

Natural Air Drying Application Guide

**Reference for
Corn, Beans,
Wheat and Barley**

PNEG-701



a division of

THE GSI GROUP



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(4.00" CORRUGATION)**

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Grain Systems, principle concern is your safety and the safety of others associated with grain handling equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist and inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel. Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

It is also important you read the safety section of any product that is attached to or used in conjunction with this product.

Safety Alert Symbol

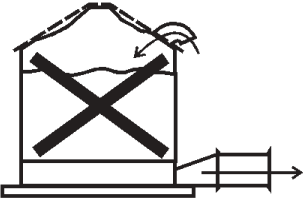
The symbol shown is used to call your attention to instructions concerning your personal safety. Watch for this symbol; it points out important safety precautions. It means "ATTENTION", "WARNING", "CAUTION", and "DANGER". Read the message and be cautious to the possibility of personal injury or death.



Personnel operating or working around equipment should read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

Roof Damage Warning and Disclaimer

▲ CAUTION!



Excessive vacuum (or pressure) may damage roof. Use positive aeration system. Make sure all roof vents are open and unobstructed. Start roof fans when supply fans are started. Do not operate when conditions exist that may cause roof vent icing.

GSI DOES NOT WARRANT ANY ROOF DAMAGE CAUSED BY EXCESSIVE VACUUM OR INTERNAL PRESSURE FROM FANS OR OTHER AIR MOVING SYSTEMS. ADEQUATE VENTILATION AND/OR "MAKEUP AIR" DEVICES SHOULD BE PROVIDED FOR ALL POWERED AIR HANDLING SYSTEMS. GSI DOES NOT RECOMMEND THE USE OF DOWNWARD FLOW SYSTEMS (SUCTION). SEVERE ROOF DAMAGE CAN RESULT FROM ANY BLOCKAGE OF AIR PASSAGES. RUNNING FANS DURING HIGH HUMIDITY/COLD WEATHER CONDITIONS CAN CAUSE AIR EXHAUST OR INTAKE PORTS TO FREEZE.

ATTENTION: The decal shown below should be present on the outside of the door cover of the two ring, 24" porthole door cover and the roof manway cover. If a decal has been damaged or is missing in any of these locations contact Grain Systems for a free replacement decal.

GRAIN SYSTEMS

1004 EAST ILLINOIS STREET
ASSUMPTION, IL. 62510-0020
(217) 226-4421



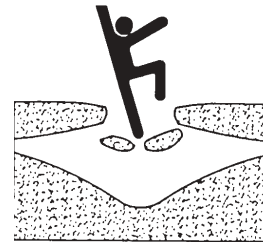
DANGER



Rotating flighting can
kill or dismember.



Flowing material can
trap and suffocate.



Crusted material can
collapse and suffocate.

**Keep clear of all augers.
DO NOT ENTER this bin!**

If you must enter this bin:

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

**Failure to heed these
warnings will result in
serious injury or death**

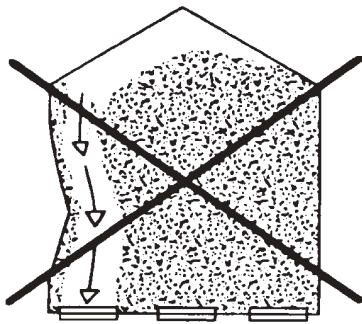
DC-552

ATTENTION: The decal shown below should be present on the outside of the door cover of the two ring, 24" porthole door cover and the roof manway cover. If a decal has been damaged or is missing in any of these locations contact Grain Systems for a free replacement decal.

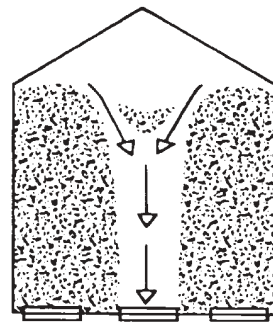
GRAIN SYSTEMS
1004 EAST ILLINOIS STREET
ASSUMPTION, IL. 62510-0020
(217) 226-4421



CAUTION



DON'T



DO

UNLOADING INSTRUCTIONS:

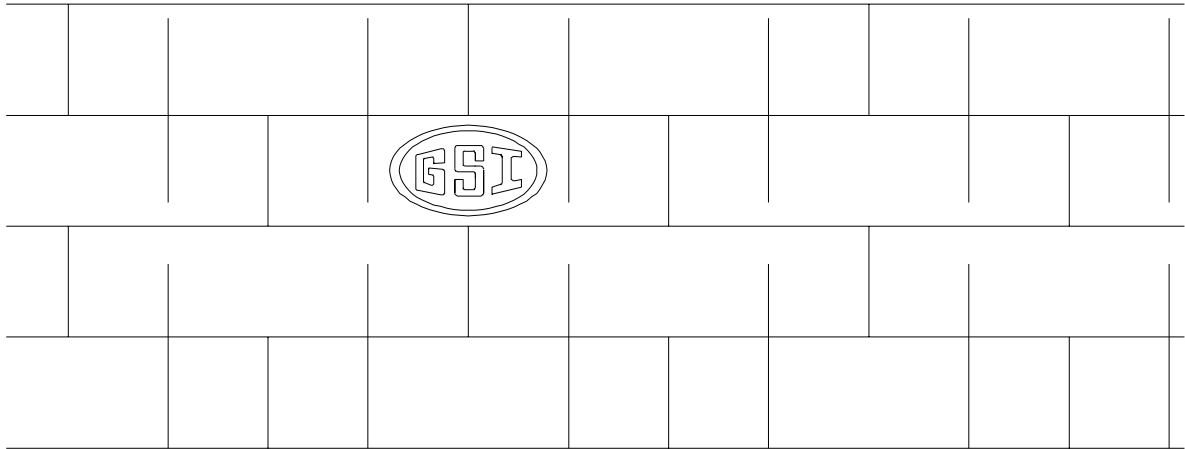
1. Use **CENTER OUTLET ONLY** until **NO** grain remains above this outlet.
2. Side outlets to be used **ONLY** when above condition is satisfied.
3. Lock all side outlets to avoid accidental premature use.

Failure to follow proper unloading practices will result in structural damage or collapse of tank.

DC-566

NOTE: The decal sheets are located in the second ring from the top, evenly spaced around the diameter of the bin.

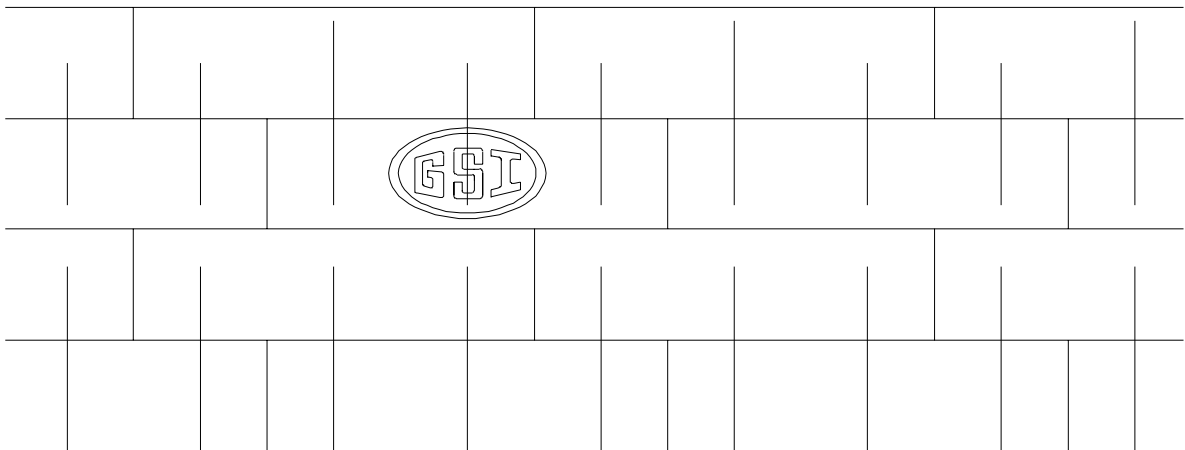
Note: Dashed lines represent stiffener locations.



2 - POST

(Two rows of stiffeners used on each sidewall sheet)

Note: Dashed lines represent stiffener locations.

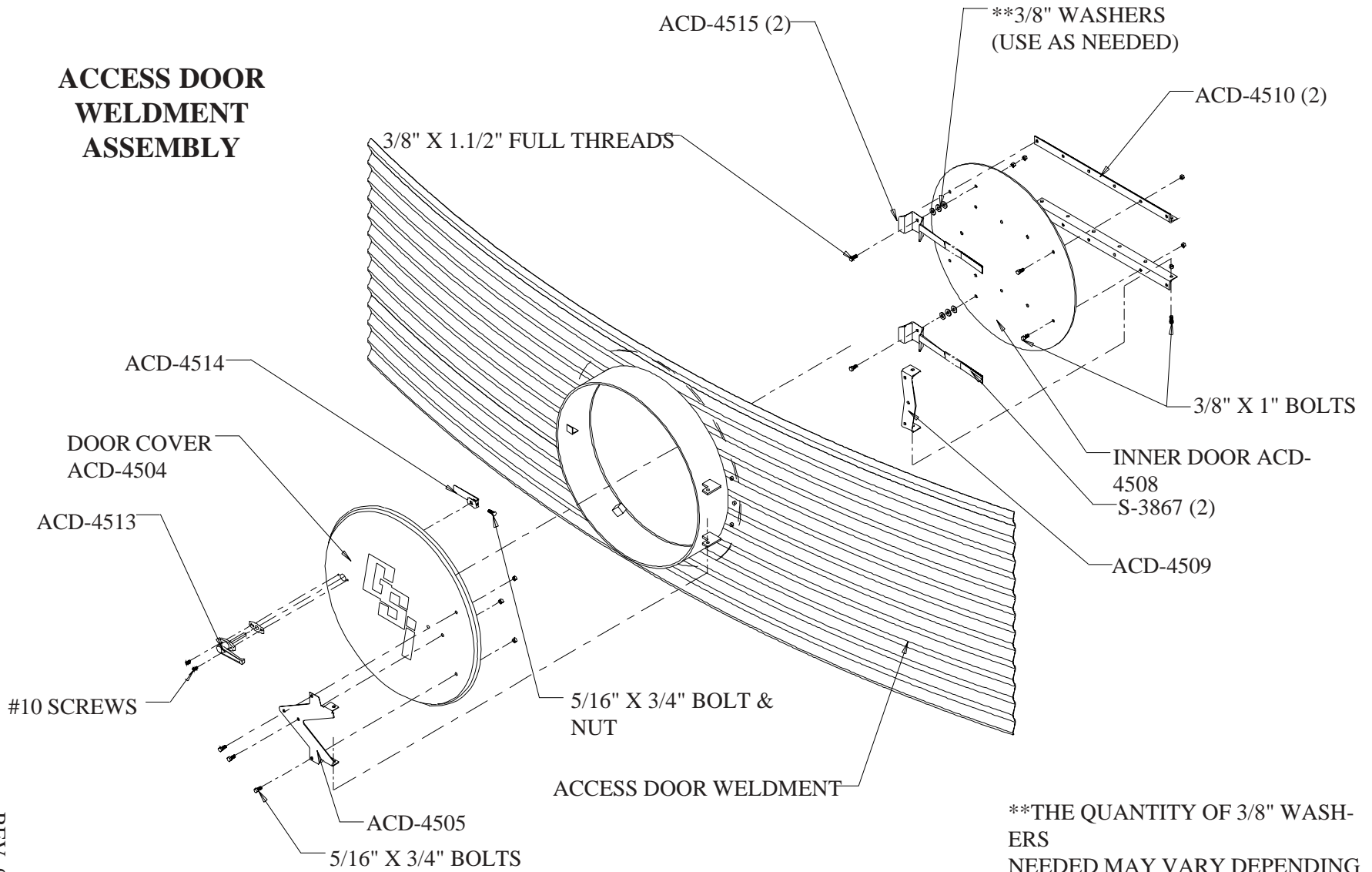


3 - POST

(Three rows of stiffeners used on each sidewall sheet)

NOTE: On three post bins the top ring is not normally stiffened except for 42' diameter and larger bins with roof stiffeners, (one per sidewall panel). Reference stiffener to sidewall attachment detail and the specific gauge sheet for your bin.

ACCESS DOOR WELDMENT ASSEMBLY



**THE QUANTITY OF 3/8" WASHERS NEEDED MAY VARY DEPENDING ON THE SIDEWALL GAUGES.

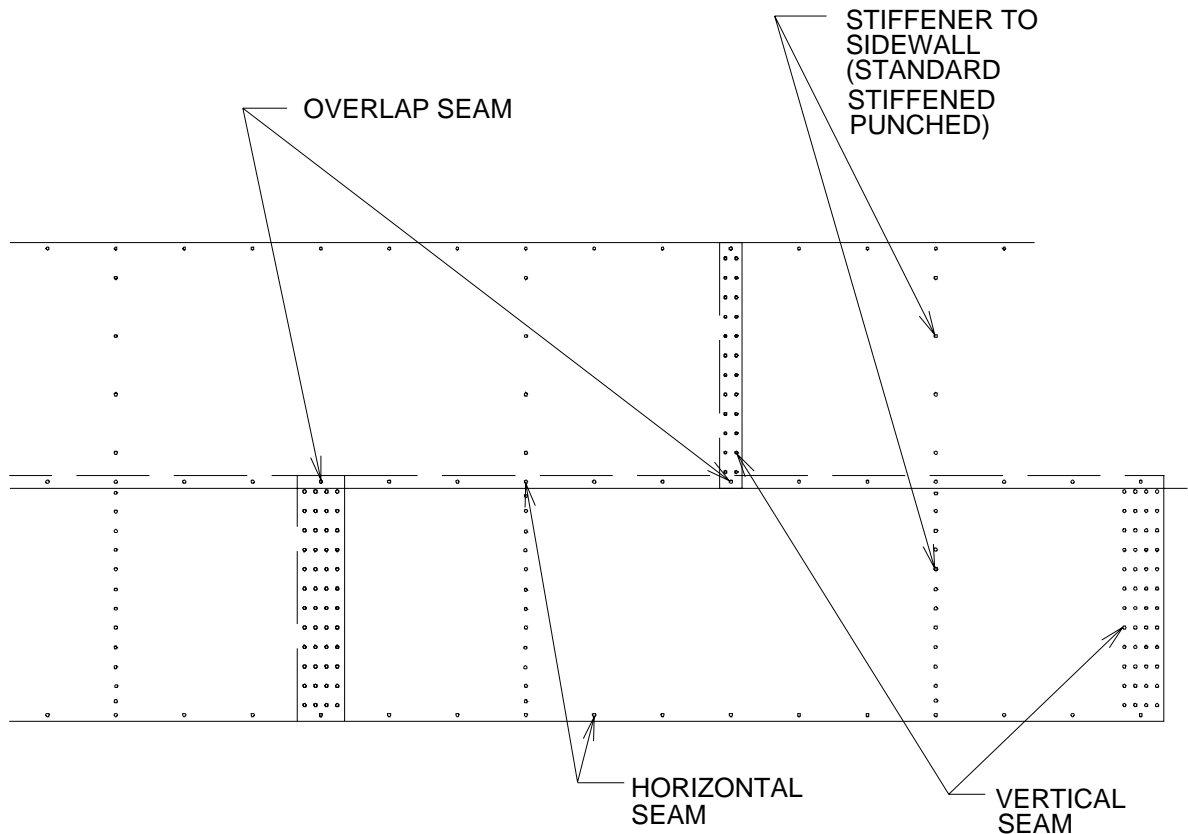
**2.66" COMMERCIAL TANK BOLTING REQUIREMENTS
2 STIFFENERS PER SIDEWALL SHEET**

SIDEWALL GAUGE	HORIZONTAL SEAM	VERTICAL SEAM	STIFFENER TO SIDEWALL	OVERLAP SEAM
20-19	5/16" X 3/4" (10)	5/16" X 3/4" (24)	3/8" X 1" (8)	5/16" X 3/4" (2)
18Q - 14Q	5/16" X 3/4" (22)	5/16" X 3/4" (48)	3/8" X 1" (24)	5/16" X 3/4" (2)
13Q - 10Q	3/8" X 1" (22)	3/8" X 1" (48)	3/8" X 1" (24)	3/8" X 1" (2)

Q - QUAD PUNCHED SHEETS (48 HOLES IN VERTICAL SEAMS)

QL- ALL BOLTS ARE STANDARD BIN BOLTS WITH NEOPRENE WASHERS. FOR HORIZONTAL AND VERTICAL SEAM BOLTS, THE BOLT HEAD AND NEOPRENE WASHERS ARE ON THE OUTSIDE OF THE BIN. REFERENCE STIFFENER INSTRUCTIONS ON STIFFENER TO SIDEWALL BOLT USAGE.

STANDARD (20 & 19) AND QUAD (18Q - 10Q) SHEET BOLTING DETAIL

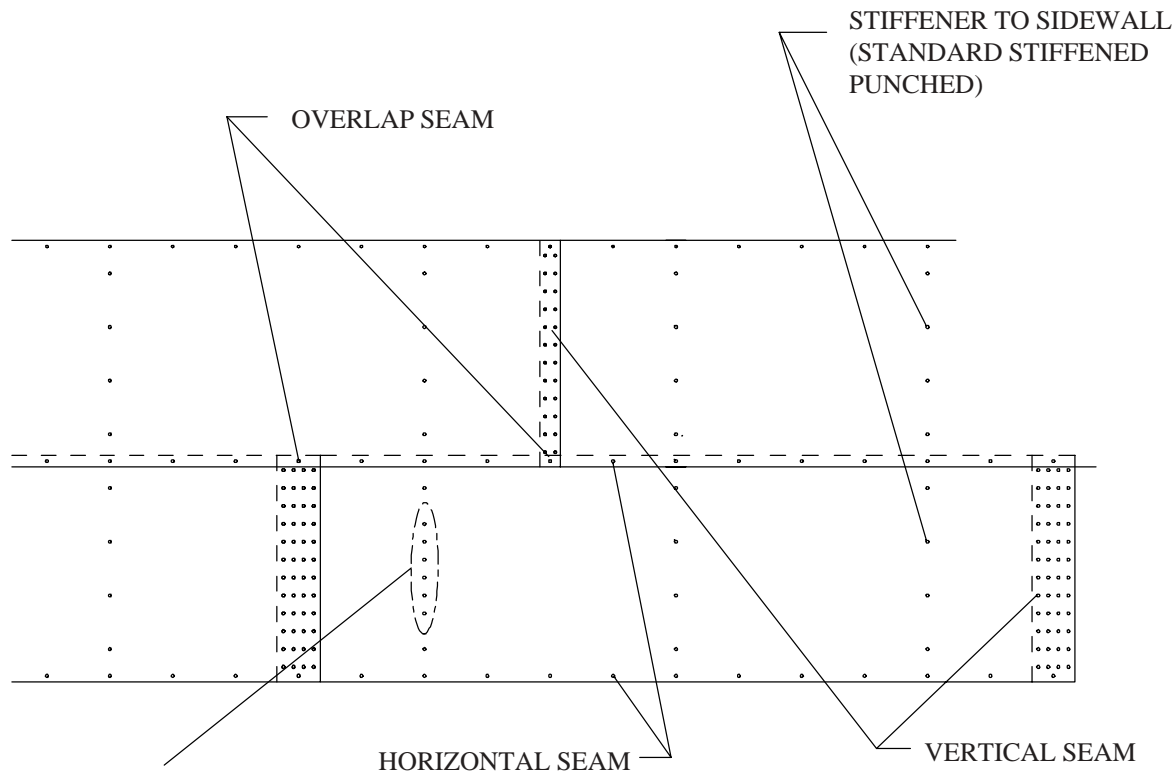


**2.66" COMMERCIAL TANK BOLTING REQUIREMENTS
3 STIFFENERS PER SIDEWALL SHEET**

SIDEWALL GAUGE	HORIZONTAL SEAM	VERTICAL SEAM	STIFFENER TO SIDEWALL	OVERLAP SEAM
20-19	5/16" X 3/4" (10)	5/16" X 3/4" (24)	3/8" X 1" (12)	5/16" X 3/4" (2)
18Q - 14Q	5/16" X 3/4" (10)	5/16" X 3/4" (48)	3/8" X 1" (12)	5/16" X 3/4" (2)
13Q - 10Q	3/8" X 1" (22)	3/8" X 1" (48)	3/8" X 1" (12)	3/8" X 1" (2)
9Q - 13QL	3/8" X 1" (22)	3/8" X 1" (48)	3/8" X 1.1/2" (12)	3/8" X 1.1/2" (2)
11QL-12QL	3/8" X 1.1/2" (22)	3/8" X 1.1/2" (48)	3/8" X 1.1/2" (12)	3/8" X 1.1/2" (2)
10QL	3/8" X 1.1/2" (22)	3/8" X 1.1/2" (48)	3/8" X 1.1/2" (24)	3/8" X 1.1/2" (2)
9QL - 8QL	3/8" X 1.1/2" (22)	7/16" X 1.1/2" (48)	3/8" X 1.1/2" (24)	3/8" X 1.1/2" (2)

Q - QUAD PUNCHED SHEETS (48 HOLES IN VERTICAL SEAMS)
 QL- LAMINATED QUAD PUNCHED SHEETS (2 SHEETS OF SAME GAUGE BOLTED TOGETHER)
 - ALL BOLTS ARE STANDARD BIN BOLTS WITH NEOPRENE WASHERS ON THE OUTSIDE OF THE TANK, NO WASHERS ARE REQUIRED ON THE INSIDE OF THE TANK.

