



12', 15', 18' and 21' Bulk Feed Tanks BFT and GHT Series

Assembly Manual

PNEG-257

Date: 01-27-12

G S I GROUP



PNEG-257

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.

Contents

Chapter 1 Introduction	5
Chapter 2 Safety	6
Safety Guidelines	6
General Safety Statement	7
Safety Instructions	8
Proper Storage of Grain Bin/Silo Materials Prior to Construction	10
Chapter 3 Decals	11
Chapter 4 General Information	14
Bulk Feed Tank Assembly Manual General Instructions	14
Chapter 5 Foundation	15
Chapter 6 Sidewall Assembly	26
Bulk Feed Tank Assembly	26
Sidewall Sheet Orientation (12' Only)	27
Sidewall Erection	28
Chapter 7 Roof	30
Sealed Roof Panel Installation (12'-18' BFT)	30
12' Roof Reinforcement Angle	32
Roof Ladder	33
12' 60° Roof Cap Ground Control	36
Roof Cap	41
15' and 18' Roof Assembly Instructions	42
Raising the Roof	44
Chapter 8 Hopper Assembly	46
Hopper Sheets	46
Hopper Collar Assembly	49
Chapter 9 Leg and Leg Bracing	50
12' Only	50
Installation of Leg to Sidewall	51
Installation of Leg to Sidewall for 15', 18' and 21' BFT	52
12'-21' Leg Bracing	53
Bracing Hole Layouts	55
Hopper to Leg Bracing	59
Chapter 10 Ladder	60
Optional Sidewall Ladder	60
Ladder Safety Cage	61
Optional Safety Cage	61
Safety Cage Assembly	63
Chapter 11 Raising Bin	65
Raising Bin to Set on Foundation	65
Chapter 12 Grounding	67
Chapter 13 Pneumatic Fill Kit	68
Pneumatic Fill Kit Assembly	68
Roof Panel	68

Table of Contents

Chapter 14 Parts List	71
12' Diameter 60° Hopper Bin Specifications	72
12' Diameter 60° Hopper Bin Hardware Specification	74
12' Diameter 45° Hopper Bin Specifications	76
12' Diameter 45° Hopper Bin Hardware Specification	78
15' Diameter 60° Hopper Bin Specifications	80
15' Diameter 60° Hopper Bin Hardware Specification	82
15' Diameter 45° Hopper Bin Specifications	84
15' Diameter 45° Hopper Bin Hardware Specification	86
18' Diameter 45° Hopper Bin Specifications	88
18' Diameter 45° Hopper Bin Hardware Specification	90
21' Diameter 45° Hopper Bin Specifications	92
21' Diameter 45° Hopper Bin Hardware Specification	94
Chapter 15 Warranty	97

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. The customer should report and note any damage or shortage on the bill of lading to justify their claim to the transport company.

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

This warranty provides you the assurance that the company will back its products when 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 its 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 a hazardous situation which, if not avoided, will result in death or serious injury.



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



CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury.

General Safety Statement

Our foremost 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 that may be encountered by the operator and other personnel.

As owner and/or operator, you are responsible 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, which 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. 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 also be reviewed and considered. 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, which may cause serious injury. To avoid injury, handle sharp edges with caution and always use proper protective clothing and equipment.

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, like a dome. Sidewall sheets stored on edge must be secured so that they cannot fall over and cause injury. Use care when handling and moving 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.

2. Safety

Safety Instructions

Our foremost concern is your safety and the safety of others associated with this equipment. We want to keep you as a customer. This manual is to help you understand safe operating procedures and some problems that 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 to 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.

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 installations are made.

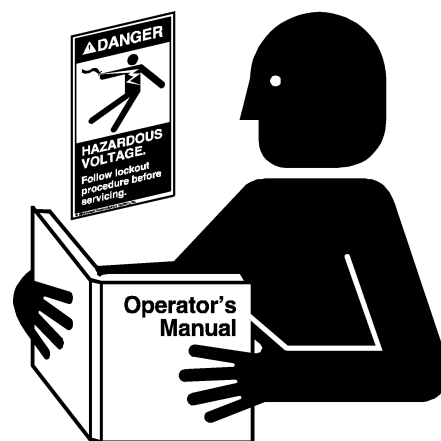
Follow Safety Instructions

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 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 or 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 away from rotating parts.

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



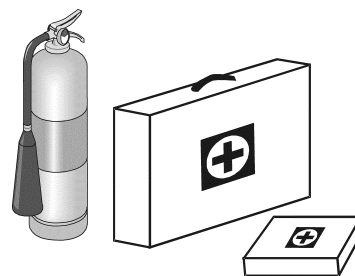
Maintain Equipment and Work Area

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.

Remove all jewelry.

Tie long hair up and back.

Wear safety glasses at all times to protect eyes from debris.

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

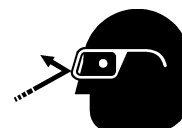
Wear steel toed-boots to help protect your feet from falling debris. Tuck in any loose or dangling shoestrings.

A respirator may be needed to prevent breathing potentially toxic fumes and dust.

Wear a hard hat to help protect your head.

Wear appropriate fall protection equipment when working at elevations greater than six feet (6').

Eye Protection



Gloves



Steel-Toed Boots



Respirator



Hard Hat



Fall Protection



Proper Storage of Grain Bin/Silo Materials Prior to Construction

Wet storage stain (rust) will develop when closely packed bundles of galvanized material, such as sidewall and roof sheets, have moisture present. Inspect roof and sidewall bundles on arrival for any moisture. If moisture is present, it must not be allowed to remain between the sheets. Separate the sheets or panels immediately and wipe them down. Spray with a light oil or diesel fuel.

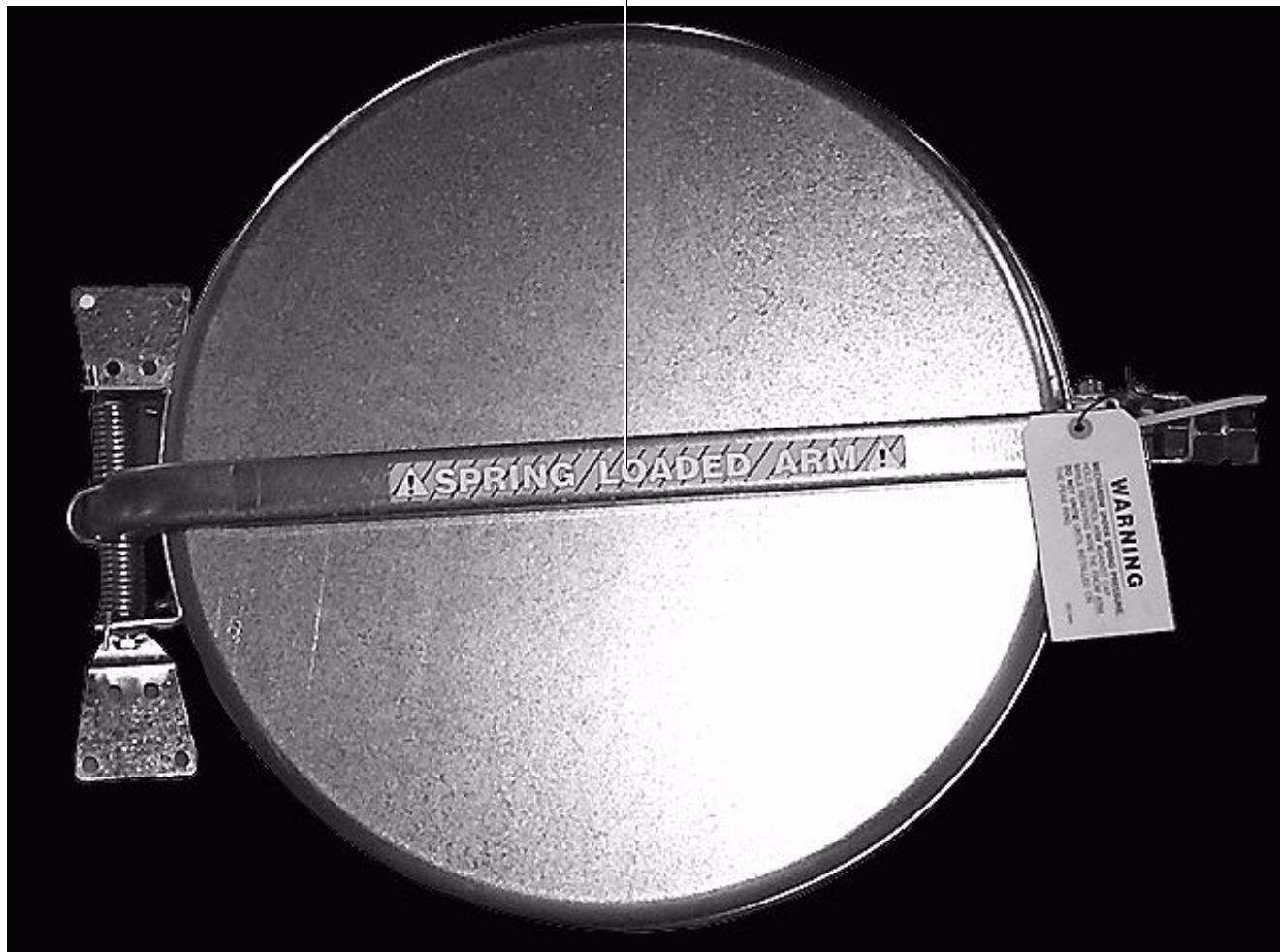
If possible, sidewall bundles, roof sheets and other closely packed galvanized materials should be stored in a dry, climate controlled building. If outdoor storage is unavoidable, the materials should be stored so that they are raised above the ground and vegetation. Any stacking and spacing materials should not be corrosive or wet. Be sure to protect materials from the weather, but permit air movement around the bundles if possible.

Storing roof bundles and sidewall sheets at a slight incline can also help minimize the presence of moisture. Storing the bundles with the center of the dome up (like an arch) is one option for minimizing moisture during storage. Sidewall bundles can also be stored on edge but must be secured so that they do not fall over and cause injury.

If “white rust” or “wet storage stain” occurs, contact the manufacturer immediately about ways to minimize the adverse effect upon the galvanized coating.

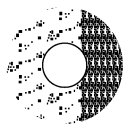
! SPRING LOADED ARM !

DC-604



DC-604 Located on the cap latch control arm.

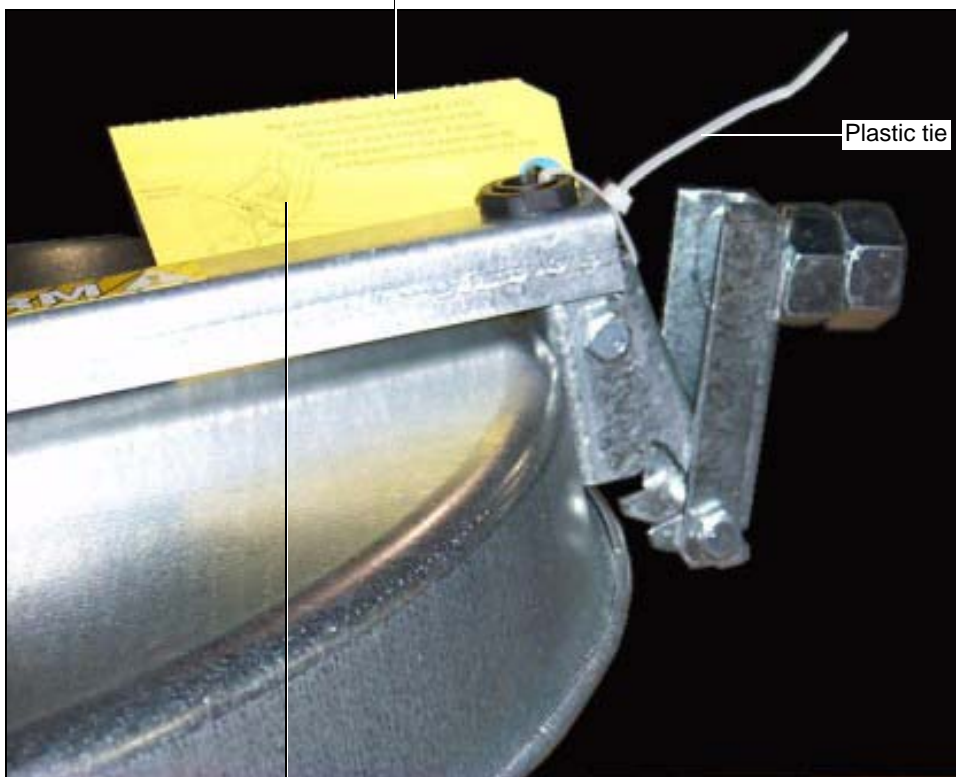
WARNING



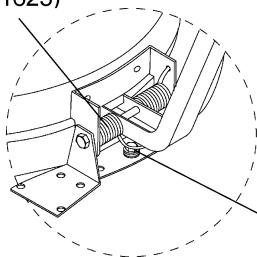
**MECHANISM UNDER SPRING PRESSURE.
HOLD CONTROL ARM AGAINST CAP
WHILE REMOVING WIRE TIE FROM ARM.
DO NOT UNITE UNTIL INSTALLED ON
THE PEAK RING.**

DC-590

DC-590 Located on the cap latch control arm.



Main cap spring
(BLK-11623)



Make sure loop of main cap spring (BLK-11623) is held securely in the preloaded position by the 5/16" x 1-1/4" stop bolt beneath. If necessary, place one or more 5/16" flat washers under the bolt head to ensure that the bolt catches the loop.



5/16" x 1-1/4" Stop bolt
5/16" Flat washers

! 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:

GSI Decals
 1004 E. Illinois St.
 Assumption, IL. 62510
 Phone: 1-217-226-4421

4. General Information

Bulk Feed Tank Assembly Manual General Instructions

First, read the assembly manual completely before starting to assemble the Bulk Feed Tank. Check the 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 2 rings, the leg holes must be in **alignment** in the bottom 2 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.

1. Assorted sizes of combination wrenches
2. Hammer
3. 3-12" Long drift punches
4. 1 Large flathead screwdriver
5. 1 Pair of slip joint pliers
6. Two (2) adjustable wrenches
7. Ratchet and sockets
8. 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.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# 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

*

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-5	381 mm	6.93 Cu. Meters	18.21 Sq. Meters	8
6	406 mm	7.40 Cu. Meters	18.21 Sq. Meters	8
7	406 mm	7.40 Cu. Meters	18.21 Sq. Meters	8
8	432 mm	7.86 Cu. Meters	18.21 Sq. Meters	8

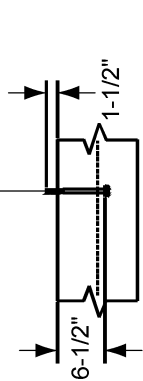
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GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.^2 allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

Anchor bolt 5/8" x 8" (203 mm) bolt with a 1/8" thick x 1-3/4" O.D. washer on head.



Ø 12' - 2-15/16" (3732 mm)

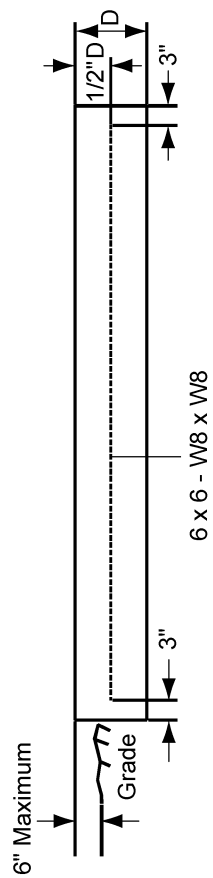
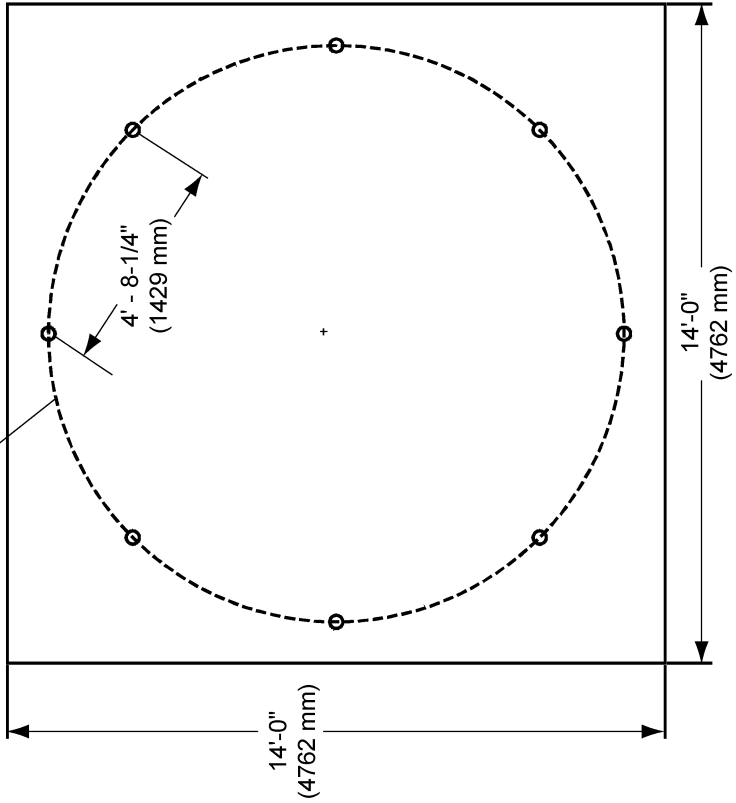
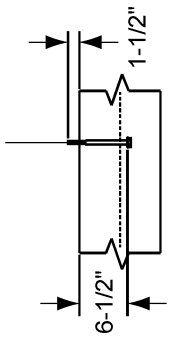


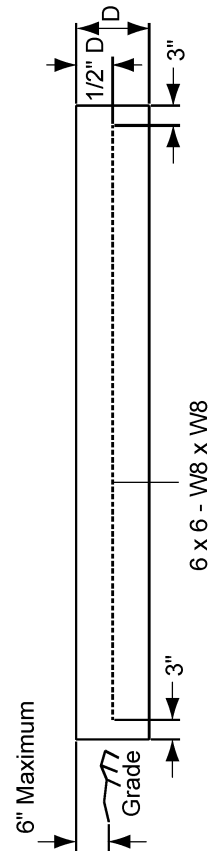
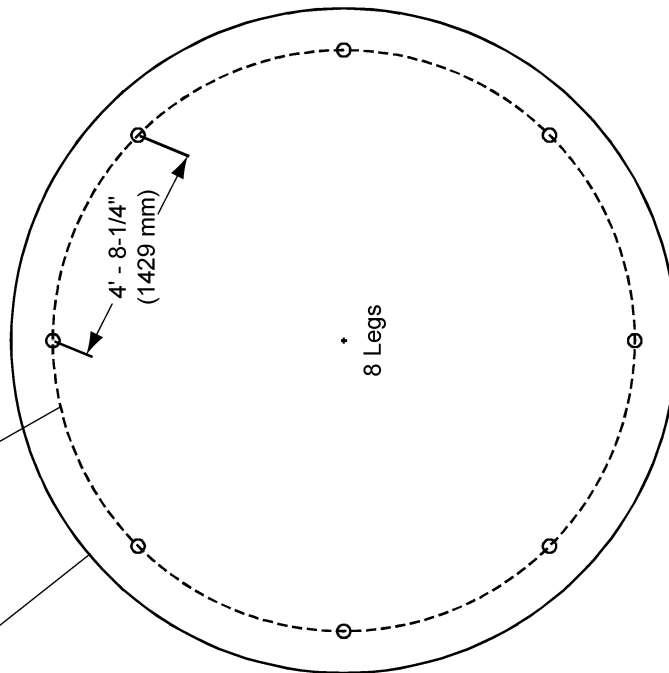
Figure 5A 12' 2-8 Rings BFT/GHT Square Pad

Anchor bolt 5/8" x 8" (203 mm) bolt with a 1/8" thick x 1-3/4" O.D. washer on head.



