84.5	84'6"	25.76	105.7	105'8"	32.21	
7808	77'7" 23.65 m	143250	4812	3885	29.5	29'6"	8.99	51.5	51'6"	15.70	
7809		158020	5303	4286	33.2	33'2"	10.11	55.2	55'2"	16.82	
7810		172790	5794	4687	36.8	36'10"	11.23	58.8	58'10"	17.94	
7811		187560	6285	5087	40.5	40'6"	12.35	62.5	62'6"	19.05	
7812		202330	6776	5488	44.2	44'2"	13.46	66.2	66'2"	20.17	
7813		217100	7267	5889	47.8	47'10"	14.58	69.8	69'10"	21.29	
7814		231880	7758	6289	51.5	51'6"	15.70	73.5	73'6"	22.41	
7815		246730	8252	6692	55.2	55'2"	16.82	77.2	77'2"	23.53	
7816		261500	8742	7093	58.9	58'10"	17.94	80.9	80'10"	24.65	
7817		276280	9233	7494	62.5	62'6"	19.06	84.5	84'6"	25.77	
7818		291050	9724	7894	66.2	66'2"	20.17	88.2	88'2"	26.88	
7819		305820	10215	8295	69.9	69'10"	21.29	91.9	91'10"	28.00	
7820		320590	10706	8696	73.5	73'6"	22.41	95.5	95'6"	29.12	

Table 10 Centurion Commercial Grain Bin Specifications (continued)

MODEL	BIN DIAMETER	CAPACITY			HEIGHT						
		bu	m ³	Tonnes	EAVES			OVERALL			
					ft	ft - in	m	ft	ft - in	m	
7821	83'7" 27.29 m	335360	11197	9096	77.2	77'2"	23.53	99.2	99'2"	30.24	
7822		350140	11688	9497	80.9	80'10"	24.65	102.9	102'10"	31.35	
7823		364910	12179	9898	84.5	84'6"	25.76	106.5	106'6"	32.47	
8408		169100	5685	4587	29.5	29'6"	8.99	53.2	53'3"	16.23	
8409		186230	6254	5051	33.2	33'2"	10.11	56.9	56'11"	17.34	
8410		203360	6823	5516	36.8	36'10"	11.23	60.6	60'7"	18.46	
8411		220490	7393	5981	40.5	40'6"	12.35	64.2	64'3"	19.58	
8412		237630	7962	6445	44.2	44'2"	13.46	67.9	67'11"	20.70	
8413		254760	8531	6910	47.8	47'10"	14.58	71.6	71'7"	21.82	
8414		271890	9101	7375	51.5	51'6"	15.70	75.2	75'3"	22.93	
8415		289120	9673	7842	55.2	55'2"	16.82	78.9	78'11"	24.06	
8416		306250	10242	8307	58.9	58'10"	17.94	82.6	82'7"	25.17	
8417		323380	10812	8771	62.5	62'6"	19.06	86.3	86'3"	26.29	
8418		340510	11381	9236	66.2	66'2"	20.17	89.9	89'11"	27.41	
8419		357650	11950	9701	69.9	69'10"	21.29	93.6	93'7"	28.53	
