

## WIDE CORR GRAIN BINS 18' – 48' CENTURION INSTALLATION AND STORAGE INSTRUCTIONS



**READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY  
BEFORE BEGINNING INSTALLATION  
EFFECTIVE DATE: November 9, 2012**

## **NEW IN THIS MANUAL**

- Corrected "Roof Ring" chart, page 26

## LIMITED WARRANTY

Westeel Division of Vicwest Operating Limited Partnership ("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"):

1. **Duration of Warranty.** The duration of the warranty is limited as follows:

Galvanized Bins	12 months
EasyCheck	12 months
EasyFlow	24 months
EasyAer	12 months
Floors	12 months
SeedStor-K Cones	
Paint	12 months
Structural	30 months
SeedStor Cones	
Paint	30 months
Structural	10 years
Elite Cones	
Paint	30 months
Structural	10 years
WESTEEL cones	
Paint	No warranty
Structural	12 months
Smooth Wall Bins	
Paint	30 months
Structural	10 years

The duration of the warranty will run from the date of purchase from a dealer or distributor authorized by Westeel (the "warranty period").

2. **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
3. **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:

- i. use of a kind and/or to a degree not reasonably expected to be made of the goods;
- ii. improper storage of the goods both prior to and after purchase;
- iii. damage caused by, or in the course of, installation or assembly;
- iv. 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;
- v. any equipment attached to or used in conjunction with the goods;
- vi. any field modifications or substitutions to original bin components;
- vii. inadequate ventilation or any other circumstance not in keeping with proper maintenance and/or use of the goods;
- viii. Acts of God, accident, neglect or abuse of the goods by the purchaser and/or any other individual or entity; or
- ix. Any use or installation inconsistent with Westeel's Standard Disclaimers.

4. **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.

6. **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.

7. **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.

# DISCLAIMERS

## Foundation Design

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.

## Method of Erection

The recommendations for erecting Westeel Grain Bins should be closely followed to achieve the full strength of the bin and to achieve adequate weather sealing. Warranty is void if the recommendations are not followed including but not limited to:

1. Wall sheets and/or uprights, which are 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/ft<sup>3</sup> (880 kg/m<sup>3</sup>).

If using Bin Jacks: Always lift on an upright. Choose a hoist with a suitable capacity for the expected empty bin deadload. Make sure the rated capacity of the hoist is not exceeded.

## Design

These Westeel Grain Bins are designed for:

1. Non-corrosive, free-flowing materials up to 55 lbs/ft<sup>3</sup> (880 kg/m<sup>3</sup>) average compacted bulk density.
2. Maximum horizontal gusted wind speed of 94 mph (151 km/h).
3. Seismic zone 2a (U.B.C. 1997).
4. 15.0 lbs/ft<sup>2</sup> (.72 kPa) roof snow load.  
24.0 lbs/ft<sup>2</sup> (1.15 kPa) roof snow load when the optional roof stiffening rings are installed.
5. 4000 lbs. (17.8 kN) evenly distributed on peak ring for 15' – 24' bins.  
5000 lbs. (22.2 kN) evenly distributed on peak ring for 27' – 48' bins.

## 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 neighbouring 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.

## **Critical Assembly Requirements**

1. Local code and jurisdictional requirements that are applicable to the grain bin installation must be adhered to.
2. Foundations must be designed for the loads being imparted to them, and for local soil conditions. Westeel foundation guidelines are for a set of stated conditions and may not be applicable to local conditions.
3. A foundation must provide uniform and level support to the grain bin structure being supported. Surface imperfections causing gapping must be remedied. This may involve, but not be limited to - grouting under the bottom ring of a non-stiffened bin, and shimming under the uprights of a stiffened bin or under the legs of a hopper.
4. If extending an existing bin, ensure that the foundation is adequate for the increased loads that will be subjected to it.
5. If installing an existing bin on a hopper, ensure that 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, ensure that they are supported.
6. Ensure that the proper hardware is utilized for all bolted connections. Refer to the 'Hardware "Where Used" Chart' in the Installation Manual. If a shortage occurs do not substitute. Take the necessary steps to obtain the proper hardware. Ensure nuts are tightened to the required torque values as provided in the Installation Manual.
7. Refer to the appropriate Installation Manual to ensure a safe, proper structure, in particular but not exclusively for the wall sheet and upright layouts. **Do not deviate from the layouts provided.**
8. Ensure that an integral end-to-end connection exists between mating uprights. Successive uprights must not overlap.

9. 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 bin sheet holes.
10. When installing roof stiffening rings, and 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. On roofs with multiple stiffening rings, stagger the joints to avoid having more than one joint on the same roof sheet.
11. Before anchoring the bin to the foundation, ensure that the bin is round. The maximum variation from perfect roundness is 3/4" on the radius (see details in "wall sheet and bottom angle " section of manual). Locate anchor bolts towards the outside of the anchor bolt holes (away from bin) to permit the incremental expansion that can occur with the initial filling.

### **Grain Bin Use**

1. 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.
2. 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.
3. 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.
4. Ensure that the inner door panels of grain bin doors are completely closed and latched before filling the grain bin.
5. Never enter a loaded grain bin for any reason. Grain can be a killer.

## **Product Storage**

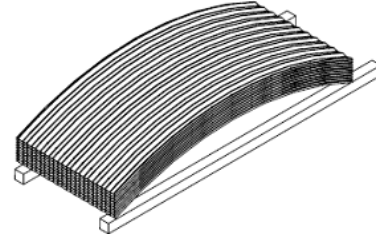
### **Rust on Galvanized Parts**

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.

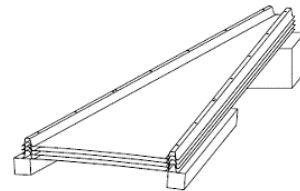
4. If moisture is left on parts, this white rust can become more aggressive and turn into red rust. Red rust can cause degradation in the material and become a structural concern. Any parts that have red rust should be replaced immediately.

### **Storage Guidelines**

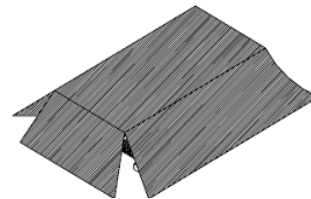
1. Keep all bundles dry before assembly of the bin. Start assembly as soon as possible. Do not lay bundles on the bare ground, raise all bundles 6" – 8" off the ground on wood blocks or timbers. Store curved wall sheets 'hump-up'. All other bundles material should be placed so that they are well sloped to promote good drainage.



2. Roof sheets must be elevated at least 12" at the small end of the sheets.



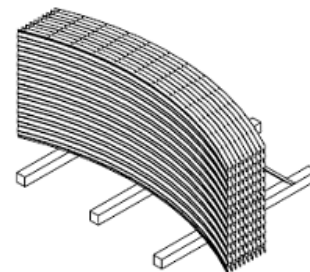
3. Temporary storage can be provided by erecting a simple framework supporting a waterproof tarp.



4. 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.

### **If Parts Become Wet**

1. If goods become submerged or wet, the bundles should be opened as soon as possible, sheets or material separated and dried. Keep separated until assembly. Brace goods properly so as to avoid damage or injury from material falling when in storage.



2. Any boxed goods that become wet should be dried and stored in a new box that is free of moisture.
3. In addition to wiping down wallsheets, 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.



# IMPORTANT NOTES

1. 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.
2. To keep an even pressure on walls, the bin must always be unloaded from the centre.
3. Contact local power officials for minimum power line clearance.
4. See "Disclaimers - Design" for materials which can be stored.
5. Tighten all bolts to the recommended torque setting (see Recommended Bolt Torques table in Appendix).
6. Do not locate grain bin 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.

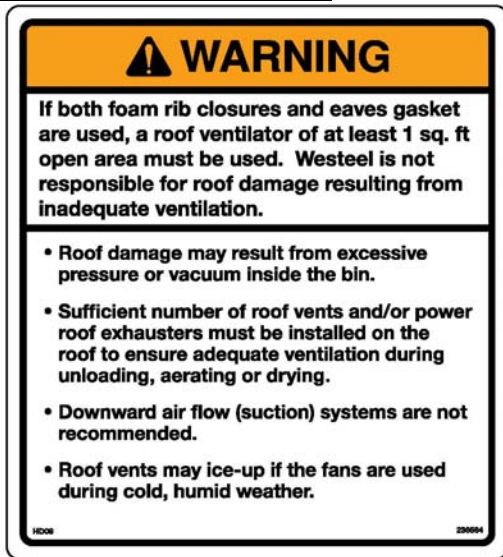
### Shortages and Damaged Parts:

Report damaged parts or shortages immediately to the delivering carrier, followed by a confirming letter requesting inspection by the carrier, if required. Order any 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 bill are signed as received in good condition.

### 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 instructions supplied with optional equipment.

### List of Warning Decals:



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Consistent with Westeel Limited's policy of continued research and development of our products, we reserve the right to modify or change information contained in this publication Without notice.

# **Instructions For cutting Openings in Westeel Wide Corr Grain Bins**

## **A. 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.

## **B. 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.

## **C. 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;

## **D. 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".

# CENTURION GRAIN BIN SPECIFICATIONS

MODEL	BIN DIAMETER	CAPACITY <sup>(a)</sup>			HEIGHT			
		bu <sup>(b)</sup>	m <sup>3</sup>	Tonnes <sup>(c)</sup>	EAVES		OVERALL	
					ft	m	ft	m
1813	17' 11" 5.46 m	10510	353	285	47.8	14.58	52.6	16.05
1814		11290	379	306	51.5	15.70	56.3	17.16
2113	20' 11" 6.37 m	14390	484	390	47.8	14.58	53.5	16.31
2114		15450	519	419	51.5	15.70	57.2	17.42
2413	23' 10" 7.28 m	18900	635	513	47.8	14.58	54.4	16.57
2414		20280	682	550	51.5	15.70	58.0	17.69
2415		21670	728	588	55.2	16.81	61.7	18.80
2416		23050	775	625	58.8	17.93	65.4	19.92
2417		24440	821	663	62.5	19.05	69.0	21.04
2418		25820	868	700	66.2	20.17	72.7	22.16
2713		26' 10" 8.19 m	24050	809	652	47.8	14.58	55.2
2714	25800		868	700	51.5	15.70	58.9	17.95
2715	27550		926	747	55.2	16.81	62.6	19.07
2716	29310		985	795	58.8	17.93	66.2	20.19
2717	31060		1044	843	62.5	19.05	69.9	21.30
2718	32810		1103	890	66.2	20.17	73.6	22.42
3013	29' 10" 9.10 m	29850	1004	810	47.8	14.58	55.6	16.95
3014		32020	1077	868	51.5	15.70	59.3	18.07
3015		34180	1149	927	55.2	16.81	62.9	19.19
3016		36340	1222	986	58.8	17.93	66.6	20.31
3017		38510	1295	1045	62.5	19.05	70.3	21.42
3018		40670	1367	1103	66.2	20.17	73.9	22.54
3019		42840	1440	1162	69.8	21.29	77.6	23.66
3020		45000	1512	1221	73.5	22.40	81.3	24.78
3313	32' 10" 10.01 m	36310	1222	985	47.8	14.58	56.5	17.22
3314		38930	1310	1056	51.5	15.70	60.2	18.34
3315		41550	1398	1127	55.2	16.81	63.8	19.45
3316		44170	1485	1198	58.8	17.93	67.5	20.57
3317		46790	1573	1269	62.5	19.05	71.2	21.69
3318		49410	1661	1340	66.2	20.17	74.8	22.81
3319		52030	1749	1411	69.8	21.29	78.5	23.92
3320		54650	1837	1482	73.5	22.40	82.2	25.04
3321		57260	1925	1553	77.2	23.52	85.8	26.16
3322		59880	2013	1624	80.8	24.64	89.5	27.28
3323		62500	2100	1695	84.5	25.76	93.2	28.39
3613		35' 10" 10.91 m	43450	1462	1178	47.8	14.58	57.4
3614	46560		1567	1263	51.5	15.70	61.0	18.60
3615	49680		1671	1348	55.2	16.81	64.7	19.72
3616	52800		1776	1432	58.8	17.93	68.4	20.83
3617	55920		1881	1517	62.5	19.05	72.0	21.95
3618	59030		1985	1601	66.2	20.17	75.7	23.07
3619	62150		2090	1686	69.8	21.29	79.4	24.19
3620	65270		2194	1770	73.5	22.40	83.0	25.30
3621	68380		2299	1855	77.2	23.52	86.7	26.42
3622	71500		2403	1939	80.8	24.64	90.4	27.54
3623	74620		2508	2024	84.5	25.76	94.0	28.66
4213	41' 9" 12.73 m	59770	2013	1621	47.8	14.58	59.1	18.01
4214		64010	2155	1736	51.5	15.70	62.7	19.12
4215		68260	2297	1851	55.2	16.81	66.4	20.24
4216		72500	2440	1966	58.8	17.93	70.1	21.36
4217		76740	2582	2082	62.5	19.05	73.7	22.48
4218		80980	2724	2197	66.2	20.17	77.4	23.59
4219		85230	2867	2312	69.8	21.29	81.1	24.71
4220		89470	3009	2427	73.5	22.40	84.7	25.83
4221		93710	3151	2542	77.2	23.52	88.4	26.95
4222		97950	3294	2657	80.8	24.64	92.1	28.06
4223		102200	3436	2772	84.5	25.76	95.7	29.18
4813	47' 9" 14.55 m	78900	2658	2140	47.8	14.58	60.8	18.53
4814		84440	2844	2290	51.5	15.70	64.5	19.65
4815		89980	3030	2441	55.2	16.81	68.1	20.77
4816		95520	3216	2591	58.8	17.93	71.8	21.88
4817		101060	3402	2741	62.5	19.05	75.5	23.00
4818		106600	3587	2892	66.2	20.17	79.1	24.12
4819		112140	3773	3042	69.8	21.29	82.8	25.24
4820		117690	3959	3192	73.5	22.40	86.5	26.36
4821		123230	4145	3342	77.2	23.52	90.1	27.47
4822		128770	4331	3493	80.8	24.64	93.8	28.59
4823		134310	4517	3643	84.5	25.76	97.5	29.71

- (a) Capacity based on bin filled to eaves line with 30° filling angle of repose
- (b) Based on 1.244 cu. ft. per bushel and 5% compaction below eaves line
- (c) Based on bulk density=770 kg/m<sup>3</sup> and 5% compaction below eaves line

**FOUNDATION LOADS - GRAIN BIN SERIES CEN**  
**IMPERIAL**  
**UNFACTORED**

<b>Model</b>	1813 CEN	1814 CEN	2113 CEN	2114 CEN	2413 CEN	2414 CEN	2415 CEN	2416 CEN	2417 CEN	2418 CEN
Vertical dead load	0.7	0.8	0.7	0.8	0.8	0.9	1.0	1.0	1.1	1.2
Vertical grain load	46.8	54.6	49.8	55.6	53.2	59.5	66.0	72.6	79.7	89.8
Vertical roof snow load *	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Vertical roof peak load	0.30	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Bin floor pressure	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5	1.6
Number of anchor bolts for uprights	12	12	16	16	16	16	16	16	16	16
Number of anchor bolts for bottom angle ring	36	36	42	42	48	48	48	48	48	48

<b>Model</b>	2713 CEN	2714 CEN	2715 CEN	2716 CEN	2717 CEN	2718 CEN	3013 CEN	3014 CEN	3015 CEN	3016 CEN
Vertical dead load	0.8	1.0	1.0	1.1	1.2	1.3	0.8	0.9	1.1	1.2
Vertical grain load	51.2	62.9	69.9	77.1	84.4	91.9	46.2	57.6	70.5	81.1
Vertical roof snow load *	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Vertical roof peak load	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Bin floor pressure	1.5	1.5	1.6	1.6	1.7	1.7	1.6	1.6	1.7	1.7
Number of anchor bolts for uprights	18	18	18	18	18	18	10	10	10	10
Number of anchor bolts for bottom angle ring	54	54	54	54	54	54	60	60	60	60

\* Based on maximum snow load of 24 psf

**IMPORTANT**

Grain Bin Anchoring: Adequate anchoring is critical to a successful bin installation. The anchoring of the bin is dependent on local wind loading conditions and forms part of the site specific design requirements. The anchor bolt details must form part of the site specific foundation design.

For stiffened bins the primary anchor bolt locations are through the base plates at each and every upright location. The anchor bolt design, plus connection details to the base plate, must accommodate the total shear and uplift loads that can occur due to wind loading at the site in question.

In addition Westeel suggests the use of 1/2" x 3" embedment anchor bolts through the bottom ring angle to insure bin roundness, for sealing purposes, and for additional localized lateral stability.

**FOUNDATION LOADS - GRAIN BIN SERIES CEN**  
**IMPERIAL**  
**UNFACTORED**

<b>Model</b>	3017 CEN	3018 CEN	3019 CEN	3020 CEN	3313 CEN	3314 CEN	3315 CEN	3316 CEN	3317 CEN	3318 CEN
Vertical dead load	1.3	1.4	1.5	1.6	0.9	0.9	1.1	1.2	1.4	1.5
Vertical grain load	88.9	96.9	105.1	113.4	43.8	52.4	64.4	78.0	93.0	101.5
Vertical roof snow load *	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
Vertical roof peak load	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Bin floor pressure	1.8	1.8	1.9	1.9	1.7	1.7	1.8	1.8	1.9	1.9
Number of anchor bolts for uprights	20	20	20	20	22	22	22	22	22	22
Number of anchor bolts for bottom angle ring	60	60	60	60	66	66	66	66	66	66

<b>Model</b>	3319 CEN	3320 CEN	3321 CEN	3322 CEN	3323 CEN	3613 CEN	3614 CEN	3615 CEN	3616 CEN	3617 CEN
Vertical dead load	1.6	1.8	2.0	2.1	2.3	0.9	1.0	1.1	1.2	1.3
Vertical grain load	110.2	119.0	128.0	137.2	146.5	45.4	51.0	58.9	71.6	85.8
Vertical roof snow load *	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0
Vertical roof peak load	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bin floor pressure	2.0	2.0	2.0	2.1	2.1	1.7	1.8	1.9	1.9	2.0
Number of anchor bolts for uprights	22	22	22	22	22	24	24	24	24	24
Number of anchor bolts for bottom angle ring	66	66	66	66	66	72	72	72	72	72

\* Based on maximum snow load of 24 psf

**IMPORTANT**

Grain Bin Anchoring: Adequate anchoring is critical to a successful bin installation. The anchoring of the bin is dependent on local wind loading conditions and forms part of the site specific design requirements. The anchor bolt details must form part of the site specific foundation design.

For stiffened bins the primary anchor bolt locations are through the base plates at each and every upright location. The anchor bolt design, plus connection details to the base plate, must accommodate the total shear and uplift loads that can occur due to wind loading at the site in question.

In addition Westeel suggests the use of 1/2" x 3" embedment anchor bolts through the bottom ring angle to insure bin roundness, for sealing purposes, and for additional localized lateral stability.

**FOUNDATION LOADS - GRAIN BIN SERIES CEN**  
**IMPERIAL**  
**UNFACTORED**

<b>Model</b>	3618 CEN	3619 CEN	3620 CEN	3621 CEN	3622 CEN	3623 CEN	4213 CEN	4214 CEN	4215 CEN	4216 CEN
Vertical dead load	1.6	1.8	1.9	2.1	2.2	2.4	1.0	1.1	1.2	1.3
Vertical grain load	101.4	114.8	124.2	133.7	143.4	153.2	48.3	54.3	60.6	67.2
Vertical roof snow load *	1.0	1.0	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
Vertical roof peak load	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bin floor pressure	2.0	2.1	2.1	2.2	2.2	2.2	1.9	1.9	2.0	2.1
Number of anchor bolts for uprights	24	24	24	24	24	24	28	28	28	28
Number of anchor bolts for bottom angle ring	66	66	66	66	66	66	84	84	84	84

<b>Model</b>	4217 CEN	4218 CEN	4219 CEN	4220 CEN	4221 CEN	4222 CEN	4223 CEN	4813 CEN	4814 CEN	4815 CEN
Vertical dead load	1.4	1.6	1.8	2.1	2.4	2.6	2.7	1.1	1.2	1.3
Vertical grain load	73.9	87.3	102.7	119.6	137.9	154.4	165.2	50.9	57.3	64.0
Vertical roof snow load *	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.4	1.4	1.4
Vertical roof peak load	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bin floor pressure	2.1	2.2	2.3	2.3	2.4	2.4	2.5	2.0	2.1	2.1
Number of anchor bolts for uprights	28	28	28	28	28	28	28	32	32	32
Number of anchor bolts for bottom angle ring	84	84	84	84	84	84	84	96	96	96

\* Based on maximum snow load of 24 psf

**IMPORTANT**

Grain Bin Anchoring: Adequate anchoring is critical to a successful bin installation. The anchoring of the bin is dependent on local wind loading conditions and forms part of the site specific design requirements. The anchor bolt details must form part of the site specific foundation design.

For stiffened bins the primary anchor bolt locations are through the base plates at each and every upright location. The anchor bolt design, plus connection details to the base plate, must accommodate the total shear and uplift loads that can occur due to wind loading at the site in question.

In addition Westeel suggests the use of 1/2" x 3" embedment anchor bolts through the bottom ring angle to insure bin roundness, for sealing purposes, and for additional localized lateral stability.

**FOUNDATION LOADS - GRAIN BIN SERIES CEN**  
**IMPERIAL**  
**UNFACTORED**

<b>Model</b>	4816 CEN	4817 CEN	4818 CEN	4819 CEN	4820 CEN	4821 CEN	4822 CEN	4823 CEN
Vertical dead load	1.4	1.5	1.6	1.8	2.0	2.3	2.6	2.9
Vertical grain load	kips/upr	78.1	85.5	93.1	104.6	121.2	139.3	158.9
Vertical roof snow load *	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Vertical roof peak load	kips/upr	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bin floor pressure	kips/ft <sup>2</sup>	2.2	2.3	2.4	2.4	2.5	2.6	2.7
Number of anchor bolts for uprights		32	32	32	32	32	32	32
Number of anchor bolts for bottom angle ring		96	96	96	96	96	96	96

Based on maximum snow load of 24 psf

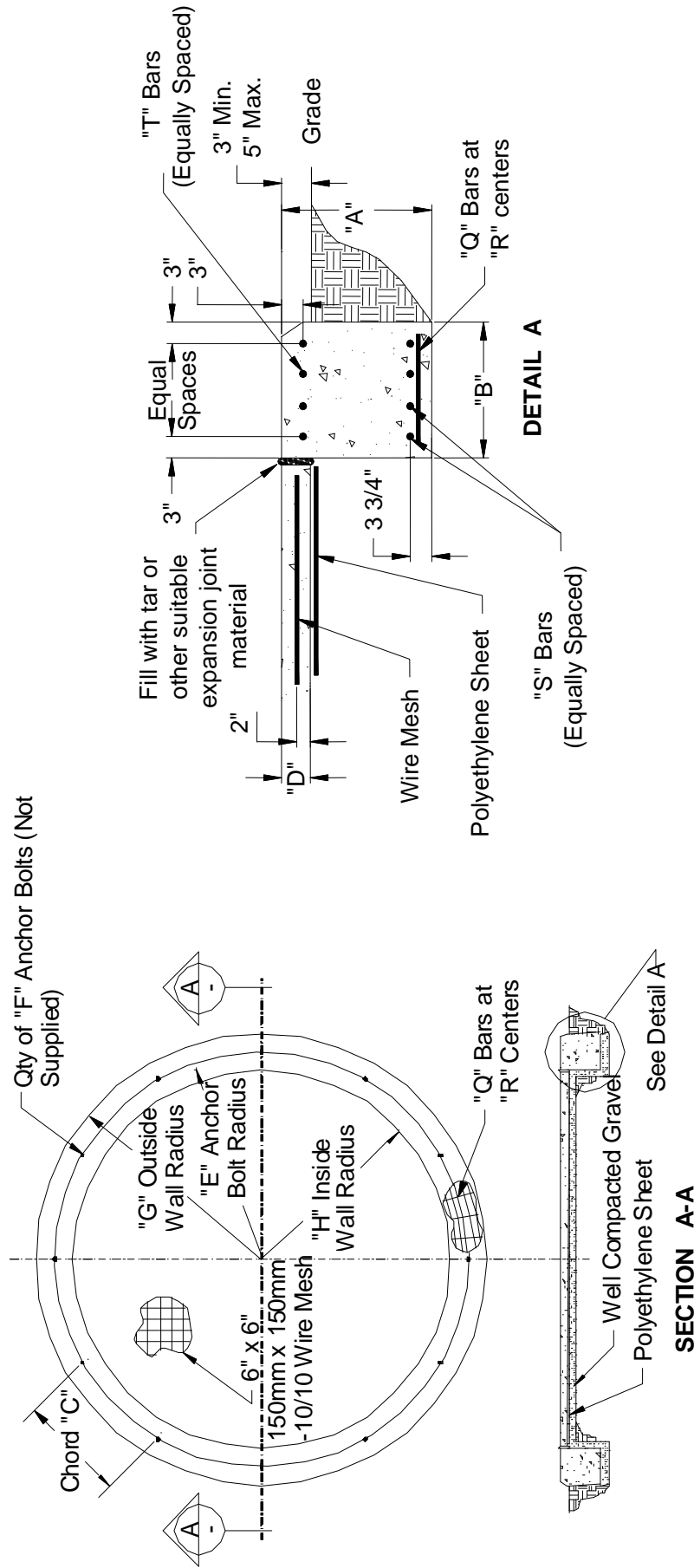
**IMPORTANT**

Grain Bin Anchoring: Adequate anchoring is critical to a successful bin installation. The anchoring of the bin is dependent on local wind loading conditions and forms part of the site specific design requirements. The anchor bolt details must form part of the site specific foundation design.

For stiffened bins the primary anchor bolt locations are through the base plates at each and every upright location. The anchor bolt design, plus connection details to the base plate, must accommodate the total shear and uplift loads that can occur due to wind loading at the site in question.

In addition Westeel suggests the use of 1/2" x 3" embedment anchor bolts through the bottom ring angle to insure bin roundness, for sealing purposes, and for additional localized lateral stability.

# CURB FOOTING – FLOATING SLAB FOUNDATION



**IMPORTANT:** Foundation level should not vary by more than 1/4" over a span of four feet under Bottom Ring Angle. Any variance from level must be shimmed under Upright (see note 4; also see Upright Assembly).

**NOTES:**

- 1) Choose a site which is well drained, and has a minimum soil-bearing capacity of 4000 lbs. per sq. ft. (192 kPa). If soil-bearing capacity is not known, consult a local engineering representative.
- 2) Use minimum 4" to 6" (100 - 150mm) of well-compacted coarse granular material below slab and curb footing.
- 3) Concrete strength shall be minimum 3000 psi (lbs/ sq inch) [21 MPa] compressive strength.
- 4) Foundation shall be kept level to within 1/4" in 4' [6 mm in 1200 mm].
- 5) Locate anchor bolt as specified in the table to ensure bin roundness
- 6) Re-bar end laps are not included. Add 15" [380mm] for each lap. To estimate weight of end lap: add 0.5 lbs. for #3 and 1.0 lbs. for #4, 0.3 kg for 10M and 0.6 kg for 15M.
- 7) Concrete slump for reinforced wall to be 5" (130 mm) maximum and 2" (50 mm) minimum.
- 8) Reinforcing bars for concrete reinforcement shall conform to Grade 40, 40000 psi (28 MPa) or grade 60, 60000 psi (420 MPa) as called for in the following: ASTM<sup>®</sup> A615, A616, or A617.
- 9) Welded wire mesh for concrete reinforcement shall conform to ASTM<sup>®</sup> A185, or A497.

- (1) ACI American Concrete Institute
- (2) ASTM American Society for Testing Materials



**CURB FOOTING SPECIFICATIONS  
(EXTERNALLY STIFFENED BINS)  
18' to 30'**

BIN MODEL		1813 1814	2113 2114	2413	2414 2415 2416	2713	2714 2715 2716	3013	3014 3015 3016
A		2'-4"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
B		2'-8"	2'-10"	3'-0"	4'-2"	3'-2"	4'-6"	3'-4"	4'-8"
C		4'-9 1/4"	4'-9 3/16"	4'-9 1/8"	4'-9 1/18"	4'-9 1/16"	4'-9 1/16"	4'-9"	4'-9"
D		6"	6"	6"	6"	6"	6"	6"	6"
E		9'-2 9/16"	10'-8 7/16"	12'-2 3/8"	12'-2 3/8"	13'-8 5/16"	13'-8 5/16"	15'-2 3/16"	15'-2 3/16"
F		12	14	16	16	18	18	20	20
G		10'-7"	12'-2"	13'-8"	14'-3"	15'-3"	15'-11"	16'-10"	17'-6"
H		7'-11"	9'-4"	10'-8"	10'-1"	12'-1"	11'-5"	13'-6"	12'-10"
Q	Metric	39 - 10M	45 - 10M	54 - 10M	51 - 15M	69 - 10M	58 - 15M	82 - 10M	68 - 15M
	Imperial	41 - #3	58 - #3	77 - #3	51 - #5	94 - #3	58 - #5	115 - #3	68 - #5
R	Metric	18" c/c	18" c/c	17" c/c	18" c/c	15" c/c	18" c/c	14" c/c	17" c/c
	Imperial	17" c/c	14" c/c	12" c/c	18" c/c	11" c/c	18" c/c	10" c/c	17" c/c
S	Metric	6 - 10M	6 - 10M	6 - 10M	4 - 15M	6 - 10M	5 - 15M	7 - 10M	6 - 15M
	Imperial	5 - #4	5 - #4	5 - #4	4 - #5	5 - #4	5 - #5	5 - #4	5 - #5
T	Metric	6 - 10M	5 - 10M	6 - 10M	4 - 15M	6 - 10M	4 - 15M	6 - 10M	4 - 15M
	Imperial	4 - #4	4 - #4	4 - #4	4 - #5	5 - #4	4 - #5	4-#5	4 - #5
Reinforcing Rod	M (kgs.)	188	203	252	383	291	481	353	547
	I (lbs.)	383	457	532	833	668	1049	760	1191
Wire Mesh (sq. ft.)		197	274	358	320	459	410	573	518
Concrete (3000 PSI) Cubic Yards	Foot- ing	13.4	14.2	17.0	23.6	20.2	28.7	23.6	33.0
	Slab	3.7	5.1	6.7	6.0	8.5	7.6	10.7	9.6

**NOTES:**

1. The anchor bolts at the upright locations should be chosen so that they can handle the loads imposed on them and that the head, either alone or with large diameter heavy washers, is large enough to sufficiently cover the 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.

2. One 1/2"x 3" (minimum embedment) anchor bolt needs to be installed into every slot into the bottom angle (6 per angle) to ensure that the bin is fixed round at the bottom.

