



# **12', 15', 18', & 21' Bulk Feed Tanks BFT & GHT Series**

Assembly Manual

**PNEG-257**

**Date: 8-22-07**



a division of  
THE GSI GROUP



PNEG-257



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All information, illustrations, photos, and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

# **Introduction**

READ THIS MANUAL carefully to learn how to properly use and install equipment. Failure to do so could result in personal injury or equipment damage.

INSPECT the shipment immediately upon arrival. The Customer is responsible for ensuring that all quantities are correct. Report any damage or shortages by recording a detailed description on the Bill of Lading to justify the Customer's claim from the Transport Firm. Our responsibility for damage to the equipment ends with acceptance by the delivering carrier. Save all paperwork and documentation furnished with any of the equipment/components.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your equipment and should be easily accessible when needed.

WARRANTY is provided as part of the company's support program for customers who use and maintain their equipment as described in the manual. The warranty is explained on the warranty page located on the inside back cover of this manual.

This warranty provides you the assurance that the company will back its products where defects appear within the warranty period. In some circumstances, the company also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the factory specifications, the warranty will become void and field improvements may be denied.



# SAFETY GUIDELINES

This manual contains information that is important for you, the owner/operator, to know and understand. This information relates to protecting **personal safety** and **preventing equipment problems**. It is the responsibility of the owner/operator to inform anyone operating or working in the area of this equipment of these safety guidelines. To help you recognize this information, we use the symbols that are defined below. Please read the manual and pay attention to these sections. Failure to read this manual and it's safety instructions is a misuse of the equipment and may lead to serious injury or death.



**This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.**



**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



**CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



**NOTE** indicates information about the equipment that you should pay special attention to.

# General Safety Statement

Our principal concern is your safety and the safety of others associated with grain handling equipment. 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.

You should consider the location of the bin site relative to power line locations or electrical transmission equipment. We recommend you contact your local power company to review your installation plan or for information concerning required equipment clearance. Clearance of portable equipment that may be taken to the bin site should be reviewed and considered as well. Any electrical control equipment in contact with the bin should be properly grounded and installed in accordance with National Electric Code provisions and other local or national codes.

This product is intended for the use of grain storage only. Any other use is a misuse of the product!



This product has sharp edges! These sharp edges may cause serious injury. To avoid injury, handle sharp edges with caution and use proper protective clothing and equipment at all times.

Sidewall bundles or sheets must be stored in a safe manner. The safest method of storing sidewall bundles is laying horizontally with the arch of the sheet upward or over like a dome. Sidewall sheets stored on edge must be secured in a way that they cannot fall over and cause injury. Care should be taken in the handling and movement of sidewall bundles.

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.

## Bulk Feed Tanks

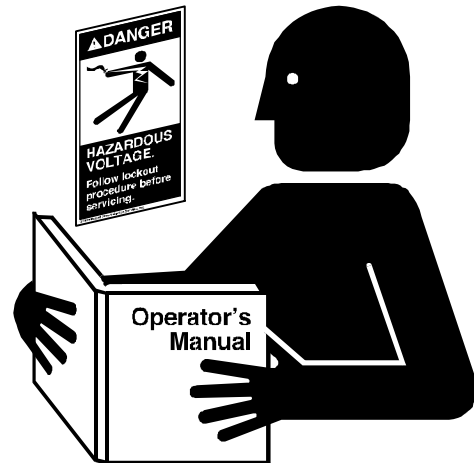
### FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction. Keep children and other unqualified personnel out of the working area at ALL times

Keep your machinery in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your dealer.



**Read and Understand Manual.**

### PRACTICE SAFE MAINTENANCE

Understand service procedures before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is in operation. Keep hands, feet, and clothing from rotating parts.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any build up grease, oil, or debris.

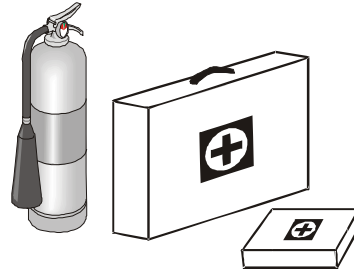


**PREPARE FOR EMERGENCIES**

Be prepared if fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



**Keep Emergency Equipment Quickly Accessible.**

**WEAR PROTECTIVE CLOTHING**

Wear close fitting clothing and safety equipment appropriate to the job.

Safety glasses should be worn at all times to protect eyes from debris.

Wear gloves to protect your hands from sharp edges on plastic or steel parts.

A respirator may be needed if a hog house has poor ventilation. Waste fumes can be toxic.

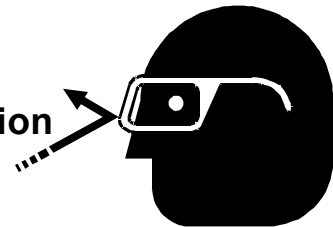
Wear hard hat and steel toe boots to help protect your head and toes from falling debris.

Remove all jewelry.

Tuck in any loose or dangling shoe strings.

Long hair should be tied up and back.

**Eye Protection**



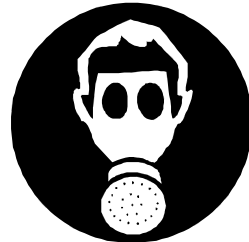
**Gloves**



**Steel Toe Boots**



**Respirator**



**Hard Hat**



### **Properly Store Grain Bin/Silo Materials Prior to Construction to Prevent Wet Storage Stain:**

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Wet storage stain (rust) will develop when closely packed bundles of galvanized material such as sidewall and roof sheets have moisture present from any source. Roof and sidewall bundles should be inspected on arrival for the presence of moisture. If moisture is present, moisture must not be permitted to remain between the sheets. In the case of moisture presence, sheets or panels should be separated immediately, wiped down, dried and sprayed with a light oil or diesel fuel.

Where possible, sidewall bundles, roof sheets and other closely packed materials should be stored in a dry, climate controlled building. Storage inside a dry building should be done if at all possible. Where outdoor storage is unavoidable, the materials should be raised out of contact from the ground or vegetation. Stacking and spacing materials should not be corrosive or wet. Materials must be protected from the weather. Weather protection that permits more air movement around the bundles is best.

The storage method of the roof bundles and sidewall sheets may also help minimize moisture presence. Roof bundles should be stored inclined. The bundles should be stored and secured in a safe & stable manner. Turning the bundles over and storing with the center of the dome “up” like a arch is an option. Sidewall bundles may be stored on edge, **however these bundles should be secured in such as way as they cannot fall over and cause injury.**

Should “white rust” or “wet storage stain” occur, contact the manufacturer immediately concerning methods to minimize the adverse effect upon the galvanized coating.

(This Page)

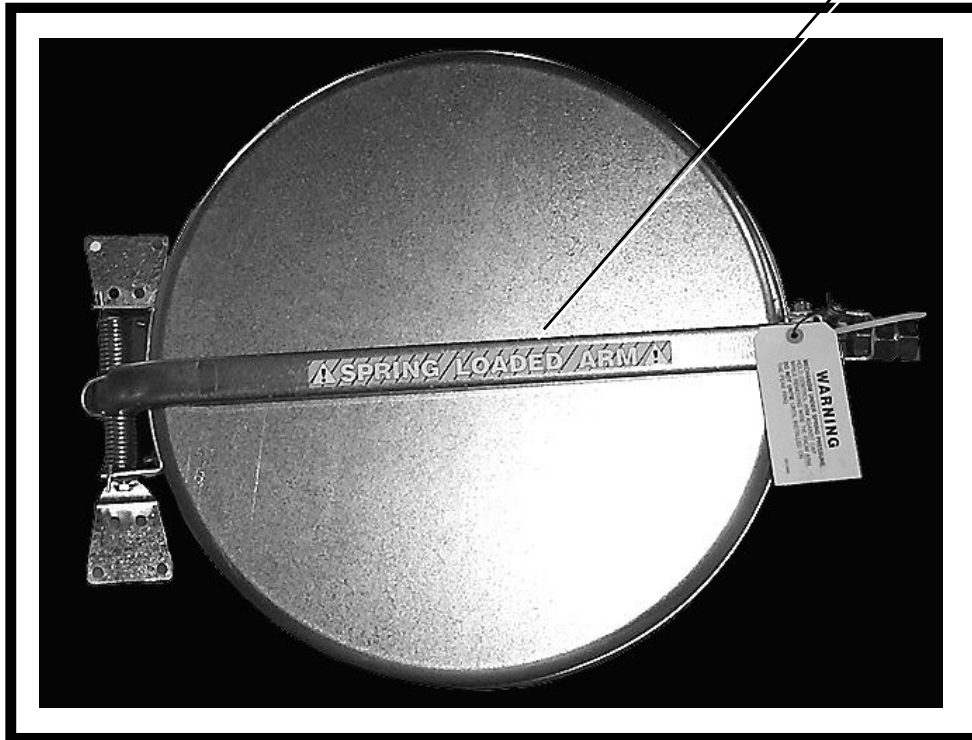
# DC-604

## Located on the Cap Latch Control Arm

(Next Page)

# DC-590

## Located on the Cap Latch Control Arm



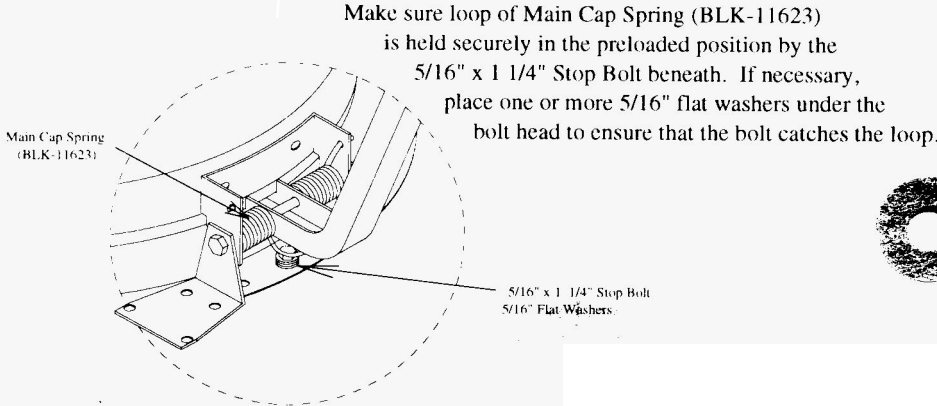
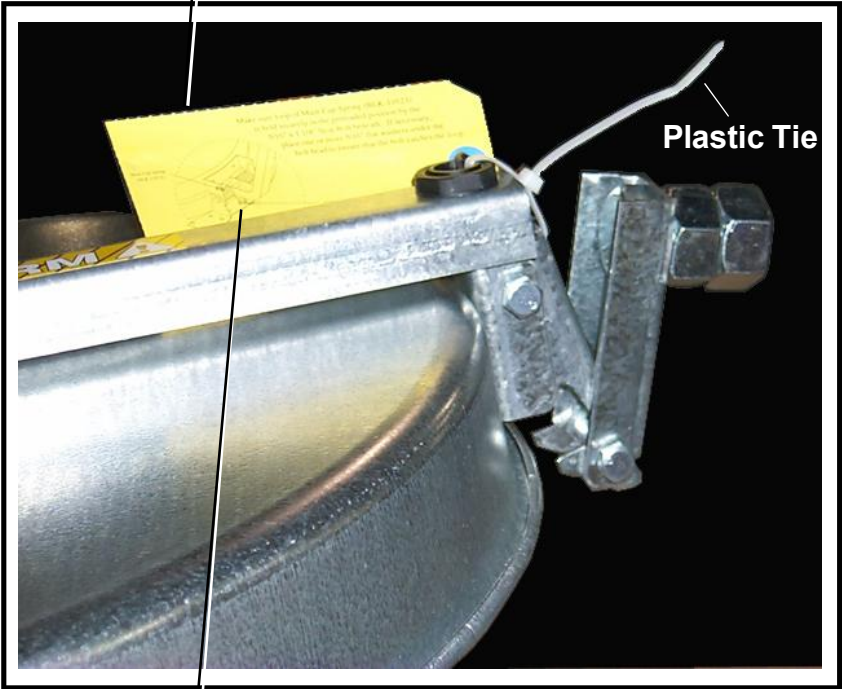
**A SPRING LOADED ARM**

# WARNING

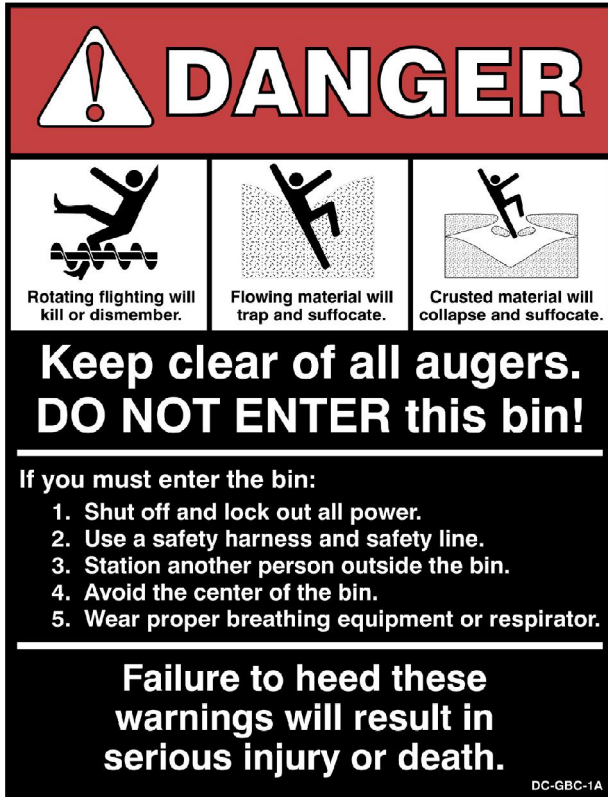


**MECHANISM UNDER SPRING PRESSURE.  
HOLD CONTROL ARM AGAINST CAP  
WHILE REMOVING WIRE TIE FROM ARM.  
DO NOT UNTIE UNTIL INSTALLED ON  
THE PEAK RING**

DC-590



PNEG-452



**! DANGER**

Rotating flighting will kill or dismember.

Flowing material will trap and suffocate.

Crusted material will collapse and suffocate.

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

If you must enter the bin:

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

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

DC-GBC-1A

## DC-GBC-1A

### Located on inside the Peak Cap

FOR REPLACEMENT DECALS CONTACT  
P.O. BOX 20  
1004 E. ILLINOIS STREET  
ASSUMPTION IL, 62510-0020  
PHONE: (217)226-4421





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## Bulk Feed Tank Assembly Manual General Instructions

First, read the Assembly Manual completely before starting to assemble your Bulk Feed Tank. Check your shipment with the packing list to be sure there are no shortages.

1. Decal protective mask must be removed when assembling tank. Mask may become difficult to remove if left exposed to sunlight.
2. Vertical seams **must be staggered** on all sidewall rings.
3. When legs extend up two rings, the leg holes must be in **alignment** in the bottom two rings.
4. All hopper seams and the hopper collar use truss head bolts. The heads of the bolts must be on the **inside** of the tank.
5. All bolts are to be tightened from the **nut side only. Do not allow bolt heads to spin.**
6. Hex head bin bolts are used on all sidewall and roof seams with the bolt heads on the **outside** of the bin.
7. Hex head bolts are to be used on all leg to sidewall connections with the bolt heads on the inside of the tank.
8. Drift punches can be used to align holes.
9. All vertical sidewall sheet seams must be overlapped in the same direction.
10. Close hole spacing is used at the top of all top sidewall sheets and at the bottom of all bottom sidewall sheets.

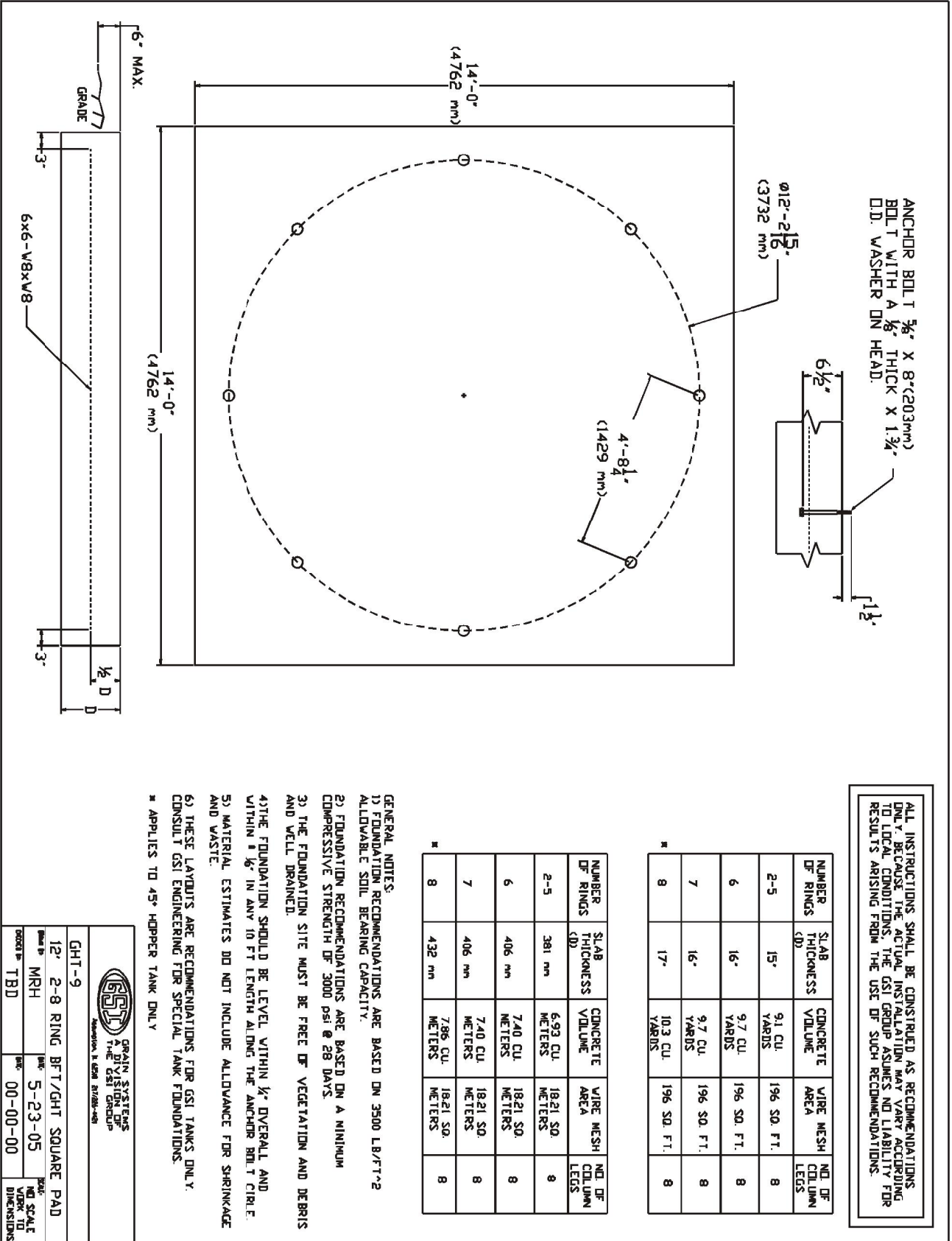
### Selecting The Proper Site

The selected site should be level, firm and free from underlying debris. The tank can be installed satisfactorily on slopes, but as the slope increases, additional labor and materials are required for the foundation. The concrete foundation surfaces must be level. If some fill is required, it should be watered and tamped thoroughly to prevent uneven settling from the weight of the tank. Good water drainage should be provided to prevent water collecting under or around the tank. Naturally, the site must allow convenient access for easy loading and unloading, plus provide additional space for future units. Also, consider the positioning of handling equipment, availability of electricity, etc.

### **Tools**

Tools recommended for assembly of Bulk Feed Tanks.

Assorted sizes of combination wrenches  
Hammer  
3-12" long drift punches  
1 Large Flathead Screwdriver  
1 Pair of slip joint pliers  
2 Adjustable wrenches  
Ratchet and sockets  
Impact wrenches and sockets (if available).



ALL INSTRUCTIONS SHALL BE CONSTRUED AS RECOMMENDATIONS ONLY. BECAUSE THE ACTUAL INSTALLATION MAY VARY ACCORDING TO LOCAL CONDITIONS, THE GSI GROUP ASSUMES NO LIABILITY FOR RESULTS ARISING FROM THE USE OF SUCH RECOMMENDATIONS.

NUMBER OF RINGS	SLAB THICKNESS (D)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
2-5	15"	9.1 CU. YARDS	196 SQ. FT.	8
6	16"	9.7 CU. YARDS	196 SQ. FT.	8
7	16"	9.7 CU. YARDS	196 SQ. FT.	8
8	17"	10.3 CU. YARDS	196 SQ. FT.	8

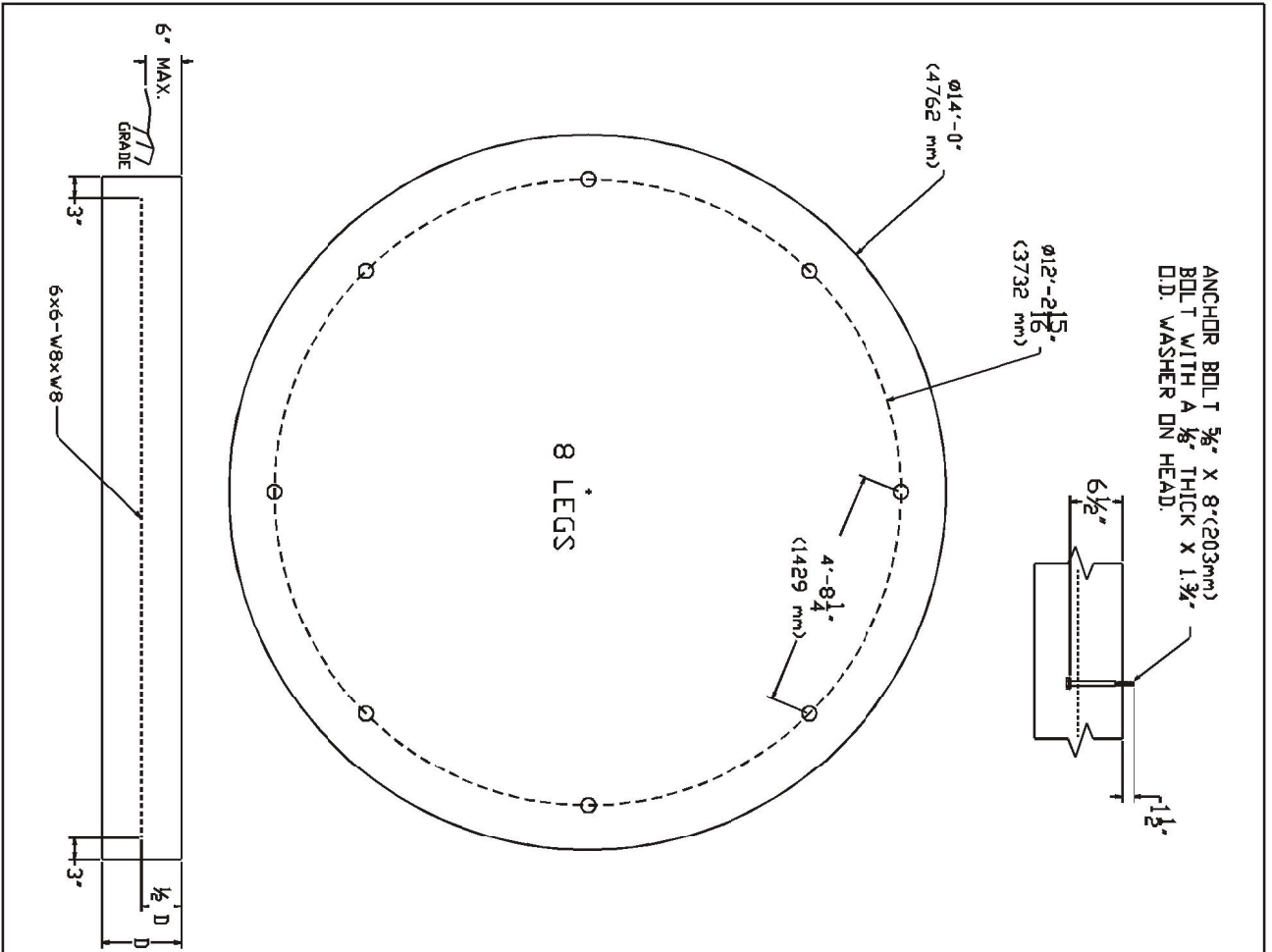
NUMBER OF RINGS	SLAB THICKNESS (D)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
2-5	381 mm	693 CU. METERS	1821 SQ. METERS	8
6	406 mm	740 CU. METERS	1821 SQ. METERS	8
7	406 mm	740 CU. METERS	1821 SQ. METERS	8
8	432 mm	786 CU. METERS	1821 SQ. METERS	8

- GENERAL NOTES:
- 1) FOUNDATION RECOMMENDATIONS ARE BASED ON 3500 LB/FT<sup>2</sup> ALLOWABLE SOIL BEARING CAPACITY.
  - 2) FOUNDATION RECOMMENDATIONS ARE BASED ON A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS.
  - 3) THE FOUNDATION SITE MUST BE FREE OF VEGETATION AND DEBRIS AND WELL DRAINED.
  - 4) THE FOUNDATION SHOULD BE LEVEL WITHIN 1/4" OVERALL AND WITHIN 1/8" IN ANY 10 FT LENGTH ALONG THE ANCHOR BOLT CIRCLE.
  - 5) MATERIAL ESTIMATES DO NOT INCLUDE ALLOWANCE FOR SHRINKAGE AND WASTE.
  - 6) THESE LAYOUTS ARE RECOMMENDATIONS FOR GSI TANKS ONLY. CONSULT GSI ENGINEERING FOR SPECIAL TANK FOUNDATIONS.
- \* APPLIES TO 45" HOPPER TANK ONLY

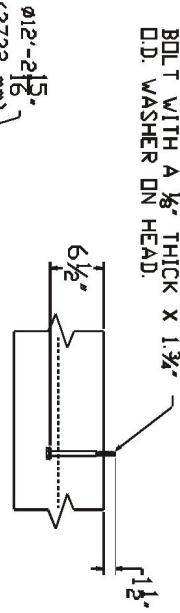
**GSI**  
GRAIN SYSTEMS  
TANK SYSTEMS GROUP  
MEMPHIS, TENNESSEE 38108-0001

GHT-9  
12' 2-8 RING BFT/GHT SQUARE PAD  
DATE: 5-23-05  
DRAWN BY: MRH  
CHECKED BY: TBD

NO SCALE  
MARK DIMENSIONS



ANCHOR BOLT 3/8" X 8' (20.3mm)  
BOLT WITH A 1/8" THICK X 1 3/4"  
O.D. WASHER ON HEAD.




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NUMBER OF RINGS	SLAB THICKNESS (D)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
2-5	15"	7.1 CU. YARDS	155 SQ. FT.	8
6	16"	7.6 CU. YARDS	155 SQ. FT.	8
7	16"	7.6 CU. YARDS	155 SQ. FT.	8
8	17"	8.1 CU. YARDS	155 SQ. FT.	8

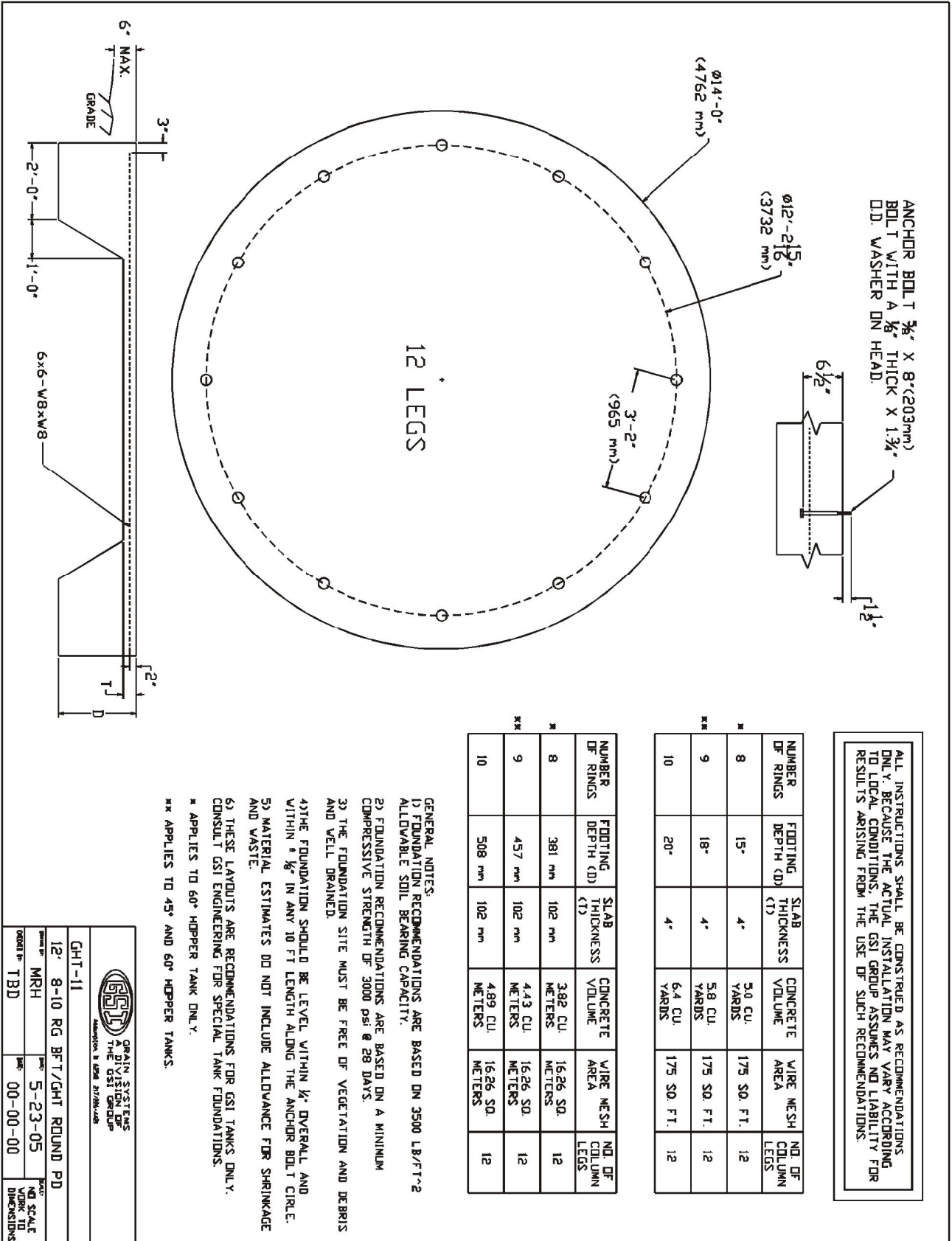
NUMBER OF RINGS	SLAB THICKNESS (D)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
2-5	381 mm	5.45 CU. METERS	14.40 SQ. METERS	8
6	406 mm	5.81 CU. METERS	14.40 SQ. METERS	8
7	406 mm	5.81 CU. METERS	14.40 SQ. METERS	8
8	432 mm	6.18 CU. METERS	14.40 SQ. METERS	8

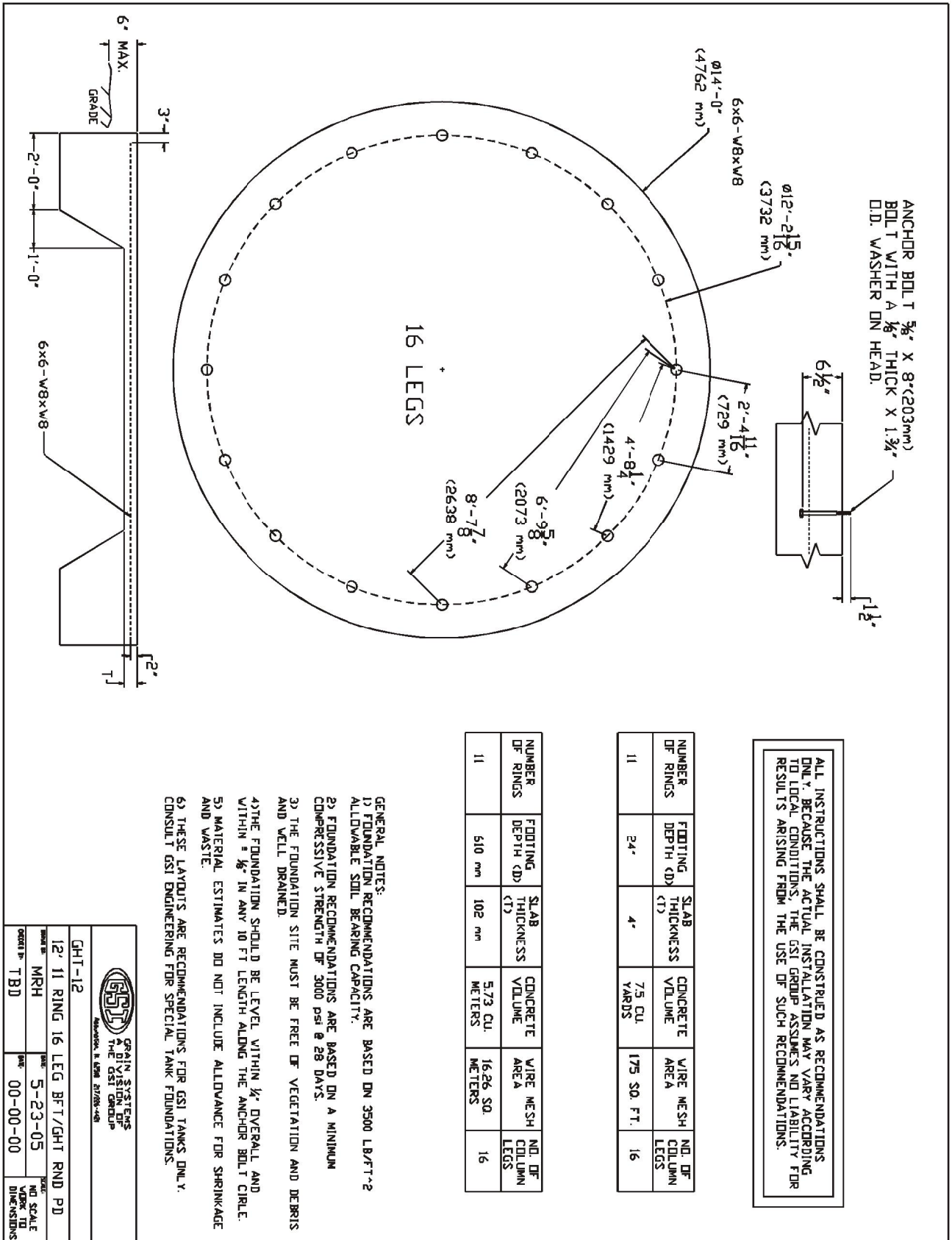
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  - 2) FOUNDATION RECOMMENDATIONS ARE BASED ON A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS.
  - 3) THE FOUNDATION SITE MUST BE FREE OF VEGETATION AND DEBRIS AND WELL DRAINED.
  - 4) THE FOUNDATION SHOULD BE LEVEL WITHIN 1/4" OVERALL AND WITHIN 1/8" IN ANY 10 FT LENGTH ALONG THE ANCHOR BOLT CIRCLE.
  - 5) MATERIAL ESTIMATES DO NOT INCLUDE ALLOWANCE FOR SHRINKAGE AND WASTE.
  - 6) THESE LAYOUTS ARE RECOMMENDATIONS FOR GSI TANKS ONLY. CONSULT GSI ENGINEERING FOR SPECIAL TANK FOUNDATIONS.
  - \* APPLIES TO 45" HOPPER TANK ONLY.