8420		374780	12520	10166	73.5	73'6"	22.41	97.3	97'3"	29.64	
8421		391910	13089	10630	77.2	77'2"	23.53	100.9	100'11"	30.76	
8422		409040	13658	11095	80.9	80'10"	24.65	104.6	104'7"	31.88	
8423		426170	14228	11560	84.5	84'6"	25.76	108.3	108'3"	33.00	
9008		89'6" 27.29 m	197540	6645	5358	29.5	29'6"	8.99	55.0	55'0"	16.76
9009	217200		7298	5891	33.2	33'2"	10.11	58.7	58'8"	17.88	
9010	236870		7952	6425	36.8	36'10"	11.23	62.3	62'4"	19.00	
9011	256540		8605	6958	40.5	40'6"	12.35	66.0	66'0"	20.11	
9012	276210		9259	7492	44.2	44'2"	13.46	69.7	69'8"	21.23	
9013	295870		9913	8025	47.8	47'10"	14.58	73.3	73'4"	22.35	
9014	315540		10566	8559	51.5	51'6"	15.70	77.0	77'0"	23.47	
9015	335320		11223	9095	55.2	55'2"	16.82	80.7	80'8"	24.59	
9016	354980		11877	9629	58.9	58'10"	17.94	84.3	84'4"	25.71	
9017	374650		12530	10162	62.5	62'6"	19.06	88.0	88'0"	26.83	
9018	394320		13184	10695	66.2	66'2"	20.17	91.7	91'8"	27.94	
9019	413980		13838	11229	69.9	69'10"	21.29	95.3	95'4"	29.06	
9020	433650		14491	11762	73.5	73'6"	22.41	99.0	99'0"	30.18	
9021	453320		15145	12296	77.2	77'2"	23.53	102.7	102'8"	31.30	
9022	472980		15798	12829	80.9	80'10"	24.65	106.3	106'4"	32.41	
9023	492650		16452	13363	84.5	84'6"	25.76	110.0	110'0"	33.53	
9608	95'6" 29.11 m		228620	7695	6201	29.5	29'6"	8.99	56.7	56'8"	17.28
9609			250990	8438	6808	33.2	33'2"	10.11	60.4	60'4"	18.39
9610			273370	9182	7415	36.8	36'10"	11.23	64.0	64'0"	19.51
9611			295740	9925	8022	40.5	40'6"	12.35	67.7	67'8"	20.63
9612		318120	10669	8629	44.2	44'2"	13.46	71.4	71'4"	21.75	
9613		340500	11413	9236	47.8	47'10"	14.58	75.0	75'0"	22.87	
9614		363000	12160	9846	51.5	51'6"	15.70	78.7	78'8"	23.99	
9615		385380	12904	10453	55.2	55'2"	16.82	82.4	82'4"	25.11	
9616		407750	13648	11060	58.9	58'10"	17.94	86.0	86'0"	26.22	
9617		430130	14391	11667	62.5	62'6"	19.06	89.7	89'8"	27.34	
9618	452510	15135	12274	66.2	66'2"	20.17	93.4	93'4"	28.46		