**CURB FOOTING SPECIFICATIONS  
(EXTERNALLY STIFFENED BINS)  
33' to 48'**

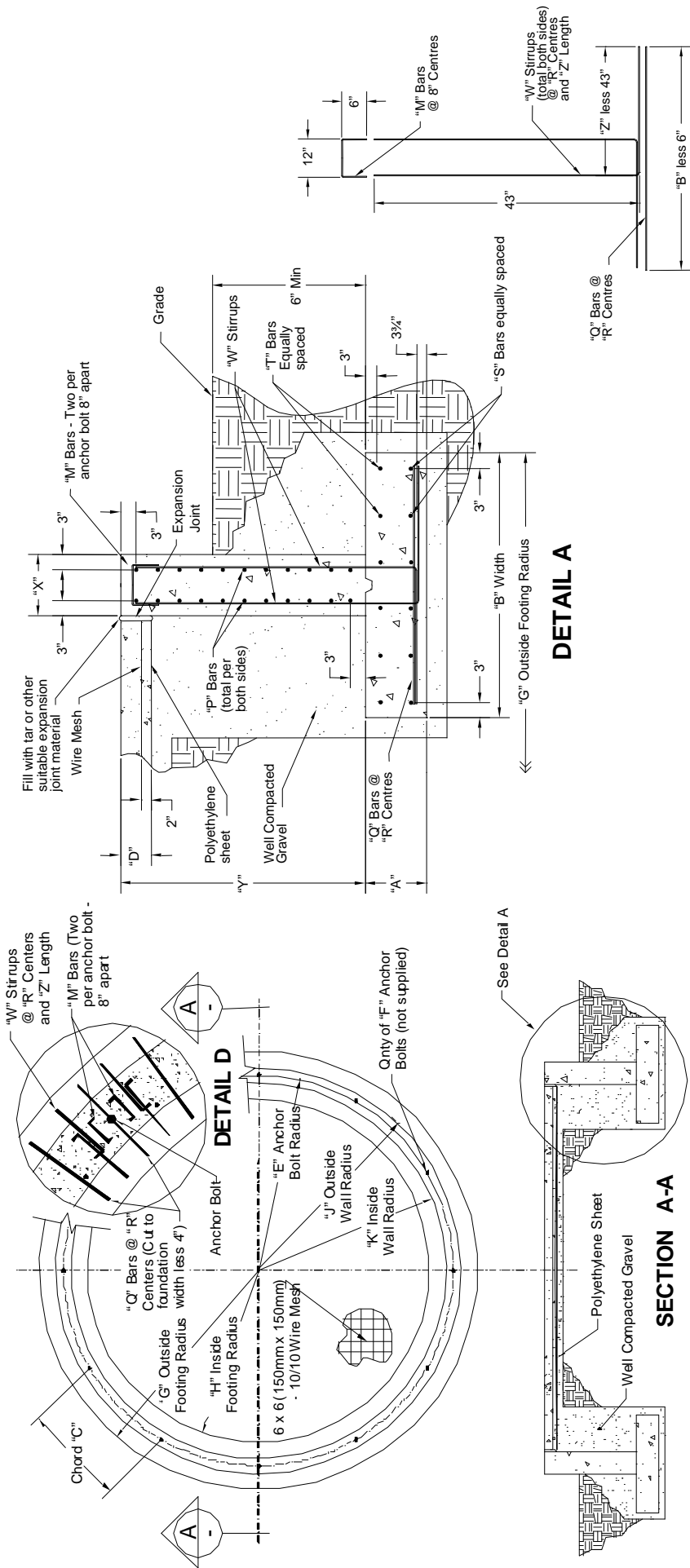
BIN MODEL		3313	3314 3315 3316	3613	3614 3615 3616	4213	4214 4215 4216	4813	4814 4815 4816
A		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
B		3'-6"	4'-10"	3'-8"	5'-2"	3'-10"	5'-6"	4'-0"	5'-8"
C		4'-8 15/16"	4'-8 15/16"	4'-8 15/16"	4'-8 15/16"	4'-8 13/16"	4'-8 13/16"	4'-8 3/4"	4'-8 3/4"
D		6"	6"	6"	6"	6"	6"	6"	6"
E		16'-8 1/8"	16'-8 1/8"	18'-2"	18'-2"	21'-1 13/16"	21'-1 13/16"	24'-1 5/8"	24'-1 5/8"
F		22	22	24	24	28	28	32	32
G		18'-5"	19'-1"	20'-0"	20'-9"	23'-1"	23'-11"	26'-2"	27'-0"
H		14'-11"	14'-3"	16'-4"	15'-7"	19'-3"	18'-5"	22'-2"	21'-4"
Q	Metric	97 - 10M	84 - 15M	115 - 10M	92 - 15M	145 - 10M	123 - 15M	183 - 10M	152 - 15M
	Imperial	140 - #3	84 - #5	153 - #3	92 - #5	114 - #4	123 - #5	141 - #4	152 - #5
R	Metric	13" c/c	15" c/c	12" c/c	15" c/c	11" c/c	13" c/c	10" c/c	12" c/c
	Imperial	9" c/c	15" c/c	9" c/c	15" c/c	14" c/c	13" c/c	13" c/c	12" c/c
S	Metric	7 - 10M	5 - 15M	7 - 10M	5 - 15M	7 - 10M	5 - 15M	8 - 10M	6 - 15M
	Imperial	5 - #4	5 - #5	6 - #4	5 - #5	6 - #4	5 - #5	6 - #4	6 - #5
T	Metric	6 - 10M	4 - 15M	6 - 10M	5 - 15M	7 - 10M	5 - 15M	7 - 10M	5 - 15M
	Imperial	5 - #4	4 - #5	5 - #4	5 - #5	6 - #4	5 - #5	6 - #4	5 - #5
Reinforcing Rod	M (kgs.)	396	626	443	752	562	931	699	1175
	I (lbs.)	858	1363	1021	1639	1320	2029	1547	2562
Wire Mesh (sq. ft.)		700	638	839	763	1165	1066	1544	1430
Concrete (3000 PSI) Cubic Yards	Foot-ing	27.2	37.5	31.0	43.7	37.8	54.2	45.0	63.8
	Slab	13.0	11.9	15.6	14.2	21.6	19.8	28.6	26.5

**NOTES:**

1. The anchor bolts at the upright locations should be chosen so that they can handle the loads imposed on them and that the head, either alone or with large diameter heavy washers, is large enough to sufficiently cover the 1.06" x 1.80" anchoring slot provided in the base plate. The base plate should not be able to pull up over the nut.

2. One 1/2" x 3" (min. embedment) anchor bolt needs to be installed into every slot into the bottom angle (6 per angle) to ensure that the bin is fixed round at the bottom.

# T-FOOTING – FLOATING SLAB FOUNDATION



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

**IMPORTANT:** Foundation level should not vary by more than 1/4" over a span of four feet under Bottom Ring Angle. Any variance from level must be shimmed under Upright (see note 4; also see Upright Assembly).

**NOTES:**

- 1) Choose a site which is well drained, and has a minimum soil-bearing capacity of 4000 lbs. per sq. ft. (192 kPa). If soil-bearing capacity is not known, consult a local engineering representative.
- 2) Use 4" to 6" (100 - 150mm) of well-compacted coarse gravel below slab and ring footing.
- 3) Use 3000 lbs. per sq. in. (21 MPa) concrete.
- 4) Make sure the foundation is level. The bin wall must have a uniform support to carry the wall loads. Weather-sealing the bottom is also made easier if the foundation is level. Camber the outside edge of the concrete to ensure that water drains off.
- 5) Locate anchor bolt as specified in table to ensure bin roundness.
- 6) Re-bar end laps are not included. Add 15" (380mm) for each lap. To estimate weight of end lap: add 0.5 lbs. for #3 (I), add 0.3 kg. for #10 (M), add 1.0 lbs. for #4 (I), add 0.6 kg. for #15 (M).
- 7) Concrete slump for reinforced wall to be 5" (130mm) max. and 2" (50mm) min.

## T-FOOTING SPECIFICATIONS (EXTERNALLY STIFFENED BINS)

BIN MODEL		1813	2113	2413	2414 2415 2416	2417 2418	2713	2714 2715 2716	2717 2718
A		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
B		2'-10"	3'-2"	3'-4"	4'-6"	5'-6"	3'-6"	4'-10"	5'-10"
C		4'-9 1/4"	4'-9 3/16"	4'-9 1/8"	4'-9 1/8"	4'-9 1/8"	4'-9 1/16"	4'-9 1/16"	4'-9 1/16"
D		6"	6"	6"	6"	6"	6"	6"	6"
E		9'-2 9/16"	10'-8 1/2"	12'-2 3/8"	12'-2 3/8"	12'-2 3/8"	13'-8 5/16"	13'-8 5/16"	13'-8 5/16"
F		12	14	16	16	16	18	18	18
G		10'-7"	12'-3"	13'-10"	14'-5"	14'-11"	15'-5"	16'-1"	16'-7"
H		7'-9"	9'-1"	10'-6"	9'-11"	9'-5"	11'-11"	11'-3"	10'-9"
J		9'-11"	11'-5"	12'-11"	12'-11"	12'-11"	14'-5"	14'-5"	14'-5"
K		8'-5"	9'-11"	11'-5"	11'-5"	11'-5"	12'-11"	12'-11"	12'-11"
X		1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
Y		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
M	Metric <sup>(1)</sup>	24 - 10M	28 - 10M	32 - 10M	32 - 10M	32 - 10M	36 - 10M	36 - 10M	36 - 10M
	Imperial	24 - #3	28 - #3	32 - #3	32 - #3	32 - #3	36 - #3	36 - #3	36 - #3
P	Metric <sup>(1)</sup>	6 - 10M	6 - 10M	6 - 10M	6 - 10M	6 - 10M	6 - 10M	6 - 10M	6 - 10M
	Imperial	8 - #3	8 - #3	8 - #3	8 - #3	8 - #3	8 - #3	8 - #3	8 - #3
Q	Metric <sup>(1)</sup>	0	0	0	51 - 10M	66 - 10M	0	65 - 10M	57 - 10M
	Imperial	0	0	0	54 - #3	54 - #4	0	65 - #3	65 - #4
R	Metric <sup>(1)</sup>	18" c/c	17" c/c	14" c/c	18" c/c	14" c/c	13" c/c	16" c/c	18" c/c
	Imperial	18" c/c	18" c/c	18" c/c	17" c/c	17" c/c	17" c/c	16" c/c	16" c/c
S	Metric <sup>(1)</sup>	4 - 10M	4 - 10M	5 - 10M	6 - 10M	7 - 10M	5 - 10M	7 - 10M	8 - 10M
	Imperial	6 - #3	6 - #3	6 - #3	9 - #3	6 - #4	7 - #3	9 - #3	6 - #4
T	Metric <sup>(1)</sup>	4 - 10M	4 - 10M	4 - 10M	6 - 10M	7 - 10M	4 - 10M	6 - 10M	7 - 10M
	Imperial	5 - #3	6 - #3	6 - #3	8 - #3	6 - #4	6 - #3	9 - #3	6 - #4
W	Metric <sup>(1)</sup>	78 - 10M	96 - 10M	132 - 10M	102 - 10M	132 - 10M	160 - 10M	130 - 10M	114 - 15M
	Imperial	78 - #4	90 - #4	102 - #4	108 - #4	108 - #4	122 - #4	130 - #4	130 - #4
Z		5'-3"	5'-5"	5'-6"	6'-1"	6'-7"	5'-7"	6'-3"	6'-9"
Reinforcing Rod	M (kgs.)	303	364	465	542	669	540	670	891
	I (lbs.)	704	851	974	1263	1523	1161	1516	1791
Wire Mesh (sq. ft.)		223	309	410	410	410	524	524	524
Concrete (3000 PSI) Cubic Yards	Ftng.	12.1	15.8	18.9	25.5	31.2	22.3	30.1	37.1
	Wall	6.4	7.5	8.5	8.5	8.5	9.6	9.6	9.6
	Slab	4.2	5.8	7.6	7.6	7.6	9.7	9.7	9.7

<sup>(1)</sup>The following table provides conversion from Canadian Metric to European Standard EN 10080/BS 4449

### Conversion for European Reinforcing Bar

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

## T-FOOTING SPECIFICATIONS (EXTERNALLY STIFFENED BINS)

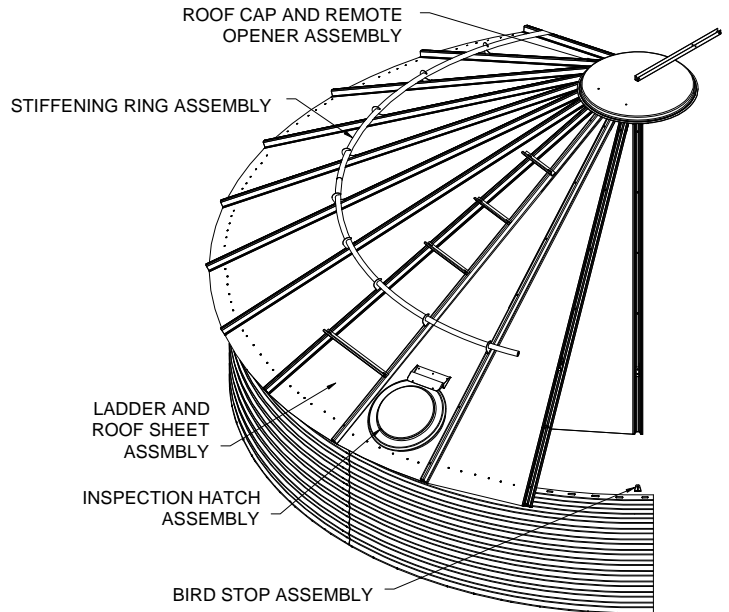
BIN MODEL		3013	3014 3015 3016	3017 3018	3313	3314 3315 3316	3317 3318	3613	3614 3615 3616	3617 3618
A		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
B		3'-8"	5'-0"	6'-2"	3'-10"	5'-4"	6'-4"	4'-0"	5'-6"	6'-8"
C		4'-9"	4'-9"	4'-9"	4'-8 15/16"	4'-8 15/16"	4'-8 15/16"	4'-8 15/16"	4'-8 15/16"	4'-8 15/16"
D		6"	6"	6"	6"	6"	6"	6"	6"	6"
E		15'-2 3/16"	15'-2 3/16"	15'-2 3/16"	16'-8 1/8"	16'-8 1/8"	16'-8 1/8"	18'-2"	18'-2"	18'-2"
F		20	20	20	22	22	22	24	24	24
G		17'-0"	17'-8"	18'-3"	18'-7"	19'-4"	19'-10"	20'-2"	20'-11"	21'-6"
H		13'-4"	12'-8"	12'-1"	14'-9"	14'-0"	13'-6"	16'-2"	15'-5"	14'-10"
J		15'-11"	15'-11"	15'-11"	17'-5"	17'-5"	17'-5"	18'-11"	18'-11"	18'-11"
K		14'-5"	14'-5"	14'-5"	15'-11"	15'-11"	15'-11"	17'-5"	17'-5"	17'-5"
X		1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
Y		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
M	Metric	40 - 10M	40 - 10M	40 - 10M	44 - 10M	44 - 10M	44 - 10M	48 - 10M	48 - 10M	48 - 10M
	Imperial	40 - #3	40 - #3	40 - #3	44 - #3	44 - #3	44 - #3	48 - #3	48 - #3	48 - #3
P	Metric	6 - 10M	6 - 10M	6 - 10M	8 - 10M	8 - 10M	8 - 10M	8 - 10M	8 - 10M	8 - 10M
	Imperial	8 - #3	8 - #3	8 - #3	10 - #3	10 - #3	10 - #3	10 - #3	10 - #3	10 - #3
Q	Metric	64 - 10M	76 - 10M	67 - 10M	70 - 10M	90 - 10M	79 - 10M	76 - 10M	106 - 10M	92 - 10M
	Imperial	64 - #3	82 - #3	82 - #4	70 - #3	90 - #3	90 - #4	76 - #3	106 - #3	106 - #4
R	Metric	18" c/c	15" c/c	17" c/c	18" c/c	14" c/c	16" c/c	18" c/c	13" c/c	15" c/c
	Imperial	18" c/c	14" c/c	14" c/c	18" c/c	14" c/c	14" c/c	18" c/c	13" c/c	13" c/c
S	Metric	5 - 10M	7 - 10M	8 - 10M	5 - 10M	7 - 10M	9 - 10M	6 - 10M	8 - 10M	9 - 10M
	Imperial	7 - #3	6 - #4	7 - #4	7 - #3	6 - #4	7 - #4	4 - #4	6 - #4	7 - #4
T	Metric	5 - 10M	6 - 10M	8 - 10M	5 - 10M	7 - 10M	8 - 10M	5 - 10M	7 - 10M	9 - 10M
	Imperial	6 - #3	5 - #4	6 - #4	7 - #3	5 - #4	6 - #4	4 - #4	6 - #4	7 - #4
W	Metric	128 - 10M	152 - 10M	134 - 15M	140 - 10M	180 - 10M	158 - 15M	152 - 10M	212 - 10M	184 - 15M
	Imperial	128 - #4	164 - #4	164 - #4	140 - #4	180 - #4	180 - #4	152 - #4	212 - #4	212 - #4
Z		5'-8"	6'-4"	6'-11"	5'-9"	6'-6"	7'-0"	5'-10"	6'-7"	7'-2"
Reinforcing Rod	M (kgs.)	607	765	1069	721	955	1287	819	1112	1499
	l (lbs.)	1344	1850	2213	1604	2142	2539	1768	2512	2985
Wire Mesh (sq. ft.)		653	653	653	796	796	796	953	953	953
Concrete (3000 PSI) Cubic Yards	Ftng.	26.3	35.3	43.6	29.8	41.4	49.2	33.9	46.5	56.4
	Wall	10.6	10.6	10.6	11.7	11.7	11.7	12.7	12.7	12.7
	Slab	12.1	12.1	12.1	14.8	14.8	14.8	17.7	17.7	17.7

## T-FOOTING SPECIFICATIONS (EXTERNALLY STIFFENED BINS)

BIN MODEL		4213	4214 4215 4216	4217 4218	4813	4814 4815 4816	4817 4818
A		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
B		4'-2"	5'-10"	7'-0"	4'-4"	6'-2"	7'-6"
C		4'-8 13/16"	4'-8 13/16"	4'-8 13/16"	4'-8 3/4"	4'-8 3/4"	4'-8 3/4"
D		6"	6"	6"	6"	6"	6"
E		21'-1 13/16"	21'-1 13/16"	21'-1 13/16"	24'-1 5/8"	24'-1 5/8"	24'-1 5/8"
F		28	28	28	32	32	32
G		23'-3"	24'-1"	24'-8"	26'-4"	27'-3"	27'-11"
H		19'-1"	18'-3"	17'-8"	22'-0"	21'-1"	20'-5"
J		21'-11"	21'-11"	21'-11"	24'-11"	24'-11"	24'-11"
K		20'-5"	20'-5"	20'-5"	23'-5"	23'-5"	23'-5"
X		1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"
Y		2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
M	Metric	56 - 10M	56 - 10M	56 - 10M	64 - 10M	64 - 10M	64 - 10M
	Imperial	56 - #3	56 - #3	56 - #3	64 - #3	64 - #3	64 - #3
P	Metric	8 - 10M	10 - 10M	10 - 10M	10 - 10M	10 - 10M	12 - 10M
	Imperial	8 - #4	8 - #4	12 - #3	8 - #4	10 - #4	10 - #4
Q	Metric	89 - 10M	133 - 10M	114 - 10M	102 - 10M	166 - 10M	140 - 10M
	Imperial	89 - #3	133 - #3	133 - #4	102 - #3	166 - #3	166 - #4
R	Metric	18" c/c	12" c/c	14" c/c	18" c/c	11" c/c	13" c/c
	Imperial	18" c/c	12" c/c	12" c/c	18" c/c	11" c/c	11" c/c
S	Metric	6 - 10M	8 - 10M	10 - 10M	6 - 10M	8 - 10M	10 - 10M
	Imperial	5 - #4	6 - #4	8 - #4	5 - #4	7 - #4	8 - #4
T	Metric	5 - 10M	8 - 10M	9 - 10M	6 - 10M	8 - 10M	10 - 10M
	Imperial	4 - #4	6 - #4	7 - #4	4 - #4	6 - #4	8 - #4
W	Metric	178 - 10M	266 - 10M	228 - 15M	204 - 10M	332 - 10M	280 - 15M
	Imperial	178 - #4	266 - #4	266 - #4	204 - #4	332 - #4	332 - #5
Z		5'-11"	6'-9"	7'-4"	6'-0"	6'-11"	7'-7"
Reinforcing Rod	M (kgs.)	962	1454	1928	1216	1750	2451
	I (lbs.)	2396	3285	3856	2738	4269	6088
Wire Mesh (sq. ft.)		1310	1310	1310	1723	1723	1723
Concrete (3000 PSI) Cubic Yards	Ftng.	41.1	57.5	69.0	48.8	69.4	84.4
	Wall	14.8	14.8	14.8	16.9	16.9	16.9
	Slab	24.3	24.3	24.3	31.9	31.9	31.9

# ROOF ASSEMBLY

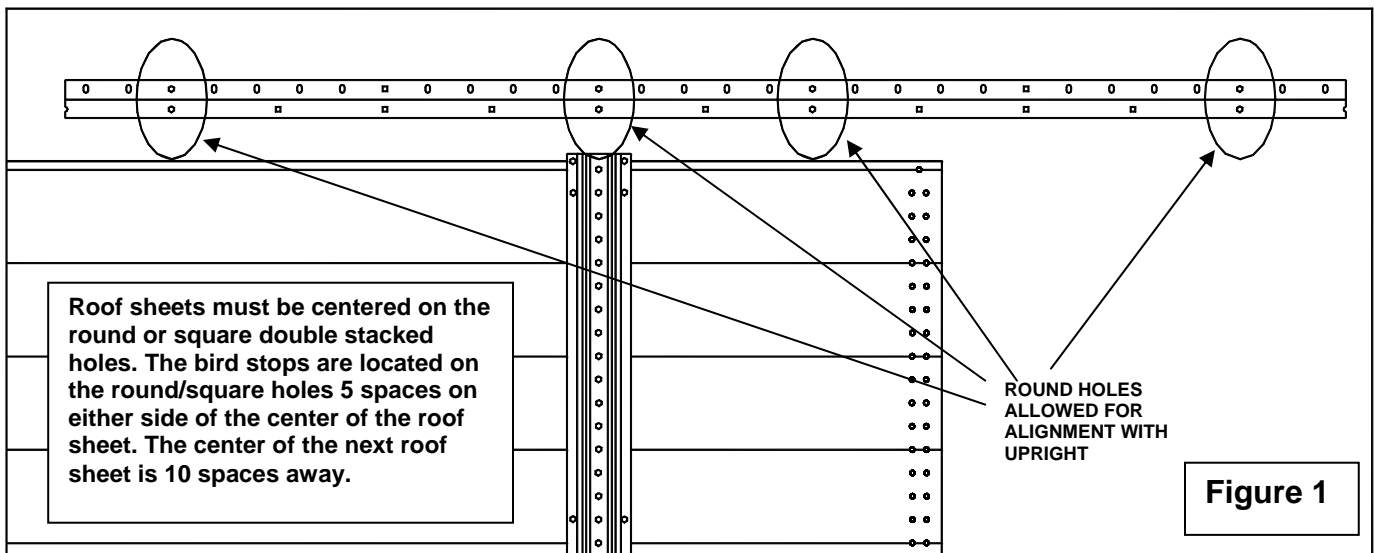
1. Assemble top tier of wall sheets as per 'Wall Sheet Assembly detail' page. Caulk vertical seams.
2. Attach top ring angle to wall sheets. **Ensure that one of the round holes on the top ring angle, lines up with the Upright.** (Figure 1, below) Do not position the joint between two adjacent top ring angles directly over the Grain Gauge cutout or a wall sheet seam. Insure that the top ring angle "bridges" the cutout and that the closest join is at least 2 or 3 holes away. (see 'Roof Ladder and Sheet detail' page).
3. Attach foam closure onto peak ring. (Page 25).
4. **The peak ring can be supported in place with roof sheets installed at 3 or 4 equal points around bin.** If using a center pole support, refer to the "Peak Ring Table" for height "H".



**IMPORTANT:** As assembly proceeds, additional support is advised to keep peak ring level. Leave all roof bolts loose until roof is completely assembled.

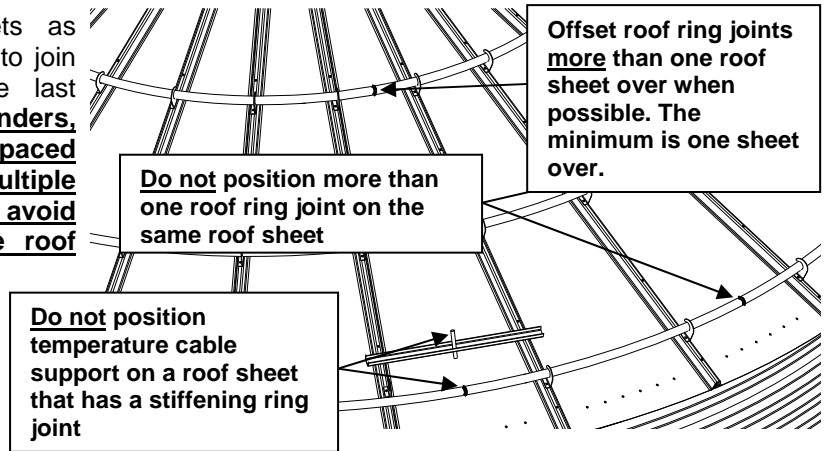
5. **Install roof sheets counterclockwise lapping left rib over right rib of preceding sheet.** Use 2 bolts at each roof sheet to peak ring connection. Ensure gap between roof sheet ribs and peak ring is sealed by foam closure.

**IMPORTANT:** The Top Ring Angle must be attached carefully to the Wall Sheets. There are four pairs of vertically aligned round holes across the face of the Ring Angle. Any of these vertically aligned round holes may be used to align the Ring Angle with an outside Upright. (Figure 1)



6. Install the inspection hatch roof sheet. The inspection hatch lid can be pre-assembled on the roof sheet if desired (see Installation of 'Inspection Hatch detail'). Install the roof ladder on the adjacent roof sheet

7. If the roof is equipped with stiffening rings, install the stiffening rib brackets (with a neoprene gasket under each), as the roof sheets are being assembled (see 'Stiffening Ring detail' page). Leave off the last few in the area where the final stiffening ring connection will be made.
8. Slide stiffening ring tubes into brackets as required. Splices and expanders are used to join tubes. Use an expander to make the last connection. On rings with multiple expanders, the expanders should be evenly spaced around the roof. On roofs with multiple stiffening rings, stagger the ring joints to avoid having more than one joint on same roof sheet.



**IMPORTANT:** When installing temperature cables, offset the cable supports more than one roof sheet from stiffening ring joint.

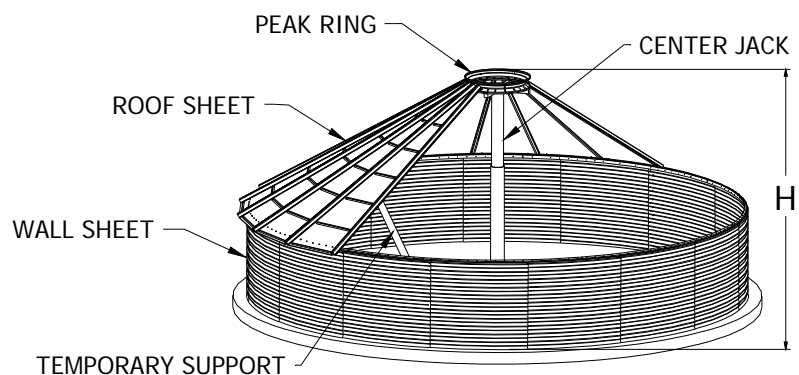
9. The last stiffening ring segment must be field cut such that there is a 2½" gap between the mating tubes. With nuts close to one end, insert long end of expander into one tube and, by flexing both tubes, make the connection to the mating tube.

**IMPORTANT:** Once this connection is made, thread nuts back until they are together at the center of the threaded rod.

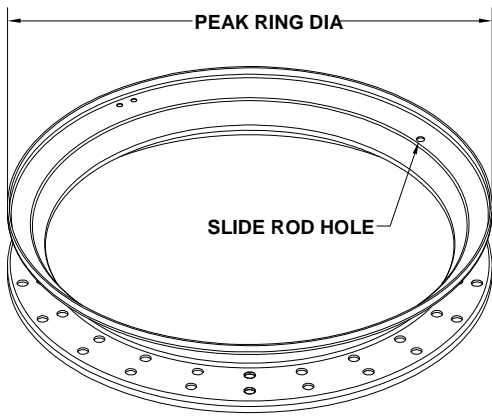
10. Install the remaining stiffening ring clips.
11. Tighten roof hardware. (see 'Recommended Bolt Torque Table')
12. Expand nuts on stiffening ring expanders until slack has been taken up and roof is snug. Nuts must be centered on the threaded rod. Use the painted marking as a guide. On rings with multiple expanders, the distance between the nuts on all of them should be equal.
13. If desired install eaves closures (Bird Stops). On all models, a steel bird stop (with mounting screw) and foam closures (with self-adhesive back) are used in tandem.
14. Assemble roof cap, remote cap opener (if applicable) and associated components (see appropriate 'Remote Cap Opener Installation' or 'Flat Roof Cap Installation').

**IMPORTANT: BIN JACKS**  
Have jacks evenly spaced around the bin. Use one jack per wall sheet. Each jack should have a capacity 5 times the expected load..