Ø 12' - 2-15/16" (3732 mm)

Ø 14'-0" (4762 mm)



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.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# 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

*

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# 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

*

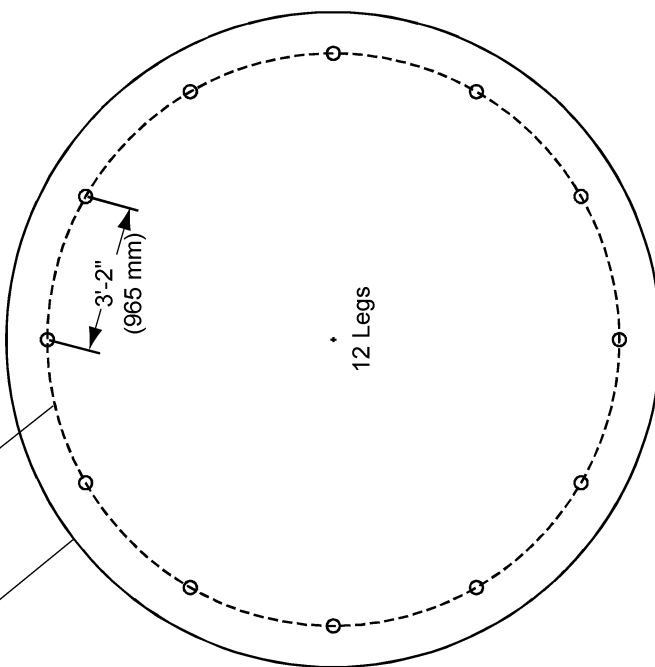
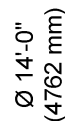
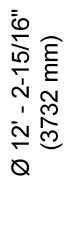
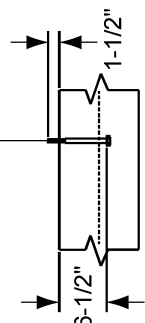
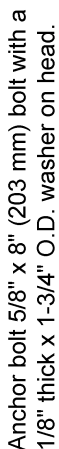
GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

Figure 5B 12' 2-8 Rings BFT/GHT Round Pad

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.



# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
8	15"	4"	5.0 Cu. Yards	175 Sq. Ft.	12
9	18"	4"	5.8 Cu. Yards	175 Sq. Ft.	12
10	20"	4"	6.4 Cu. Yards	175 Sq. Ft.	12

*

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
8	381 mm	102 mm	3.82 Cu. Meters	16.26 Sq. Meters	12
9	457 mm	102 mm	4.43 Cu. Meters	16.26 Sq. Meters	12
10	508 mm	102 mm	4.89 Cu. Meters	16.26 Sq. Meters	12

*

GENERAL NOTES:

1. *Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.*
2. *Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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 60° hopper tank only.

*** Applies to 45° and 60° hopper tanks.

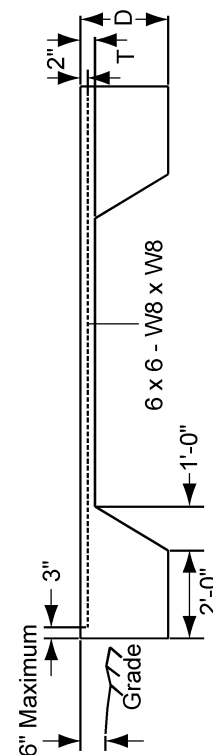
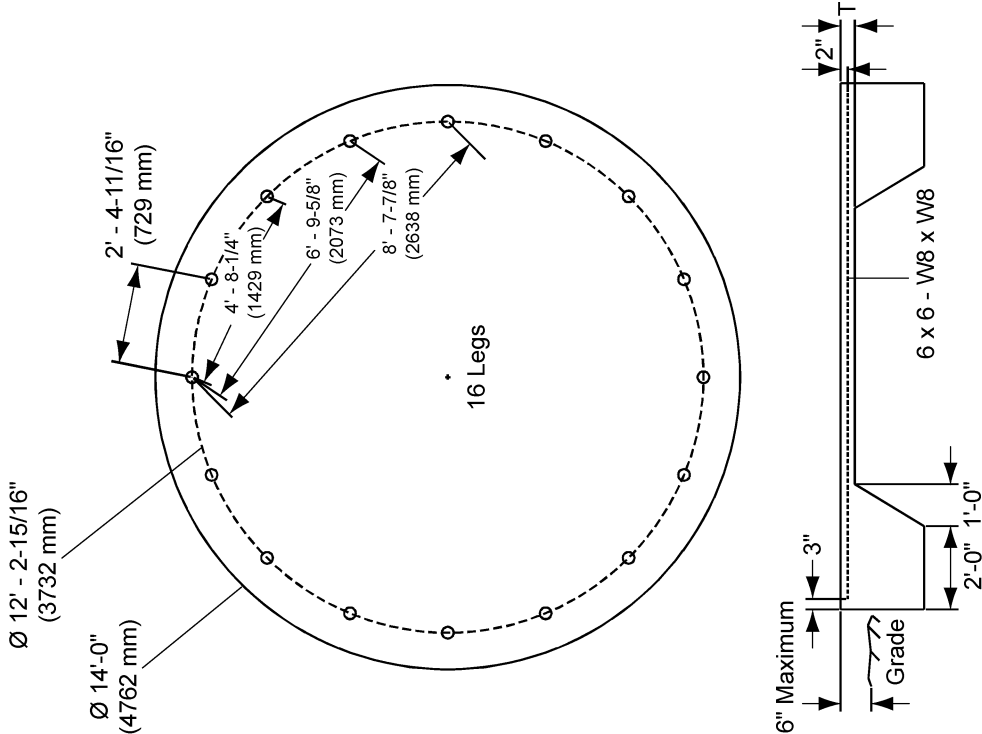
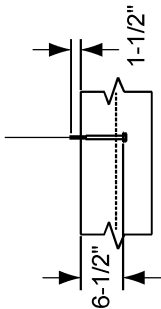


Figure 5C 12' 8-10 Rings BFT/GHT Round Pad

Anchor bolt 5/8" x 8" (203 mm) bolt with a 1/8" thick x 1-3/4" O.D. washer on head.



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.

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
11	24"	4"	7.5 Cu. Yards	175 Sq. Ft.	16

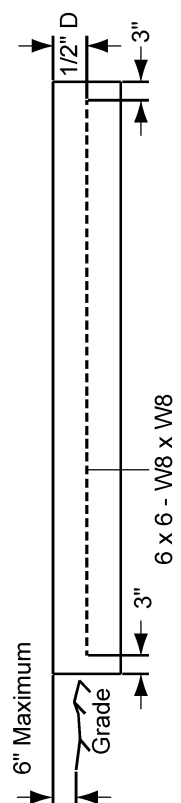
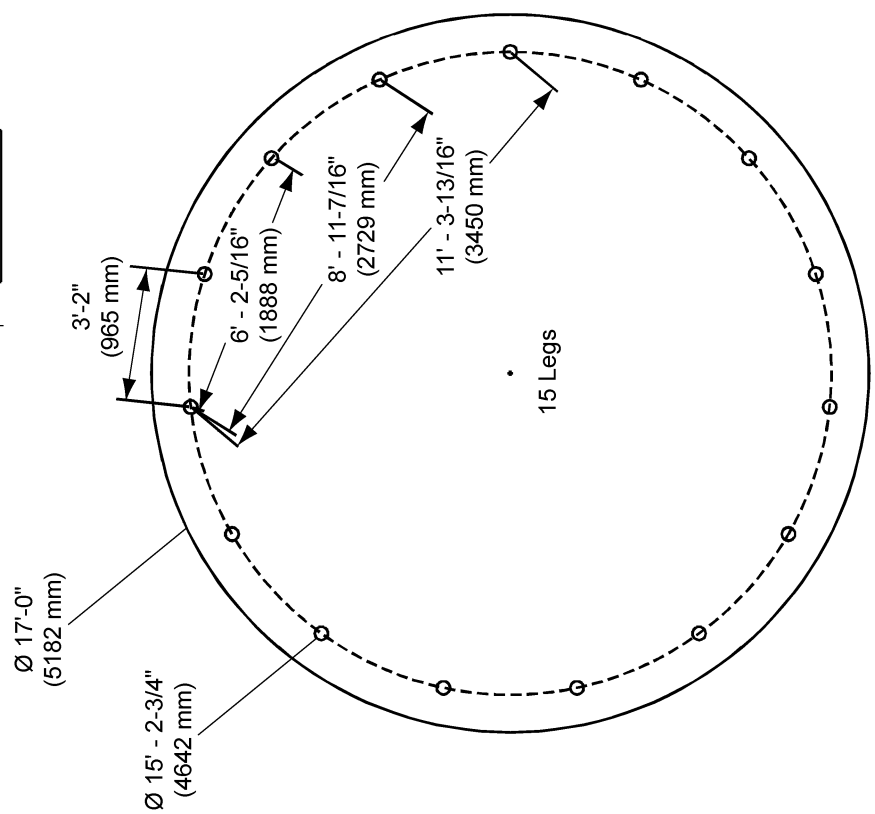
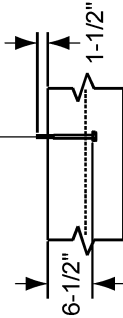
# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
11	610 mm	102 mm	5.73 Cu. Meters	16.26 Sq. Meters	16

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

Figure 5D 12' 11 Rings BFT/GHT 16 Leg Round Pad

Anchor bolt 5/8" x 8" (203 mm) bolt with a 1/8" thick x 1-3/4" O.D. washer on head.



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.

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-4	14"	11.0 Cu. Yards	255 Sq. Ft.	15
5	15"	11.8 Cu. Yards	255 Sq. Ft.	15
6	16"	12.6 Cu. Yards	255 Sq. Ft.	15

# of Rings	Slab Thickness (D)	Concrete Volume	Wire Mesh Area	# of Column Legs
1-4	356 mm	8.41 Cu. Meters	23.69 Sq. Meters	15
5	381 mm	9.01 Cu. Meters	23.69 Sq. Meters	15
6	406 mm	9.63 Cu. Meters	23.69 Sq. Meters	15

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.^2 allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

Figure 5E 15' 1-6 Rings BFT/GHT Round Pad

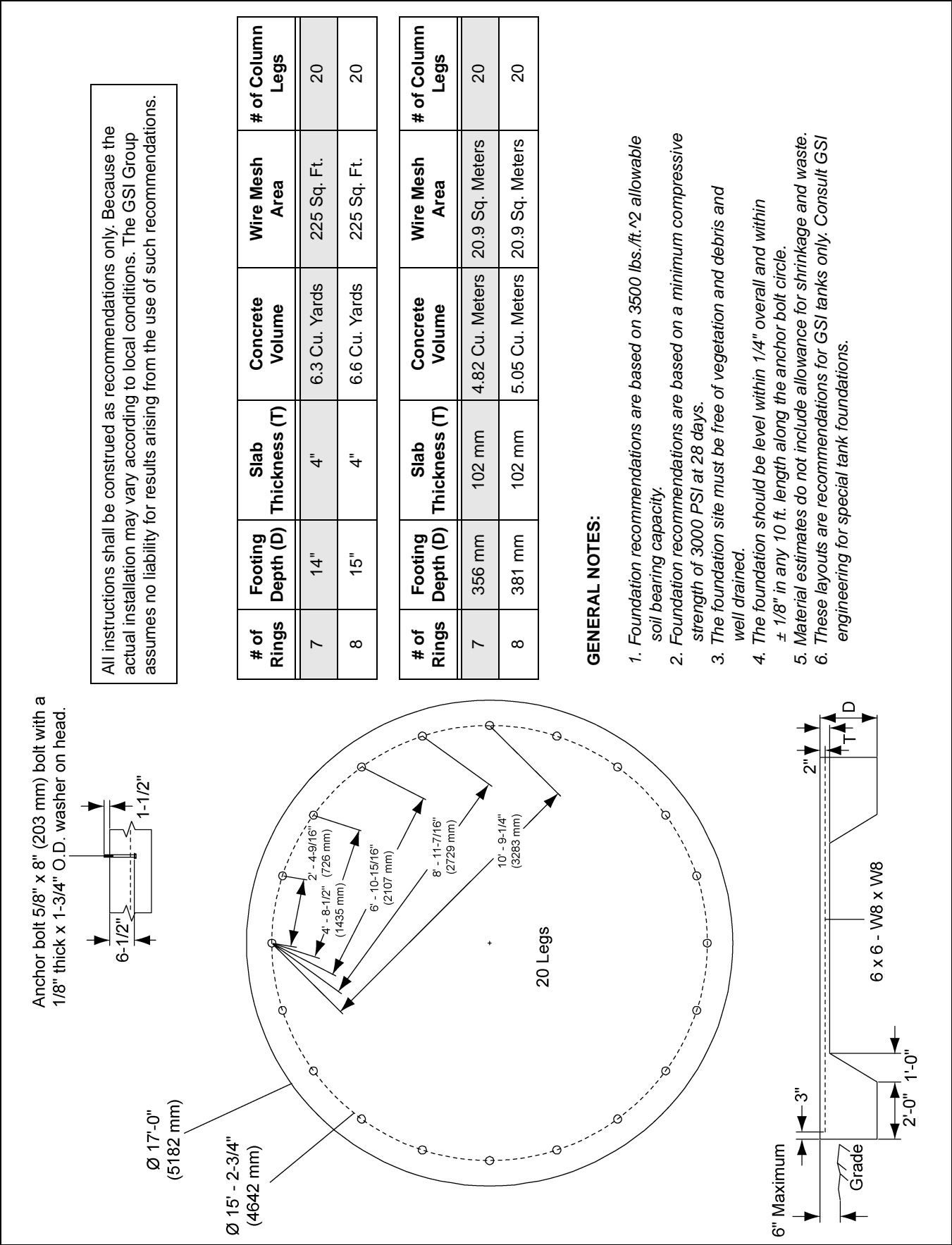
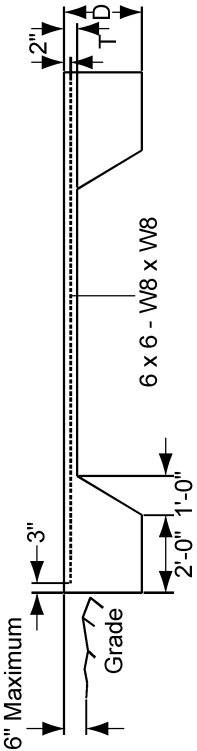
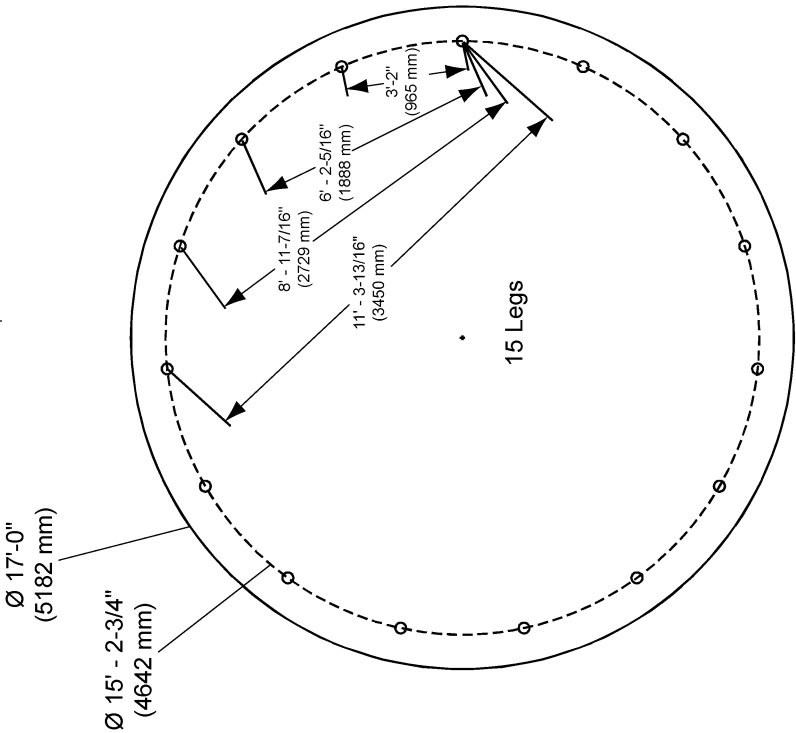
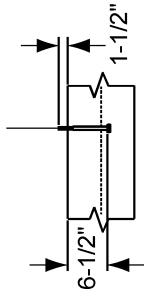


Figure 5F 15' 7-8 Rings BFT/GHT 60° Round Pad

Anchor bolt 5/8" x 8" (203 mm) bolt with a 1/8" thick x 1-3/4" O.D. washer on head.



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.

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
7	17"	4"	7.4 Cu. Yards	225 Sq. Ft.	15
8	18"	4"	7.7 Cu. Yards	225 Sq. Ft.	15

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
7	432 mm	102 mm	5.66 Cu. Meters	20.90 Sq. Meters	15
8	457 mm	102 mm	5.89 Cu. Meters	20.90 Sq. Meters	15

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.² allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

Figure 5G 15' 7-8 Rings BFT/GHT 45° Hopper Tank

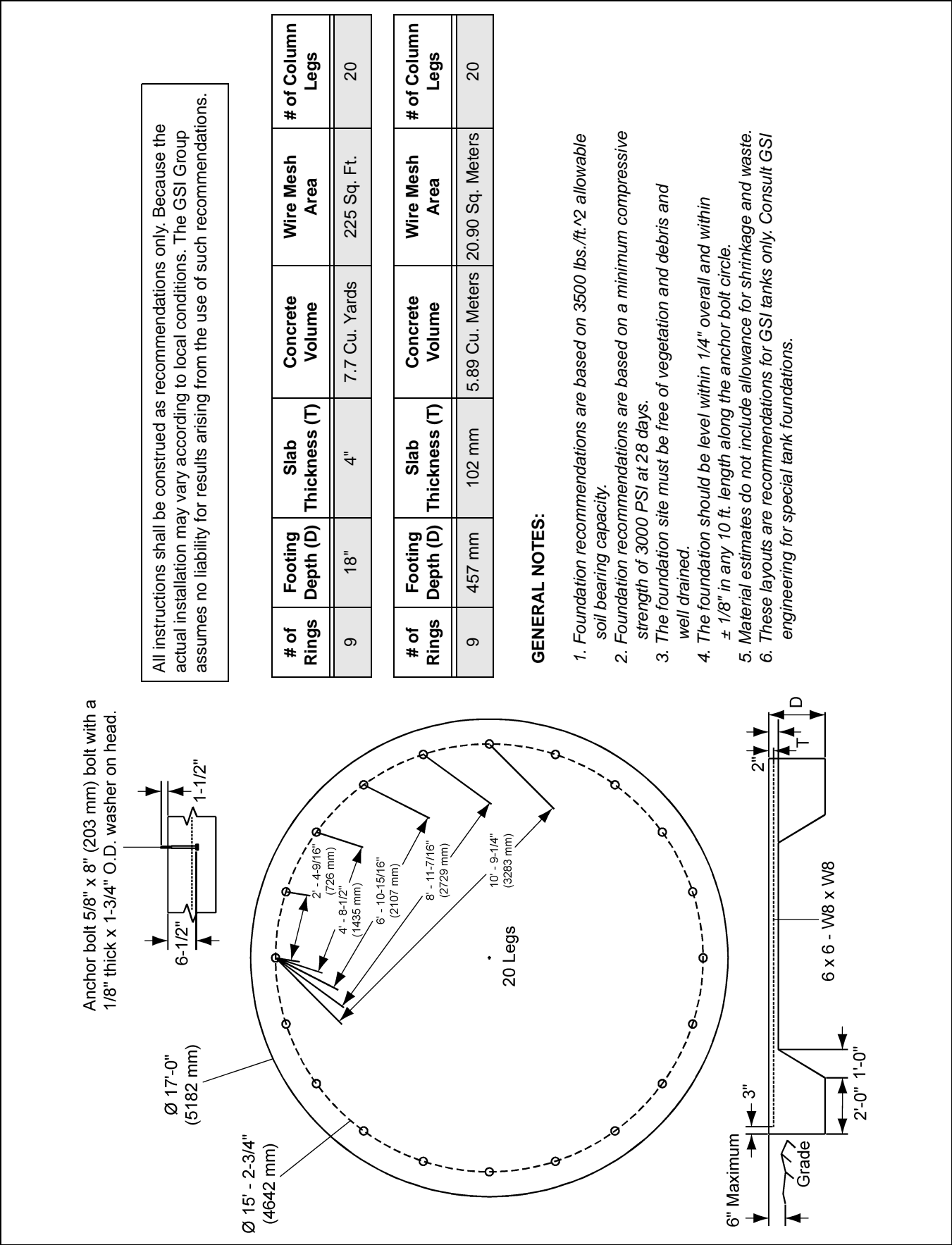


Figure 5H 15' 9 Rings BFT/GHT 20 Leg 45° Tank

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.