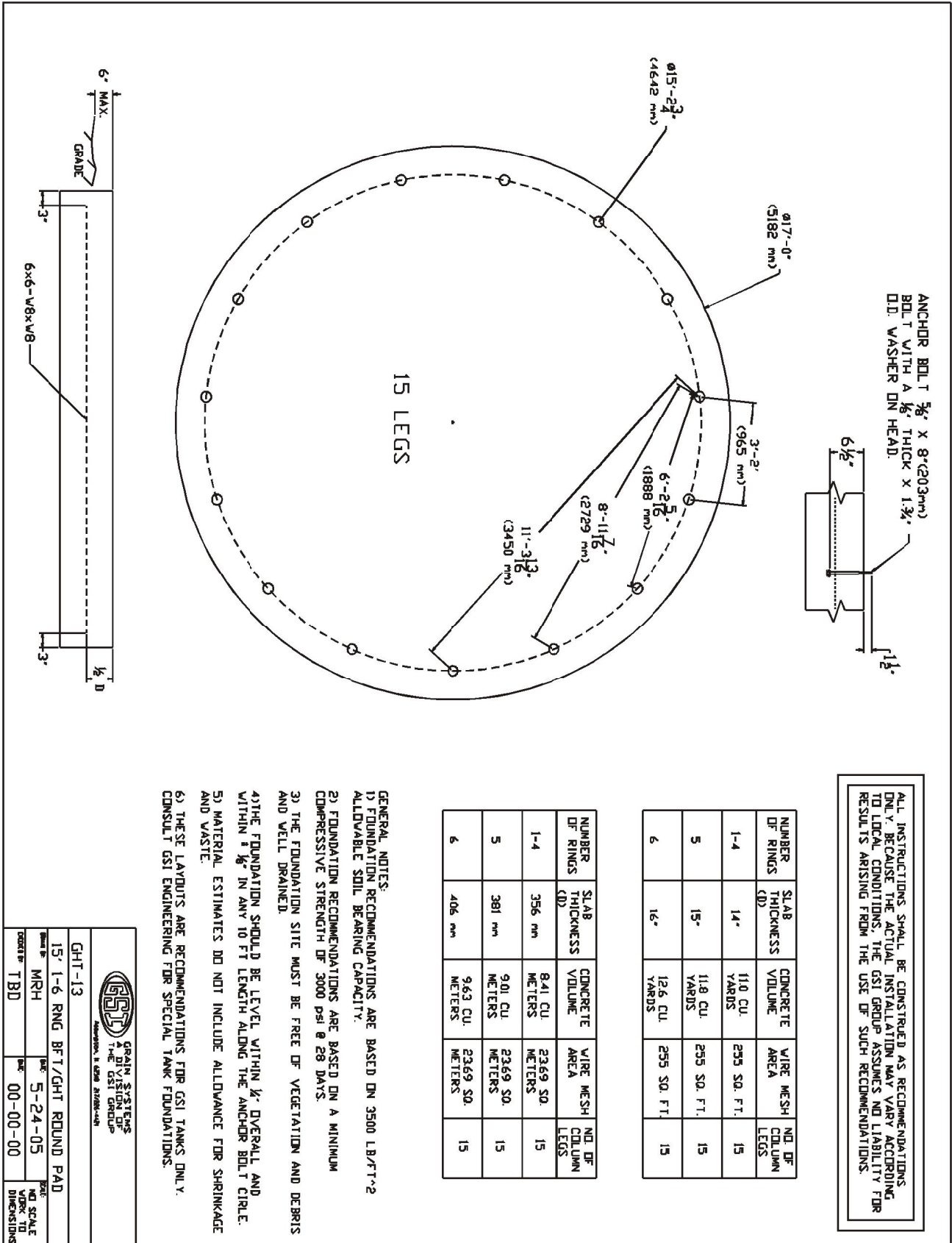


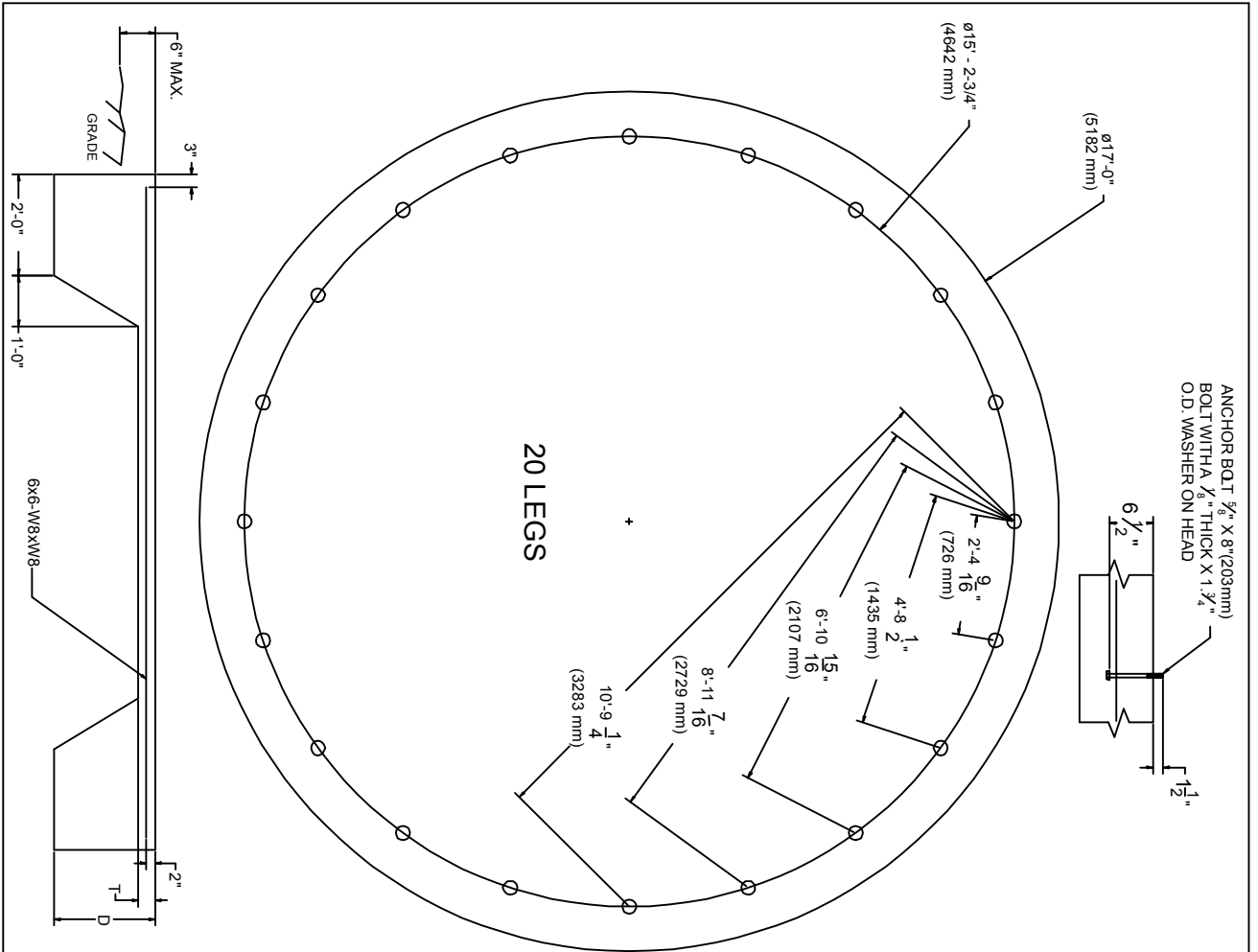
GRAIN SYSTEMS  
A DIVISION OF  
THE GSI GROUP  
FUNDATION & SPECIAL TANKS

GHT-10	
12' 2-8 RING BFT/GHT ROUND PAD	
MRH	5-23-05
TBD	00-00-00
SCALE	AS SHOWN
DATE	00-00-00









ALL INSTRUCTIONS SHALL BE CONSTRUED AS RECOMMENDATIONS ONLY BECAUSE THE ACTUAL INSTALLATION MAY VARY ACCORDING TO LOCAL CONDITIONS. THE GSI GROUP ASSUMES NO LIABILITY FOR RESULTS ARISING FROM THE USE OF SUCH RECOMMENDATIONS.

NUMBER OF RINGS	FOOTING DEPTH (D)	SLAB THICKNESS (T)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
7	14"	4"	6.3 CU. YARDS	225 SQ. FT.	20
8	15"	4"	6.6 CU. YARDS	225 SQ. FT.	20

NUMBER OF RINGS	FOOTING DEPTH (D)	SLAB THICKNESS (T)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
7	366 mm	102 mm	4.82 CU. METERS	20.9 SQ. METERS	20
8	381 mm	102 mm	5.05 CU. METERS	20.9 SQ. METERS	20

- GENERAL NOTES:
- 1) FOUNDATION RECOMMENDATIONS ARE BASED ON 3600 LB.FT<sup>3</sup> ALLOWABLE SOIL BEARING CAPACITY.
  - 2) FOUNDATION RECOMMENDATIONS ARE BASED ON A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS.
  - 3) THE FOUNDATION SITE MUST BE FREE OF VEGETATION AND DEBRIS AND WELL DRAINED.
  - 4) THE FOUNDATION SHOULD BE LEVEL WITHIN 1/4" OVERALL AND WITHIN ±1/8" IN ANY 10 FT LENGTH ALONG THE ANCHOR BOLT CIRCLE.
  - 5) MATERIAL ESTIMATES DO NOT INCLUDE ALLOWANCE FOR SHRINKAGE AND WASTE.
  - 6) THESE LAYOUTS ARE RECOMMENDATIONS FOR GSI TANKS ONLY. CONSULT ENGINEERING FOR SPECIAL TANK FOUNDATIONS.

GRAIN SYSTEMS THE GSI GROUP  
 1501 N. 1703 ST. W. #200  
 GHT-14

REVISED 6-13-06 BY KEO

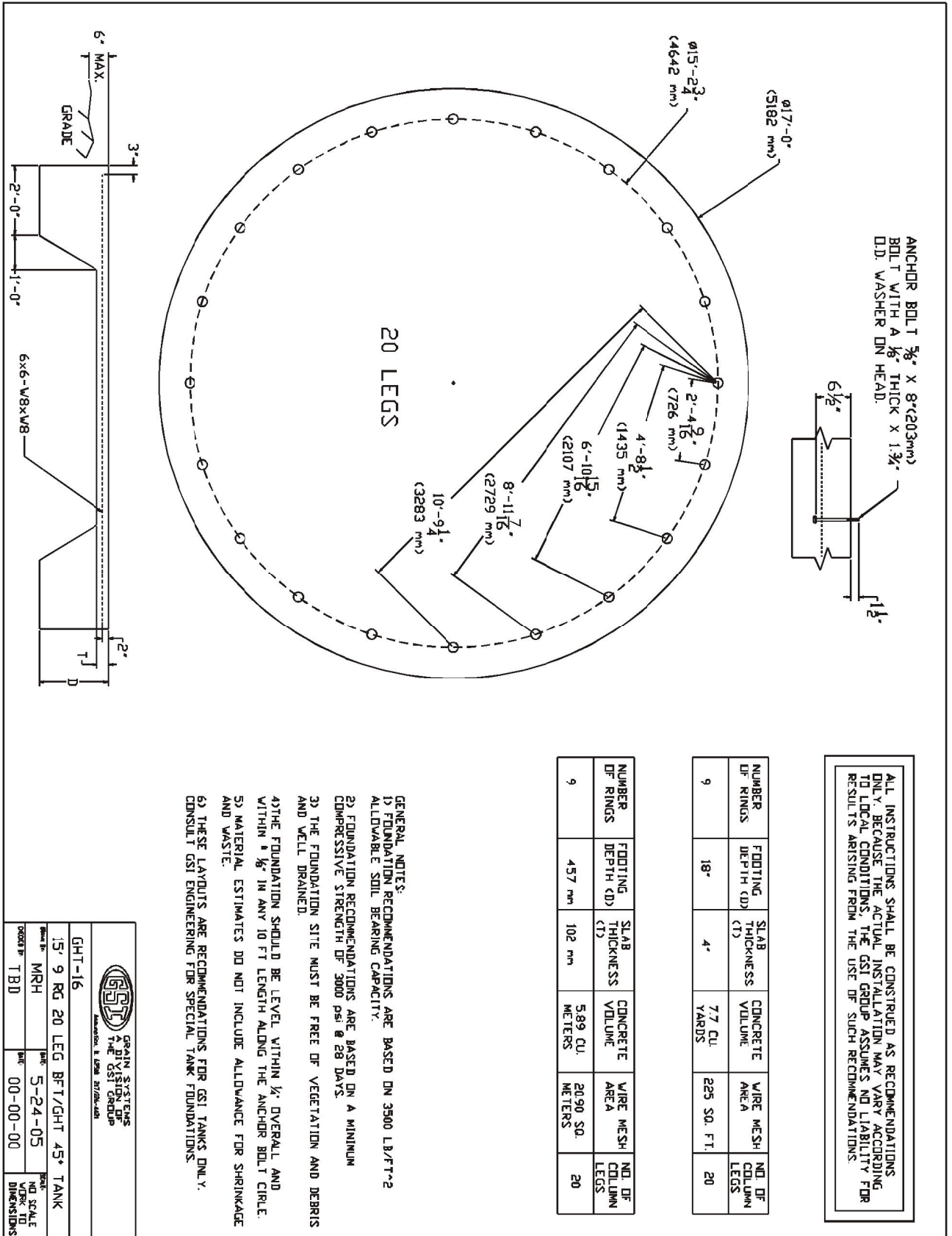
15' 7.8 RG 60" BFT/GHT ROUND PD  
 MRH  
 5-23-05  
 TBD

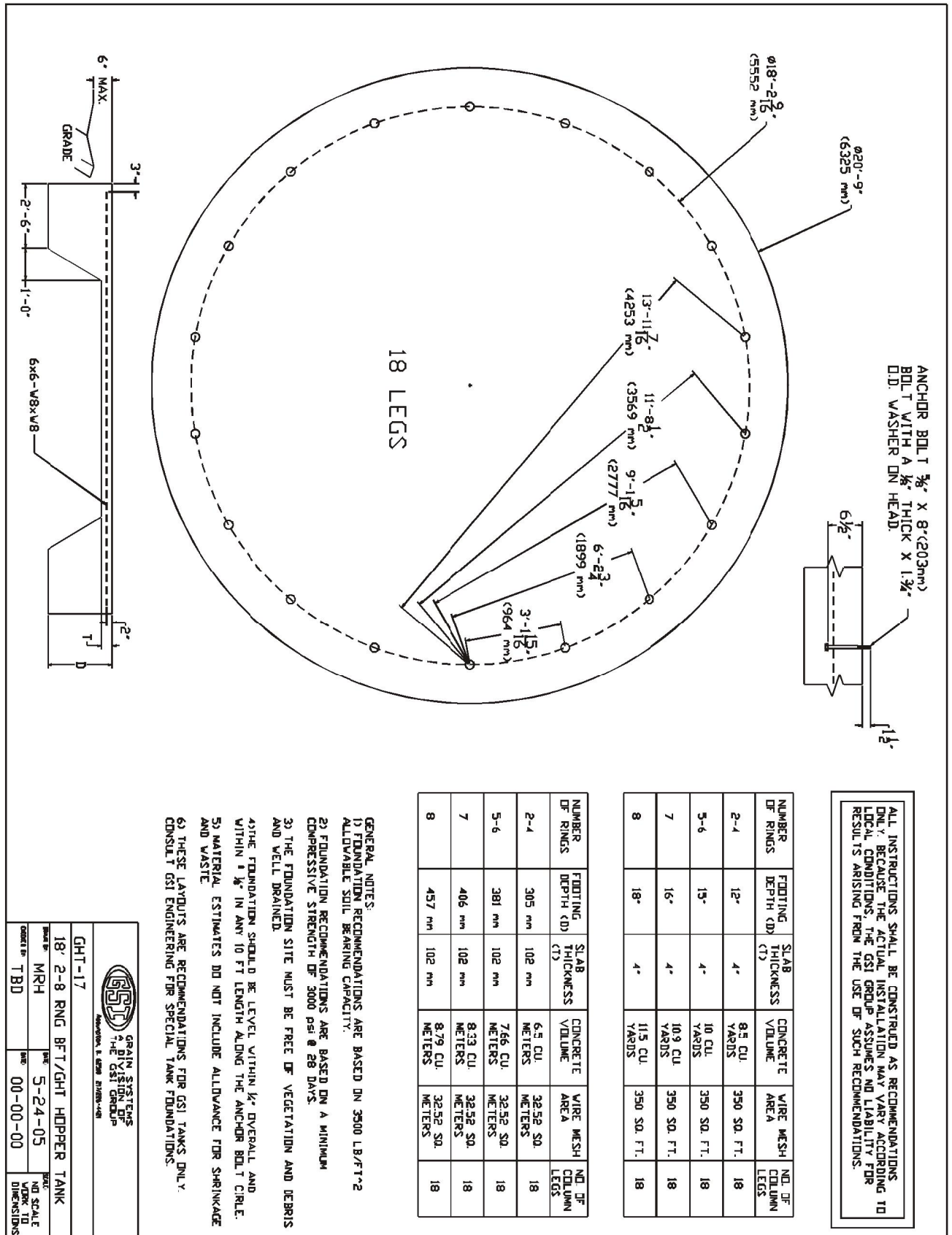
NO SCALE WORK TO DIMENSIONS

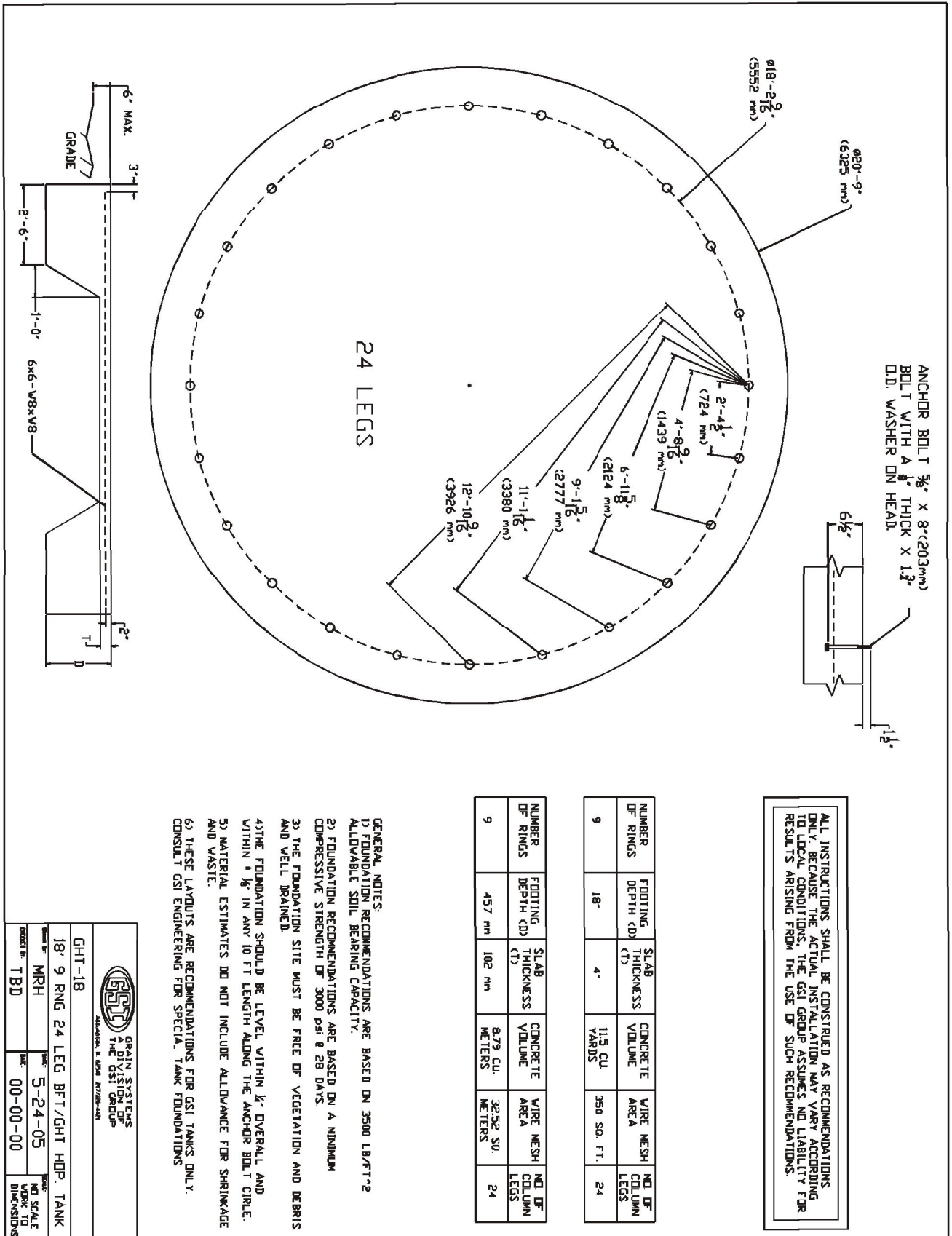













ANCHOR BOLT  $\frac{3}{8}$ " X 8" (203mm)  
 BOLT WITH A  $\frac{1}{8}$ " THICK X 1  $\frac{3}{4}$ "  
 O.D. WASHER ON HEAD.

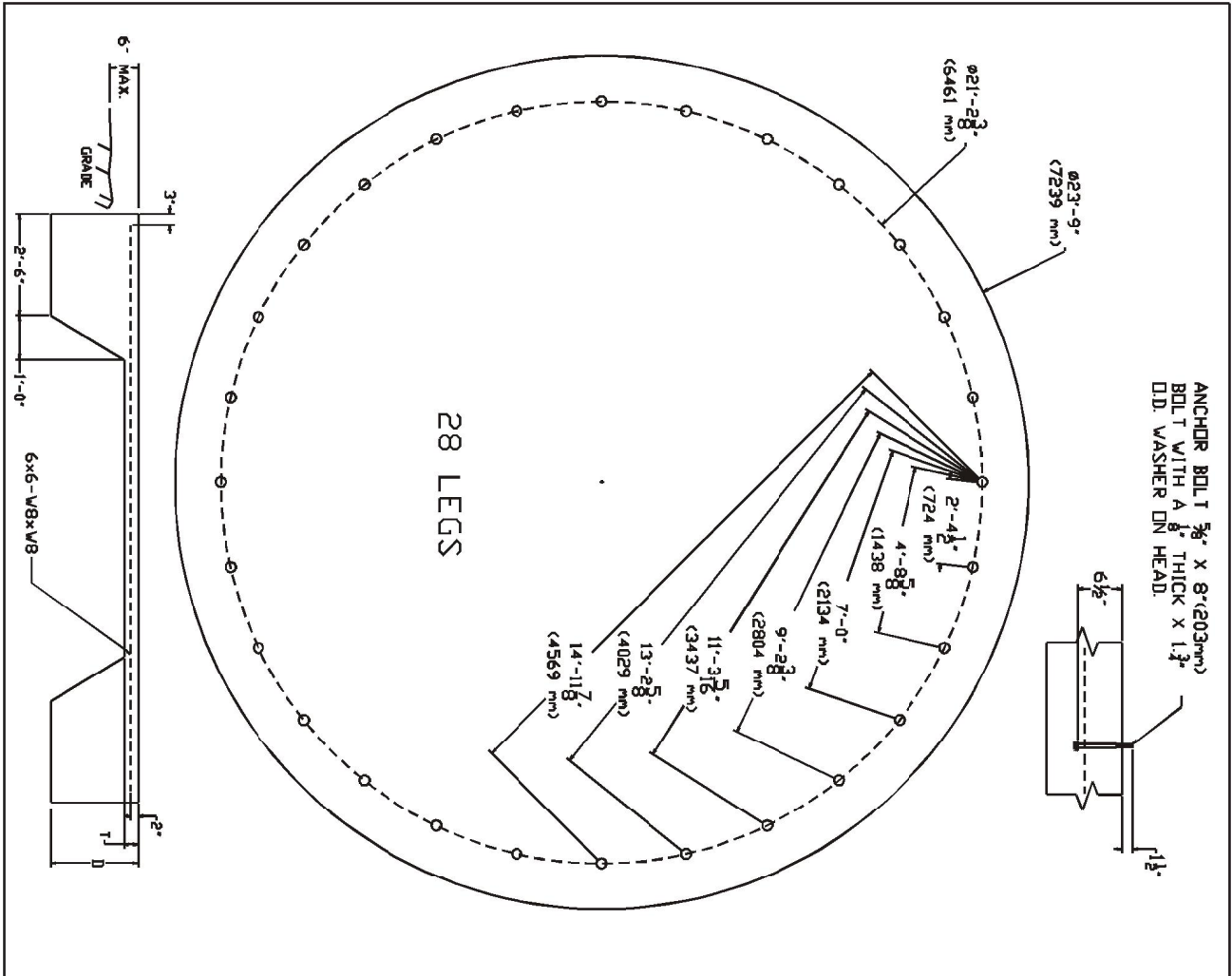
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NUMBER OF RINGS	FOOTING DEPTH (D)	SLAB THICKNESS (T)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
9	18"	4"	11.5 CU YARDS	350 SQ. FT.	24

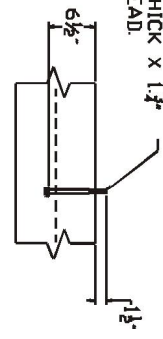
NUMBER OF RINGS	FOOTING DEPTH (D)	SLAB THICKNESS (T)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
9	457 mm	102 mm	8.79 CU. METERS	32.52 SQ. METERS	24

- GENERAL NOTES:
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  - 2) FOUNDATION RECOMMENDATIONS ARE BASED ON A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI @ 28 DAYS.
  - 3) THE FOUNDATION SITE MUST BE FREE OF VEGETATION AND DEBRIS AND WELL DRAINED.
  - 4) THE FOUNDATION SHOULD BE LEVEL WITHIN 1/4" OVERALL AND WITHIN 1/8" IN ANY 10 FT LENGTH ALONG THE ANCHOR BOLT CIRCLE.
  - 5) MATERIAL ESTIMATES DO NOT INCLUDE ALLOWANCE FOR SHRINKAGE AND WASTE.
  - 6) THESE LAYOUTS ARE RECOMMENDATIONS FOR GSI TANKS ONLY. CONSULT GSI ENGINEERING FOR SPECIAL TANK FOUNDATIONS.

 GRAIN SYSTEMS DIVISION OF THE GSI GROUP <small>MANUFACTURED BY GSI 87/2004/001</small>	
Model No.	GHT-18
Order No.	18' 9 RING 24 LEG BFT/GHT HDP. TANK
Rev.	MRH
Date	5-24-05
Order No.	TBD
Doc. No.	00-00-00
Scale	AS SHOWN
Dimensions	AS SHOWN



ANCHOR BOLT  $\frac{3}{8}$ " X 8" (203mm)  
 BOLT WITH A  $\frac{1}{8}$ " THICK X 1 1/2"  
 O.D. WASHER ON HEAD.