STANDARD (20 & 19) AND QUAD (18Q - 8QL) SHEET BOLTING DETAIL

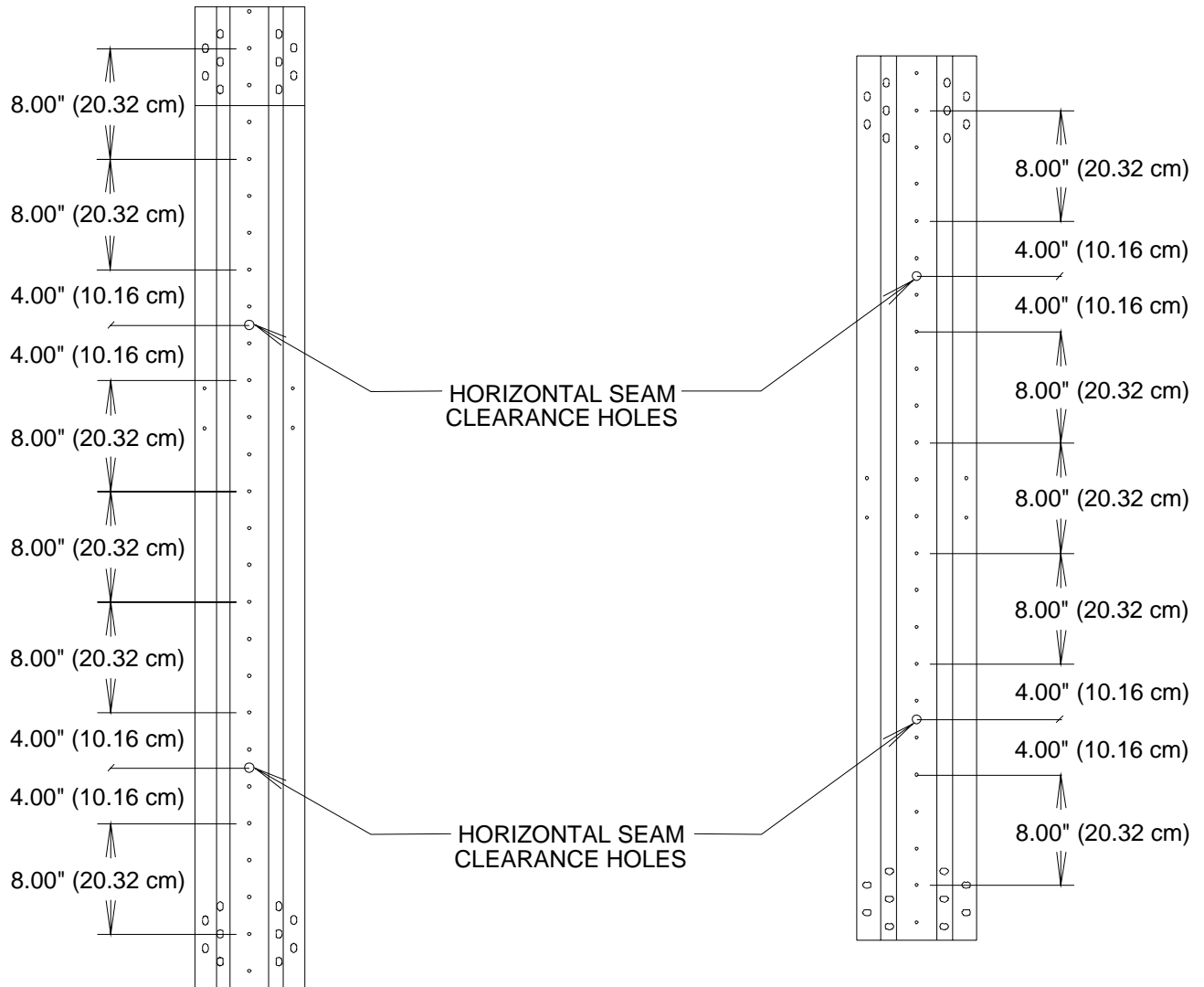


STIFFENER TO SIDEWALL (CLOSE-PUNCHED) SHEETS ARE CLOSE PUNCHED FOR STIFFENERS

REV. 3-6-98

**STIFFENER TO SIDEWALL CONNECTIONS
3-POST TANKS**

NOTE: Use the dimensioned holes for stiffener to sidewall connections on 3-post tanks.

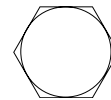


**2-RING
OFFSET STIFFENER**

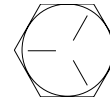
(THE SAME HOLE LOCATIONS
ARE USED FOR SS-7065 14 & 15
GA. 2-RING STIFFENER).

**2-RING
STANDARD STIFFENER**

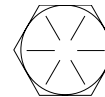
NOTE: Grade 2 bolts are designated with a plain head.



NOTE: Grade 5 bolts are designated by 3 slash marks on the head.



NOTE: Grade 8 bolts are designated by 6 slash marks on the head.



NOTE: Grade 8.2 bolts are designated by 6 slash marks on the head in a sunrise pattern.



IMPORTANT: Do not tighten bolts to exceed the torque specifications listed below.

BOLT SIZE	TORQUE (ft. lb.)	
	MINIMUM	MAXIMUM
5/16" - 18	15	20
3/8" - 16	35	42
7/16" - 14	65	72
1/2" - 13	95	105

CAUTION: UNDER NO CONDITION SHALL ANY OTHER BOLTS BE SUBSTITUTED FOR THOSE SUPPLIED BY GRAIN SYSTEMS, INC.

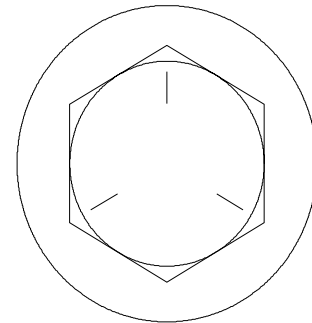
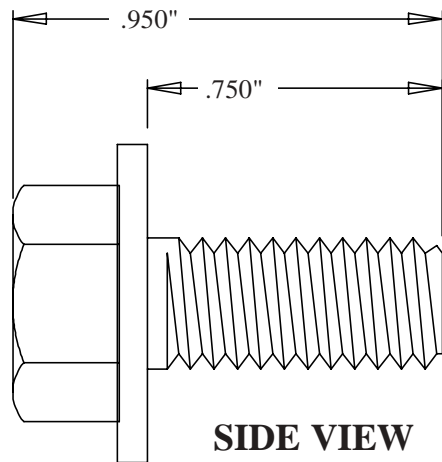
IMPORTANT: HARDWARE USAGE - 14 gauge and lighter sidewall sheets, use 5/16" bolts and nuts.

13 gauge and heavier sidewall sheets, use 3/8" bolts and nuts.

- Use 5/16" bolts and nuts when joining 14 to 13 gauge on horizontal seams.

- Hardware usage for stiffener, refer to stiffener section.

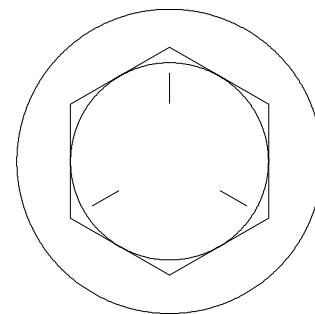
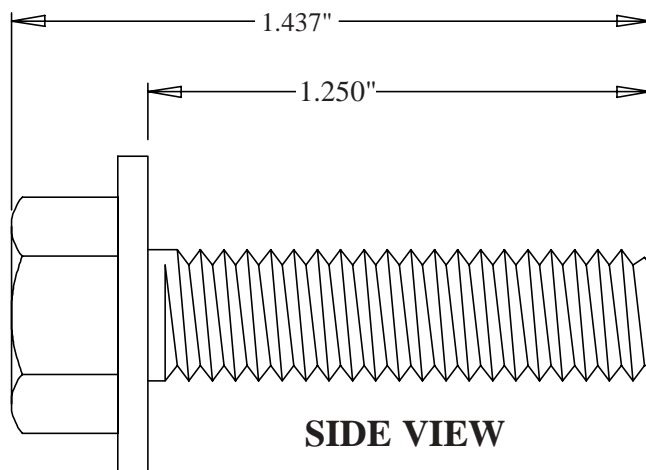
**REFER TO 2.66" COMMERCIAL TANK BOLTING REQUIREMENTS
FOR COMPLETE BOLT USAGE**



S-275

.3125" x .750" pre-assembled with a steel backed neoprene washer.

This bolt is used to connect horizontal and vertical seams for 14 gage and thinner sidewall sheets to each other. It is also used in attaching roof panels to the top sidewall sheet and attaching roof panels and flashing to the center collar.

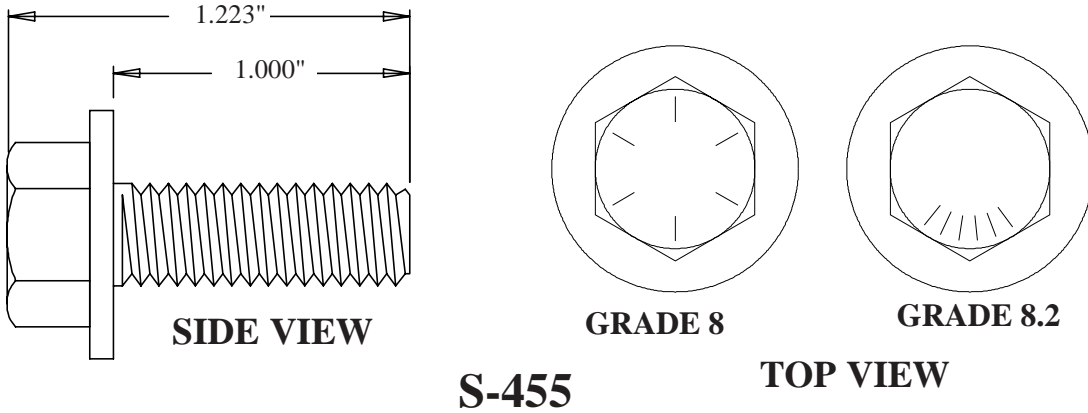


S-277

.3125" x 1.250" pre-assembled with a steel backed neoprene washer.

This bolt is primarily used to connect roof panels together where they overlap. It is also used at the bottom of the flat bottomed bins to attach the base angle to the sidewall sheet.

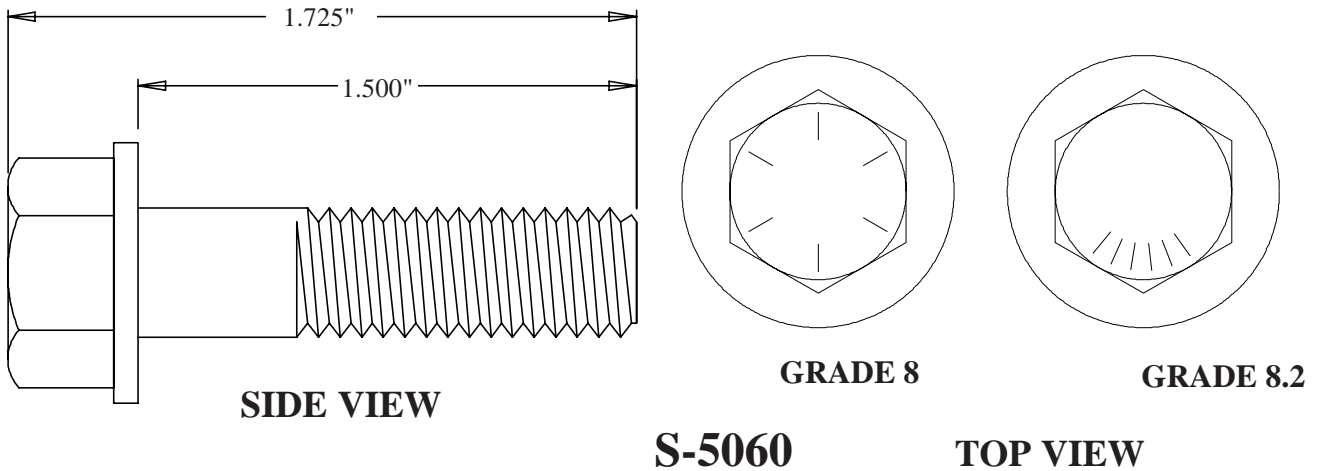
REFER TO 2.66" COMMERCIAL TANK BOLTING REQUIREMENTS FOR COMPLETE BOLT USAGE



.375" x 1.000" pre-assembled with a steel backed neoprene washer.

This bolt is used in horizontal and vertical seams for 13 gage through 12 gage laminate sidewall to attach the sheets to each other. It is also used to attach the stiffener to the sidewall sheet for up to 10 gage sidewall. It is **not** used to splice the stiffeners together on the flanges where they connect to each other or the splice plates. These are also used to attach the hopper panels to the hopper support beam for the NCHT's.

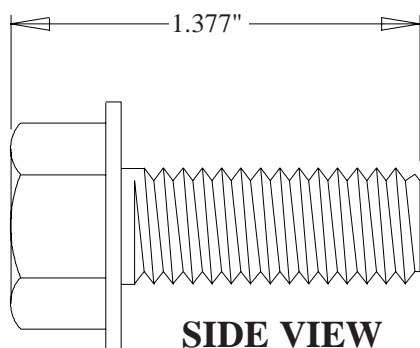
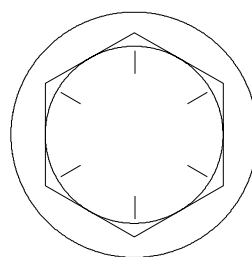
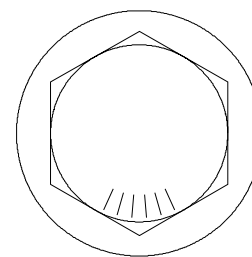
NOTE: 3/8" x 1 1/2" (S-5060) A Bolts are provided for laminated stiffeners and splices.



.375" x 1.500" pre-assembled with a steel backed neoprene washer.

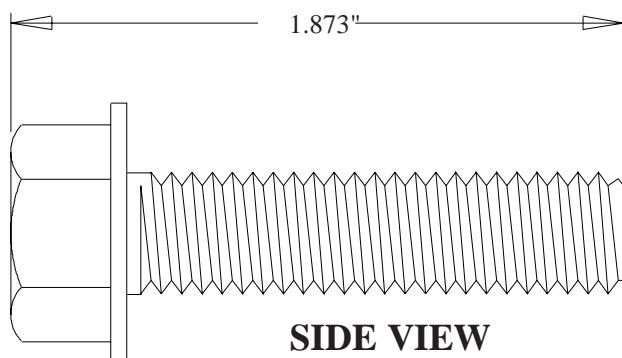
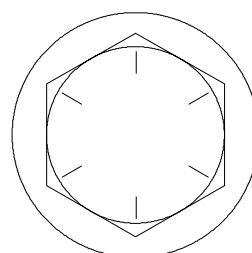
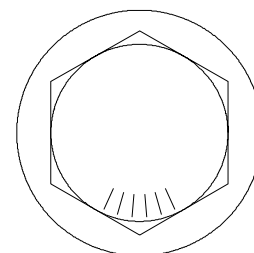
It is used to connect the stiffener to the sidewall at locations where a splice plate is used to connect the stiffener, and to connect laminated stiffeners to the sidewall sheets. It is also used to bolt stiffeners to 9 gage and thicker sidewall. This bolt is also used to bolt horizontal and vertical seams together on 11 gage laminated and thicker and some overlap seams. It is only used to attach the stiffener and the splice plate to the sidewall. The flanges where the stiffeners bolts to the splices plates use a different bolt (one without a rubber washer).

**REFER TO 2.66" COMMERCIAL TANK BOLTING REQUIREMENTS
FOR COMPLETE BOLT USAGE**

**SIDE VIEW****GRADE 8****GRADE 8.2****S-7927****TOP VIEW**

.375" x 1.000" hex flanged head **without** a plastic sealing washer.

This bolt is used to splice the stiffeners together on the flanges. A steel flat washer is used on the nut side of the connection. They are also used on the roof rafter splices for commercial roof systems.

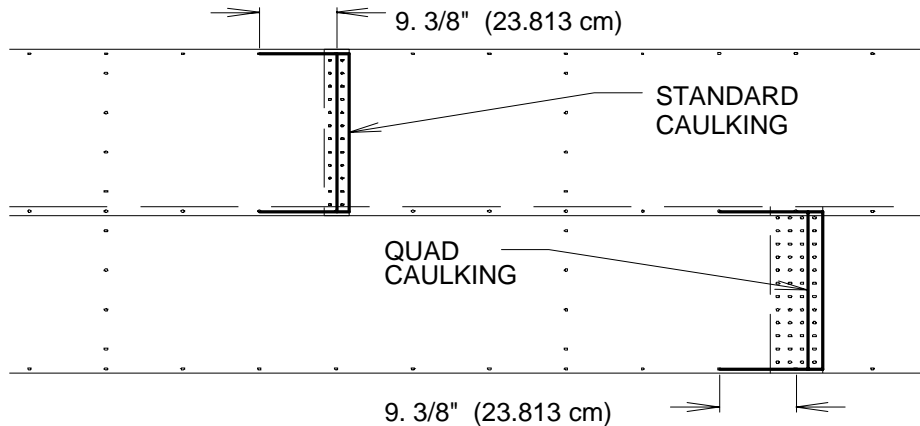
**SIDE VIEW****GRADE 8****GRADE 8.2****S-7928****TOP VIEW**

.375" x 1.500" hex flanged head **without** a plastic sealing washer.

This bolt is used to attach the flanges of the 5 gage base stiffener to the splice plates and splice laminated stiffeners together. A steel flat washer is used on the nut side of the connection.

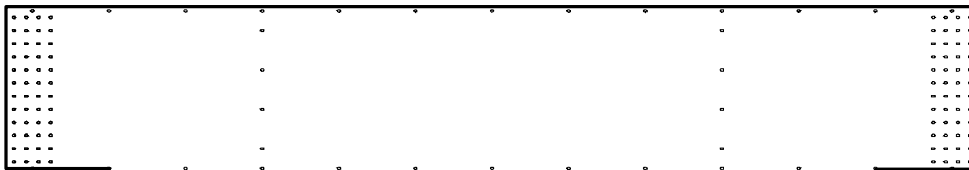
Note: The only washers shipped loose with the bins are the steel flat washers. The 5/16" steel flat washer (S-845) is used where the base angle attaches to the sheet and some are used at the main eave clips. The 3/8" steel flat washers (S-248) are used at the stiffener splices and some are used in the roof rafter splices.

**STANDARD AND QUAD PUNCHED SIDEWALL SHEETS
AS VIEWED FROM OUTSIDE**



APPLY ONE STRIP OF CAULKING NEAR THE OUTSIDE EDGE OF THE OUTER SHEET AND BETWEEN THE OUTER TWO ROWS OF BOLTS, REFER TO ILLUSTRATION ABOVE. A STRIP OF CAULKING 10" LONG, SHOULD BE PLACED ALONG THE HORIZONTAL SEAMS. BEFORE BOLTING THE NEXT RING IN PLACE, APPLY ONE STRIP OF CAULKING 10" LONG ON THE FRONT OF THE UNDERLAPPED SHEET AT EACH JOINT. ALSO, A 10" STRIP OF CAULKING IS TO BE PLACED ALONG THE LOWER HORIZONTAL EDGE OF LAPPING SHEET AT EVERY VERTICAL SEAM. THIS WILL FILL THE SPACE THAT OCCURS BETWEEN THE HOLES CAUSED BY THE OVERLAPPED SHEETS.

CAULKING BETWEEN LAMINATED SHEETS

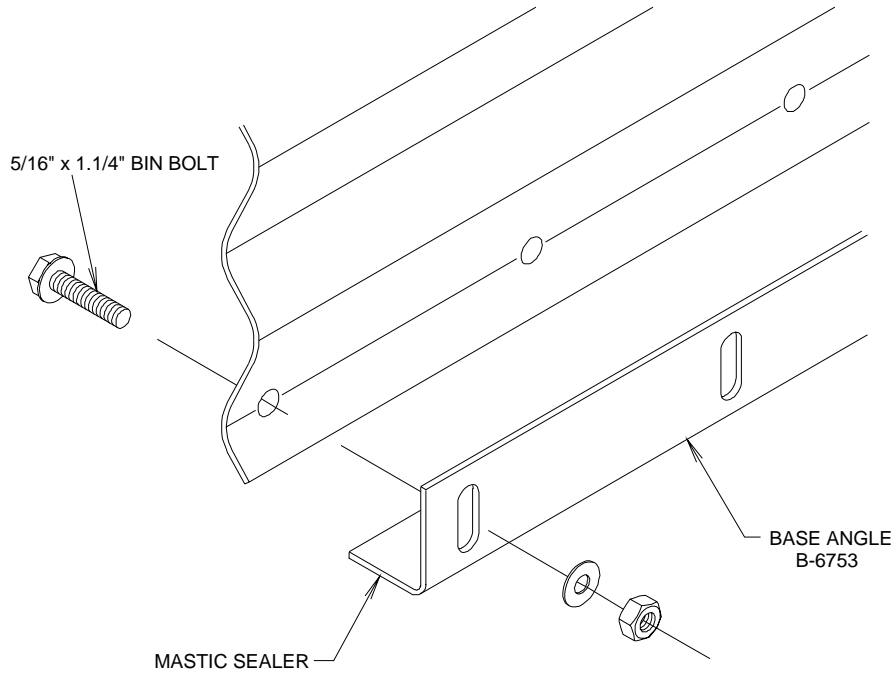


BEFORE BOLTING SHEETS TOGETHER, APPLY A SINGLE STRIP OF ROPE CAULKING ON BOTH SIDE EDGES AND ALONG TOP EDGE. DO NOT CAULK BOTTOM EDGE!

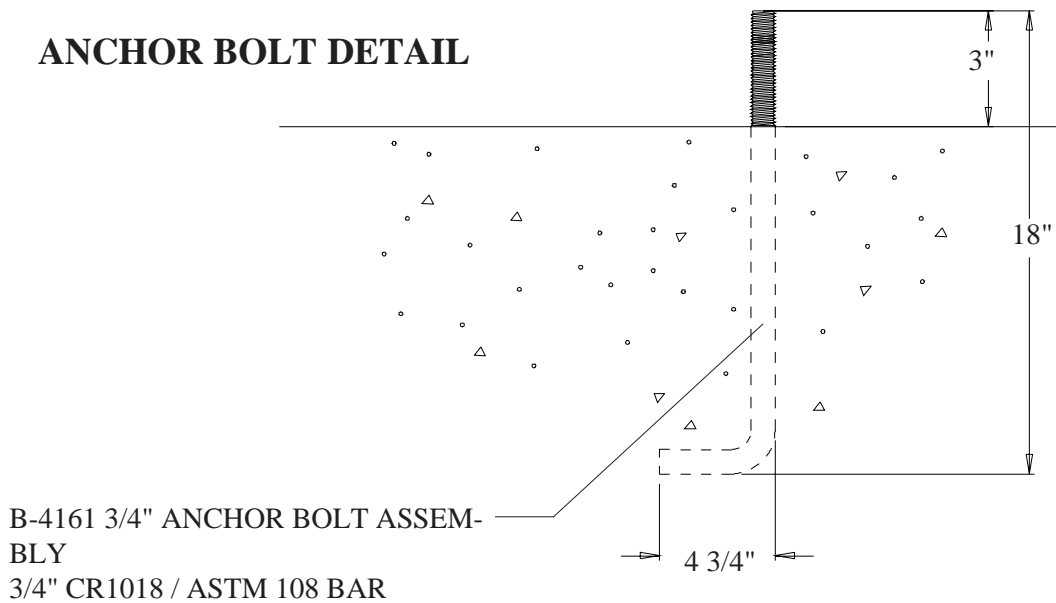
- WHEN ATTACHING A 13Q SHEET TO A 14Q SHEET, USE THE 5/16" X 3/4" BIN BOLT ON THE HORIZONTAL SEAM.
- WHEN ATTACHING AN 11QL SHEET TO A 12QL SHEET, USE THE 3/8" X 1" BIN BOLT ON THE HORIZONTAL SEAM.
- ALL BASE SHEETS ARE BOLTED TO THE BASE ANGLE WITH 5/16" X 1 1/4" BIN BOLTS. (INDEPENDENT OF SIDEWALL GAUGE)
- FOR BOLTING REQUIREMENT ON STIFFENERS AND STIFFENER SPLICES, SEE PAGES 40-42 OF ERECTION MANUAL.
- STIFFENER TO SIDEWALL BOLTING REQUIREMENT INCLUDES BOTH STANDARD STIFFENED (20-12QL) AND CLOSE PUNCHED STIFFENED (11QL-8QL) SHEETS.

BASE ANGLE INSTALLATION

On the lower edge of the final bottom ring, attach the base angle ring. Before lowering the bin, apply mastic sealer to the entire underneath side of the base angle. (See below) Next, lower the bin onto the foundation and check for an adequate seal.



ANCHOR BOLT DETAIL



THIS IS A MINIMUM REQUIREMENT FOR ANCHORAGE ON STANDARD TANK.
REFER TO SIDEDRAW INSTRUCTIONS FOR SPECIAL ANCHORAGE DETAILS.

2.66" SIDEWALL GAUGES

Note: Some colors are different than those used for stiffener sheets.