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-4	12"	4"	8.5 Cu. Yards	350 Sq. Ft.	18
5-6	15"	4"	10 Cu. Yards	350 Sq. Ft.	18
7	16"	4"	10.9 Cu. Yards	350 Sq. Ft.	18
8	18"	4"	11.5 Cu. Yards	350 Sq. Ft.	18

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-4	305 mm	102 mm	6.5 Cu. Meters	32.52 Sq. Meters	18
5-6	381 mm	102 mm	7.66 Cu. Meters	32.52 Sq. Meters	18
7	406 mm	102 mm	8.33 Cu. Meters	32.52 Sq. Meters	18
8	457 mm	102 mm	8.79 Cu. Meters	32.52 Sq. Meters	18

GENERAL NOTES:

1. Foundation recommendations are based on 3500 lbs./ft.^2 allowable soil bearing capacity.
2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

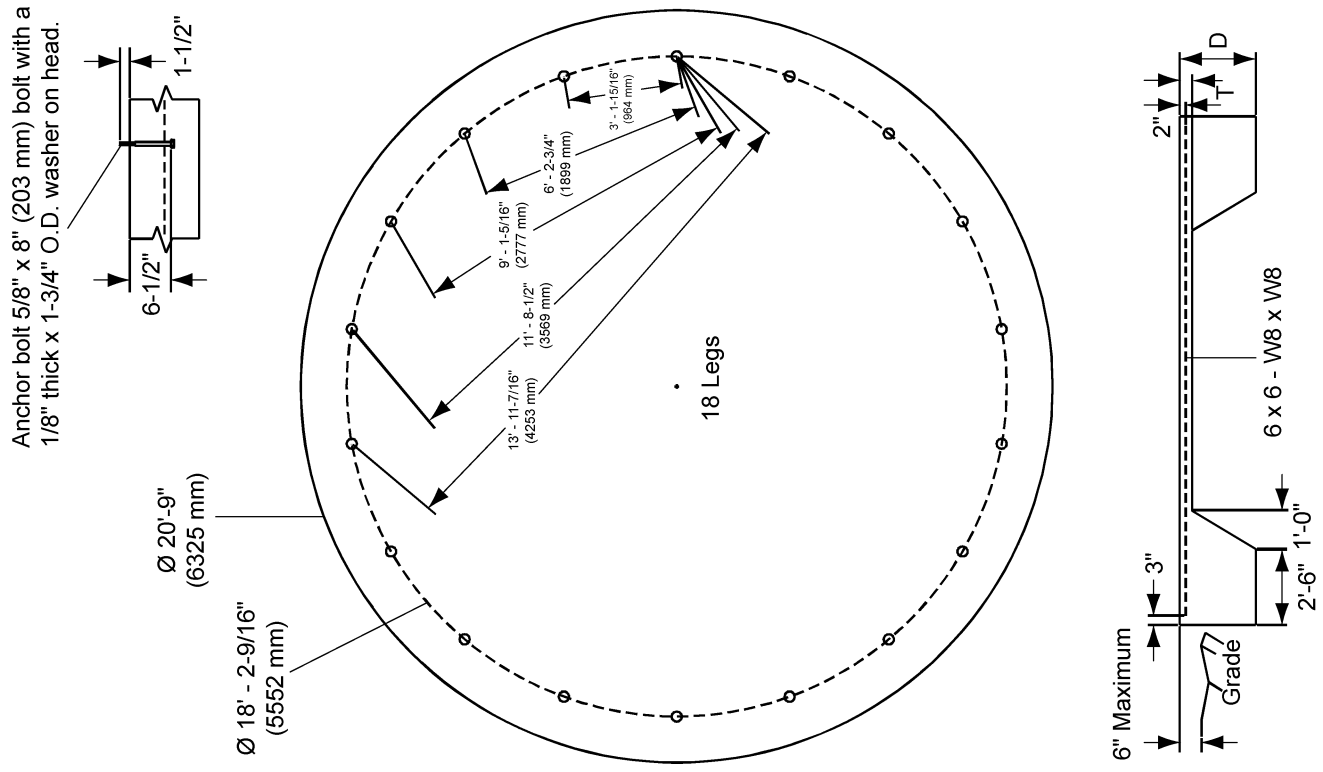


Figure 5I 18' 2-8 Rings BFT/GHT Hopper Tank

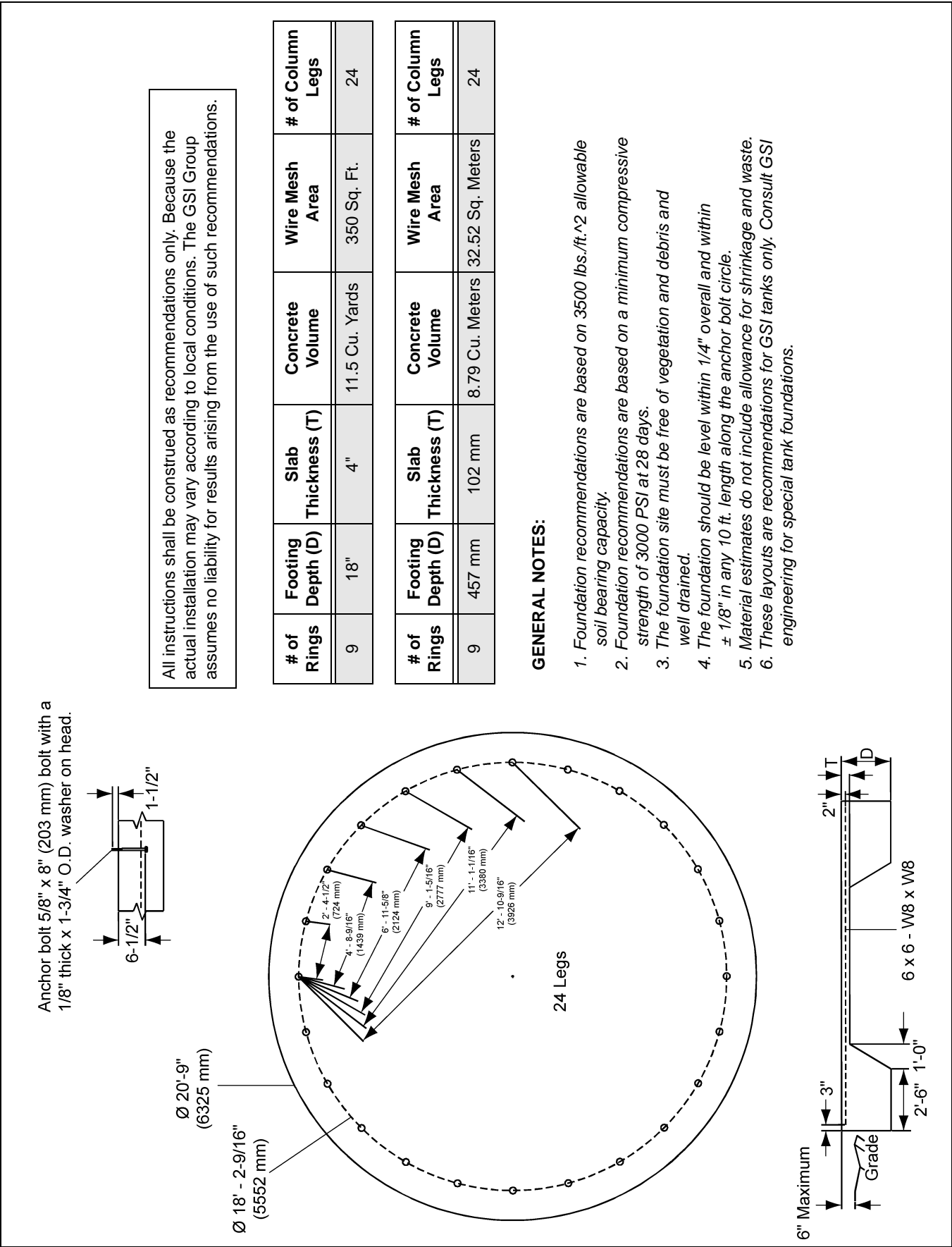


Figure 5J 18' 9 Rings BFT/GHT 24 Leg Hopper Tank

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.

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# 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

# of Rings	Footing Depth (D)	Slab Thickness (T)	Concrete Volume	Wire Mesh Area	# of Column Legs
2-6	330 mm	102 mm	8.41 Cu. Meters	41.81 Sq. Meters	28
7	381 mm	102 mm	9.25 Cu. Meters	41.81 Sq. Meters	28
8	406 mm	102 mm	9.71 Cu. Meters	41.81 Sq. Meters	28

GENERAL NOTES:

- 1. Foundation recommendations are based on 3500 lbs./ft.^2 allowable soil bearing capacity.
- 2. Foundation recommendations are based on a minimum compressive strength of 3000 PSI at 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.

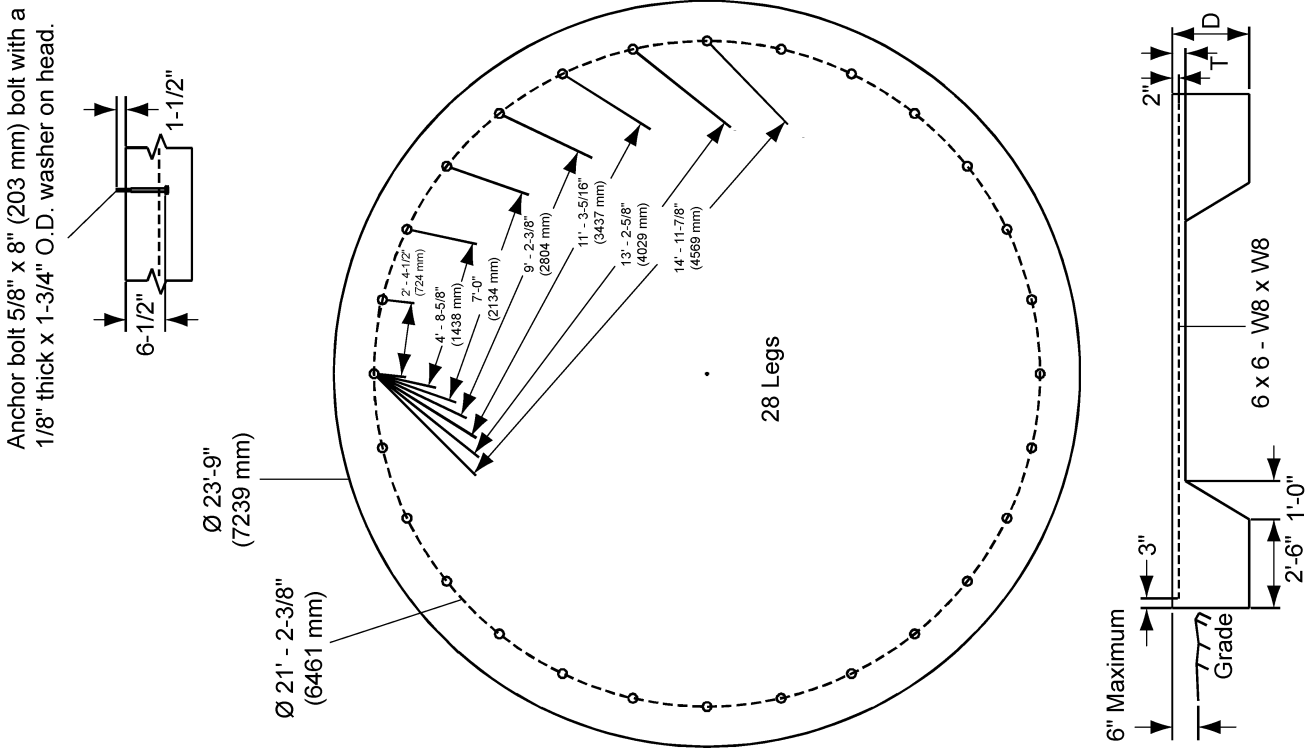


Figure 5K 21' 2-8 Rings BFT/GHT 24 Hopper Tank

Bulk Feed Tank Assembly

Body Sheet Chart

Model	Gauge
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

NOTE: *Represents 45° Bulk Tanks. All other tanks come with 60° or 45° hoppers.

How to use charts on this page:

The chart titled “body sheet chart” is for the reference when building the tank. This chart tells you how many rings the specific tank must have. To read the chart you look up the tank size you wish to build (an 18' diameter tank with 4 rings will look like BFT 18'-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.*

Sheet Gauge Color Code Chart

Code #	Color Code
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

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.*

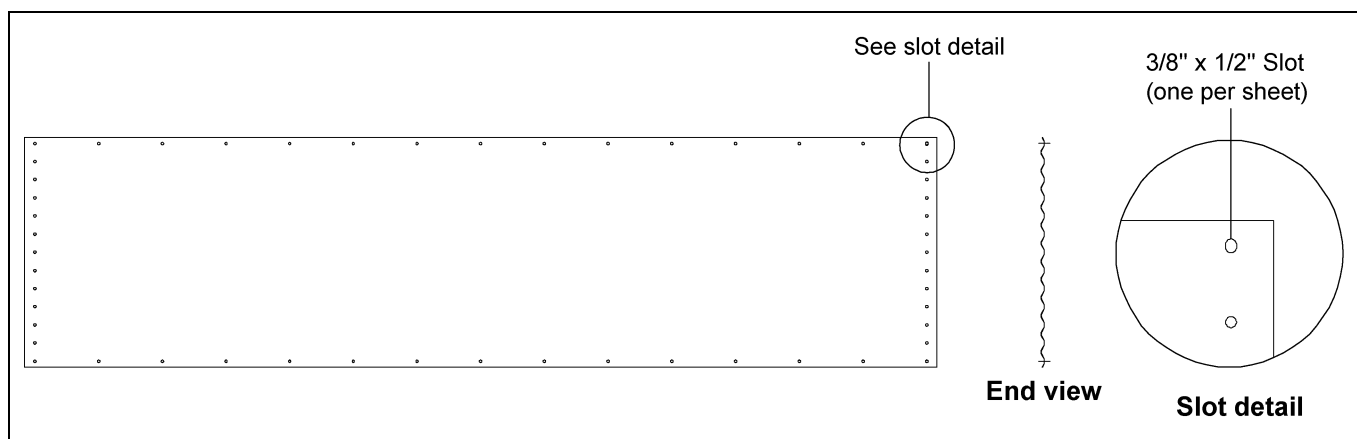


Figure 6A Viewed from Inside

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 the tank. Check the various gauges of the tank with the color code chart and begin building accordingly. Remember, assemble the top ring first. Note ring overlap detail as shown *in Figure 6B*.

NOTE: See Page 27 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.)

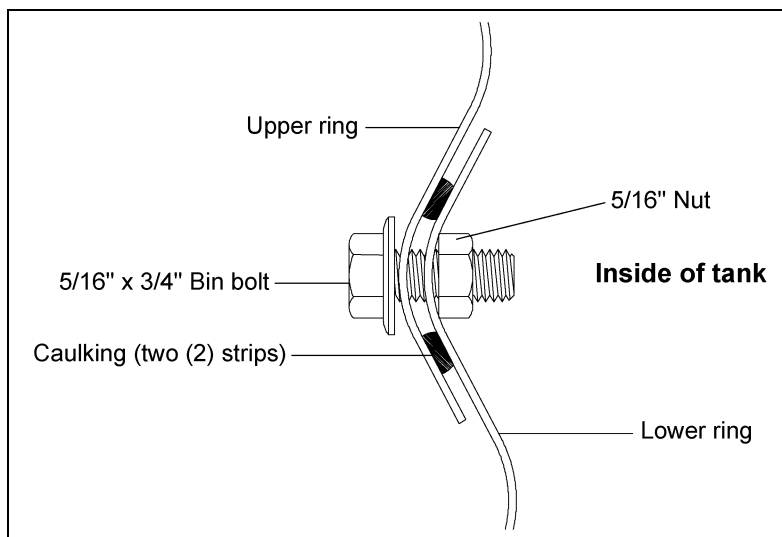


Figure 6B Ring Overlap Detail

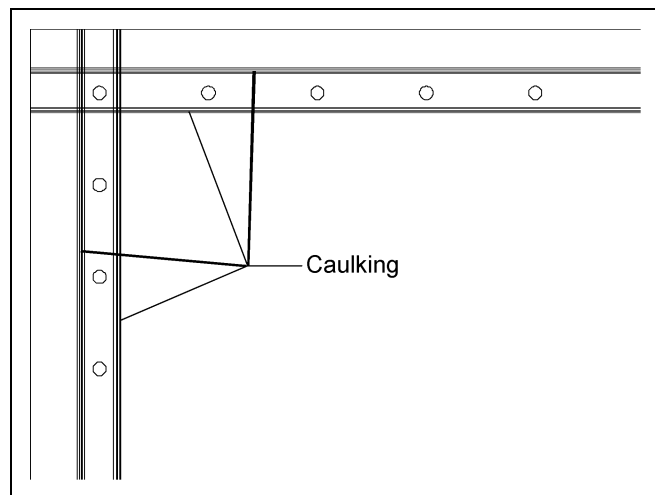


Figure 6C Caulking Detail (For 12' tanks only.)

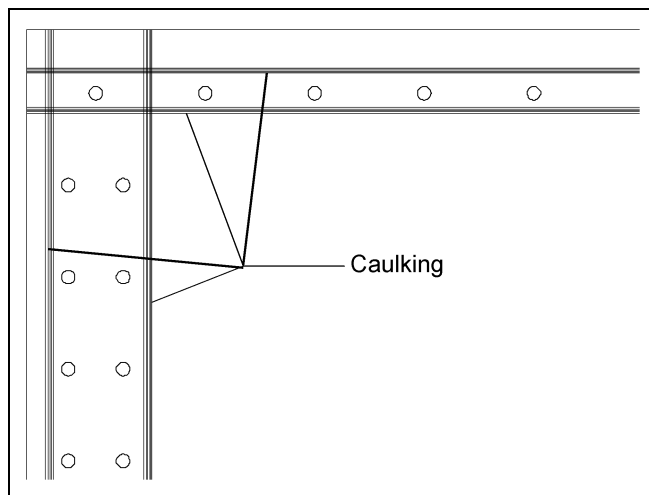


Figure 6D Caulking Detail (For 15', 18' and 21' tanks.)



Figure 6E



Figure 6F

IMPORTANT: 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.

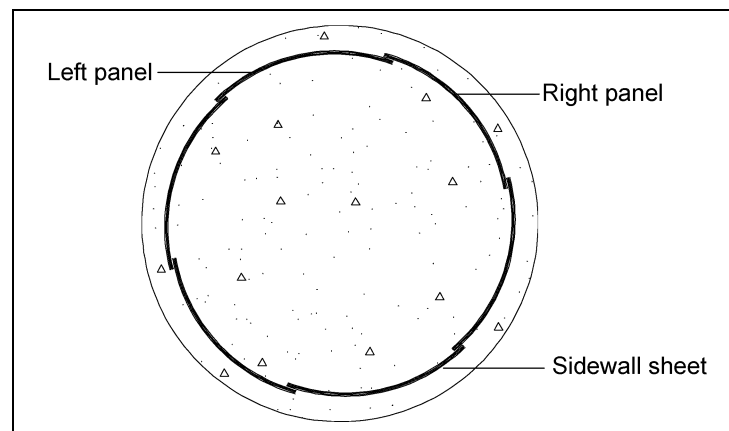


Figure 6G

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 the 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 (2) strips of caulking on all seams.

Roof Assembly

Assemble roof panels in a counterclockwise manner. On bins that will be equipped with pneumatic fill system ([See Page 68](#)), the two (2) roof panels with fill hole and exhaust hole should be located opposite each other on Bulk Feed Tank.