**NOTE:** The temporary support may be used if so desired. It should be used on 42' and 48' diameter roof.

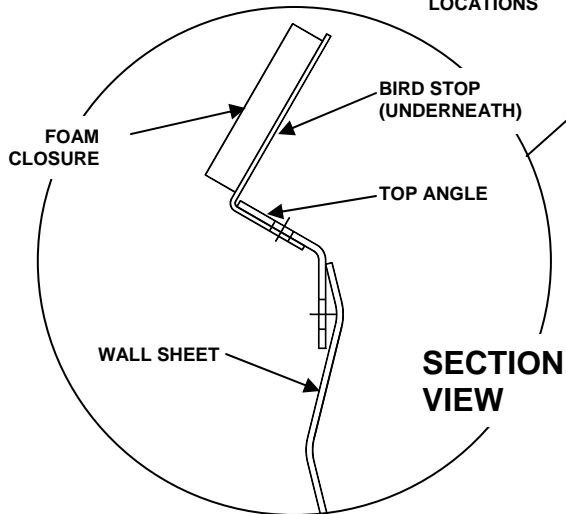
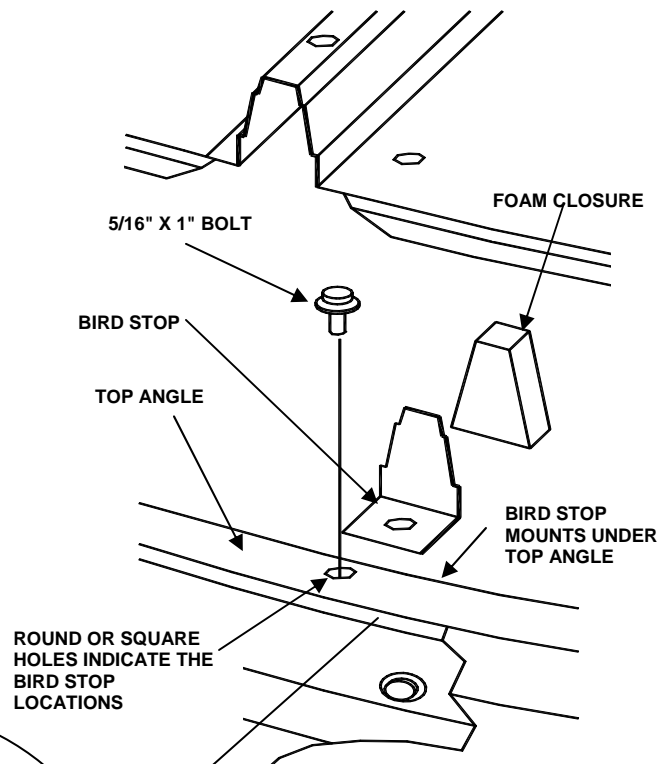
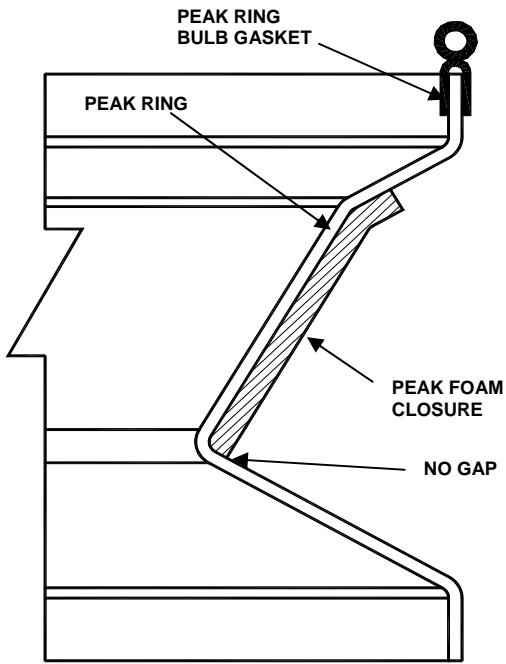




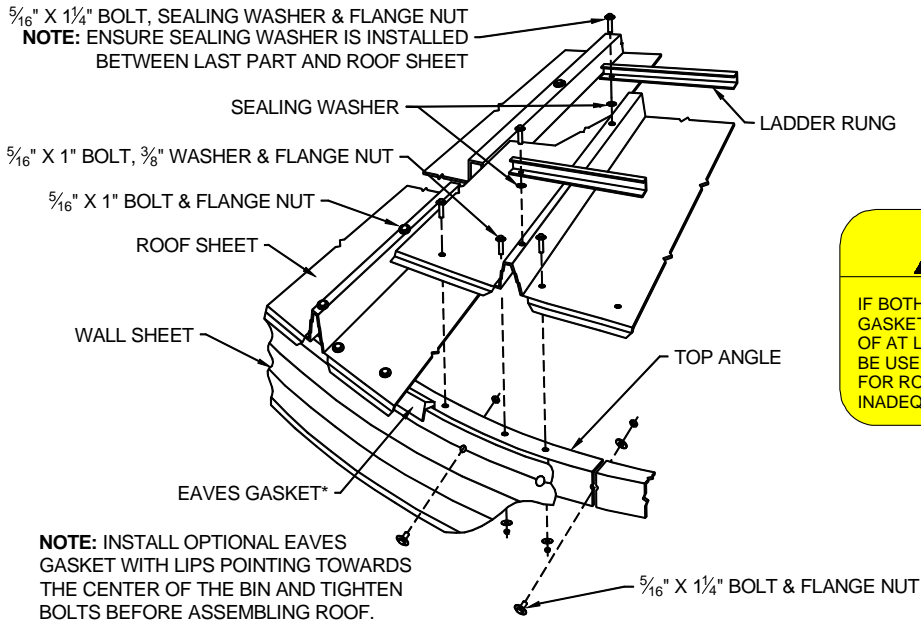


**PEAK RING TABLE**

PART NUMBER	BIN DIA	PEAK RING DIA	No of pairs of holes	"H" HEIGHT
212201	15'	33"	15	93"
212203	18'		18	103"
212204	21'		21	113"
212205	24'		24	124"
212206	27'		27	134"
212207	30'		52"	30
212208	33'	33		149"
212209	36'	36		160"
212211	42'	42		180"
212213	48'	48		201"



# ROOF LADDER & SHEET DETAIL

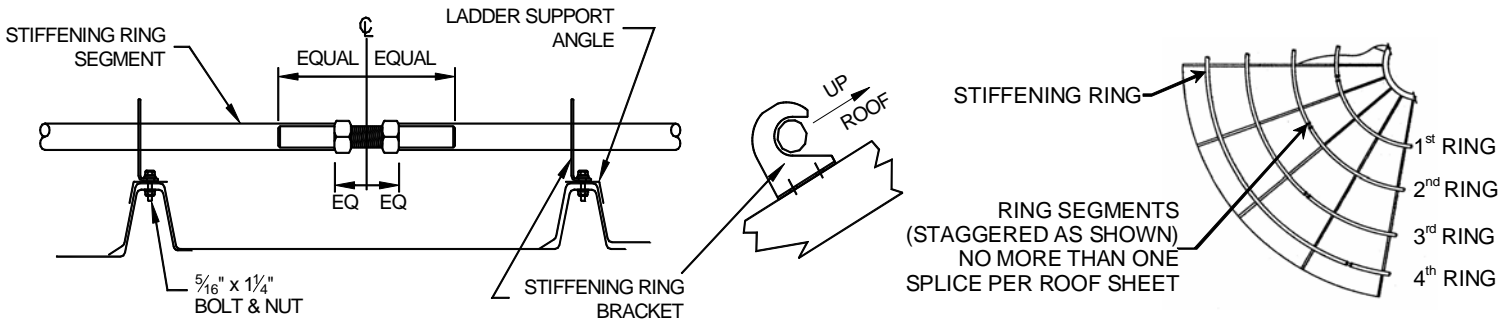


**IMPORTANT**

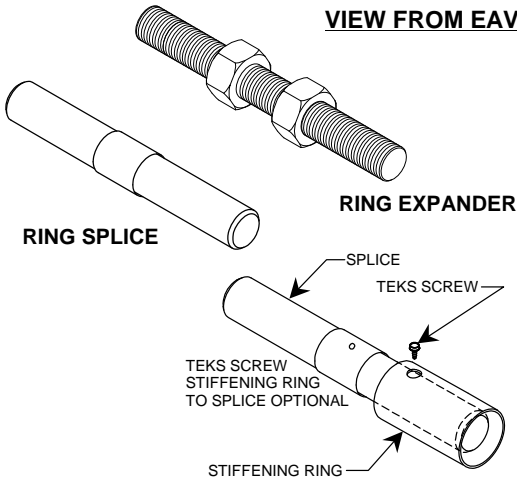
IF BOTH FOAM RIB CLOSURES AND EAVES GASKET ARE USED, A ROOF VENTILATOR OF AT LEAST 1 SQ. FT. OPEN AREA, MUST BE USED. WESTEEL IS NOT RESPONSIBLE FOR ROOF DAMAGE RESULTING FROM INADEQUATE VENTILATION.

**\*NOTE:**  
 FOR DRYING, RAISE EAVES WITH SHIM (NOT SUPPLIED) AND DO NOT USE FOAM CLOSURES OR EAVES GASKETS

## STIFFENING RING DETAIL



**VIEW FROM EAVES**



**ROOF STIFFENING RINGS**

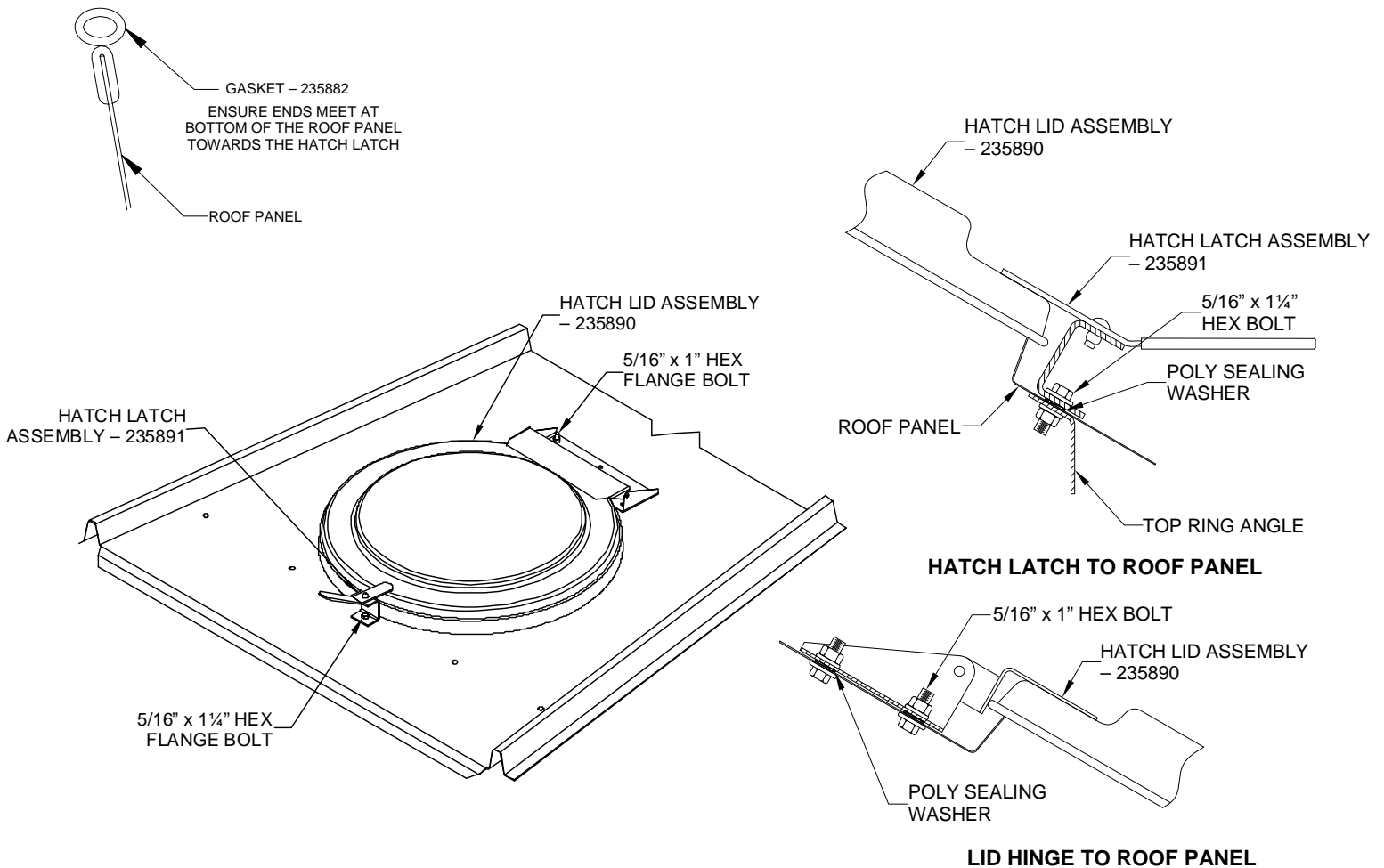
BIN SERIES	# OF STANDARD EXPANDERS	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	LOCATION
		103.8	167.4	197.6	200.4	CHORD (in)
		YELLOW	BLACK	RED	GREEN	COLOR CODE
		195100	195101	195102	195103	PART No.
18'	-	-	-	-	-	QUANTITY OF RING SEGMENTS
21'	0	5*	-	-	-	
24'	0	5*	-	-	-	
27'	0	5*	-	-	-	
30'	0	5*	-	-	-	
33'	2	5*	5	-	-	
36'	2	5*	5	-	-	
42'	4	5	5	6*	-	
48'	4	5	5*	6	7*	

\*INDICATES OPTIONAL RINGS

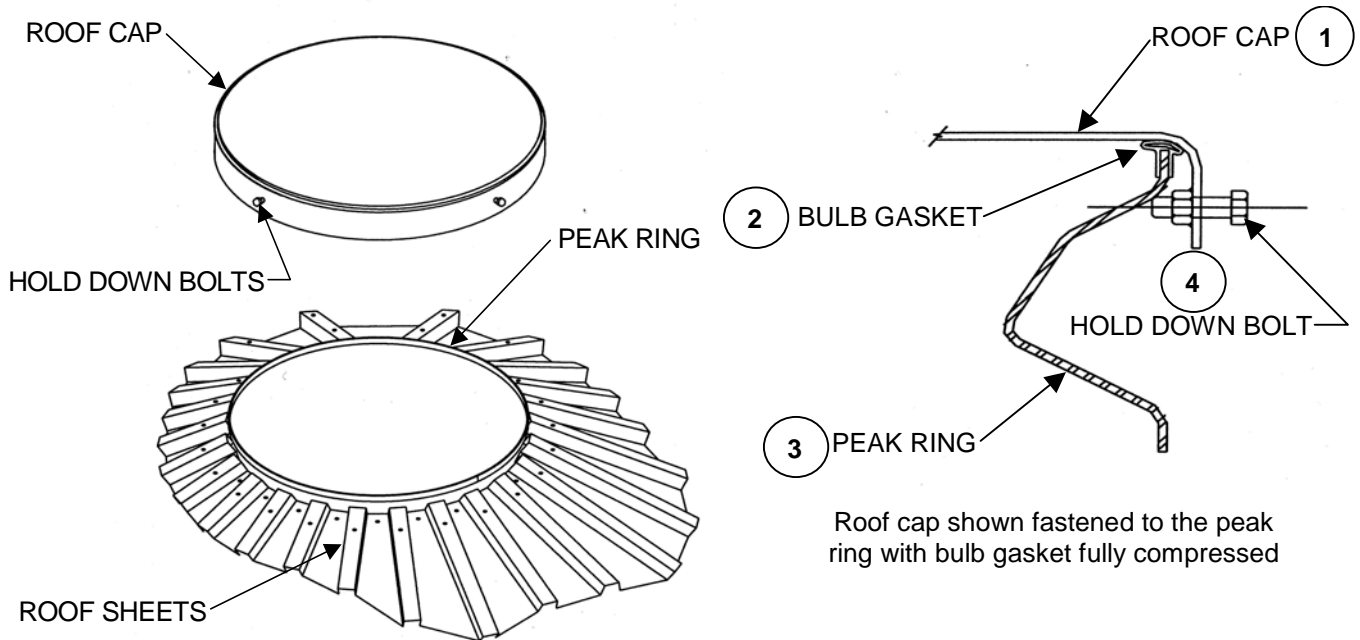
# INSPECTION HATCH DETAILS

## INSTALLATION OF INSPECTION HATCH (15' TO 48')

1. Place inspection hatch gasket (235882) around lip of inspection hatch opening. Trim the gasket to fit if necessary.
2. Bolt on the hatch lid assembly (235890) with 5/16" x 1" bolts provided for the roof. For best sealing results, the bolt heads should be on the underside of the roof panel, with the sealing washers pressed against the roof panel.
3. Bolt on the latch assembly (235891) as shown below. The latch is positioned on the center hole of the roof panel and bolts through the top ring angle as shown.



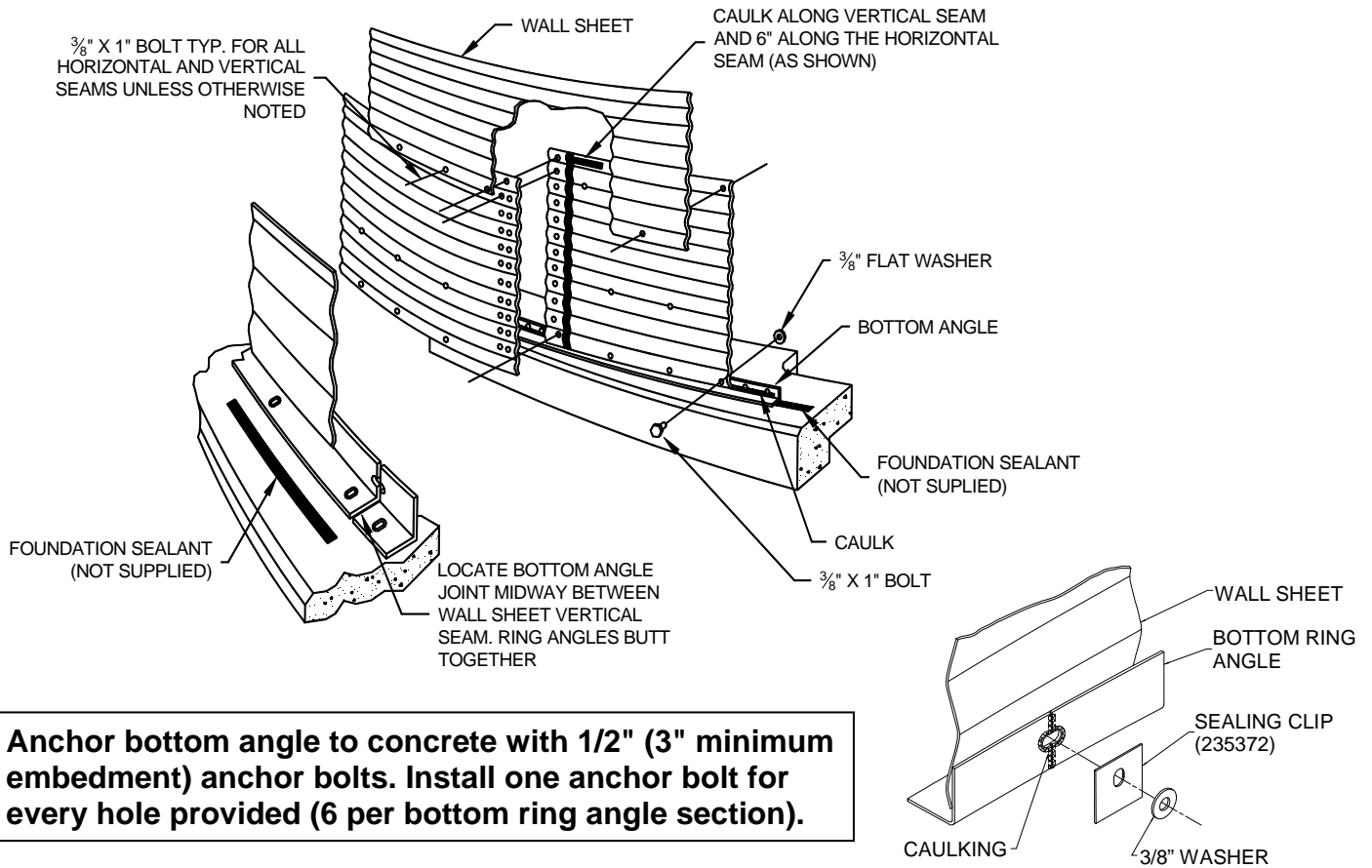
# FLAT ROOF CAP ASSEMBLY



ITEM	DESCRIPTION	Part No.	Used On
1	34" HEAVY DUTY FLAT CAP (for use with 33" peak ring)	195090	15' to 27' Bin
	53.5" HEAVY DUTY FLAT CAP (for use with 52" peak ring)	195087	30' to 48' Bin
2	PEAK RING BULB GASKET 105" LONG	195149	15' to 27' Bin
	PEAK RING BULB GASKET 168" LONG	195150	30' to 48' Bin
3	3/8" x 1 1/2" HEX FLANGE BOLT (supplied with the lid)	193797	All

1. Fasten the bulb gasket onto top rim of peak ring. Trim to fit.
2. Place roof cap on the peak ring with two of the hold down bolts, making sure they are clear of the roof ladder. Bolts should be located between the roof ribs.
3. Tighten the hold down bolt opposite the roof ladder till approximately 3/8" of the bolt is protruding past the welded nut. Then tighten the two bolts near the roof ladder till the roof cap pulls down firmly and cannot be moved. Tighten all other roof cap bolts similarly.
4. Ensure that the roof cap is fully secured around the peak ring.

# WALL SHEET AND BOTTOM ANGLE ASSEMBLY

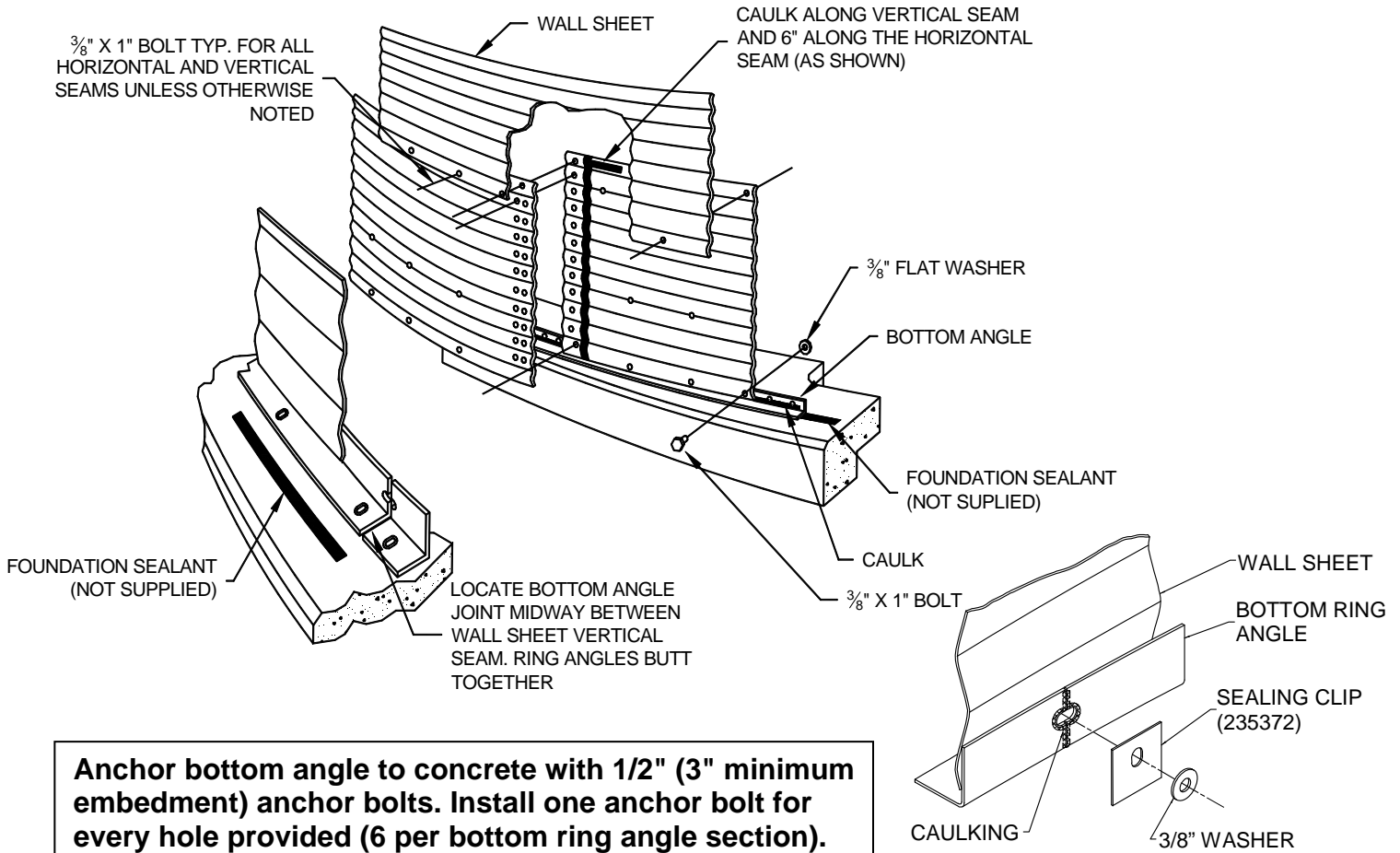


## CENTURION WALL SHEET PART NUMBER MATRIX

CORRUGATED WALL SHEETS					PUNCHED WALL SHEETS		
THICKNESS NOM (MIN)	GAUGE	LABEL COLOUR	WEIGHT lbs	LENGTH (overall)	FLAT	REGULAR	BOTTOM
.040 (.036)	20	Yellow	58.3	116.5"	194694	194912 Stencil	
					194679	194730	
					194696	194918 Stencil	
					194680	194731	194771
					194681	194732	194772
					194682	194733	194773
					194692	194919	
					194683	194734	194774
					194684	194735	194775
					194685	194736	194776
.050 (.045)	18	Orange	72.8	116.5"	194606	194737	194777
					194607	194738	194778
.057 (.052)	17	Red	83.0	117.0"		194780	
							194783
.076 (.070)	14	Lime	89.6	93.0"		194781	
							194784
.096 (.088)	13	Green	44.6	36.8"			
						194782	
.116 (.107)	12	Blue	136.8	93.0"			
							194785
			54.1	36.8"			

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.

# WALL SHEET AND BOTTOM ANGLE ASSEMBLY (INSIDE STIFFENED)



**Anchor bottom angle to concrete with 1/2" (3" minimum embedment) anchor bolts. Install one anchor bolt for every hole provided (6 per bottom ring angle section).**

WIDE-CORR WALL SHEET PART NUMBER MATRIX					CORRUGATED FLATS		CENTURION I/S STIFFENED	
THICKNESS NOM (MIN)	GAUGE	WEIGHT lbs	LENGTH inches	FLAT	REGULAR	BOTTOM		
.040 (.036)	20	58.3	116.5	194679	194750			
.050 (.045)	18	72.8		194696	194914			
.057 (.052)	17	83.0		194680	194751	194791		
.066 (.061)	15	97.7		194681	194752	194792		
.076 (.070)	14	112.2		194682	194753	194793		
.096 (.088)	13	141.1		194692	194917			
.116 (.107)	12	171.4		194683	194754	194794		
.126 (.117)	11	189.0		194684	194755	194795		
.139 (.130)	10	209.4	117.0	194685	194756	194796		
				194606	194757	194797		
				194607	194758	194798		

- Indicates Stencil Sheets

# BIN ROUNDNESS

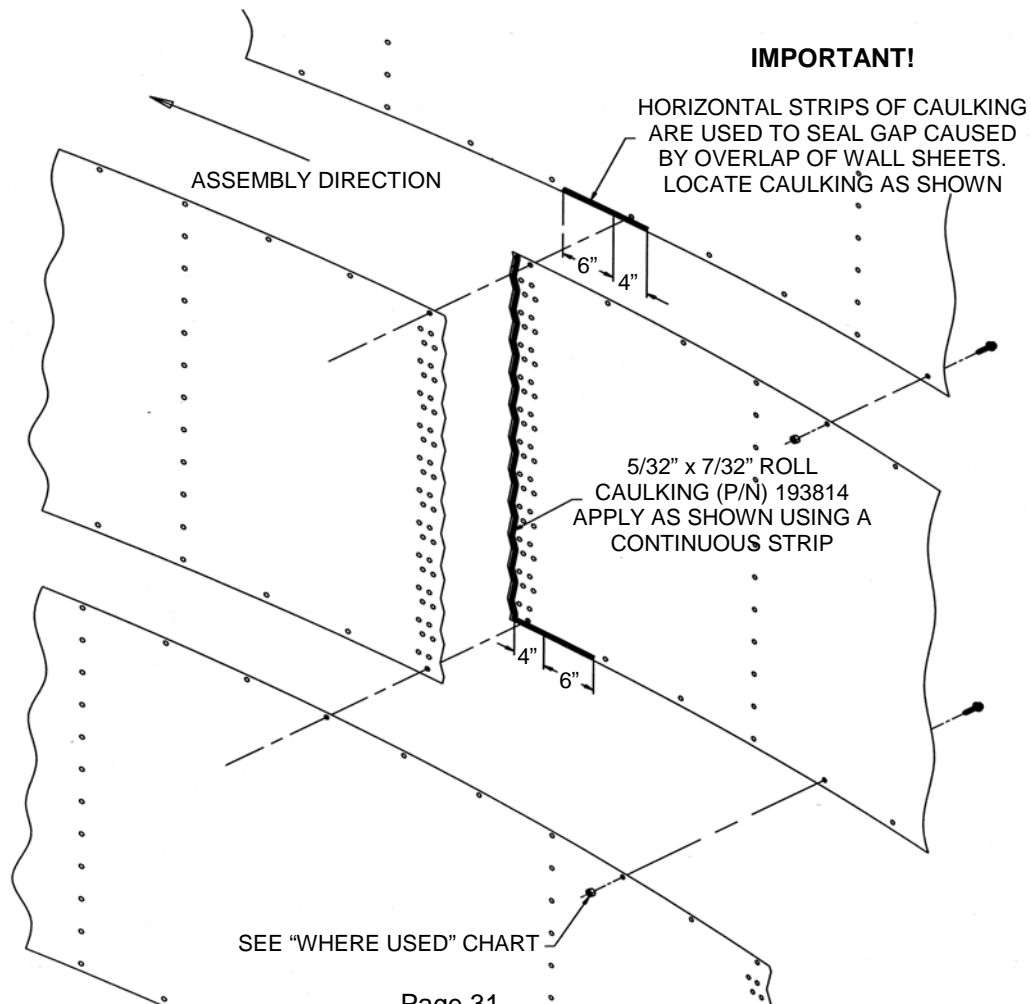
It is imperative that the bin be as perfectly round as possible. The use of a string anchored and centered on the concrete foundation to scribe a circle is required (see chart below for calculated radiuses. These radiuses are 3/4 inch smaller than the wall sheet radius at the bottom, so that the scribed circle can be seen during assembly). A perfectly placed ring of sheets should be 3/4" on the outside of this line all the way around. This should be the first step in assembling a bin. The maximum amount that a bin can be out of round is .75" on the radius, when measured from the center of the bin. In addition the wall sheets must form a smooth circle with no flat or elongated portions. Before anchoring the bin to the foundation, ensure again that the bin is round, within tolerance. Locate anchor bolts towards the outside of the anchor bolt holes (away from bin) to permit the incremental expansion that can occur with the initial filling.

Nominal Bin Dia. In feet	Scribe Radius
15	7 ft 4.77 in.
18	8 ft 10.68 in.
21	10 ft 4.58 in.
24	11 ft 10.49 in.
27	13 ft 4.39 in.
30	14 ft 10.30 in.
33	16 ft 4.20 in.
36	17 ft 10.11 in.

Nominal Bin Dia. In feet	Scribe Radius
39	19 ft 4.01 in.
42	20 ft 9.92 in.
48	23 ft 9.73 in.
51	25 ft 3.64 in.
54	26 ft 9.54 in.
60	29 ft 9.35 in.
66	32 ft 9.16 in.
72	35 ft 8.97 in.

Nominal Bin Dia. In feet	Scribe Radius
78	38 ft 8.78 in.
84	41 ft 8.59 in.
90	44 ft 8.40 in.
96	47 ft 8.21 in.
102	50 ft 8.02 in.
108	53 ft 7.83 in.