SIDEWALL GAUGE	COLOR CODE
22	White
20	Red
19	Black/Yellow
18	Orange
17	Pink/Light Blue
16	Blue
15	Brown/Red
14	Green
13	Yellow/Blue
12	Black
11	Pink
10	Light Blue
9	Blue/Orange
8	Yellow



**2.66" COMMERCIAL TANK
STIFFENER INSTRUCTIONS**

INSIDE STIFFENED ONLY

UNIVERSAL STIFFENER AND SPLICE HARDWARE

STIFFENERS

12 GA. TO 11 GA.
THRU

USE **SS-7053** SPLICE
COLOR CODE: FLUORESCENT GREEN

8 GA. TO 5 GA.

5 GA. TO 5 GA.

USE **SS-7054** SPLICE
COLOR CODE: RED/FLUORESCENT GREEN

5 GA. TO LAMINATED
LAMINATED TO LAMINATED

USE **SS-6966** SPLICE 2 PER JOINT

SPLICE HARDWARE USAGE

(NOT INCLUDING SIDEWALL TO SPLICE BOLTS)

14 & 15 GA. OFFSET	8 -	3/8" X 1"	S-7927
STIFFENER	8 -	3/8" WASHERS	S-248
JOINT	8 -	3/8" NUTS	S-456

12 & 13 GA. OFFSET	10 -	3/8" X 1"	S-7927
STIFFENER	10 -	3/8" WASHERS	S-248
JOINT	10 -	3/8" NUTS	S-456

10 & 11 GA. OFFSET	16 -	3/8" X 1"	S-7927
STIFFENER	16 -	3/8" WASHERS	S-248
JOINT	16 -	3/8" NUTS	S-456

SS-7053	20 -	3/8" X 1"	S-7927
8 GA. SPLICE	20 -	3/8" WASHERS	S-248
PLATE	20 -	3/8" NUTS	S-456

SS-7054	20 -	3/8" X 1.1/2"	S-7928
5 GA. SPLICE	20 -	3/8" WASHERS	S-248
PLATE	20 -	3/8" NUTS	S-456

SS-6966	30 -	3/8" X 1.1/2"	S-7928
	30 -	3/8" WASHERS	S-248
	30 -	3/8" NUTS	S-456

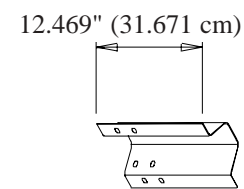
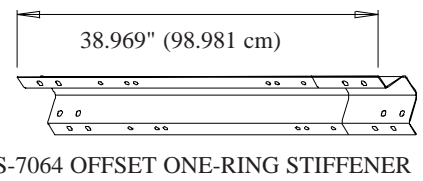
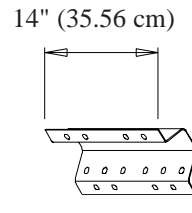
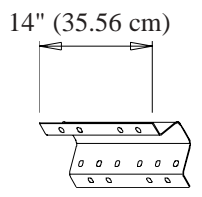
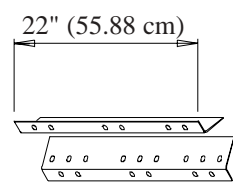
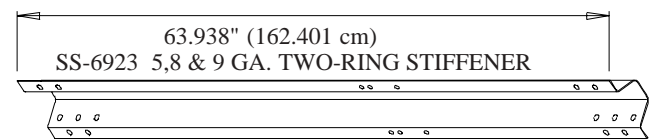
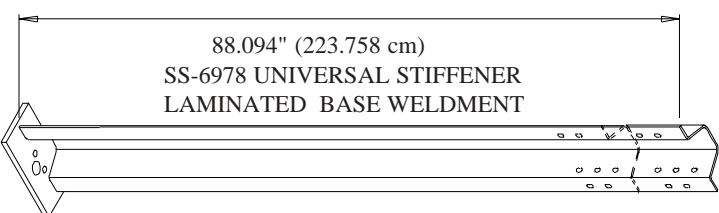
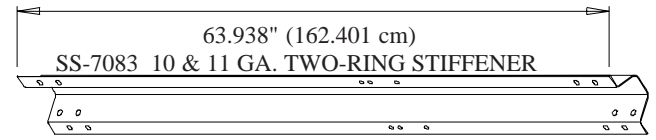
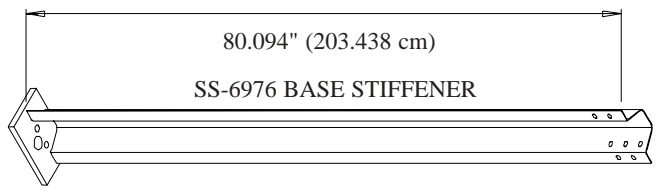
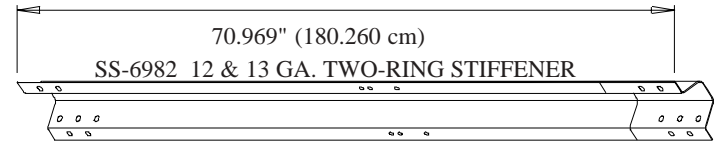
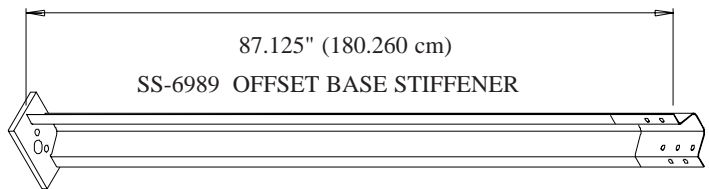
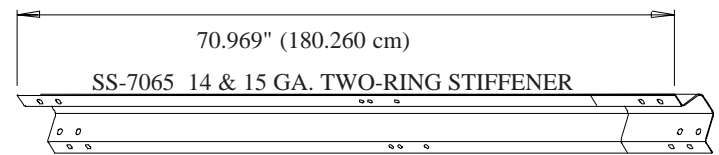
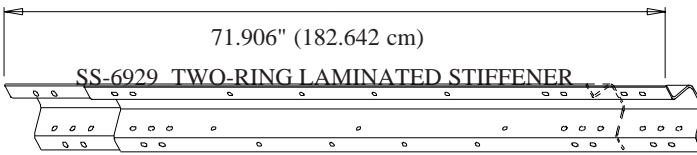
STIFFENER TO SIDEWALL HARDWARE USAGE

STIFFENER TO SIDEWALL	3/8" X 1"	S-455
	3/8" NUTS	S-456

SS-7053 AND SS-7054	3/8" X 1.1/2"	S-5060
SPLICE TO SIDEWALL	3/8" NUTS	S-456

LAMINATED STIFFENER	3/8" X 1.1/2"	S-5060
TO SIDEWALL	3/8" NUTS	S-456

COMMERCIAL STIFFENERS FOR 2.66" CORRUGATION



2.66" COMMERCIAL STIFFENERS

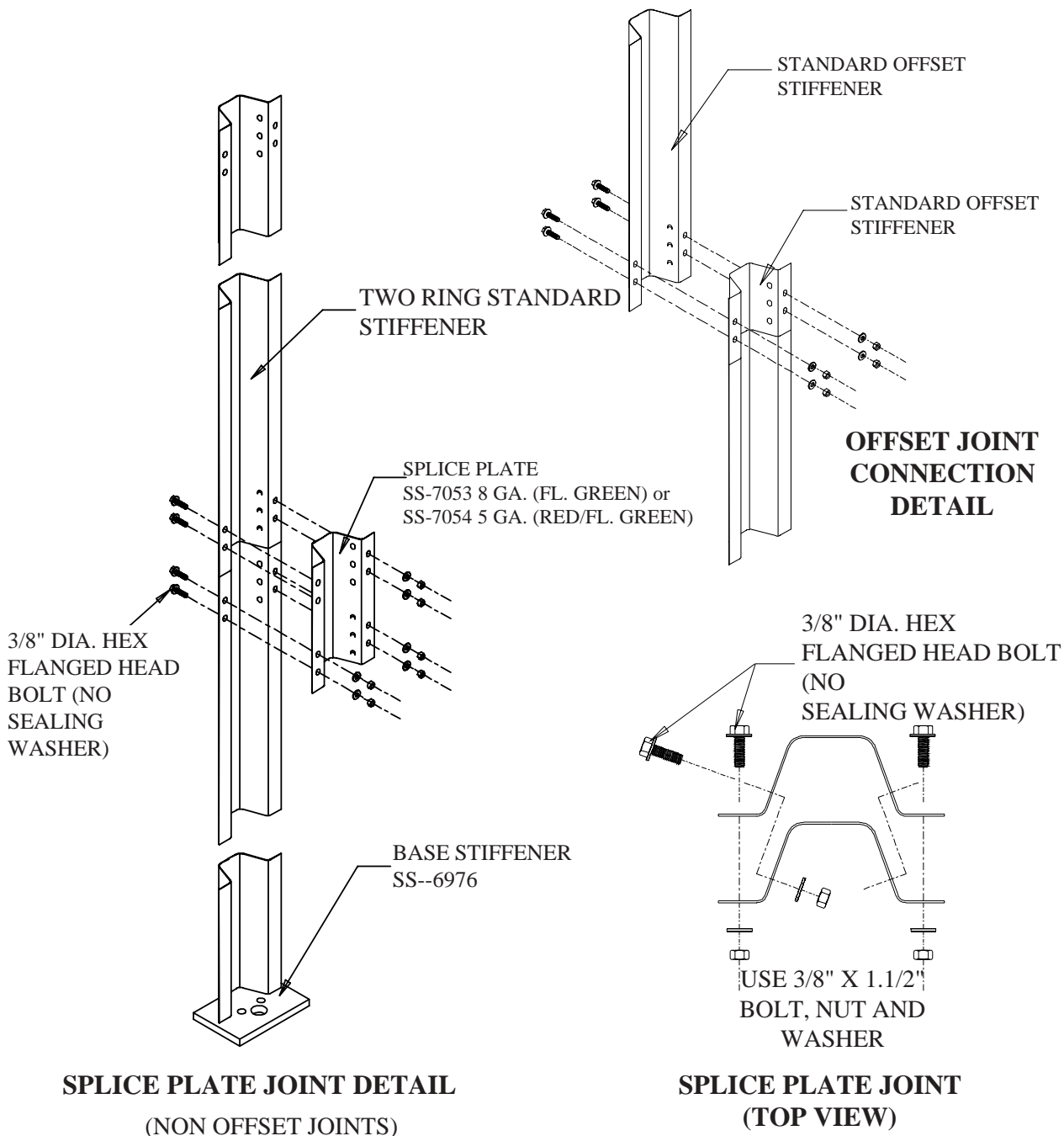
Note: Some colors are different than those used for sidewall sheets.

STIFFENER GAUGE	COLOR CODE
15	Red
14	Green
13	Dark Blue
12	Black
11	Pink
10	Light Blue
9	Purple
8	Yellow
5	Fluor. Green
5+12	Gold/Black
5+10	Gold/Light Blue
5+8	Gold/Yellow

2.66" CORRUGATION COMMERCIAL STIFFENER SPLICE DETAILS

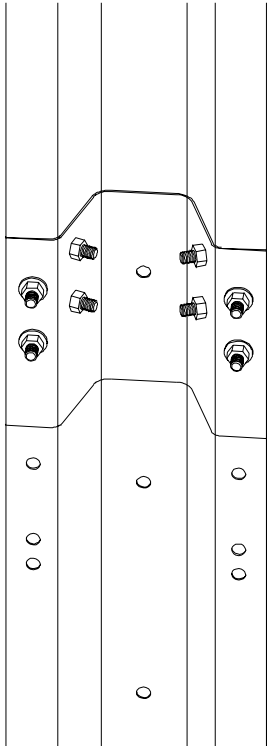
When installing bottom stiffeners, you may find that in some cases the stiffener with base plate attached will not rest on the foundation (due to unlevel foundation, etc.). Shim plates have been furnished and should be used to fill opening between base plate and concrete.

IMPORTANT: If shim plates are not used where required, the downward pressure of the stiffeners will not be transferred directly to the foundation, and bin failure could result.

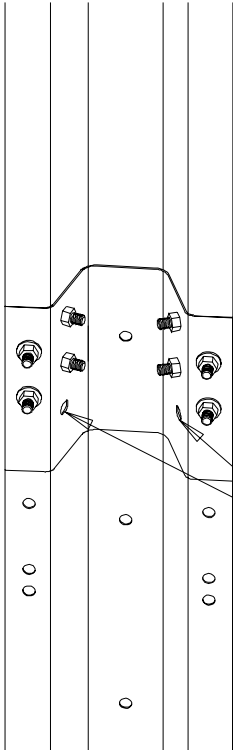


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14 AND 15 GAGE TO 14 AND 15 GAGE OFFSET CONNECTION DETAIL.

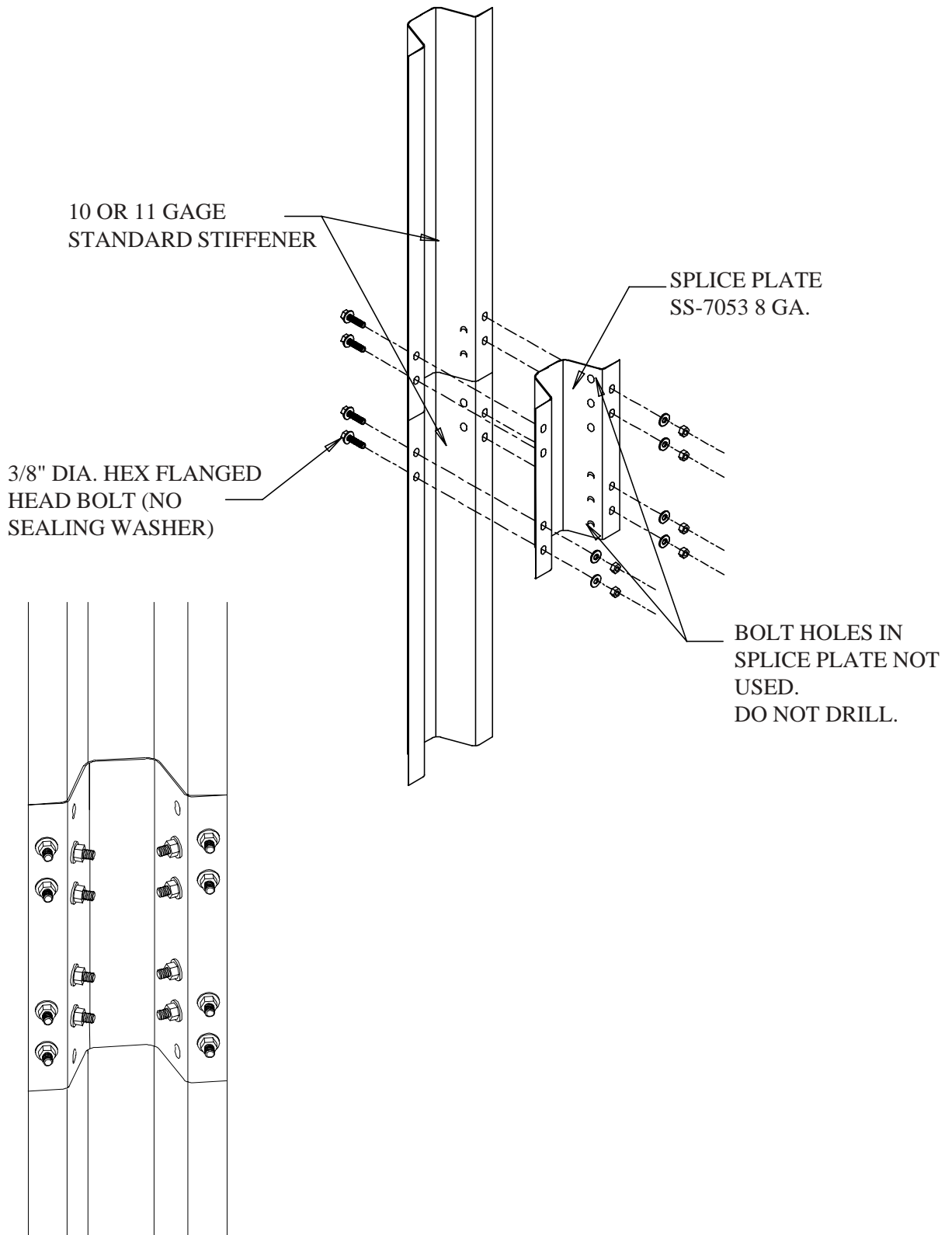


14 AND 15 GAGE TO 13 AND 12 GAGE OFFSET CONNECTION DETAIL.

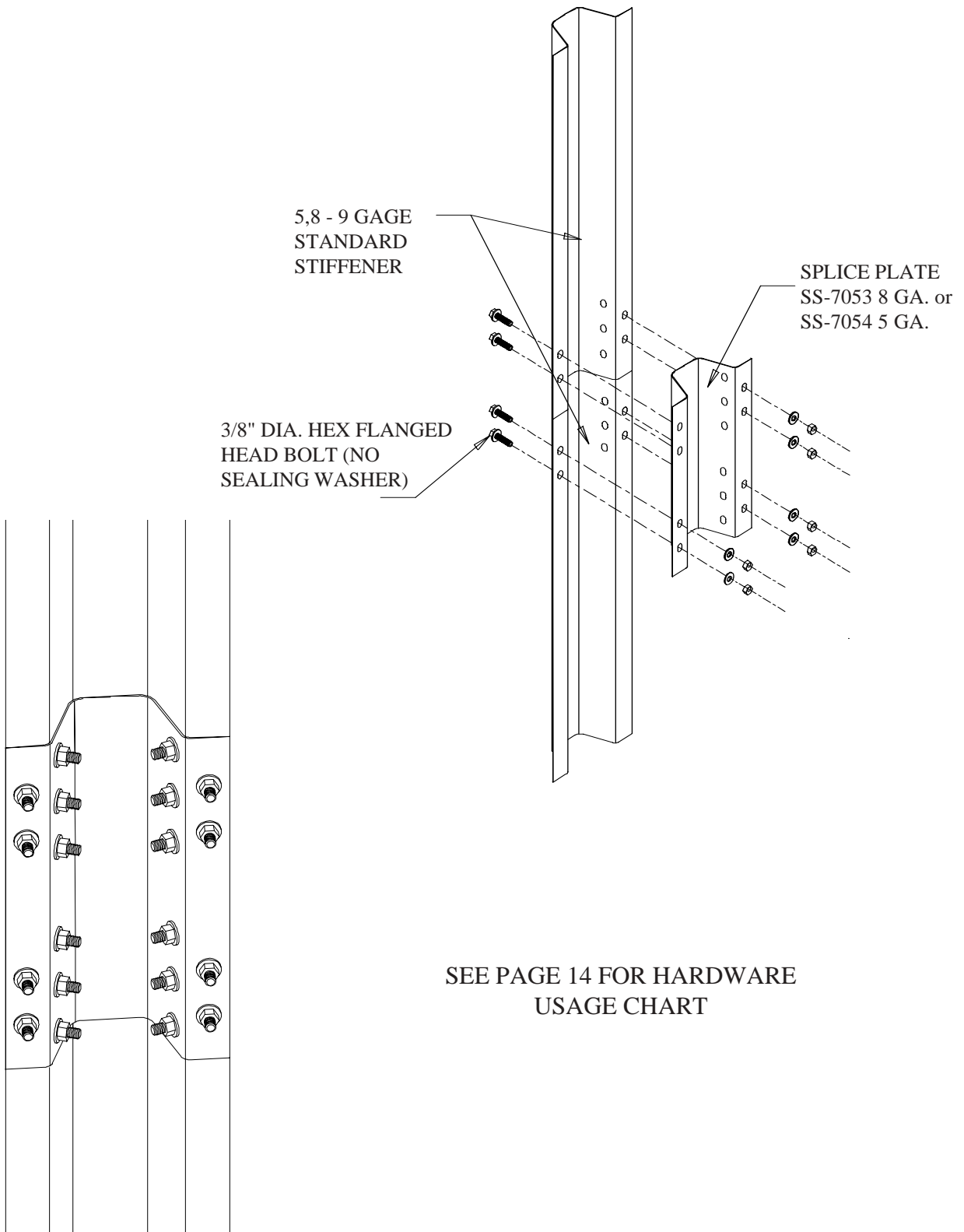


BOLT HOLE
NOT USED
IN 14 AND 15
GAGE.
DO NOT DRILL.