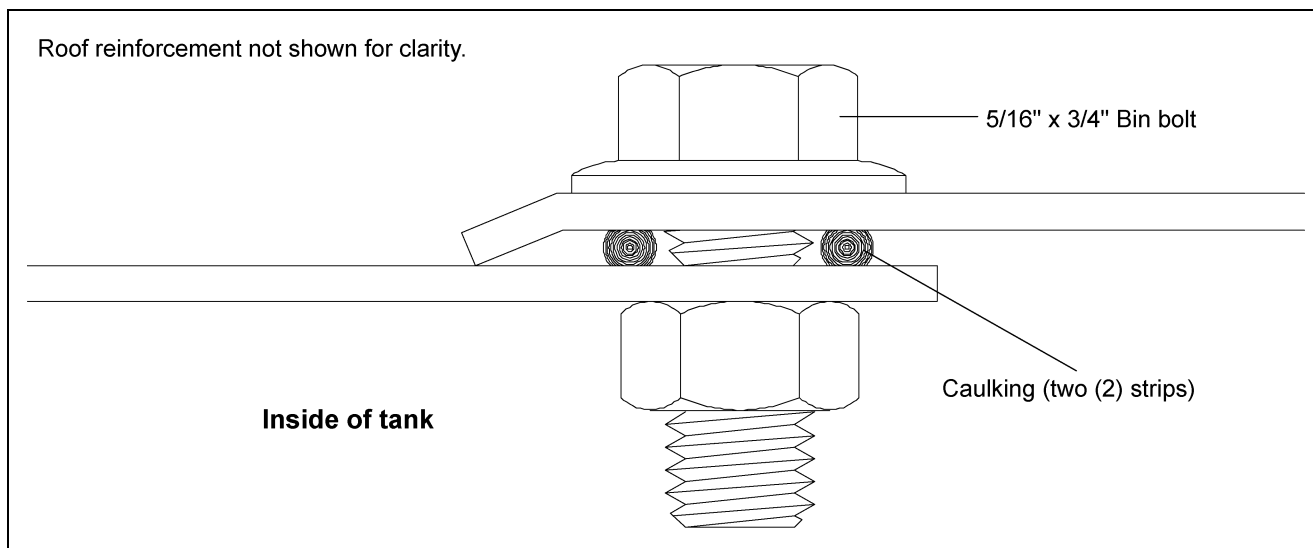


Figure 7A Roof Sheet Overlap Detail

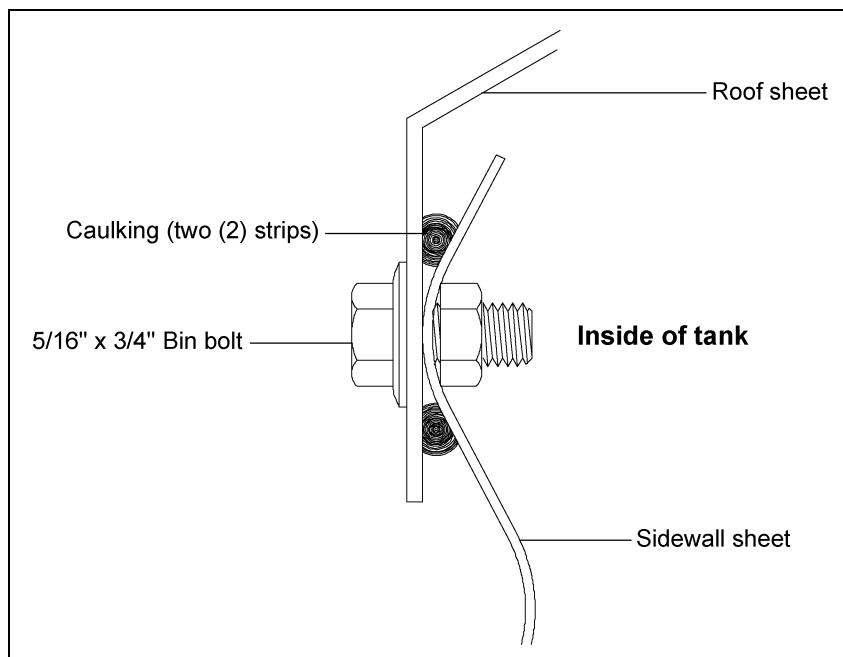


Figure 7B Eave Detail

Peak Ring

The peak ring may now be installed. Again use two (2) strips of caulking between peak ring and roof panels. (See Figure 7C.) Note that the peak ring goes to the outside of the roof panels.

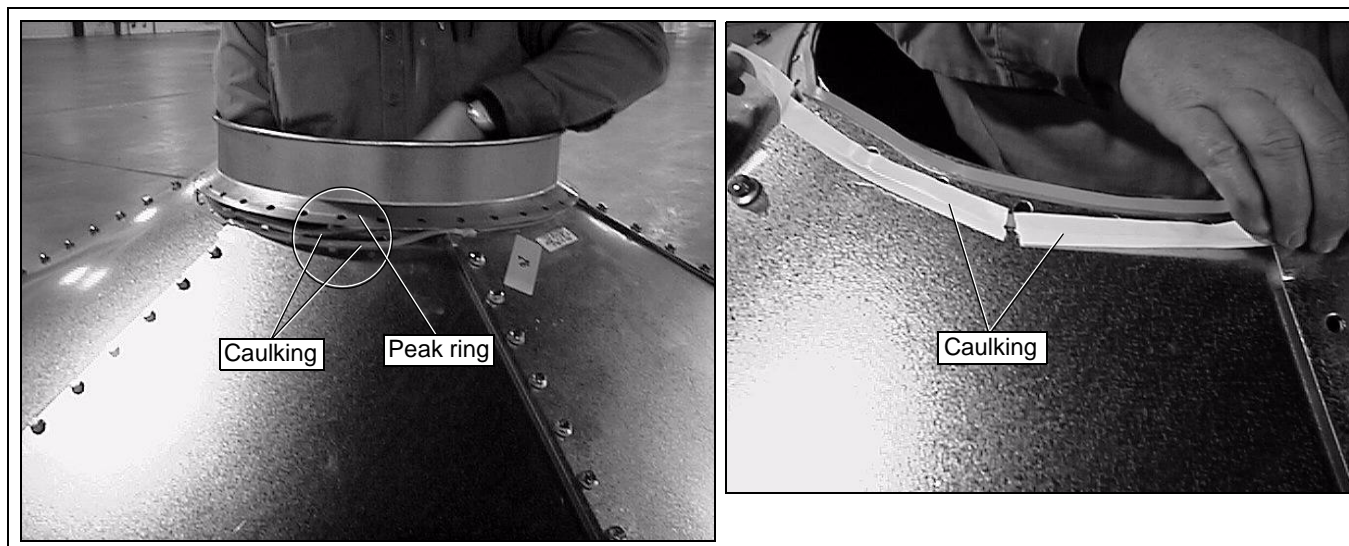


Figure 7C

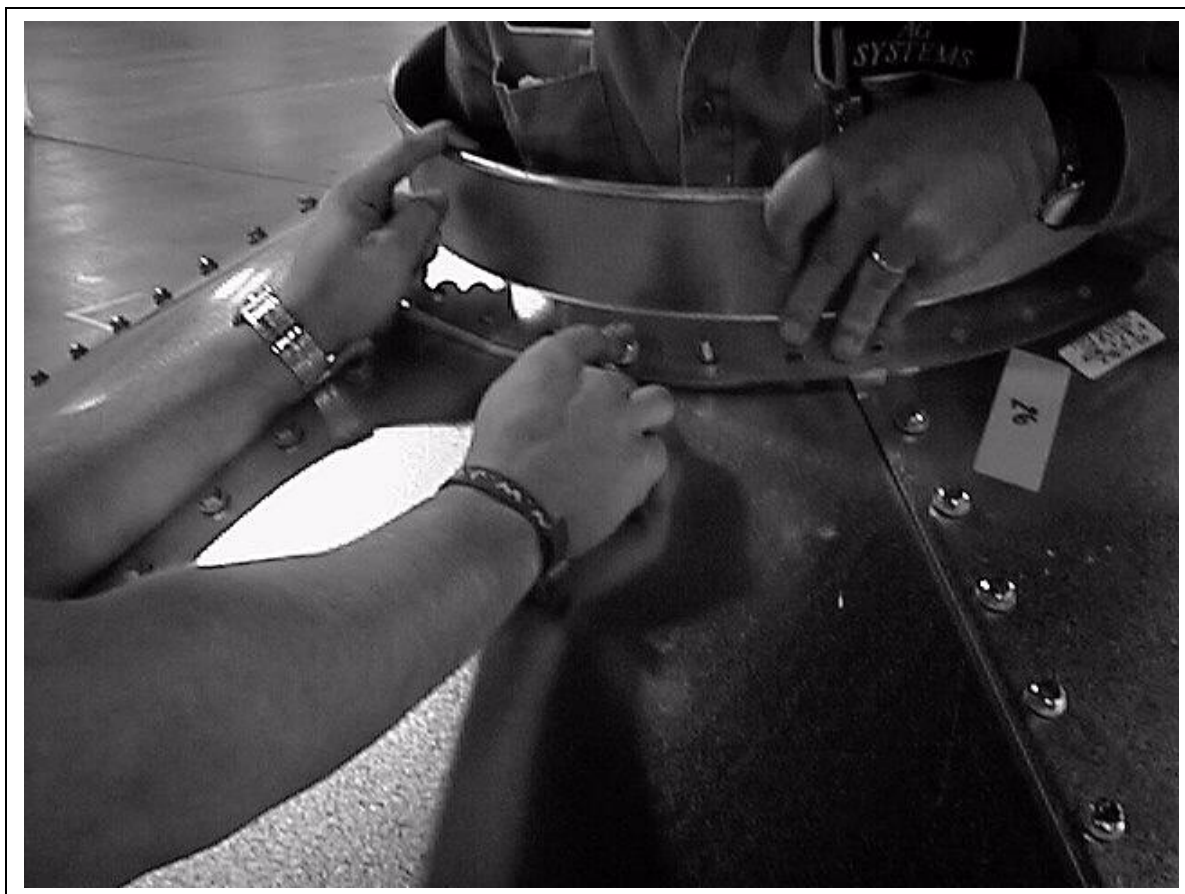


Figure 7D

Peak Ring Collar Detail

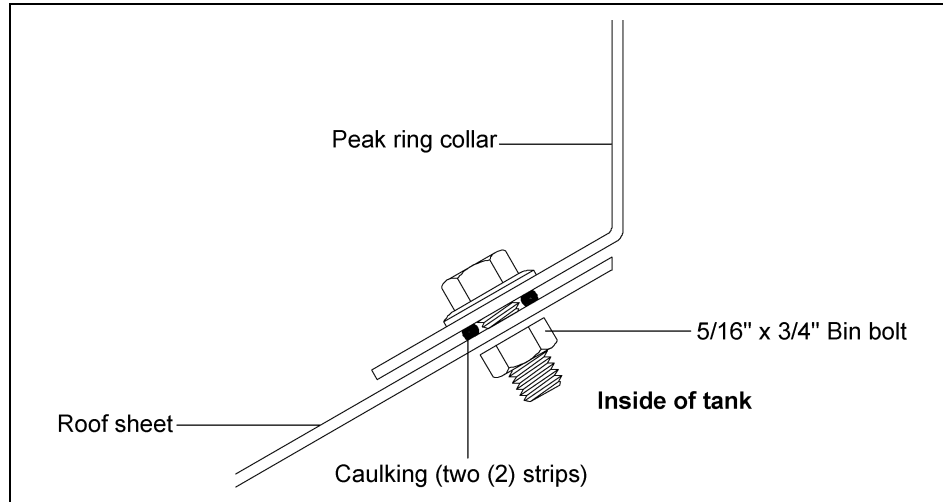


Figure 7E

12' Roof Reinforcement Angle

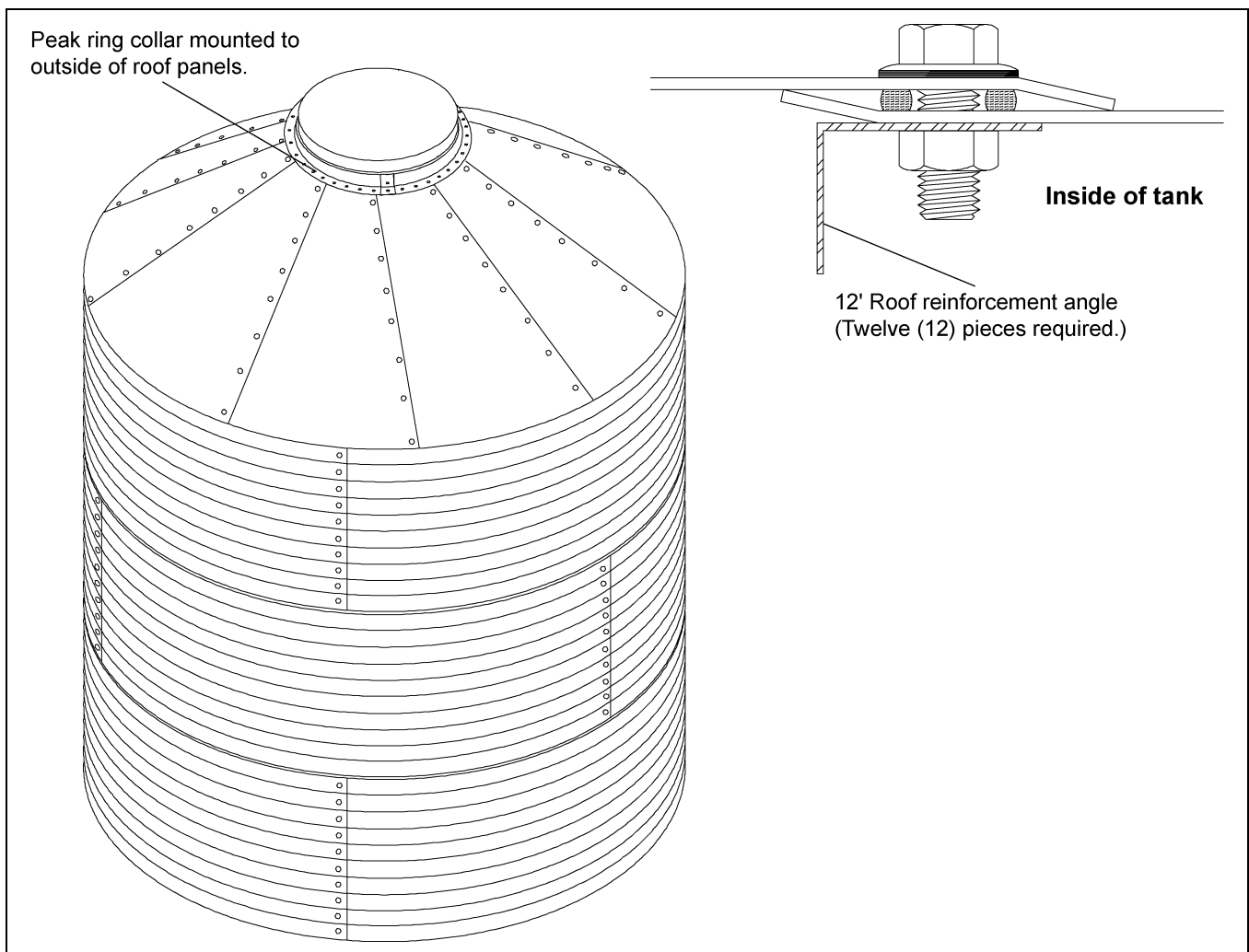


Figure 7F

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.

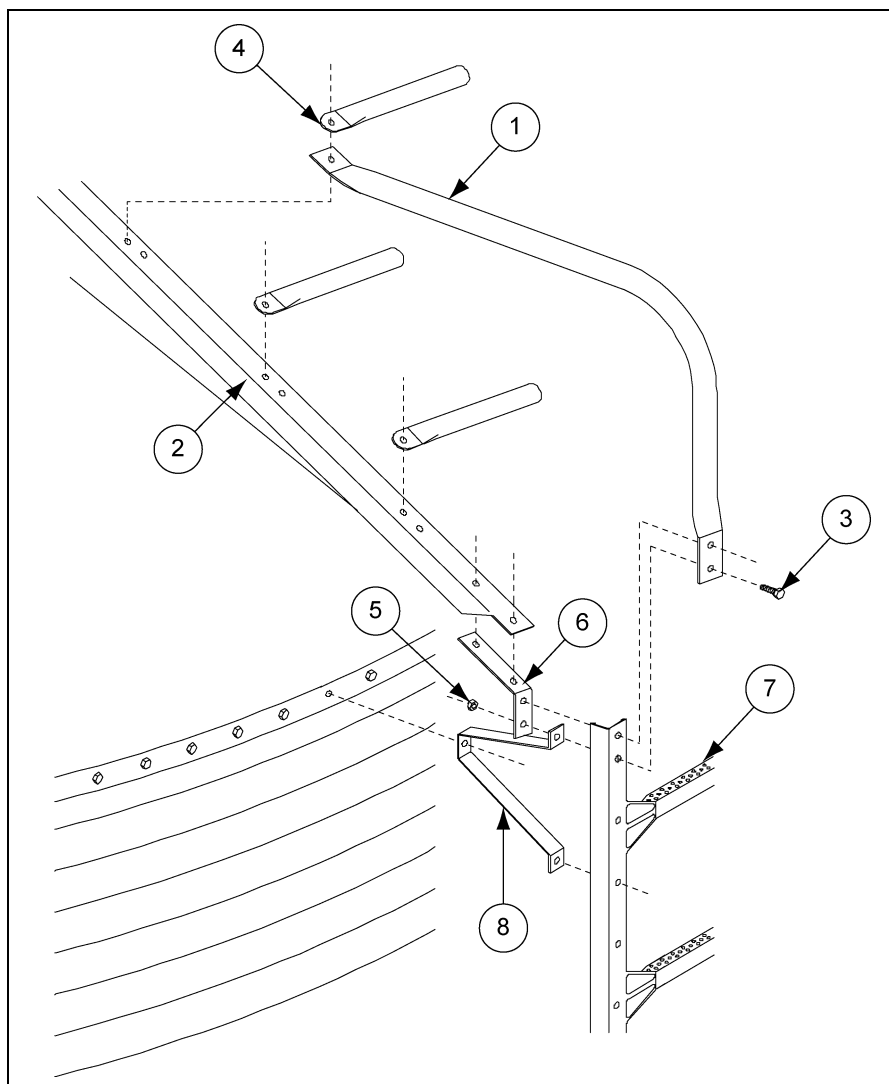


Figure 7G

Roof Ladder Parts List

Ref #	Part #	Description	Qty 12' Diameter	Qty 15' Diameter	Qty 18' Diameter
1	BLK-11680	Ladder Eave Safety Ring	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" (1118 mm) Sidewall Ladder Bracket	-	-	-
8	LS-121	Sidewall Ladder Standoff	-	-	-