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NUMBER OF RINGS	FOOTING DEPTH (D)	SLAB THICKNESS (T)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
2-6	13"	4"	11 CU. YARDS	450 SQ. FT.	28
7	15"	4"	12.1 CU. YARDS	450 SQ. FT.	28
8	16"	4"	12.7 CU. YARDS	450 SQ. FT.	28

NUMBER OF RINGS	FOOTING DEPTH (D)	SLAB THICKNESS (T)	CONCRETE VOLUME	WIRE MESH AREA	NO. OF COLUMN LEGS
2-6	330 mm	102 mm	8.41 CU. METERS	4181 SQ. METERS	28
7	361 mm	102 mm	9.25 CU. METERS	4181 SQ. METERS	28
8	406 mm	102 mm	9.71 CU. METERS	4181 SQ. METERS	28

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**GSI**  
GRAIN SYSTEMS  
DIVISION OF  
THE GSI GROUP  
MANASSAS, VA 20108-2100

GHT-19	
Drawn by: MRH	Scale: 5-24-05
Checked by: TBD	Date: 00-00-00

NO SCALE  
DIMENSIONS

**Bulk Feed Tank Assembly**

**Body Sheet Chart**

<b>Model</b>	<b>Gauge</b>
BFT 12'-1 Ring	18
BFT 12'-2 Ring	13-20
BFT 12'-3 Ring	13-20-20
BFT 12'-4 Ring	13-18-20-20
BFT 12'-5 Ring	12-16-18-20-20
BFT 12'-6 Ring	12-15-16-18-20-20
BFT 12'-7 Ring	12-13-15-16-18-20-20
BFT 15'-2 Ring	14-16
BFT 15'-3 Ring	14-16-20
BFT 15'-4 Ring	14-16-18-20
BFT 15'-5 Ring	12-14-16-18-20
BFT 15'-6 Ring	12-14-16-16-18-20
BFT 15'-7 Ring	12-14-14-16-16-18-20
BFT 15'-8 Ring	12-14-14-14-16-16-18-20
BFT 18'-2 Ring	10-16
BFT 18'-3 Ring	10-16-20
BFT 18'-4 Ring	10-16-18-20
BFT 18'-5 Ring	10-16-18-20-20
BFT 18'-6 Ring	10-14-16-18-20-20
BFT 18'-7 Ring	10-14-16-18-18-20-20
BFT 18'-8 Ring	10-14-14-16-18-18-20-20
BFT 21'-2 Ring	10-16
BFT 21'-3 Ring	10-16-20
BFT 21'- 4 Ring	10-16-20-20
BFT 21'-5 Ring	10-16-17-20-20
BFT 21'-6 Ring	10-16-17-17-20-20

**Sheet Gauge Color Code Chart**

20	Red
18	Orange
17	Pink/Light Blue
16	Blue
15	Brown/Red
14	Green
13	Yellow/Blue
12	Black
11	Pink
10	Light Blue

*Note: \*Represents 45 degree Bulk Tanks. All other tanks come with 60 degree or 45 degree hoppers*

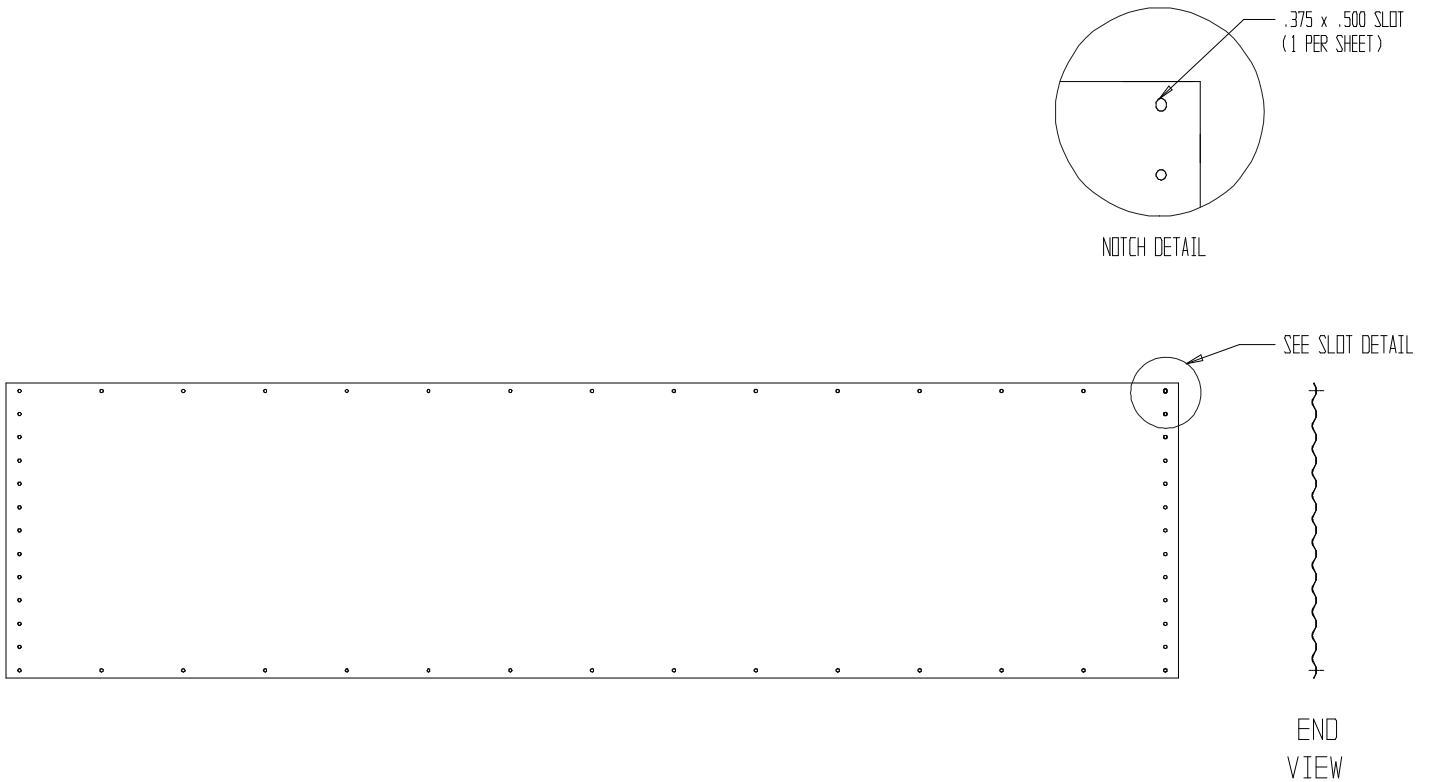
**How to use charts on this page:**  
The chart titled "Body Sheet Chart" is for your reference when building the tank. This chart tells you how many rings your specific tank must have. To read the chart you look up the tank size you wish to build (an 18 foot diameter tank with 4 rings will look like BFT18'-4 Rings). The side labeled "Gauge" will tell you which body sheets to use. The sheets are color coded, all that needs to be done is to match the gauge number with the color (use "Sheet Gauge Color Code Chart").

*Important: Number of rings shown for each tank size are maximums. (12' 60° tanks have a 6 ring maximum. 15' 45° and 18' 45° tanks have an 8 ring maximum).*

*Note: Body sheets are color coded on edges for gauge identification*

## SIDEWALL SHEET ORIENTATION (12' ONLY)

**IMPORTANT:** Please note the sheet orientation when assembling the bin sidewall. The upper right corner will have a slot or identifying sticker. This corner should be on the inside of the tank when assembled.



**Viewed from Inside.**

Sheet orientation will effect how the sheets lap together.

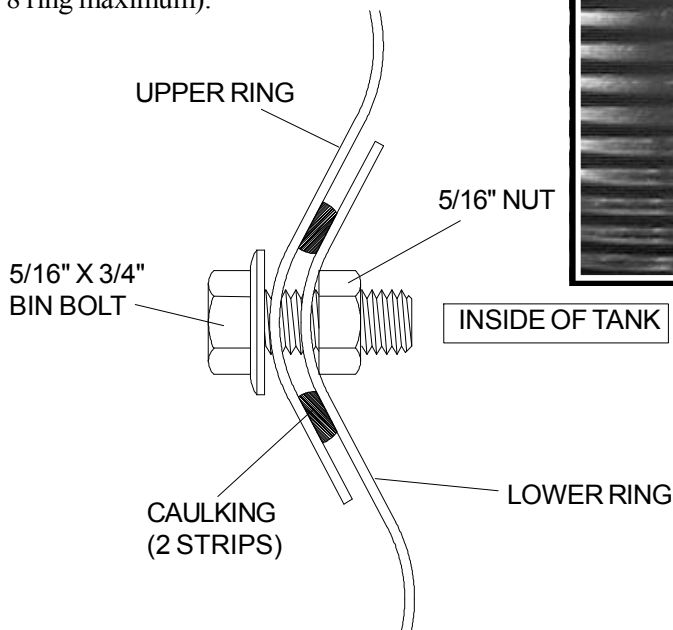
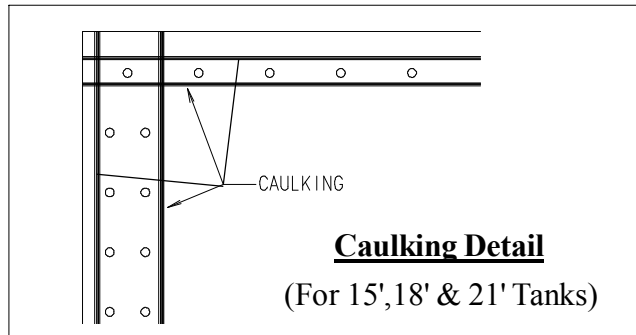
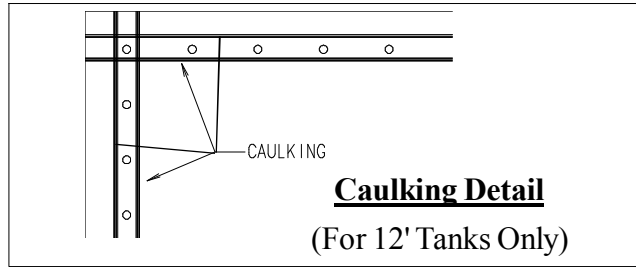
**Sidewall Erection**

**12'-21' Bulk Feed Tank**

12' - 21' diameter Bulk Feed Tanks are designed to be built vertically utilizing bin jacks or a crane of adequate capacity. Before bolting the sidewall sheets together, check that you have the proper gauge steel for the first ring. The higher gauge number denote the thinner materials. (Example, 20 gauge material is thinner than 14 gauge.) In erecting all bulk feed tanks the thinnest material always goes on top, therefore the first sidewall ring you assemble will be the top ring of your tank. Check the various gauges of your tank with the Color Code Chart and begin building accordingly. Remember! Assemble The Top Ring First! Note ring overlap detail above.

*Note: See page 25 for proper gauges and Color Code Chart*

Important: The number of rings shown for each tank size are **maximums**. ( 21' 45°, and 15' 60° tanks have a 6 ring maximum. 12' 60° tanks have a 7 ring maximum. The 12' 45°, 15' 45° and 18' 45° tanks have an 8 ring maximum).



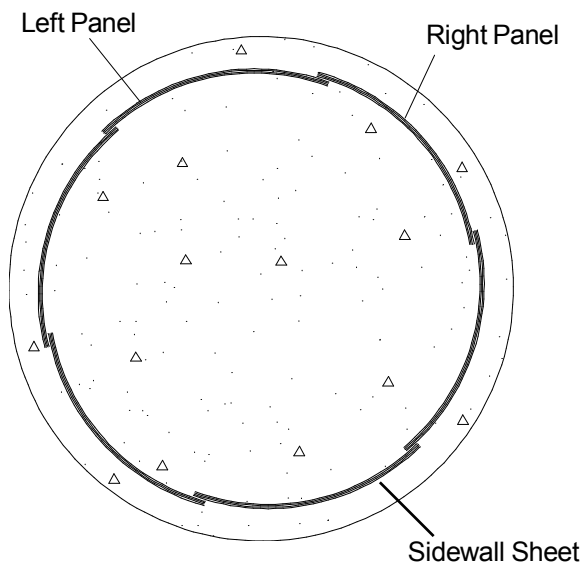




### **IMPORTANT NOTE**

#### **BOLTING PATTERN BEGINS IN THE CENTER OF THE SHEET**

*When starting to assemble the sidewall rings to one another. Be sure to start in the center of the sheets and work to the outside edges (horizontal seams). This allows the sidewall sheets to draw up evenly.*



Once you have selected the proper gauge material, begin assembling all sidewall sheets in the following manner: Standing on the inside of the tank, place the left panel to the inside with the right panel to the outside.

**NOTE:** *The rope caulking is installed before each sheet is assembled. Wipe sheets clean where caulking is to be applied. Apply caulking on each side of the holes in the vertical seams and also on each side of the horizontal row of holes.*

Using correct size bin bolt throughout, begin assembling sidewall sheet end to end (overlapping the same way throughout) until the ring is completed. All body sheet bolts are to be installed with the bolt head and its neoprene washer to the outside, and the nut to the inside. Do not tighten bolts until all sheets are assembled and form a complete ring. Remember to attach lifting straps at the bottom of the vertical seams while bolting the sheets together. These straps, coupled to the jacks, will enable you to later elevate your tank. Now tighten the bolts, in sequence, starting from the center and working to the edge in both directions. This permits the sidewall sheets to draw-up evenly. Complete one ring and stop. You are now ready to assemble the roof.



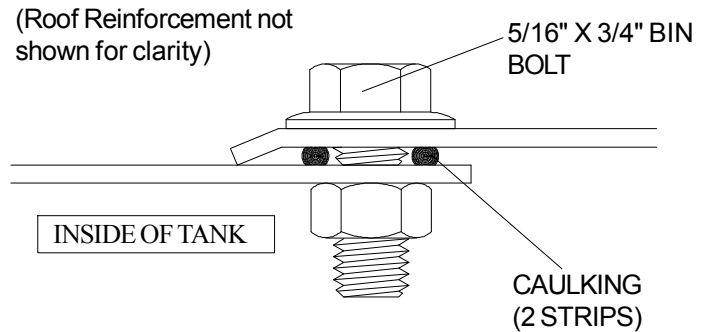
**Sealed Roof Panel  
Installation  
(12'-18' BFT)**

**Roof to Sidewall**

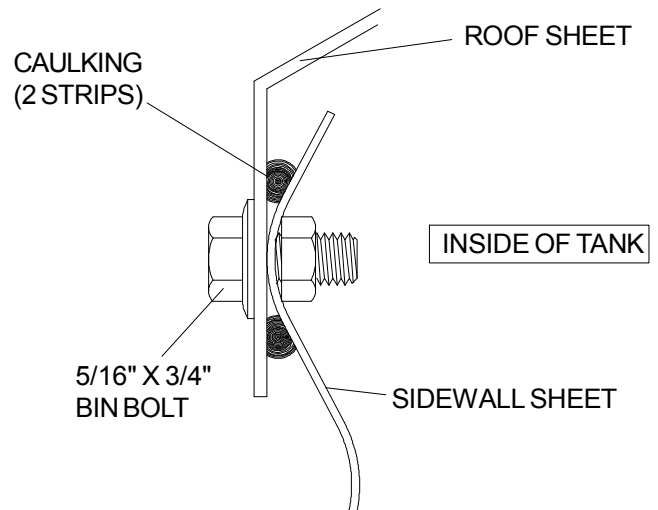
Note that the roof and sidewall ladders are centered on a roof seam. Take notice when placing roof panel, that one edge is bent down. This edge is to be placed on the outside of other roof panel to form a tight seal. Be sure to apply two strips of caulking on all seams.

**Roof Assembly**

Assemble roof panels in a counter clockwise manner. On bins that will be equipped with pneumatic fill system (refer to page 59), the two roof panels with fill hole and exhaust hole should be located opposite each other on bulk feed tank.



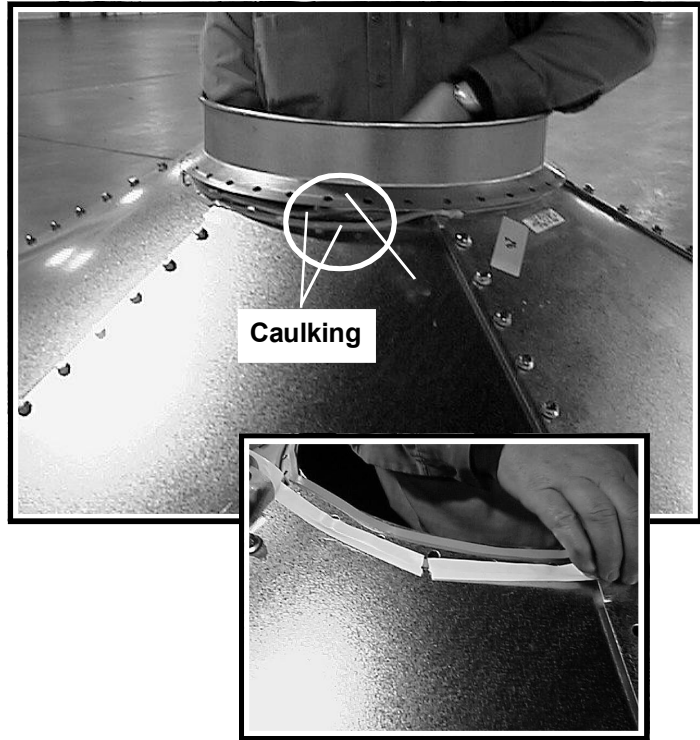
**ROOF SHEET OVERLAP DETAIL**



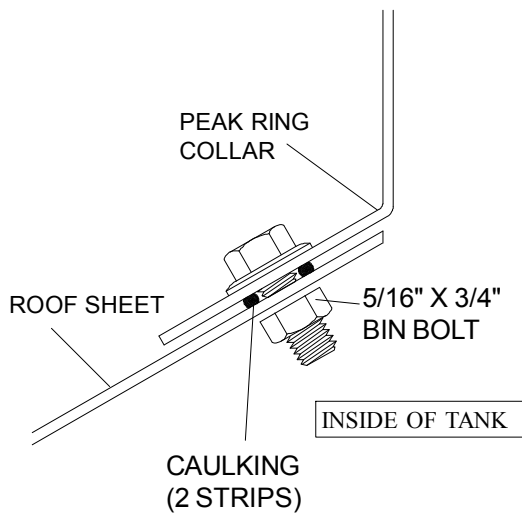
**EAVE DETAIL**

### Peak Ring

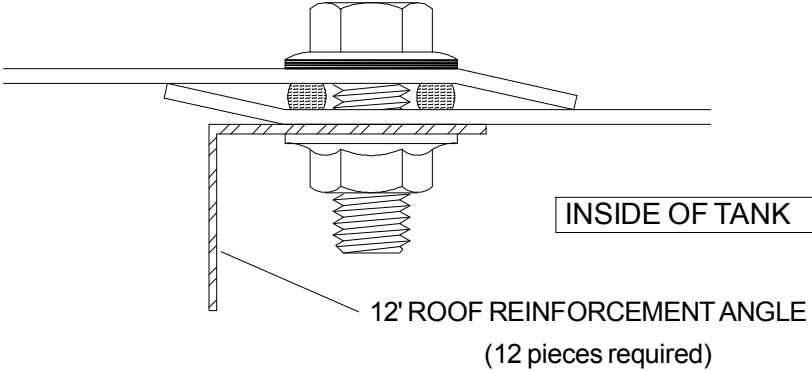
The peak ring may now be installed. Again use two strips of caulking between peak ring and roof panels (refer to photo). Note that the peak ring goes to the outside of the roof panels.



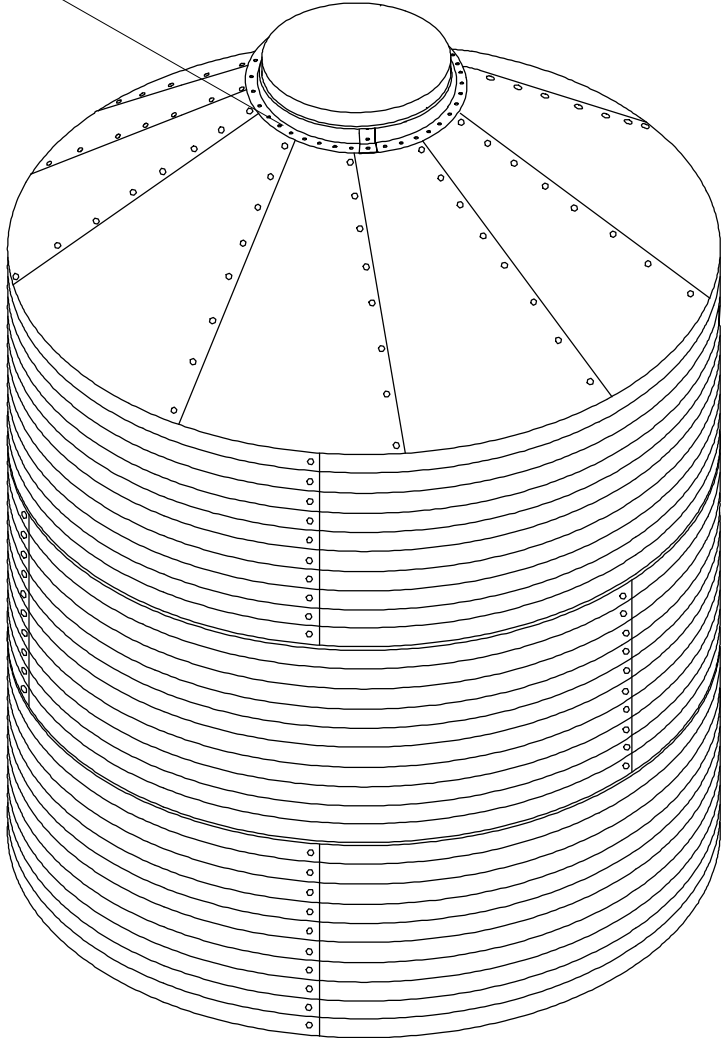
### PEAK RING COLLAR DETAIL



**12' Roof Reinforcement Angle**



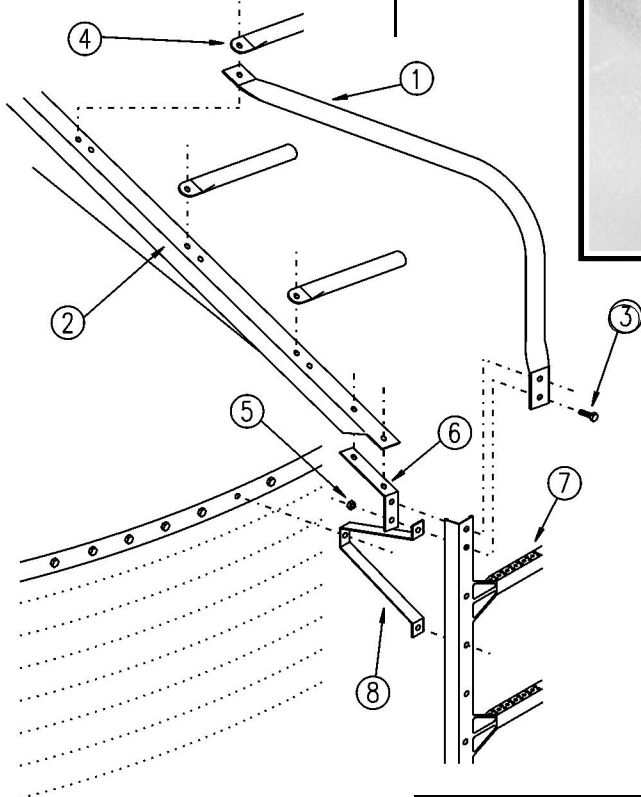
Peak ring collar mounted to outside of roof panels



**Roof Ladder**

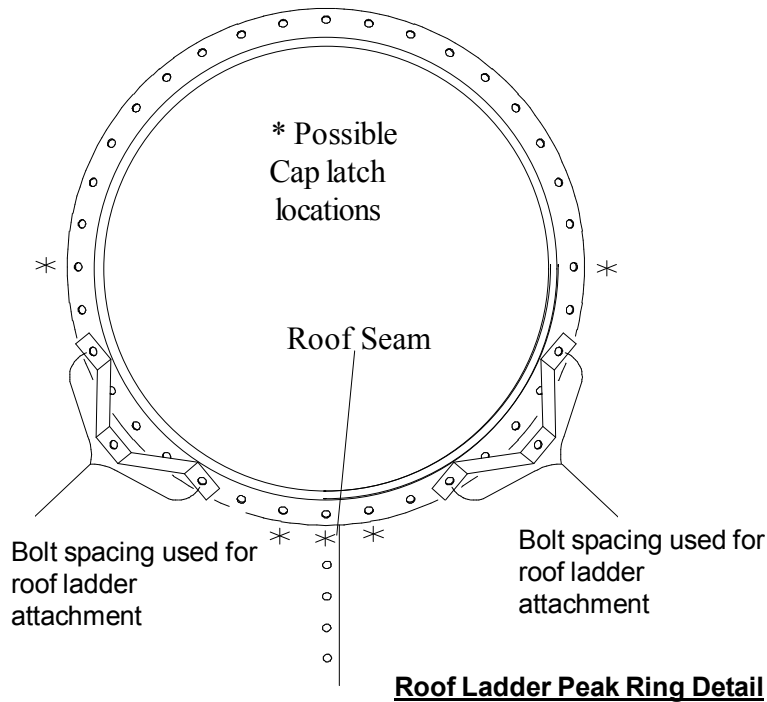
*Note: Make sure ladder is positioned so it will fall between the legs when tank is complete.*

*Note: Ladder is symmetrical about roof seam. One side shown for clarity.*

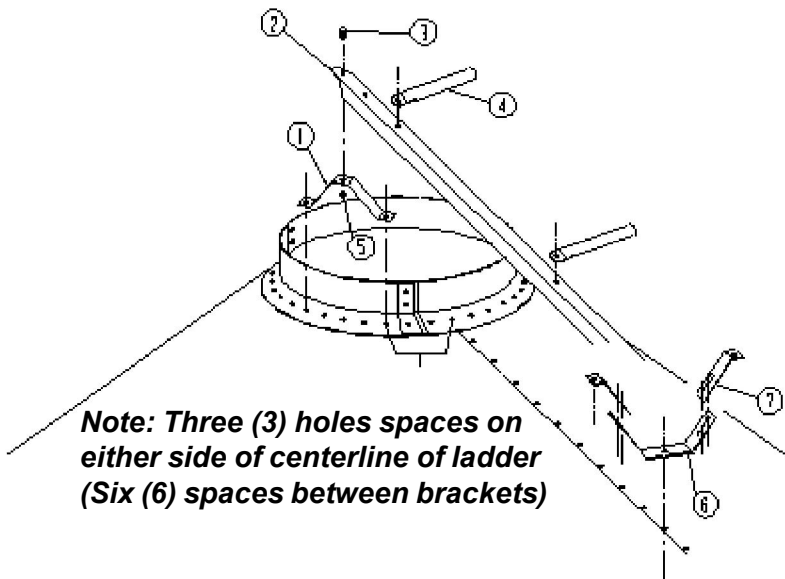


**Part List for Roof Ladder**

Key	Part No.	Description	Qty 12" Dia	Qty 15' Dia	Qty 18' Dia
1	BLK-11680	Ladder Eave Safety Rung	2	2	2
2	BLK-11762	12' BFT Roof Ladder Support Channel	2	--	--
2	BLK-11763	15' BFT Roof Ladder Support Channel	--	2	--
2	BLK-11764	18' BFT Roof Ladder Support Channel	--	--	2
3	S-275	5/16" x 3/4" Bin Bolt	20	22	24
4	BLK-11679	Roof Ladder Rung	4	5	6
5	S-396	5/16" - 18 Hex Nut	20	22	24
6	BLK-11673	Lower Support Channel Bracket	2	2	2
7	LDR-4002	44" (1118mm) Sidewall Ladder Section	--	--	--
8	LS-121	Sidewall Ladder Standoff	--	--	--



*Note: Center roof ladder over roof seam during assembly. Ladder is symmetrical about roof seam. One side shown for clarity. Use 5/16" bin bolts and nuts for assembly. Position Items 6 & 7 as needed for additional support.*



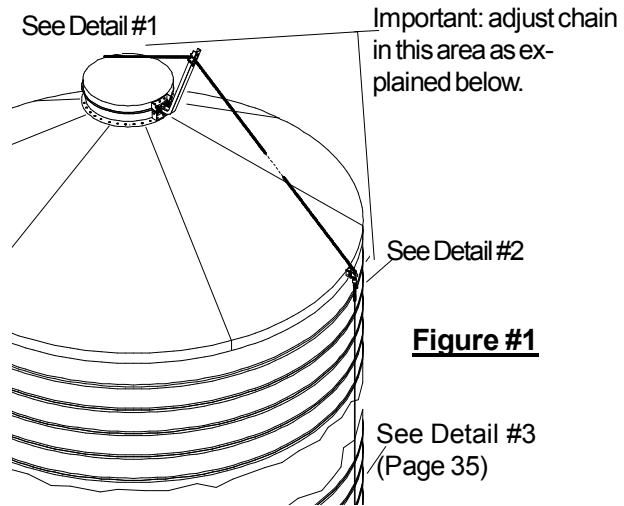
Key	Part No.	Description	Qty 12" Dia	Qty 15' Dia	Qty 18' Dia
1	LS-147	Inside Ladder Standoff	2	2	2
2	BLK-11762	12' BFT Roof Ladder Support Channel	2	--	-
2	BLK-11763	15' BFT Roof Ladder Support Channel	--	2	-
2	BLK-11764	18' BFT Roof Ladder Support Channel	--	--	2
3	S-275	5/16" x 3/4" Bin Bolt	20	22	24
4	BLK-11679	Roof Ladder Rung	4	5	6
5	S-396	5/16" - 18 Hex Nut	20	22	24
6	BLK-11872	Center Roof Ladder Support	1	2	2
7	BLK-11873	Outer Ladder Support	2	4	4

## 12' 60 Degree Roof Cap Ground Control

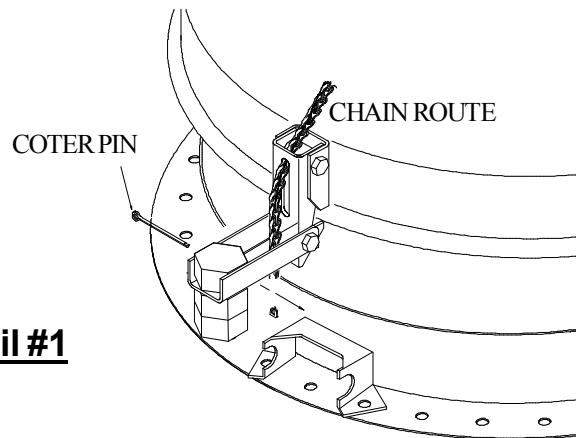
Ground control comes standard on 12' 60° Bulk Feed Tanks. Ground Control is optional on all 45° Bulk Feed Tanks. Ground control components come fully assembled for your convenience. The ground control is shipped with the arm secured for safety and shipping purposes. The wire and retaining tie are intended for shipping use only.

**CAUTION:** *The control arm is spring loaded. Be careful when removing shipping retainers.*

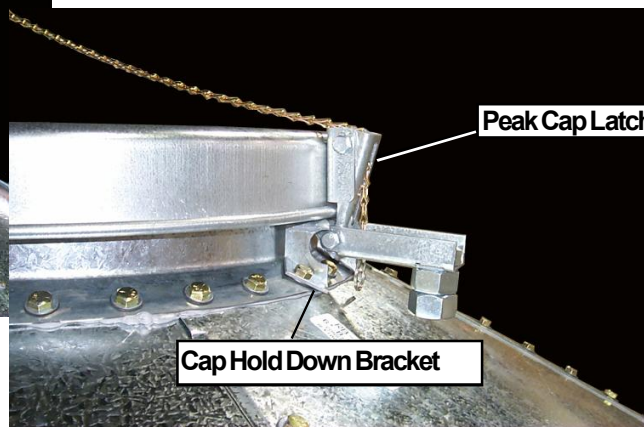
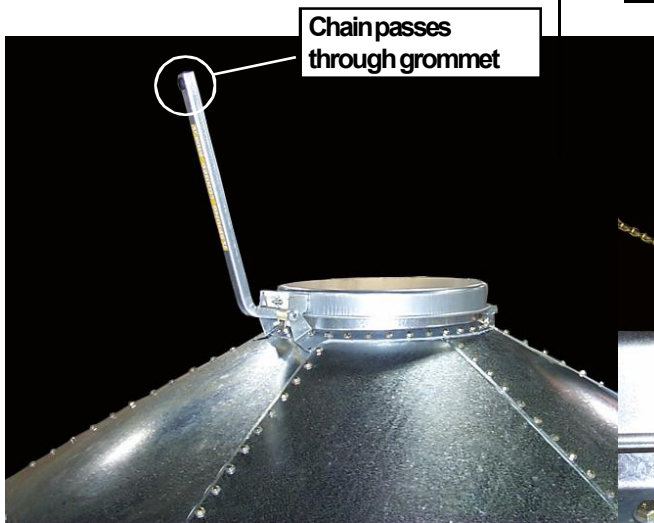
Refer to the Control Arm and Ground Control details for component part assembly. The peak cap latch hook, located opposite the cap hinge, latches over the cap hold down bracket (Item 20, Ground Control Detail pg. 37). One end of the ground control chain is secured at the counterweight arm with a cotter pin (See Detail #1). The chain is passed up and over the cap, through the grommet on the pivot arm, and through the Roof Eave Bracket (BLK-11950), then continues down the side of the tank.