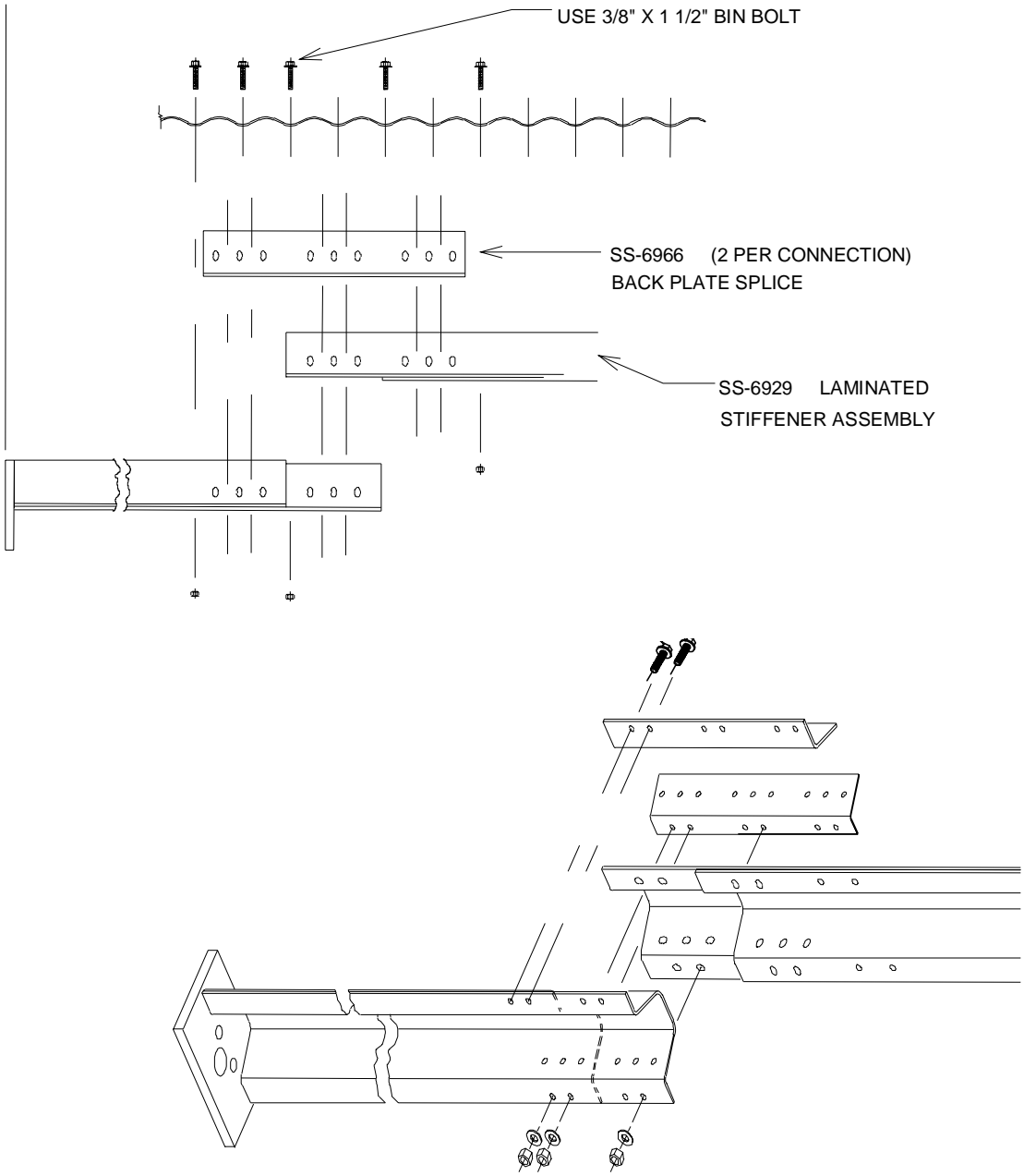
10 - 11 GAGE BEARING SPLICE



5,8 - 9 GAGE BEARING SPLICE



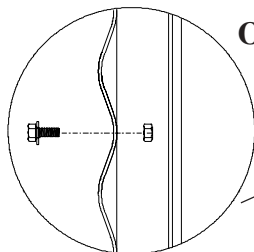
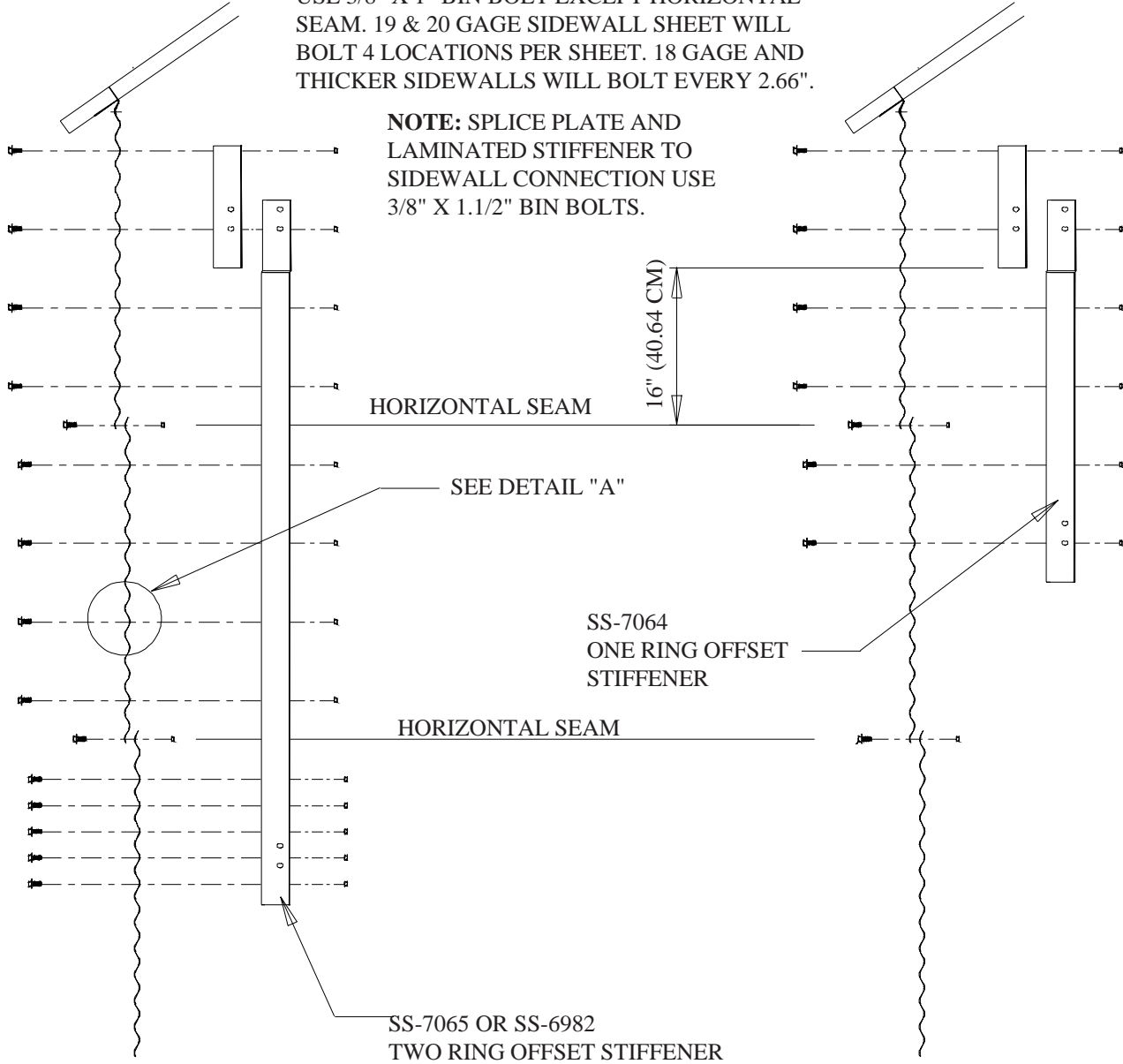
LAMINATED STIFFENER SPLICE 2.66" CORRUGATION



**2 STIFFENERS PER SIDEWALL SHEET
COMMERCIAL STIFFENER STARTING LOCATION -36' DIA. & SMALLER
2.66" CORRUGATION INSIDE STIFFENER ONLY**

FOR SIDEWALL TO STIFFENER CONNECTIONS USE 3/8" X 1" BIN BOLT EXCEPT HORIZONTAL SEAM. 19 & 20 GAGE SIDEWALL SHEET WILL BOLT 4 LOCATIONS PER SHEET. 18 GAGE AND THICKER SIDEWALLS WILL BOLT EVERY 2.66".

NOTE: SPLICE PLATE AND LAMINATED STIFFENER TO SIDEWALL CONNECTION USE 3/8" X 1.1/2" BIN BOLTS.



ODD RING BINS

EVEN RING BINS

DETAIL "A"

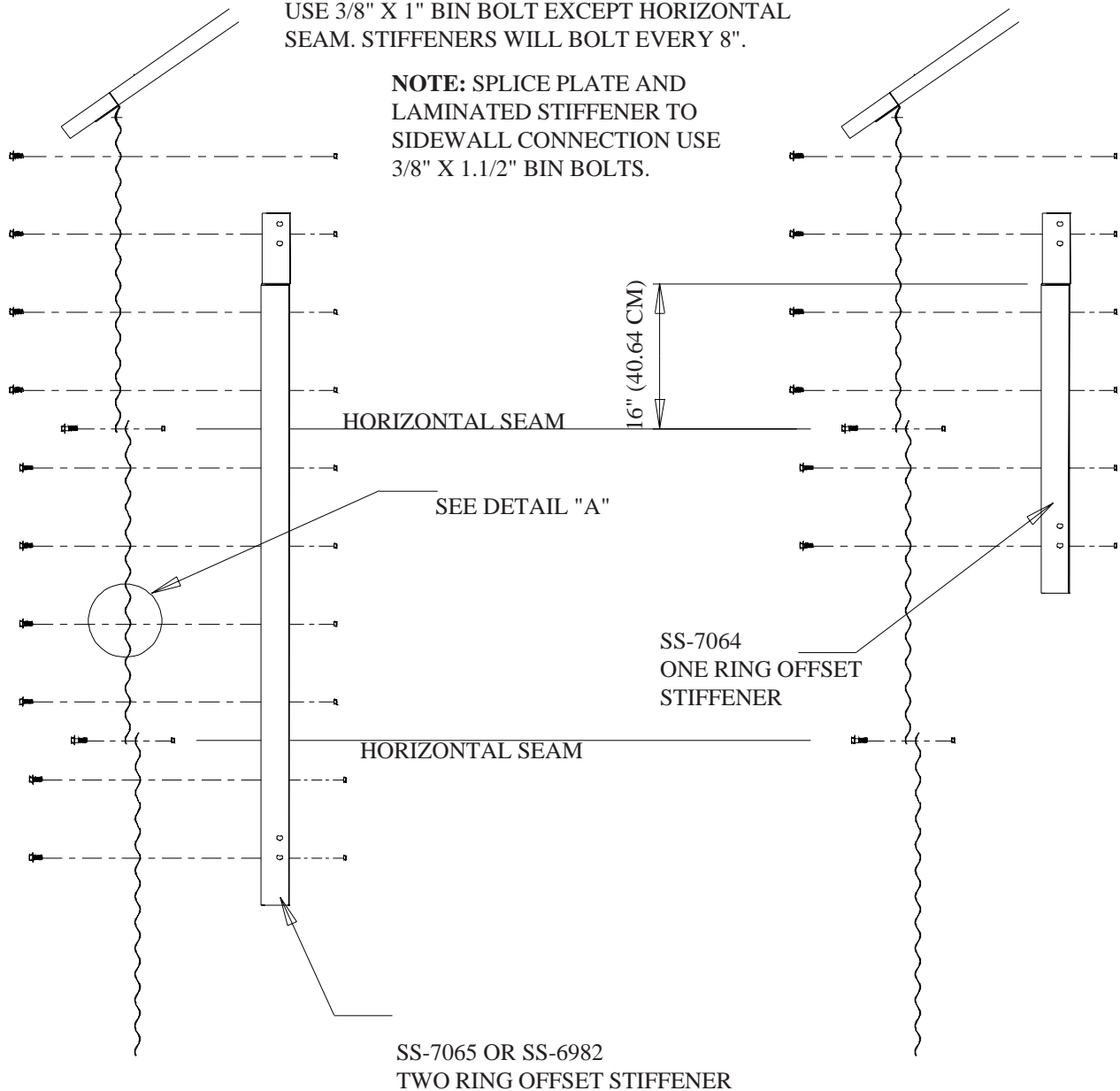
OFFSET JOINTS AND 8 GAGE SPLICE PLATED JOINTS USE 3/8" X 1" HEX FLANGED HEAD BOLTS. ALL OTHER STIFFENER JOINTS USE 3/8" X 1.1/2" HEX FLANGED HEAD BOLTS. WASHERS USED BOTH SIDES OF ALL STIFFENER JOINT CONNECTIONS.

3 STIFFENERS PER SIDEWALL SHEET
COMMERCIAL STIFFENER STARTING LOCATION - 36' DIA. & SMALLER
2.66" CORRUGATION INSIDE STIFFENER ONLY

NOTE: CERTAIN TANKS MAY BE STIFFENED TO THE EAVE. REFER TO YOUR TANK GAUGE LAYOUT SHEET TO DETERMINE IF THIS IS THE CASE FOR YOUR BIN.

FOR SIDEWALL TO STIFFENER CONNECTIONS
 USE 3/8" X 1" BIN BOLT EXCEPT HORIZONTAL
 SEAM. STIFFENERS WILL BOLT EVERY 8".

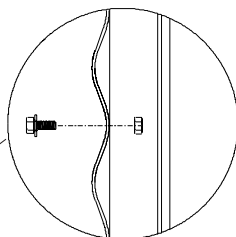
NOTE: SPLICE PLATE AND
 LAMINATED STIFFENER TO
 SIDEWALL CONNECTION USE
 3/8" X 1.1/2" BIN BOLTS.



ODD RING BINS

EVEN RING BINS

DETAIL "A"

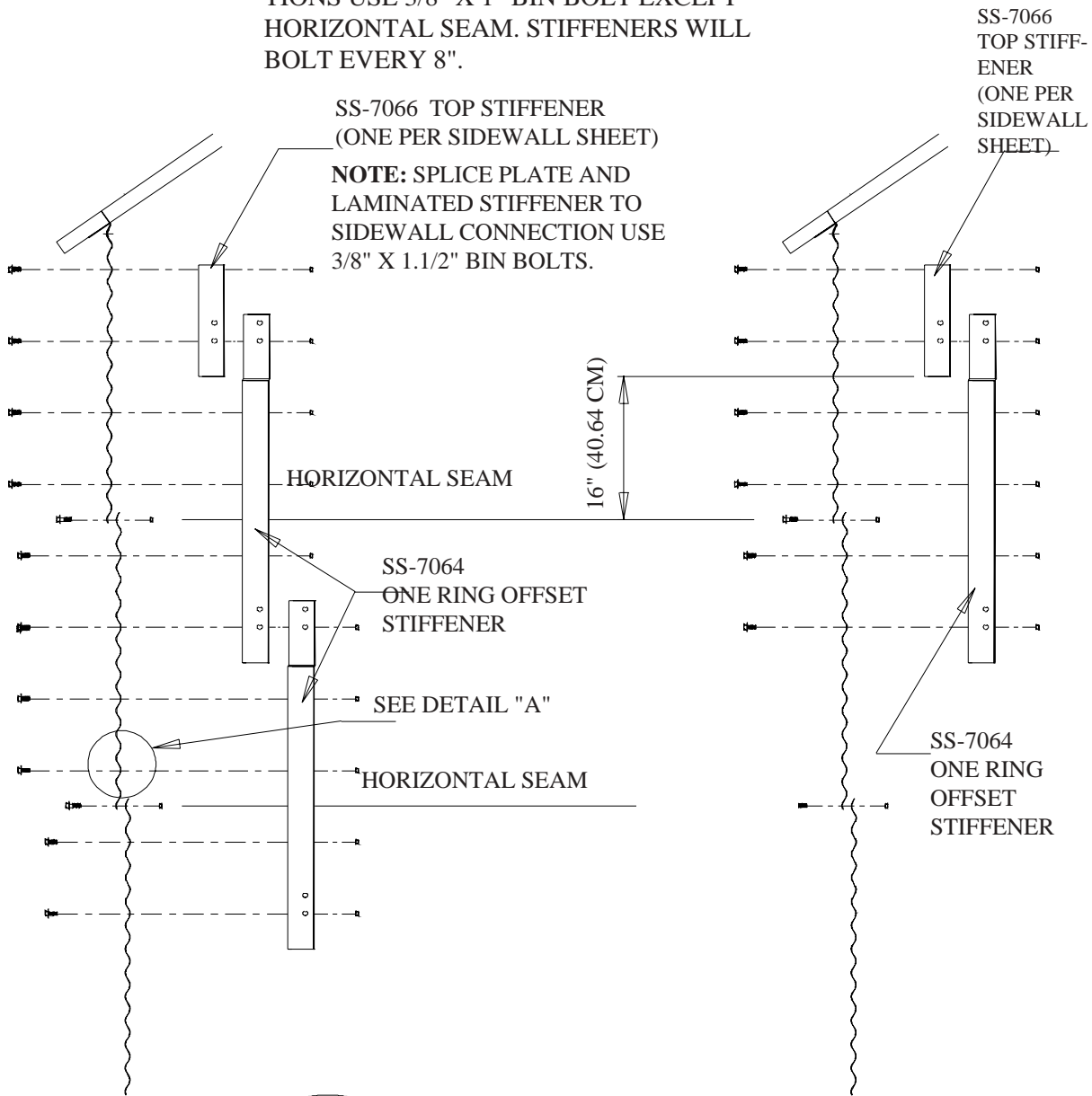


OFFSET JOINTS AND 8 GAGE SPLICE PLATED JOINTS USE 3/8" X 1" HEX FLANGED HEAD BOLTS. ALL OTHER STIFFENER JOINTS USE 3/8" X 1.1/2" HEX FLANGED HEAD BOLTS. WASHERS USED BOTH SIDES OF ALL STIFFENER JOINT CONNECTIONS.

3 STIFFENERS PER SIDEWALL SHEET
COMMERCIAL STIFFENER STARTING LOCATION - 42' DIA. TO 105' DIA.
2.66" CORRUGATION INSIDE STIFFENER ONLY

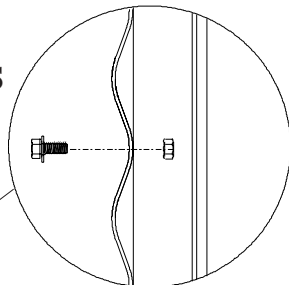
NOTE: CERTAIN TANKS MAY BE STIFFENED TO THE EAVE. REFER TO YOUR TANK GAUGE LAYOUT SHEET TO DETERMINE IF THIS IS THE CASE FOR YOUR BIN.

FOR SIDEWALL TO STIFFENER CONNECTIONS USE 3/8" X 1" BIN BOLT EXCEPT HORIZONTAL SEAM. STIFFENERS WILL BOLT EVERY 8".



ODD RING BINS

DETAIL "A"

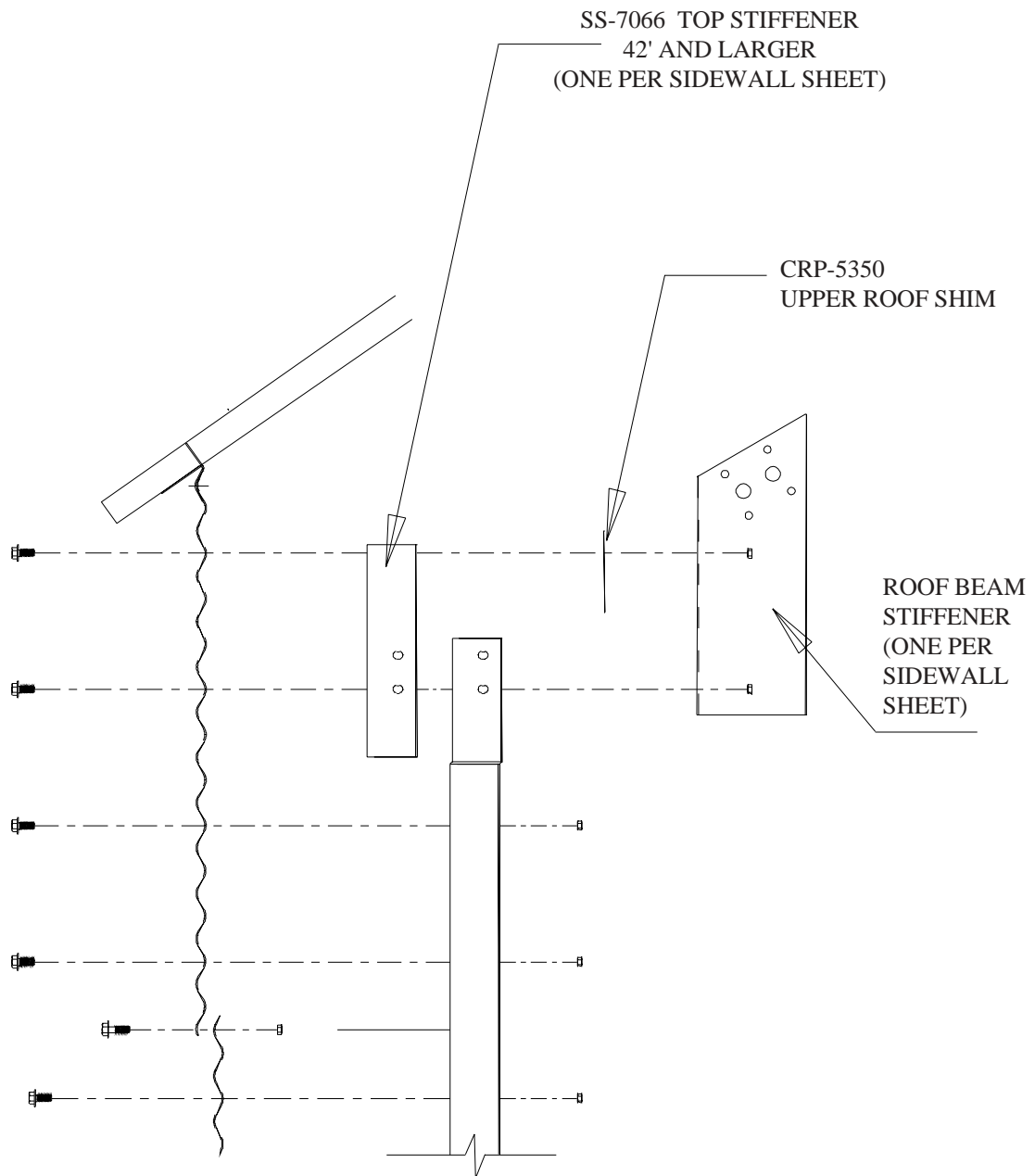


EVEN RING BINS

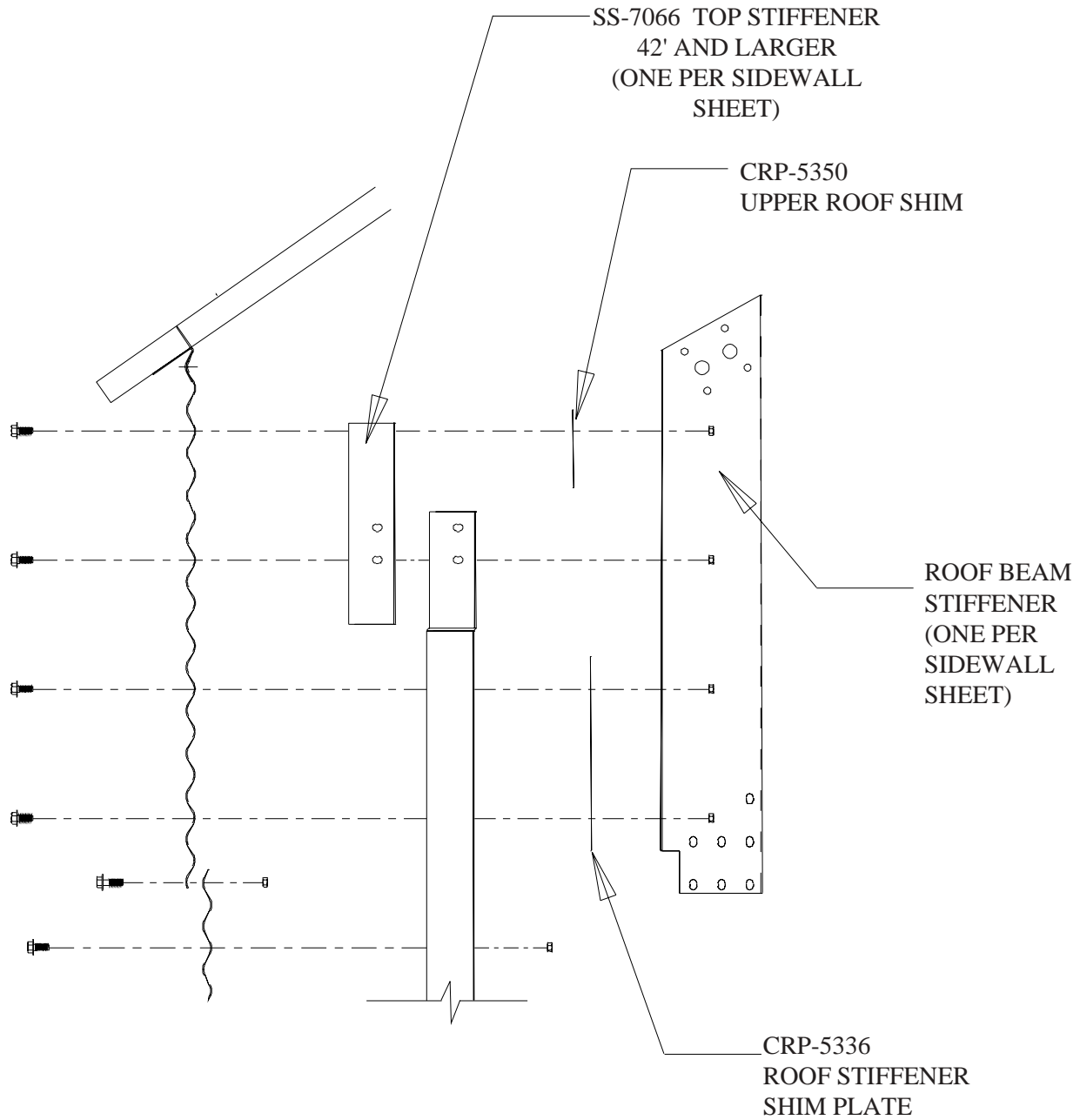
OFFSET JOINTS AND 8 GAGE SPLICE PLATED JOINTS USE 3/8" X 1" HEX FLANGED HEAD BOLTS. ALL OTHER STIFFENER JOINTS USE 3/8" X 1.1/2" HEX FLANGED HEAD BOLTS. WASHERS USED BOTH SIDES OF ALL STIFFENER JOINT CONNECTIONS.