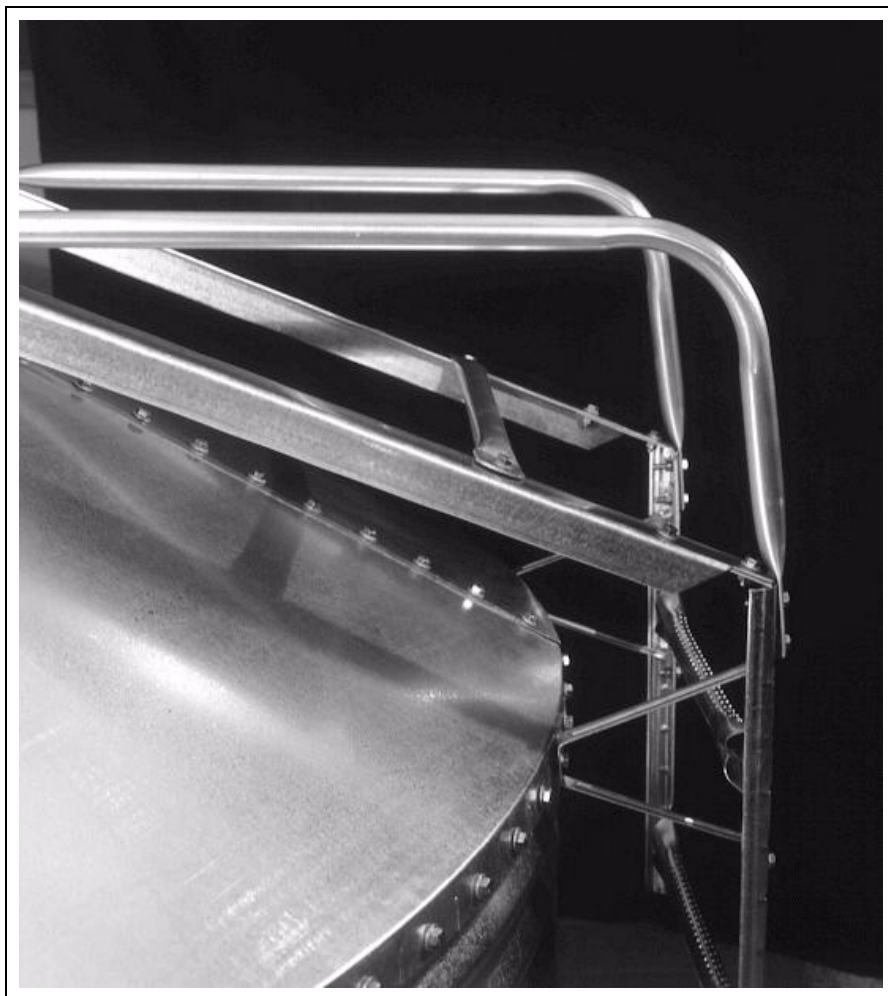


Figure 7H

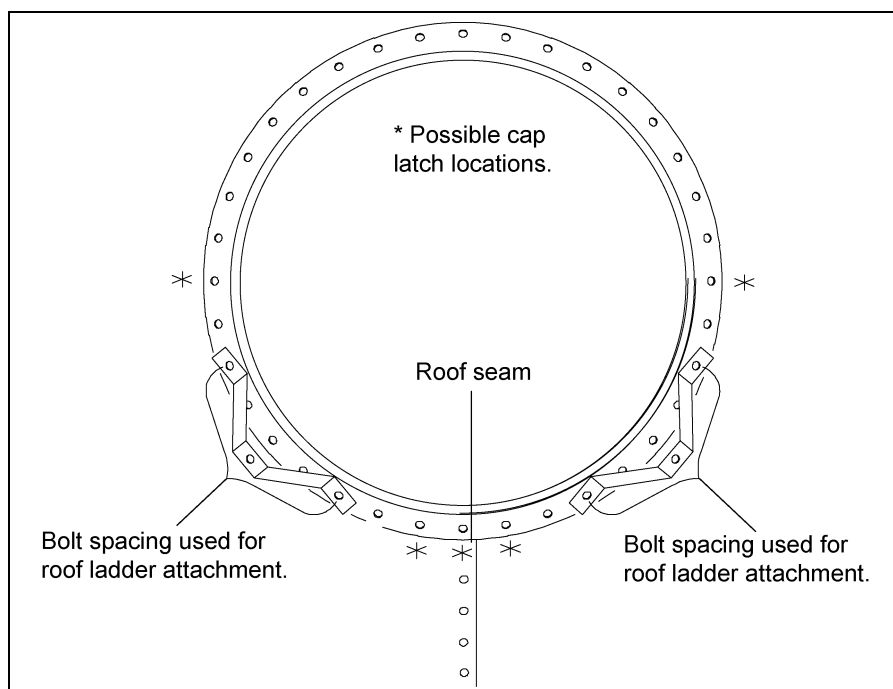


Figure 7I *Roof Ladder Peak Ring Detail*

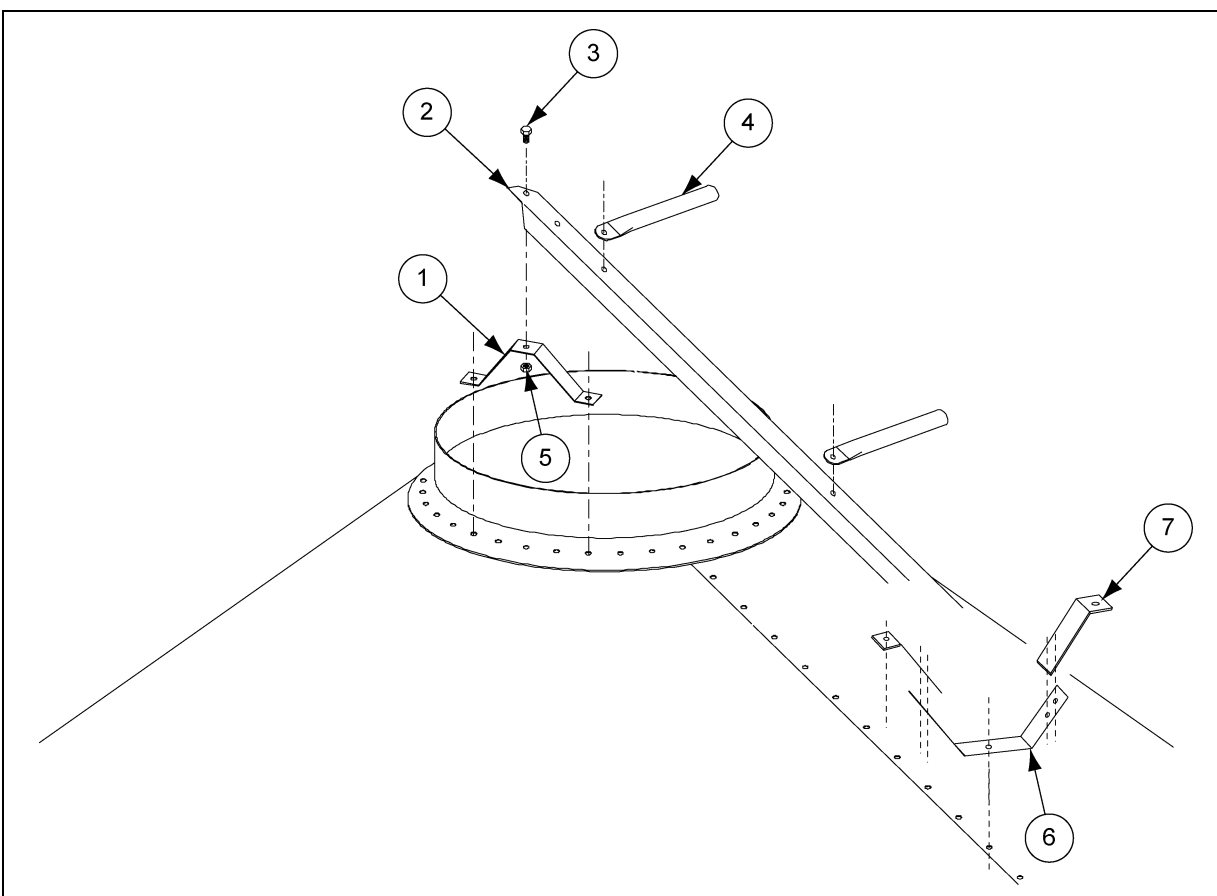


Figure 7J

Roof Ladder Parts List

Ref #	Part #	Description	Qty 12' Diameter	Qty 15' Diameter	Qty 18' Diameter
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	-
3	BLK-11764	18' BFT Roof Ladder Support Channel	-	-	2
4	S-275	5/16" x 3/4" Bin Bolt	20	22	24
5	BLK-11679	Roof Ladder Rung	4	5	6
6	S-396	5/16"-18 Hex Nut	20	22	24
7	BLK-11872	Center Roof Ladder Support	1	2	2
8	BLK-11873	Outer Ladder Support	2	4	4

NOTE: Three (3) holes spaces on either side of centerline of ladder. (Six (6) spaces between brackets.)

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 ref# 6 and ref# 7 as needed for additional support.

12' 60° 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 the 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.



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

Refer to control arm and ground control details [on Page 40](#) for component part assembly. The peak cap latch hook, located opposite the cap hinge, latches over the cap hold-down bracket. (Ref# 20, ground control detail [on Page 40](#)). One end of the ground control chain is secured at the counterweight arm with a cotter pin. ([See Figure 7L.](#)) 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.

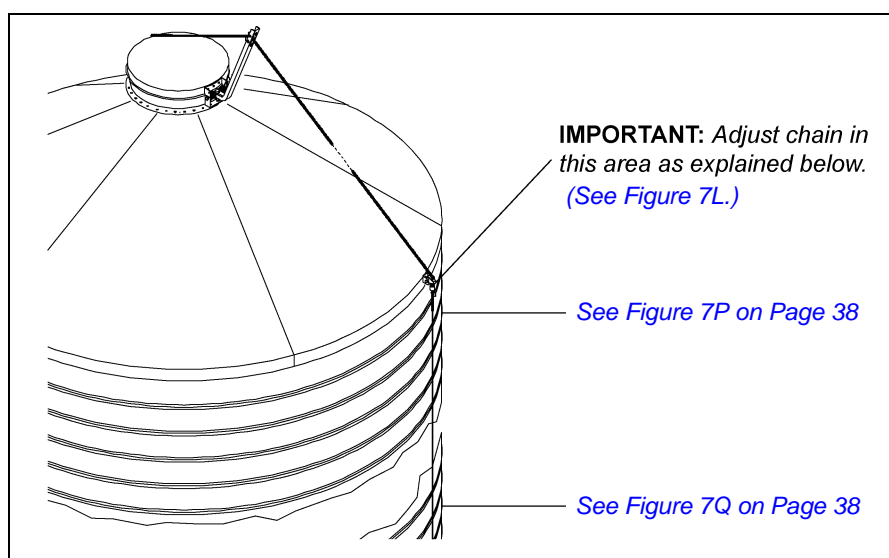


Figure 7K

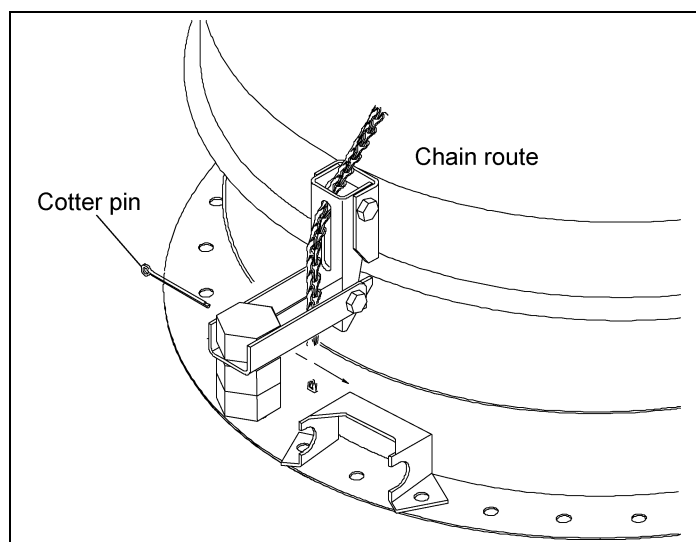


Figure 7L

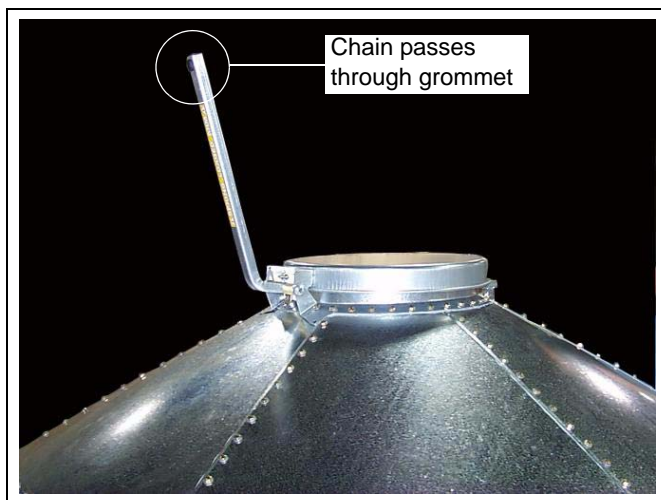


Figure 7M

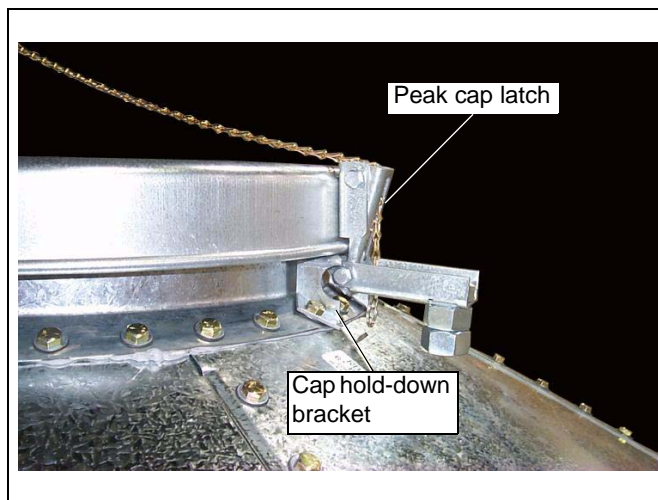
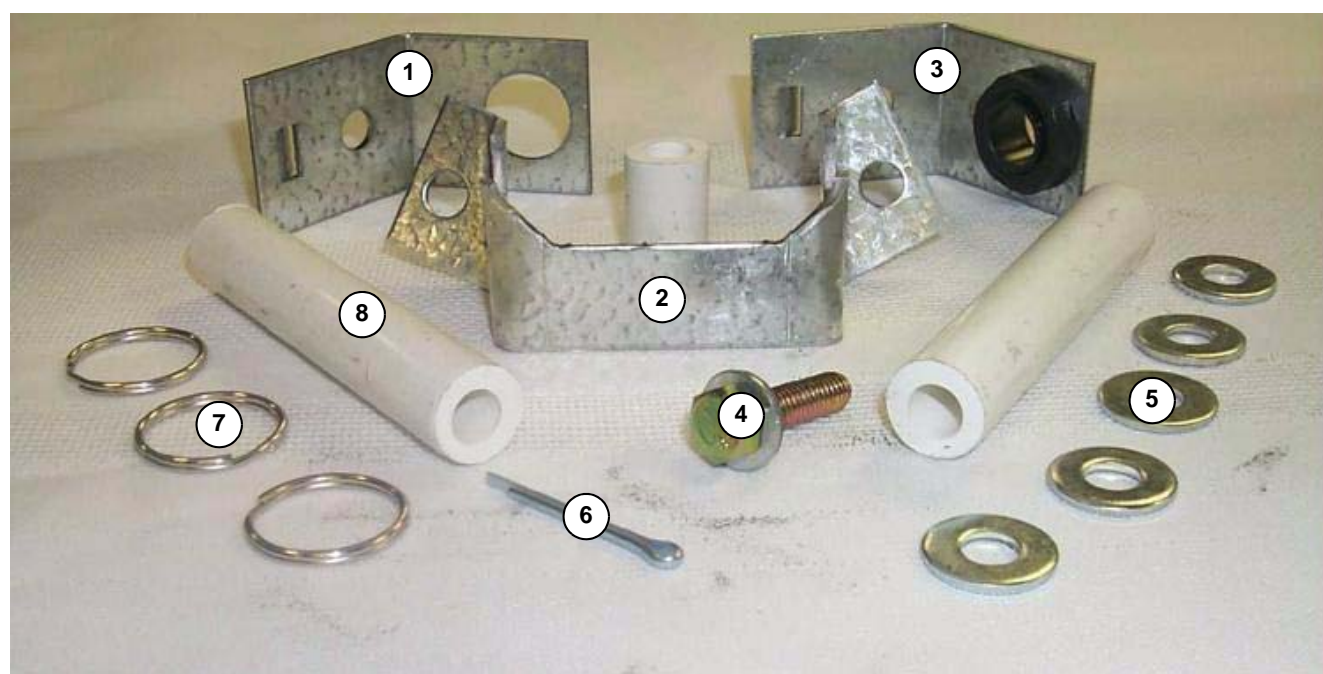


Figure 7N



- 1 - Chain holder (BLK-11949)
- 2 - Cap hold-down bracket
- 3 - Roof eave bracket (BLK-11950)
- 4 - 5/16" Bolt
- 5 - 5/16" Flat washers
- 6 - Cotter pin
- 7 - Key ring clips
- 8 - 4" Plastic handles (2)

Figure 7O

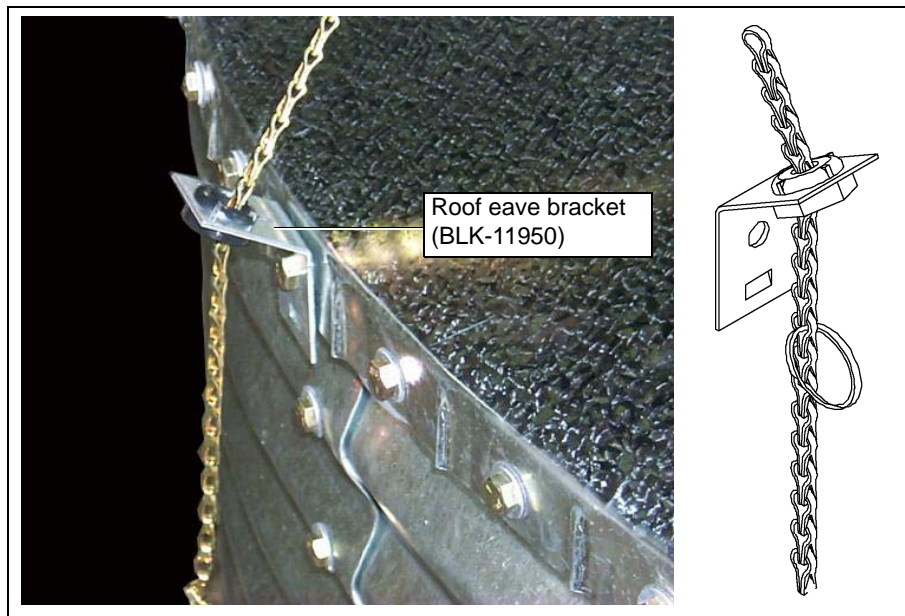


Figure 7P

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 [Figure 7Q.](#)) 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 [Figure 7Q.](#)) 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.

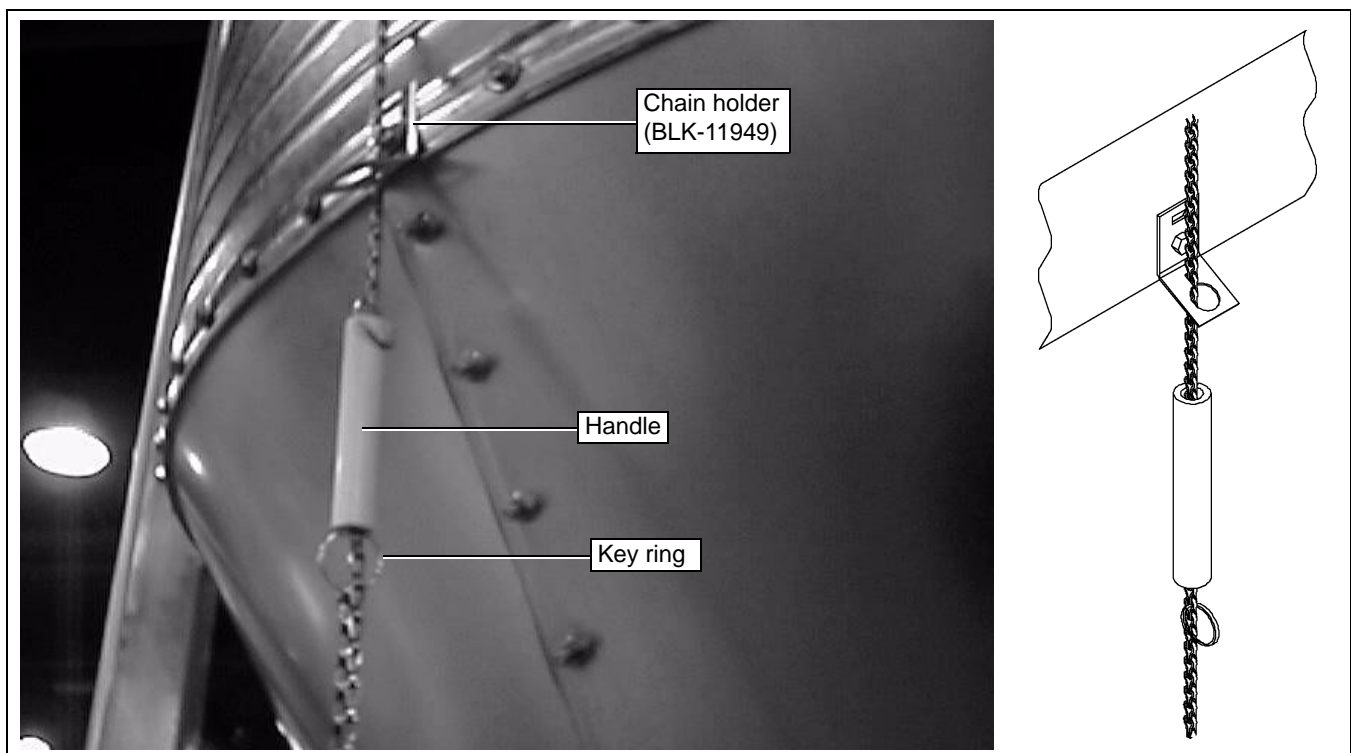
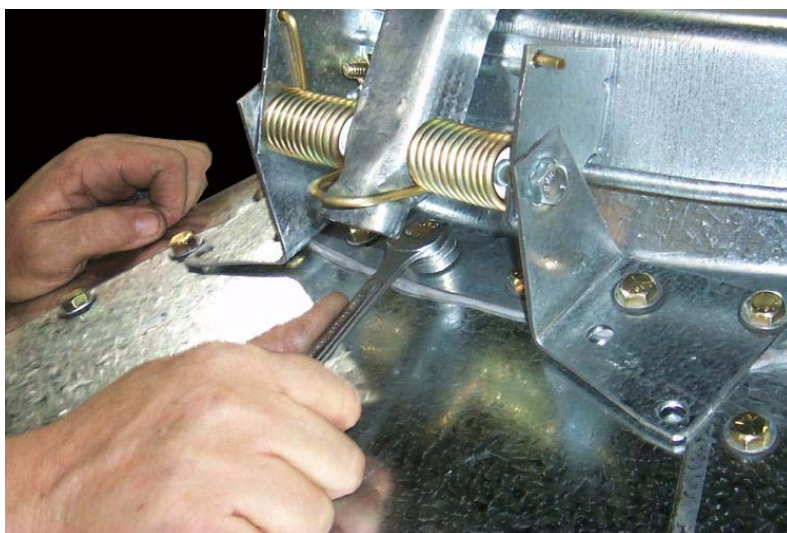


Figure 7Q



Make sure the loop of the main cap spring (BLK-11623) is held securely in the pre-loaded position by the head of the 5/16" bolt beneath.