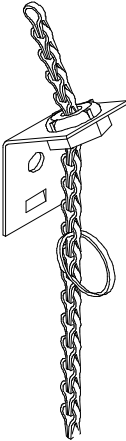
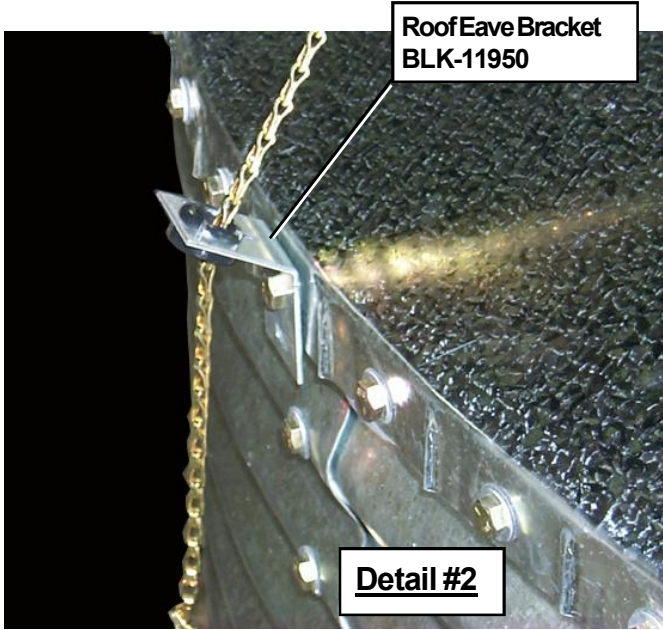
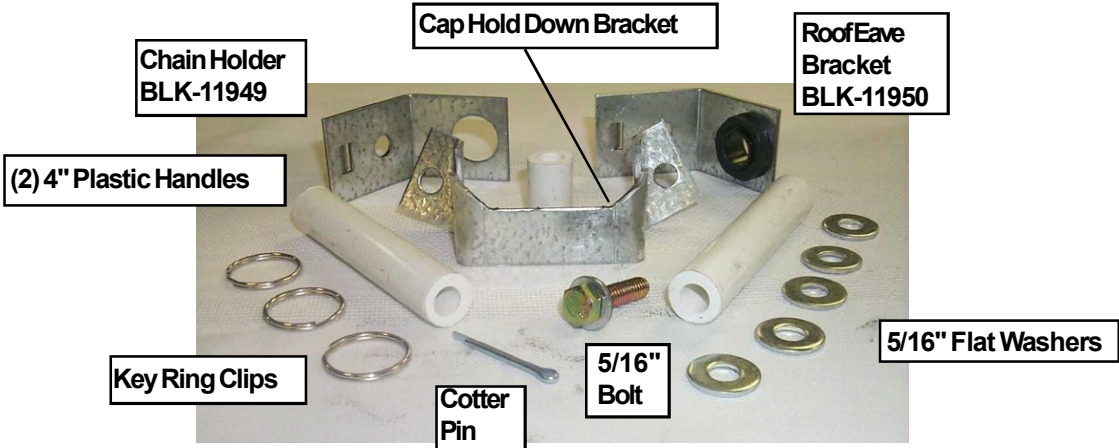


**Figure #1**



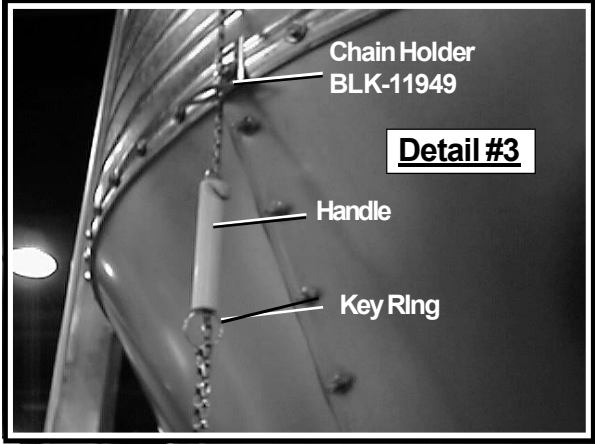
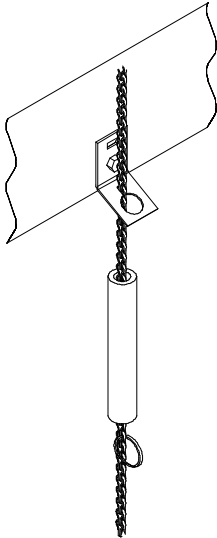
**Detail #1**





After removing the slack from the ground control chain while in the fully closed and latched position. Install the key ring clip 2" below chain holder bracket. (See Detail #3). Ensure that the key ring allows the cap to fully latch when the cap is in the closed position, yet will not allow the chain enough slack on top of the cap to become wrapped around the pivot arm in a high wind condition.

Bolt the Chain Holder (BLK-11949) to the bottom horizontal row of sidewall holes, or field drill and bolt to the leg tie brace (See Detail #3). Two (2) 4" plastic handles and extra key ring clips are provided for use at the hopper eave to be used as fully open and fully closed cap indicators.







Make sure the loop of the Main Cap Spring (BLK-11623) is held securely in the preloaded position by the head of the 5/16" bolt beneath.

If necessary, place one or more 5/16" flat washers under the bolt head to ensure that the bolt catches the loop.

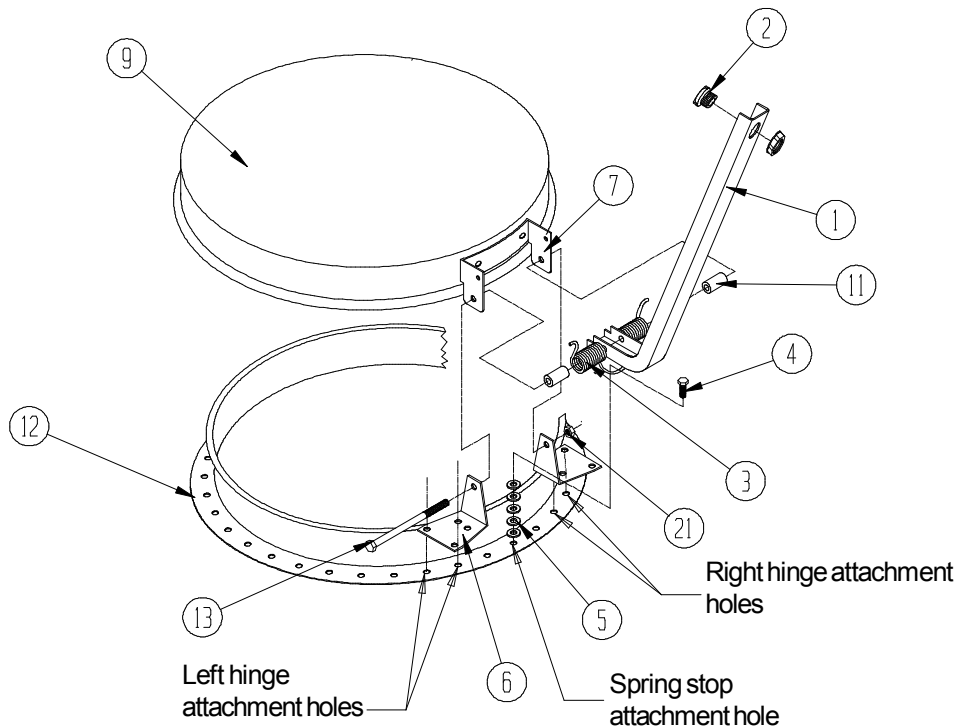


**⚠ WARNING**

The control arm is spring loaded. It must be released while on the ground and before attaching it to the peak ring. Failure to do so will result in serious injury.

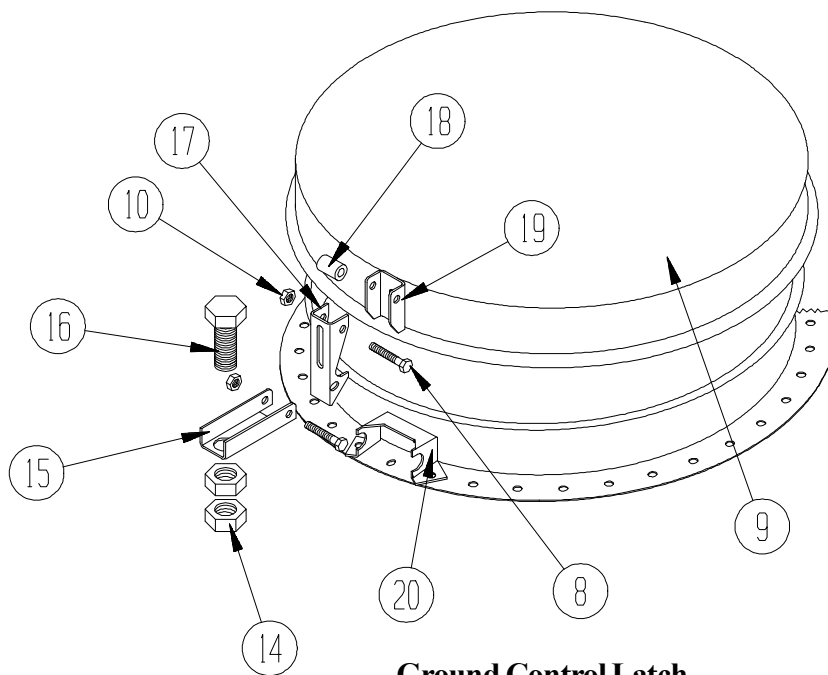
*Note: Use the chart on page 37 for Control Arm and Ground Control details.*

**Control Arm Detail**





# Bulk Feed Tanks

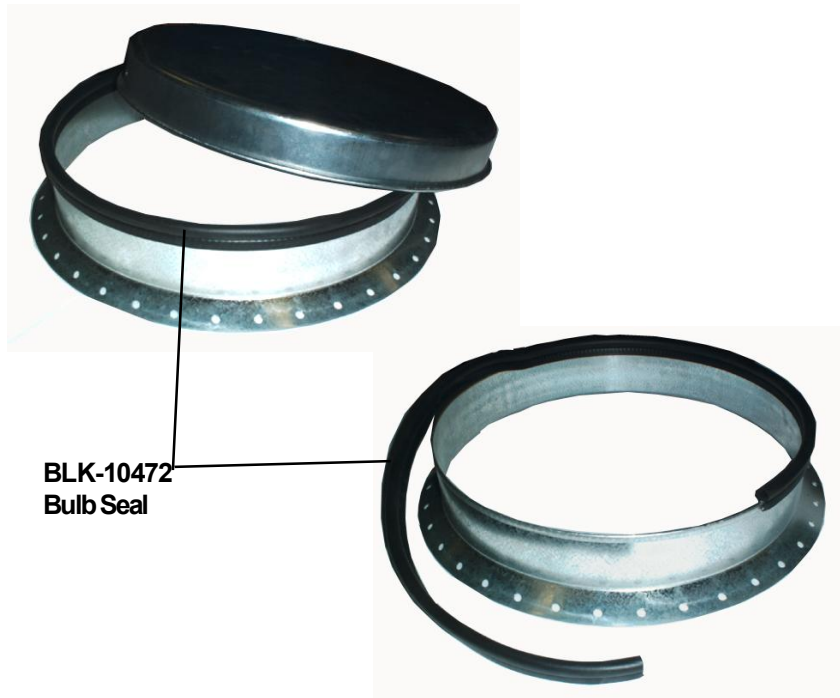


**Ground Control Latch**  
**Detail**

## Parts List for Control Arm and Ground Control Latch

Key	Part No.	Description	Key	Part No.	Description
1	BLK-11735	Control Arm	12	BLK-11730	1 Piece Bulk Tank Peak Ring
2	BLK-11876	Nylon Grommet with Nut	13	S-7171	3/8" - 16 x 6.5" Hex Head Bolt (Grade 5)
3	BLK-11623	Flush Cap Main Spring	14	S-3214	7/8" - 9 Hex Nut (Grade 2)
4	S-277	5/16" - 18 x 1.25" Bin Bolt (Grade 5)	15	BLK-11845	Latch Counterweight
5	S-845	5/16" Wrought Iron Washer (Grade 2)	16	S-7281	7/8" - 9 x 1.5" Hex Head Bolt
6	BLK-11842	Lower cap Hinge	17	BLK-11844	Peak Cap Latch
7	BLK-11734	Upper Cap Hinge	18	BLK-11795	0.938" x .750 Dia. Plastic Spacer
8	S-7329	5/16"-18 x 2" Hex Head Bolt	19	BLK-11843	Pivot Bracket
9	BLK-10015	Bulk Tank Roof Cap	20	BLK-11846	Cap Hold Down Bracket
10	S-5220	5/16" - 18 Hex Lock Nut (Grade 2)	21	S-4663	3/8" - 16 Hex Head Locknut
11	BLK-11503	1.875" Long Spring Spacer			

**Bulb Seal Kit (Optional)**

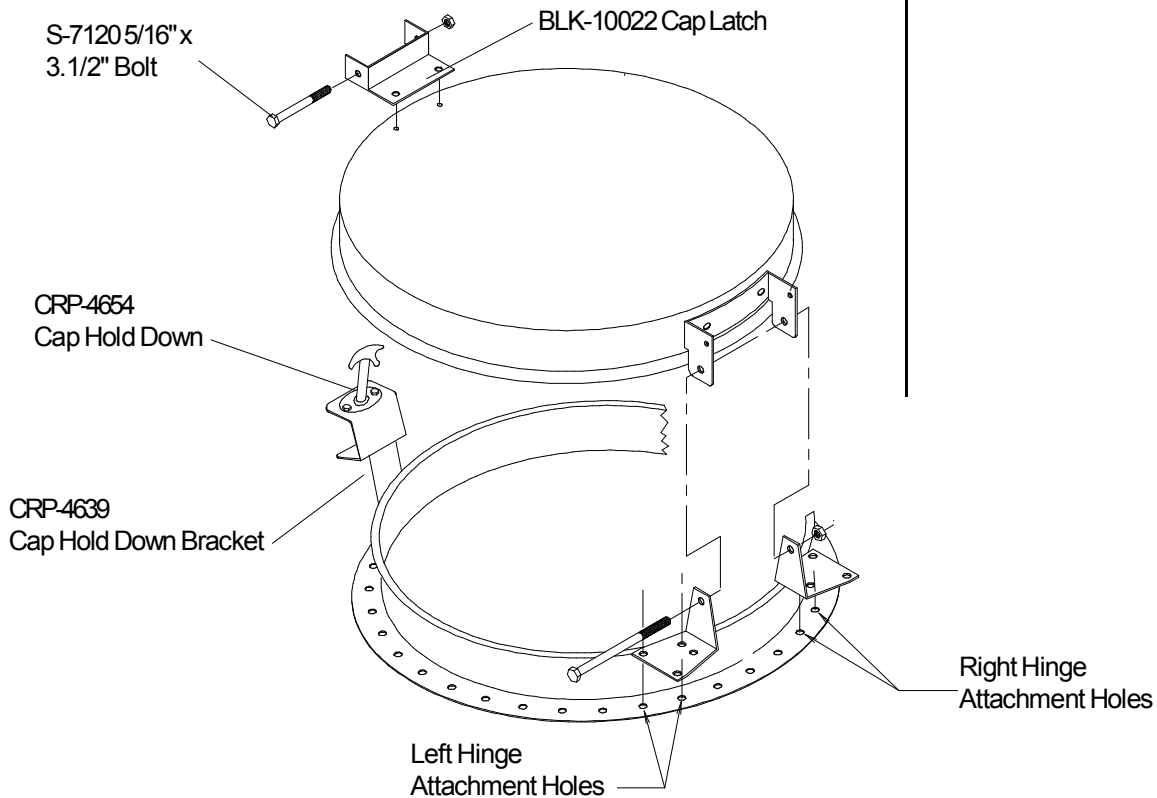


Bulb Seal is pressed into place around the lip of the peak ring.

**Note: Bulb seal kit is included with all pneumatic fill kits. When ordered as a separate option, specify Part No. BLK-10472.**

Cap Hold Down Package comes standard on all 45° hopper bulk tanks. Optional on all 60° hopper bulk tanks.

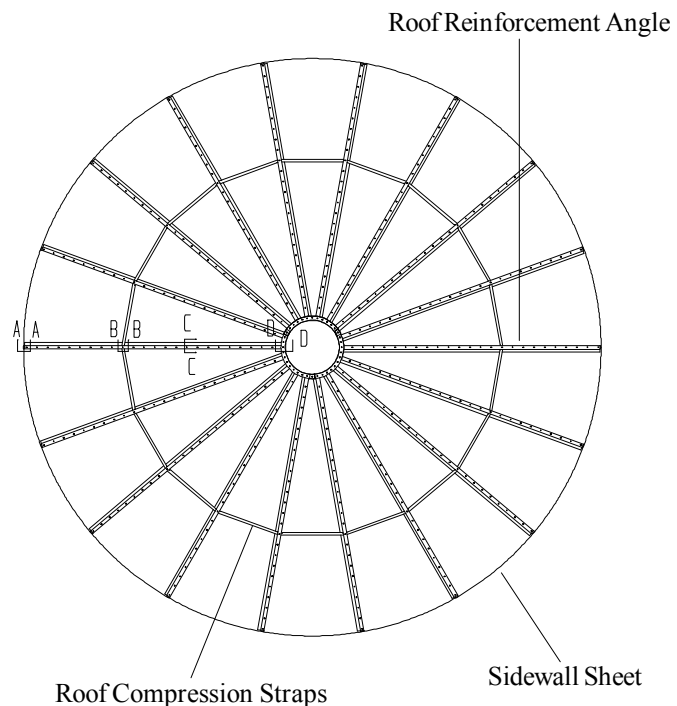
**Cap Hold Down Package**

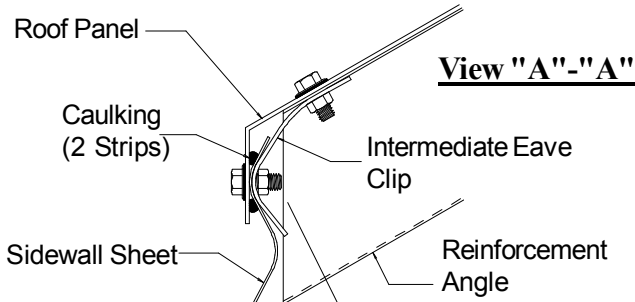


### 15' and 18' Roof Assembly Instructions

After completing first ring assembly, you are ready to begin roof construction. First, build a roof center support to hold the peak ring in place at the proper height. A simple structure consisting of a sturdy cross arm attached to a pole and supported by a platform or scaffolding will do. Stand the center support directly in the center of the tank. The bottom of the peak ring should be 89.5/16" (2269 mm) above the foundation on the 18' tank and 78.15/16" (2005 mm) above it on the 15' tank. These dimensions are approximate ones used in BFT construction. Adjusting the center support height will ease roof erection. Refer to the accompanying drawings for details. Install 6 roof reinforcement angles spaced equally around the tank. Reinforcement angle edges are parallel with sidewall sheet and peak ring, see views "A-A" and "D-D".

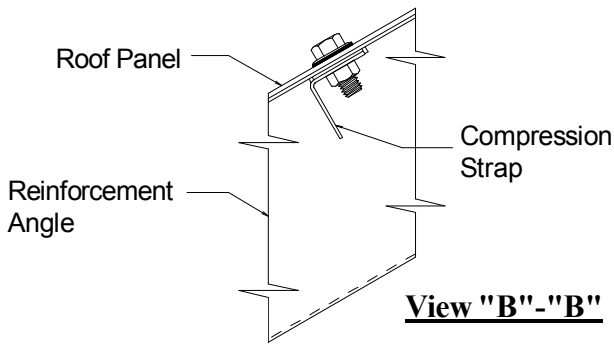
The reinforcement angles utilize every other hole in the the peak ring. At the sidewall, there are 12 spaces between each reinforcement angle on the 18' tank and 10 spaces between each on the 15' tank. Next, "skin" the roof by installing the roof panels on the just completed reinforcement structure. Reinforcement angles will share all roof panels holes, including hole where panel and peak ring attach. Insure that all roof seams are caulked and lapped correctly as shown in the accompanying detail drawings.



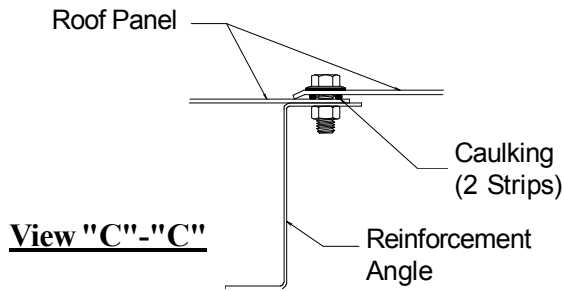


**View "A"-"A"**

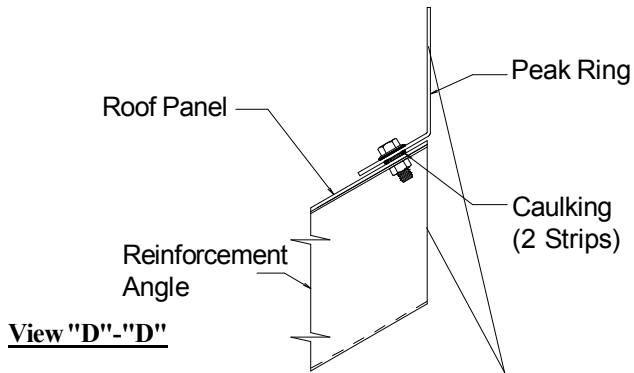
**NOTE: REINFORCEMENT ANGLE EDGE IS PARALLEL TO SIDEWALL SHEET (ANGLE CAN BE INSTALLED CORRECTLY ONLY ONE WAY)**



**View "B"-"B"**



**View "C"-"C"**

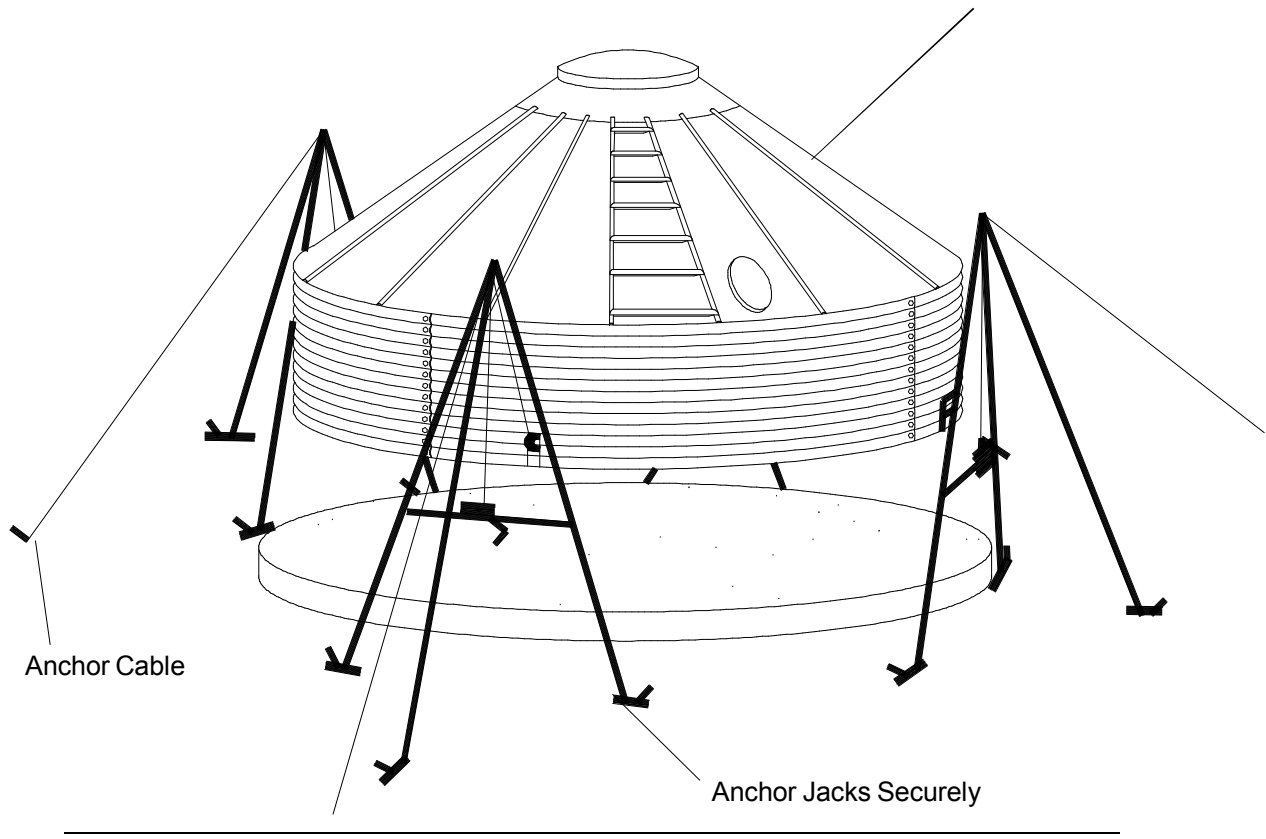


**View "D"-"D"**

**NOTE: REINFORCEMENT ANGLE EDGE IS PARALLEL WITH PEAK RING**

**Note: See 30-degree roof manual(PNEG-1092) in roof hardware box for instructions on 12',15',18' & 21' grain bin roof.**

**Grain Bin Roof Shown**



**Anchor Tank Before 2nd Ring Assembly**

Anchor all jacks securely with metal stakes and cables (use one jack per sidewall sheet). Now raise the tank just enough to assemble the next ring. When lifting your tank crank all jacks at an equal rate. This will prevent bowing previously assembled rings and make for easier hole alignment. To the inside of the first ring bolt the next ring. Be sure to stagger the sheets and select the proper gauge material. Lower the tank on the foundation after assembling and tightening bolts on each new ring. Now re-bolt lifting straps to the lowest ring in place thus far.

***NOTE: Add outside ladders and other accessories to tank walls as you continue to raise the tank.***

After body sheets are assembled and bolts are tightened, raise the tank and attach the legs. Do not put a bolt in the bottom sidewall hole yet, because the hopper must be attached here. When the legs are in place and tightened, release the jack enough to rest the tank on the legs.



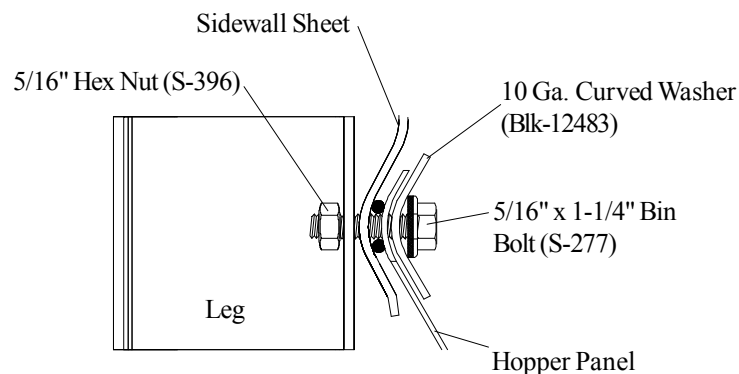
## Watch for power lines.

The crane and anything associated with building the bin (due to height) can get in the way of power lines.

A crane of adequate capacity attached to a spider assembly with cables connecting at each vertical sidewall seam just above the legs can also be used to lift the tank. Make sure the tank is being lifted smoothly and evenly. Raise it enough to assemble the next ring and/or to attach the legs. Reference a qualified rigger.

### 12' 60° & 15' 60° Leg Attachment (for 12' 60° & 15' 60° Tanks Only)

Curved Washers are supplied in the hardware packages. These washers must be installed at the Bottom Leg to Sidewall Bolt Connection, to the inside of the Hopper Panel as indicated in the Illustration Below. Apply caulking in between the hopper panel and the sidewall sheet.

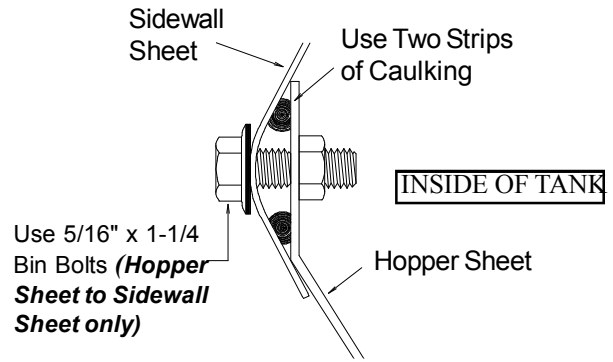


**Hopper Sheets**

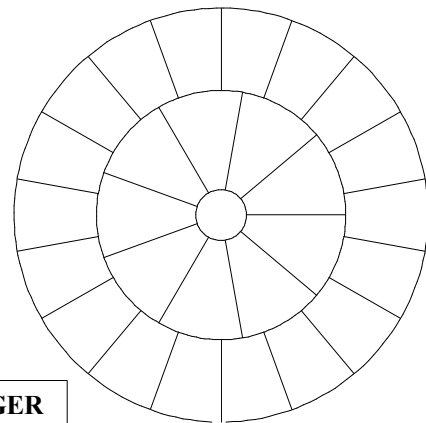
When starting to attach hopper sheets to sidewall it is recommended that the first hopper sheet seam be positioned halfway between leg positions. Lap the hopper sheets as shown. Use two (2) strips of caulking on all seams at sidewall to hopper and hopper sheet to hopper sheet. Use 5/16" x 1.1/4" bin bolts (head to outside of tank) for attaching hopper sheets to bottom sidewall sheet. Use truss head bolts to attach hopper sheet to hopper sheet. Be sure to place the head of the truss head bolt on the inside of the hopper. Leave one hopper sheet out to allow room to install the hopper collar. Be sure to use two (2) strips of caulking between hopper collar and hopper sheets, then put last hopper sheet in place. After the collar is in place, attach the hopper braces and tighten all bolts.

**15' 60° , 18' 45° ,and 21' 45°**

Install hopper sections. When starting to attach hopper sheets to sidewall it is recommended that the first hopper sheet seam be positioned halfway between leg positions. Lap the hopper sheets as shown. Use 5/16" x 1.1/4" bin bolts (head to outside of tank) for attaching hopper sheets to bottom sidewall sheet. Use truss head bolts to attach hopper sheet to hopper sheet. Be sure to place the head of the truss head bolt on the inside of the hopper. Caulk all seams (double bead). Remember, the hopper collar must be installed before the last hopper section is in place. Clean any caulking, which may have squeezed out during assembly, off the inside of the hopper. After the collar is in place, attach the hopper braces and tighten all bolts.