## WALL SHEET CAULKING DETAIL (Inside view shown)

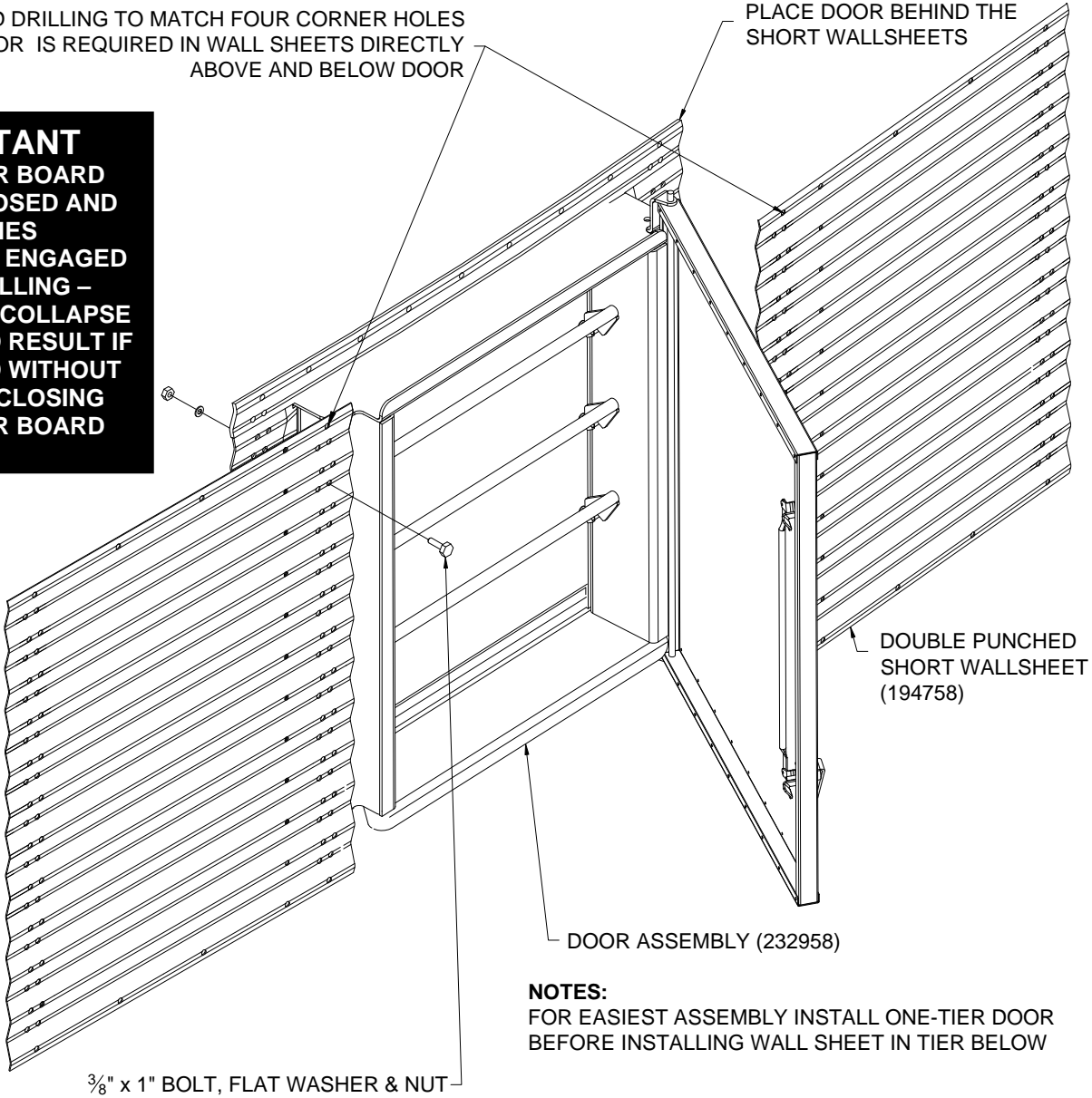


# ONE-TIER LIGHT DUTY DOOR INSTALLATION

FIELD DRILLING TO MATCH FOUR CORNER HOLES IN DOOR IS REQUIRED IN WALL SHEETS DIRECTLY ABOVE AND BELOW DOOR

PLACE DOOR BEHIND THE SHORT WALLSHEETS

**IMPORTANT**  
INNER DOOR BOARD MUST BE CLOSED AND LATCHES COMPLETELY ENGAGED BEFORE FILLING – FAILURE AND COLLAPSE OF BIN COULD RESULT IF BIN IS FILLED WITHOUT PROPERLY CLOSING INNER DOOR BOARD



**NOTES:**  
FOR EASIEST ASSEMBLY INSTALL ONE-TIER DOOR BEFORE INSTALLING WALL SHEET IN TIER BELOW

**IMPORTANT**  
INNER DOOR BOARD MUST BE CLOSED AND LATCHES COMPLETELY ENGAGED BEFORE FILLING – FAILURE AND COLLAPSE OF BIN COULD RESULT IF BIN IS FILLED WITHOUT PROPERLY CLOSING INNER DOOR BOARD

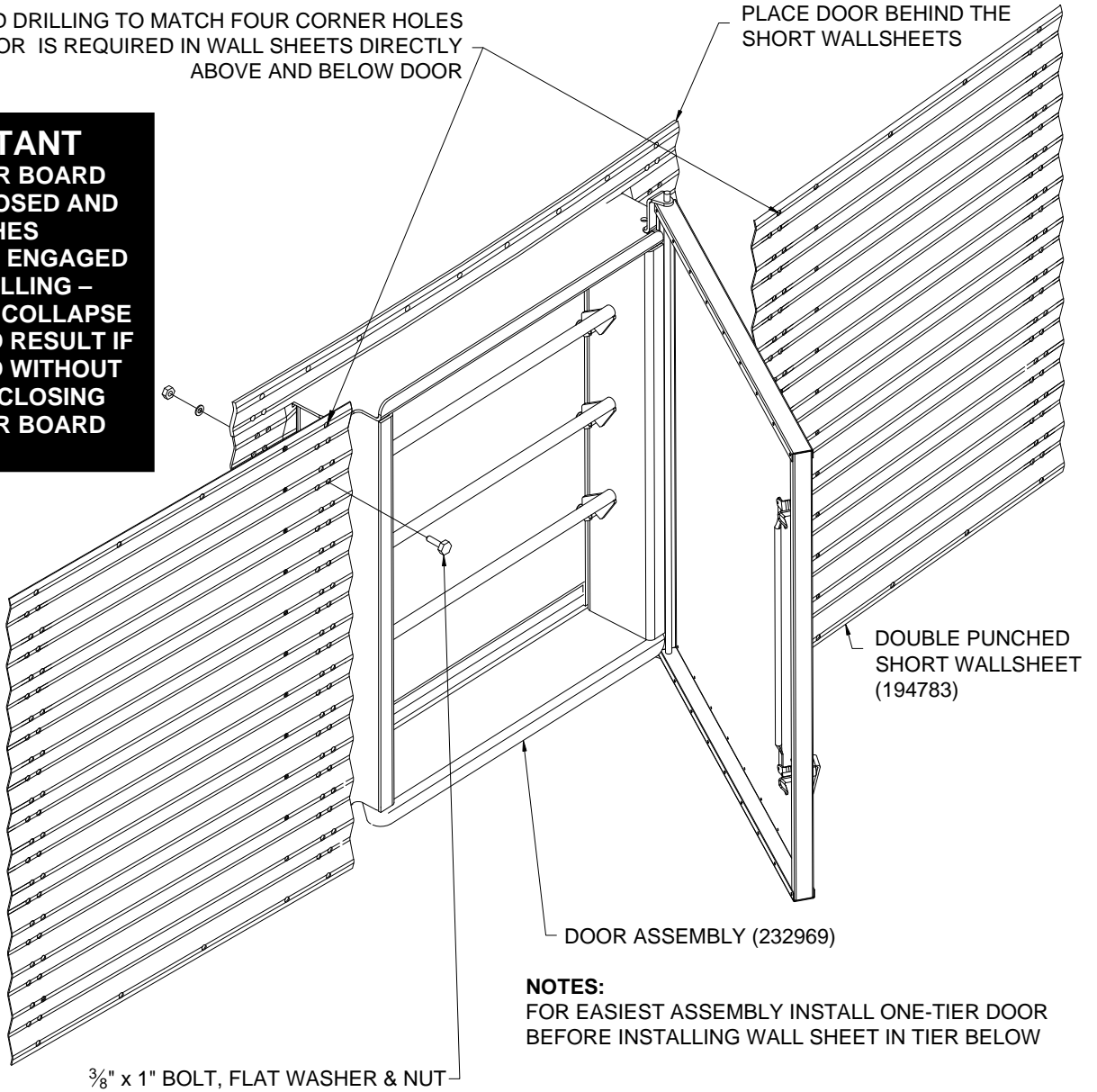


# ONE-TIER LIGHT DUTY (15-27) DOOR INSTALLATION

FIELD DRILLING TO MATCH FOUR CORNER HOLES IN DOOR IS REQUIRED IN WALL SHEETS DIRECTLY ABOVE AND BELOW DOOR

PLACE DOOR BEHIND THE SHORT WALLSHEETS

**IMPORTANT**  
INNER DOOR BOARD MUST BE CLOSED AND LATCHES COMPLETELY ENGAGED BEFORE FILLING – FAILURE AND COLLAPSE OF BIN COULD RESULT IF BIN IS FILLED WITHOUT PROPERLY CLOSING INNER DOOR BOARD



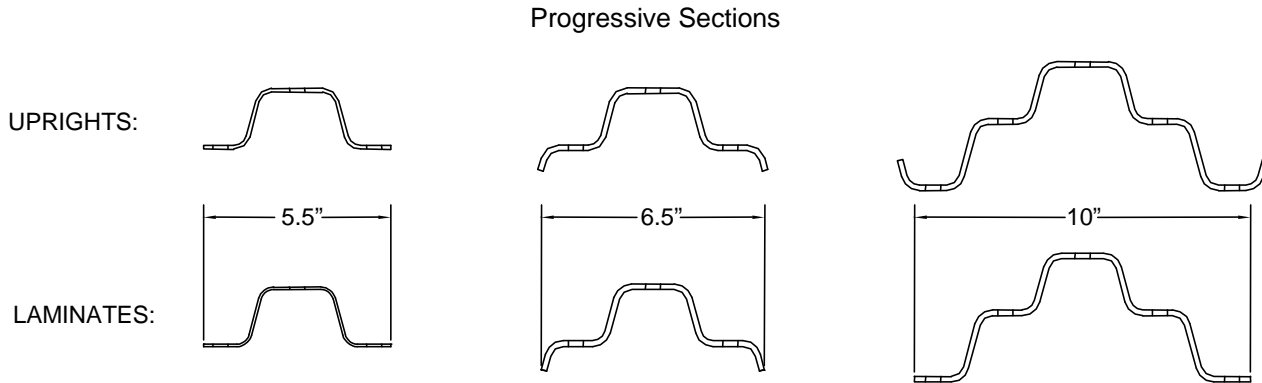
**NOTES:**  
FOR EASIEST ASSEMBLY INSTALL ONE-TIER DOOR BEFORE INSTALLING WALL SHEET IN TIER BELOW

**IMPORTANT**  
INNER DOOR BOARD MUST BE CLOSED AND LATCHES COMPLETELY ENGAGED BEFORE FILLING – FAILURE AND COLLAPSE OF BIN COULD RESULT IF BIN IS FILLED WITHOUT PROPERLY CLOSING INNER DOOR BOARD

## COMMERCIAL BIN UPRIGHT ASSEMBLY

**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.



**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 2" centers. This permits use on both internally and 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. Therefore only half of the center upright holes get used. Which set of holes depends on whether the bin is internally or externally stiffened. The center holes not being used do not need to be filled with bolts. All other 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 erection is contained on the label.**

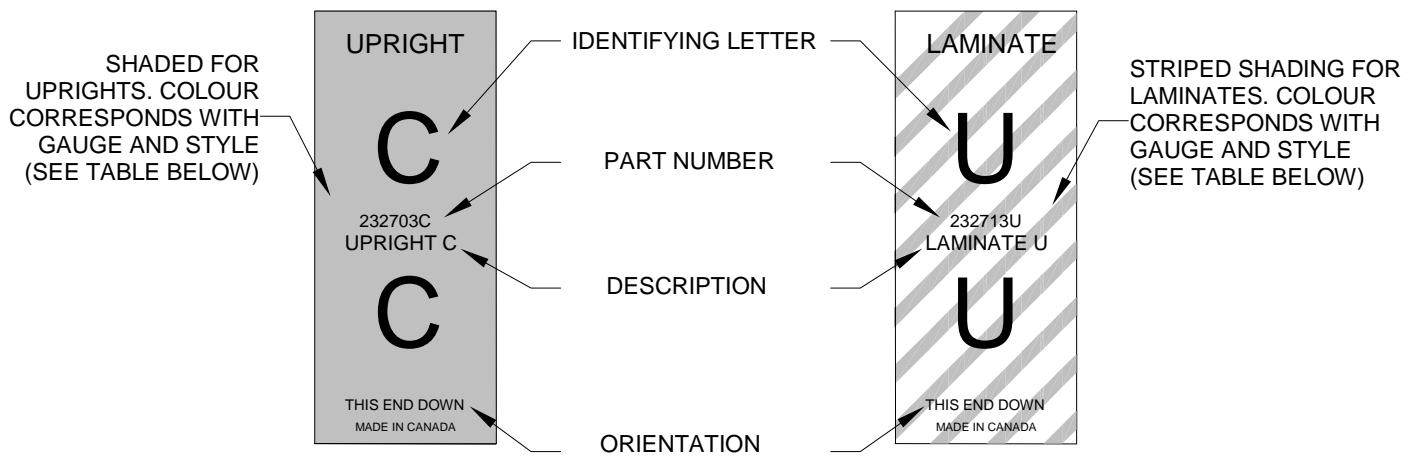
The label, is the easiest means of identification. It contains all of the necessary information. For assembly purposes, **the label is placed on the bottom of both uprights and laminates.**

**Upright labels have solid colours and laminate labels are striped.** For both uprights and laminates, the **colour corresponds with gauge and style** (see table next page).

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 Upright/Laminate Graphic)

**Assembly 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 erected, 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.**



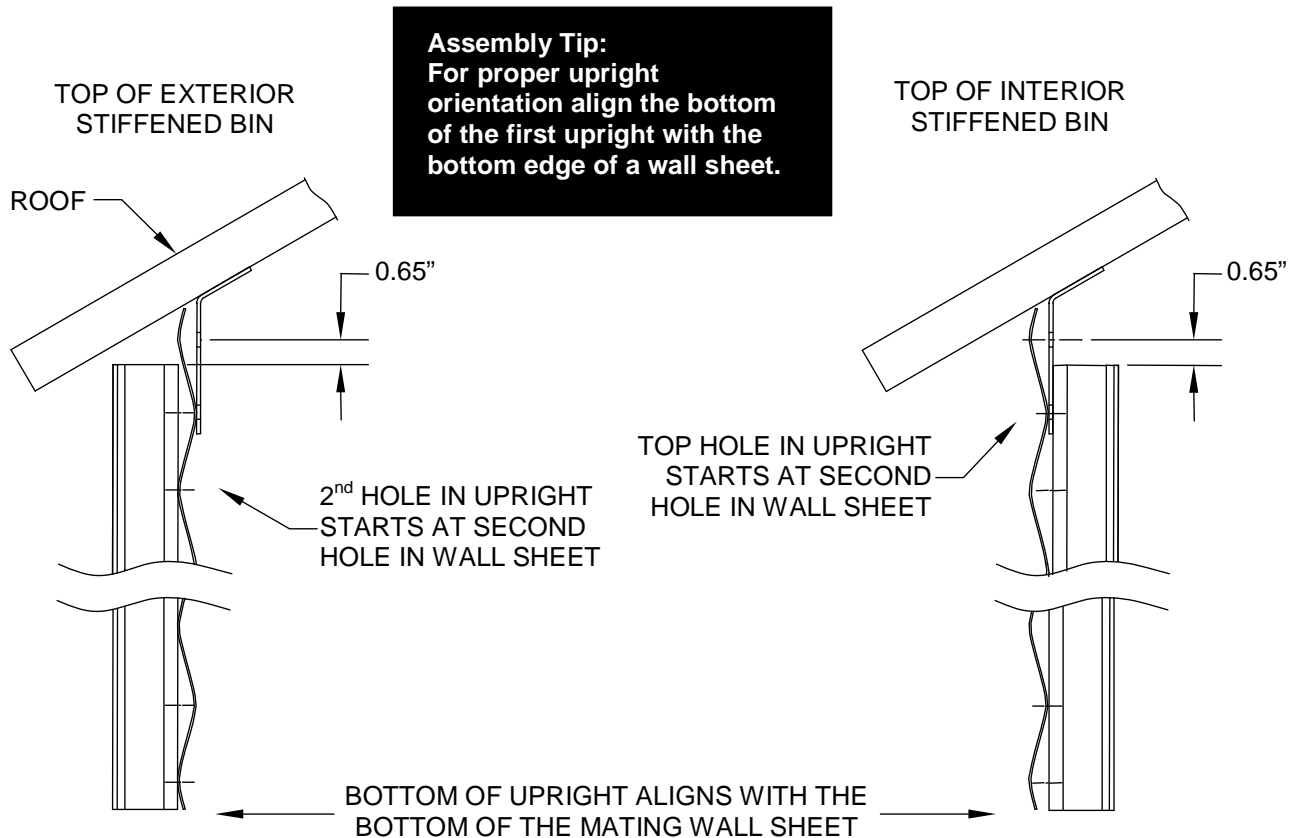
**Short Upright:** There is one short upright measuring 44" long for use in odd tier bins. The alpha character for this part is "S". There is no corresponding laminate as it is used at the top of the bin before the laminates are introduced. The short upright always goes in the top tier.

**Assembly 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.

**Assembly 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 does not bolt into the top horizontal wall sheet seam (see diagram below).**

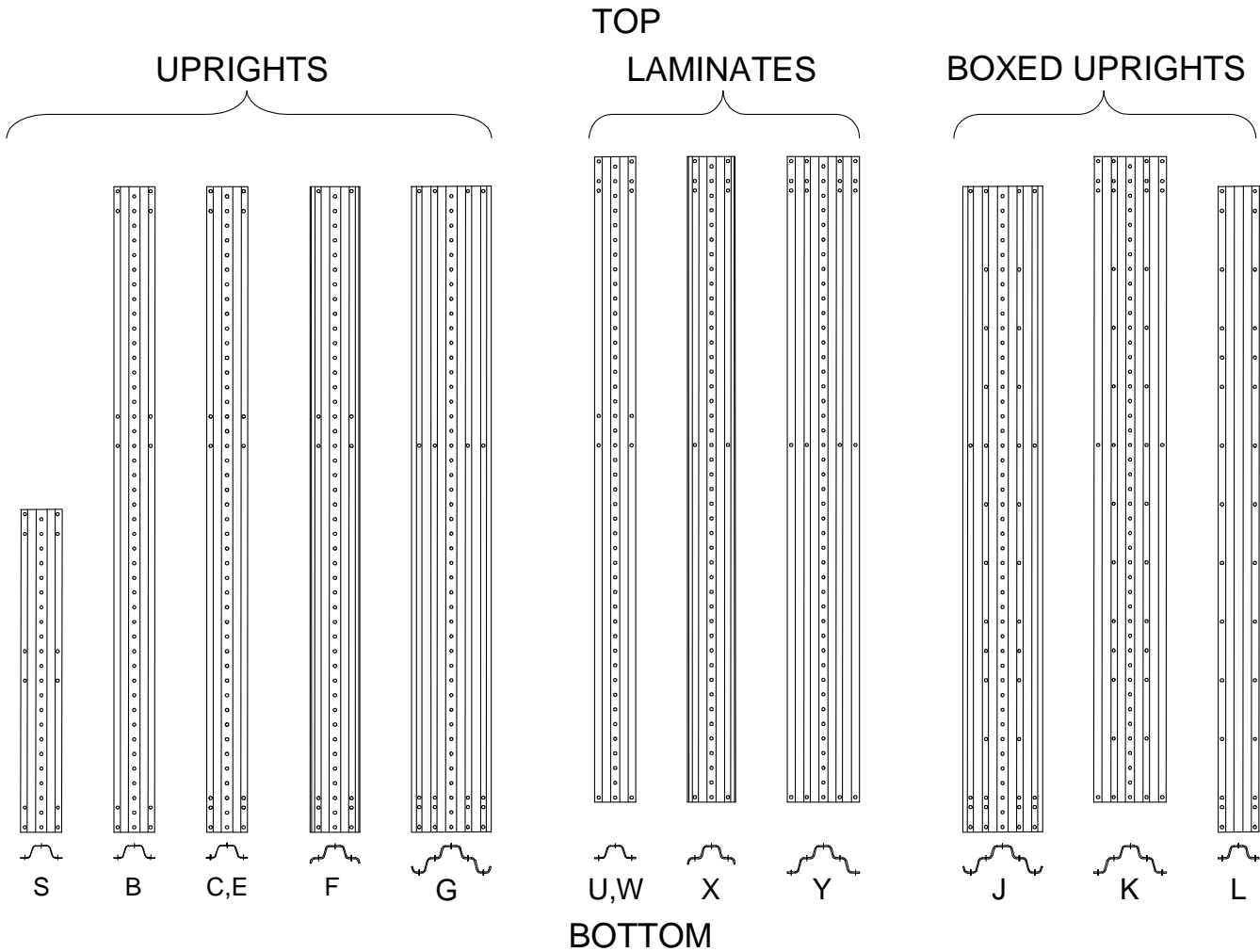


## Upright/Laminate Identification Chart

	Identifying Letter	Part Number	Description	Gauge	Label Colour	Width of Section (in)
Uprights	S	232700S	Upright S .076" Short	14	Light green	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"

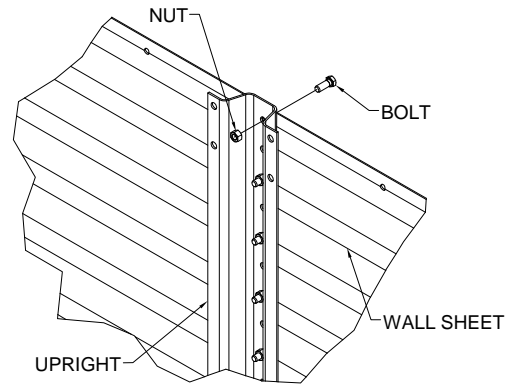
- NOT ALL SECTIONS ARE USED ON ALL BINS -

## Upright/Laminate Identification Graphic

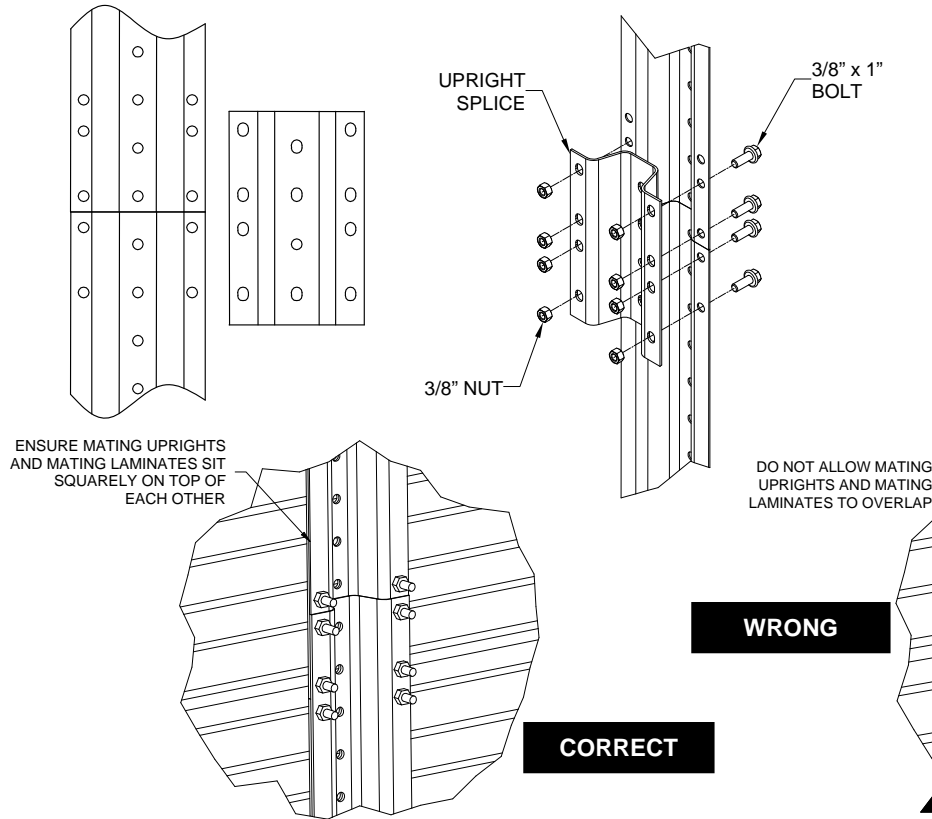


Catwalk Support Uprights: **The upright/laminate requirements under catwalk support locations are likely different from the normal upright/laminate order. Consult your Westeel representative for specifications.**

**Bolt/Nut Orientation:** To allow for a good seal install the bolts from the inside of the bin as shown for an externally stiffened bins. Install the bolts from the outside of the bin for internally stiffened bins.



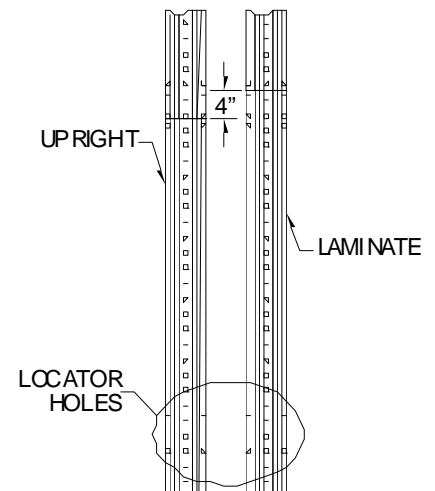
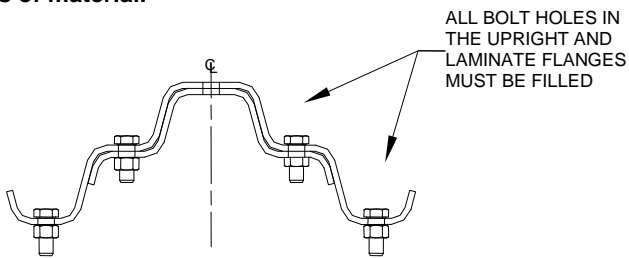
**Upright/Splice Pre-Assemblies:** At the top of a bin, laminates are not utilized and a splice is required to make the connection between mating uprights. The splice nests inside the upright similar to a laminate. When pre-assembling uprights to splices, insure that the splice goes on the top end of 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.



**Assembly Tip:**  
It may be advantageous to conduct pre-assemblies during the erection process. This can be a real time saver.

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

**Upright/Laminate Pre-Assemblies:** Laminates nest inside of uprights and are offset 4" above the uprights. 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.**



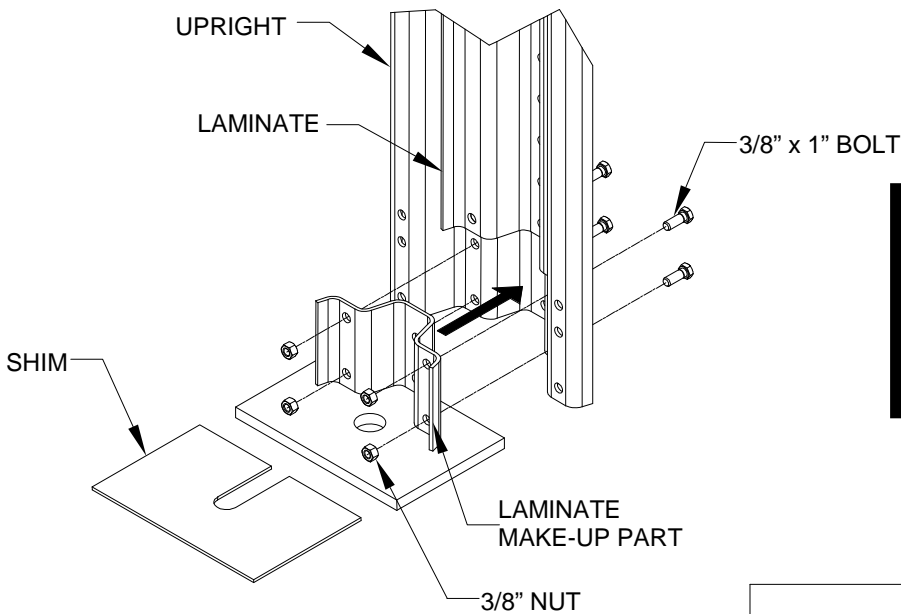
When properly assembled, both the upright label and the laminate label will remain visible during the pre – assembly phase. Once assembled on the bin, the upright label will be covered.

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.

**Assembly 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.

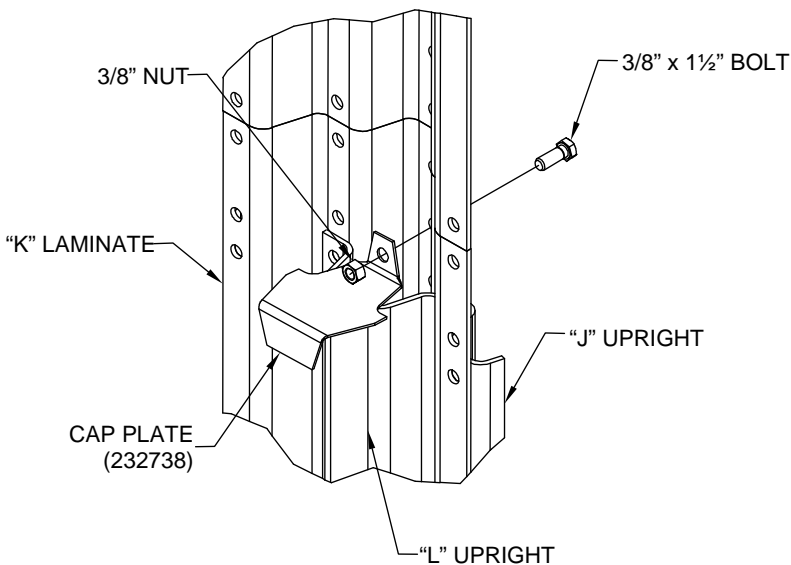
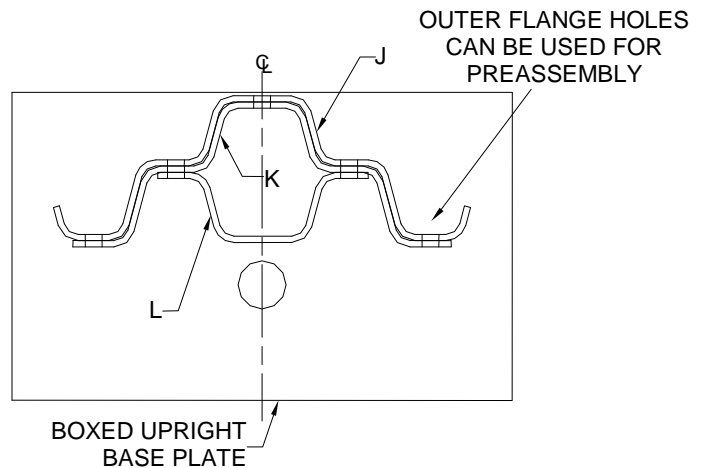
**Assembly Tip:**  
 Once completely assembled onto the bin, all visible holes in the upright and laminate flanges must be filled. This does not apply to the center row of holes. Here all mating wall sheet/upright holes must be filled.

**Base Assembly (for uprights 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 plate. In many cases this part can also be added to the bottom upright/laminate assembly during pre-assembly.



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

**Boxed Uprights:** Special boxed uprights are located at the bottom of certain tall bins. They consist of a heavy 10" wide upright segment (J), a heavy 10" wide laminate section (K), and another 5.5" wide laminate section (L) that is used to form a box.



The 10" wide segments (JK) can be pre-assembled as previously indicated. The remaining 5.5" wide section (L) cannot be installed until after the JK pre-assembly has been bolted to the bin, the base plate has been positioned, and all of the center bolts tightened. The 5.5" wide section (L) can then be bolted to JK along the mating flange holes. L rests against the base plate. To prevent water from damming in the boxed section, install the cap plate (232738) as shown.

## 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.

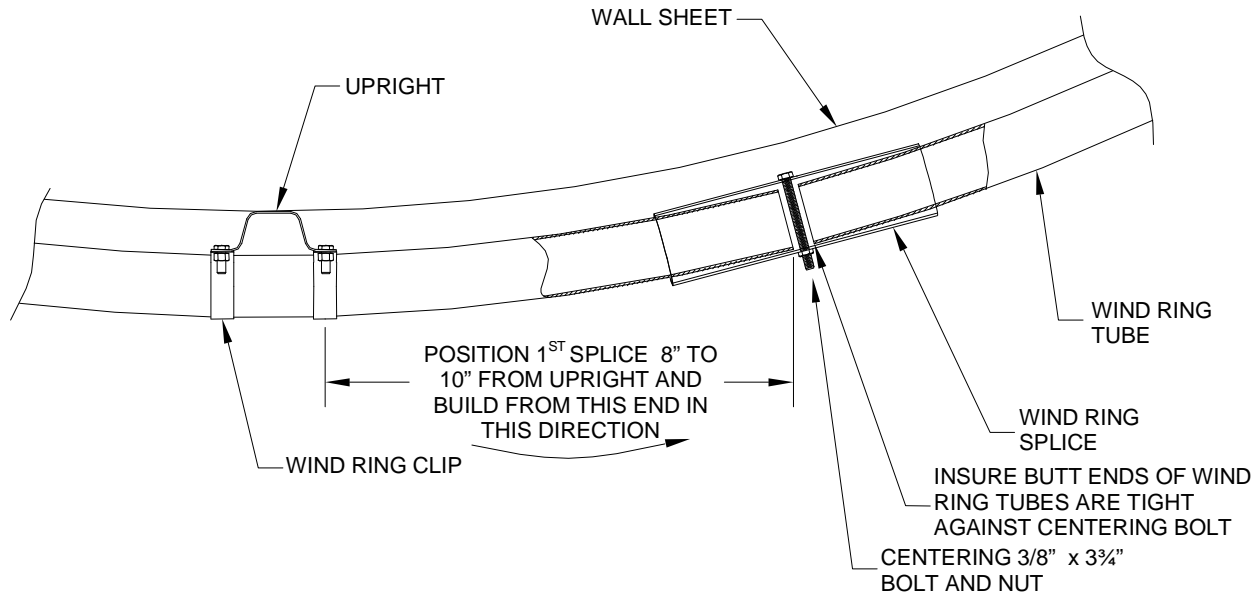


FIGURE 1

### 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.

**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

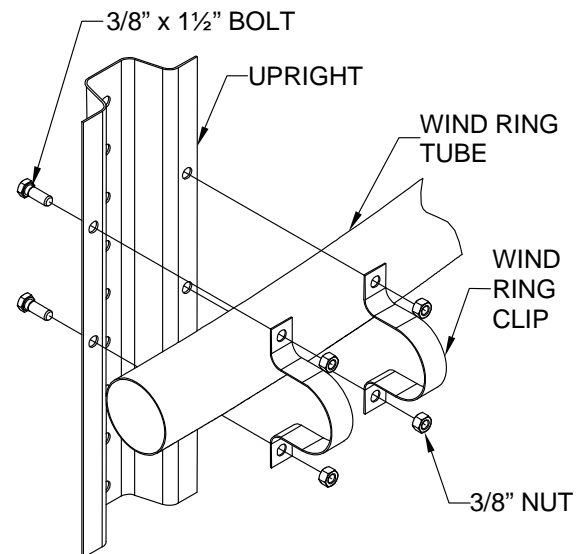


FIGURE 2

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.