Table 10 Centurion Commercial Grain Bin Specifications (continued)

MODEL	BIN DIAMETER	CAPACITY			HEIGHT					
					EAVES			OVERALL		
		bu	m ³	Tonnes	ft	ft - in	m	ft	ft - in	m
9619	101'6" 30.93 m	474880	15879	12881	69.9	69'10"	21.29	97.0	97'0"	29.58
9620		497260	16622	13488	73.5	73'6"	22.41	100.7	100'8"	30.69
9621		519640	17366	14095	77.2	77'2"	23.53	104.4	104'4"	31.81
9622		542010	18109	14702	80.9	80'10"	24.65	108.0	108'0"	32.93
9623		564390	18853	15309	84.5	84'6"	25.76	111.7	111'8"	34.05
10208		101'6" 30.93 m	261690	8813	7098	29.5	29'6"	8.99	58.2	58'3"
10209	286950		9653	7783	33.2	33'2"	10.11	61.9	61'11"	18.86
10210	312210		10492	8468	36.8	36'10"	11.23	65.5	65'7"	19.98
10211	337470		11332	9154	40.5	40'6"	12.35	69.2	69'3"	21.10
10212	362730		12171	9839	44.2	44'2"	13.46	72.9	72'11"	22.21
10213	388000		13010	10524	47.8	47'10"	14.58	76.5	76'7"	23.33
10214	413400		13855	11213	51.5	51'6"	15.70	80.2	80'3"	24.46
10215	438660		14694	11898	55.2	55'2"	16.82	83.9	83'11"	25.57
10216	463920		15534	12583	58.9	58'10"	17.94	87.6	87'7"	26.69
10217	489180		16373	13269	62.5	62'6"	19.06	91.2	91'3"	27.81
10218	514440		17213	13954	66.2	66'2"	20.17	94.9	94'11"	28.93
10219	539700		18052	14639	69.9	69'10"	21.29	98.6	98'7"	30.04
10220	564960		18892	15324	73.5	73'6"	22.41	102.2	102'3"	31.16
10221	590230		19731	16009	77.2	77'2"	23.53	105.9	105'11"	32.28
10222	615490		20570	16695	80.9	80'10"	24.65	109.6	109'7"	33.40
10223	640750	21410	17380	84.5	84'6"	25.76	113.2	113'3"	34.51	
10508	104'5" 31.83 m	278680	9388	7559	29.5	29'6"	8.99	59.1	59'1"	18.01
10509		305450	10278	8285	33.2	33'2"	10.11	62.7	62'9"	19.12
10510		332210	11167	9011	36.8	36'10"	11.23	66.4	66'5"	20.24
10511		358980	12057	9737	40.5	40'6"	12.35	70.1	70'1"	21.36
10512		385750	12946	10463	44.2	44'2"	13.46	73.7	73'9"	22.48
10513		412520	13836	11189	47.8	47'10"	14.58	77.4	77'5"	23.59
10514		439440	14731	11919	51.5	51'6"	15.70	81.1	81'1"	24.72
10515		466210	15620	12645	55.2	55'2"	16.82	84.8	84'9"	25.84
10516		492980	16510	13372	58.9	58'10"	17.94	88.4	88'5"	26.95
10517		519750	17399	14098	62.5	62'6"	19.06	92.1	92'1"	28.07
10518		546510	18289	14824	66.2	66'2"	20.17	95.8	95'9"	29.19
10519		573280	19179	15550	69.9	69'10"	21.29	99.4	99'5"	30.31
10520		600050	20068	16276	73.5	73'6"	22.41	103.1	103'1"	31.42
10521		626820	20958	17002	77.2	77'2"	23.53	106.8	106'9"	32.54
10522		653590	21847	17728	80.9	80'10"	24.65	110.4	110'5"	33.66
10523	680360	22737	18454	84.5	84'6"	25.76	114.1	114'1"	34.78	
10808	107'5" 32.74 m	297240	10016	8062	29.5	29'6"	8.99	59.9	59'11"	18.27
10809		325560	10957	8830	33.2	33'2"	10.11	63.6	63'7"	19.39
10810		353880	11898	9599	36.8	36'10"	11.23	67.3	67'3"	20.50
10811		382200	12840	10367	40.5	40'6"	12.35	70.9	70'11"	21.62
10812		410520	13781	11135	44.2	44'2"	13.46	74.6	74'7"	22.74
10813		438840	14722	11903	47.8	47'10"	14.58	78.3	78'3"	23.86
10814		467320	15668	12676	51.5	51'6"	15.70	82.0	81'11"	24.98
10815		495640	16609	13444	55.2	55'2"	16.82	85.6	85'7"	26.10
10816		523960	17551	14212	58.9	58'10"	17.94	89.3	89'3"	27.22

Table 10 Centurion Commercial Grain Bin Specifications (continued)

MODEL	BIN DIAMETER	CAPACITY			HEIGHT					
					EAVES			OVERALL		
		bu	m ³	Tonnes	ft	ft - in	m	ft	ft - in	m
10817		552280	18492	14980	62.5	62'6"	19.06	93.0	92'11"	28.33
10818		580600	19433	15748	66.2	66'2"	20.17	96.6	96'7"	29.45
10819		608920	20374	16516	69.9	69'10"	21.29	100.3	100'3"	30.57
10820		637240	21315	17285	73.5	73'6"	22.41	104.0	103'11"	31.69
10821		665560	22256	18053	77.2	77'2"	23.53	107.6	107'7"	32.80
10822		693880	23197	18821	80.9	80'10"	24.65	111.3	111'3"	33.92

Note

1. 28° roof cone. Fill slightly below eaves line for 54' – 96' bins with structural roofs.
2. 6% compaction below eaves line for bushels and tonnes.
3. 1 bushel = 1.244 ft³
4. Bulk density = 770 kg/m³ = 48 lb/ft³