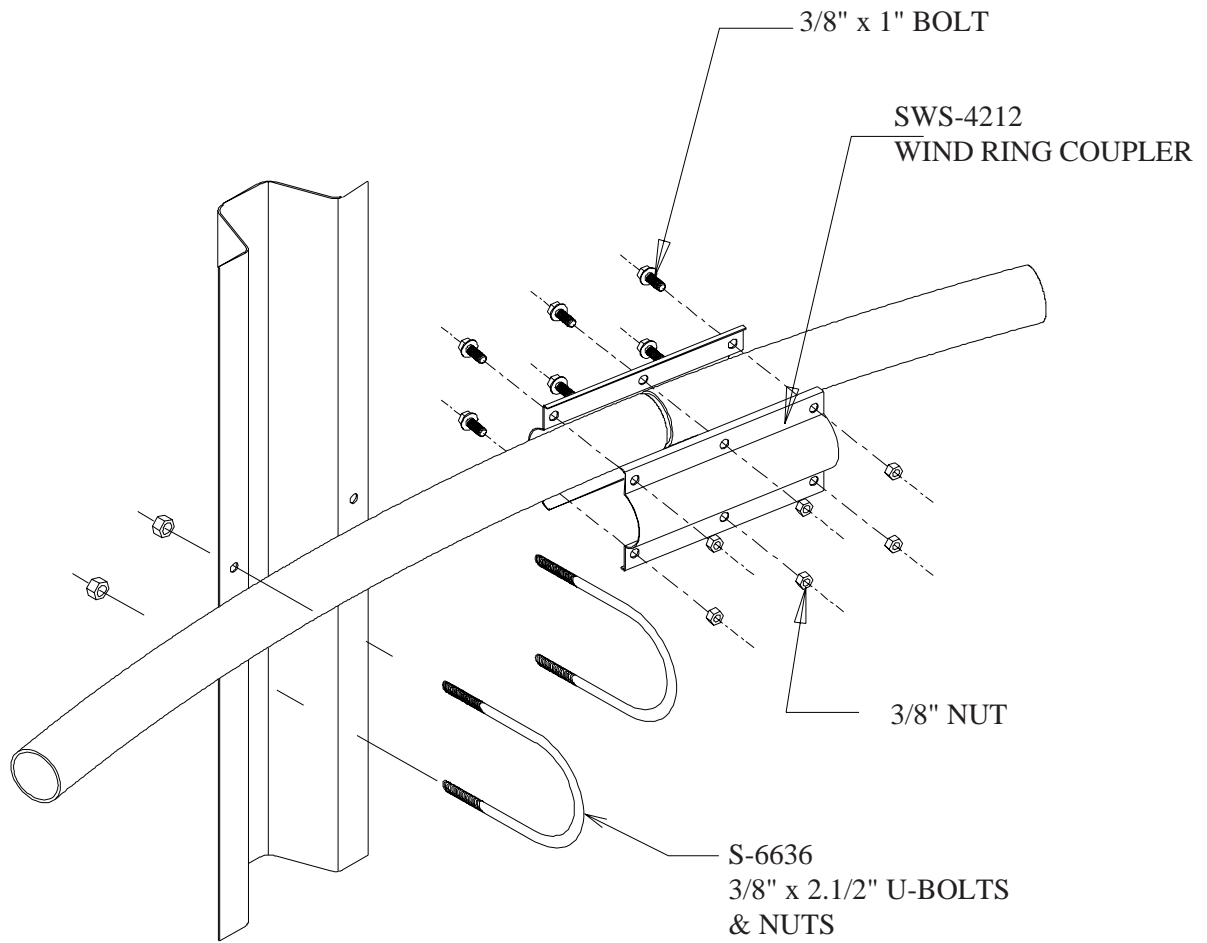
REV. 7-17-96

**42' THRU 60' STANDARD ROOF STIFFENER DETAIL
2.66" CORRUGATION INSIDE STIFFENER ONLY**



72' THRU 105' DIA. ROOF STIFFENER DETAIL
60' DIA. 10,000 LB. PEAK LOAD ROOF STIFFENER DETAIL
2.66" CORRUGATION INSIDE STIFFENER ONLY







**2.66" COMMERCIAL TANK
STIFFENER INSTRUCTIONS
OUTSIDE STIFFENED ONLY**

UNIVERSAL STIFFENER AND SPLICE HARDWARE

STIFFENERS

12 GA. TO 11 GA.

THRU

8 GA. TO 5 GA.

5 GA. TO 5 GA.

USE **SS-7053** SPLICE

COLOR CODE: FLUORESCENT GREEN

USE **SS-7054** SPLICE

COLOR CODE: RED/FLUORESCENT GREEN

5 GA. TO LAMINATED

USE **SS-6966** SPLICE 2 PER JOINT

LAMINATED TO LAMINATED

SPLICE HARDWARE USAGE

(NOT INCLUDING SIDEWALL TO SPLICE BOLTS)

14 & 15 GA. OFFSET	8 -	3/8" X 1"	S-7927
STIFFENER	8 -	3/8" WASHERS	S-248
JOINT	8 -	3/8" NUTS	S-456

12 & 13 GA. OFFSET	10 -	3/8" X 1"	S-7927
STIFFENER	10 -	3/8" WASHERS	S-248
JOINT	10 -	3/8" NUTS	S-456

10 & 11 GA. OFFSET	16 -	3/8" X 1"	S-7927
STIFFENER	16 -	3/8" WASHERS	S-248
JOINT	16 -	3/8" NUTS	S-456

SS-7053	20 -	3/8" X 1"	S-7927
8 GA. SPLICE	20 -	3/8" WASHERS	S-248
PLATE	20 -	3/8" NUTS	S-456

SS-7054	20 -	3/8" X 1.1/2"	S-7928
5 GA. SPLICE	20 -	3/8" WASHERS	S-248
PLATE	20 -	3/8" NUTS	S-456

SS-6966	30 -	3/8" X 1.1/2"	S-7928
	30 -	3/8" WASHERS	S-248
	30 -	3/8" NUTS	S-456

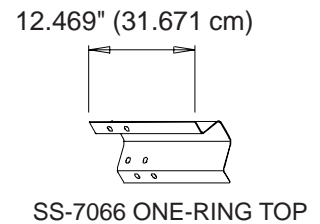
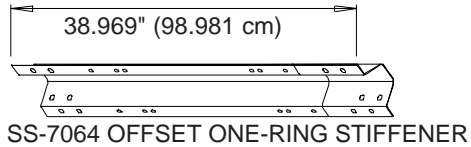
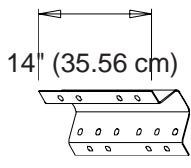
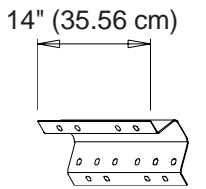
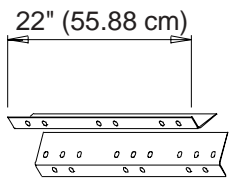
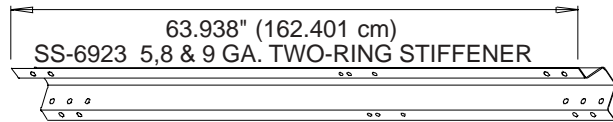
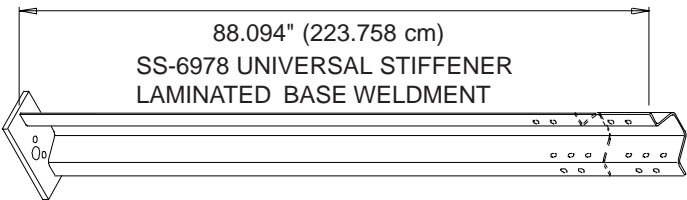
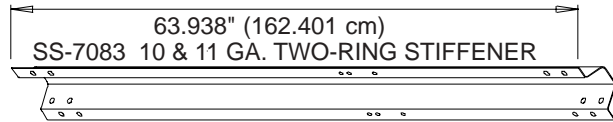
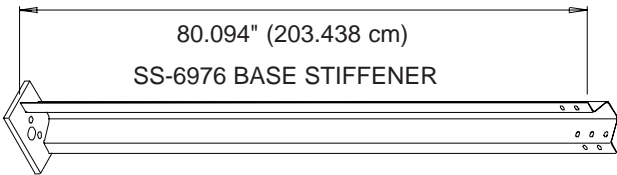
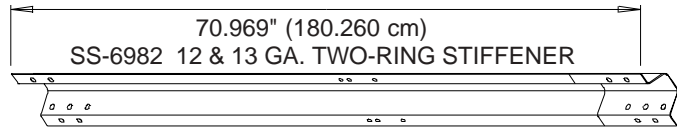
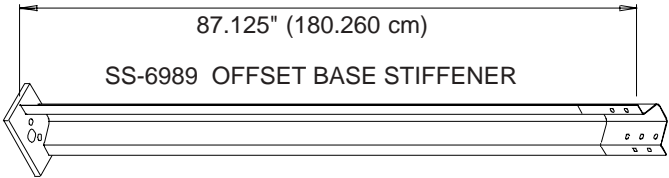
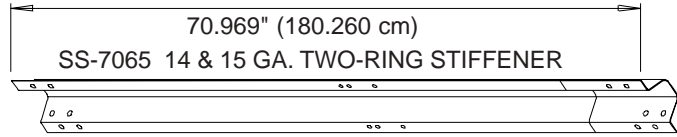
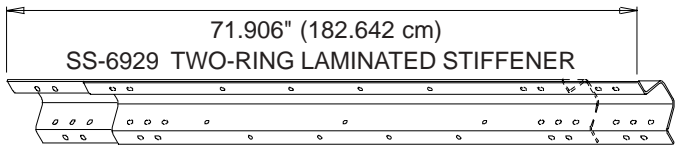
STIFFENER TO SIDEWALL HARDWARE USAGE

STIFFENER TO SIDEWALL	3/8" X 1"	S-455
	3/8" NUTS	S-456

SS-7053 AND SS-7054	3/8" X 1.1/2"	S-5060
SPLICE TO SIDEWALL	3/8" NUTS	S-456

LAMINATED STIFFENER	3/8" X 1.1/2"	S-5060
TO SIDEWALL	3/8" NUTS	S-456

COMMERCIAL STIFFENERS FOR 2.66" CORRUGATION



2.66" COMMERCIAL STIFFENER

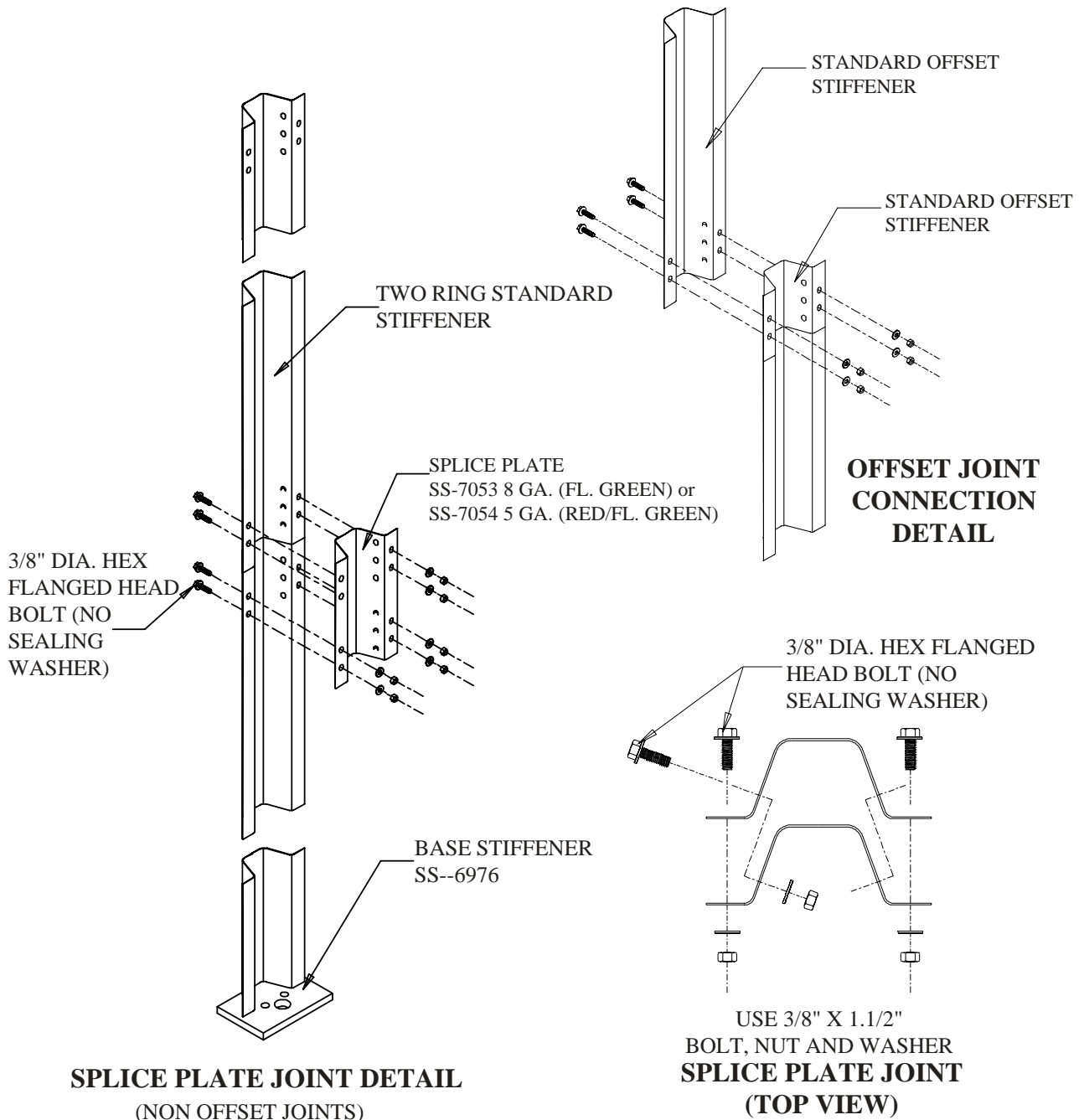
Note: Some colors are different than those used for sidewall sheets.

STIFFENER GAUGE	COLOR CODE
15	Red
14	Green
13	Dark Blue
12	Black
11	Pink
10	Light Blue
9	Purple
8	Yellow
5	Fluor. Green
5+12	Gold/Black
5+10	Gold/Light Blue
5+8	Gold/Yellow

**2.66" CORRUGATION
COMMERCIAL STIFFENER SPLICE DETAILS**

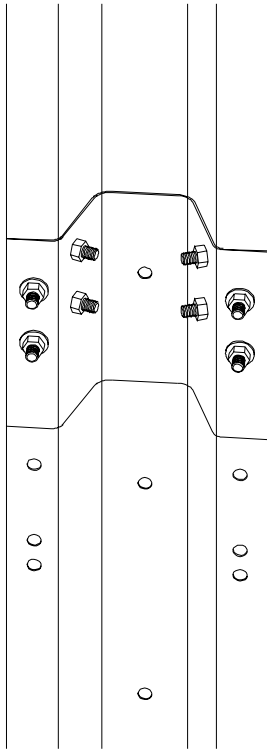
When installing bottom stiffeners, you may find that in some cases the stiffener with base plate attached will not rest on the foundation (due to unlevel foundation, etc.). Shim plates have been furnished and should be used to fill opening between base plate and concrete.

IMPORTANT: If shim plates are not used where required, the downward pressure of the stiffeners will not be transferred directly to the foundation, and bin failure could result.

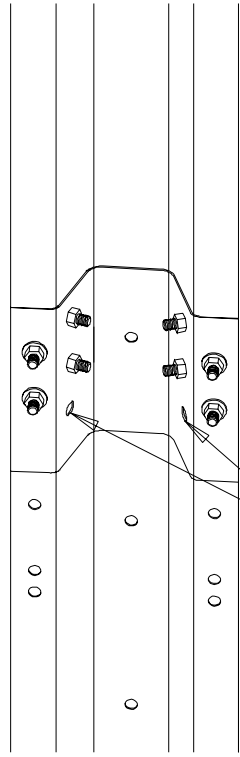


REV. 2-27-96

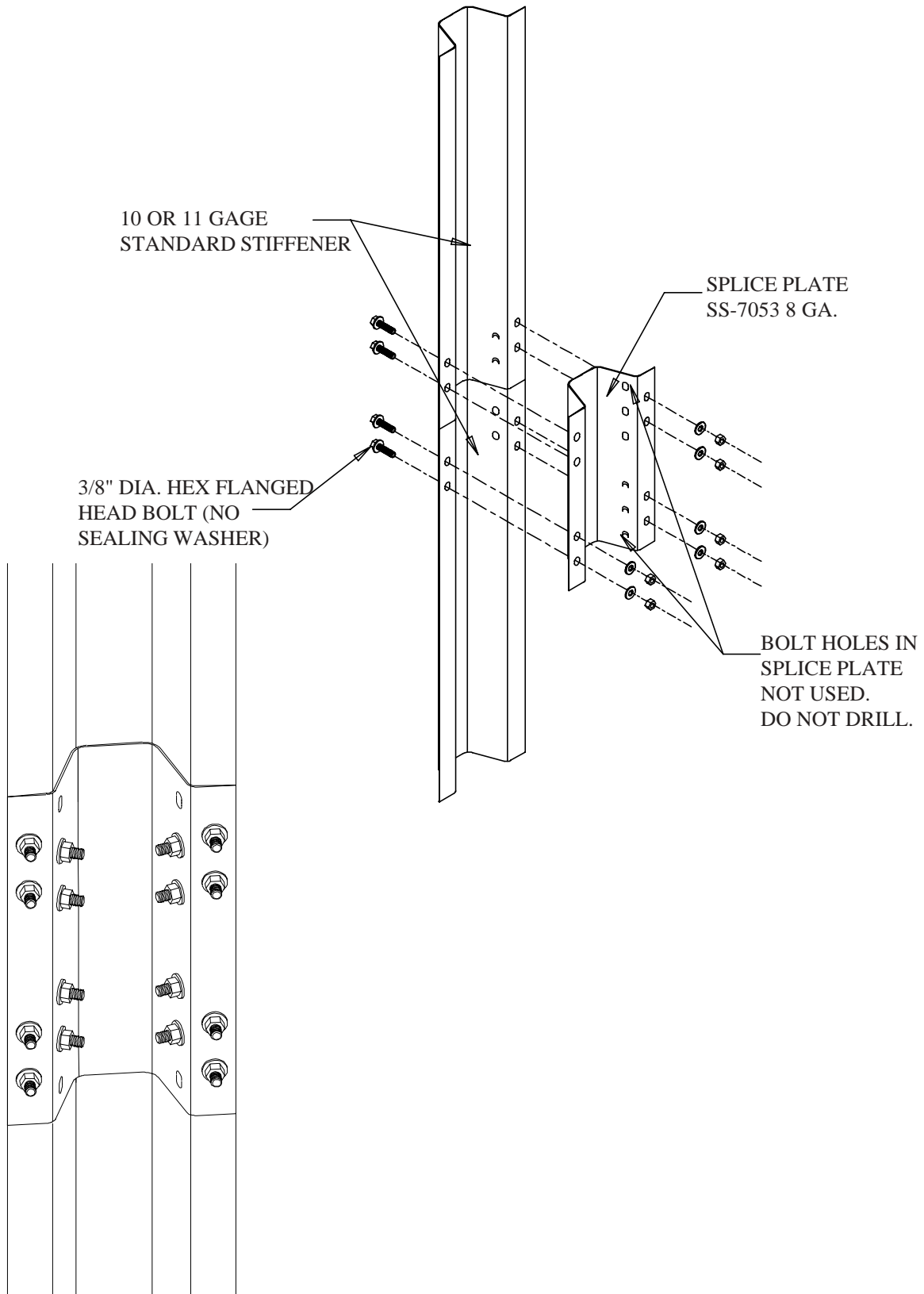
14 AND 15 GAGE TO 14 AND 15 GAGE
OFFSET CONNECTION DETAIL.



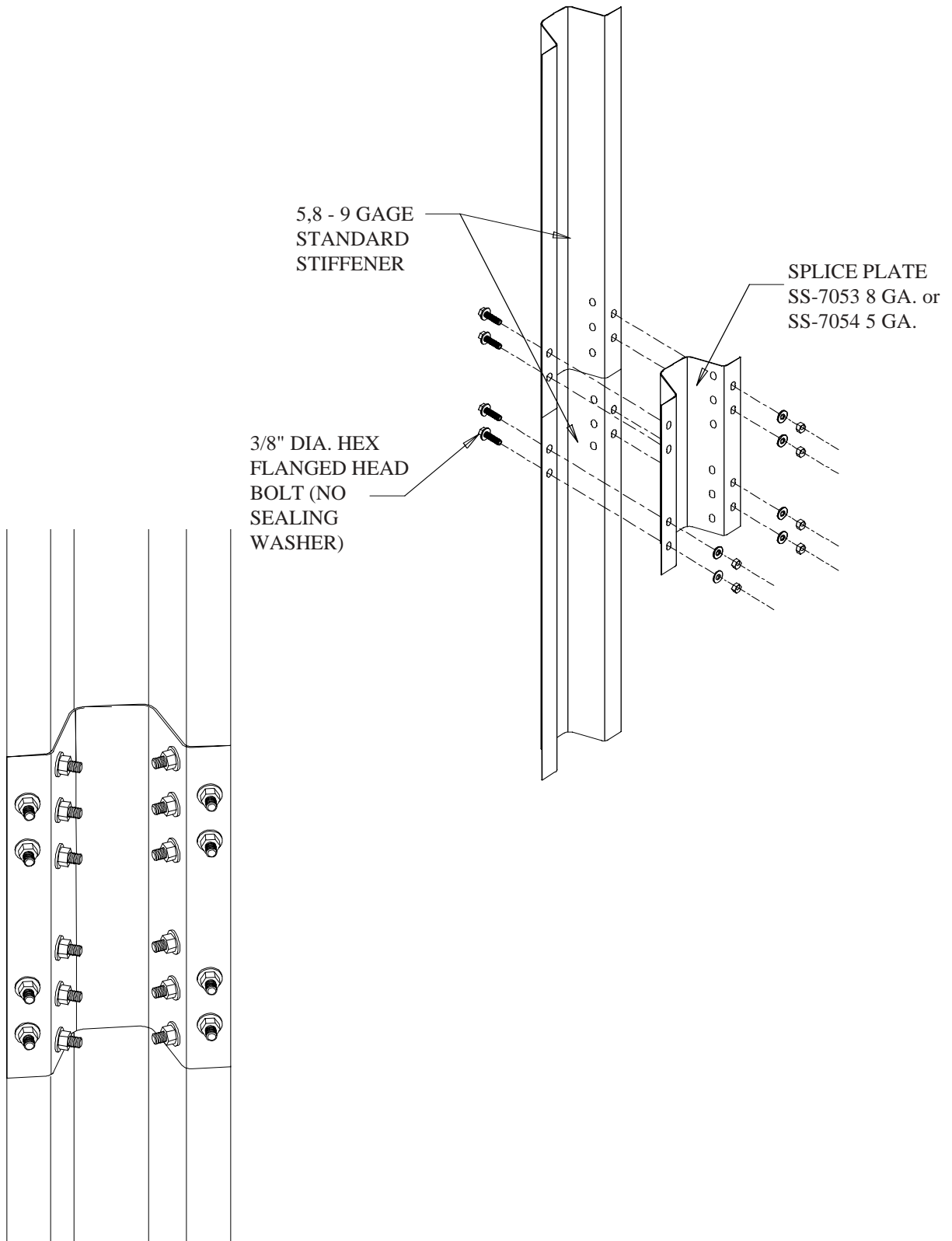
14 AND 15 GAGE TO 13 AND 12 GAGE
OFFSET CONNECTION DETAIL.