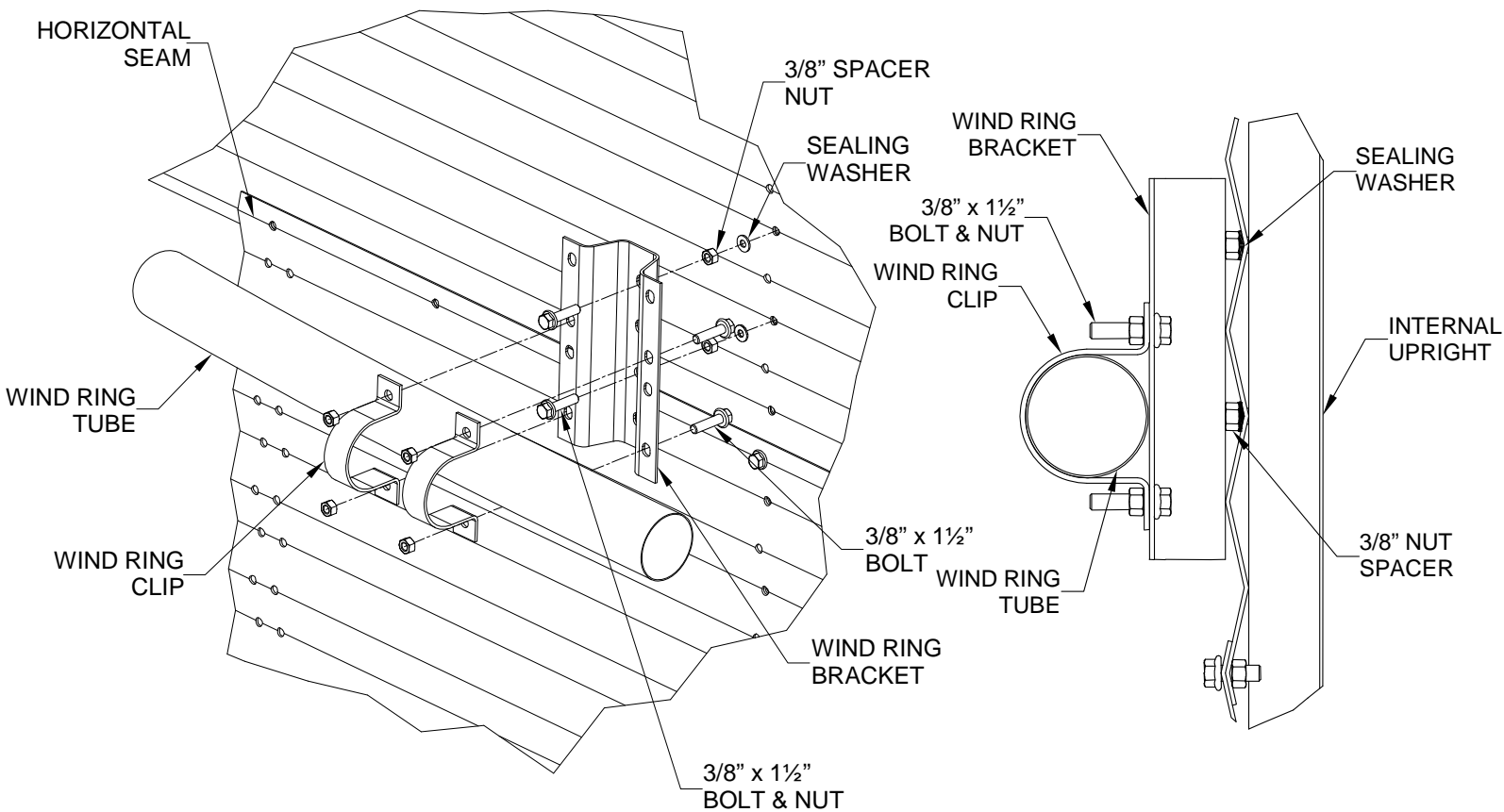
**Assembly Tip:**  
When placing the first wind ring tube in place, place one end close to an upright with a 8" to 10" overhang, and continue building from that end. This will reduce the need for multiple cuts.

**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.

**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.

### Internally Stiffened Bins

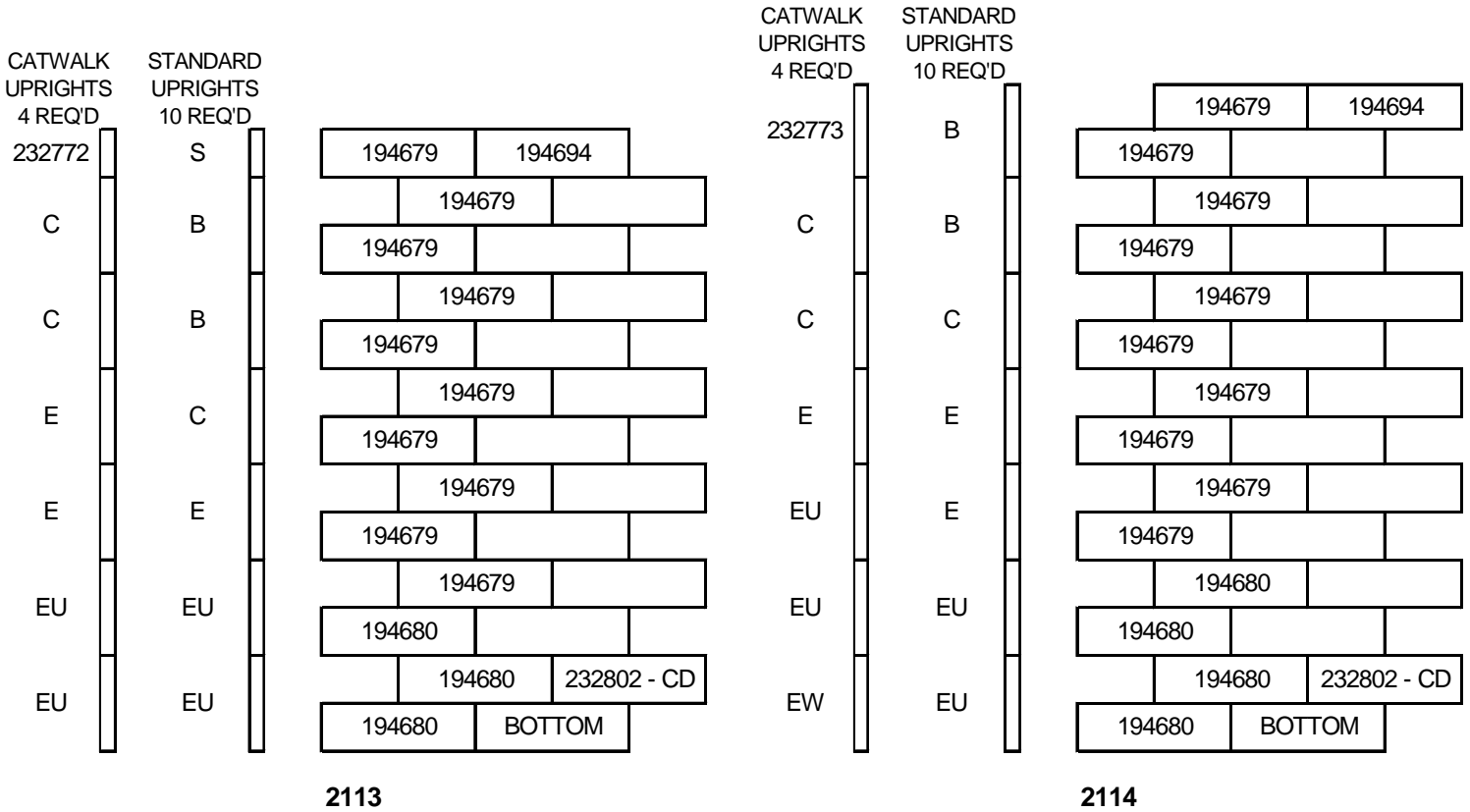
The location of the wind ring tubes for internally stiffened bins are identical to those for the externally stiffened bins. See the "O", as shown in the wall sheet and upright layout, located beside a horizontal wall sheet seam. The tubes are mounted to the outside of the bin. When assembling the internal uprights, bolt on the short wind ring bracket (same as upright splice 232720), such that it is just above the horizontal seam as shown. These need to be mounted consistently around the bin at every upright location. The actual installation of the wind ring tubes is identical to that described in the externally stiffened bin section above.







## WALL SHEET AND UPRIGHT LAYOUT – MODEL 2113 TO 2114



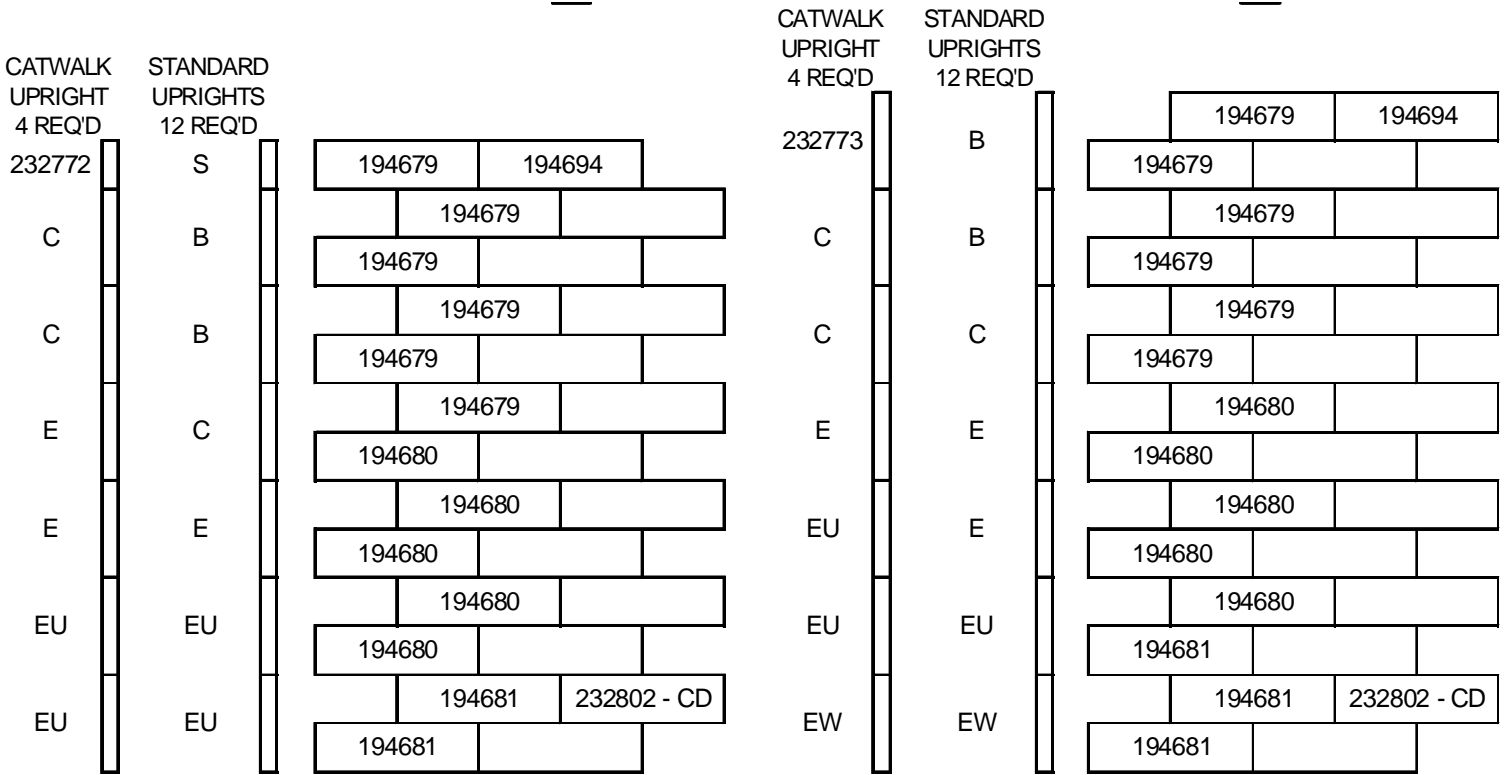
**Notes:**

1. Each tier requires 7 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 14 uprights. All uprights except for the top “S” and 232772 catwalk upright are 2 tiers long.
3. 232802-21 is the crawl door for all models.

**Legend:**

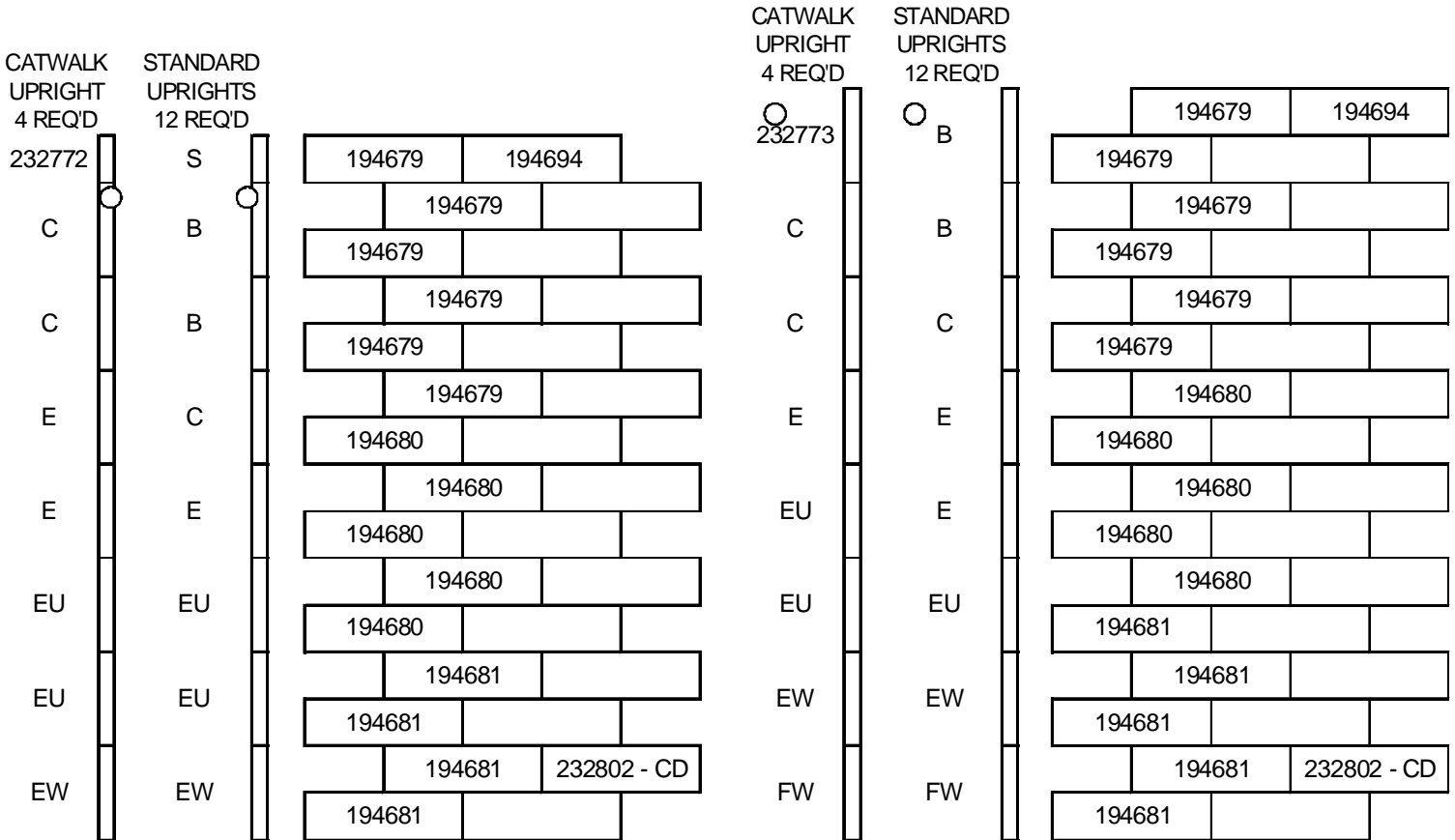
	Alpha Character	Part Number	Gauge	Label Colour	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light Green	5.5
	C	232703C	12	Light Green	5.5
	E	232705E	8	Brown	5.5
	S (Short)	232700S	14	Blue	5.5
	-	232772 (Short)	12	-	5.5
	-	232773	12	-	5.5
<b>Laminates</b>	U	232713U	12	Blue Striped	5.5
	W	232715W	8	Brown Striped	5.5

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 2413 TO 2416



**2413**

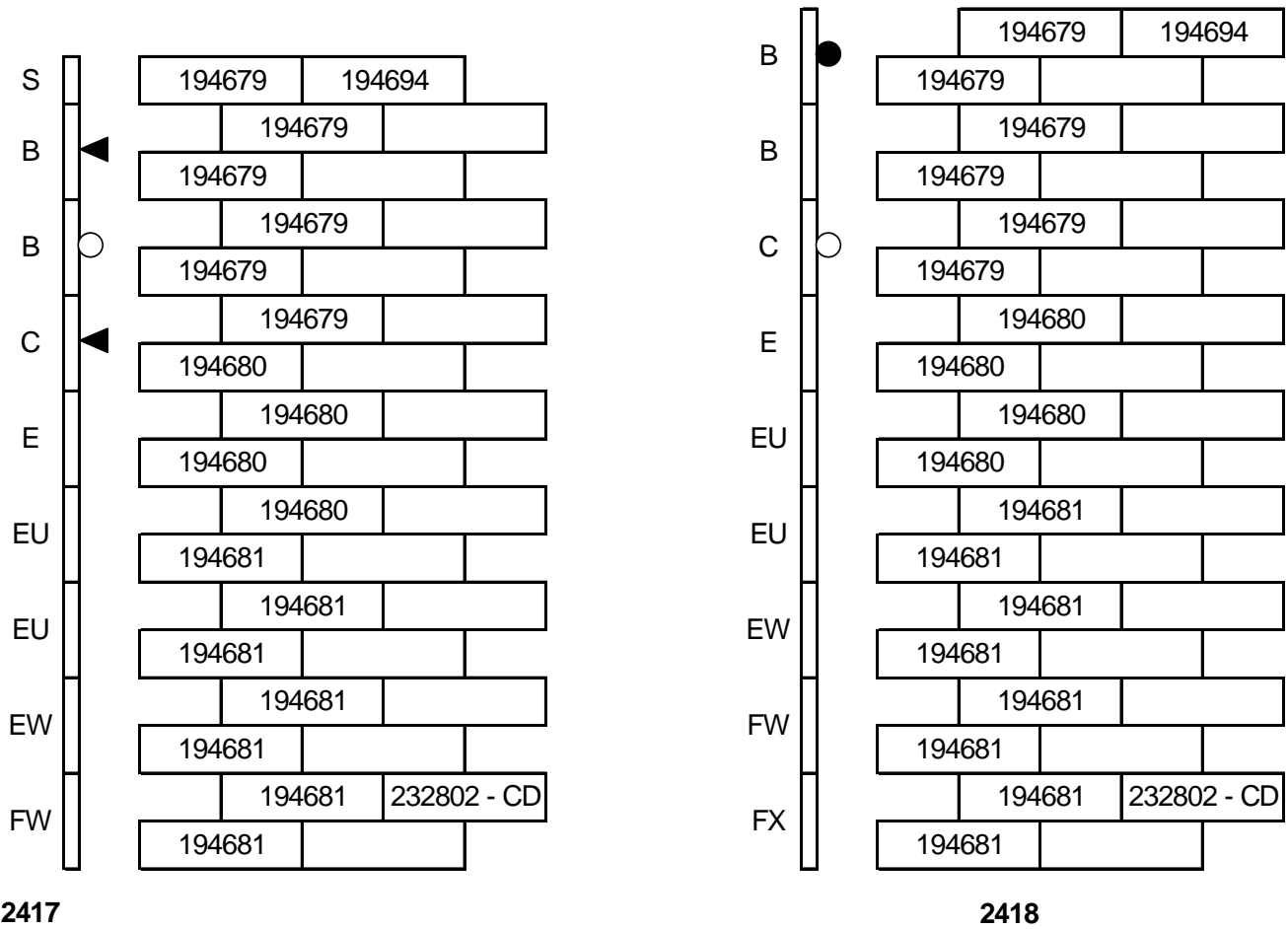
**2414**



**2415**

**2416**

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 2417 TO 2418



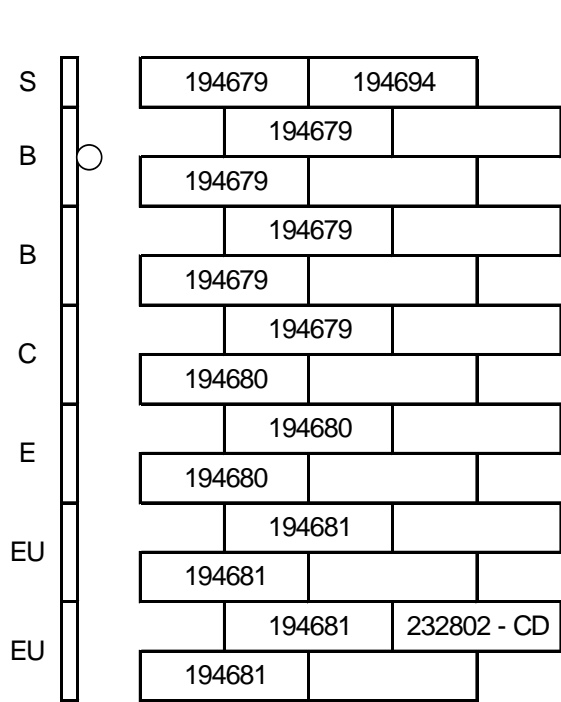
**Notes:**

1. Each tier requires 8 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 16 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
 ◀ – Indicates wind ring placement INSTEAD of the standard position if using Westeel side draw system  
 ● – Indicates additional wind ring placement if using Westeel side draw system

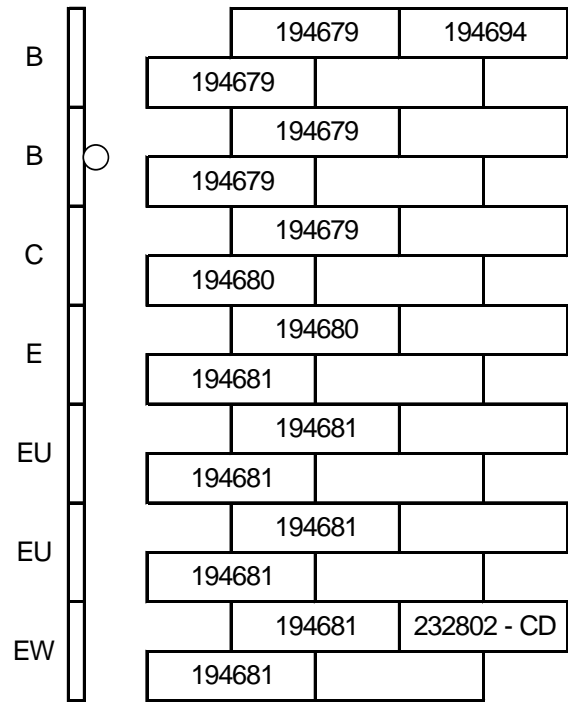
**Legend:**

	Alpha Character	Part Number	Gauge	Label Colour	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5

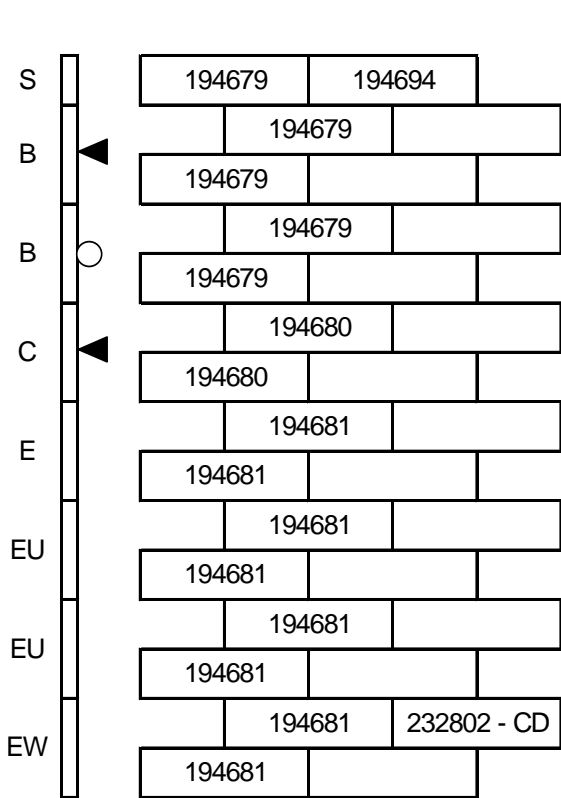
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 2713 TO 2716



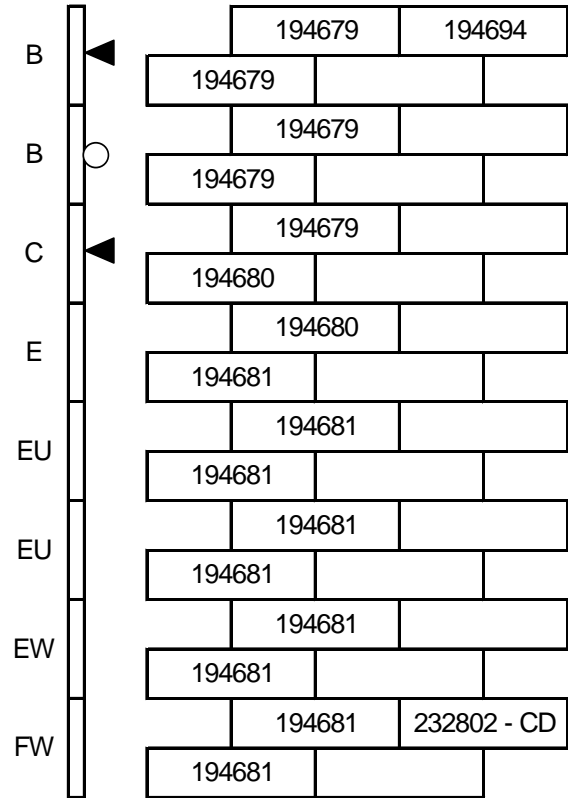
**2713**



**2714**

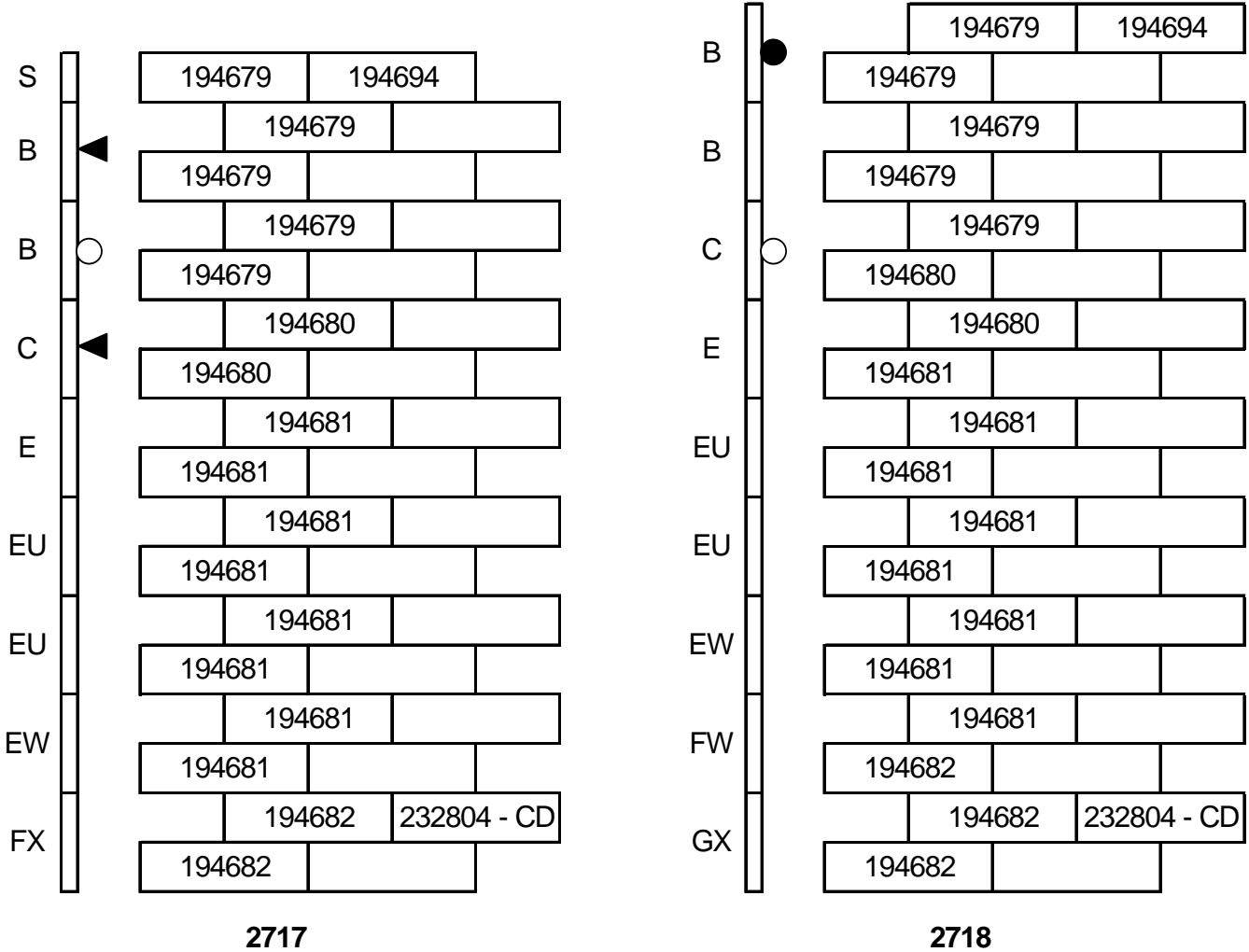


**2715**



**2716**

## WALL SHEET AND UPRIGHT LAYOUT – MODEL 2717 TO 2718



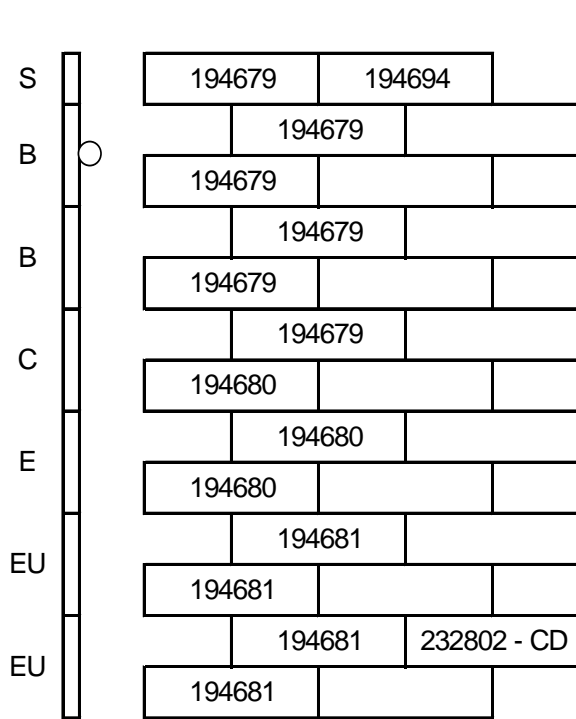
**Notes:**

1. Each tier requires 9 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 18 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
 ◀ – Indicates wind ring placement INSTEAD of the standard position if using Westeel side draw system  
 ● – Indicates additional wind ring placement if using Westeel side draw system

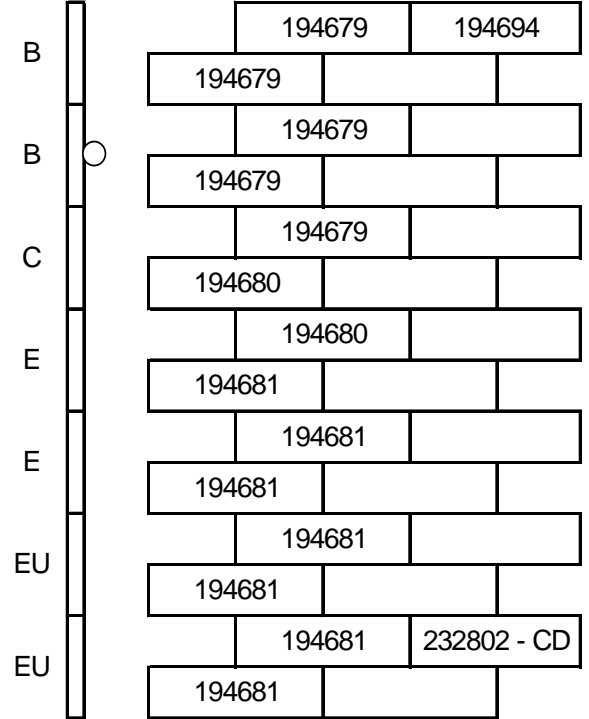
**Legend:**

	Alpha Character	Part Number	Gauge	Label Colour	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	G	232707G	8	Gold	10
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5