7. Appendix

7.1. Hardware Usage

Table 11. Bin Hardware

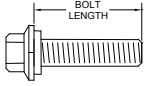
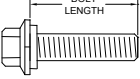
	3/8" x 1" Flanged Hex Bolt (Washer)	3/8" x 1" Round Head Bolt	3/8" x 1-1/2" Flanged Hex Bolt (Washer)	3/8" x 3-3/4" Hex Bolt	3/8" Flanged Lock Nut	3/8" Hex Nut	3/8" Wingnut	3/8" Flat Washer	3/8" STL/NEO Sealing Washer	7/16" x 1-1/2" Flanged Hex Bolt (Washer)	7/16" x 1-3/4" Flanged Hex Bolt (Washer)	7/16" Hex Nut	1/2" Flat Washer
	232850 (700) 235941 (325) 235943 (50)	150594	232852 (500) 235946 (100)	235949 (10)	235954 (300) 235955 (50)	232850 (700) 232852 (500) 235950 (300) 235951 (100)	154208	235956 (200) 235957 (75)	235975 (100)	232855 (400)	232856 (300)	232855 (400) 232856 (300)	154981
INSIDE ROOF CONNECTOR UPRIGHT to WALL SHEET to OUTSIDE UPRIGHT (DOUBLE NUT)			•		•	•			•				
WALL SHEETS 194679 to 194685, and 194606 to 194607 (0.040" to 0.139")	•					•		•☀					
WALL SHEET 194608 (0.168")			•			•		•☀					
UPRIGHT to WALL SHEETS 194679 to 194685 (0.040" to 0.116")	•					•							
UPRIGHT to WALL SHEETS 194606 to 194608, and 194604 to 194618 (0.126" to 0.168", AND 0.096" LAM to 0.139" LAM)			•			•							
WALL SHEETS 194604 to 194605, and 194616 to 194617 (0.096" LAM to 0.139" LAM)										•		•	•♦
WALL SHEET 194618 (0.168" LAM)											•	•	•♦
UPRIGHT to WALL SHEET AT HORIZONTAL SEAMS			•			•							
UPRIGHT to LAMINATE to CAP PLATE to WALL SHEET (FOR BINS WITH BOXED UPRIGHTS ONLY)			•			•							
UPRIGHT to UPRIGHT SPLICE	•					•							
UPRIGHT to LAMINATE	•					•							

Table 11 Bin Hardware (continued)

	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 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)	7/16" x 1-3/4" Flanged Hex Bolt (Washer)	7/16" Hex Nut	1/2" Flat Washer
	232850 (700) 235941 (325) 235943 (50)	150594	232852 (500) 235946 (100)	235949 (10)	235954 (300) 235955 (50)	232850 (700) 232852 (500) 235950 (300) 235951 (100)	154208	235956 (200) 235957 (75)	235975 (100)	232855 (400)	232856 (300)	232855 (400) 232856 (300)	154981
UPRIGHT to LAMINATE to BOXED UPRIGHT			•			•							
WALL SHEET to UPRIGHT to LAMINATE to CAP PLATE (FOR BINS WITH BOXED UPRIGHTS)			•			•							
WIND RING CLIP to UPRIGHT			•			•							
WIND RING SPLICE				•		•							
WALL SHEET to BOTTOM RING ANGLE	•				•	•		•					
DRYING FLOOR FLASHING HOLES in BOTTOM WALL SHEET	•					•							
WALL SHEET to DOOR			•			•		•☀					
DOOR TIE-BACK to WALL SHEET	•					•							
AUGER CHUTE HOOD to AUGER DOOR BOARD		•				•							
AUGER CHUTE BLOCK-OFF PLATE to AUGER DOOR BOARD			•			•	•						
BIN WALL to HOPPER ASSEMBLY			•			•		•					

Note

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

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

7.2. 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 12. Recommended Impact Gun Torque Values Capacity to Achieve Snug-Tightened Bolts

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

For proper sealing, do not overtighten the wall seam connections. Sealing is not critical on upright splice connections; these connections should be tightened securely to prevent loosening.

Hold the bolt head securely when tightening the nut to prevent damage to the sealing washer.

Important

ALWAYS TIGHTEN THE NUT, NOT THE BOLT.