Figure 7R



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

Figure 7S



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.

7. Roof

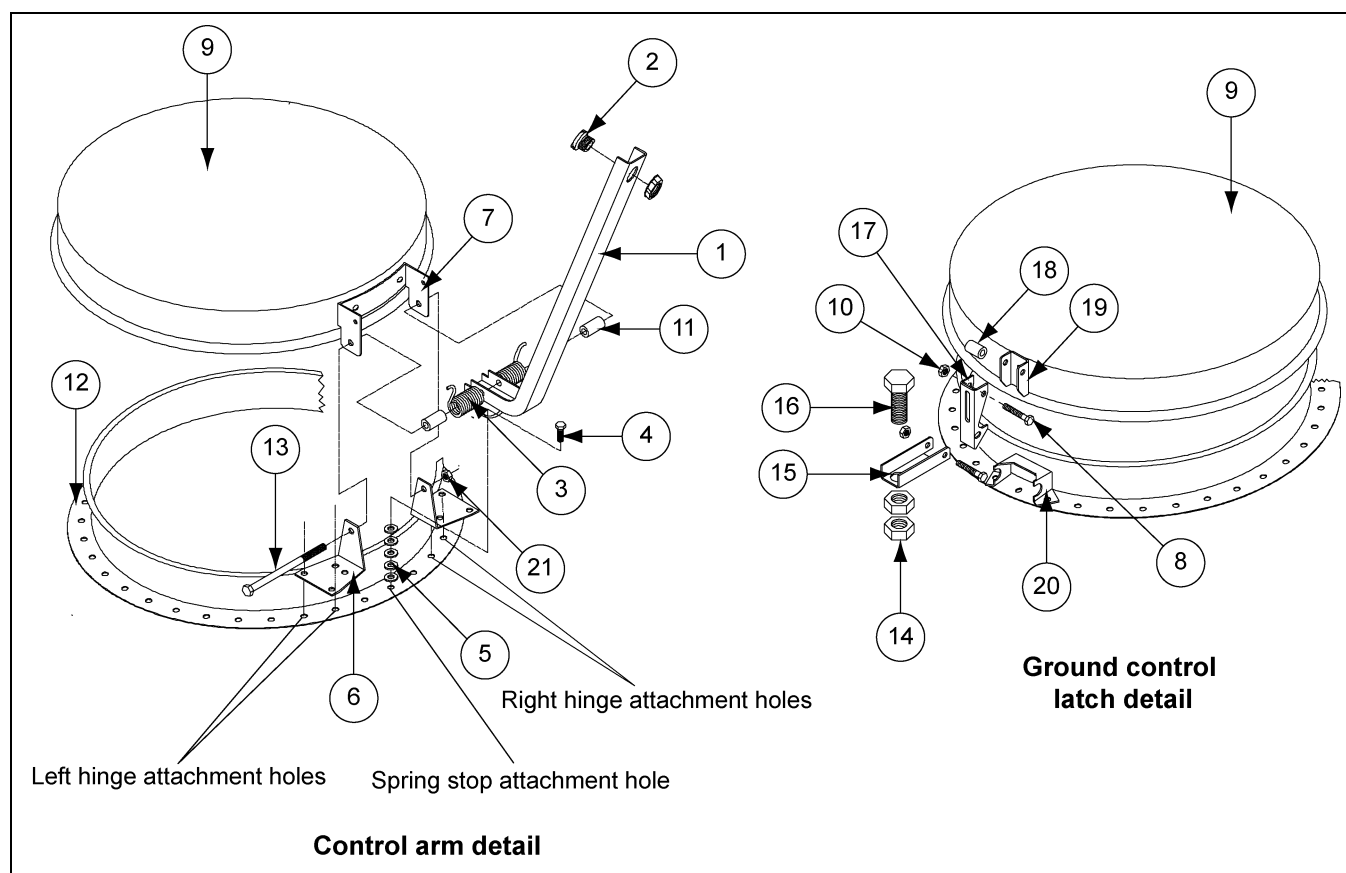


Figure 7T

Control Arm and Ground Control Parts List

Ref #	Part #	Description
1	BLK-11735	Control Arm
2	BLK-11876	Nylon Grommet with Nut
3	BLK-11623	Flush Cap Main Spring
4	S-277	5/16"-18 x 1-1/4" Bin Bolt (Grade 5)
5	S-845	5/16" Wrought Iron Washer (Grade 2)
6	BLK-11842	Lower Cap Hinge
7	BLK-11734	Upper Cap Hinge
8	S-7329	5/16"-18 x 2" Hex Head Bolt
9	BLK-10015	Bulk Tank Roof Cap
10	S-5220	5/16"-18 Hex Lock Nut (Grade 2)
11	BLK-11503	1-7/8" Long Spring Spacer
12	BLK-11730	1 Piece Bulk Tank Peak Ring
13	S-7171	3/8"-16 x 6-1/2" Hex Head Bolt (Grade 5)
14	S-3214	7/8"-9 Hex Nut (Grade 2)
15	BLK-11845	Latch Counterweight
16	S-7281	7/8"-9 x 1-1/2" Hex Head Bolt
17	BLK-11844	Peak Cap Latch
18	BLK-11795	15/16" x 3/4" Diameter Plastic Spacer
19	BLK-11843	Pivot Bracket
20	BLK-11846	Cap Hold-Down Bracket
21	S-4663	3/8"-16 Hex Head Lock Nut

NOTE: Use the [above](#) chart for control arm and ground control details.

Roof Cap

Bulb Seal Kit (Optional)

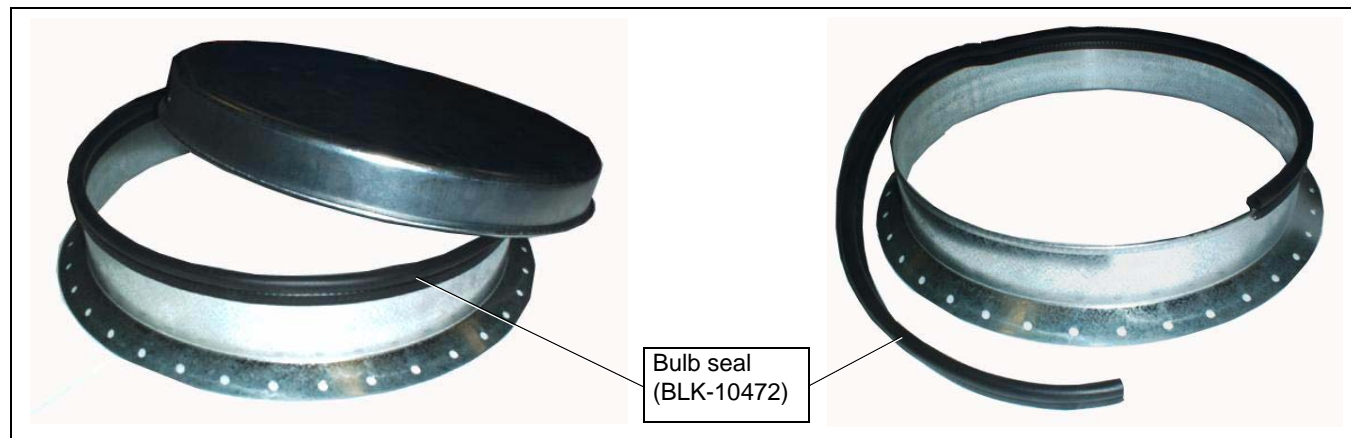


Figure 7U

Cap Hold-Down Package

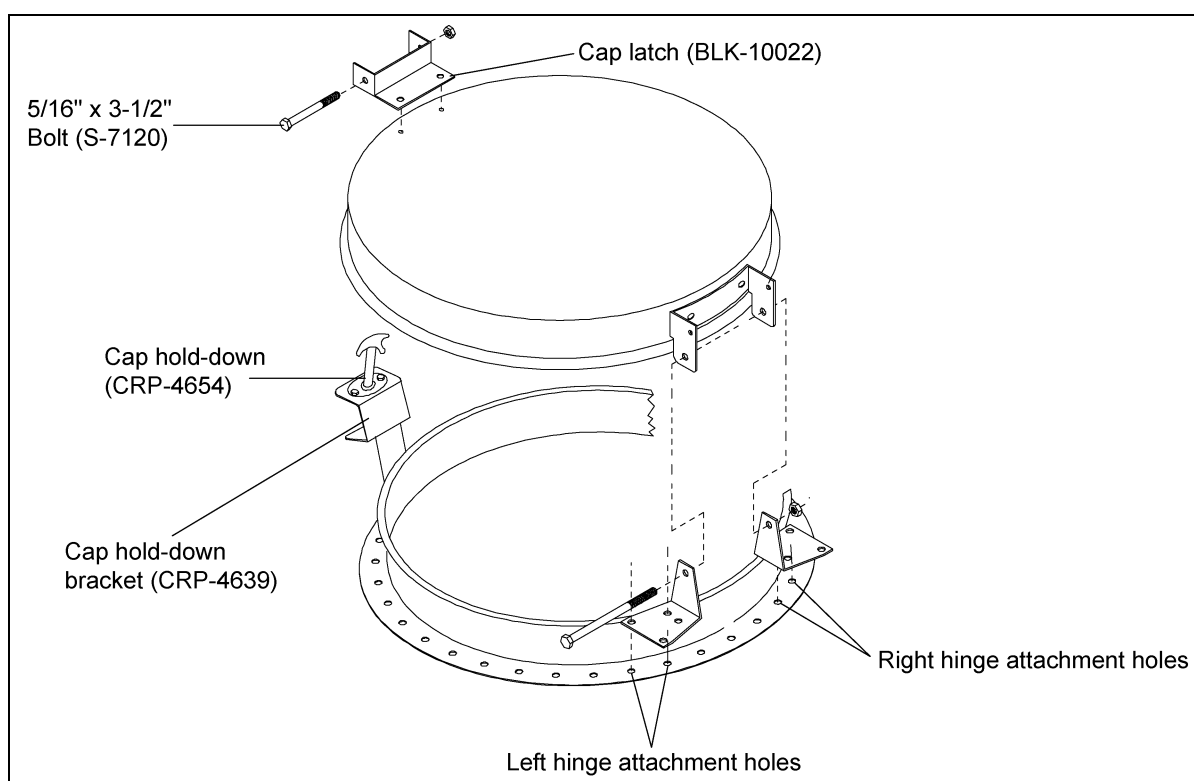


Figure 7V

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# BLK-10472.

Cap hold-down package comes standard on all 45° hopper bulk tanks. Optional on all 60° hopper bulk tanks.

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 accompanying drawings for details. Install six (6) roof reinforcement angles spaced equally around the tank. Reinforcement angle edges are parallel with sidewall sheet and peak ring, see views "AA" and "DD" [on Page 43](#).

The reinforcement angles utilize every other hole in the peak ring. At the sidewall, there are twelve (12) spaces between each reinforcement angle on the 18' tank and ten (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. Ensure that all roof seams are caulked and lapped correctly as shown in the accompanying detail drawings.

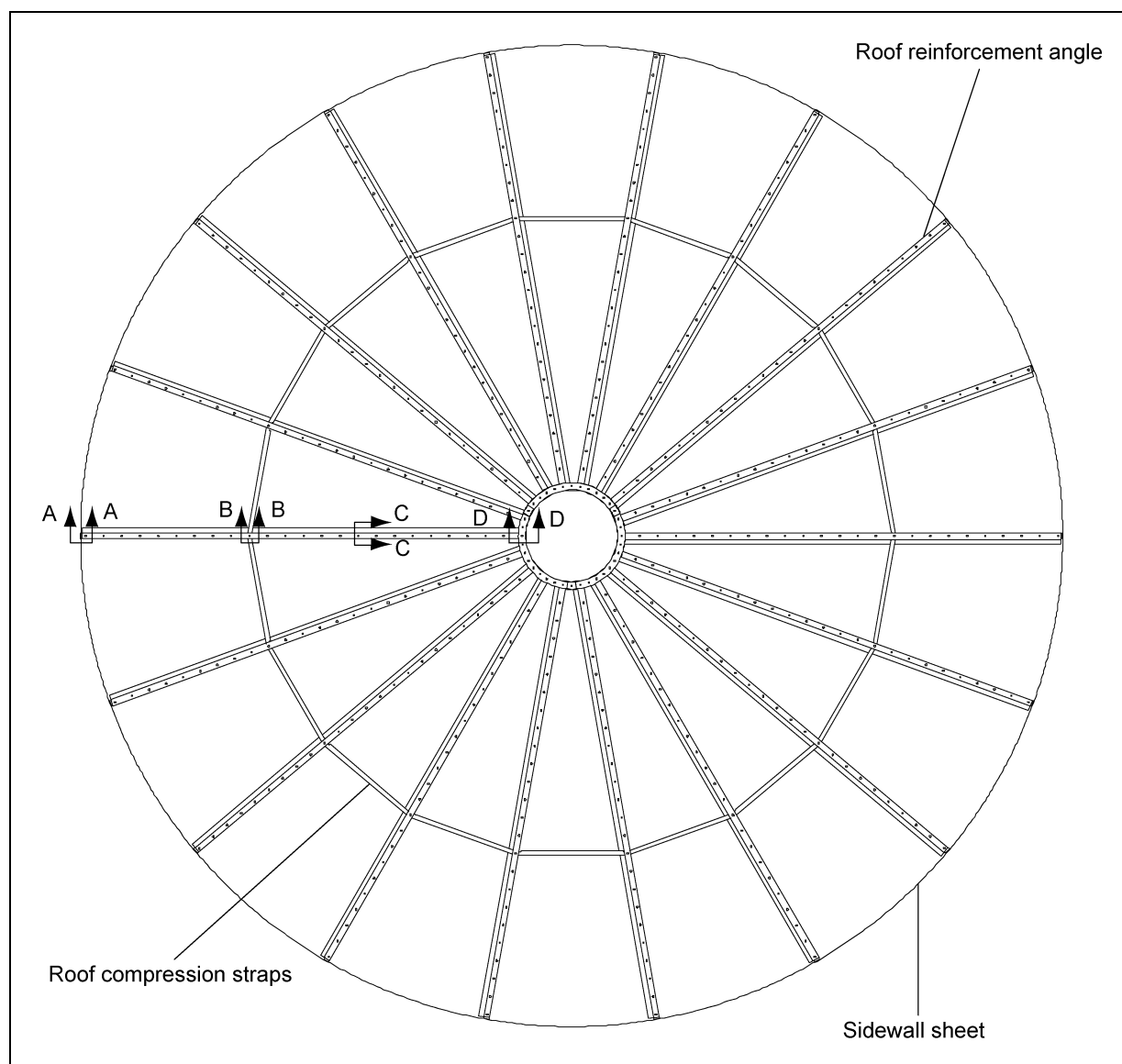


Figure 7W

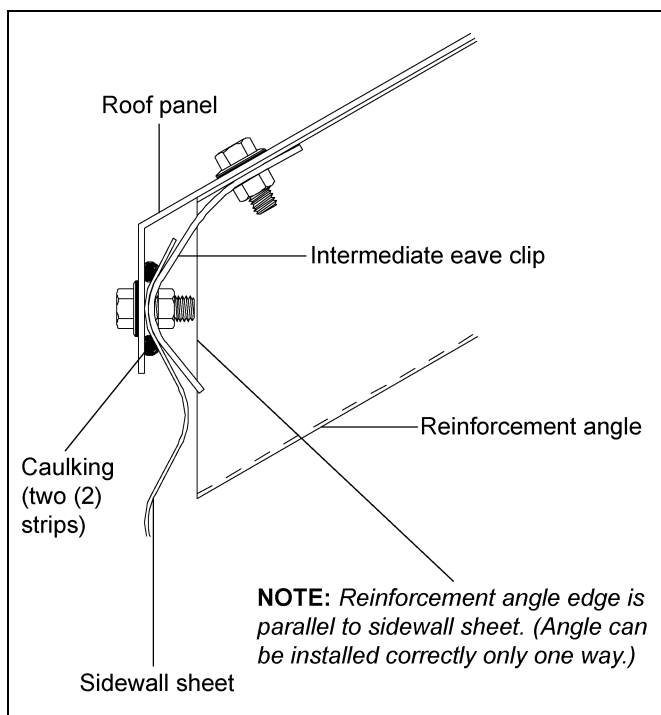


Figure 7X View "A"-"A"

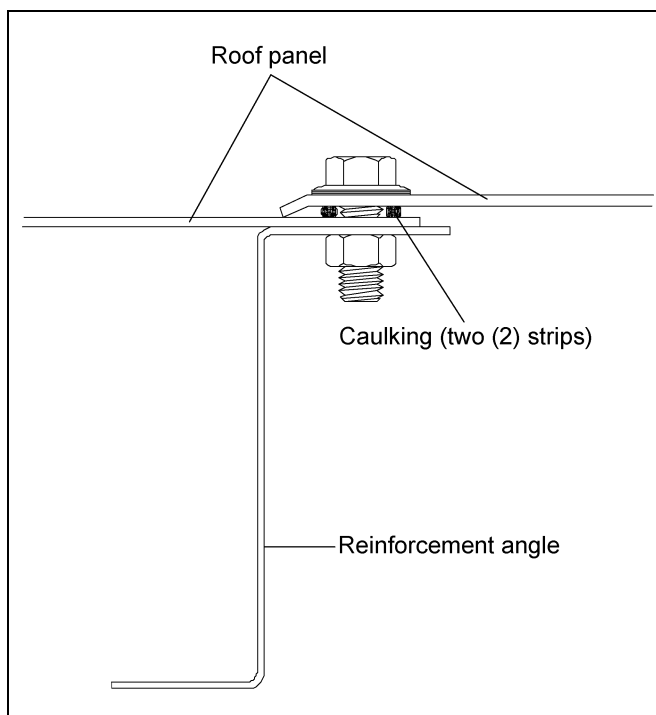


Figure 7Z View "C"-"C"

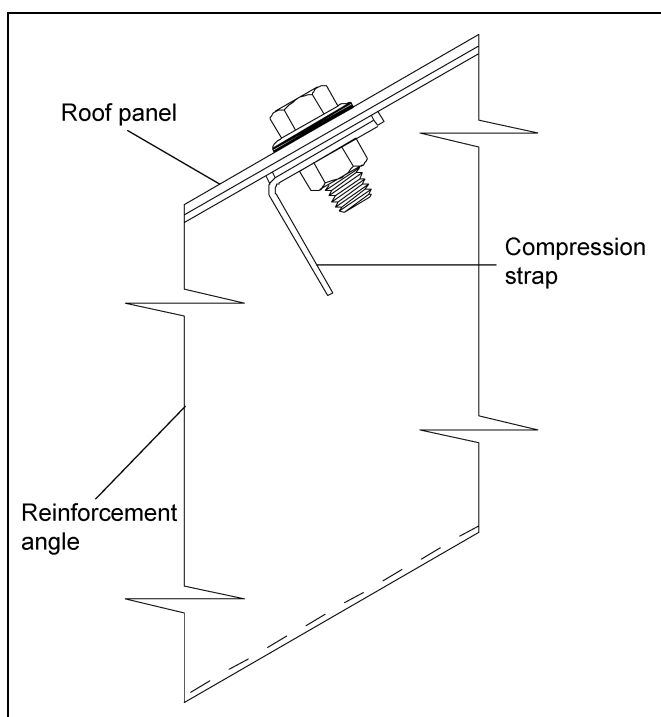


Figure 7Y View "B"-"B"

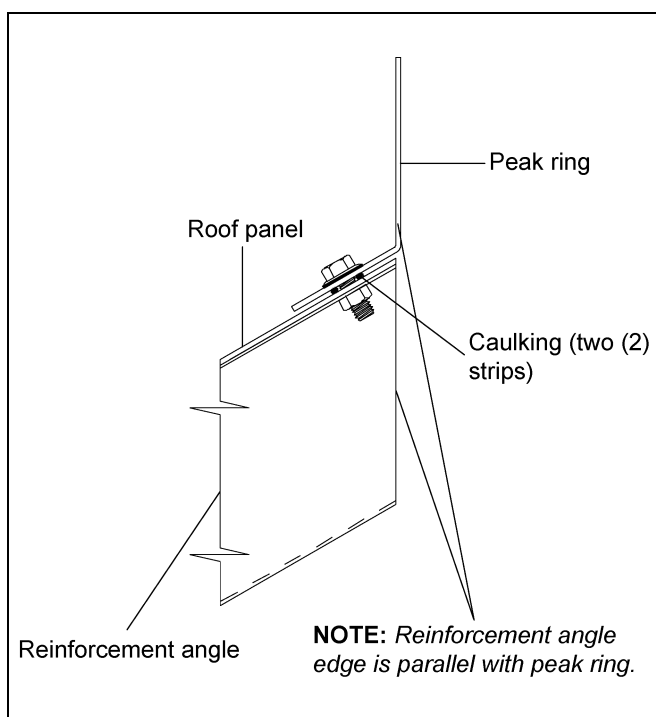


Figure 7AA View "D"-"D"

Raising the Roof

NOTE: See 30° roof manual (PNEG-1092) in roof hardware box for instructions on 12', 15', 18' and 21' grain bin roof.