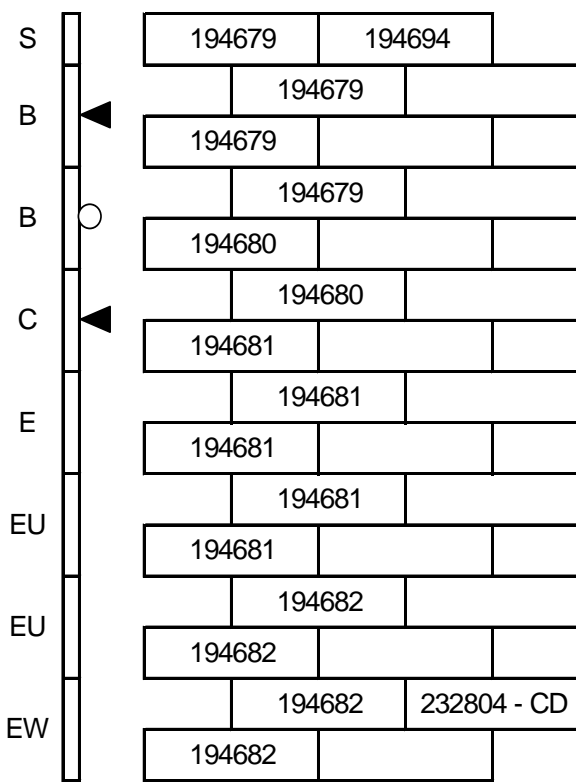
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3013 TO 3016



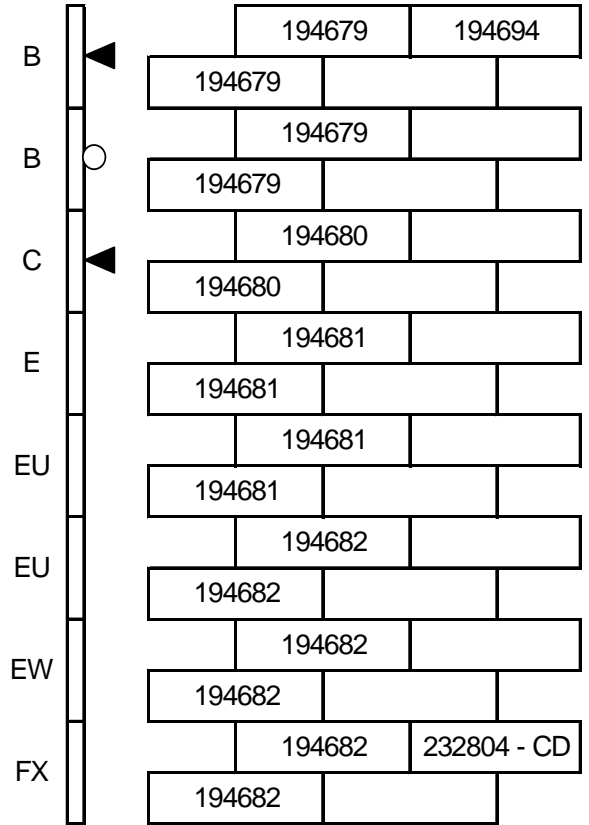
**3013**



**3014**

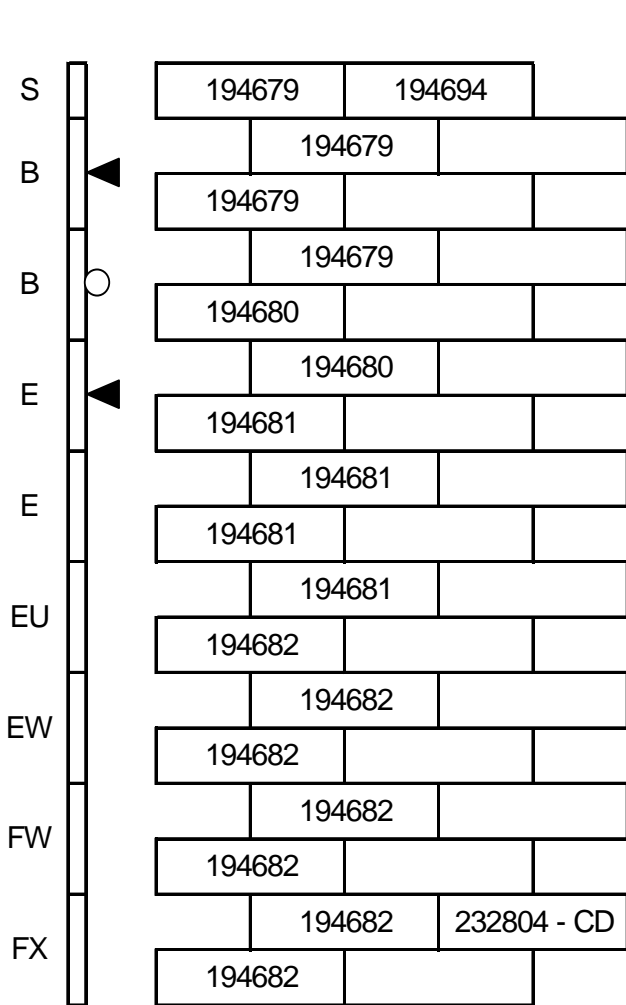


**3015**

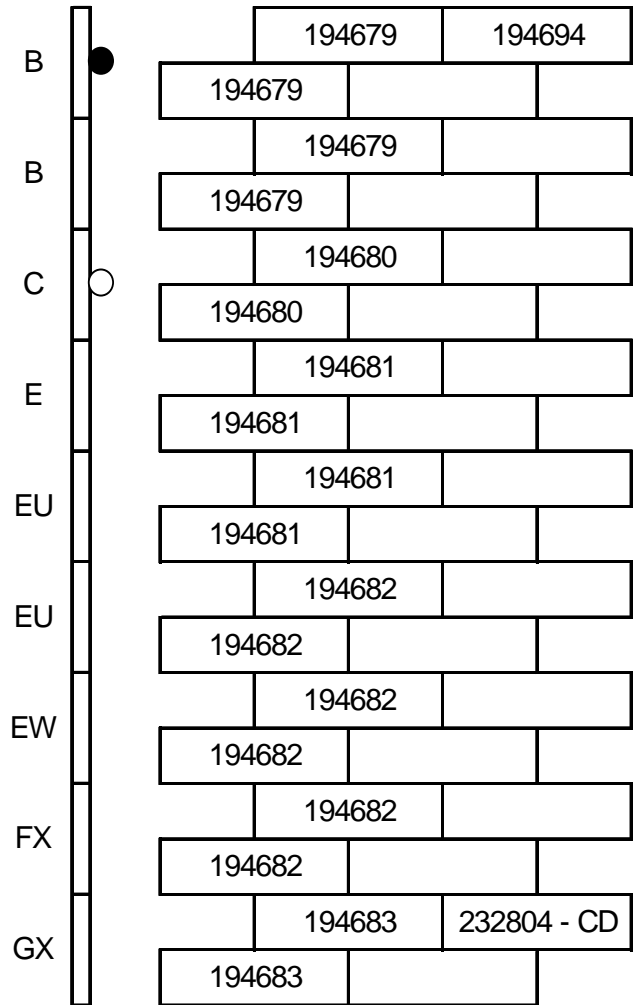


**3016**

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3017 TO 3018



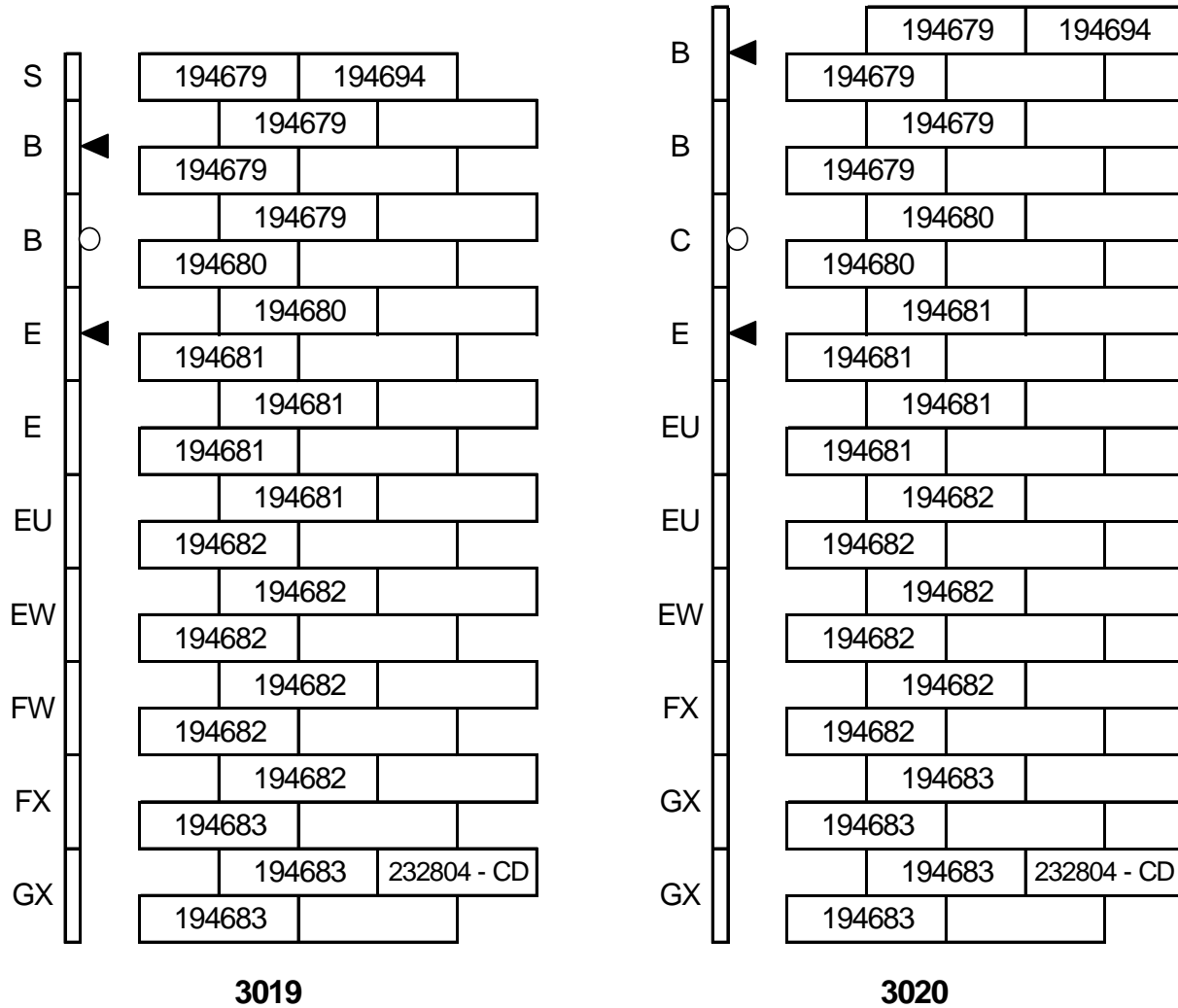
**3017**



**3018**



## WALL SHEET AND UPRIGHT LAYOUT – MODEL 3019 TO 3020



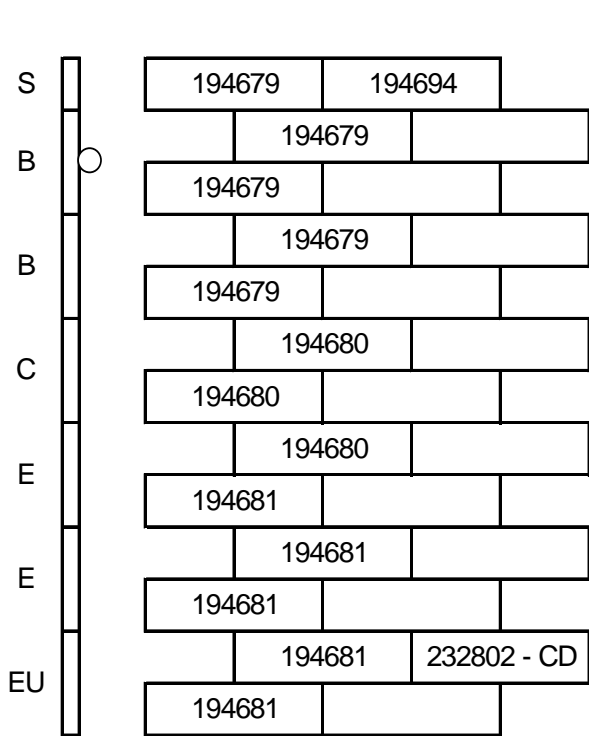
**Notes:**

1. Each tier requires 10 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 20 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
 ◀ – Indicates wind ring placement INSTEAD of the standard position if using Westeel side draw system  
 ● – Indicates additional wind ring placement if using Westeel side draw system

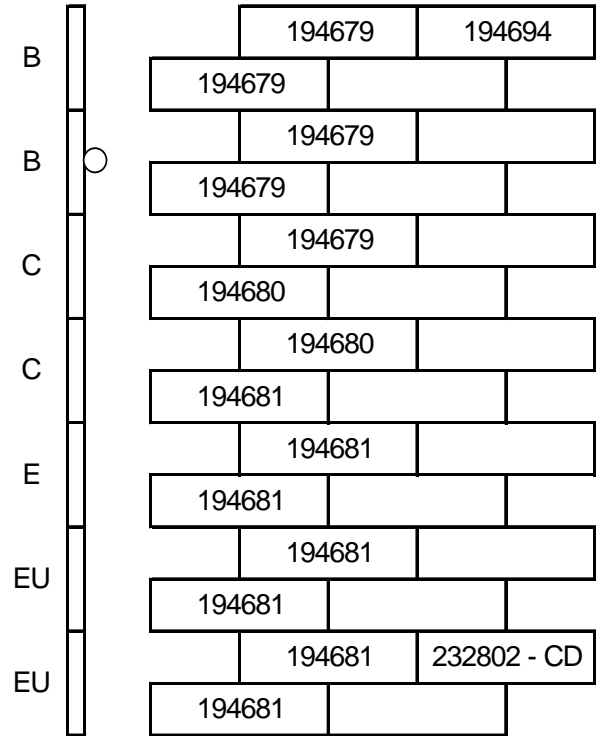
**Legend:**

	Alpha Character	Part Number	Gauge	Label Colour	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	G	232707G	8	Gold	10
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5

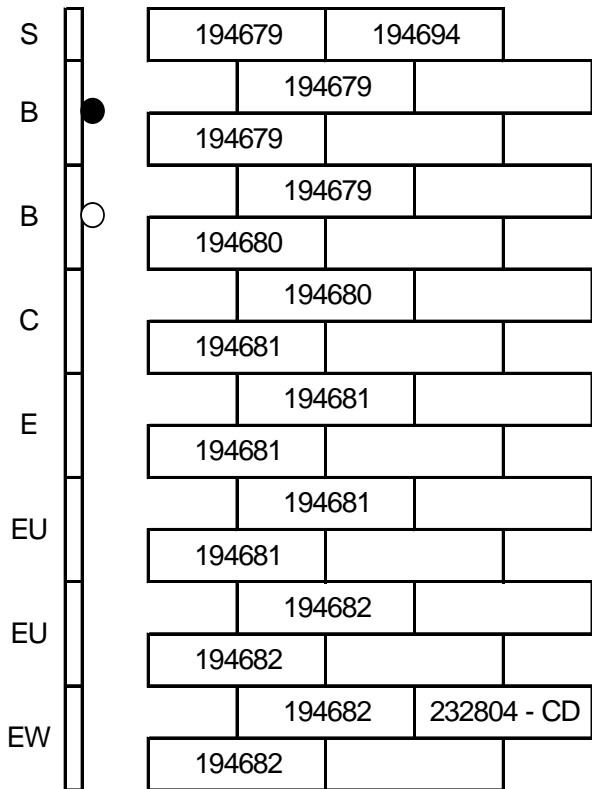
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3313 TO 3316



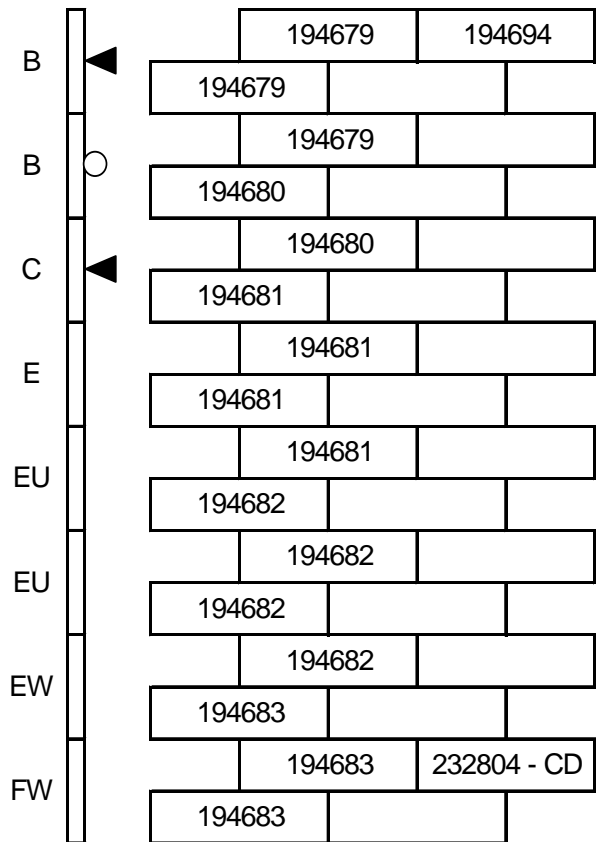
**3313**



**3314**

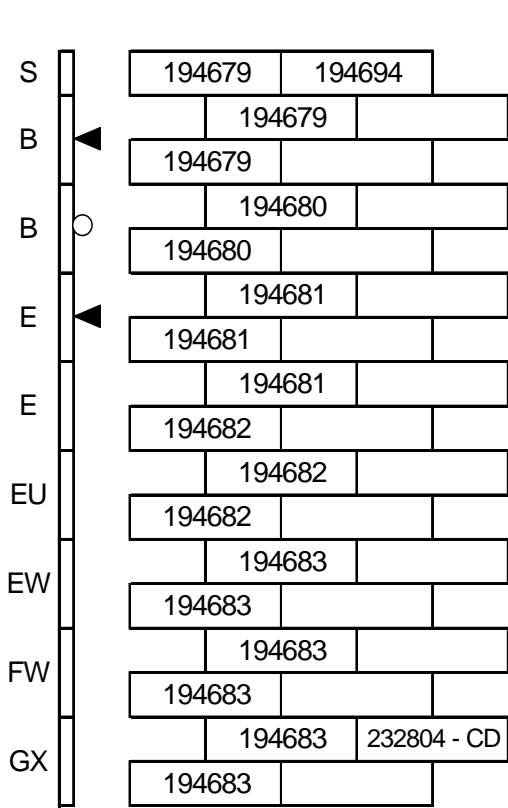


**3315**

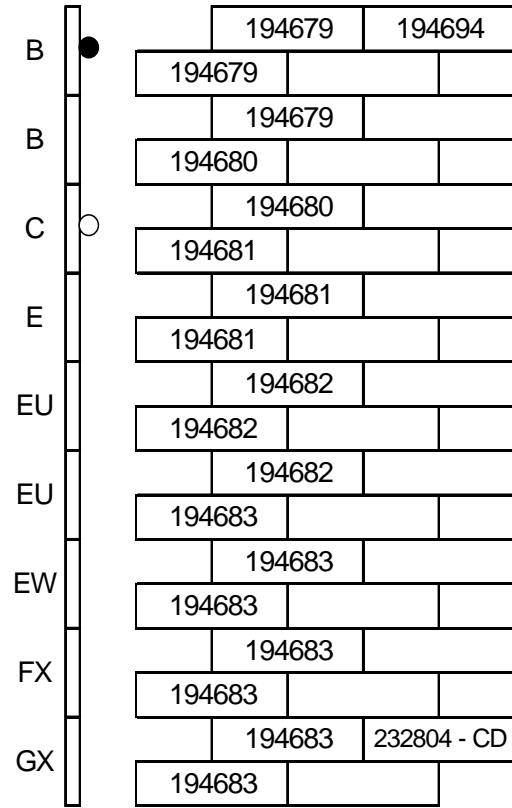


**3316**

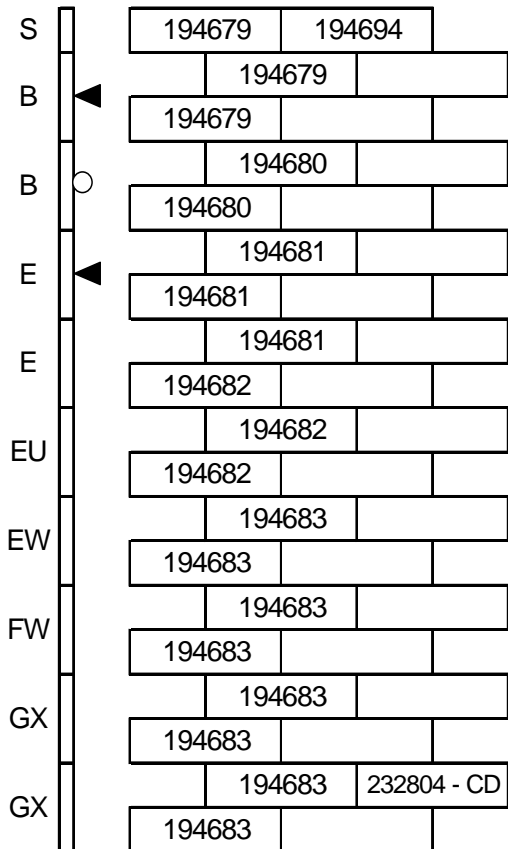
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3317 TO 3319



**3317**

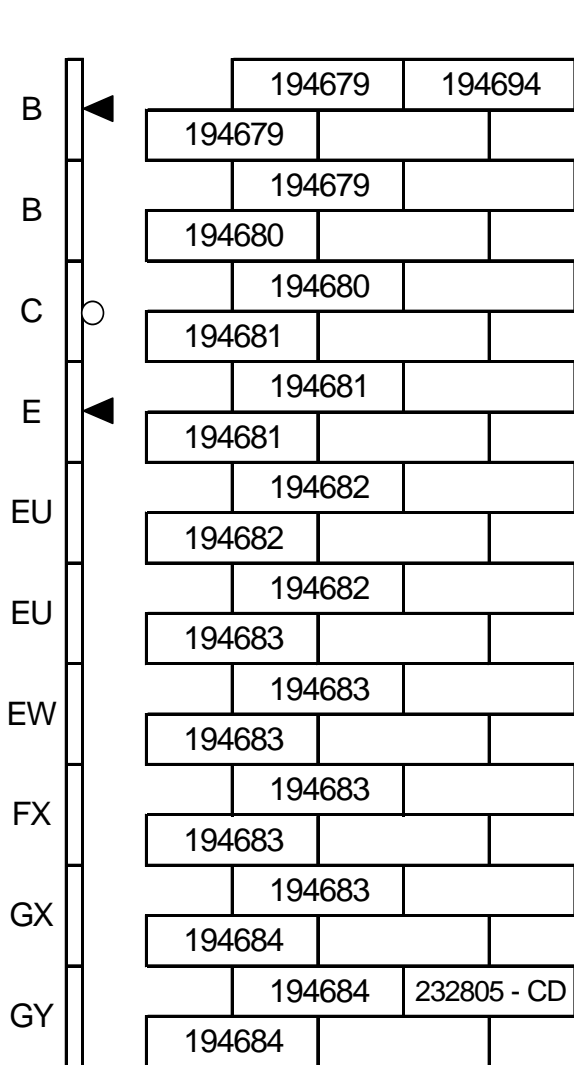


**3318**

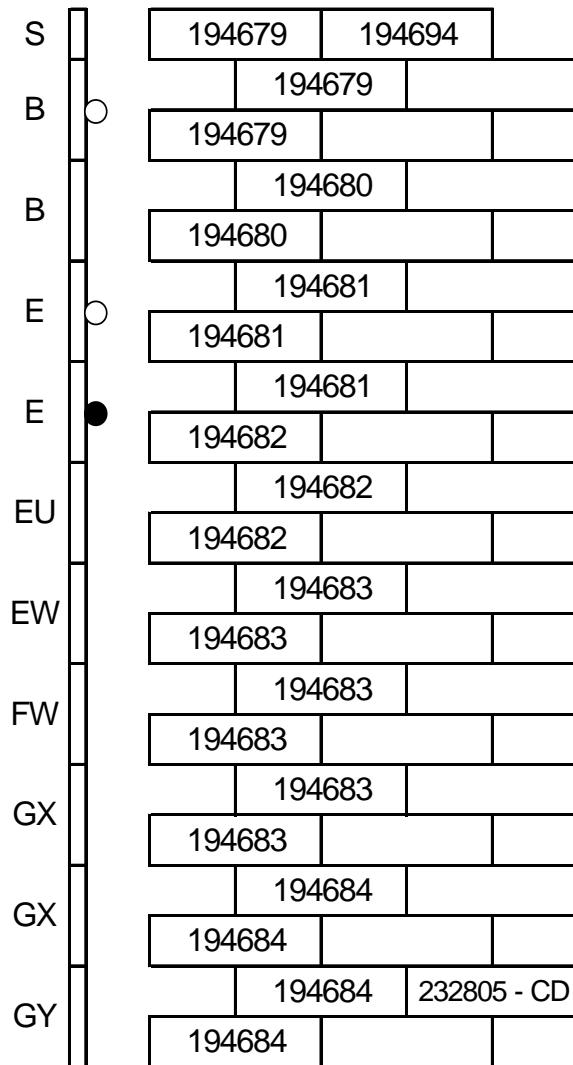


**3319**

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3320 TO 3321

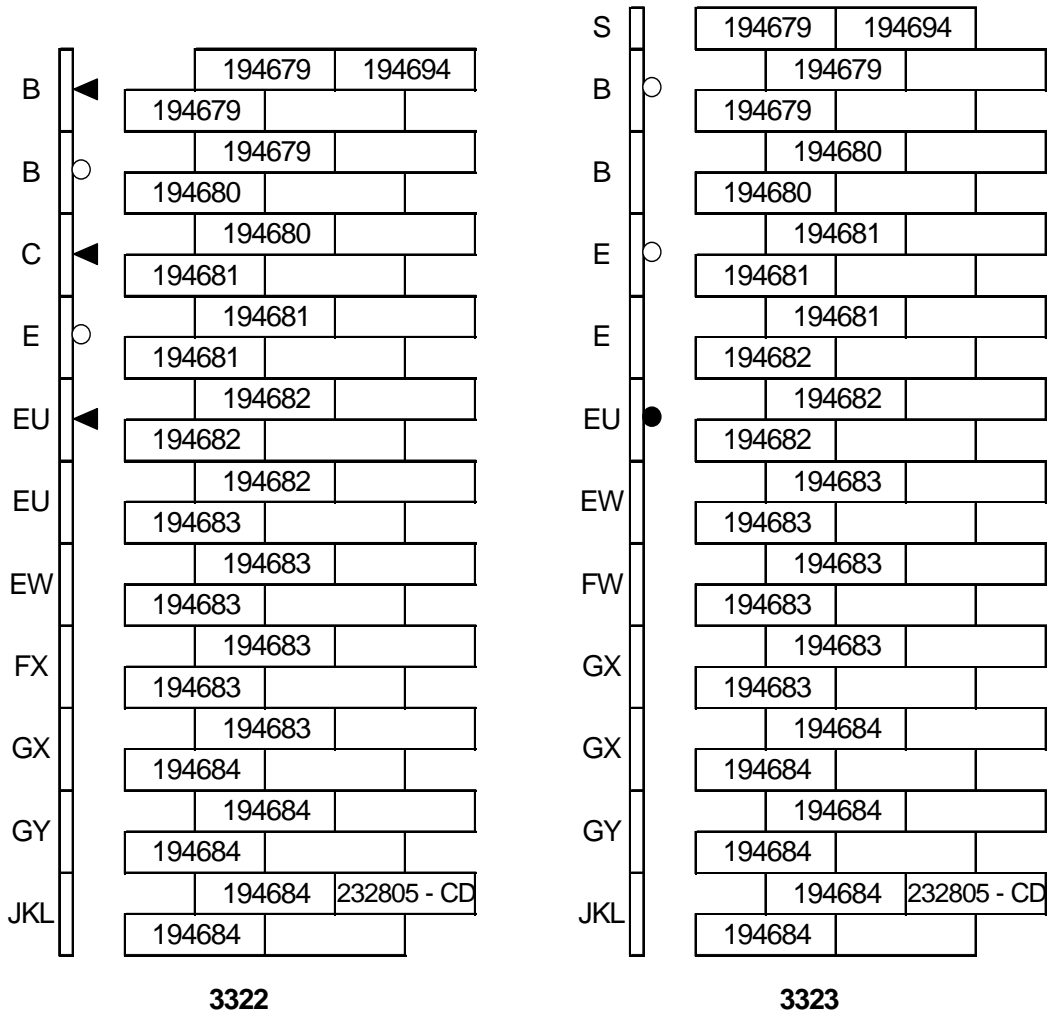


**3320**



**3321**

## WALL SHEET AND UPRIGHT LAYOUT – MODEL 3322 TO 3323



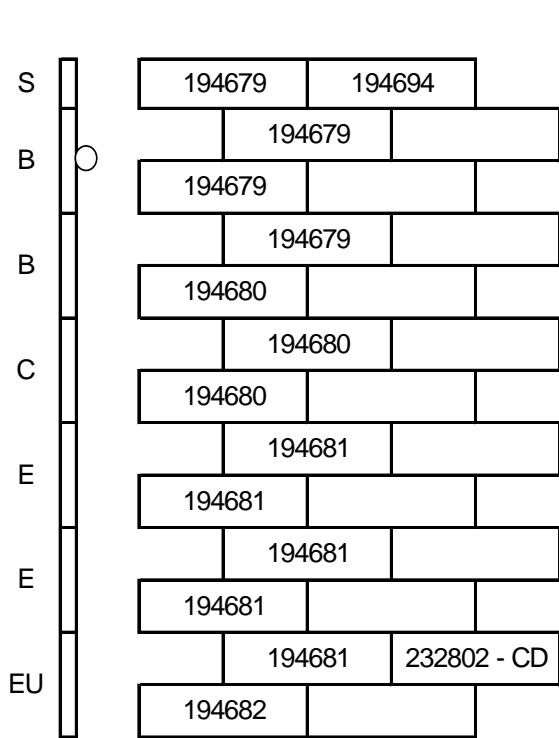
**Notes:**

1. Each tier requires 11 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 22 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
 ◀ – Indicates wind ring placement INSTEAD of the standard position if using Westeel side draw system  
 ● – Indicates additional wind ring placement if using Westeel side draw system