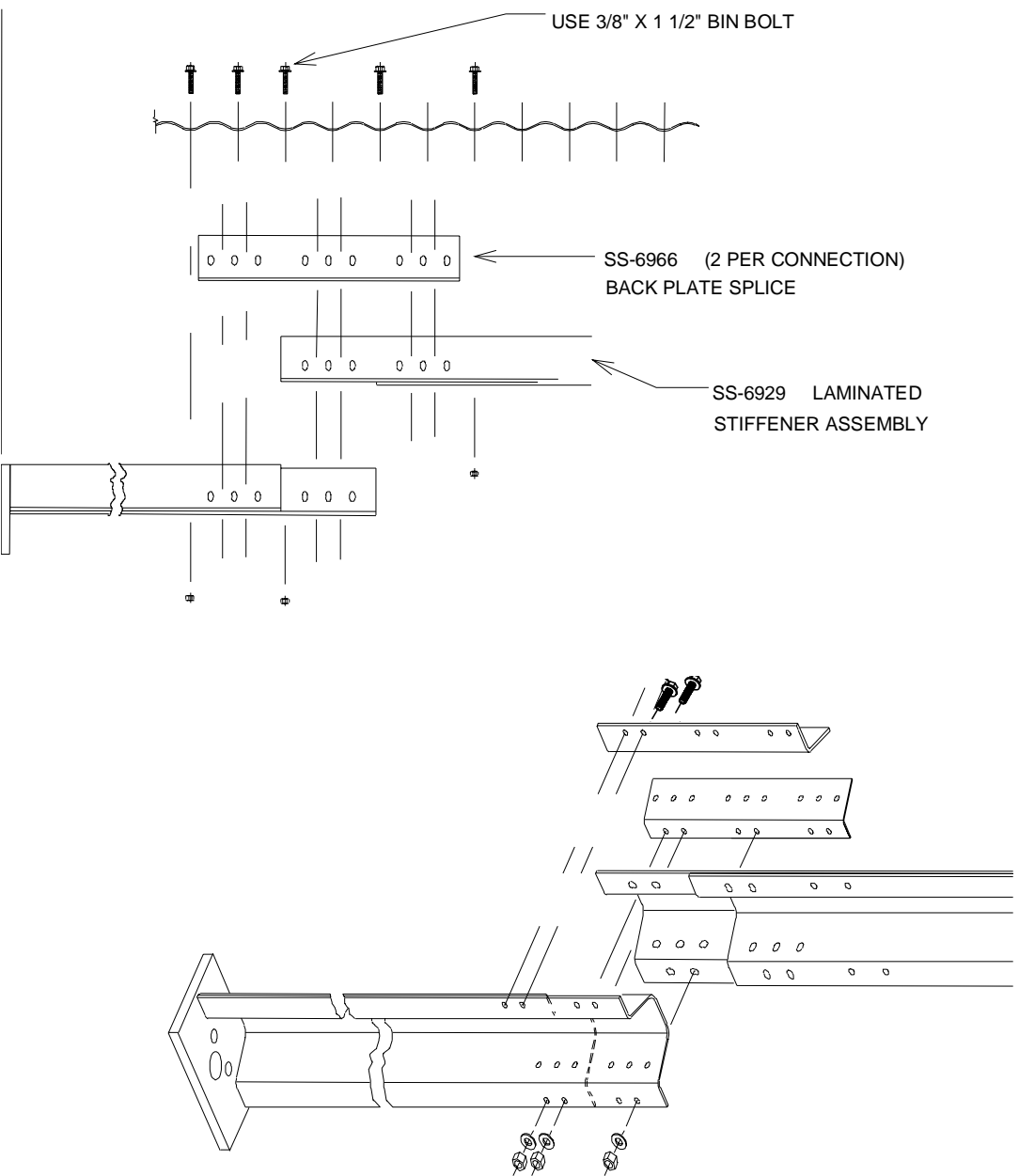
BOLT HOLE
NOT USED
IN 14 AND 15
GAGE.
DO NOT DRILL.



SEE PAGE 29 FOR USAGE CHART



LAMINATED STIFFENER SPLICE 2.66" CORRUGATION

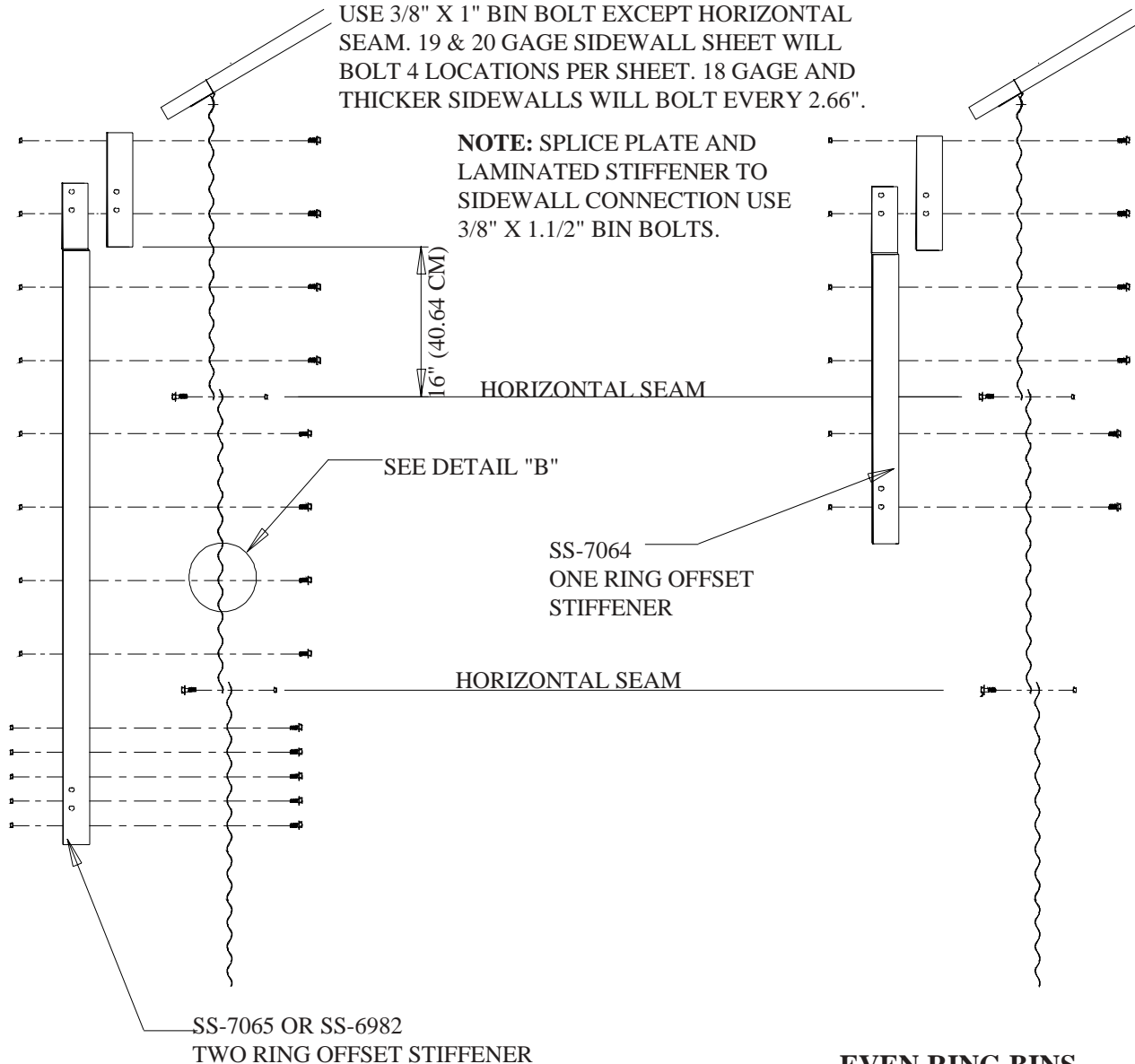


**2 STIFFENERS PER SIDEWALL SHEET
COMMERCIAL STIFFENER STARTING LOCATION - 36' DIA. & SMALLER
2.66" CORRUGATION OUTSIDE STIFFENER ONLY**

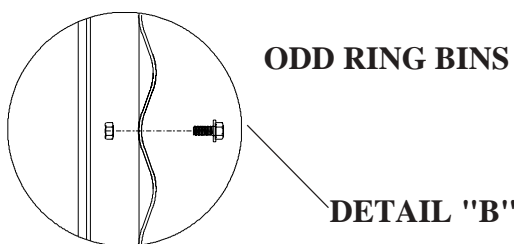
NOTE: CERTAIN TANKS MAY BE STIFFENED TO THE EAVE. REFER TO YOUR TANK GAUGE LAYOUT SHEET TO DETERMINE IF THIS IS THE CASE FOR YOUR BIN.

FOR SIDEWALL TO STIFFENER CONNECTIONS USE 3/8" X 1" BIN BOLT EXCEPT HORIZONTAL SEAM. 19 & 20 GAGE SIDEWALL SHEET WILL BOLT 4 LOCATIONS PER SHEET. 18 GAGE AND THICKER SIDEWALLS WILL BOLT EVERY 2.66".

NOTE: SPLICE PLATE AND LAMINATED STIFFENER TO SIDEWALL CONNECTION USE 3/8" X 1.1/2" BIN BOLTS.



EVEN RING BINS



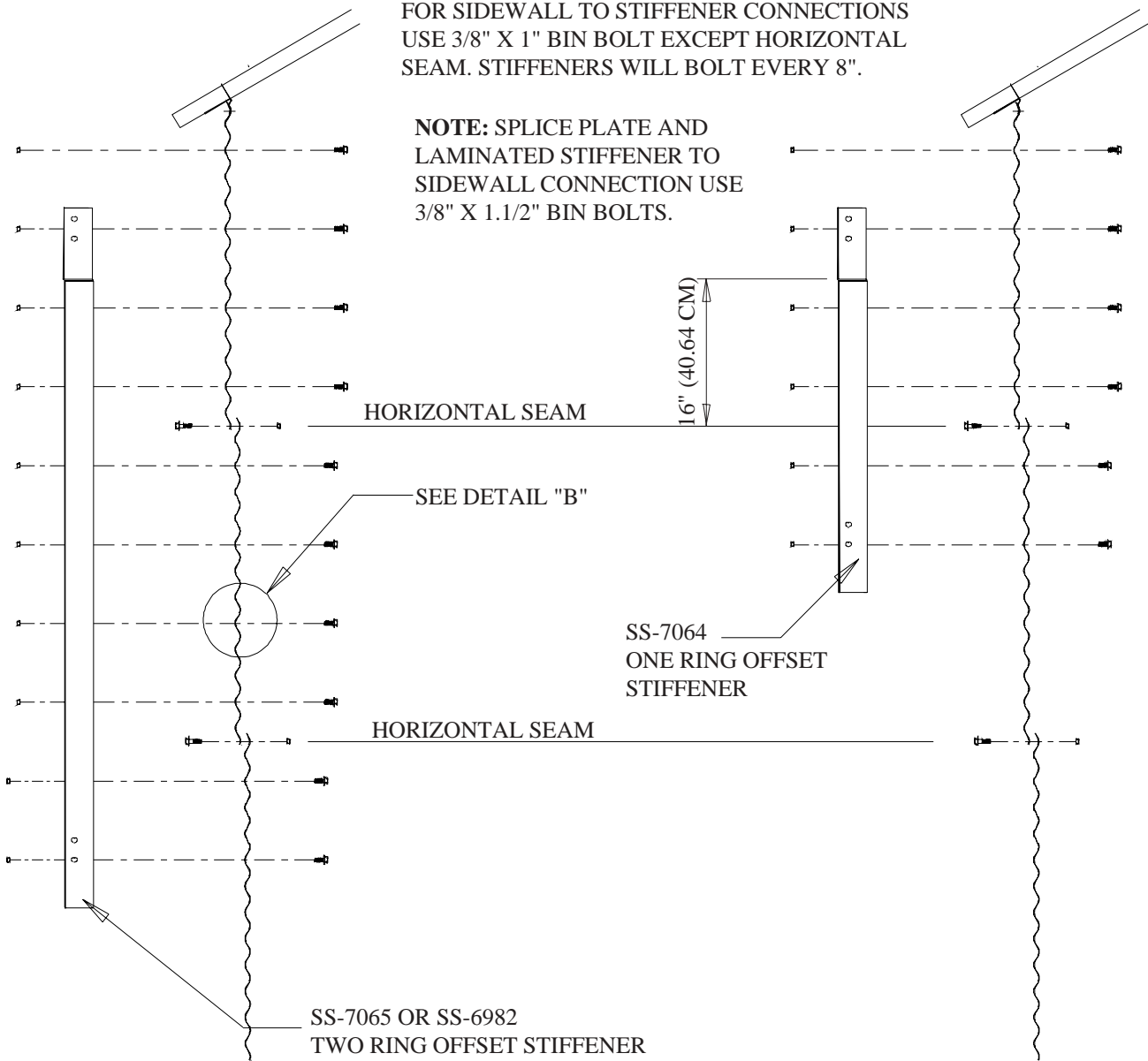
OFFSET JOINTS AND 8 GAGE SPLICE PLATED JOINTS USE 3/8" X 1" HEX FLANGED HEAD BOLTS. ALL OTHER STIFFENER JOINTS USE 3/8" X 1.1/2" HEX FLANGED HEAD BOLTS. WASHERS USED BOTH SIDES OF ALL STIFFENER JOINT CONNECTIONS.

**3 STIFFENERS PER SIDEWALL SHEET
COMMERCIAL STIFFENER STARTING LOCATION - 36' DIA. & SMALLER
2.66" CORRUGATION OUTSIDE STIFFENER ONLY**

NOTE: CERTAIN TANKS MAY BE STIFFENED TO THE EAVE. REFER TO YOUR TANK GAUGE LAYOUT SHEET TO DETERMINE IF THIS IS THE CASE FOR YOUR BIN.

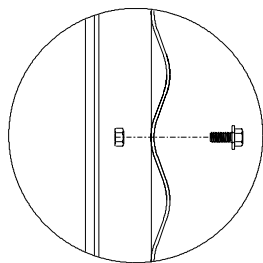
FOR SIDEWALL TO STIFFENER CONNECTIONS USE 3/8" X 1" BIN BOLT EXCEPT HORIZONTAL SEAM. STIFFENERS WILL BOLT EVERY 8".

NOTE: SPLICE PLATE AND LAMINATED STIFFENER TO SIDEWALL CONNECTION USE 3/8" X 1.1/2" BIN BOLTS.



ODD RING BINS

EVEN RING BINS



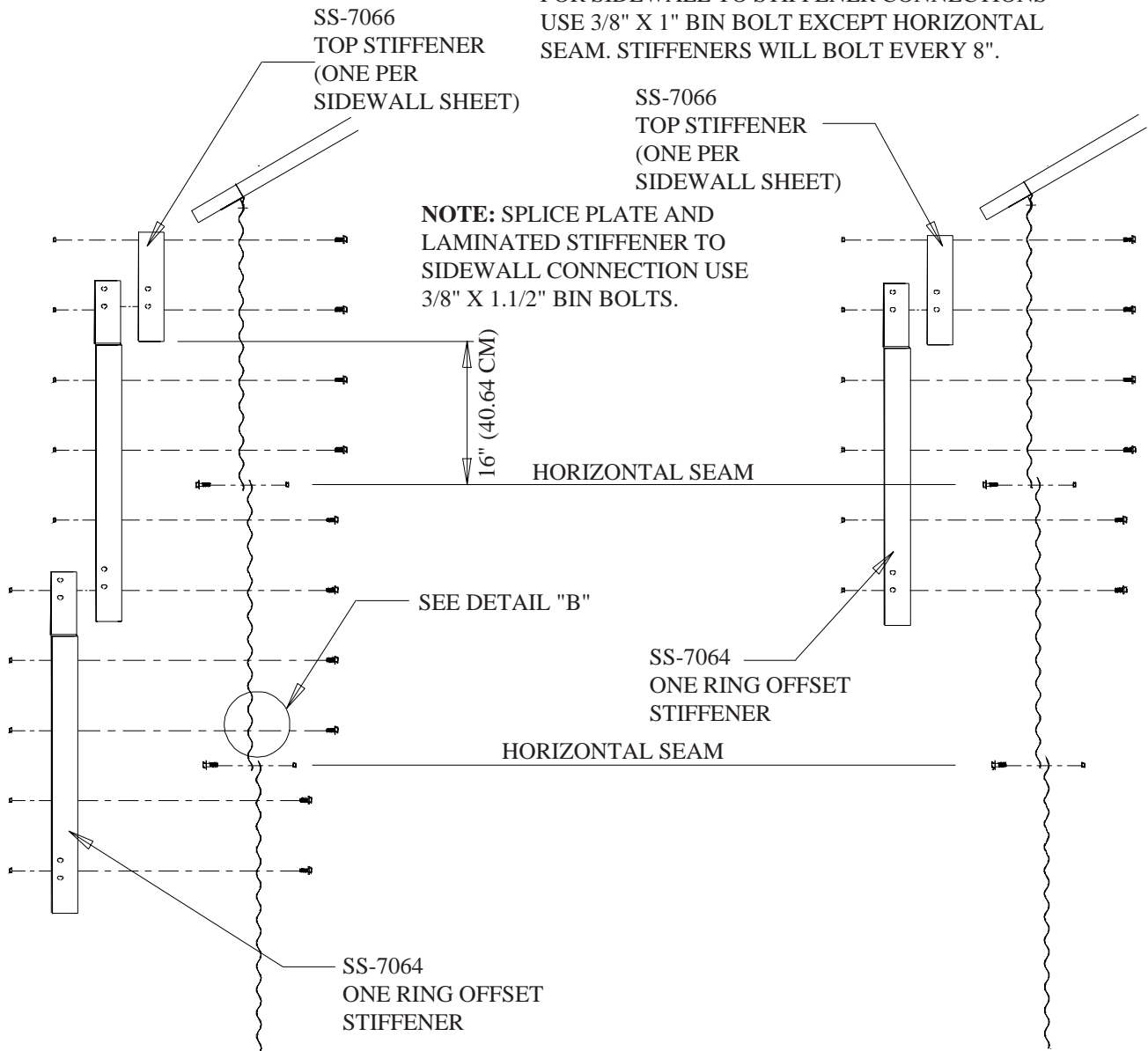
DETAIL "B"

OFFSET JOINTS AND 8 GAGE SPLICE PLATED JOINTS USE 3/8" X 1" HEX FLANGED HEAD BOLTS. ALL OTHER STIFFENER JOINTS USE 3/8" X 1.1/2" HEX FLANGED HEAD BOLTS. WASHERS USED BOTH SIDES OF ALL STIFFENER JOINT CONNECTIONS.

3 STIFFENERS PER SIDEWALL SHEET
COMMERCIAL STIFFENER STARTING LOCATION - 42' TO 105' DIA.
2.66" REVERSE CORRUGATION OUTSIDE STIFFENER ONLY

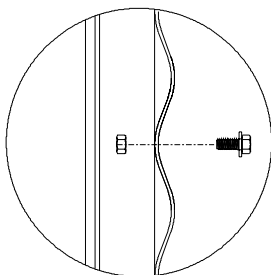
NOTE: CERTAIN TANKS MAY BE STIFFENED TO THE EAVE. REFER TO YOUR TANK GAUGE LAYOUT SHEET TO DETERMINE IF THIS IS THE CASE FOR YOUR BIN.

FOR SIDEWALL TO STIFFENER CONNECTIONS USE 3/8" X 1" BIN BOLT EXCEPT HORIZONTAL SEAM. STIFFENERS WILL BOLT EVERY 8".



ODD RING BINS

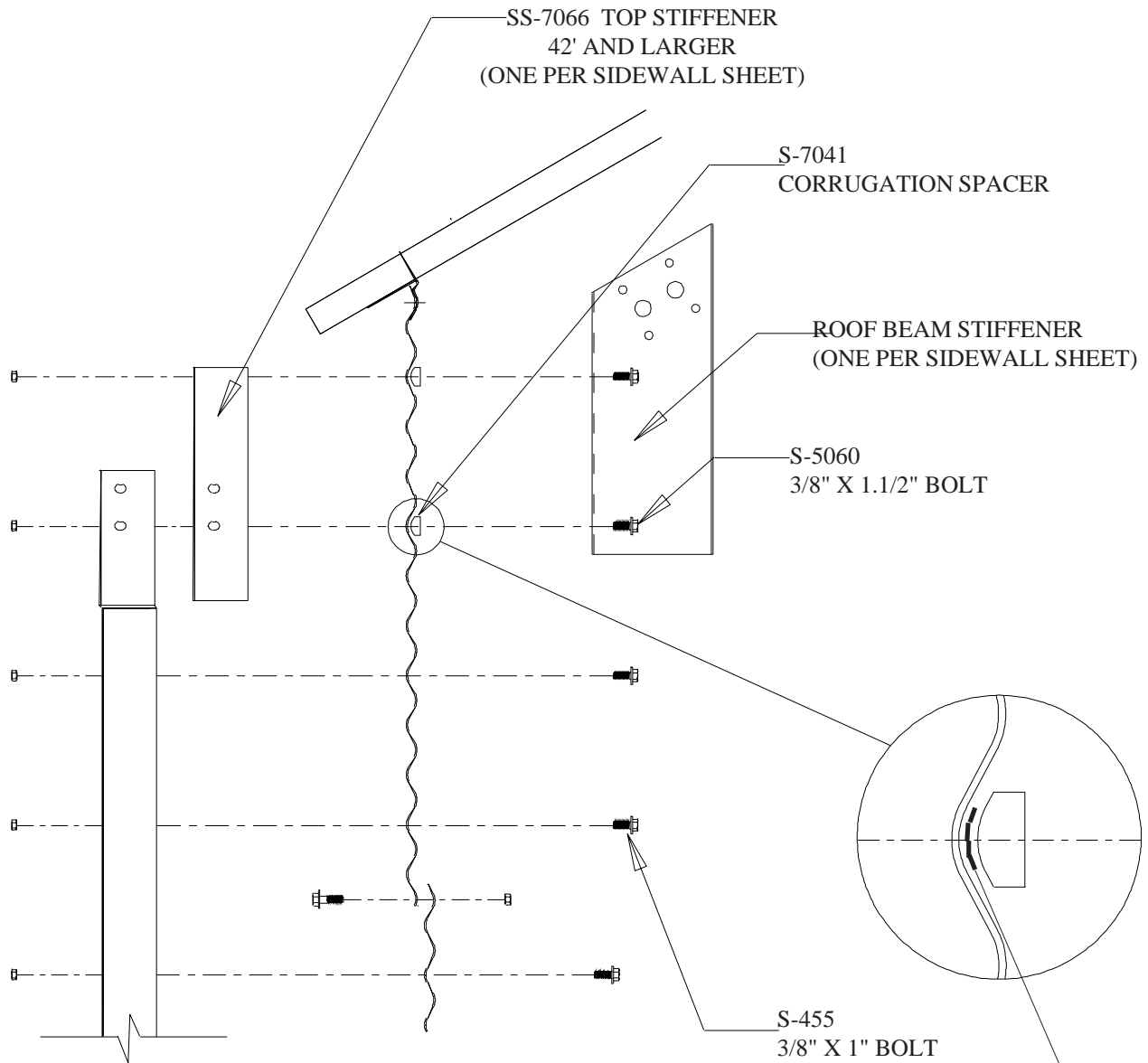
EVEN RING BINS



DETAIL "B"

OFFSET JOINTS AND 8 GAGE SPLICE PLATED JOINTS USE 3/8" X 1" HEX FLANGED HEAD BOLTS. ALL OTHER STIFFENER JOINTS USE 3/8" X 1.1/2" HEX FLANGED HEAD BOLTS. WASHERS USED BOTH SIDES OF ALL STIFFENER JOINT CONNECTIONS.