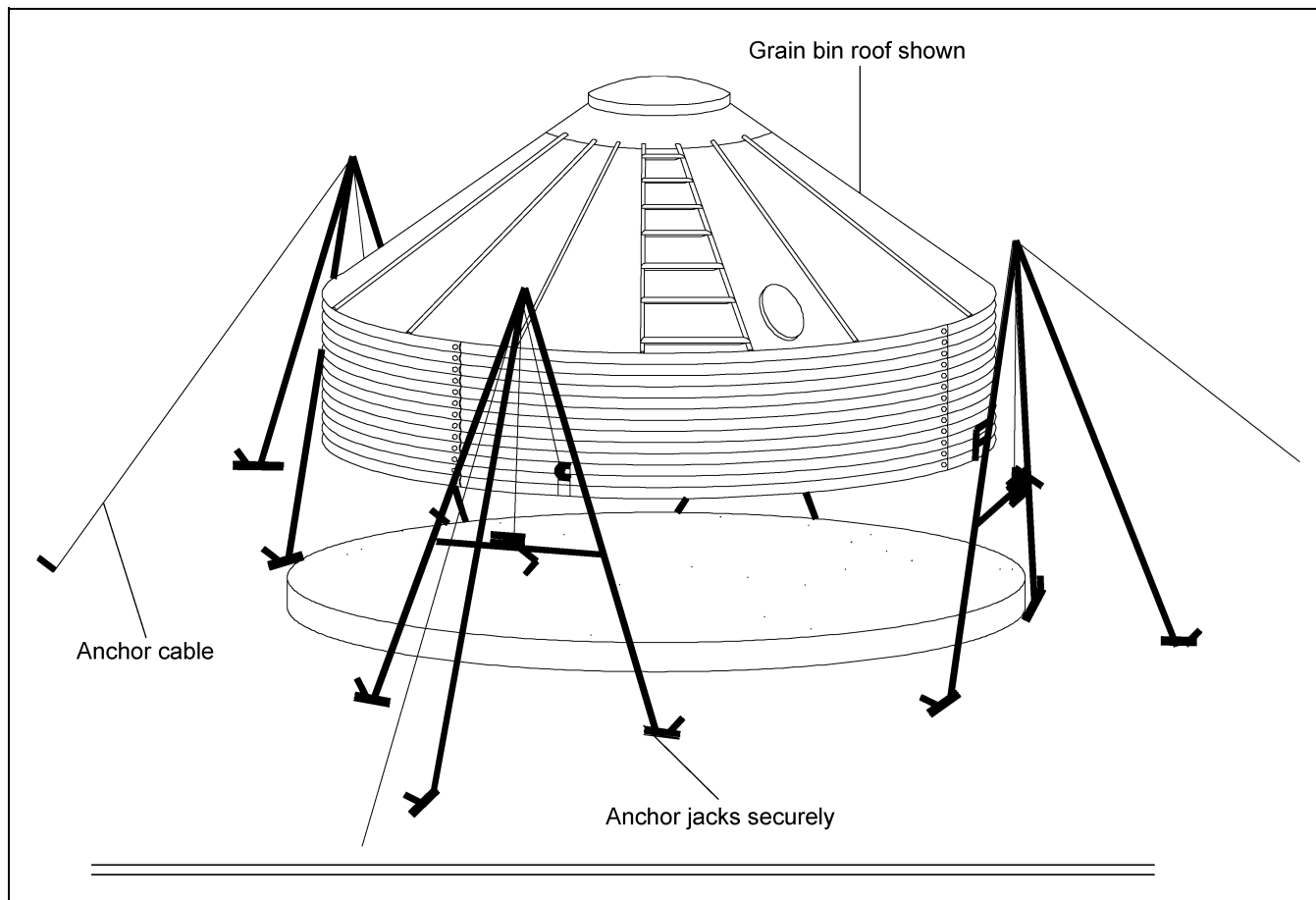


Figure 7AB

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 the 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.



Figure 7AC

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.



Watch for power lines.

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

12' 60° and 15' 60° Leg Attachment (for 12' 60° and 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 Figure 7AD](#). Apply caulking in between the hopper panel and the sidewall sheet.

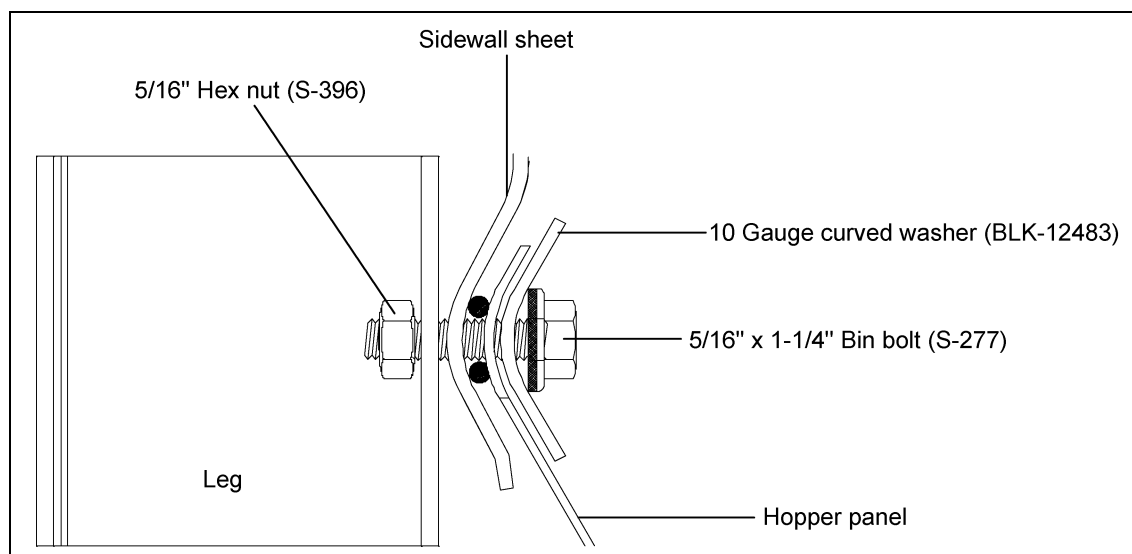


Figure 7AD

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 in [Figure 8D](#) and [Figure 8G on Page 48](#). 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.

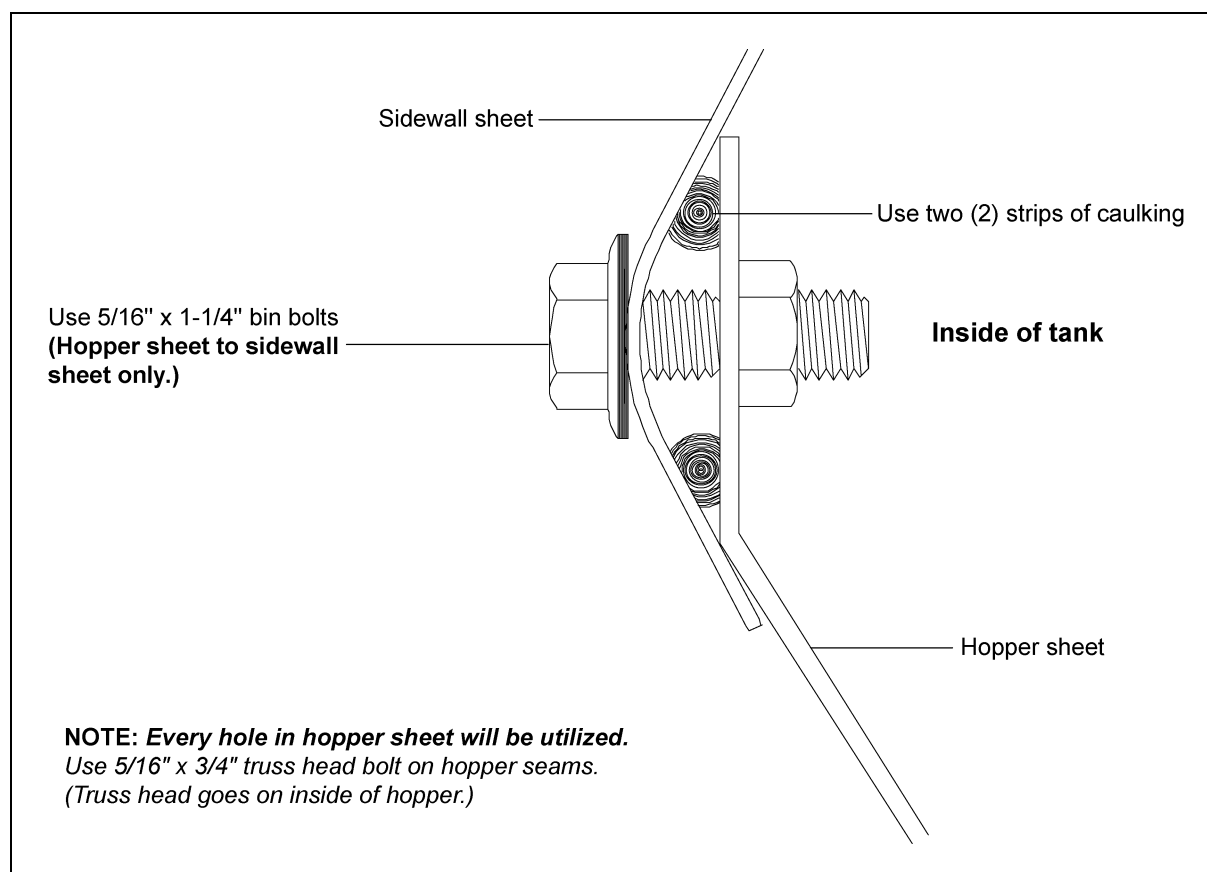


Figure 8A

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 in [Figure 8B](#) and [Figure 8C on Page 47](#). 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.

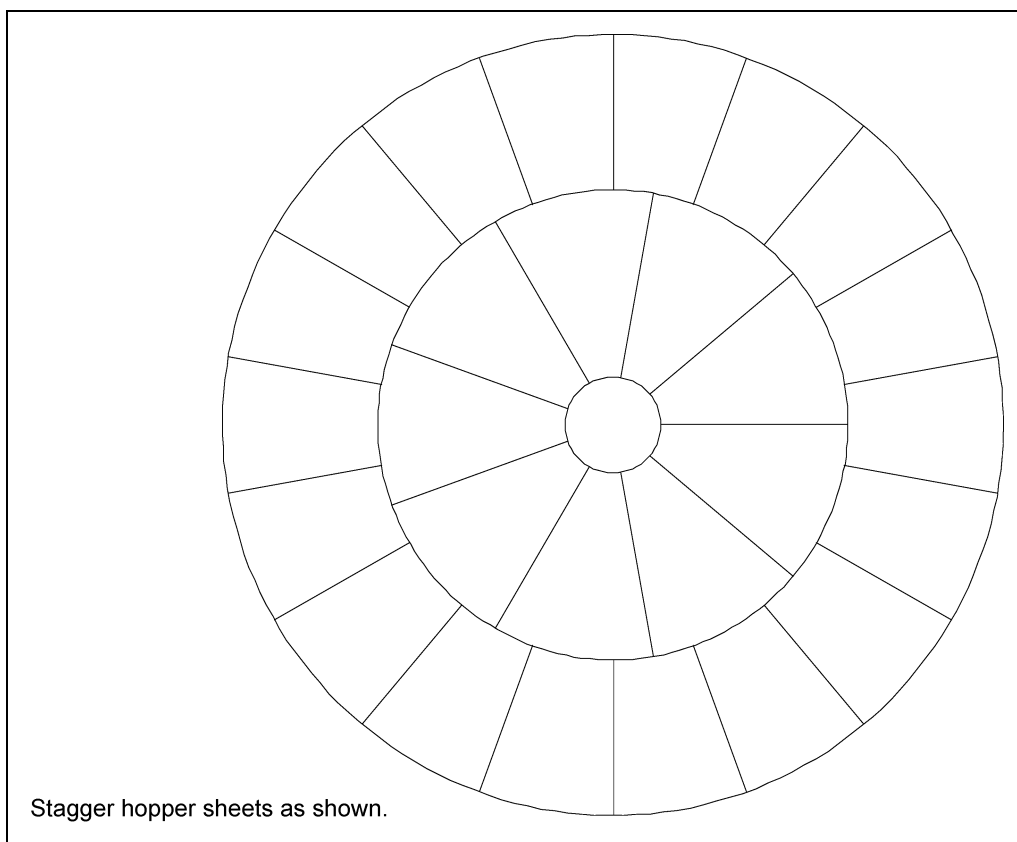


Figure 8B 15' 60° Two-Piece Hopper Overhead View of 15' 60° Hopper Sheet Assembly

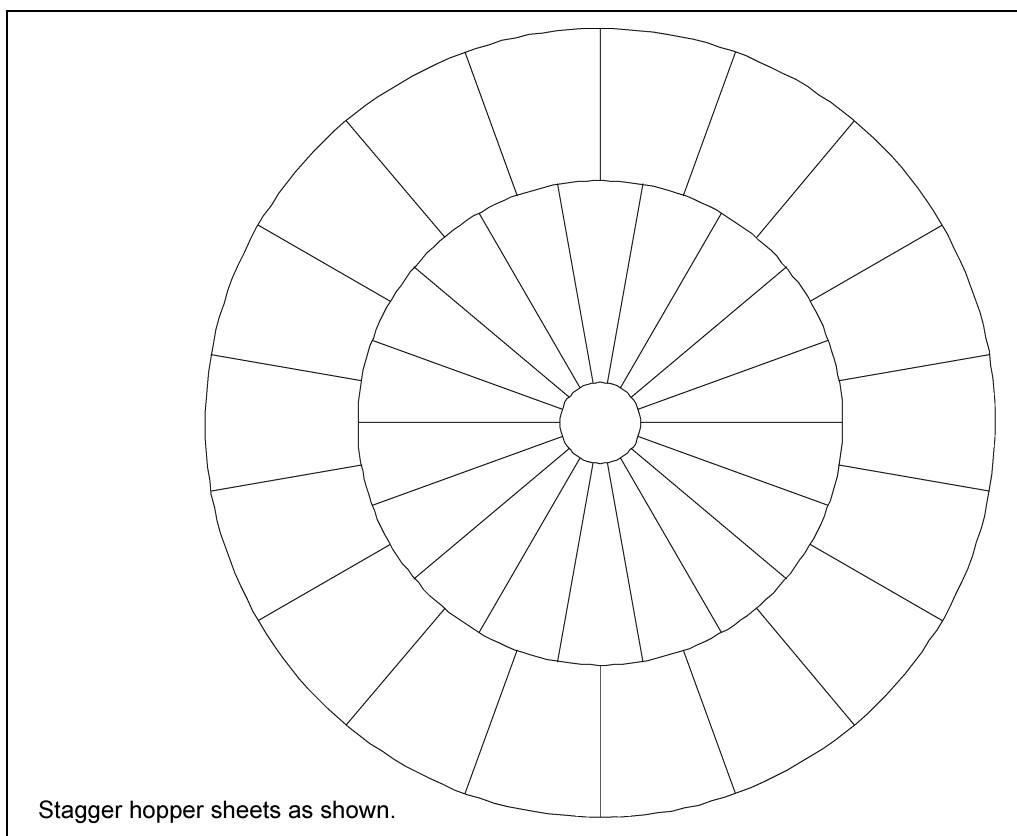


Figure 8C 18' and 21' Two-Piece Hopper Overhead View of 18' 45° and 21' 45° Hopper Sheet Assembly

8. Hopper Assembly

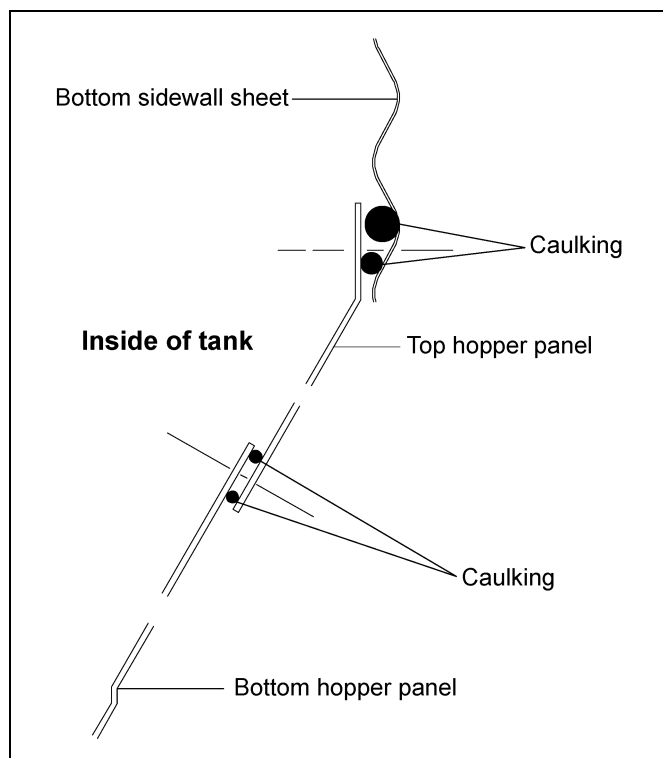


Figure 8D 15' 60°, 18' 45° and 21' 45°
Hopper Sheet Detail

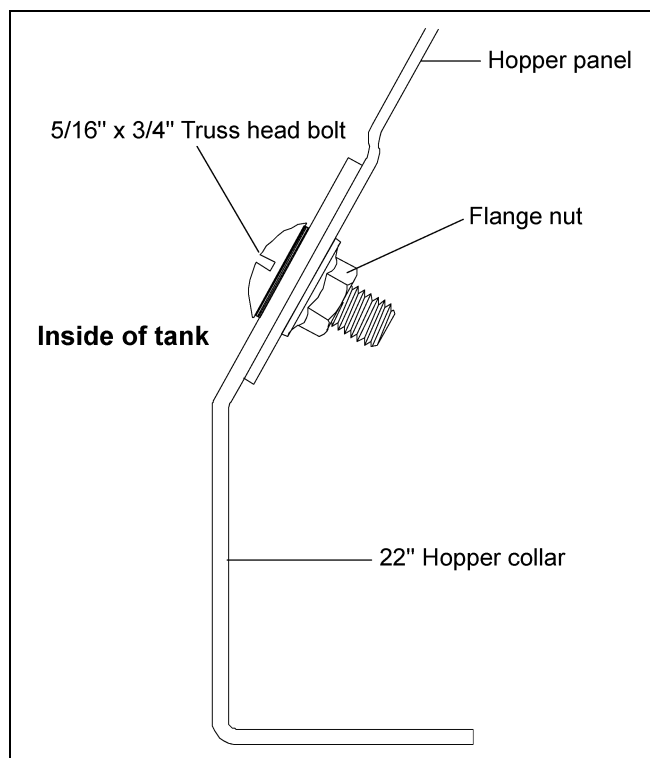


Figure 8F 22" Hopper Collar Detail

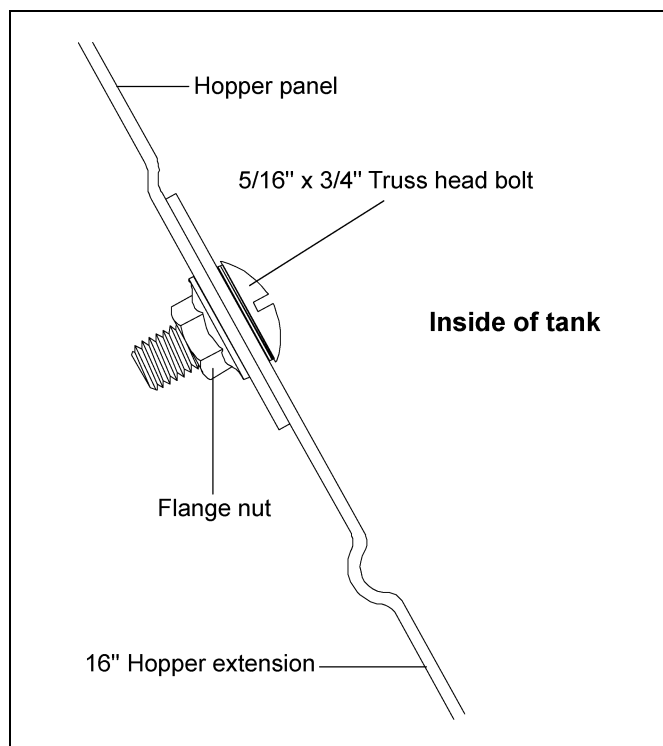


Figure 8E 16" Hopper Extension Detail

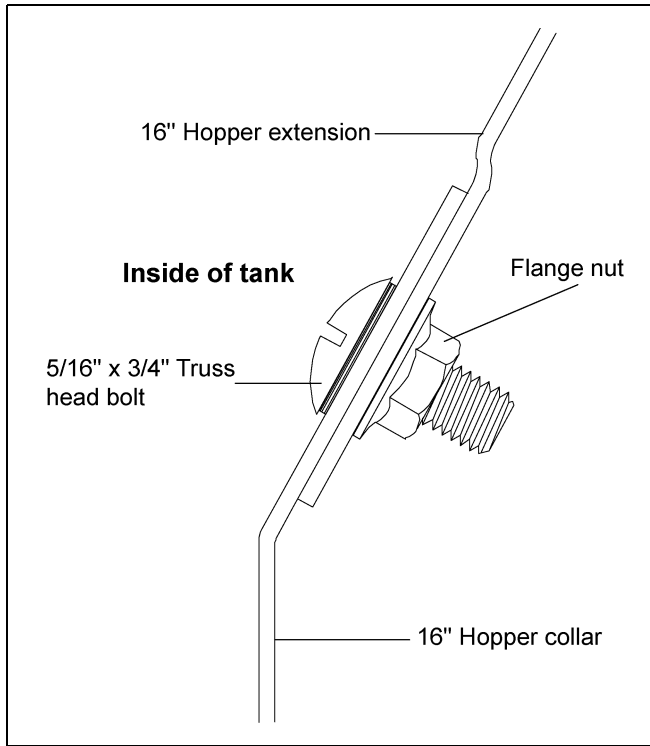


Figure 8G 16" Hopper Collar Detail

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.)