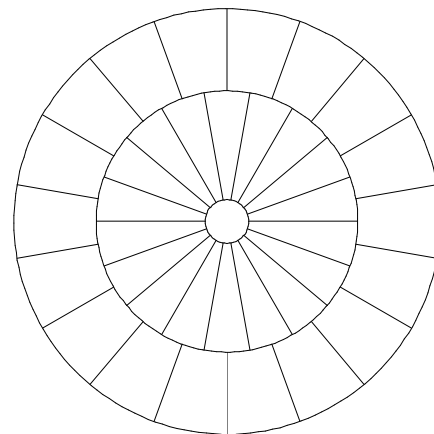


**NOTE: EVERY HOLE IN HOPPER SHEET WILL BE UTILIZED.** Use 5/16"x3/4" truss head bolt on hopper seams. (truss head goes on inside of hopper)

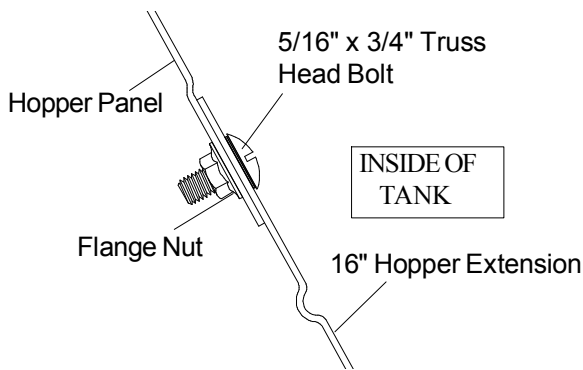
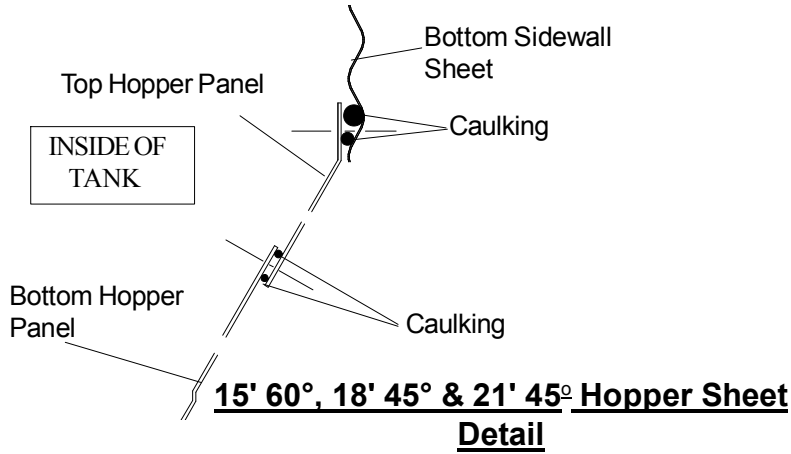


**STAGGER HOPPER SHEETS AS SHOWN**

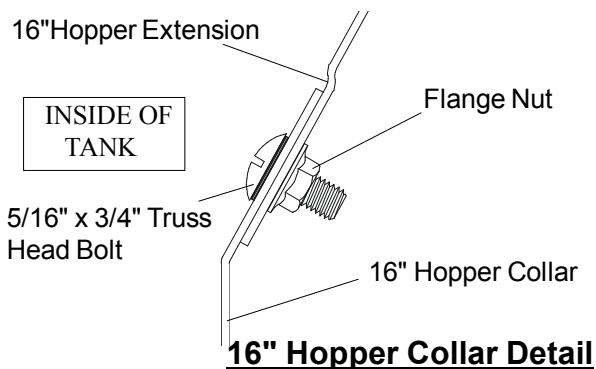
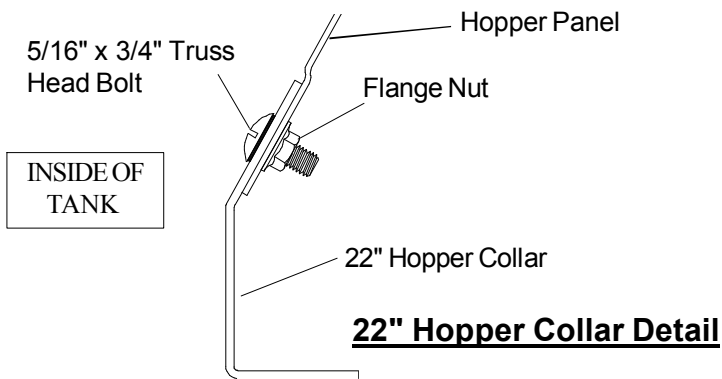
**15' 60° Two-Piece Hopper  
Overhead View of 15' 60° Hopper Sheet Assembly**



**18' and 21' Two-Piece Hopper  
Overhead View of 18' 45°and 21' 45° Hopper Sheet Assembly**



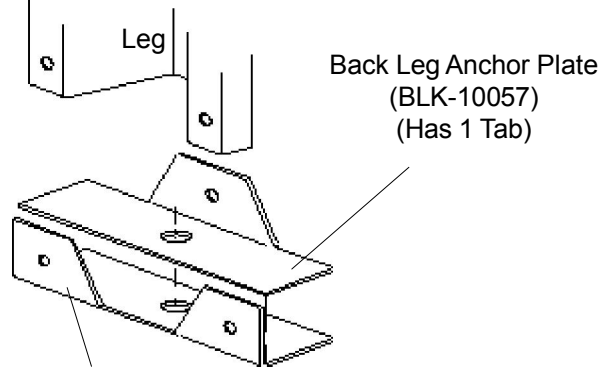
**16" Hopper Extension Detail**



**NOTE: EVERY HOLE IN HOPPER SHEET WILL BE UTILIZED.** Use 5/16" x 3/4" truss head bolt on hopper seams. (truss head goes on inside of hopper)



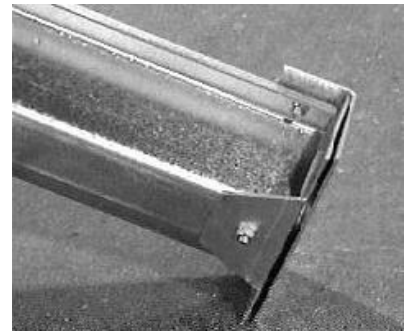
**12 Ft. Only**



Front Leg Anchor Plate  
(BLK-10058)  
(Has 2 Tabs)

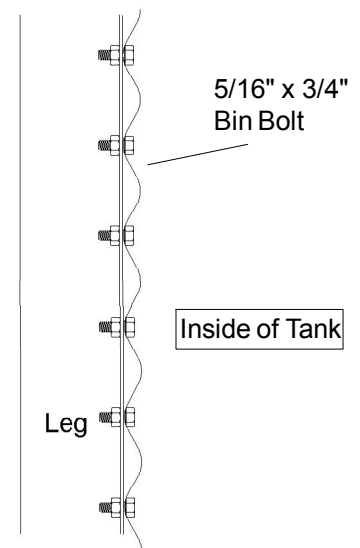


**Installation of Leg to Sidewall**



Use 5/16" x 3/4" bin bolts and nuts when attaching the leg to base. Make sure the washer is used on the slot side of the leg.

When installing legs to sidewall, reverse normal insertion procedure on bolts. Place hex head and neoprene washer to inside of sidewall, leaving threaded portion of bolt protruding outward. This provides for a weather tight seal at the leg attachment location. (See Leg Size Chart on page 48 before attaching legs.)

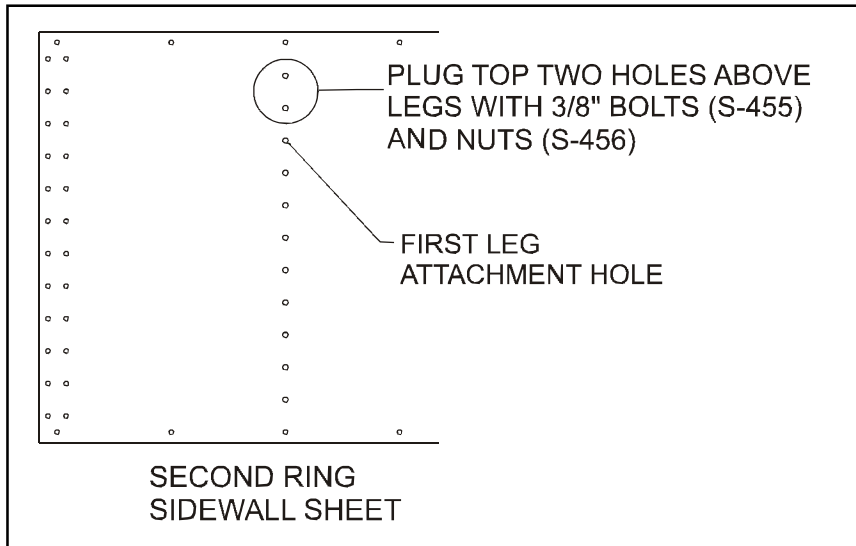


Insert bolts from inside to outside on all leg to tank connections.

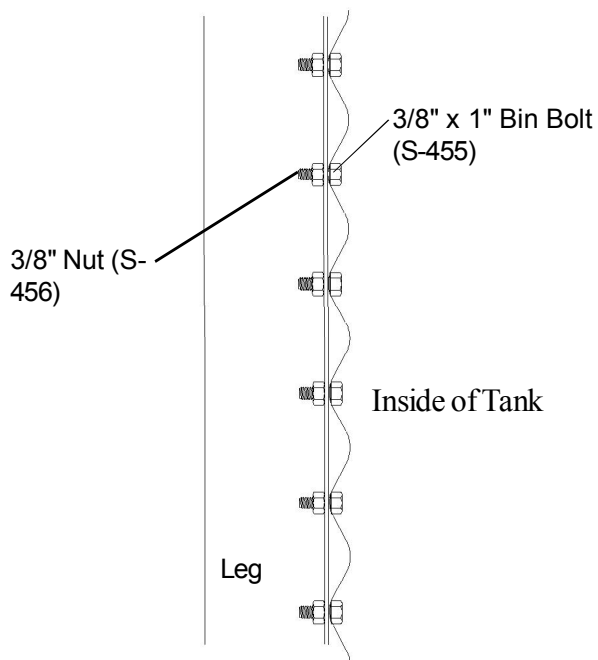
## Installation of Leg to Sidewall for 15', 18', & 21' BFT

1. When installing legs to sidewall, reverse normal insertion procedure on bolts. Place hex head and neoprene washer to inside of sidewall, leaving threaded portion of bolt protruding outward. This provides for a weather tight seal at the leg attachment location.

**NOTE:** Insert bolts from inside to outside on all leg to tank connections.



**Figure 1:** Plug Holes.



**Figure 2:** Installing legs to bin with bolt heads on the inside of bin and nuts on the outside.

**Hopper Collar Assembly**

45 Degree 22" Hopper Collar  
BLK-10854

60 Degree 22" Hopper Collar  
BLK-10342

Install hopper collar before all hopper panels are assembled. Use 5/16" truss head bolts, as shown in the illustration, on all hopper seams. Be sure to caulk between the hopper collar and hopper panels. Refer to drawings.

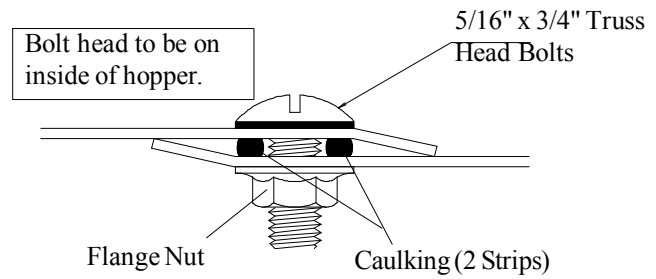
16" 45° Hopper Extension Panel  
BLK-10697 (3 Required)

16" 45° Hopper Collar  
BLK-10696

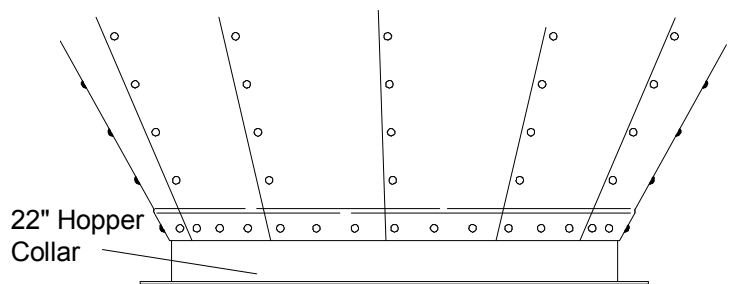
16" 60° Hopper Extension Panel  
BLK-10487 (3 Required)

16" 60° Hopper Collar  
BLK-10489

Before last hopper panel is attached, assemble the hopper extensions (if utilized) on the hopper collar. Use 5/16" truss head bolts, and caulk all joints on the hopper extensions and collar. After completing this assembly, attach to the hopper panels, using 5/16" truss head bolts. Be sure to caulk between hopper extensions and hopper panels (refer to drawings.)

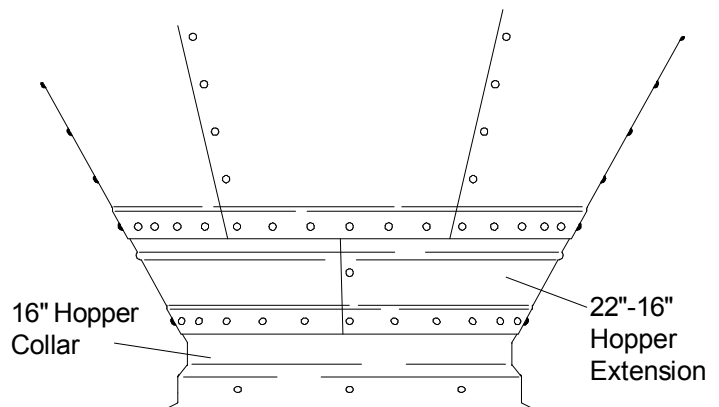


**Hopper Seam Overlap Detail**



**22" Hopper Collar**

**16" Hopper Extensions and Collar**



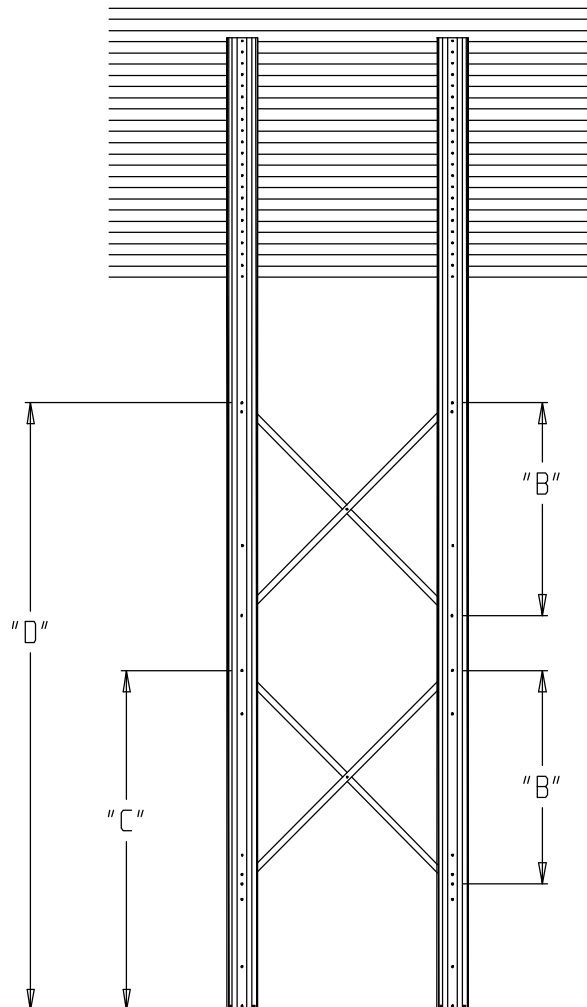
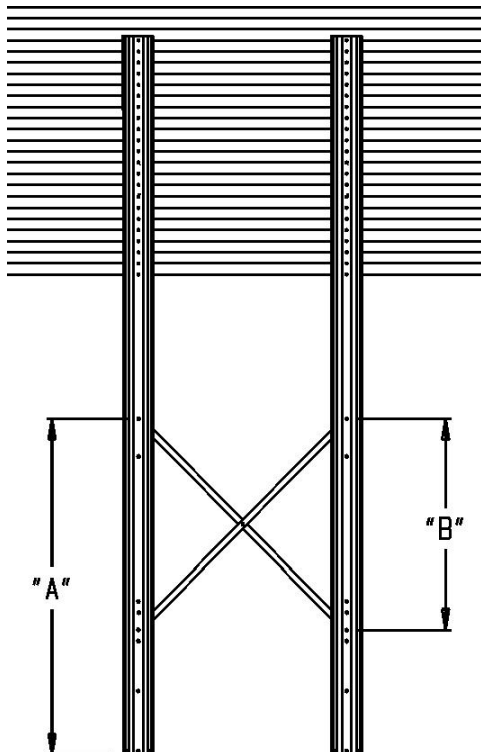
**12'--21' Leg Bracing**

Tank	"A"	"B"	"C"	"D"
12' 60°		36.962"	66.962"	112.359"
12' 45°	66.962"	36.962"		
15' 60°		50.596"	75.596"	138.250"
15' 45°	80.596"	50.596"		
18' 45°		50.596"	63.640"	120.237"
21' 45°		55.075"	66.075"	133.075"

See the diagrams on Pages 49-51 for attachment points of bracing. Use 3/8" nuts and bolts to attach cross ties to each other and to leg. Hopper braces are attached to legs with 3/8" nuts and bolts and to hopper collar with 5/16" hardware. Ladder standoffs are attached to legs with 5/16" nuts and bolts. The diagrams below show typical bracing attachment points to the leg. Do not tighten any hardware until all bracing is in place. See chart above for dimensions called out in the diagrams below.

**TYPICAL 18' & 21' 45° & 12' & 15' 60° BRACING LAYOUT**

**TYPICAL 12' & 15' 45° BRACING LAYOUT**

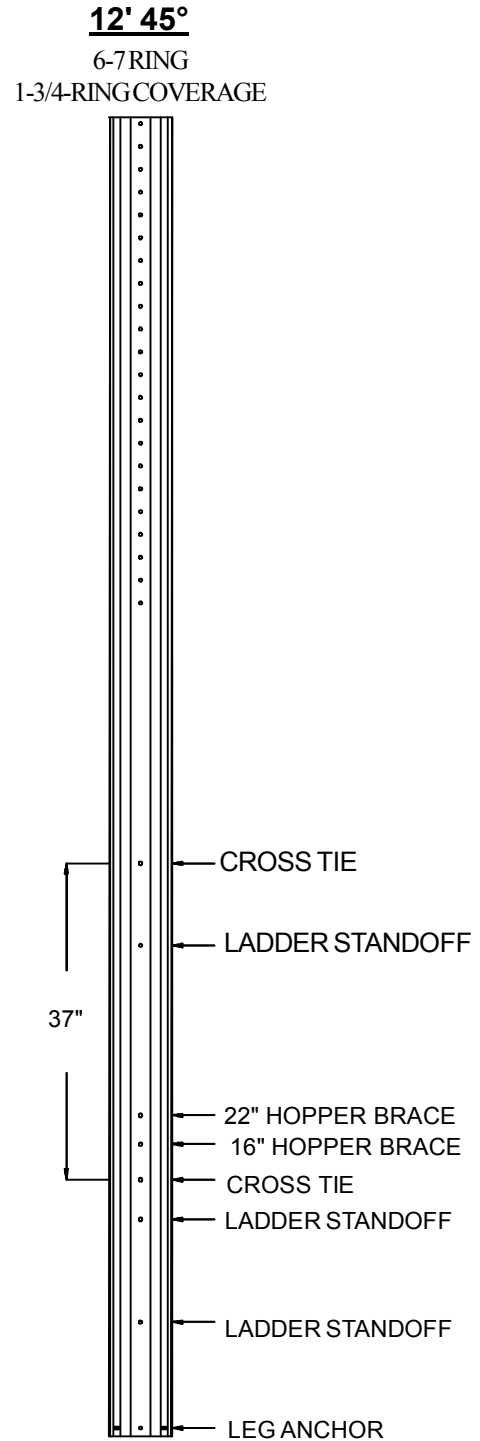
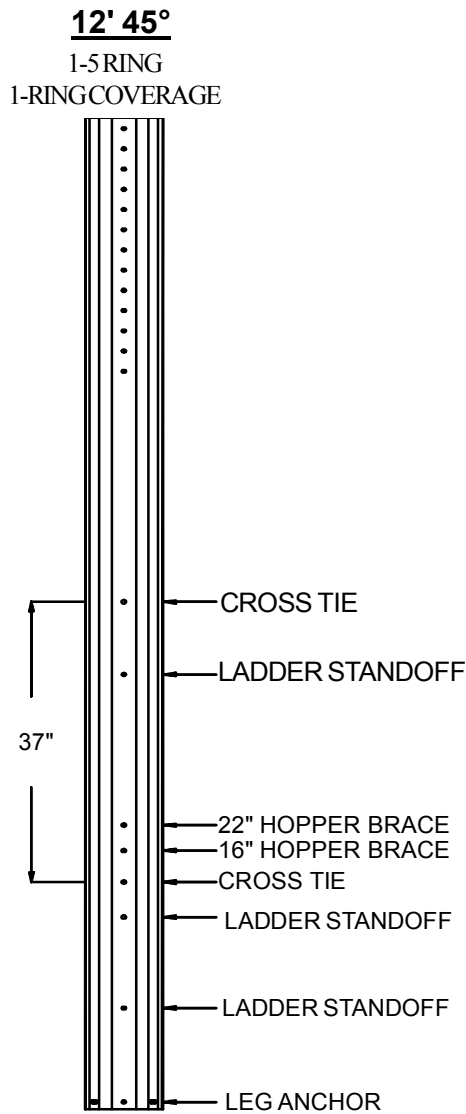


# Bulk Feed Tanks

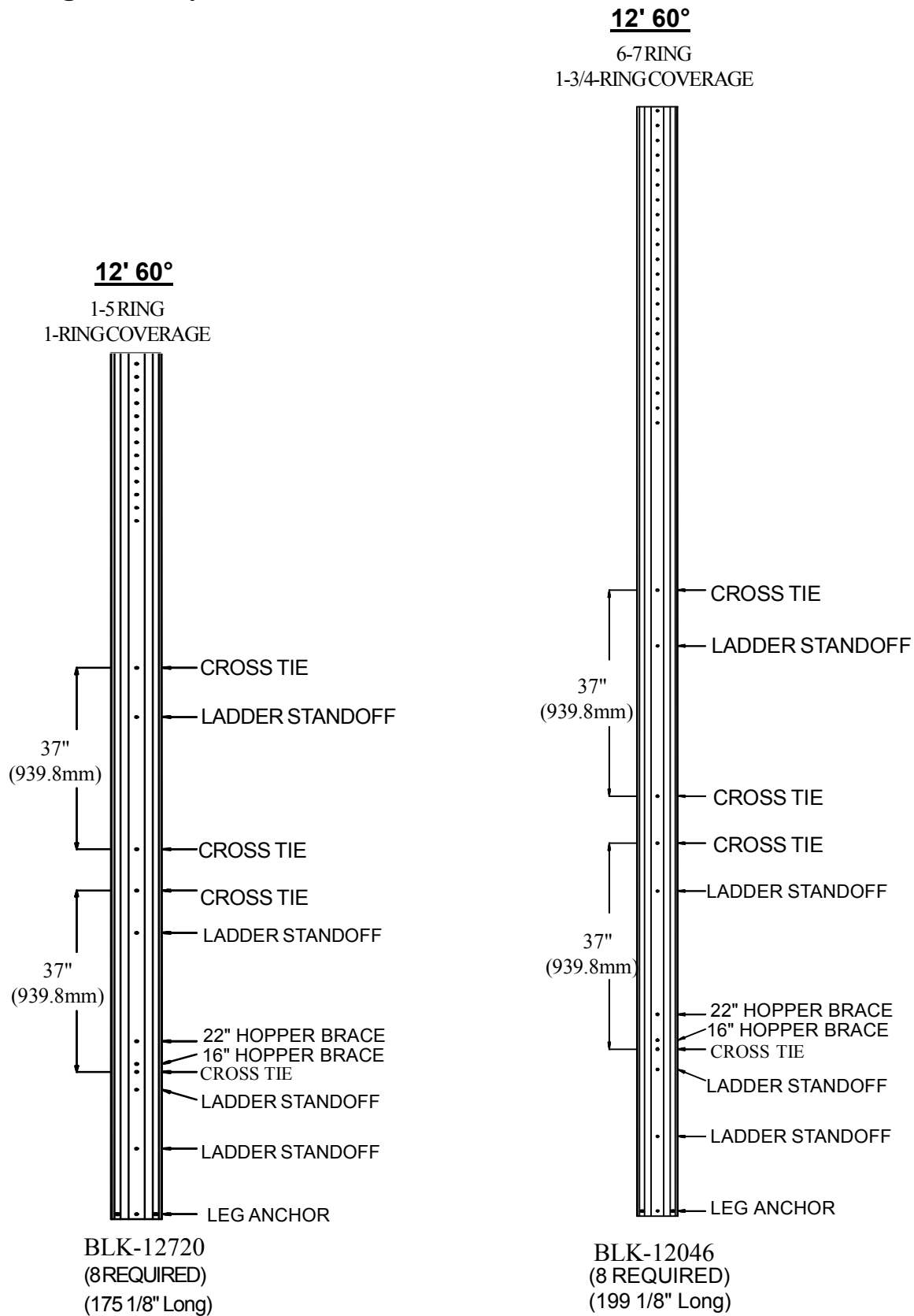
## Leg Size Chart

Tank Size	Hopper	No. of Rings	Length
12' Diameter Tank	45 Degree	1-5 Rings	130.125"
12' Diameter Tank	45 Degree	6-7 Rings	154.125"
12' Diameter Tank	60 Degree	1-5 Rings	175.125"
12' Diameter Tank	60 Degree	6-7 Rings	199.125"
15' Diameter Tank	45 Degree	2-8 Rings	172.375"
15' Diameter Tank	60 Degree	2-6 Rings	231"
18' Diameter Tank	45 Degree	2-8 Rings	190.250"
21' Diameter Tank	45 Degree	2-6 Rings	201.500"

Depending on the size of the Bulk Feed Tank you are assembling, the leg will cover either the bottom ring or 1-3/4 rings (56"). Refer to this chart to find the correct number of rings your legs will cover. **Put all legs on, but don't tighten bolts until all braces are in place.** Be sure to put leg braces on properly. (Refer to pages 49-51.)



**Bracing Hole Layout**

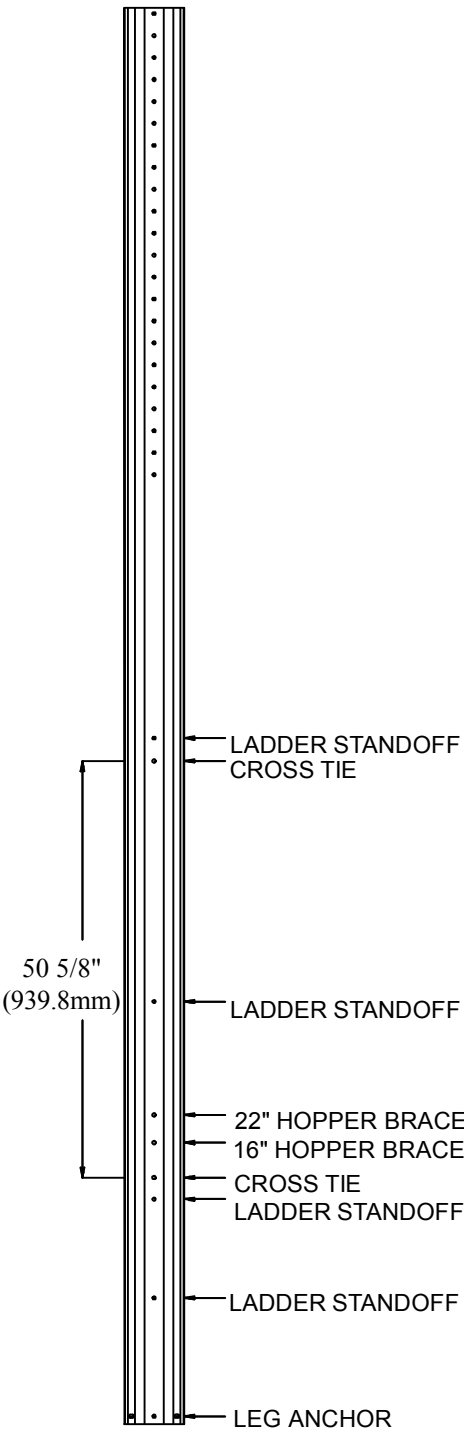


**All leg to sidewall holes must be utilized for leg attachment.**

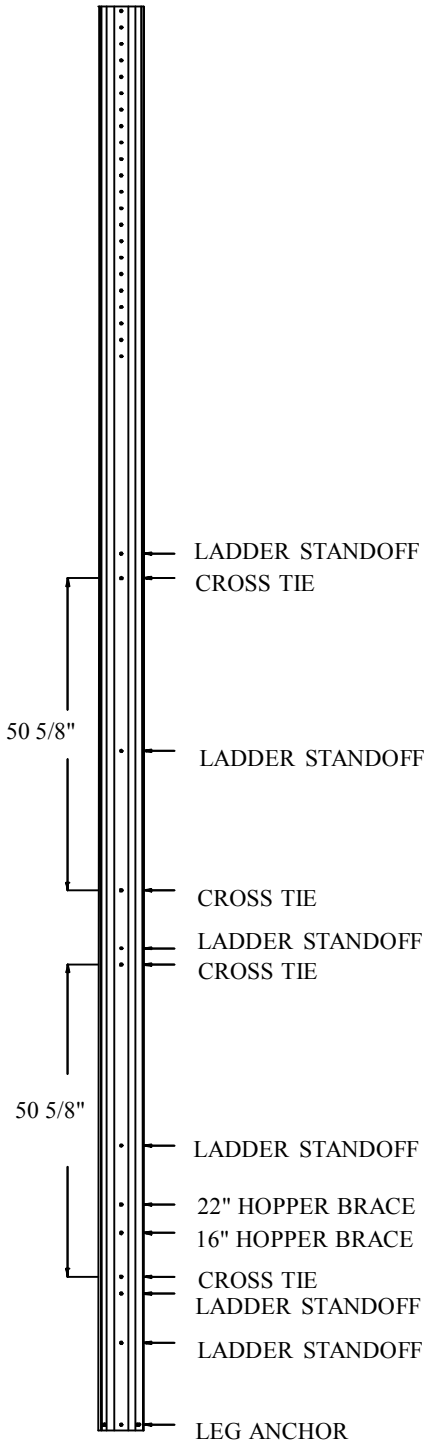
Bracing Hole Layouts cont...

15' 45°

15' 60°



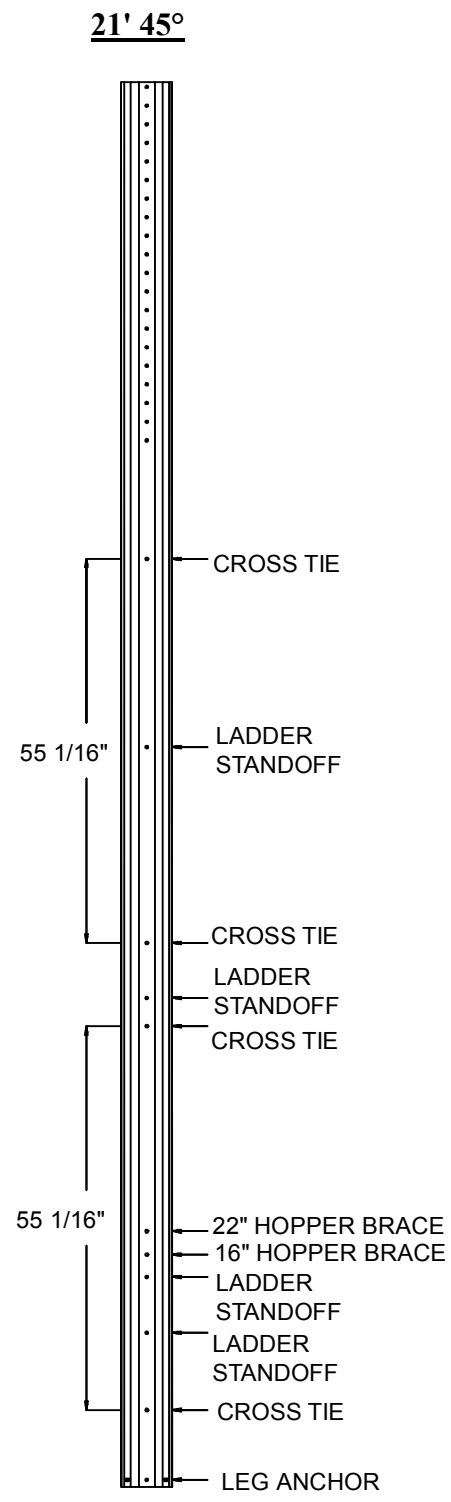
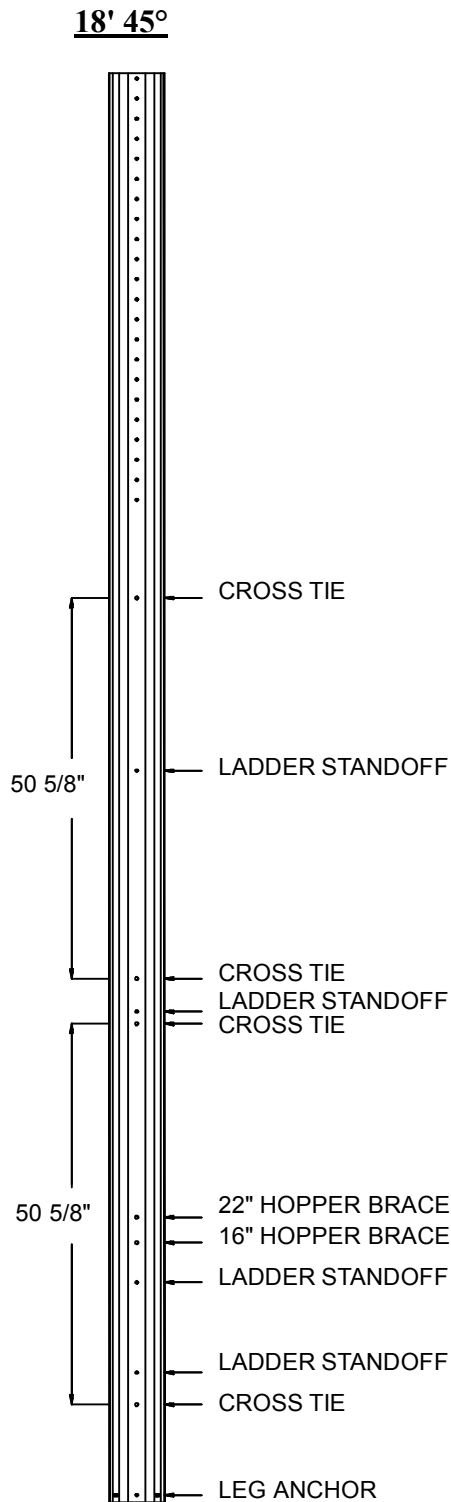
BLK-12047  
(15 REQUIRED)  
(172 1/8" Long)



BLK-12048  
(15 REQUIRED)  
(231" Long)

All leg to sidewall holes (22 @ 2.666" spacing) must be utilized for leg attachment.