Avoid bin assembly at temperatures below -10°C (14°F) if possible. Erection in low temperatures does not ensure strong, well sealed connections. Do not substitute bolts in place of those supplied by Westeel.

8. Limited Warranty: Westeel Grain Bin Products

Westeel – Ag Growth International ("Westeel") warrants products that it has manufactured and/or that are branded with its name (the "goods") subject to the following terms and limitations, (the "warranty"):

Duration of Warranty

This warranty will run from the date of purchase from the dealer or distributor, authorized by Westeel. The duration of the warranty is limited as follows:

Galvanized Bins	5 years
EasyFlow2	24 months
Westeel Fans	36 months
Floors	12 months
Catwalk	12 months
Bulk Feed Tanks	24 months
SeedStor-K Cones	
Paint	12 months
Structural	30 months
Elite Cones	
Paint	30 months
Structural	10 years
WESTEEL cones	
Paint	No Warranty
Structural	12 months
Smooth Wall Bins	
Paint	60 months
Structural	10 years
Commercial Smooth Wall Bins	
Paint	12 months
Structural	10 years

Limitation of Remedies Replacement

Within the warranty period, Westeel will replace the goods and/or original manufactured components thereof which are found, to Westeel's satisfaction, to be defective. Westeel is not responsible for direct, indirect, special, consequential, or any other damages of any kind, including personal injury to any individual, howsoever caused, including caused by transportation of the goods for repair or replacement.

Procedure for Obtaining Service

In the event of a warranty claim, the purchaser must complete any and all information required by Westeel in order to properly assess or investigate the claim. Westeel will not be responsible for the removal of any of the goods found to be defective, or transportation charges to and from Westeel's authorized dealer or distributor, or for installation of any replacement goods and/or parts furnished under the warranty.

Limitations as to Scope of Warranty

The warranty does not extend to defects or damage caused, in whole or in part, by:

1. use of a kind and/or to a degree not reasonably expected to be made of the goods;
2. improper storage of the goods both prior to and after purchase;
3. damage caused by, or in the course of, installation or assembly;
4. any use of the goods which is not an intended use as specified in Westeel's published product literature, or otherwise specified by Westeel in writing;
5. any equipment attached to or used in conjunction with the goods;
6. any field modifications or substitutions to original bin components;
7. inadequate ventilation or any other circumstance not in keeping with proper maintenance and/or use of the goods;
8. Acts of God, accident, neglect or abuse of the goods by the purchaser and/or any other individual or entity; or
9. Any use or installation inconsistent with Westeel's Standard Disclaimers.

Limitations as to Manufacturer

The warranty does not cover products sold by Westeel that are not manufactured by Westeel. In those circumstances, the purchaser is referred to the manufacturer of those products.

Limitation of Implied Warranties and Other Remedies

To the extent allowed by law, neither Westeel nor its dealers, nor any company affiliated with Westeel makes any warranties, representations, or promises as to the quality, performance, or freedom from defect of any Product covered by this Warranty.

WESTEEL HEREBY DISCLAIMS, TO THE EXTENT APPLICABLE, ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. A PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THIS WARRANTY ARE THOSE SET FORTH IN THIS WARRANTY. IN NO EVENT WILL WESTEEL, ITS DEALERS, OR ANY COMPANY AFFILIATED WITH WESTEEL BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES.

Some jurisdictions do not allow waivers of certain warranties, so the above waivers may not apply to you. In that event, any implied warranties are limited in duration to ninety (90) days from delivery of the products. You may also have other rights which vary from jurisdiction to jurisdiction.

Exclusive Warranty

This warranty is the only warranty provided by Westeel and all other warranties and/or commitments, whether express or implied and no matter by whom made, statutory or otherwise, are subsumed and replaced by it and are of no legal effect. If any provision of the warranty is held by a court of






competent jurisdiction to be void or unenforceable, in whole or in part, such provision shall be deemed severable and will not affect or impair the legal validity of any other provision of the warranty.

Westeel is an AGI Brand.

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



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Please include the part number listed on the cover page in your message.