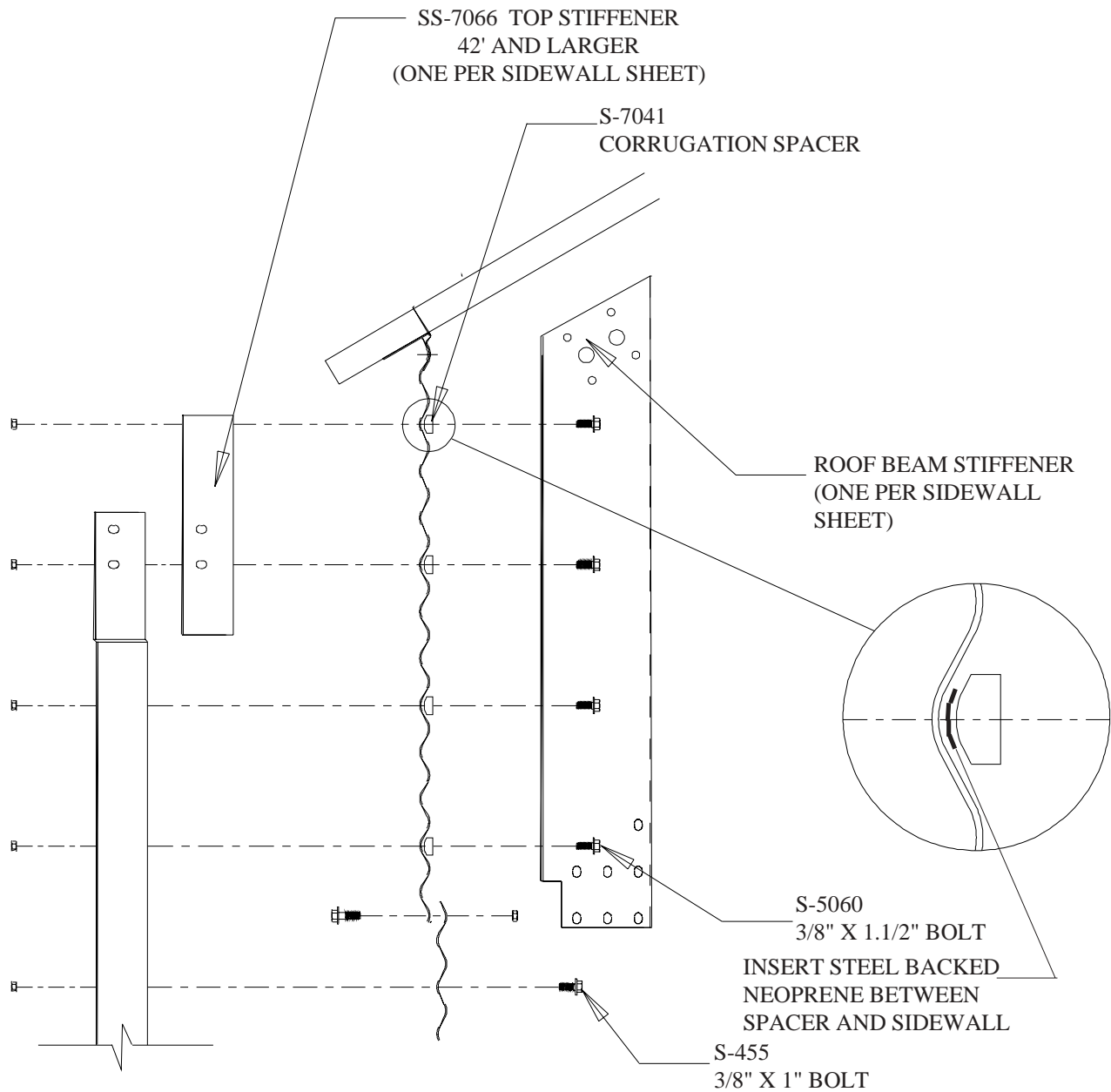
**42' THRU 60' STANDARD ROOF STIFFENER DETAIL
2.66" CORRUGATION OUTSIDE STIFFENER ONLY**



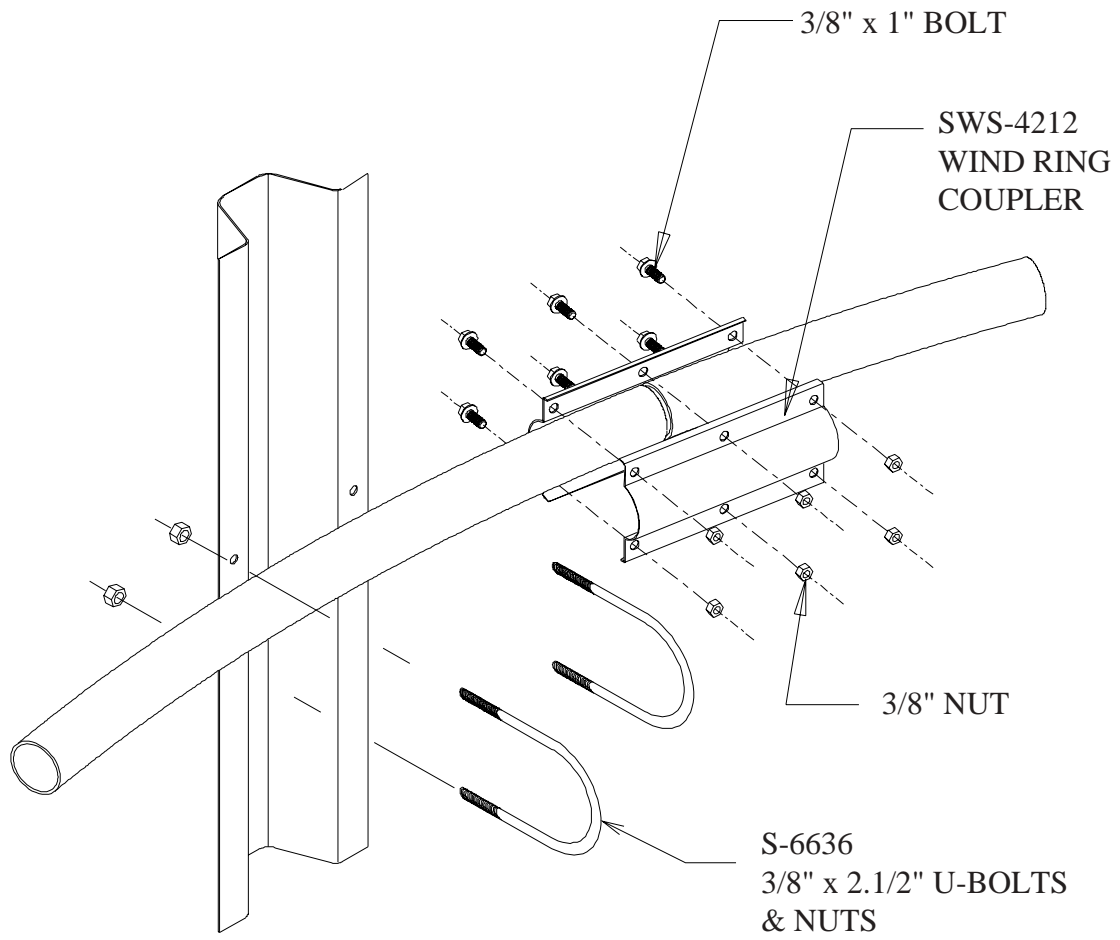
NOTE:
INSERT CORRUGATION SPACER
(S-7041) INTO CORRUGATION

INSERT STEEL BACKED
NEOPRENE BETWEEN
SPACER AND SIDEWALL

72' THRU 105' DIA. ROOF STIFFENER DETAIL
60' DIA. 10,000 LB. PEAK LOAD ROOF STIFFENER DETAIL
2.66" CORRUGATION OUTSIDE STIFFENER ONLY



NOTE:
INSERT CORRUGATION SPACER
(S-7041) INTO CORRUGATION





**ACCESSORY
INSTRUCTIONS**

INSTALLATION AND MANAGEMENT OF SIDE DRAW SYSTEMS

Grain Systems designs and manufactures bins to the highest standards, however proper installation and good usage practices for a commercial flume system are essential, regardless of manufacturer. The following practices address general usage and installation criteria for such systems.

A.) SIDE DRAW INSTALLATION:

- 1.) Side discharge is only permitted in GSI commercial bins when a GSI manufactured side draw flume system has been installed. No corrugated steel bin should be unloaded through the sidewall without installation of such a system and permission of the manufacturer.
- 2.) Installation of a flume system may require installation of additional wind rings and 1" diameter anchor bolts. Reference the following pages or the commercial bin section of the GSI sales catalog. Installation of multiple systems requires additional wind rings and must be placed a minimum of 90 degrees apart. Installation of multiple systems requires approval of GSI engineering.
- 3.) A side draw should not be the only discharge system available. A standard center discharge and conveyor should be installed.

B.) SIDE DRAW MANAGEMENT AND USAGE:

- 1.) Side draw systems are intended for use with dry flowable grain. Side draws are not to be used for poorly flowing products. This is not unique to GSI bins and flume systems but is a general rule for such systems.
- 2.) In multiple systems installations only one side draw may be used at any one time.
- 3.) Filling should not be occurring at the same time as grain is being withdrawn through the side draw flume system.
- 4.) Prolonged storage of grain in the sloped condition produced by side draw discharge may accelerate differential settlement and result in deformations of the bin/silo. After using the side draw system the sloped grain should be returned to a near level condition by use of the center discharge. Leveling of the grain should also allow more even consolidation of foundation and fill soils and produce more even settlement of the bin/silo
- 5.) If geotechnical investigations or past experience indicate significant foundation level soil variations or a site propensity toward differential settlement, side draw usage may be prohibited or severely restricted. In this situation the use of a flume system should be reviewed with geotechnical consultants or the foundation engineer.

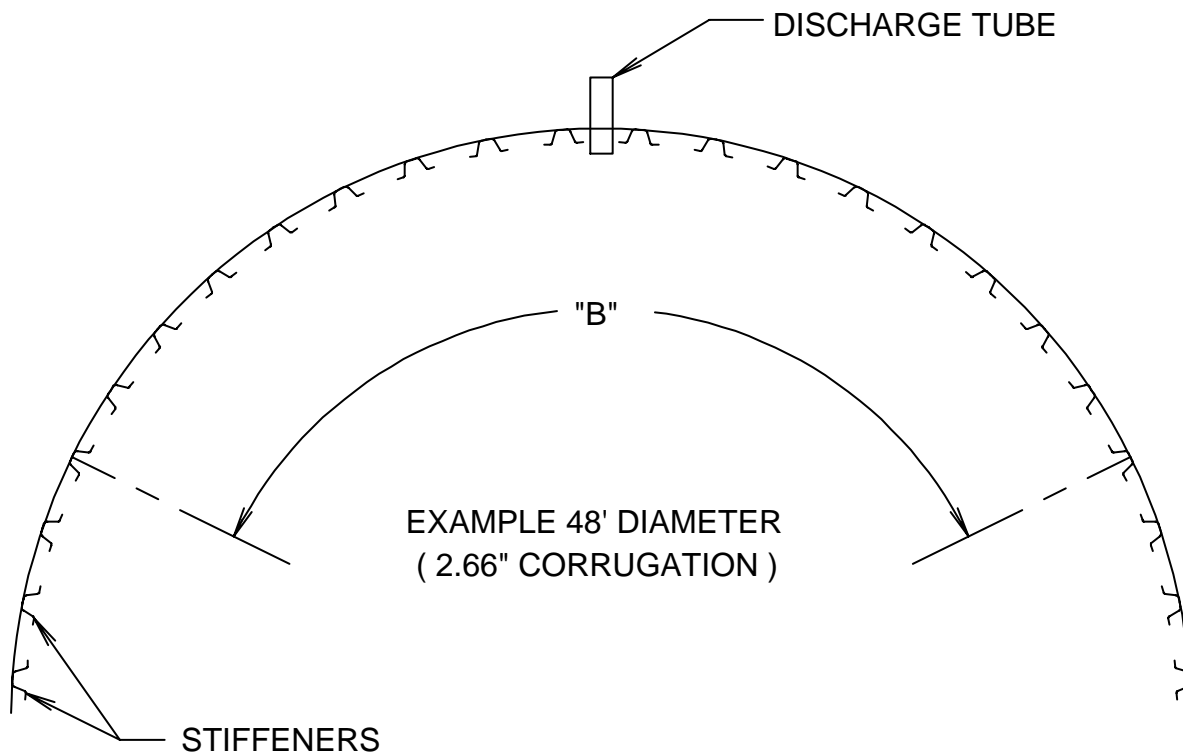
REV. 3-2-98

**1" ANCHOR BOLTS REQUIRED WITH SIDE DRAW SYSTEMS
USED WITH 2.66" CORRUGATION COMMERCIAL TANKS**

CORRUGATION	TANK DIAMETER	TOTAL NUMBER OF ANCHOR BOLTS	NUMBER OF 1" ANCHOR BOLTS REQUIRED ("B")
2.66"	42'	42	18
2.66"	48'	48	18
2.66"	60'	60	22
2.66"	72'	72	24
2.66"	75'	75	26
2.66"	78'	78	28
2.66"	90'	90	30
2.66"	105'	105	105

USE 1" DIAMETER ANCHOR BOLTS AT THE REQUIRED STIFFENER LOCATIONS, HALF THE TOTAL NUMBER OF 1" DIAMETER BOLTS ON EACH SIDE OF THE DISCHARGE TUBE. REFER TO ERECTION MANUAL FOR ANCHOR BOLT LOCATION, SIZE, AND EMBEDMENT DETAILS. FOR MULTIPLE SIDE DRAW SYSTEMS AND ALL 105' DIAMETER BINS WITH SIDEDRAW SYSTEMS UTILIZE 1" DIAMETER ANCHOR BOLTS ON ALL STIFFENERS.

ALL BINS ARE SHIPPED WITH THE STANDARD HT-635 ANCHOR BOLT WASHER (PUNCHED FOR 3/4" BOLT). THE GSI 1" ANCHOR BOLT ASSEMBLY IS SHIPPED WITH A B-6756 ANCHOR BOLT WASHER FOR 1" DIAMETER BOLTS. IF ANCHOR BOLTS ARE PROVIDED BY ANOTHER SOURCE THESE WASHERS MUST BE ORDERED AS AN ADDITIONAL ITEM.



ANCHOR BOLT LAYOUT

**ADDITIONAL WIND RINGS REQUIRED FOR 2.66" COMMERCIAL TANKS
WITH SIDE DRAW CHUTE SYSTEMS**

(ONE SYSTEM ONLY)

PNEG-066
2.66" SIDE DRAW
INSTRUCTIONS - 2 POST
(VIEWED FROM INSIDE OF BIN)

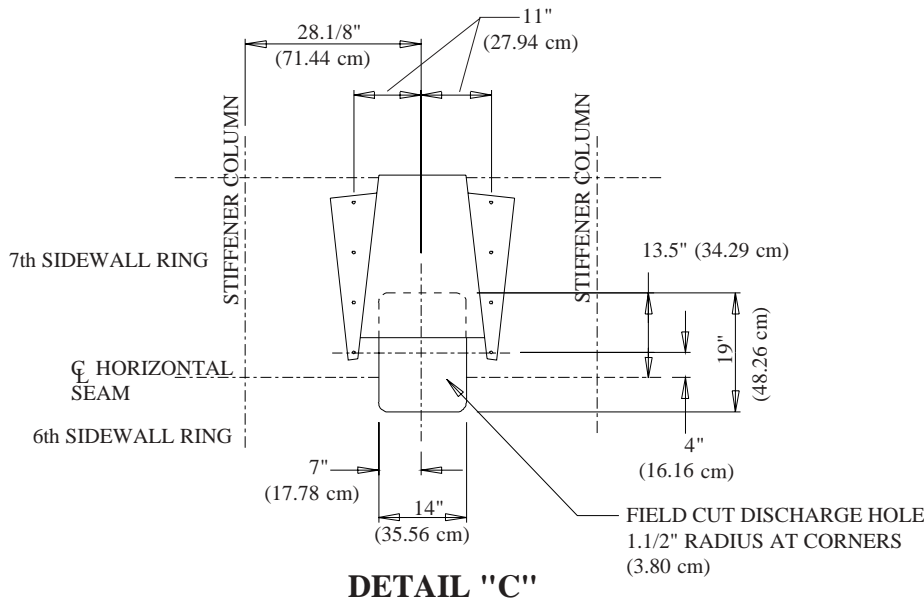
WIND RING INSTALLATION

Tanks that use wind rings require 2.3/4" dia. holes passing through the side draw chute; with the center no less than 6" from either end and 4.3/8" from the sidewall. The wind ring must penetrate through the chute and form a complete ring. Do not locate wind ring in 8" space at chute entrance. Field drill stiffeners for wind ring u-bolts (if required.)

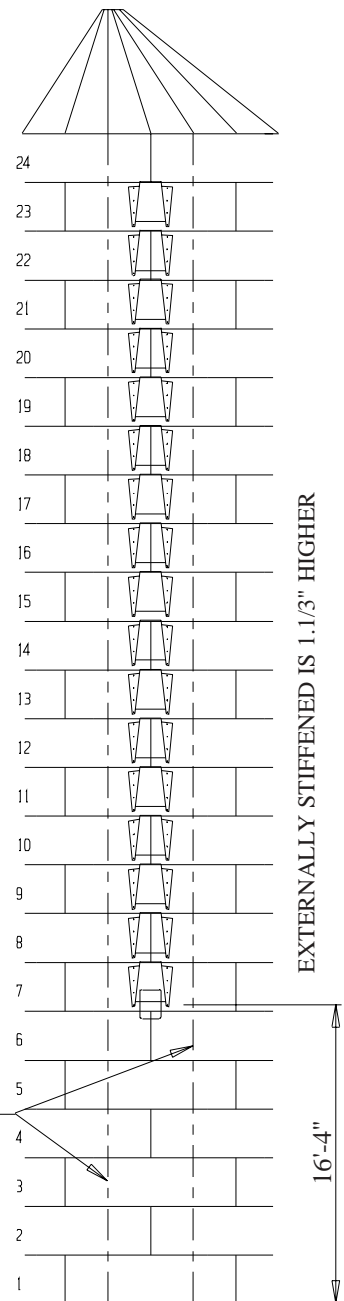
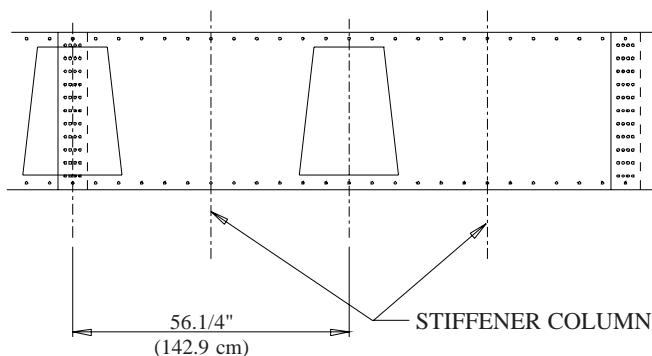
DISCHARGE TUBE INSTALLATION

- 1.) Use the bottom 2 holes in the last chute to locate discharge tube 28" below the 7th horizontal seam. Refer to Detail "C" for sidewall sheet hole dimensions.
- 2.) For proper water shed install plate so upper body sheet overlaps the plate, as shown in Detail "D".
- 3.) Use discharge tube assembly as a template, drill all holes 7/16" diameter.
- 4.) Use 2 beads of caulking to seal discharge plate to body sheets. Use 3/8" bolts & nuts provided to bolt discharge assembly to body sheets.

NUMBER OF RINGS IN TANK	CHUTE LOCATION HORIZONTAL STARTING LOCATION
ALL	1.) LOCATE 1st CHUTE IN 2nd RING FROM TOP 2.) TOP BOLT HOLES IN CHUTE TO BE LOCATED ON 2nd CORRUGATION OF BODY SHEET.
11, 13, 15, 17, 19, 21 & 23	3.) CENTER CHUTE OVER VERTICAL SEAM.
10, 12, 14, 16, 18, 20, 22 & 24	3.) CENTER CHUTE 56.1/4" FROM THE 1st HORIZONTAL SEAM BOLT IN THE 2nd RING.



DETAIL "C"
FIRST CHUTE LOCATION



**VIEWING INSIDE OF
TYPICAL 24 RING BIN**

NOTE: UNLOAD TUBE & SUPPORTS FROM RACK & PINION DOWN NOT PROVIDED BY G.S.I.

**PNEG-066
2.66" SIDE DRAW
INSTRUCTIONS - 3 POST
(VIEWED FROM INSIDE OF BIN)**

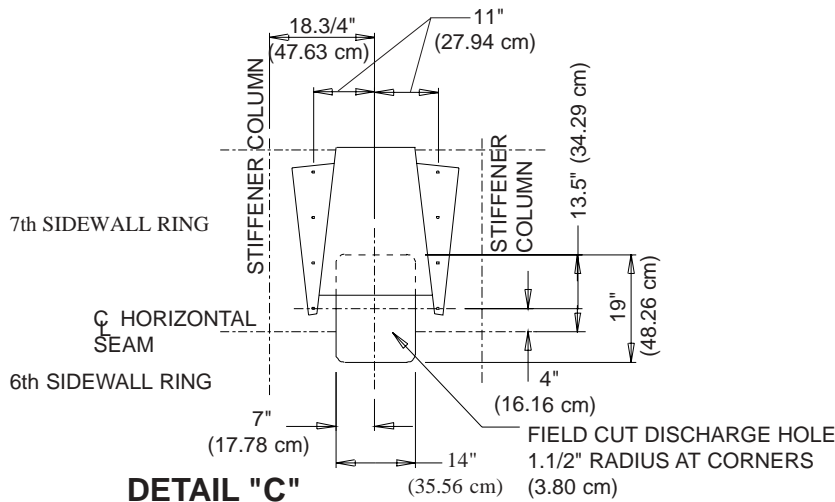
WIND RING INSTALLATION

Tanks that use wind rings require 2.3/4" dia. holes passing through the side draw chute; with the center no less than 6" from either end and 4.3/8" from the sidewall. The wind ring must penetrate through the chute and form a complete ring. Do not locate wind ring in 8" space at chute entrance. Field drill stiffeners for wind ring u-bolts (if required.)