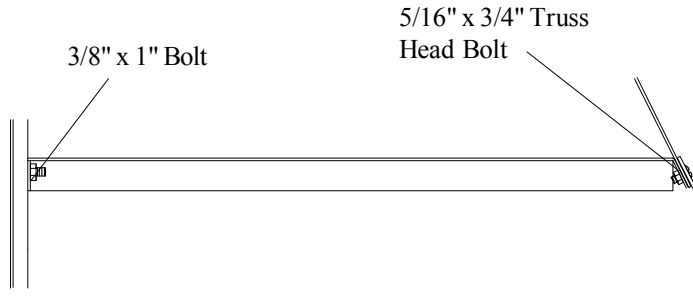
## Bracing Hole Layouts cont...



**All leg to sidewall holes (22 @ 2.666" spacing on 18'; 20 @ 2.66" on 21') must be utilized for leg attachment.**



**Hopper to Leg Bracing**



Hopper braces are to be spaced equally around tank. Hopper braces are required on all hopper tanks. Refer to the chart below for the quantities required.

Description	16" Hopper Brace Part No.	22" Hopper Brace Part No.	Qty
12' Diameter 45° Hopper	BLK-12115	BKL-12116	8
12' Diameter 60° Hopper	BLK-12113	BLK-12114	8
15' Diameter 45° Hopper	BLK-12118	BLK-12120	3
15' Diameter 60° Hopper	BLK-12117	BLK-12119	3
18' Diameter 45° Hopper	BLK-12121	BLK-12122	3
21' Diameter 45° Hopper	BLK-12123	BLK-12124	4

*Note: Hopper braces attach between the legs and the collar/hopper horizontal seam. Never bolt the braces directly to the hopper seam above the collar.*

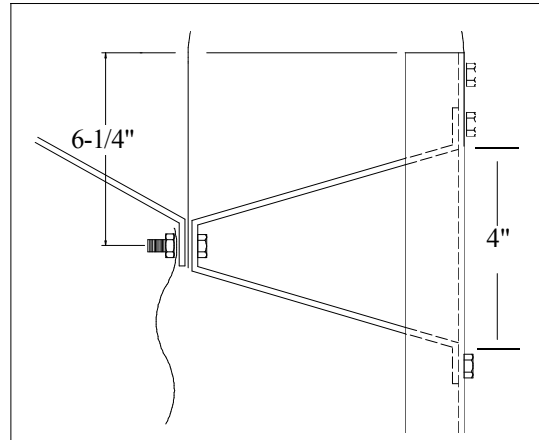
**Cross Tie Brace Usage Chart**

Description	Inside Cross Tie	Outside Cross Tie
12' Diameter 60° Hopper	16	16
12' Diameter 45° Hopper	8	8
15' Diameter 45° Hopper	15	15
15' Diameter 60° Hopper	30	30
18' Diameter 45° Hopper	36	36
21' Diameter 45° Hopper	56	56

**Directions:** Locate correct tank in far left column, braces are located across top of chart. Follow the column down to correct tank line and read the quantity required for that tank.

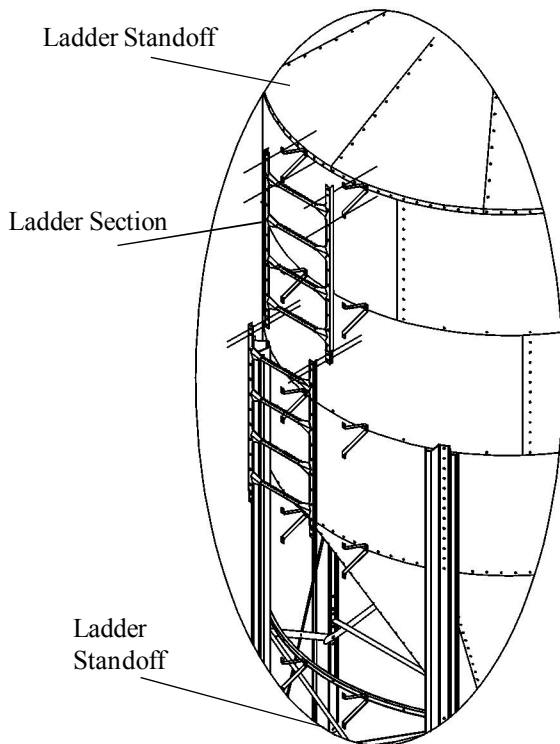
**Optional Sidewall Ladder**

To start sidewall ladder, places two (2) outside standoffs spaces 18.3/4" apart. At the roof eave, the ladder should be located on the standoffs. (Refer to drawing). Continue with standoff located on every horizontal seam. Ladder support ring should be located between two legs as shown. This will standoff the ladder at the bottom of bulk feed tank. When positioning the ladder on the tank, be sure to attach ladder so the raised non-slip tread surface is to the **top** of the ladder rungs.



**Ladder Standoff Ring Chart**

Tank Dia.	Ladder Standoff Ring Part No.	QTY REQ 45°	QTY REQ 60°
12'	BLK-10150	3	3
15'	BLK-11814	3	4
18'	BLK-11814	3	--
21'	BLK-11815	3	--



**Ladder Standoff Detail**

Note locations of legs and other rings horizontal hole spacing when placing ladder.



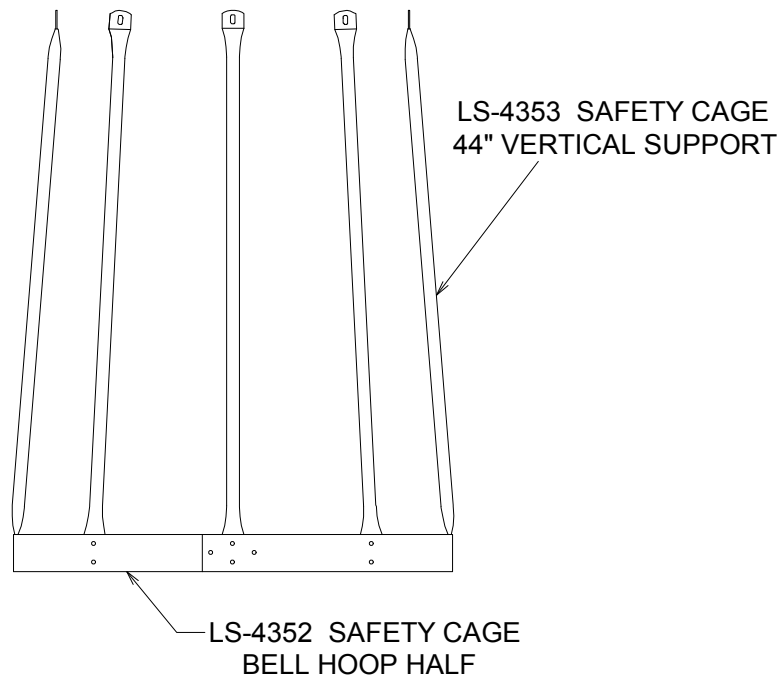
**Ladder and Safety Cage Usage Chart (Number in chart specifies ring size).**

Ladder Package No.	Safety Cage No.	12' 60°	12' 45°	15' 45°	18' 45°
BLK-10635	BLK-10833	--	2	--	--
BLK-10825	BLK-10834	--	--	2	2
BLK-10640	BLK-10835	2	3	3	--
BLK-10637	BLK-10836	--	4	--	3
BLK-10641	BLK-10837	3	5	4	4
BLK-10642	BLK-10838	4	--	5	--
BLK-10643	BLK-10839	5	6	--	5
BLK-10826	BLK-10840	--	7	6	--
BLK-10644	BLK-10841	6	--	7	6
BLK-10827	BLK-10842	--	--	--	7
BLK-10828	BLK-10843	--	--	8	8



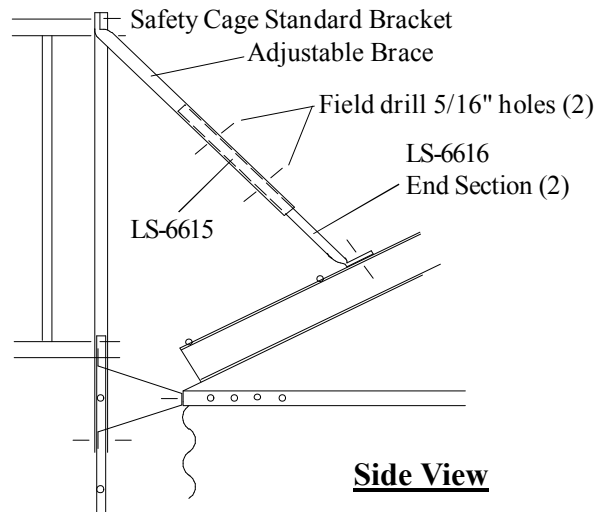
**Optional Safety Cage**

*Use 5/16" Hex head bolts on all safety cage connections.*

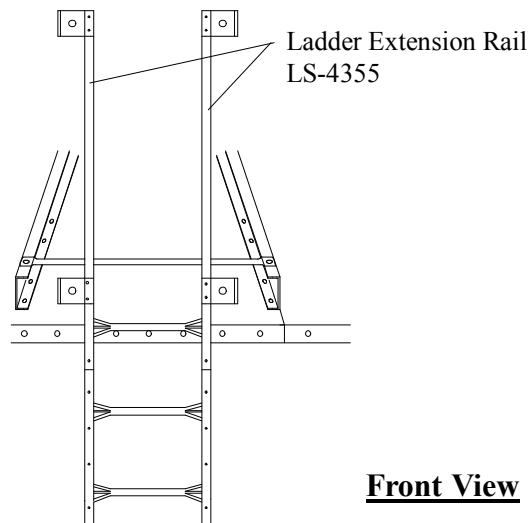


Start attaching ladder at the eave (top) of the Bulk Feed Tank. After the first ladder has been attached to the sidewall of tank, attach ladder extension rails to the ladder as shown. Refer to previous page for proper ladder placement in relation to the eave of the tank. Use hex head bolts on all safety cage connections. Attach hoop brackets and adjustable safety cage brace to the top of the extension rails. Be sure to attach the adjustable brace on the *left* side of the ladder. Now attach the opposite end of the adjustable brace to the roof ladder rail. After completing this, drill two (2) 5/16" holes through the adjustable brace and use 1/4" x 1.1/2" bolts and nuts to secure the two braces together.

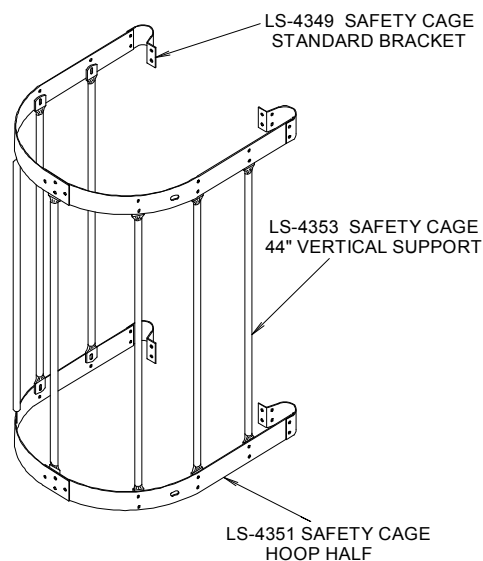
Add the safety cage hoops to the brackets and attach vertical supports to the hoops. Continue adding ladder sections and safety cage as sidewall rings are attached. Included in your safety cage package are two (2) Bell hoop halves (pg 54) which should be located at the bottom of the safety cage. Follow all drawings and details for proper placement of parts and proper location of safety cage.



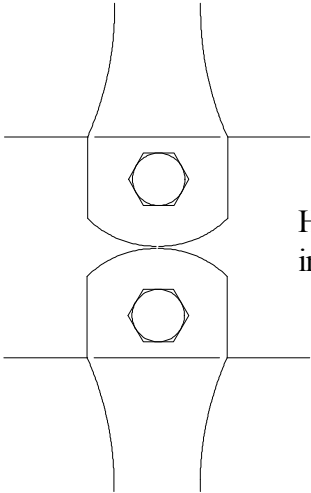
**Side View**



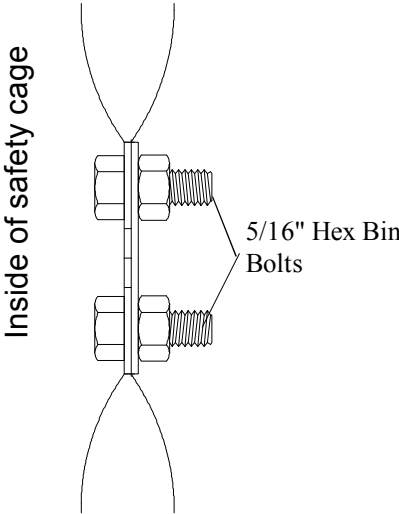
**Front View**



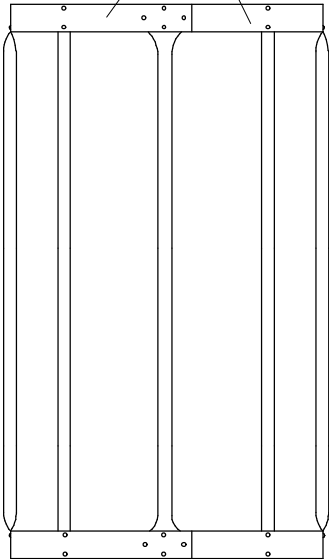
Safety Cage Assembly



Head of the bolt to be placed to the inside of the safety cage.

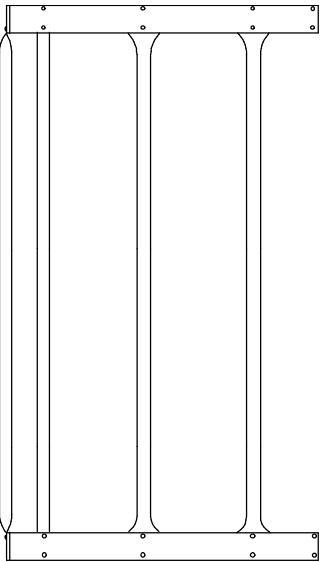


Safety Cage Half Hoop LS-4351

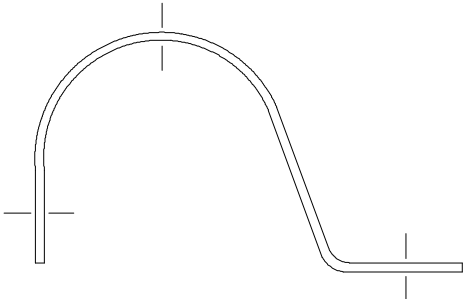


Front View

Safety Cage Vertical Support LS-4353

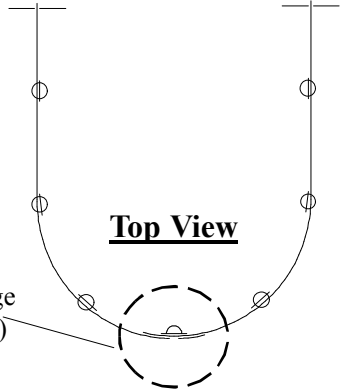


Side View



Safety Cage Standard Bracket LS-4349

Attach hoop to bracket on ladder

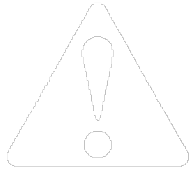


Top View

Overlap Safety Cage Hoops 5" (127 mm)

## Raising Bin To Set On Foundation

Be sure that all bolts are tightened properly. The bulk feed tank can now be set up on foundation. A crane of adequate capacity attached to a spider assembly with cables connecting at each vertical sidewall seam just above the legs will usually do the job. Reference a qualified rigger.

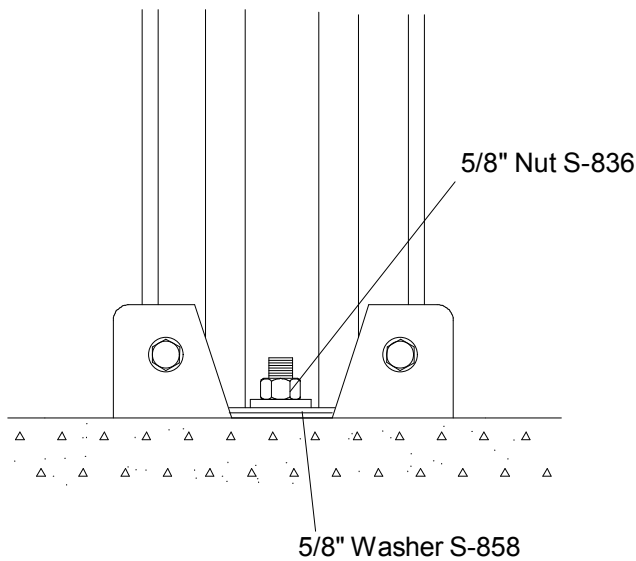


*Make sure there is enough clearance between the tank and surrounding power lines, electricution may occur.*

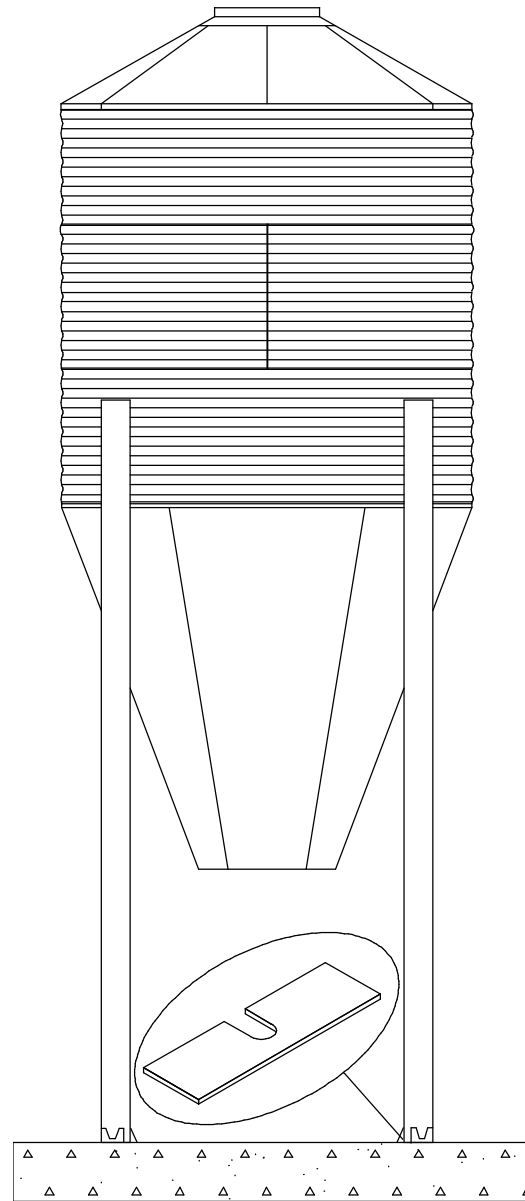
**WARNING!!** All usual and customary precautions must be taken to insure safety of personnel and property.

### Anchoring Tank

Check all legs to see if shims are necessary to level the tank properly (shims are to be obtained locally). After bulk feed tank is level and shimmed properly, anchor the tank down with 5/8" washers and nuts. (Refer to drawing below).



**Leg Base Detail**

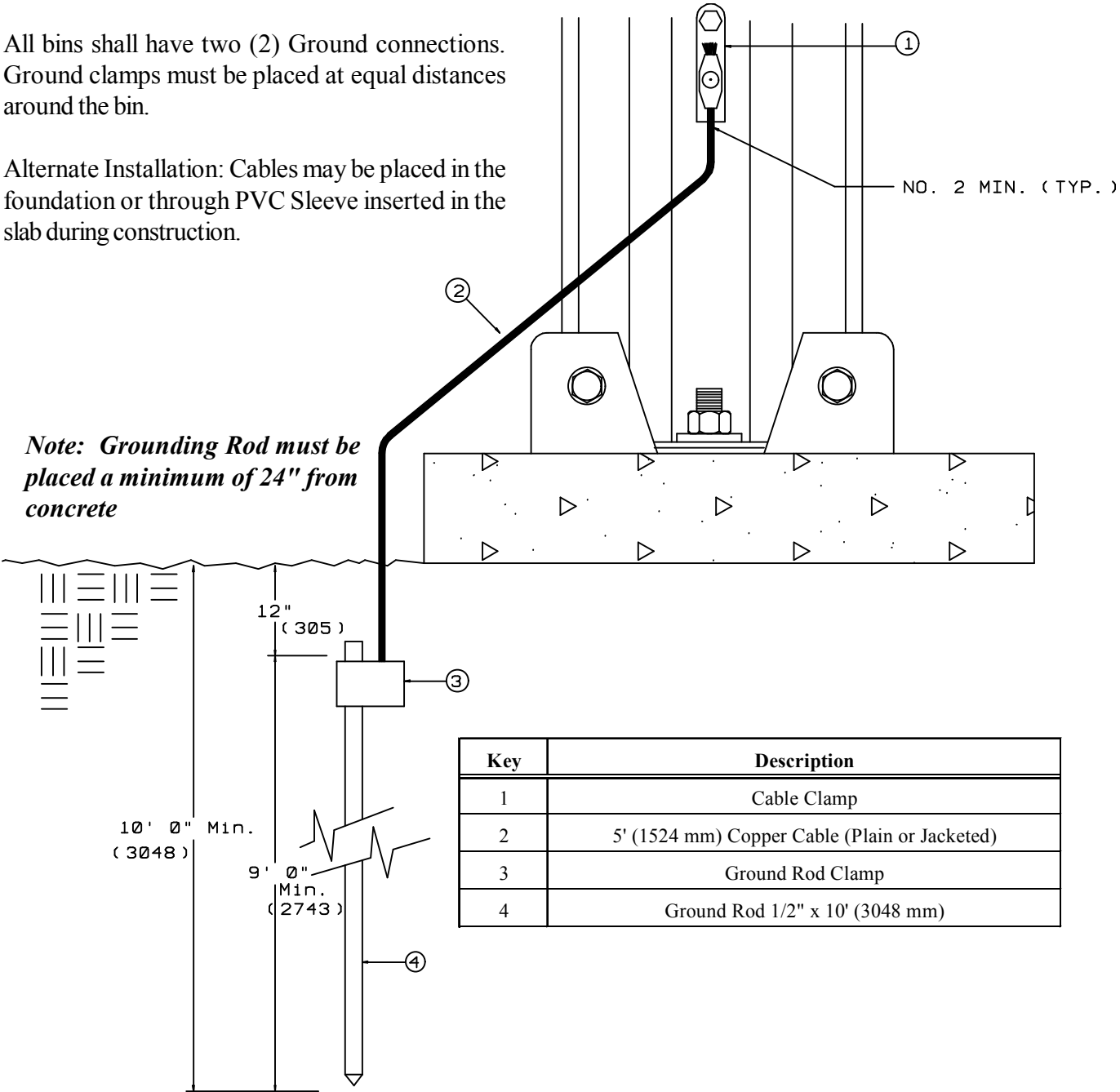


*Note: Leg shims are not standard equipment and must be obtained locally.*

*Note: Parts not supplied by Manufacturer, they should be purchased Locally*

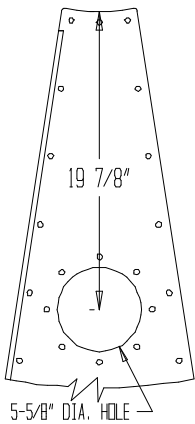
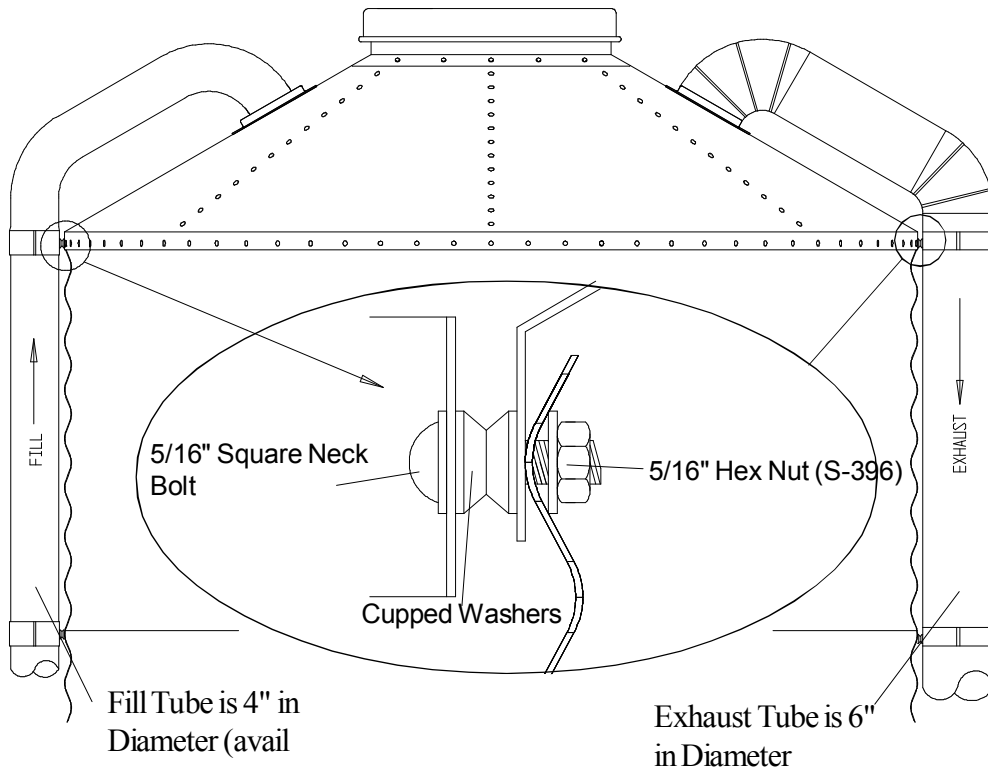
All bins shall have two (2) Ground connections. Ground clamps must be placed at equal distances around the bin.

Alternate Installation: Cables may be placed in the foundation or through PVC Sleeve inserted in the slab during construction.

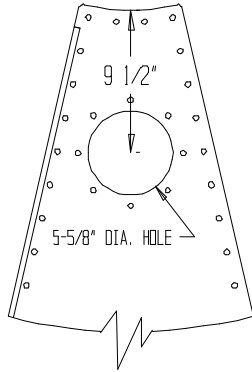


**PNEUMATIC FILL KIT ASSEMBLY**

*Note: inlet and exhaust parts from roof eave upward supplied with kit.*



15' & 18' Roof Panels



12' Roof Panel

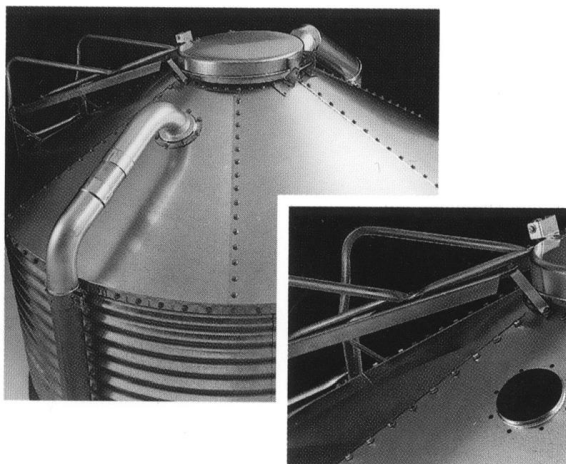
**Roof Panel**

Identical pre-punched roof panels are available from G.S.I. for inlet and outlet sections of Pneumatic fill systems. Extruded lip of the panels provide for weather tight installation. Caulking placed between angle rings virtually eliminates all leakage problems. Rubber seal must be utilized at roof cap area to prevent material "Blow By" from pressurized systems.

To install fill kits in roof panels not pre-punched, cut 5 5/8" (143 mm) diameter holes in opposing roof panels as shown. Caulk sufficiently to provide weather tight seal.

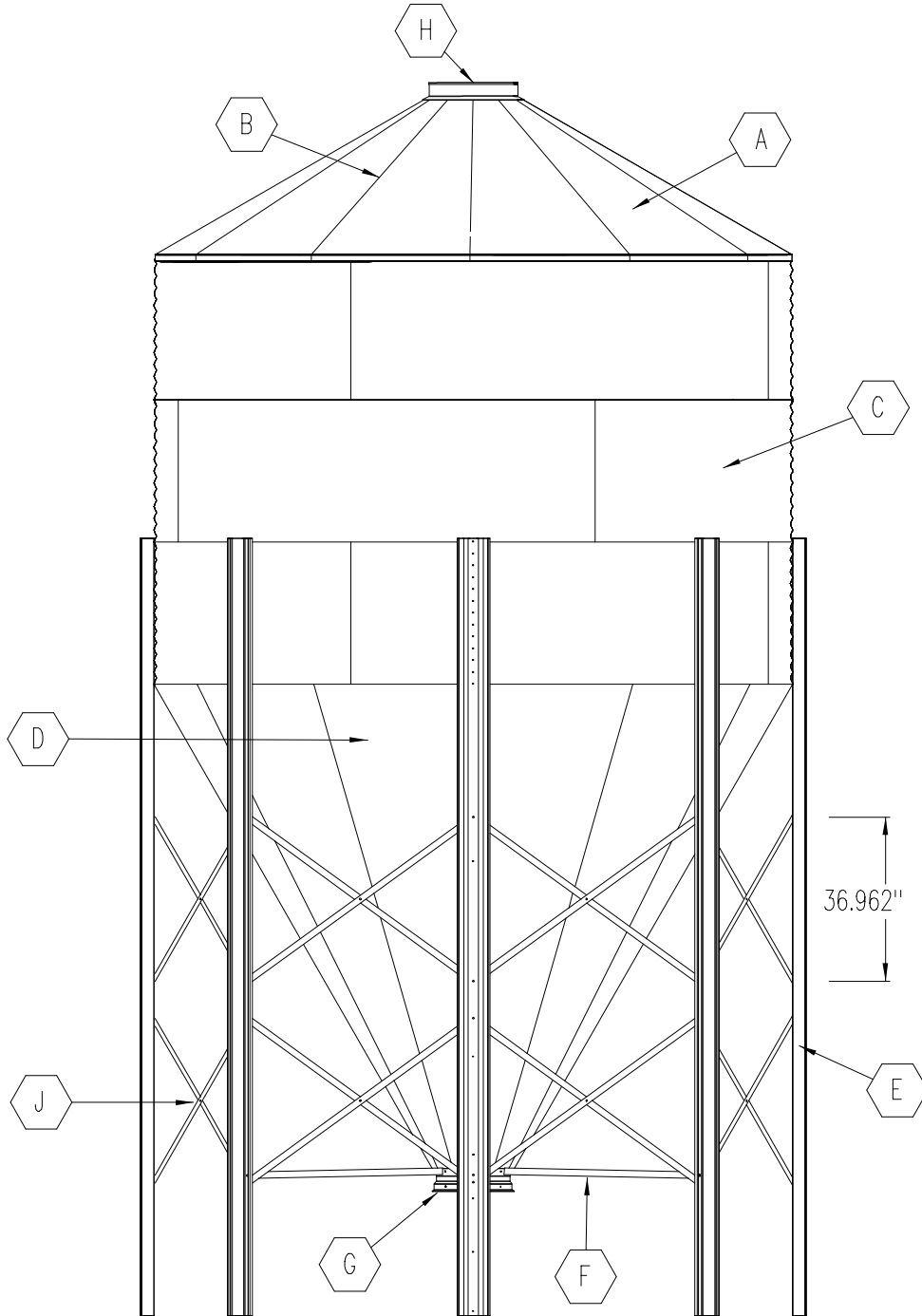
Refer to "Peak Ring Seal Strip" installation procedure when installing pneumatic fill kits.