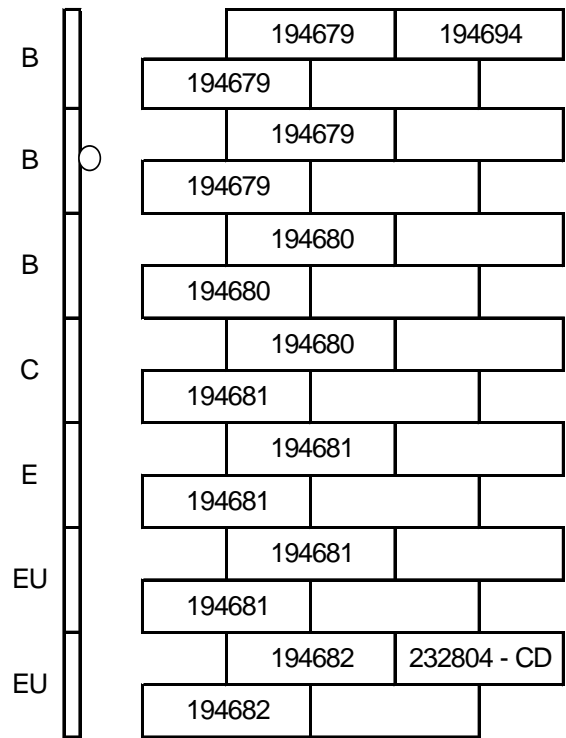
**Legend:**

	Alpha Character	Part Number	Gauge	Label Colour	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	G	232707G	8	Gold	10
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5
	Y	232717Y	8	Gold striped	10
<b>Boxed</b>	J	232709J	8	Red	10
	K	232710K	8	Red Striped	10
	L	232711L	8	Red Striped	5.5

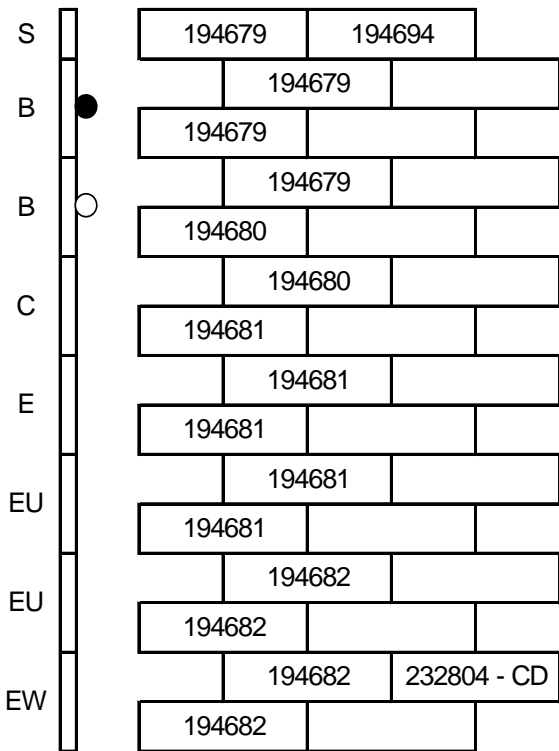
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3613 TO 3616



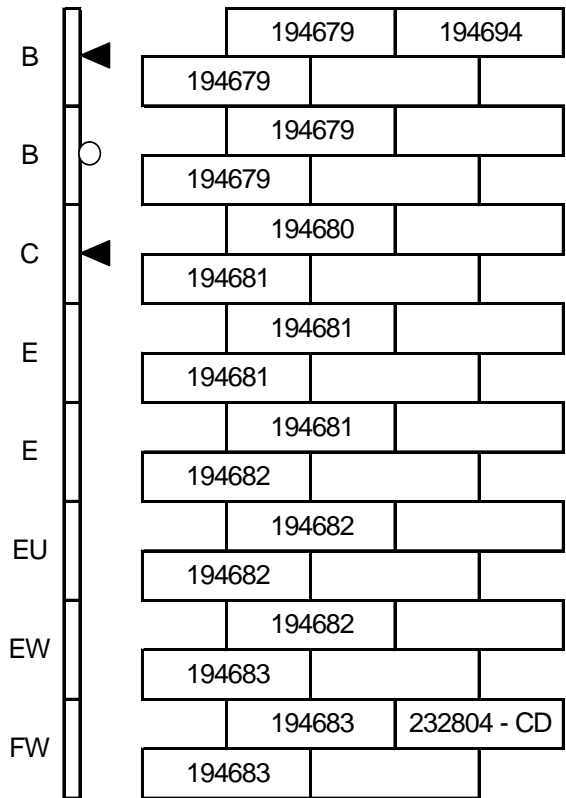
**3613**



**3614**

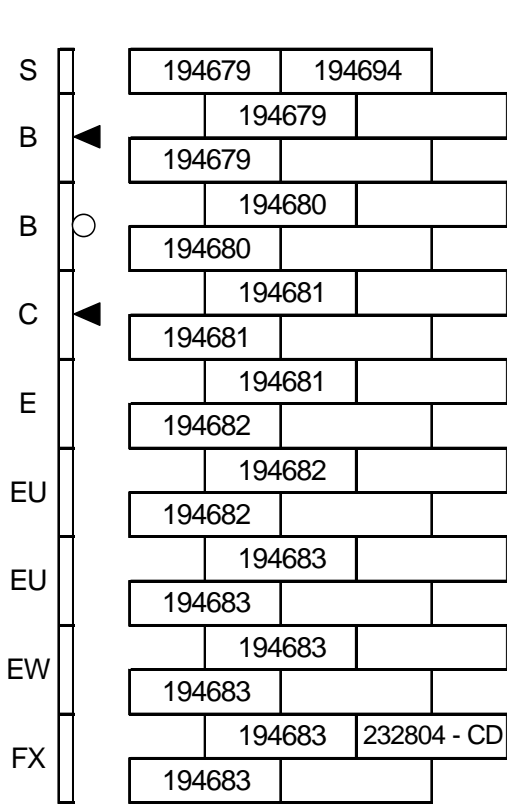


**3615**

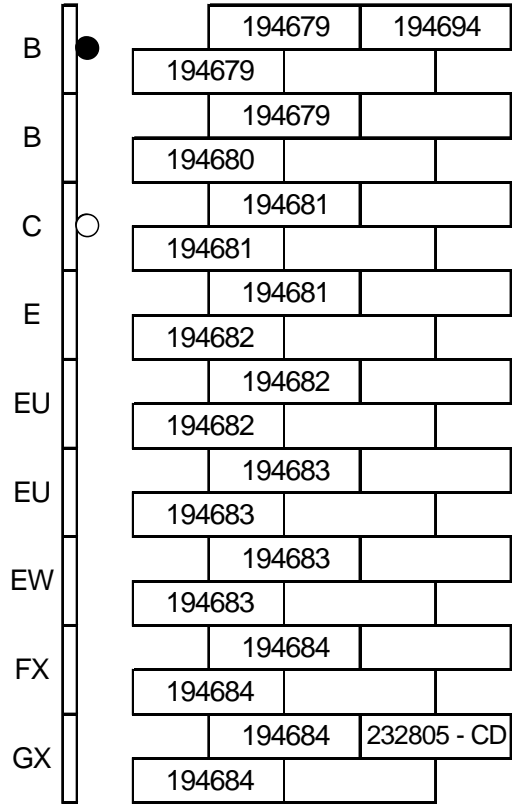


**3616**

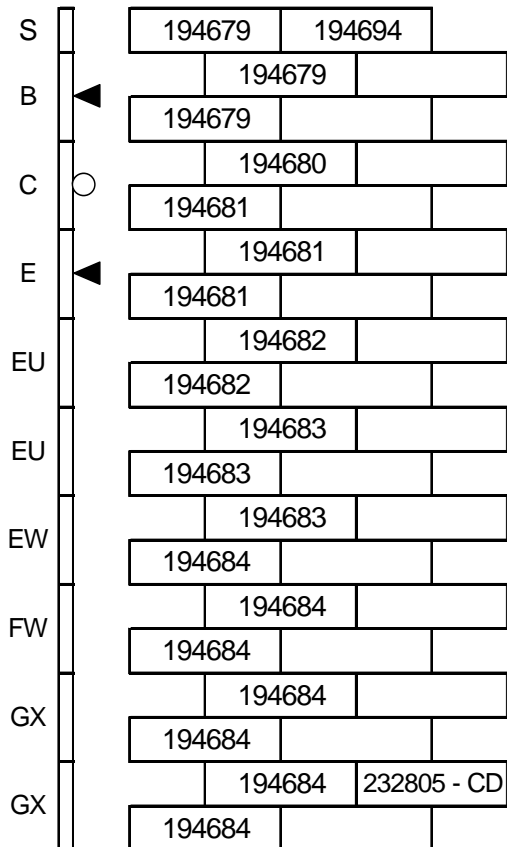
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3617 TO 3619



**3617**

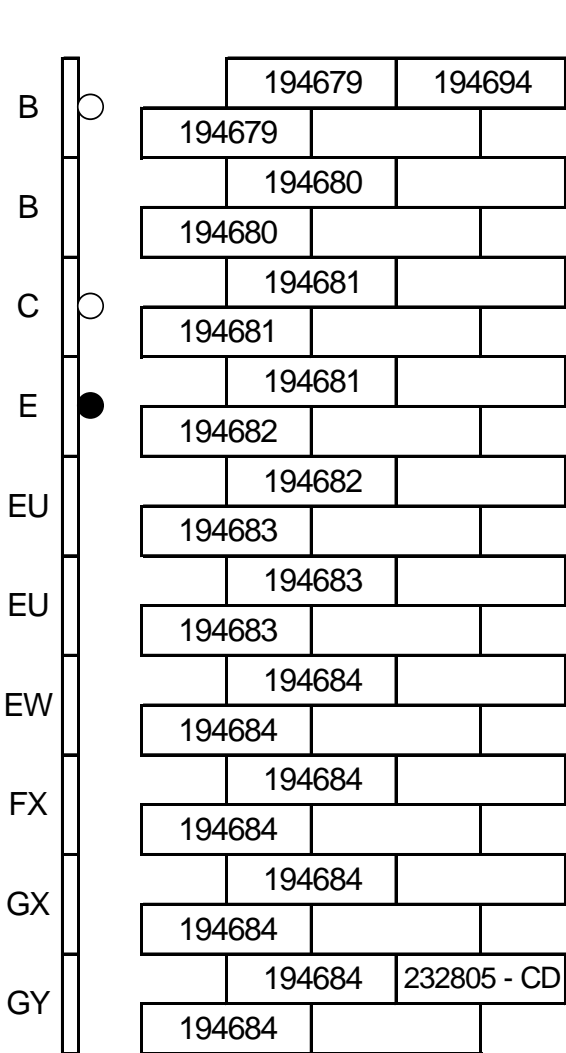


**3618**

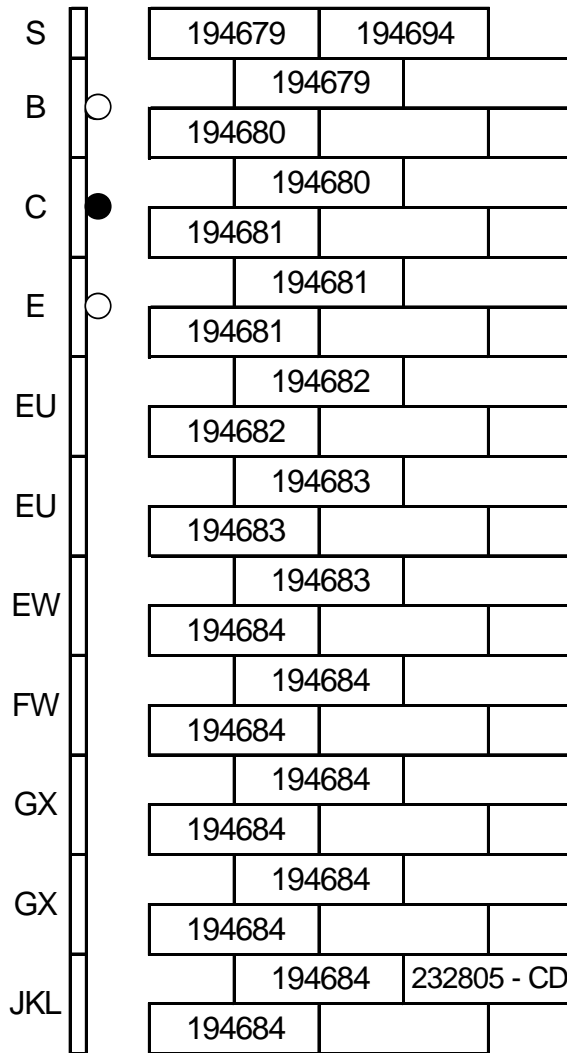


**3619**

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 3620 TO 3621



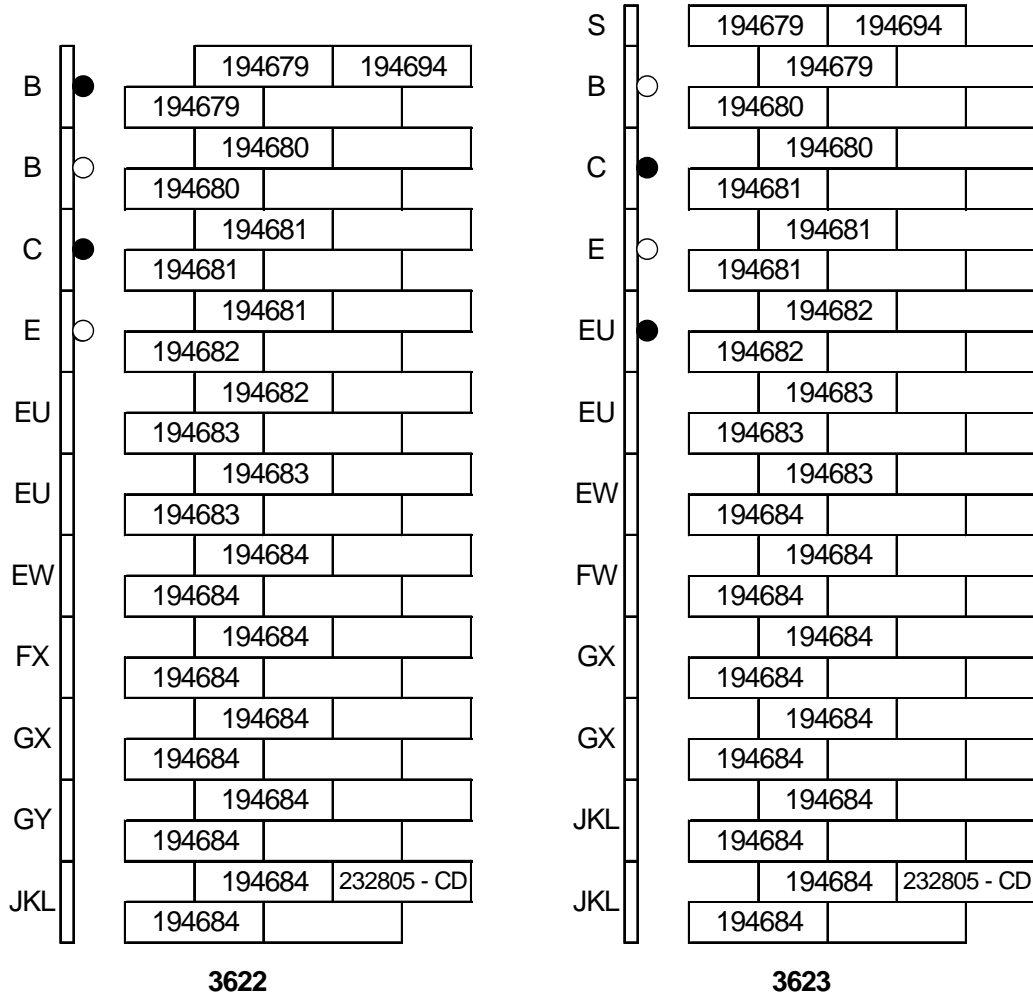
**3620**



**3621**



## WALL SHEET AND UPRIGHT LAYOUT – MODEL 3622 TO 3623



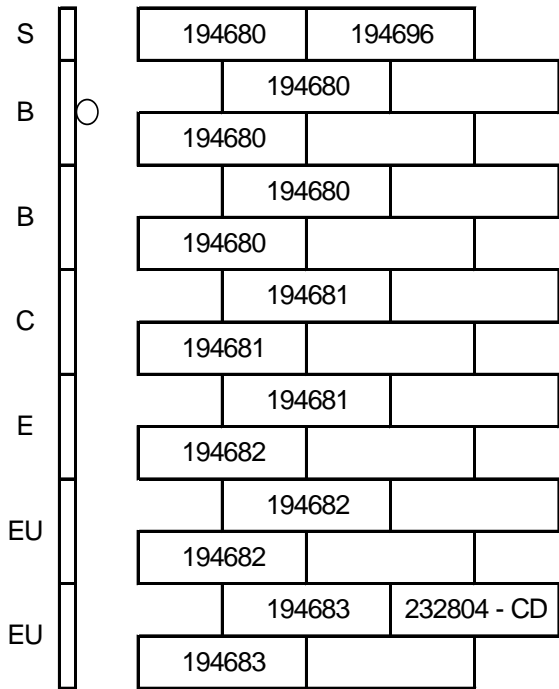
**Notes:**

1. Each tier requires 12 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 24 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
 ◀ – Indicates wind ring placement INSTEAD of the standard position if using Westeel side draw system  
 ● – Indicates additional wind ring placement if using Westeel side draw system

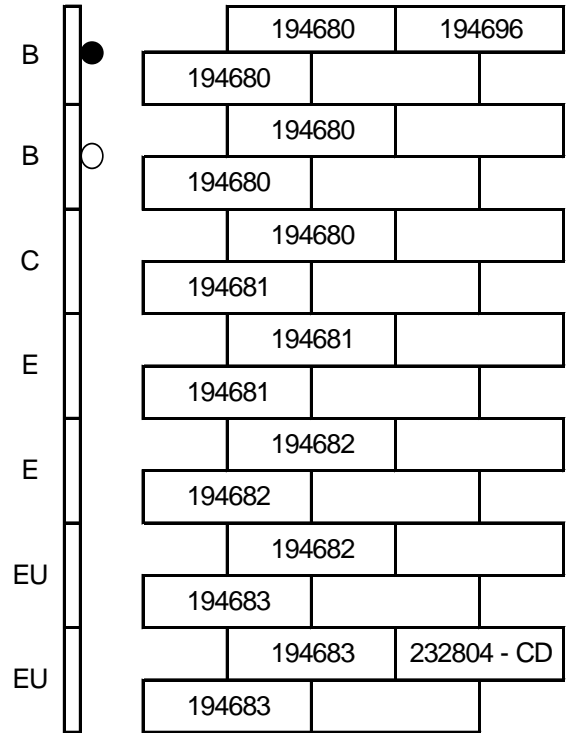
**Legend:**

	Alpha Character	Part Number	Gauge	Label Colour	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	G	232707G	8	Gold	10
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5
	Y	232717Y	8	Gold striped	10
<b>Boxed</b>	J	232709J	8	Red	10
	K	232710K	8	Red Striped	10
	L	232711L	8	Red Striped	5.5

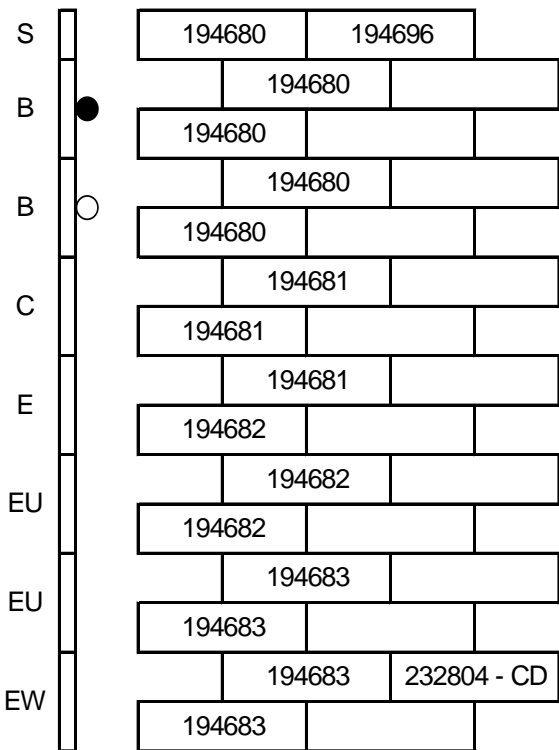
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 4213 TO 4216



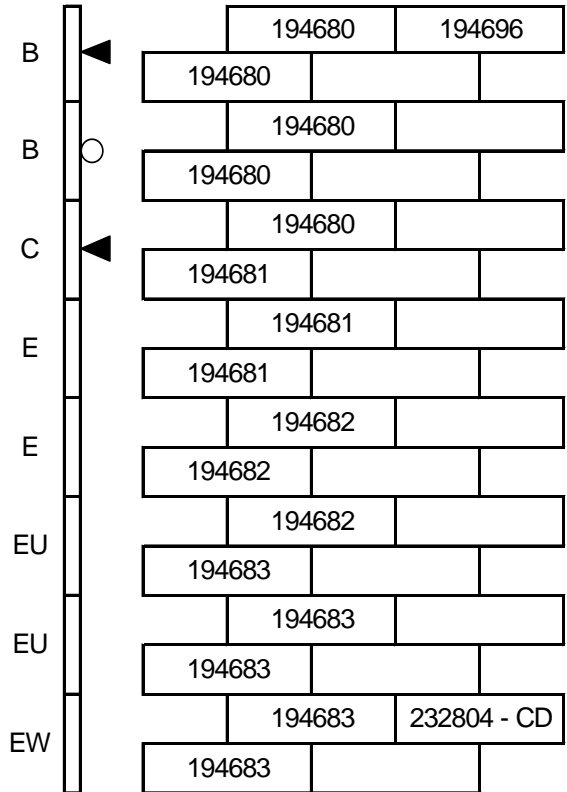
**4213**



**4214**

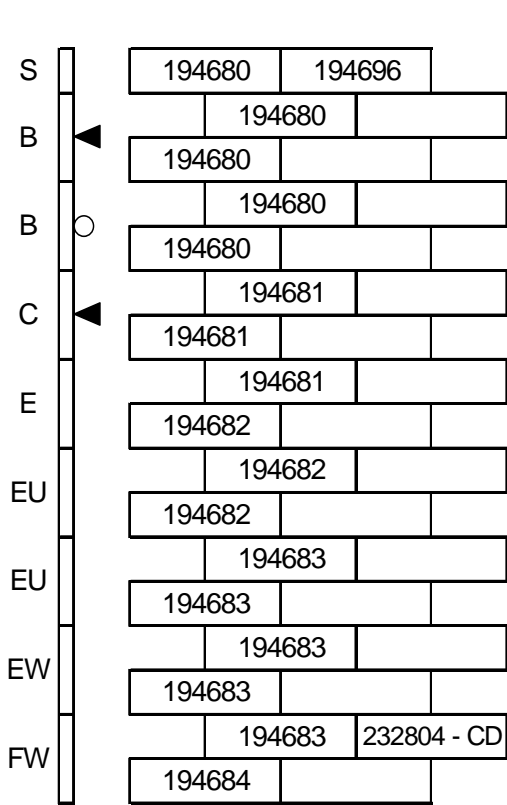


**4215**

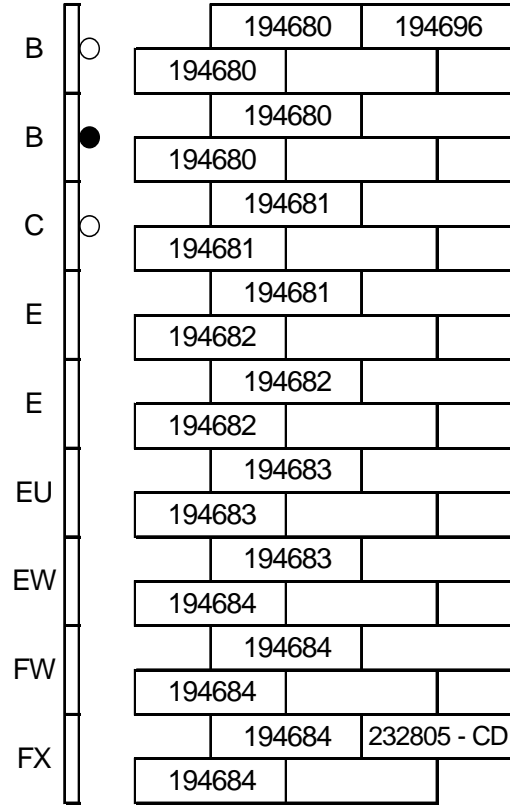


**4216**

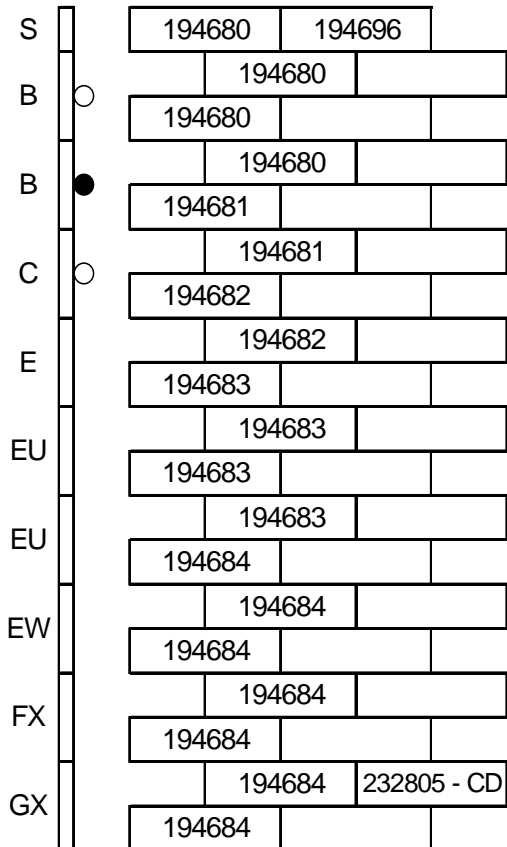
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 4217 TO 4219



**4217**

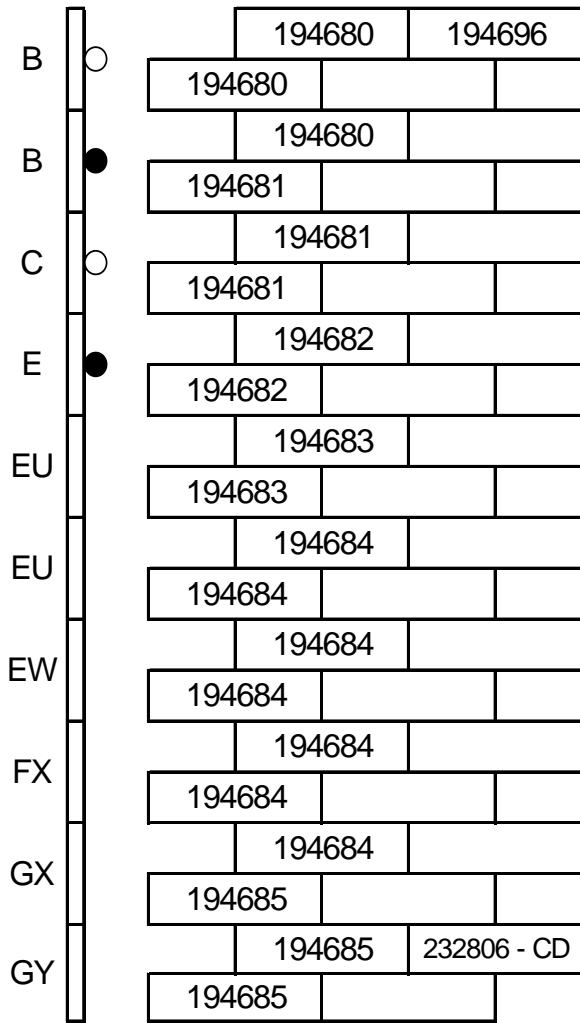


**4218**

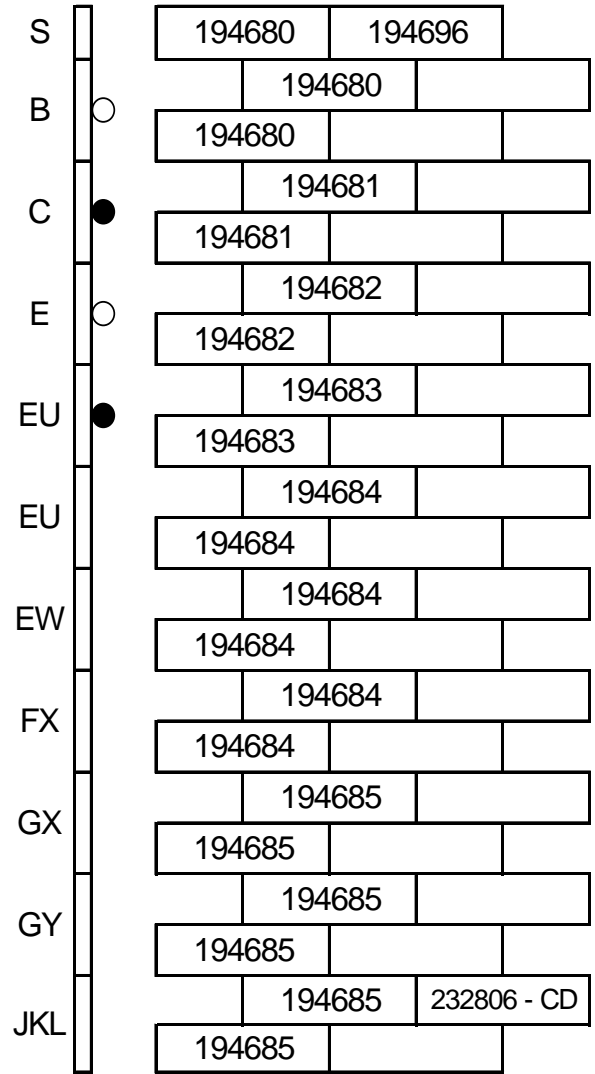


**4219**

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 4220 TO 4221

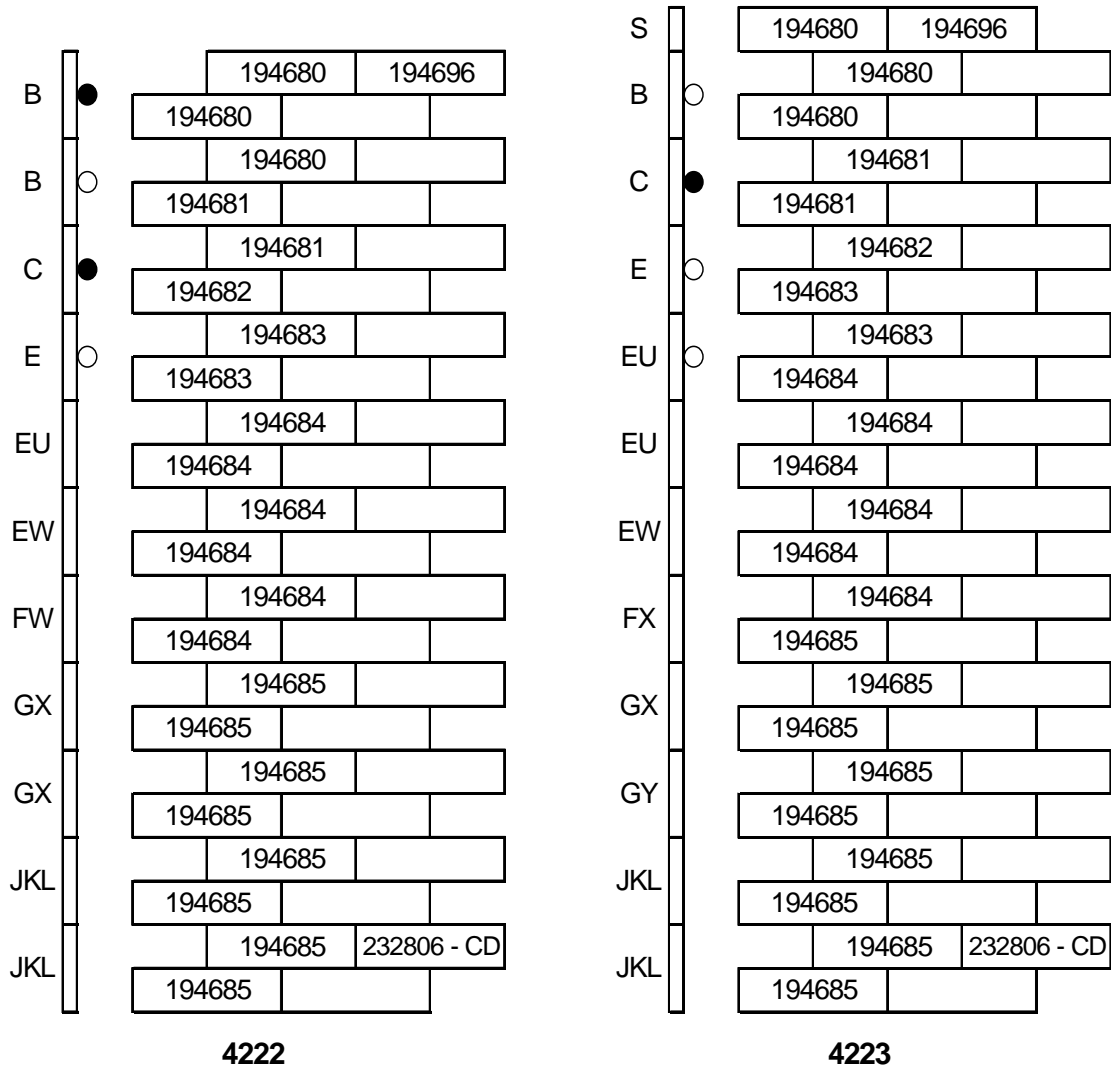


**4220**



**4221**

## WALL SHEET AND UPRIGHT LAYOUT – MODEL 4222 TO 4223



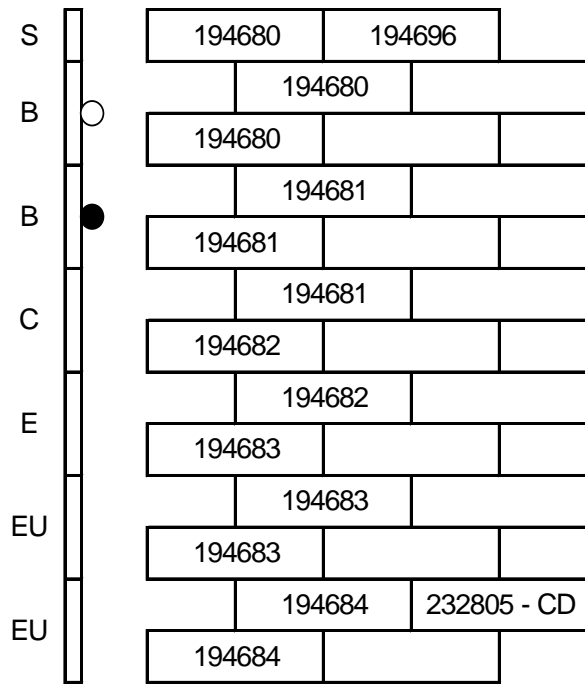
**Notes:**

1. Each tier requires 14 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 28 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
 ◀ – Indicates wind ring placement INSTEAD of the standard position if using Westeel side draw system  
 ● – Indicates additional wind ring placement if using Westeel side draw system