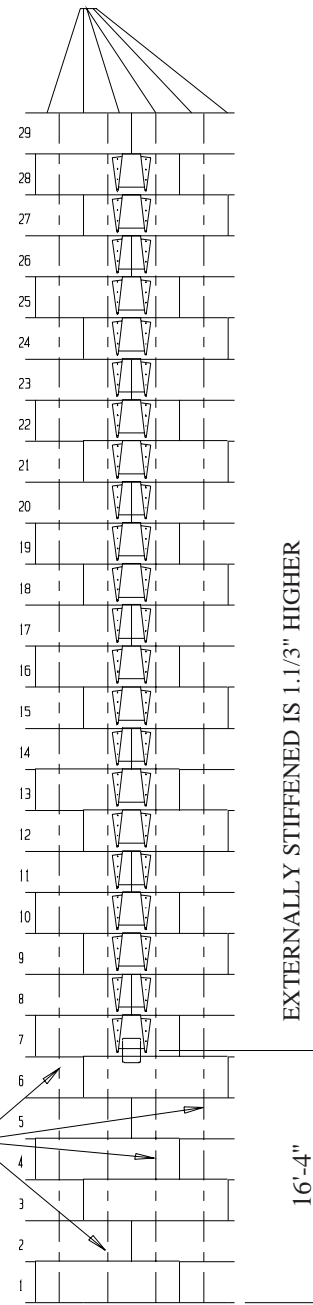
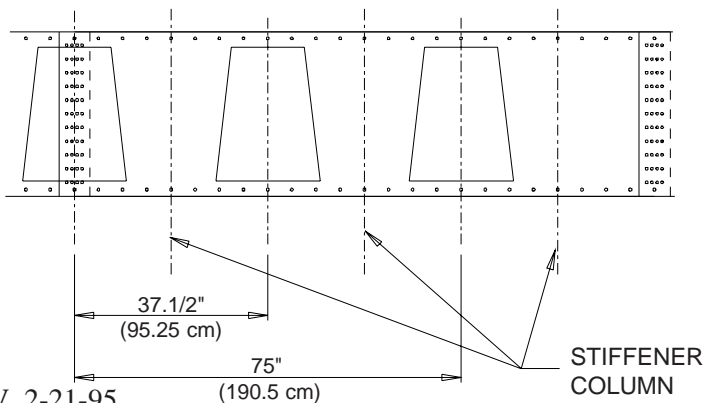
DISCHARGE TUBE INSTALLATION

- 1.) Use the bottom 2 holes in the last chute to locate discharge tube 28" below the 7th horizontal seam. Refer to Detail "C" for sidewall sheet hole dimensions.
- 2.) For proper water shed install plate so upper body sheet overlaps the plate, as shown in Detail "D".
- 3.) Use discharge tube assembly as a template, drill all holes 7/16" diameter.
- 4.) Use 2 beads of caulking to seal discharge plate to body sheets. Use 3/8" bolts & nuts provided to bolt discharge assembly to body sheets.

NUMBER OF RINGS IN TANK	CHUTE LOCATION HORIZONTAL STARTING LOCATION
ALL	1.) LOCATE 1st CHUTE IN 2nd RING FROM TOP 2.) TOP BOLT HOLES IN CHUTE TO BE LOCATED ON 2nd CORRUGATION OF BODY SHEET.
11, 14, 17, 20, 23, 26 & 29	3.) CENTER CHUTE 75" (LEFT TO RIGHT) FROM 1st HOLE IN 2nd BODY SHEET
10, 13, 16, 19, 22, 25 & 28	3.) CENTER CHUTE 37.1/2" (LEFT TO RIGHT) FROM 1st HOLE IN 2nd BODY SHEET
12, 15, 18, 21, 24, 27 & 30	3.) CENTER CHUTE OVER VERTICAL SEAM.



FIRST CHUTE LOCATION



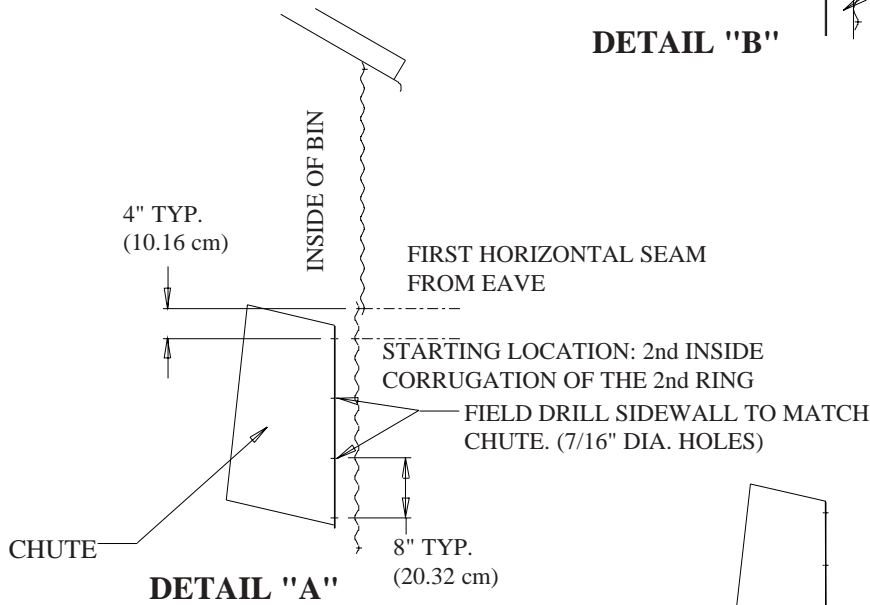
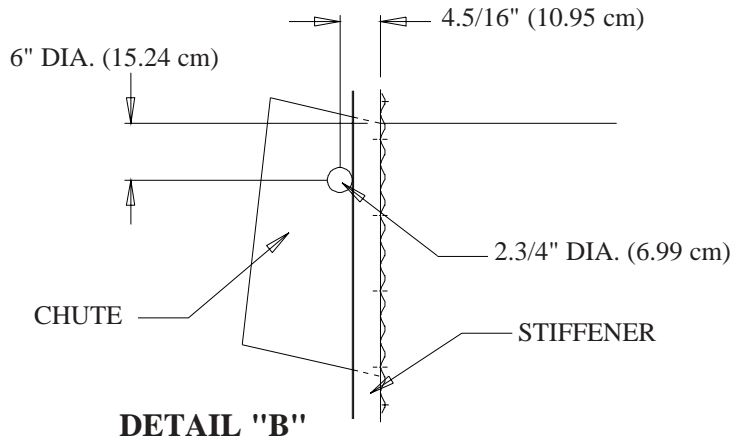
EXTERNALLY STIFFENED IS 1.1/3" HIGHER

**VIEWING INSIDE OF
TYPICAL 29 RING BIN**

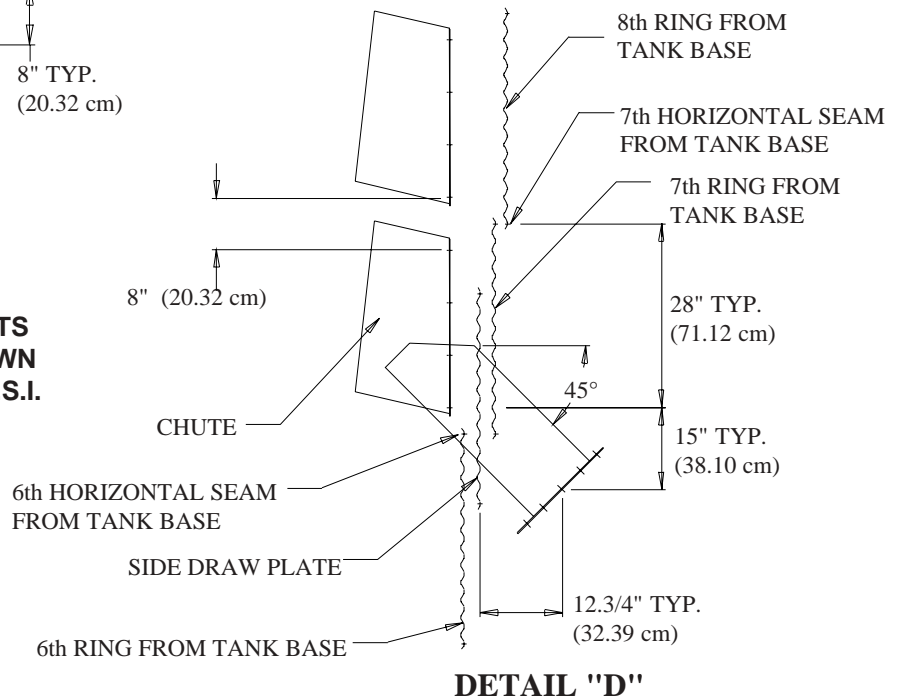
NOTE: UNLOAD TUBE & SUPPORTS FROM RACK & PINION DOWN NOT PROVIDED BY G.S.I.

**2.66" SIDE DRAW INSTRUCTIONS
2 & 3 POST (INTERNALLY STIFFENED)**

FIELD CUTTING OF CHUTES IS NECESSARY TO ACCEPT THE WIND RINGS. LOCATE WIND RINGS AS SHOWN. THE WIND RING MUST BE ASSEMBLED IN TO A COMPLETE RING AND PENETRATE THROUGH THE CHUTE. FIELD DRILL STIFFENERS FOR U-BLOTS (IF REQUIRED).

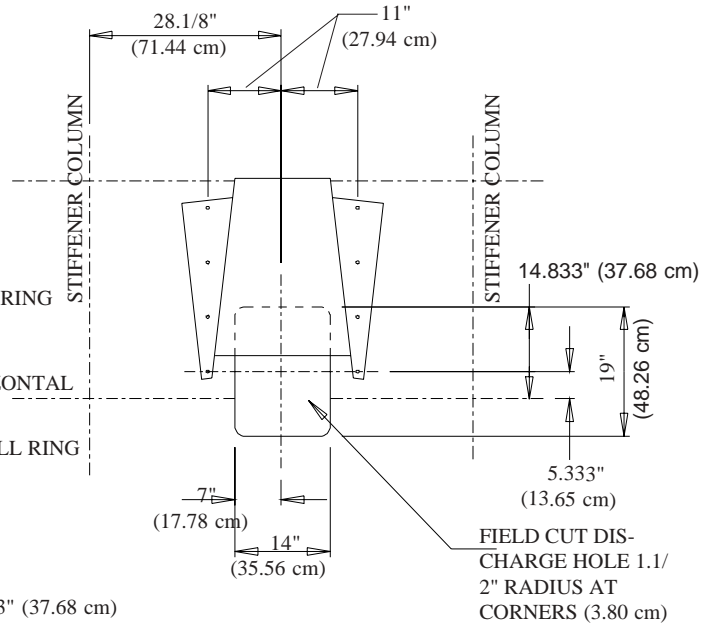
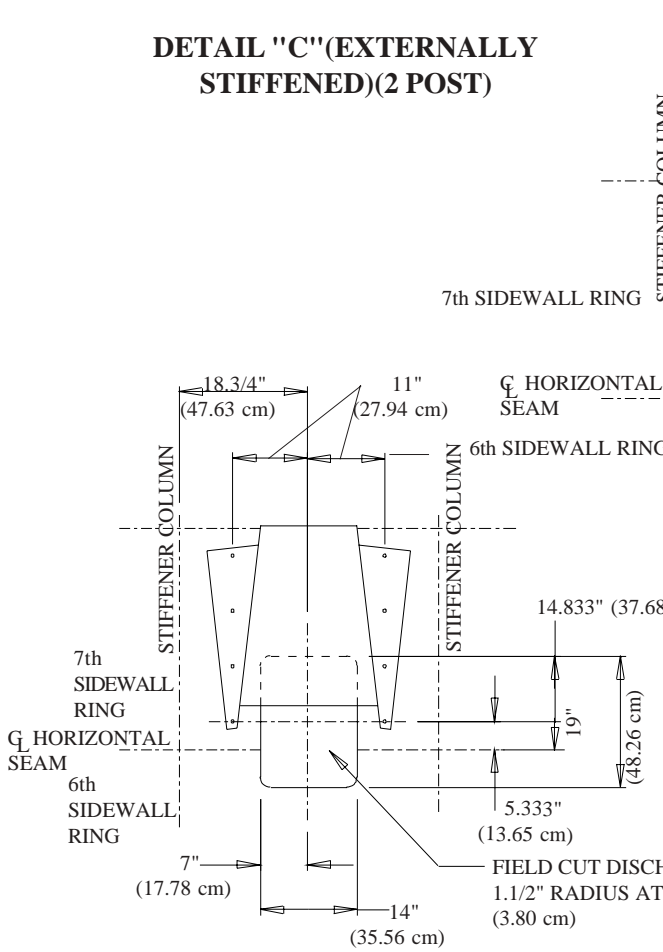


**NOTE:
UNLOAD TUBE & SUPPORTS
FROM RACK & PINION DOWN
ARE NOT PROVIDED BY G.S.I.**

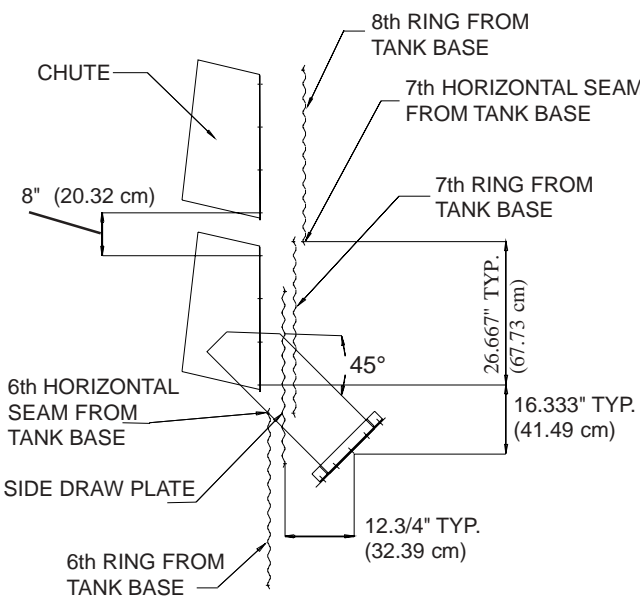


**2.66" SIDE DRAW INSTRUCTIONS
2 & 3 POST (EXTERNALLY STIFFENED)**

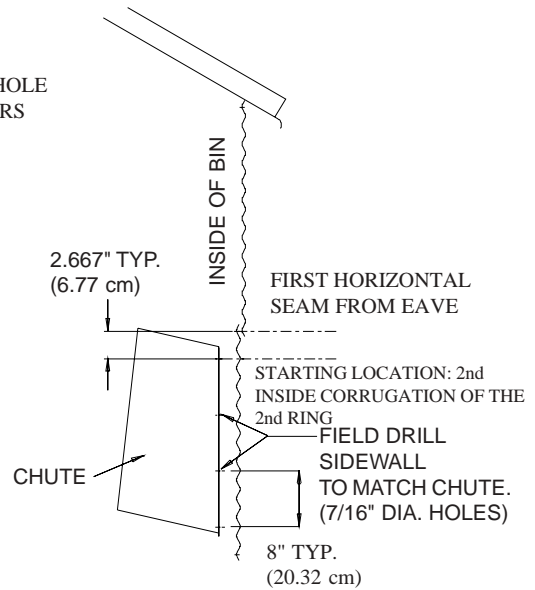
DETAIL "C"(EXTERNALLY STIFFENED)(2 POST)



DETAIL "C"(EXTERNALLY STIFFENED)(3 POST)



DETAIL "D" (EXTERNALLY STIFFENED)

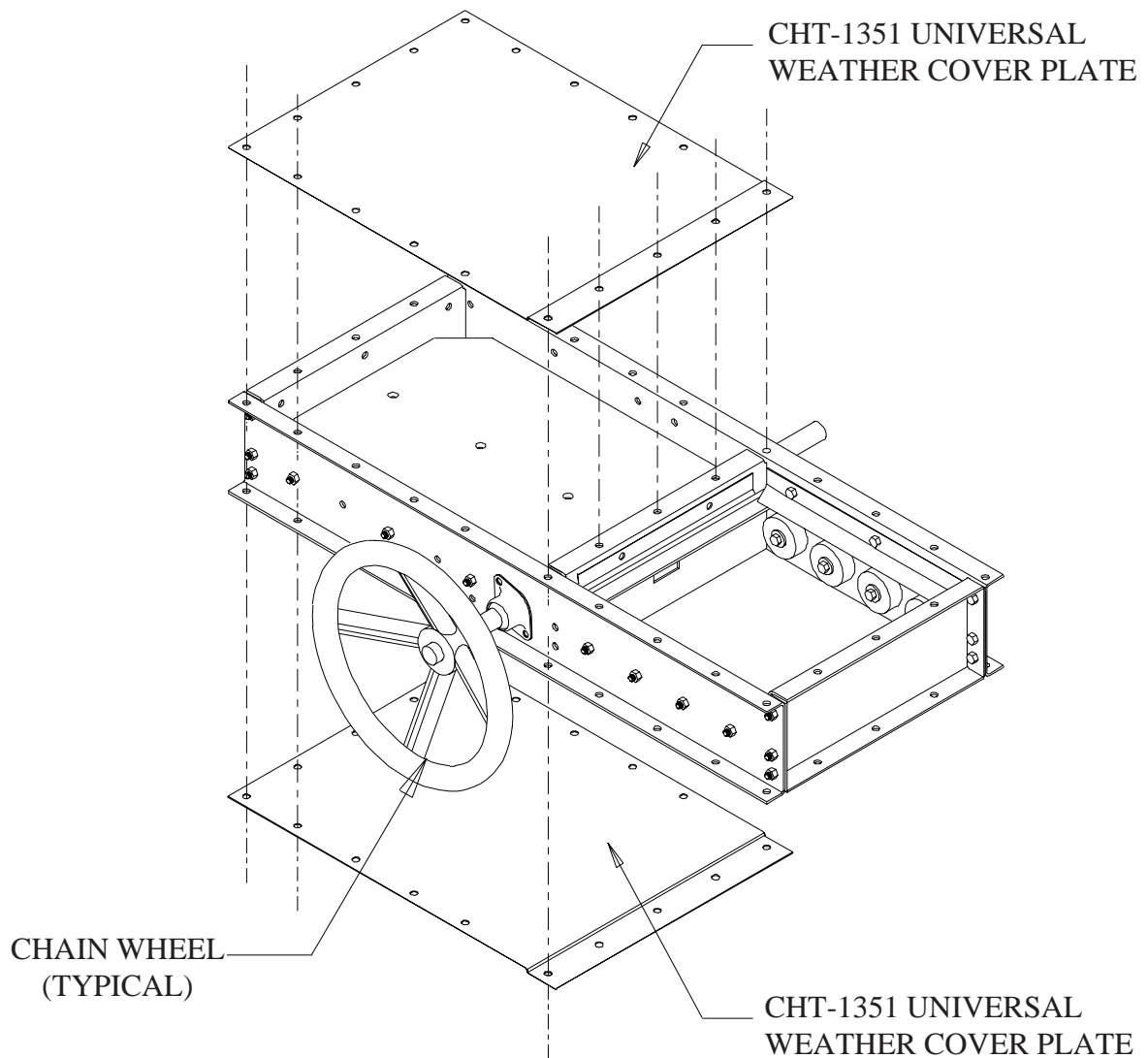


DETAIL "A" (EXTERNALLY STIFFENED)

**NOTE:
UNLOAD TUBE & SUPPORTS FROM RACK
& PINION DOWN ARE NOT PROVIDED BY G.S.I.**

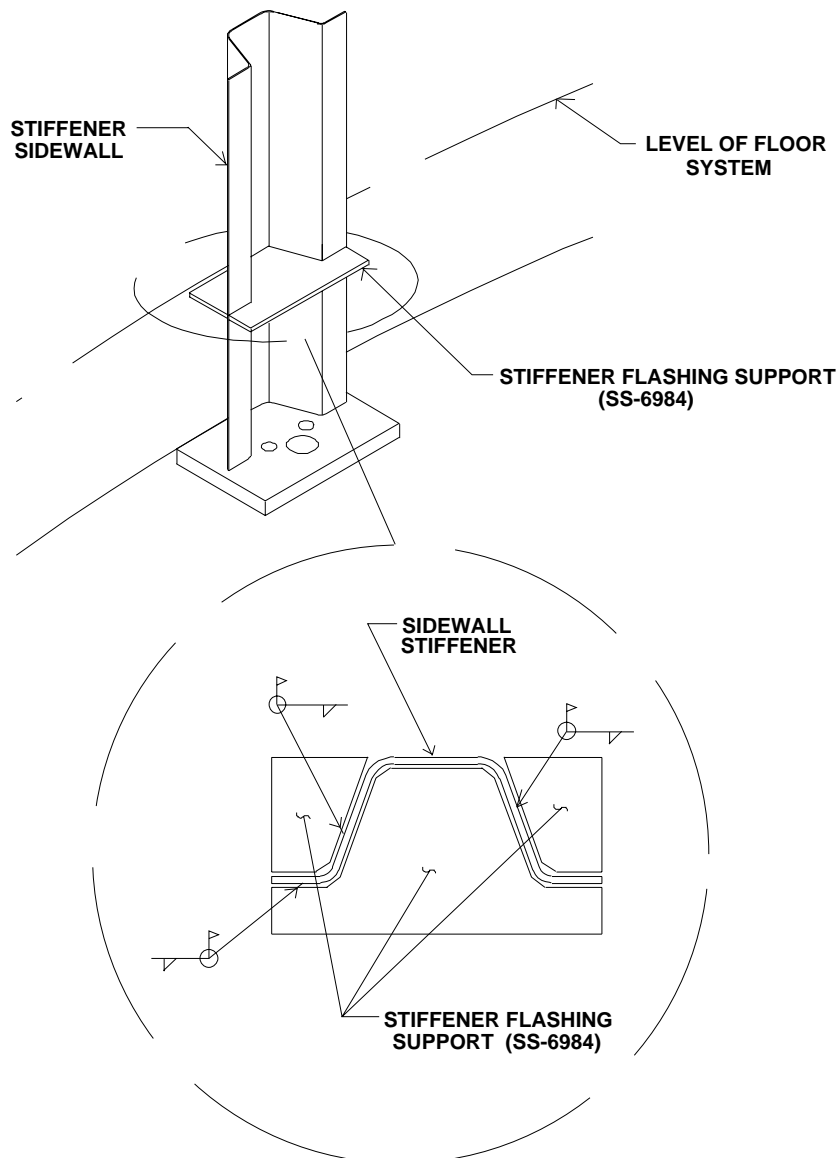
PNEG-265
WEATHER COVER ASSEMBLY INSTRUCTIONS
FOR ROLLER VALVE

- 1.) INSTALL WEATHER COVER KIT AFTER GATE HAS BEEN INSTALLED.
- 2.) USE BEAD CAULKING AT ALL SEAMS WHERE WEATHER COVER ATTACH TO GATE.
- 3.) USE 5/8" X 3/4" BOLTS & NUTS TO PLUG ALL HOLES NOT IN USE.
- 4.) USE 1/4" SELF-DRILLERS TO SEAL GATE END PLATE CORNERS.



**STIFFENER FLASHING
SUPPORT INSTRUCTIONS**

- 1) INSTALL THE FLOOR AND SUPPORT SYSTEM, CUTTING THE FLOOR TO GO AROUND THE INTERNAL STIFFENERS AS REQUIRED.
- 2) BREAK THE STIFFENER FLASHING SUPPORT (SS-6984) INTO IT'S THREE COMPONENTS.
- 3) LAY THE FLASHING SUPPORTS ON TOP OF THE FLOORING AND WELD THE FLASHING SUPPORTS TO THE STIFFENER, CUT THE FLASHING TO FIT AROUND STIFFENER AS CLOSE AS POSSIBLE. FASTEN THE FLASHING TO THE WALL, FLASHING SUPPORT, AND FLOOR. SEAL ALL SPACES BY WELDING OR CAULKING.
- 4) PAINT ALL WELDS WITH GOOD QUALITY ZINC RICH PAINT.
- 5) STIFFENER FLASHING SUPPORTS (SS-6984), MUST BE ORDERED SEPERATELY FROM THE STANDARD FLOOR AND FLASHING.



Revised March 1998



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March 1998