Abnormal pressure may require us of optional "Cap Hold Down Package". (BLK-10474)





12' Diameter 60° Hopper Bin Specifications



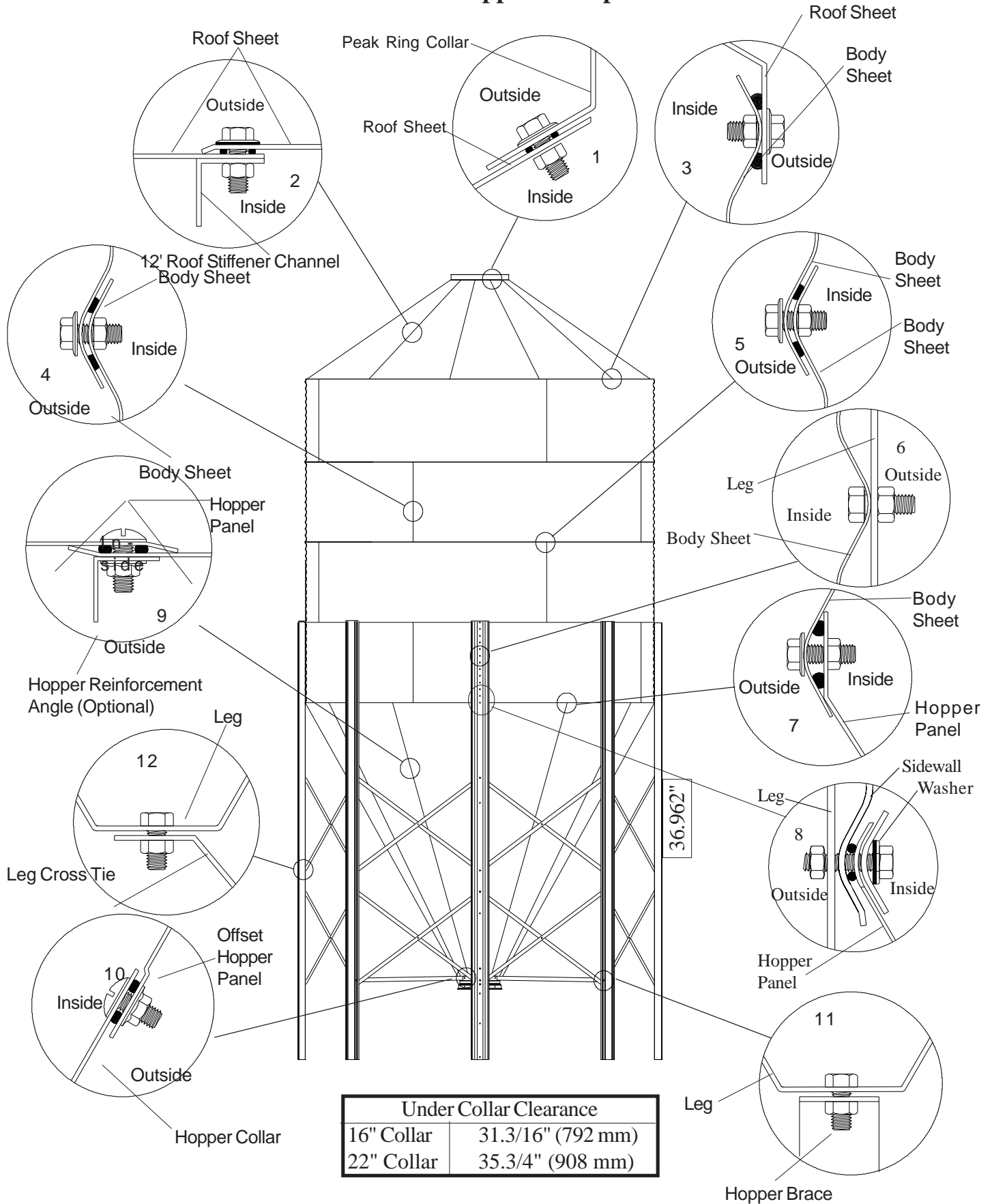
Under Collar Clearance	
16" Collar	31.3/16" (792 mm)
22" Collar	35.3/4" (908 mm)

*IMPORTANT: Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #26-27 for location of caulking.*

**12' Diameter 60° Hopper Bin Parts List**

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>A</b>	BLK-12272	12	12' 30° Roof Panel (20 Gauge)
	BLK-12275	12	12' 40° Roof Panel (20 Gauge)
<b>B</b>	BLK-12286	12	12' 30° Roof Stiffener Channel (18 Gauge)
	BLK-12287	12	12' 40° Roof Stiffener Channel (18 Gauge)
<b>C</b>	<b>12' Sidewall Sheet</b>	<b>4 Per Ring</b>	
	SS40682012		20 Gauge (Top Punched Sidewall Sheet)
	SS41932012		20 Gauge (Top Punched Decal Sidewall Sheet)
	SS40692012		20 Gauge (Middle Punched Sidewall Sheet)
	SS40691812		18 Gauge (Middle Punched Sidewall Sheet)
	SS40691612		16 Gauge (Middle Punched Sidewall Sheet)
	SS40691512		15 Gauge (Middle Punched Sidewall Sheet)
	SS40701512		15 Gauge (Middle Leg Punched Sidewall Sheet)
	SS40701312		13 Gauge (Middle Leg Punched Sidewall Sheet)
	SS40721312		13 Gauge (Bottom Punched Leg Sheet)
	SS40721212		12 Gauge (Bottom Punched Leg Sheet)
<b>D</b>	BLK-10155	12	12' 60° Offset Hopper Panel (14 Ga.)
<b>E</b>	BLK-12720	8	12' 60° (1-5 Ring) Leg 175-1/8" (12 Gauge) 1-Ring Coverage
	BLK-12046	8	12' 60° (6-7 Ring) Leg 199-1/8" (10 Gauge) 1-3/4 Ring Coverage
<b>F</b>	BLK-12113	8	Hopper Brace for 16" Collar (Shown)
	BLK-12114	8	Hopper Brace for 22" Collar
<b>G</b>	BLK-10587	1	16" 60° Hopper Extension Kit w/ Collar (Shown)
	BLK-10342	1	22" 60° Hopper Collar (36 Holes)
<b>H</b>	Blk-11730	1	30° Roof Bulk Tank Peak Ring
	Blk-12534	1	40° Roof Bulk Tank Peak Ring
<b>J</b>	BLK-12060	16	12' Inside Cross Tie Brace (67.788") (12 Gauge)
	BLK-12061	16	12' Outside Cross Tie Brace (67.788") (12 Gauge)
<b>NS</b>	BLK-11840A	12	12' 60° Hopper Reinforcement Angle (optional)

**12' Diameter 60° Hopper Bin Specifications**

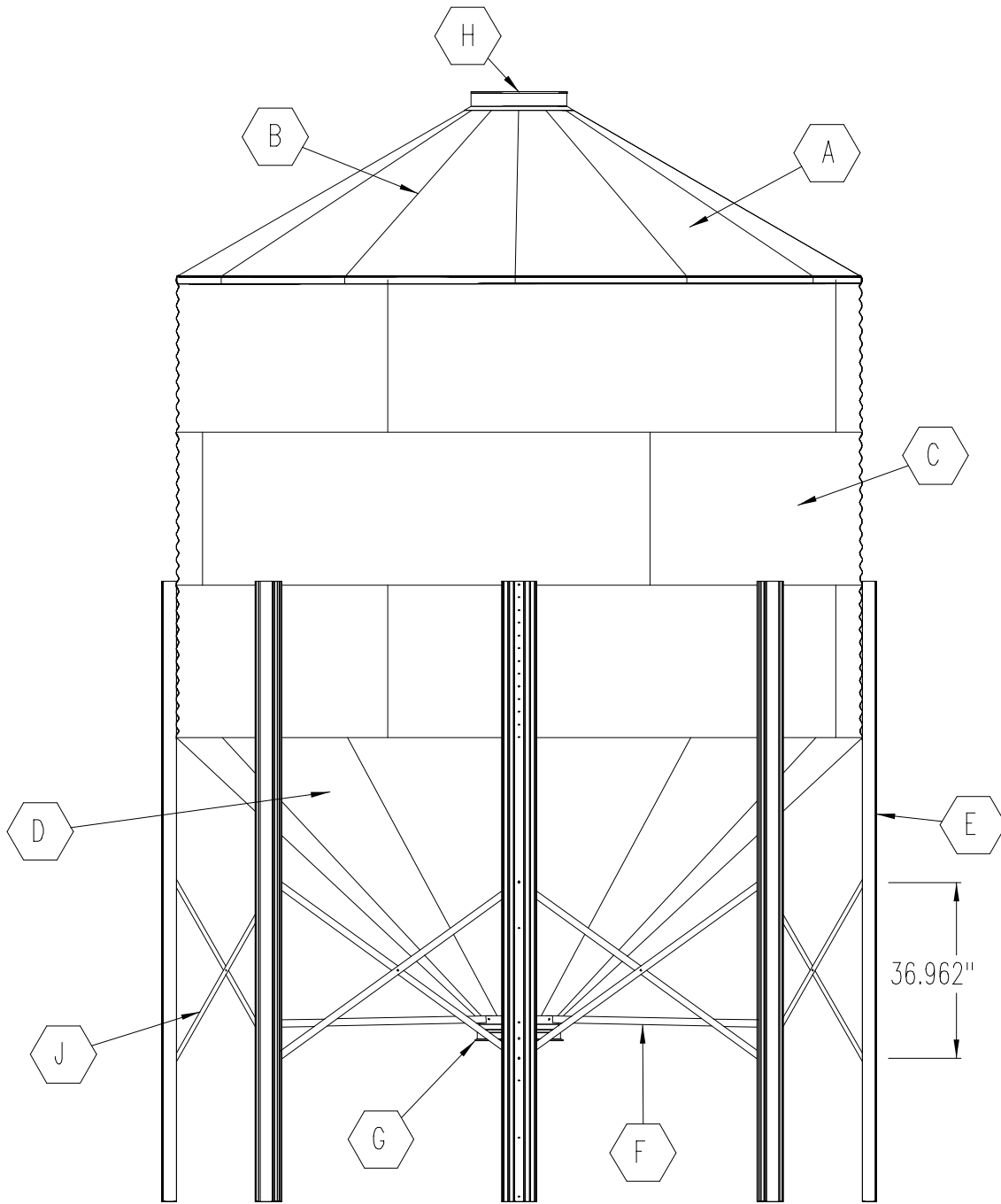


**12' DIAMETER 60° HOPPER BIN HARDWARE USAGE**

*Note: Bolt listed first, nut second for each usage.*

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>1</b>	S-275	36	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	36	
<b>2</b>	S-275	240	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	240	
<b>3</b>	S-275	144	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	144	
<b>4</b>	S-275	Varies	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>5</b>	S-275	Varies	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>6</b>	S-275	96 OR 168	Leg to Sidewall Sheet (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank)
	S-396	96 OR 168	
<b>7</b>	S-277	288	Hopper Panels to Sidewall Sheet (Use 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	288	
<b>8</b>	S-277	8	Leg to Body Sheet to Hopper Connection (Use 10 Gauge Washer under 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	8	
	BLK-12483	8	
<b>9</b>	S-4303	420	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)
	S-3611	420	
<b>10</b>	S-4303	36	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown)
	S-3611	36	
<b>11</b>	S-7927	8	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	8	
<b>12</b>	S-7927	48	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	48	

12' Diameter 45° Hopper Bin Specifications



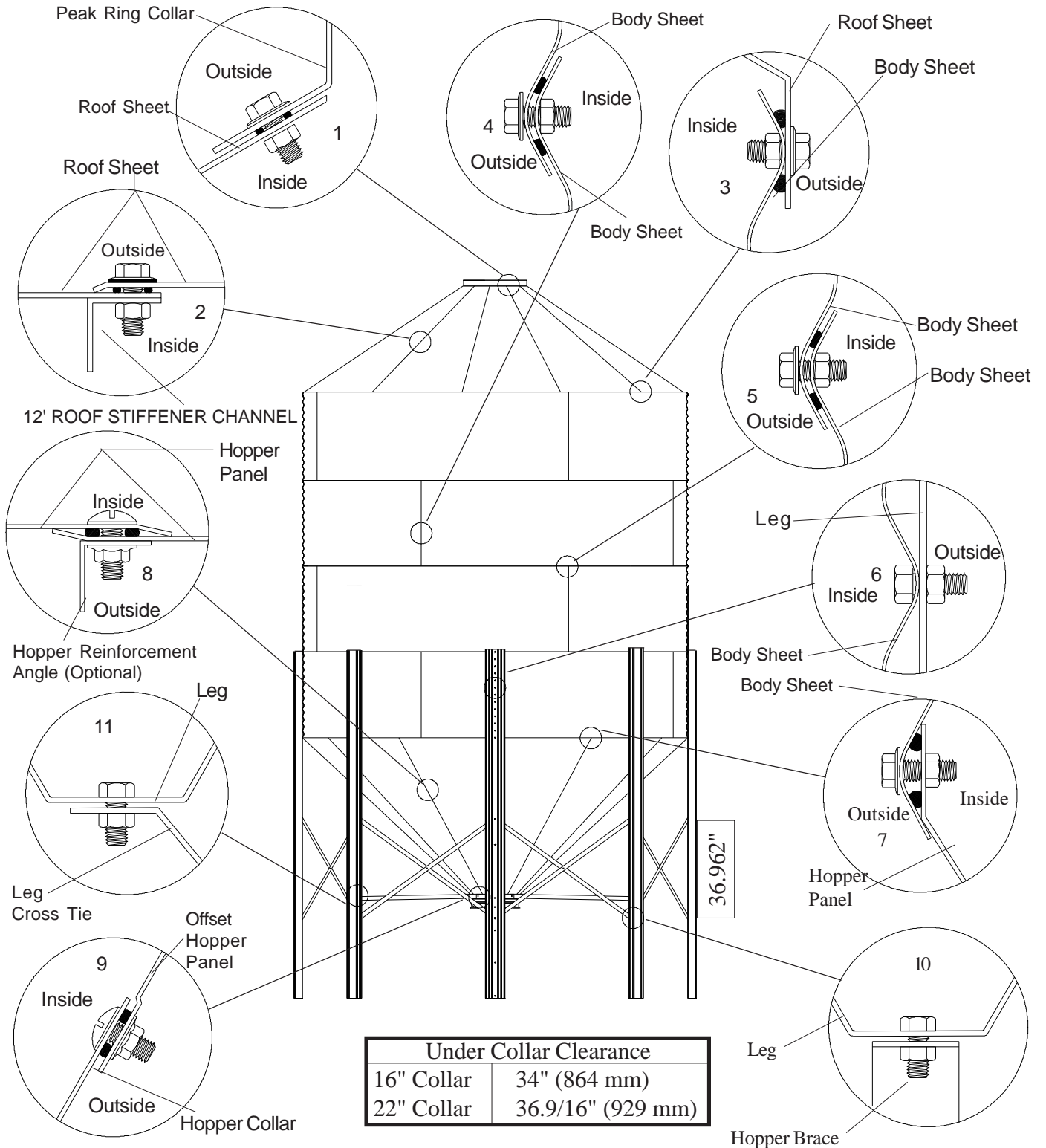
Under Collar Clearance	
16" Collar	34" (864 mm)
22" Collar	36-9/16" (929 mm)

*IMPORTANT: Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #26-27 for location of caulking.*

**12' DIAMETER 45° HOPPER BIN PARTS LIST**

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>A</b>	BLK-12272	12	12' 30° Roof Panel (20 Gauge)
	BLK-12275	12	12' 40° Roof Panel (20 Gauge)
<b>B</b>	BLK-12286	12	12' 30° Roof Stiffener Channel (18 Gauge)
	BLK-12287	12	12' 40° Roof Stiffener Channel (18 Gauge)
<b>C</b>	<b>12' Sidewall Sheet</b>	<b>4 Per Ring</b>	
	SS40682012		20 Gauge (Top Punched Sidewall Sheet)
	SS41932012		20 Gauge (Top Punched Decal Sidewall Sheet)
	SS40692012		20 Gauge (Middle Punched Sidewall Sheet)
	SS40691812		18 Gauge (Middle Punched Sidewall Sheet)
	SS40691612		16 Gauge (Middle Punched Sidewall Sheet)
	SS40691512		15 Gauge (Middle Punched Sidewall Sheet)
	SS40701512		15 Gauge (Middle Leg Punched Sidewall Sheet)
	SS40701312		13 Gauge (Middle Leg Punched Sidewall Sheet)
	SS40721312		13 Gauge (Bottom Punched Leg Sheet)
SS40721212		12 Gauge (Bottom Punched Leg Sheet)	
<b>D</b>	BLK-10695	12	12' 45° Offset Hopper Panel (14 Ga.)
<b>E</b>	BLK-12045	8	12' 45° (1-5 Ring) Leg (154.125") (12 Gauge) 1-Ring Coverage
	BLK-12045	8	12' 45° (6-7 Ring) Leg (154.125") (10 Gauge) 1-3/4 Ring Coverage
<b>F</b>	BLK-12115	8	Hopper Brace for 16" Collar (62.7")(Shown)
	BLK-12116	8	Hopper Brace for 22" Collar (60.1")
<b>G</b>	BLK-10847	1	16" 45° Hopper Extension Kit w/ Collar (Shown)
	BLK-10854	1	22" 45° Hopper Collar (36 Holes)
<b>H</b>	Blk-11730	1	30° Roof Bulk Tank Peak Ring
	Blk-12534	1	40° Roof Bulk Tank Peak Ring
<b>J</b>	BLK-12060	8	12' Inside Cross Tie Brace (67.788") (12 Gauge)
	BLK-12061	8	12' Outside Cross Tie Brace (67.788") (12 Gauge)
<b>NS</b>	BLK-12021	12	12' Hopper Reinforcement Angle (optional)

**12' DIAMETER 45° HOPPER BIN SPECIFICATIONS**



**IMPORTANT:** Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #26-27 for location of caulking.

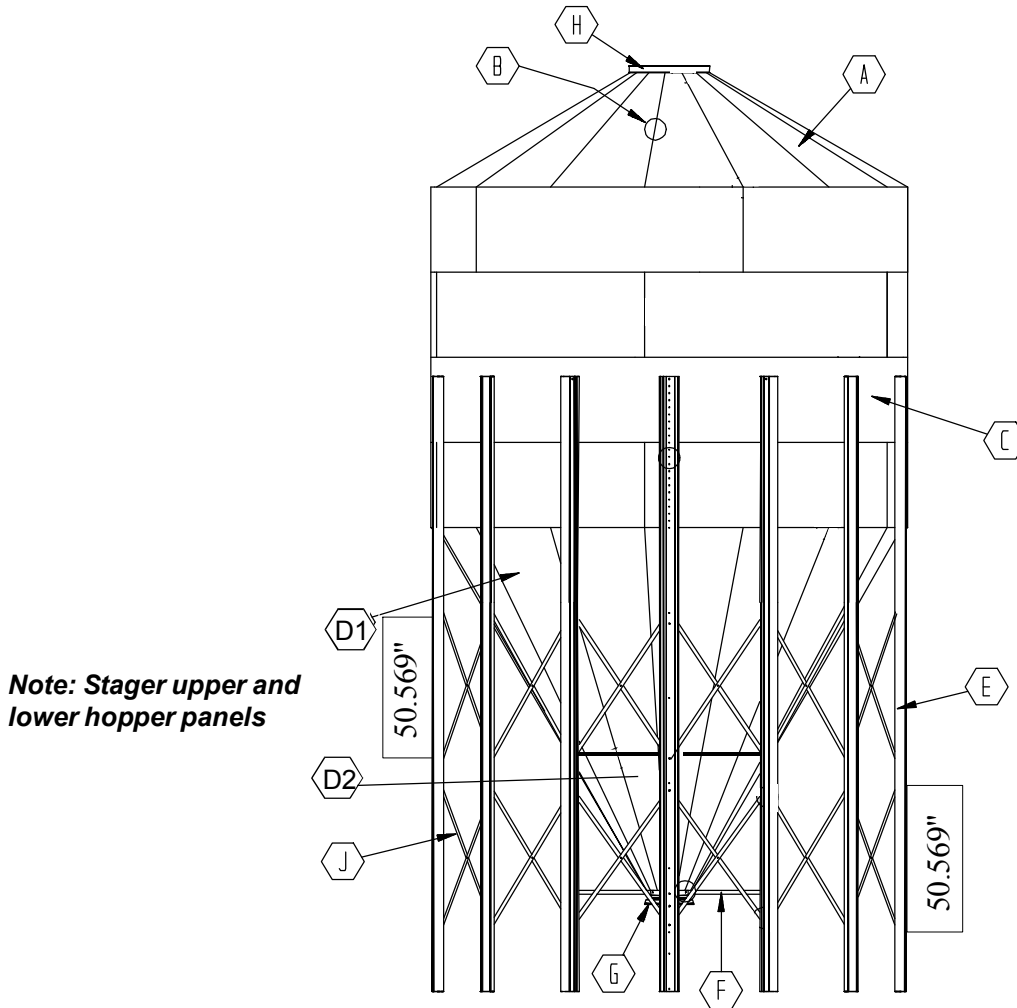
**12' DIAMETER 45° HOPPER BIN HARDWARE USAGE**

*Note: Bolts listed first, nuts second for each usage.*

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>1</b>	S-275	36	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	36	
<b>2</b>	S-275	240	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	240	
<b>3</b>	S-275	144	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	144	
<b>4</b>	S-275	Varies	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>5</b>	S-275	Varies	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>6</b>	S-275	96 OR 168	Leg to Sidewall Sheet (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank)
	S-396	96 OR 168	
<b>7</b>	S-277	288	Hopper Panels to Sidewall Sheet (Use 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	288	
<b>8</b>	S-4303	300	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)
	S-3611	300	
<b>9</b>	S-4303	36	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown)
	S-3611	36	
<b>10</b>	S-7927	8	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	8	
<b>11</b>	S-7927	24	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	24	



15' DIAMETER 60° HOPPER BIN SPECIFICATIONS



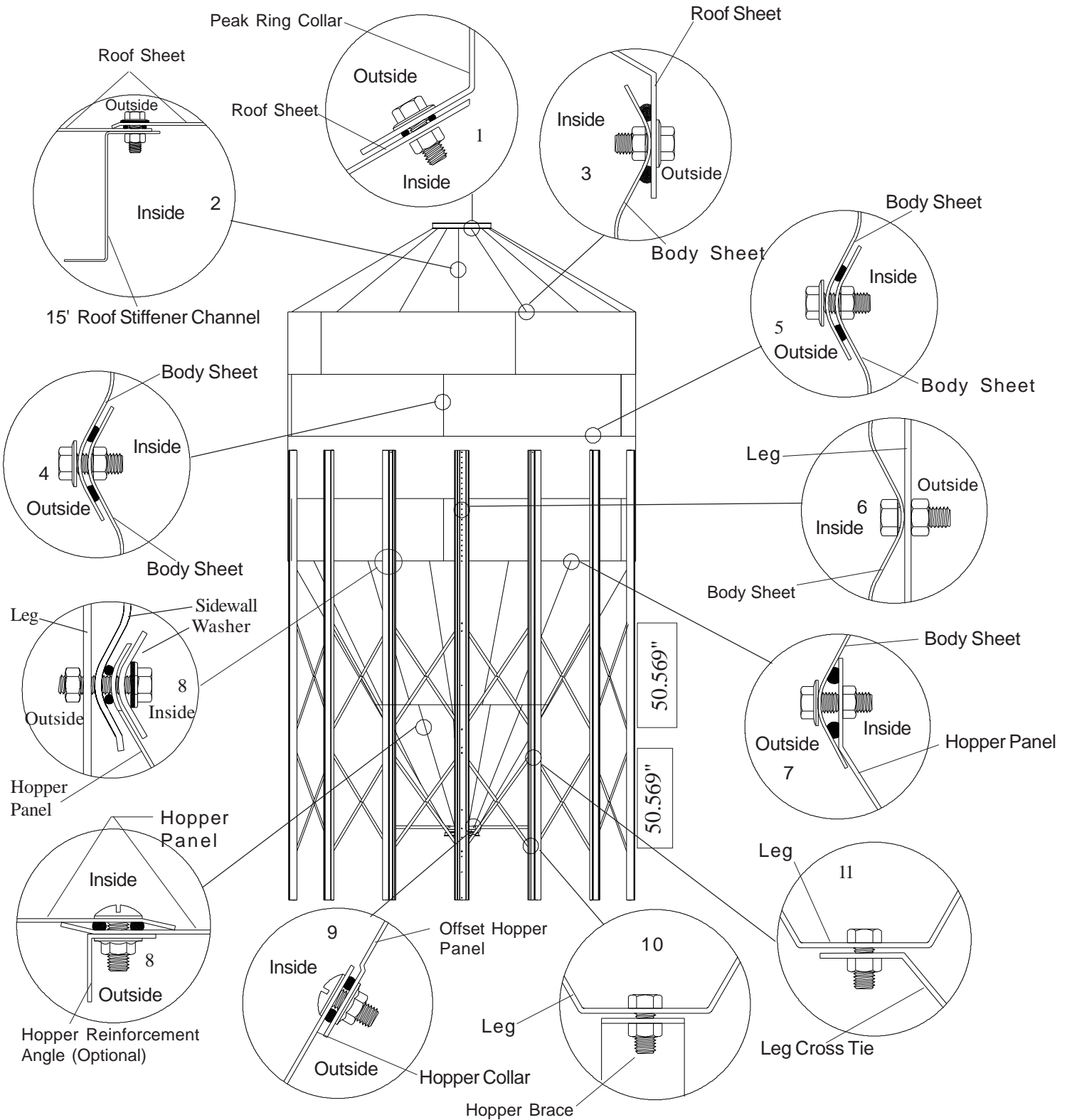
Under Collar Clearance	
16" Collar	33" (838 mm)
22" Collar	37.9/16" (954 mm)

IMPORTANT: Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #27 for location of caulking.

**15' DIAMETER 60° HOPPER BIN PARTS LIST**

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>A</b>	BLK-12278	18	15' 30° Roof Panel (20 Gauge)
<b>B</b>	BLK-12288	18	15' 30° Roof Stiffener Channel
<b>C</b>	<b>15' Sidewall Sheet</b>	<b>5 Per Ring</b>	
	HT38742015		20 Gauge (Top Punched Sidewall Sheet)
	HT38752015		20 Gauge (Top Punched Decal Sidewall Sheet)
	HT43421815		18 Gauge (Top 3-Leg Punched Sidewall Sheet)
	HT43431815		18 Gauge (Top 3-Leg Punched Decal Sidewall Sheet)
	SS00151815		18 Gauge (Middle Punched Sidewall Sheet)
	HT33911815		18 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	SS00151615		16 Gauge (Middle Punched Sidewall Sheet)
	HT33911615		16 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	SS00151415		14 Gauge (Middle Punched Sidewall Sheet)
	HT33911415		14 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	HT43691415		14 Gauge (Bottom 3-Leg Punched Sidewall Sheet)
HT43691215		12 Gauge (Bottom 3-Leg Punched Sidewall Sheet)	
<b>D1</b>	BLK-11209	18	15' 60° Upper Hopper Panel (14 Gauge)
<b>D2</b>	BLK-11210	9	15' 60° Lower Hopper Panel (16 Gauge)
<b>E</b>	BLK-12048	15	15' 60° Leg 231.00" (10 Gauge)
<b>F</b>	BLK-12117	3	Hopper Brace for 16" Collar (Shown)
	BLK-12119	3	Hopper Brace for 22" Collar
<b>G</b>	BLK-10587	1	16" 60° Hopper Extension Kit w/ Collar (Shown)
	BLK-10324	1	22" 60° Hopper Collar (36 Holes)
<b>H</b>	BLK-11730	1	Bulk Tank Peak Ring
<b>J</b>	BLK-12062	30	15' Inside Cross Tie Brace (64.4") (12 ga.)
	BLK-12063	30	15' Outside Cross Tie Brace (64.4") (12 ga.)

**15' DIAMETER 60° HOPPER BIN SPECIFICATIONS**



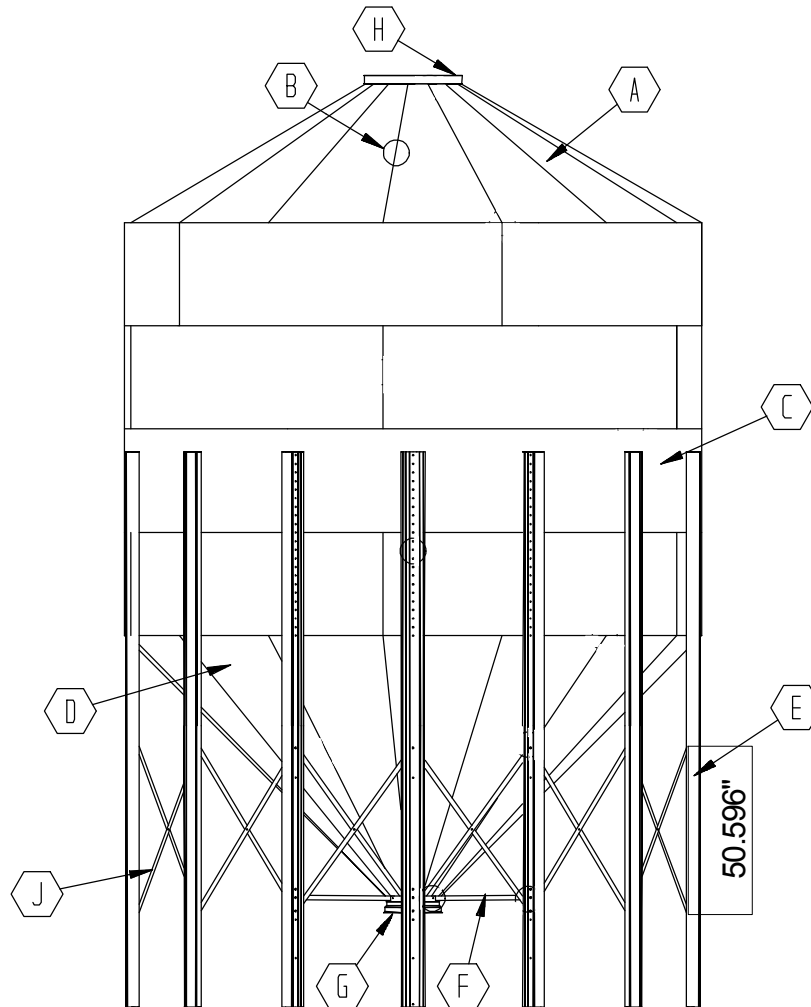
**IMPORTANT:** Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #27 for location of caulking.