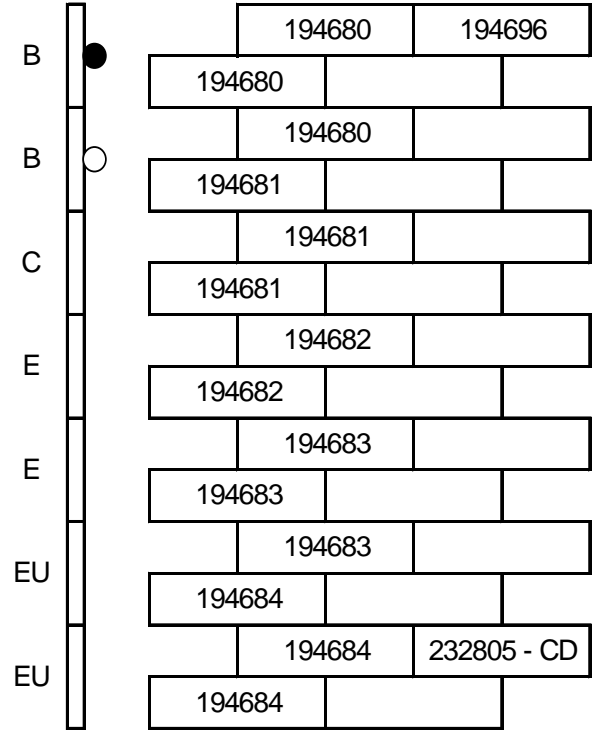
**Legend:**

	Alpha Character	Part Number	Gauge	Label Color	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	G	232707G	8	Gold	10
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5
	Y	232717Y	8	Gold striped	10
<b>Boxed</b>	J	232709J	8	Red	10
	K	232710K	8	Red Striped	10
	L	232711L	8	Red Striped	5.5

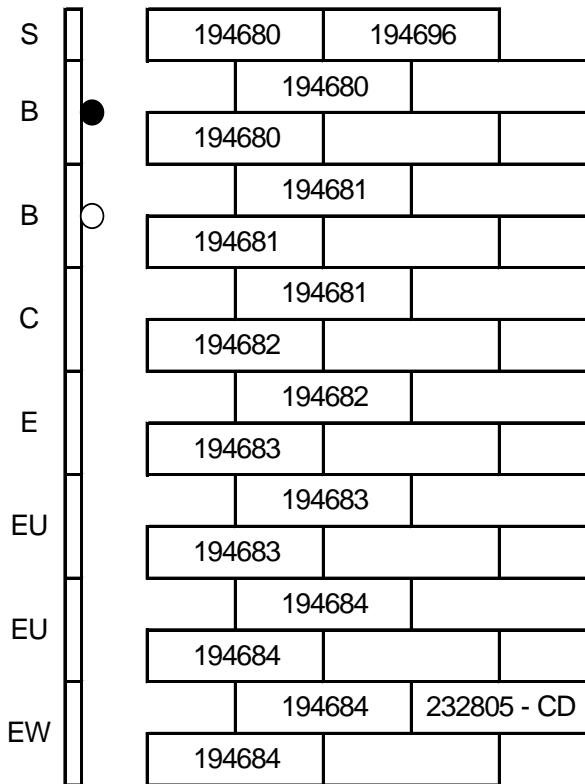
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 4813 TO 4816



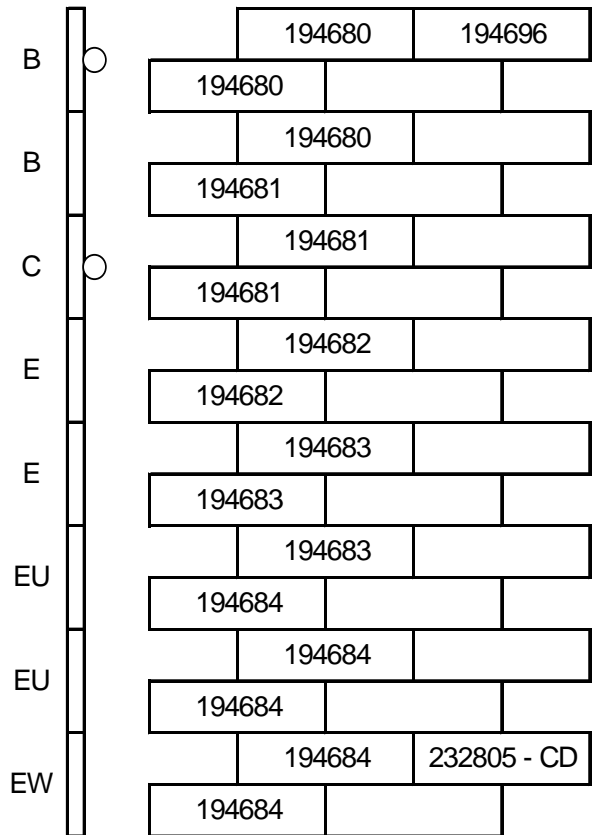
**4813**



**4814**

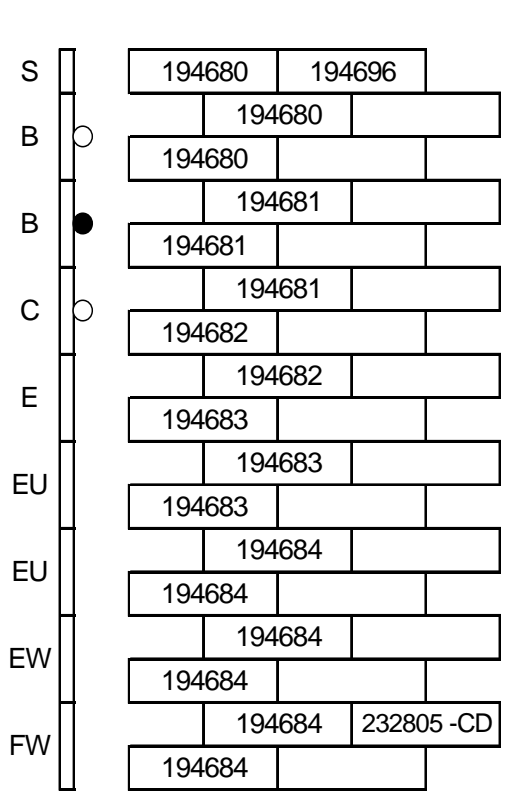


**4815**

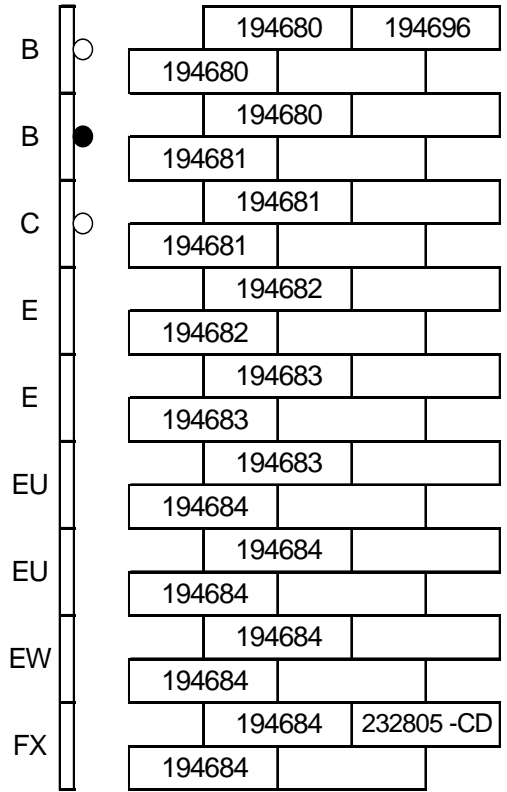


**4816**

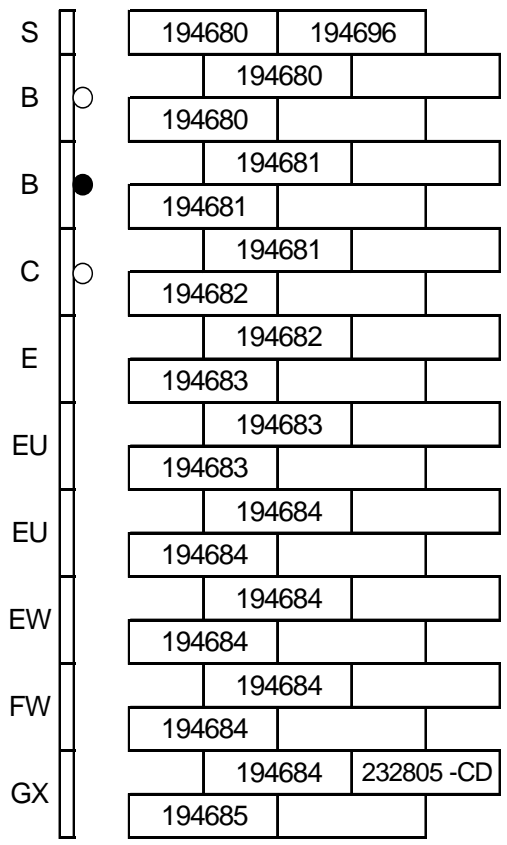
# WALL SHEET AND UPRIGHT LAYOUT – MODEL 4817 TO 4819



**4817**

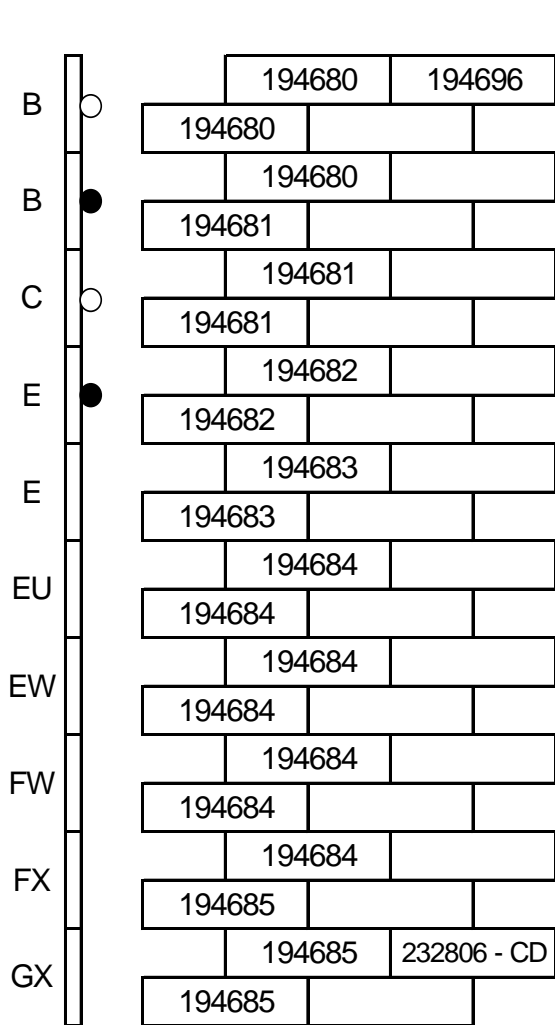


**4818**

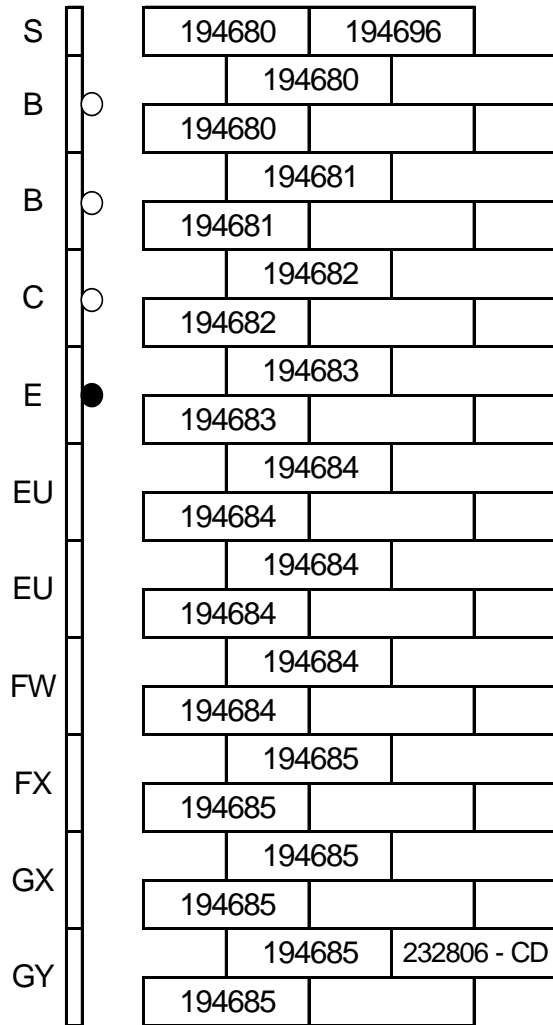


**4819**

# WALL SHEET AND UPRIGHT LAYOUT – MODEL 4820 TO 4821



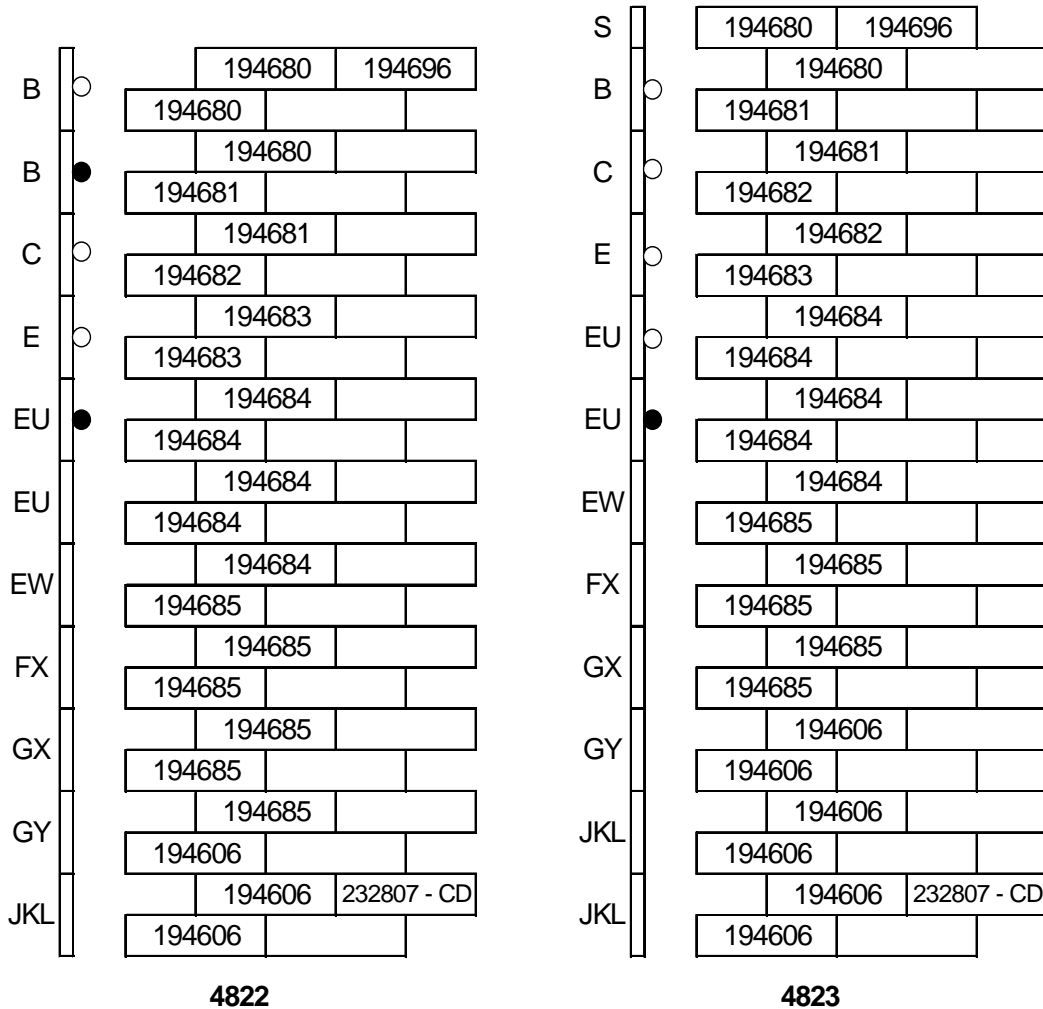
**4820**



**4821**



## WALL SHEET AND UPRIGHT LAYOUT – MODEL 4822 TO 4823



**Notes:**

1. Each tier requires 16 wall sheets; crawl door, indicated by “CD” above, and stencil sheet count as one wall sheet.
2. Each tier requires 32 uprights. All uprights except for the top “S” upright are 2 tiers long.
3. ○ – Indicates standard wind ring placement  
● – Indicates additional wind ring placement if using Westeel side draw system

**Legend:**

	Alpha Character	Part Number	Gauge	Label Color	Width of Section (in)
<b>Uprights</b>	B	232702B	14	Light green	5.5
	C	232703C	12	Light green	5.5
	E	232705E	8	Brown	5.5
	F	232706F	8	Silver	6.5
	G	232707G	8	Gold	10
	S (Short)	232700S	14	Blue	5.5
<b>Laminates</b>	U	232713U	12	Blue striped	5.5
	W	232715W	8	Brown striped	5.5
	X	232716X	8	Silver Striped	6.5
	Y	232717Y	8	Gold striped	10
<b>Boxed</b>	J	232709J	8	Red	10
	K	232710K	8	Red Striped	10
	L	232711L	8	Red Striped	5.5

## APPENDIX I - ROOF PARTS BOX

DESCRIPTION and PART NUMBER		15'	18'	21'	24'	27'	30'	33'	36'	42'	48'
		235760	235761	235762	235763	235764	235765	235766	235767	235768	235769
PEAK RING	VARIES	212201	212203	212204	212205	212206	Too large for parts box				
PEAK RING BULB GASKET 105"	195149	1	1	1	1	1					
PEAK RING BULB GASKET 168"	195150						1	1	1	1	1
PEAK RING FOAM 96"	212228	1	1	1	1	1					
PEAK RING FOAM 160"	212229						1	1	1	1	1
INSPECTION HATCH LID	235890	1	1	1	1	1	1	1	1	1	1
INSPECTION HATCH LATCH	235891	1	1	1	1	1	1	1	1	1	1
INSPECTION HATCH BULB GASKET 76"	235882	1	1	1	1	1	1	1	1	1	1
BIRD STOP ANGLE	212230	15	18	21	24	27	30	33	36	42	48
FOAM for BIRD STOPS (set of 12)	212231	2	2	2	2	3	3	3	3	4	4
STIFFENING RING SPLICE 1.375"	195074							3	3	6	6
STIFFENING RING EXPANDER 1.375	195085							2	2	4	4
STIFFENING RING BRACKET	195062							33	36	84	96
STIFFENING RING GASKET – BAG 50	195080							1	1	2	2
LADDER RUNG 14.5 (6")	193062										1
LADDER RUNG 14.5 (8")	193063				1	1			1	1	1
LADDER RUNG 14.5 (10")	193064			1			1	1		1	
LADDER RUNG 14.5 (12")	193065		1			1			1		
LADDER RUNG 16.5 (14")	193066	1			1		1	1			1
LADDER RUNG 18.5 (16")	193067			1		1		1	1	1	1
LADDER RUNG 20.5 (18")	193068		1		1		1		1	1	1
LADDER RUNG 22.5 (20")	193069			1		1		1			1
LADDER RUNG 24.5 (22")	193070	1			1		1		1		1
LADDER RUNG 26.5 (24")	193071		1			1		1		1	
LADDER RUNG 28.5 (26")	193072			1			1			1	
LADDER RUNG 30.5 (28")	193073	1			1	1			1	1	1
LADDER RUNG 32.5 (30")	193074		1				1	1	1		1
LADDER RUNG 34.5 (32")	193075			1	1	1				1	1
LADDER RUNG 36.5 (34")	193076						1	1	1	1	1
LADDER RUNG 38.5 (36")	193077	1	1	1	1	1	1	1	1	1	
LADDER RUNG 40.5 (38")	193078										1
DOOR TIE BACK ASSEMBLY	236801	1	1	1	1	1	1	1	1	1	1
SEALING CLIP for BOTTOM ANGLE	235372	5	6	7	8	9	10	11	12	14	16
SELFDRIILL SCREW .25 x 1.0 – BAG 7	235151							1	1	1	1
BOLT HFS .313" x 1.00" GR8.2 – BAG 250	235914	1	1	1	1	2	2	2	3	4	5
BOLT HFS .313" x 1.00" GR8.2 – BAG 50	235915			2	4		1	4	1	1	2
BOLT HFS .313" x 1.25" GR8.2 – BAG 80	235916	1	1	1	1	1	2	2	1		1
BOLT HFS .313" x 1.25" GR8.2 – BAG 50	235917		2	1	1	1			2	4	3
HEX FLANGE NUT .313" – BAG 250	235923	1	1	1	2	2	3	3	4	5	6
HEX FLANGE NUT .313" – BAG 50	235925	1	2	4	1	3		2			2
WASHER POLY .313" – BAG 25	235929	1	1	1	1	1	1	1	1	1	1
FLAT WASHER .375 – BAG 75	235957	1	2				1	2	2		1
FLAT WASHER .375 – BAG 200	235956			1	1	1	1	1	1	2	2

## APPENDIX II – ROOF PARTS BOX PART IDENTIFICATION



195085 – Expander (1.375" Dia.)



195074 – Stiffening Ring Splice (1.375" Dia.)



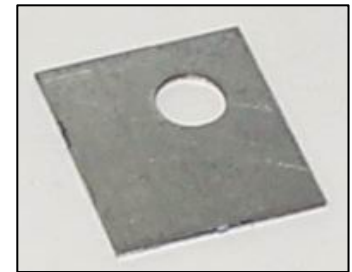
195062 – Stiffening Ring Bracket  
195080 – Stiffening Ring Gasket  
(Bag of 50)



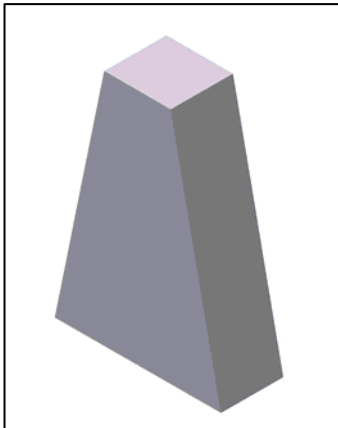
212228 – Foam Closure for Peak Ring  
(15' - 27')  
212229 -- Foam Closure for Peak Ring  
(30' - 48')



235891 – Inspection Hatch Latch  
Assembly



235372 – Sealing Clip for  
Bottom Ring Angle

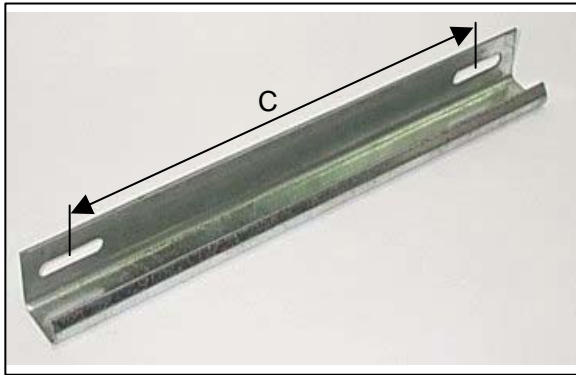


212231 – Foam Roof  
Rib Closure



235890 – Hatch Lid Assembly

## APPENDIX II – ROOF PARTS BOX PART IDENTIFICATION

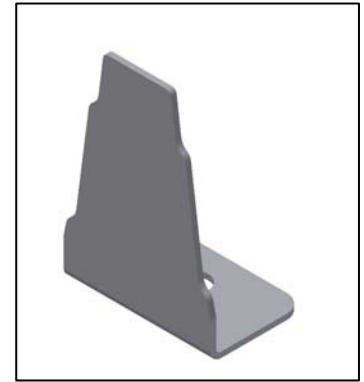


P/N	C
193061	4
193062	6
193063	8
193064	10
193065	12
193066	14
193067	16
193068	18
193069	20
193070	22

P/N	C
193071	24
193072	26
193073	28
193074	30
193075	32
193076	34
193078	38

"C" Dimension  
Is In Inches

193060-79 – Roof Ladder Rung



212230 - Bird Stop



235882 – Inspection Hatch Bulb Gasket



195149 – Peak Ring Bulb Gasket (105")  
195150 – Peak Ring Bulb Gasket (168")

## APPENDIX I - BIN WALL HARDWARE "WHERE USED" CHART

CONNECTION LOCATION	3/8" x 1" Flange Bolt & Hex Nut	3/8" x 1½" Flange Bolt & Hex Nut	3/8" x 3¼" Hex Bolt & Hex Nut	3/8" Flat Washer	3/8" Poly Washer & Hex Nut	7/16" x 1½" Flange Bolt & Hex Nut	7/16" x 1¼" Flange Bolt & Hex Nut	1/2" Flat Washer
BOLT Part Number	193795	193797	150477	154977	154951 Washer	193768	193771	154981
NUT Part Number	193805	193805	193805		193805	193770	193770	
UPRIGHT to WALL SHEET to ROOF CONNECTION UPRIGHT (Outside Stiffened Bins)		•		•	•			
WALL SHEET to UPRIGHT to ROOF CONNECTION UPRIGHT (Inside Stiffened Bins)		•		•				
<b>HORIZONTAL and VERTICAL WALL SHEET SEAMS</b>								
WALL SHEETS 194679 to 194685, 194606 to 194607 THICKNESS .040" to .139"	•			•☆				
WALL SHEET 194608 THICKNESS .168"		•		•☆				
WALL SHEETS 194604 to 194605, 194616 to 194617 THICKNESS .096" LAMINATED to .139" LAMINATED						•		◆
SIDE DRAW SHEETS to SURROUNDING WALL SHEETS		•						
WALL SHEET 194618 THICKNESS .168" LAMINATED							•	◆
<b>WALL SHEET to UPRIGHT CONNECTIONS</b>								
WALL SHEETS 194679 to 194685 THICKNESS .040" to 0.116"	•							
WALL SHEETS 194606 to 194608, 194604 to 194618 THICKNESS .126" to .168", .096" LAM to .168" LAM		•						
WALL SHEET to UPRIGHT at HORIZONTAL SEAMS		•						
WALL SHEET to UPRIGHT to LAMINATE to CAP PLATE (for bins with Boxed Uprights)		•						
ALL ROOF SHEET CONNECTIONS	5/16" X 1" Flange Bolt & Hex Nut							
UPRIGHT to SPLICE	•							
UPRIGHT to LAMINATE	•							
UPRIGHT to LAMINATE to BOXED UPRIGHT		•						
WIND RING BRACKET to WALL SHEET to UPRIGHT (Inside Stiffened Bins Only)		•			•			
WIND RING CLIP to UPRIGHT or WIND RING CLIP to WIND RING BRACKET		•						
WIND RING SPLICE			•					
DOOR TIE BACK to WALL SHEET or UPRIGHT	•							

☆ - 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)

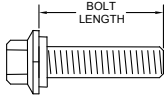
◆ - Use washers only at wall sheet to *bottom ring angle*

## APPENDIX IV - HARDWARE USAGE

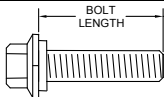


Use 5/16" x 1 1/4" bolts provided in the bin parts boxes for the top ring angle to wall sheet connection. Use 3/8" hardware at all other wall sheet connections as shown below. There may be a shortage of 3/8" bolts if used at the top ring angle connection.

### Roof Hardware

	5/16" x 1" bolt (washer)	5/16" x 1 1/4" bolt (washer)	5/16" flange lock nut	5/16" poly washer
	193802	193803	193732	193806
Roof sheet rib to roof sheet rib	•		•	
Roof sheet to top ring angle	•		•	
Roof sheet to peak ring	•		•	
Stiffening ring bracket to roof sheet	•		•	
Stiffening ring bracket to ladder support to roof rib		•	•	
Ladder rung to ladder support to roof rib		•	•	
Ladder rung to roof rib		•	•	
<b>Top wall sheet to top ring angle</b>		•	•	
Bird stop to top ring angle	• (27'-48')		•	
Between ladder rung & ladder support or roof rib				•
Inspection hatch lid assembly to roof panel	•		•	
Inspection hatch latch to roof panel		•	•	

### Bin Hardware

	3/8" x 1" bolt (washer)	3/8" x 1" round head bolt	3/8" x 1 1/4" bolt (washer)	3/8" x 1 1/2" bolt (washer)	3/8" nut	3/8" flat washer
	193795	150594	150037	193797	193805	154977
Auger chute hood to auger door board		•			•	
Auger chute block-off plate to auger door board				•	•	
Drying floor flashing holes in bottom wall sheet	•				•	
Wall sheet to bottom ring angle	•				•	•
Door tie-back to wall sheet	•				•	
Wall sheet to door			•		•	
Bin to hopper cone			•		•	•
<b>Wall sheet to wall sheet</b>	•				•	




## APPENDIX IV - RECOMMENDED BOLT ASSEMBLY



# IMPORTANT

CHECK TO MAKE SURE THAT THE PROPER TORQUE HAS BEEN APPLIED TO ALL BOLTS AND THAT THE RECOMMENDED ASSEMBLY PROCEDURE HAS BEEN FOLLOWED.

### RECOMMENDED TORQUE VALUES FOR BOLTS

BOLT DIAMETER	BOLT GRADE	GRADE MARK	RECOMMENDED TORQUE		
			in-lb	ft-lb	N-m
5/16"	Grade 8.2		300	25	33
3/8"	Grade 8.2		520	43	58
7/16"	Grade 8.2		840	70	95

Periodically check bolt assembly with an accurate torque wrench to ensure that above torque specifications are maintained. A properly tightened bolt will compress sealing washer noticeably.

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

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



### **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.

# **WESTEEL**

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[www.westeel.com](http://www.westeel.com)