**15' DIAMETER 60° HOPPER BIN HARDWARE USAGE**

*Note: Bolts listed first, nut second for each usage.*

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>1</b>	S-275	36	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	36	
<b>2</b>	S-275	414	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	414	
<b>3</b>	S-275	180	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	180	
<b>4</b>	S-275	Varies	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>5</b>	S-275	Varies	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>6</b>	S-275	330	Leg to Sidewall Sheet (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank)
	S-396	330	
<b>7</b>	S-277	360	Hopper Panels to Sidewall Sheet (Use 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	360	
<b>8</b>	S-277	15	Leg to Body Sheet to Hopper Connection (Use 10 Gauge Washer under 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	15	
	BLK-12483	15	
<b>9</b>	S-4303	850	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)
	S-3611	850	
<b>10</b>	S-4303	36	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown)
	S-3611	36	
<b>11</b>	S-7927	3	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	3	
<b>12</b>	S-7927	90	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	90	

15' DIAMETER 45° HOPPER BIN SPECIFICATIONS



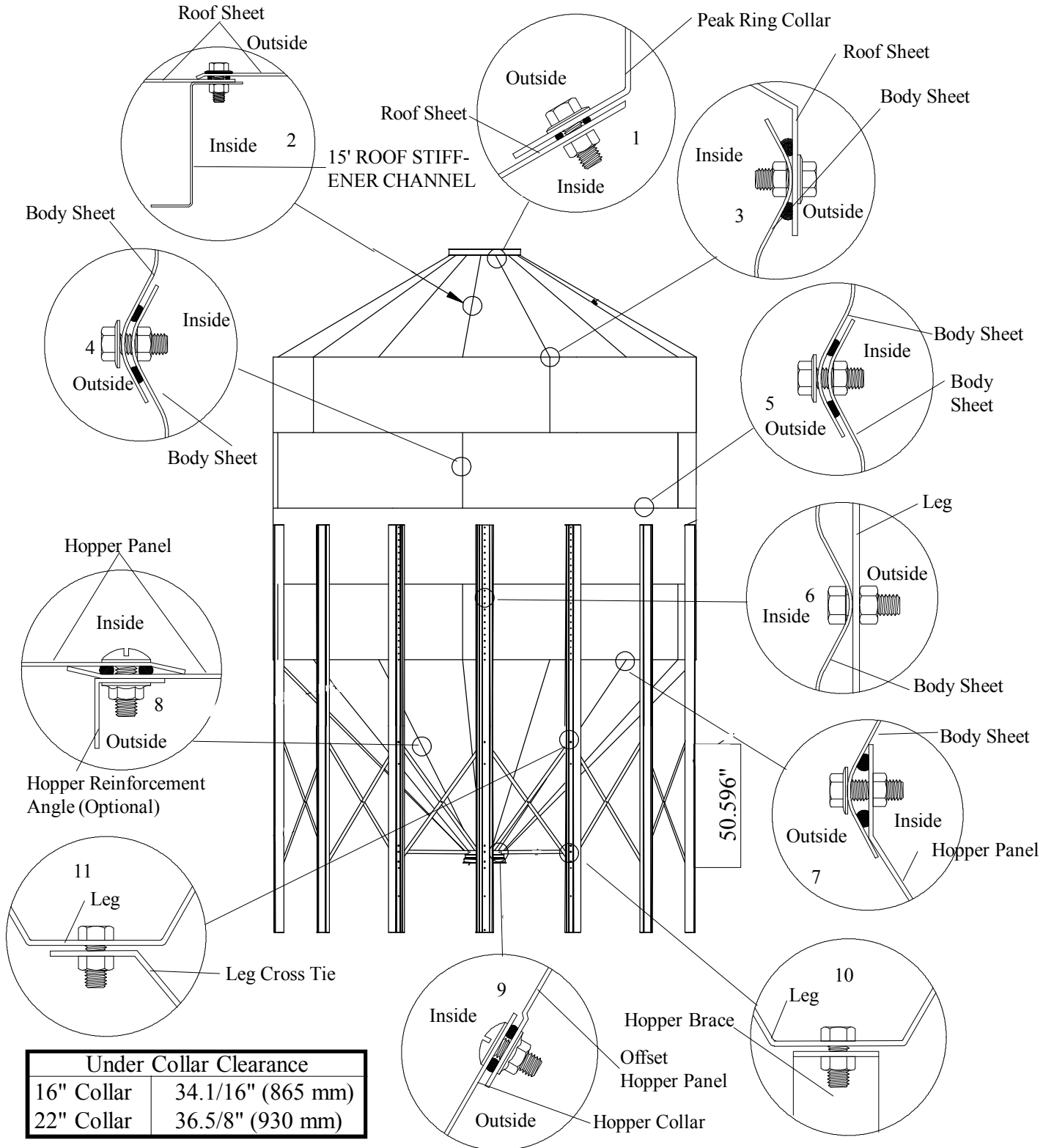
Under Collar Clearance	
16" Collar	34.1/16" (865 mm)
22" Collar	36.5/8" (930 mm)

IMPORTANT: Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #27 for location of caulking.

**15' DIAMETER 45° HOPPER BIN PARTS LIST**

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>A</b>	BLK-12278	18	15' 30° Roof Panel (20 Gauge)
<b>B</b>	BLK-12288	18	15' 30° Roof Stiffener Channel
<b>C</b>	<b>15' Sidewall Sheet</b>	<b>5 Per Ring</b>	
	HT38742015		20 Gauge (Top Punched Sidewall Sheet)
	HT38752015		20 Gauge (Top Punched Decal Sidewall Sheet)
	HT43421815		18 Gauge (Top 3-Leg Punched Sidewall Sheet)
	HT43431815		18 Gauge (Top 3-Leg Punched Decal Sidewall Sheet)
	SS00151815		18 Gauge (Middle Punched Sidewall Sheet)
	HT33911815		18 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	SS00151615		16 Gauge (Middle Punched Sidewall Sheet)
	HT33911615		16 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	SS00151415		14 Gauge (Middle Punched Sidewall Sheet)
	HT33911415		14 Gauge (Middle 3-Leg Punched Sidewall Sheet)
HT43691415		14 Gauge (Bottom 3-Leg Punched Sidewall Sheet)	
HT43691215		12 Gauge (Bottom 3-Leg Punched Sidewall Sheet)	
<b>D</b>	BLK-10845	18	15' 45° Hopper Panel (14 Gauge)
<b>E</b>	BLK-12047	15	15' 45° Leg 172.125" (10 Gauge)
<b>F</b>	BLK-12118	3	Hopper Brace for 16" Collar (Shown)
	BLK-12120	3	Hopper Brace for 22" Collar
<b>G</b>	BLK-10847	1	16" 45° Hopper Extension Kit w/ Collar (Shown)
	BLK-10854	1	22" 45° Hopper Collar (36 Holes)
<b>H</b>	BLK-11730	1	Bulk Tank Peak Ring
<b>J</b>	BLK-12062	30	15' Inside Cross Tie Brace (64.4") (12 ga.)
	BLK-12063	30	15' Outside Cross Tie Brace (64.4") (12 ga.)

**15' DIAMETER 45° HOPPER BIN SPECIFICATIONS**



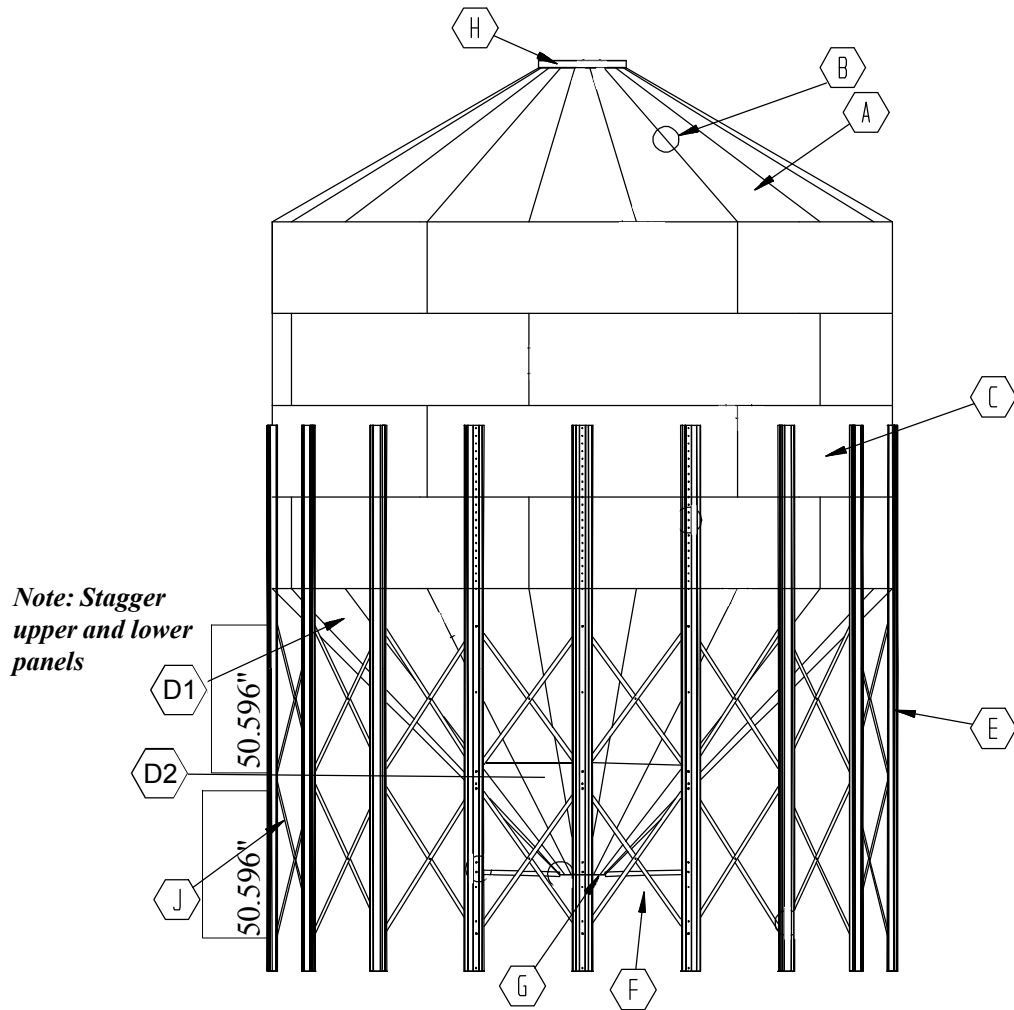
**15' DIAMETER 45° HOPPER BIN HARDWARE USAGE**

*Note: Bolts listed first, nuts second for each usage.*

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>1</b>	S-275	36	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	36	
<b>2</b>	S-275	414	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	414	
<b>3</b>	S-275	180	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	180	
<b>4</b>	S-275	Varies	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>5</b>	S-275	Varies	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>6</b>	S-275	330	Leg to Sidewall Sheet (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank)
	S-396	330	
<b>7</b>	S-277	360	Hopper Panels to Sidewall Sheet (Use 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	360	
<b>8</b>	S-4303	720	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)
	S-3611	720	
<b>9</b>	S-4303	36	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown)
	S-3611	36	
<b>10</b>	S-7927	3	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	3	
<b>11</b>	S-7927	45	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	45	



18' DIAMETER 45° HOPPER BIN SPECIFICATIONS



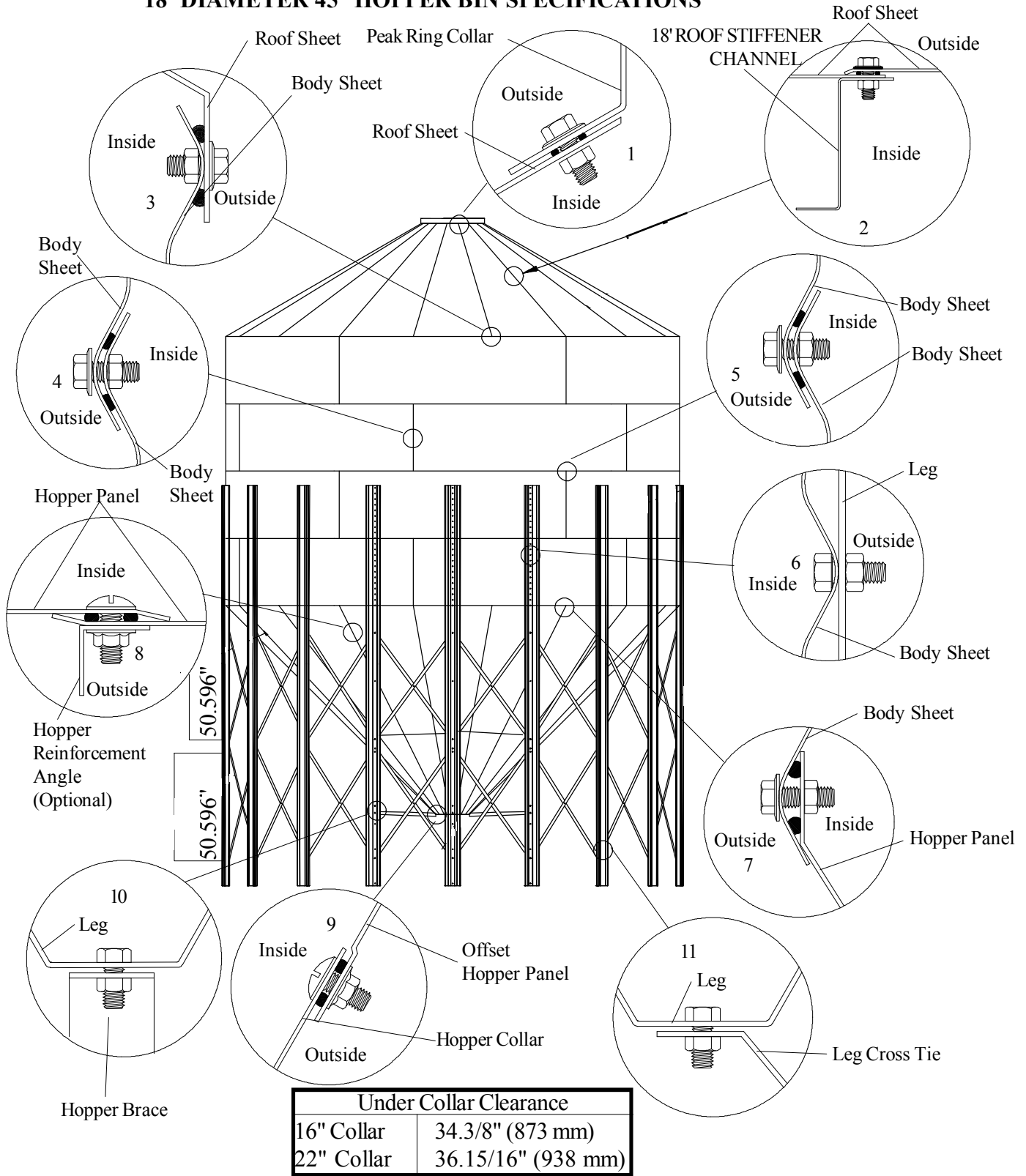
Under Collar Clearance	
16" Collar	34.3/8" (873 mm)
22" Collar	36.15/16" (938 mm)

*IMPORTANT: Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #27 for location of caulking.*

**18' DIAMETER 45° HOPPER BIN PARTS LIST**

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>A</b>	BLK-12281	18	18' 30° Roof Panel (20 Gauge)
<b>B</b>	BLK-12286	18	18' 30° Roof Stiffener Channel
<b>C</b>	<b>18' Sidewall Sheet</b>	<b>5 Per Ring</b>	
	HT38742018		20 Gauge (Top Punched Sidewall Sheet)
	SS00152018		20 Gauge (Middle Punched Sidewall Sheet)
	SS00151818		18 Gauge (Middle Punched Sidewall Sheet)
	HT43421618		16 Gauge (Top 3-Leg Punched Sidewall Sheet)
	HT33911618		16 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	SS00151618		16 Gauge (Middle Punched Sidewall Sheet)
	HT33911418		14 Gauge (Middle 3-Leg Punched Sidewall Sheet)
	HT33921218		12 Gauge (Bottom 3-Leg Punched Sidewall Sheet)
HT33921018		10 Gauge (Bottom 3-Leg Punched Sidewall Sheet)	
<b>D1</b>	BLK-11887	18	18' 45° Upper Hopper Panel (12 Gauge)
<b>D2</b>	BLK-10846	18	18' 45° Lower Hopper Panel (14 Gauge)
<b>E</b>	BLK-12049	18	18' 45° Leg (190.0") (10 gauge)
<b>F</b>	BLK-12121	3	Hopper Brace for 16" Collar (Shown)
	BLK-12122	3	Hopper Brace for 22" Collar
<b>G</b>	BLK-10847	1	16" 45° Hopper Extension Kit w/ Collar (Shown)
	BLK-10854	1	22" 45° Hopper Collar (36 Holes)
<b>H</b>	BLK-11730	1	Bulk Tank Peak Ring
<b>G</b>	BLK-12062	36	18' Inside Cross Tie Brace (12 gauge)
	BLK-12063	36	18' Outside Cross Tie Brace (12 gauge)

**18' DIAMETER 45° HOPPER BIN SPECIFICATIONS**



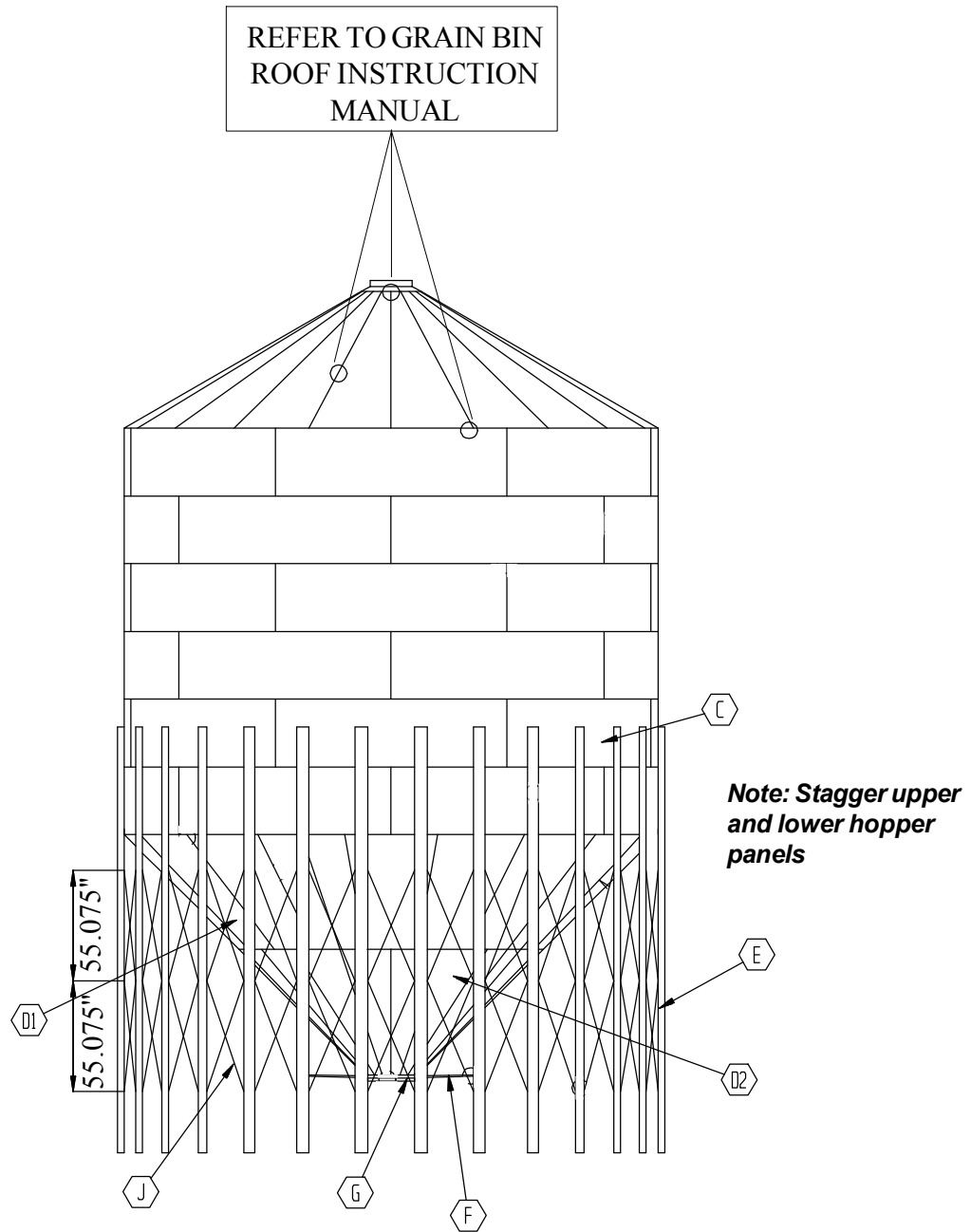
**IMPORTANT:** Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #27 for location of caulking.

**18' DIAMETER 45° HOPPER BIN HARDWARE USAGE**

*Note: Bolts listed first, nut second for each usage.*

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
<b>1</b>	S-275	36	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	36	
<b>2</b>	S-275	504	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	504	
<b>3</b>	S-275	216	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	216	
<b>4</b>	S-275	Varies	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>5</b>	S-275	Varies	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>6</b>	S-275	396	Leg to Sidewall Sheet (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank)
	S-396	396	
<b>7</b>	S-277	288	Hopper Panels to Sidewall Sheet (Use 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	288	
<b>8</b>	S-4303	1260	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)
	S-3611	1260	
<b>9</b>	S-4303	36	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown)
	S-3611	36	
<b>10</b>	S-7927	3	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	3	
<b>11</b>	S-7927	108	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	108	

21' DIAMETER 45° HOPPER BIN SPECIFICATIONS



Under Collar Clearance	
16" Collar	33.15/16" (862 mm)
22" Collar	36.1/2" (927 mm)

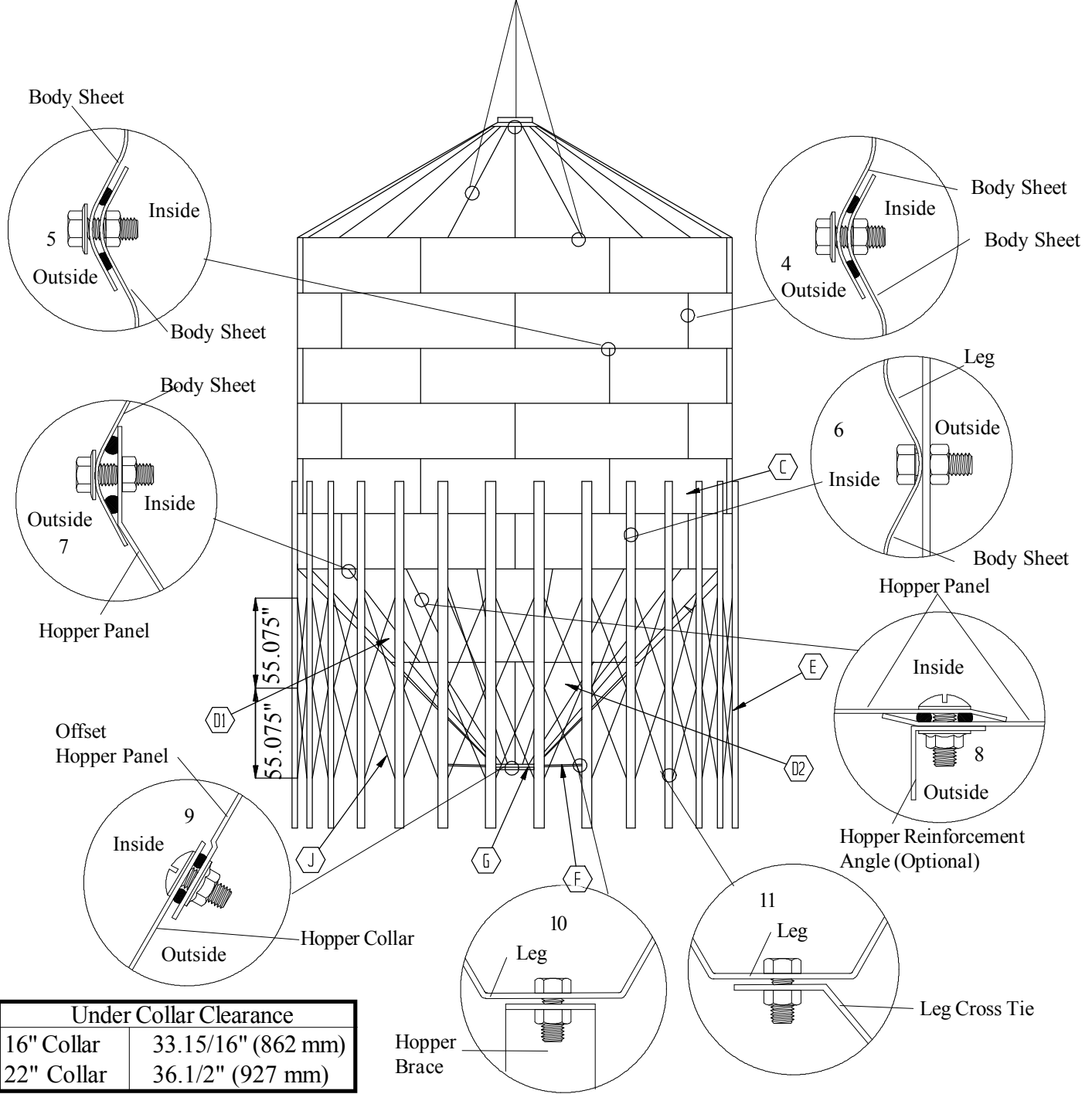
*IMPORTANT: Bolt Heads are inside of bin at the Leg to Body attachment and on all Vertical Seams on Hopper Panels. All bolts to be tightened from the nut side only. Refer to Detail on Page #27 for location of caulking.*

**21' DIAMETER 45° HOPPER BIN PARTS LIST**

Key	Part No.	Qty	Description
	Grain Bin Roof		UTILIZES GRAIN BIN STYLE ROOF, SEE 30° GRAIN BIN ROOF ERECTION MANUAL
	<b>21' Body Sheets</b>	<b>7 per Ring</b>	
C	SS22012021 SS00152021 SS00151721 SS00151621 SS60141621 SS60131021		20 gauge (Decal Sheet) 20 gauge (Middle Sheet) 17 gauge (Middle Sheet) 16 gauge (Middle Sheet) 16 gauge (middle-Leg Sheet) 10 gauge ( Bottom Sheet)
D1 D2	BLK-11244 BLK-10846	18 18	21' 45 ° Upper Hopper Panel (12 gauge) 21' 45 ° Lower Hopper Panel (14 gauge)
E	BLK-12050	28	21' 45 ° Leg 201-1/2" (10 gauge)
F	BLK-12123 BLK-12124	4 4	Hopper Brace for 16" Collar (Shown) Hopper Brace for 22" Collar
G	BLK-10847 BLK-10854	1 1	16" 45 ° Hopper Extension Kit w/ Collar (Shown) 22" 45 ° Hopper Collar (36 Holes)
J	BLK-12066 BLK-12067	56 56	21' Inside Cross Tie Brace (12 gauge) 21' Outside Cross Tie Brace (12 gauge)

**21' DIAMETER 45° HOPPER BIN SPECIFICATIONS**

REFER TO GRAIN BIN  
ROOF INSTRUCTION  
MANUAL



Under Collar Clearance	
16" Collar	33.15/16" (862 mm)
22" Collar	36.1/2" (927 mm)

**21' DIAMETER 45° HOPPER BIN HARDWARE USAGE**

*Note: Bolts listed first, nut second in each usage.*

<b>Key</b>	<b>Part No.</b>	<b>Qty.</b>	<b>Description</b>
	Grain Bin Roof Hardware		UTILIZES GRAIN BIN STYLE ROOF - SEE 30° GRAIN BIN ROOF INSTRUCTION MANUAL
<b>4</b>	S-275	Varies	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>5</b>	S-275	Varies	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)
	S-396	Varies	
<b>6</b>	S-275	532	Leg to Sidewall Sheet (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Heads to Inside of Tank)
	S-396	532	
<b>7</b>	S-277	504	Hopper Panels to Sidewall Sheet (Use 5/16" x 1-1/4" Hex Head Bin Bolts and 5/16" Hex Nuts.) (Bolt Head to Inside at Leg to Hopper to Sidewall Connection Only.)
	S-396	504	
<b>8</b>	S-4303	1700	Vertical Hopper Seams (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.)
	S-3611	1700	
<b>9</b>	S-4303	36	Hopper Collar to Hopper Panel (Use 5/16" x 3/4" Truss Head Bin Bolts and 5/16" Flanged Whiz Nuts.) (Bolt Heads to Inside of Tank.) (16" Shown)
	S-3611	36	
<b>10</b>	S-7927	4	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	4	
<b>11</b>	S-7927	168	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)
	S-456	168	



# **NOTES**



## **The GSI Group, Inc. Warranty**

THE GSI GROUP, INC. ("GSI") WARRANTS ALL PRODUCTS WHICH IT MANUFACTURES TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USAGE AND CONDITIONS FOR A PERIOD OF 12 MONTHS AFTER RETAIL SALE TO THE ORIGINAL END USER. THE PURCHASER'S SOLE REMEDY AND GSI'S ONLY OBLIGATION SHALL BE TO REPAIR OR REPLACE, AT GSI'S OPTION AND EXPENSE, PRODUCTS THAT, IN GSI'S SOLE JUDGMENT, CONTAIN A MATERIAL DEFECT DUE TO MATERIALS OR WORKMANSHIP. ALL DELIVERY AND SHIPMENT CHARGES TO AND FROM GSI'S FACTORY WILL BE PURCHASER'S RESPONSIBILITY. EXPENSES INCURRED BY OR ON BEHALF OF THE PURCHASER WITHOUT PRIOR WRITTEN AUTHORIZATION FROM AN AUTHORIZED EMPLOYEE OF GSI SHALL BE THE SOLE RESPONSIBILITY OF THE PURCHASER.

EXCEPT FOR THE LIMITED WARRANTY EXPRESSED ABOVE, GSI MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH (i) PRODUCT MANUFACTURED OR SOLD BY GSI OR (ii) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

GSI SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR BENEFITS. PURCHASER'S SOLE AND EXCLUSIVE REMEDY IS AS SET FORTH IN THE LIMITED WARRANTY EXPRESSED ABOVE, WHICH SHALL NOT EXCEED THE AMOUNT PAID FOR THE PRODUCT PURCHASED. THIS WARRANTY IS NOT TRANSFERABLE AND APPLIES ONLY TO THE ORIGINAL PURCHASER. GSI SHALL HAVE NO OBLIGATION OR RESPONSIBILITY FOR ANY REPRESENTATIONS OR WARRANTIES MADE BY OR ON BEHALF OF ANY DEALER, AGENT OR DISTRIBUTOR OF GSI.

GSI ASSUMES NO RESPONSIBILITY FOR CLAIMS RESULTING FROM ERECTION DEFECTS OR UNAUTHORIZED MODIFICATIONS TO PRODUCTS WHICH IT MANUFACTURED. MODIFICATIONS TO PRODUCTS NOT SPECIFICALLY DELINEATED IN THE MANUAL ACCOMPANYING THE EQUIPMENT AT INITIAL SALE WILL NULLIFY THE PRODUCT WARRANTY THAT MIGHT HAVE BEEN OTHERWISE AVAILABLE.

THE FOREGOING WARRANTY SHALL NOT EXTEND TO PRODUCTS OR PARTS WHICH HAVE BEEN DAMAGED BY NEGLIGENT USE, MISUSE, ALTERATION OR ACCIDENT. THIS WARRANTY EXTENDS SOLELY TO ONLY PRODUCTS MANUFACTURED BY GSI. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. GSI RESERVES THE RIGHT TO MAKE DESIGN OR SPECIFICATION CHANGES AT ANY TIME.

PRIOR TO INSTALLATION, PURCHASER HAS THE RESPONSIBILITY TO COMPLY WITH ALL FEDERAL, STATE AND LOCAL CODES WHICH MAY APPLY TO THE LOCATION AND INSTALLATION OF PRODUCTS MANUFACTURED OR SOLD BY GSI.

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This Equipment shall be installed in accordance with the current installation codes and applicable regulations which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installation occurs.



The GSI Group, Inc.  
1004 E. Illinois St.  
Assumption, IL 62510-0020  
Phone: 217-226-4421  
Fax: 217-226-4420

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