Hopper Collar Assembly

45° 22" Hopper collar (BLK-10854)

60° 22" Hopper collar (BLK-10342)

Install hopper collar before all hopper panels are assembled. Use 5/16" truss head bolts, as shown in [Figure 8H](#), on all hopper seams. Be sure to caulk between the hopper collar and hopper panels. (See [Figure 8I](#) and [Figure 8J](#).)

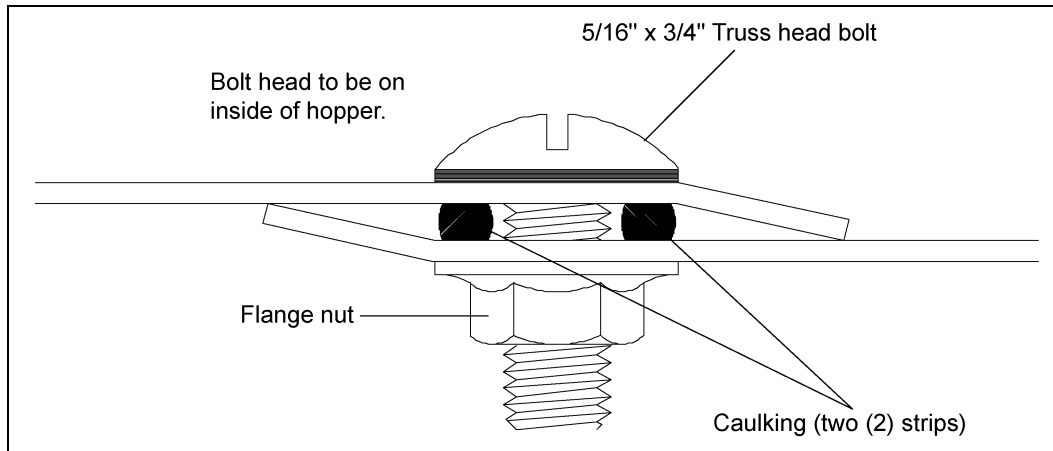


Figure 8H Hopper Seam Overlap Detail

16" 45° Hopper extension panel (BLK-10697) (three (3) required)

16" 45° Hopper collar (BLK-10696)

16" 60° Hopper extension panel (BLK-10487) (three (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. (See [Figure 8I](#) and [Figure 8J](#).)

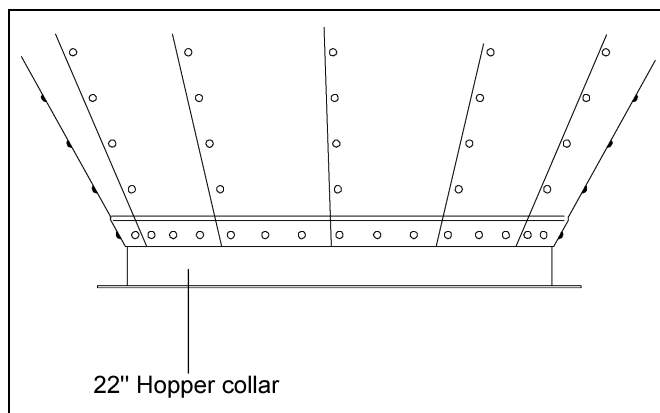


Figure 8I 22" Hopper Collar

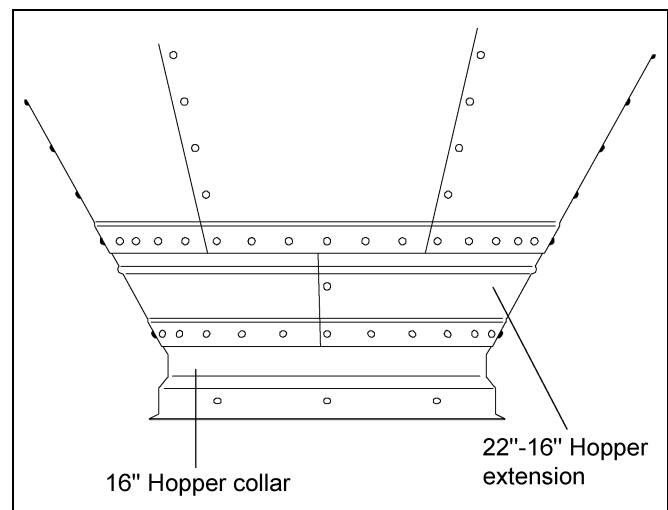


Figure 8J 16" Hopper Extensions and Collar

12' Only

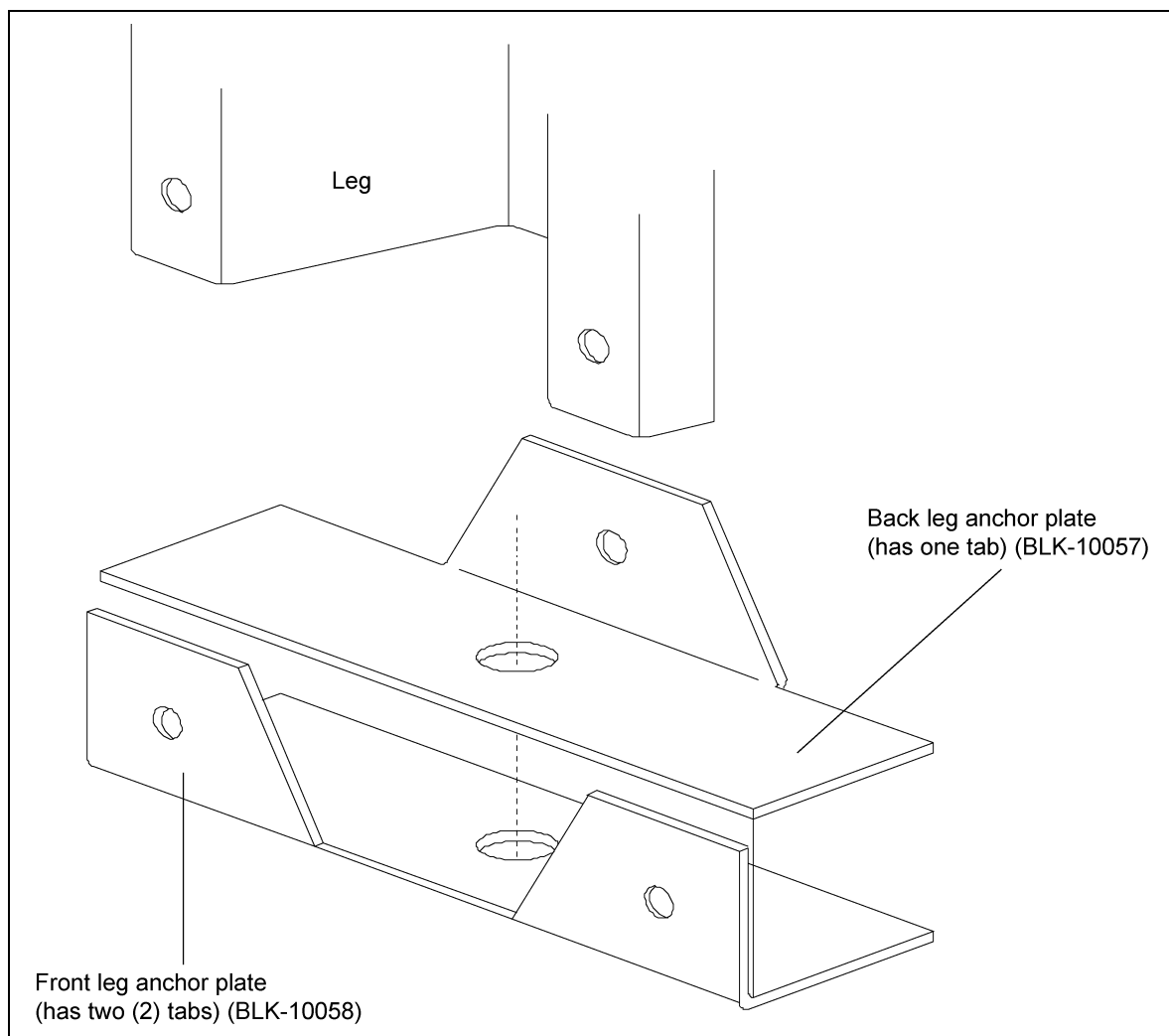


Figure 9A



Figure 9B



Figure 9C

Installation of Leg to Sidewall

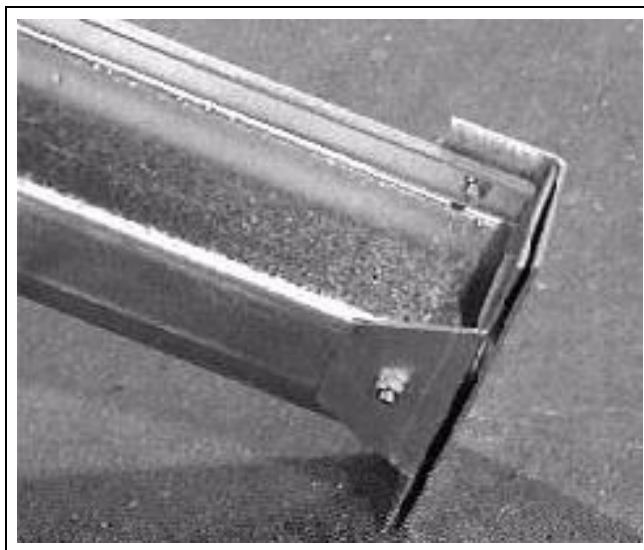


Figure 9D

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 54](#) before attaching legs.)

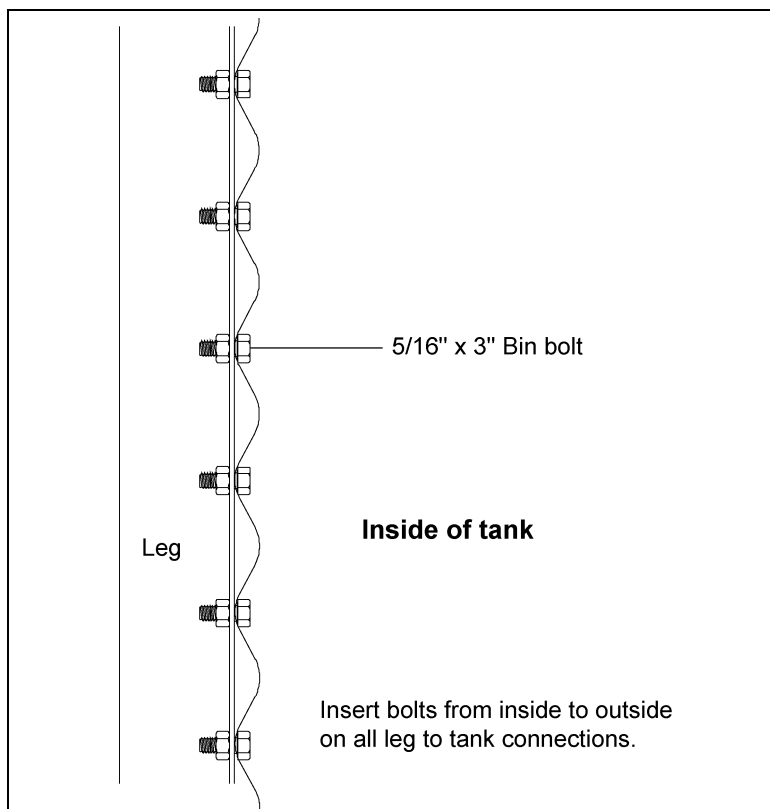


Figure 9E

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

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.

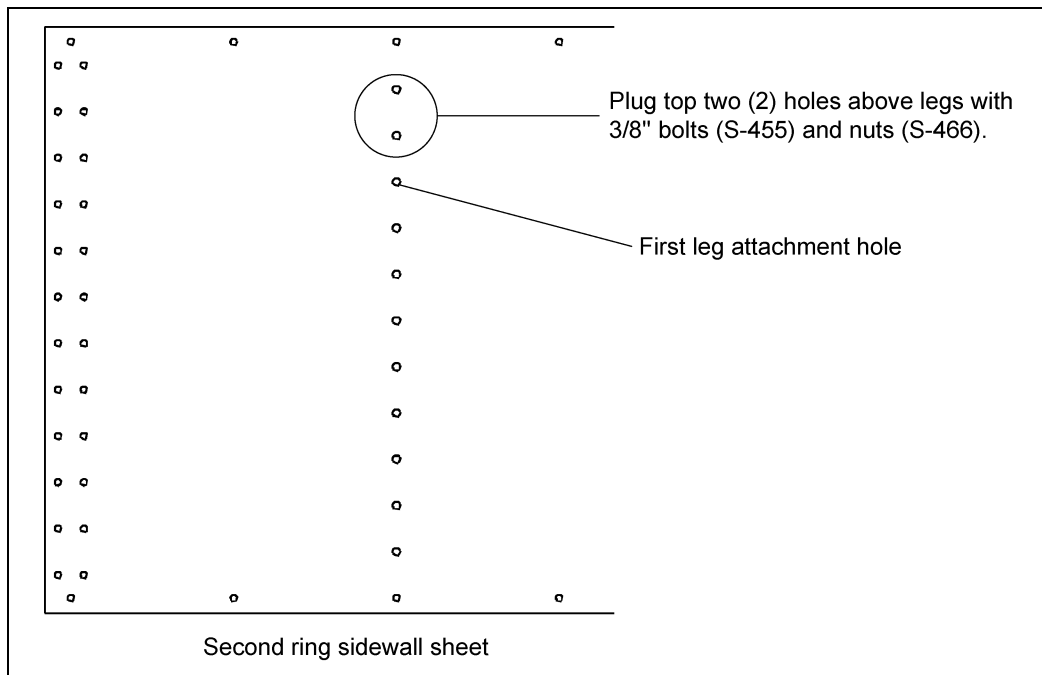


Figure 9F Plug Holes

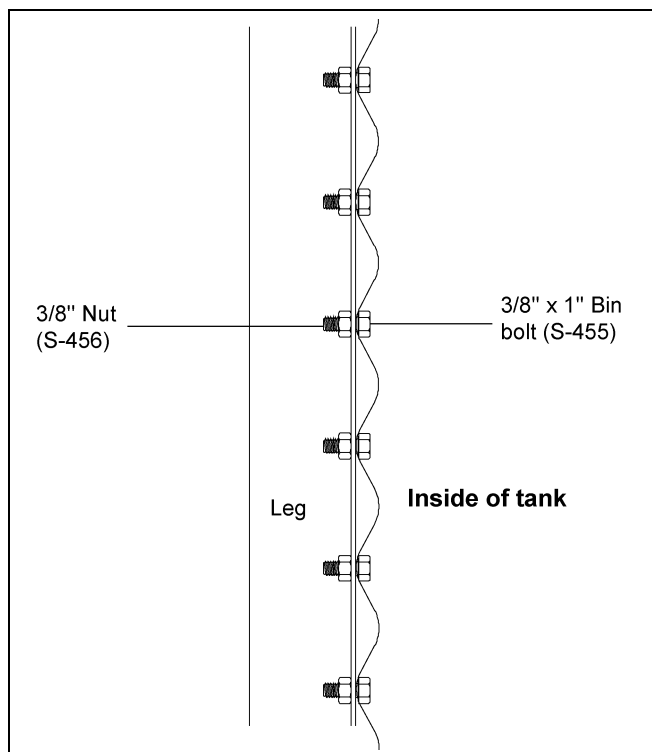


Figure 9G



Figure 9H Installing legs to bin with bolt heads on the inside of bin and nuts on the outside.

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 Pages 55-58 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. See Figure 9I below and Figure 9J on Page 54 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 as shown in Figure 9I below and Figure 9J on Page 54.

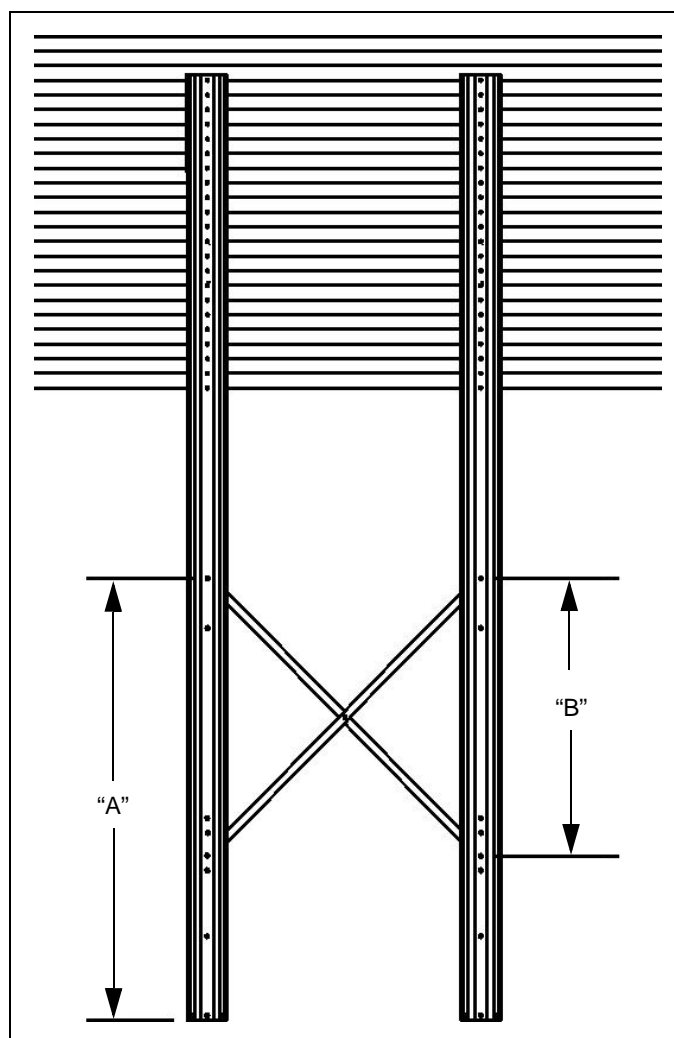


Figure 9I Typical 12' and 15' 45° Bracing Layout

9. Leg and Leg Bracing

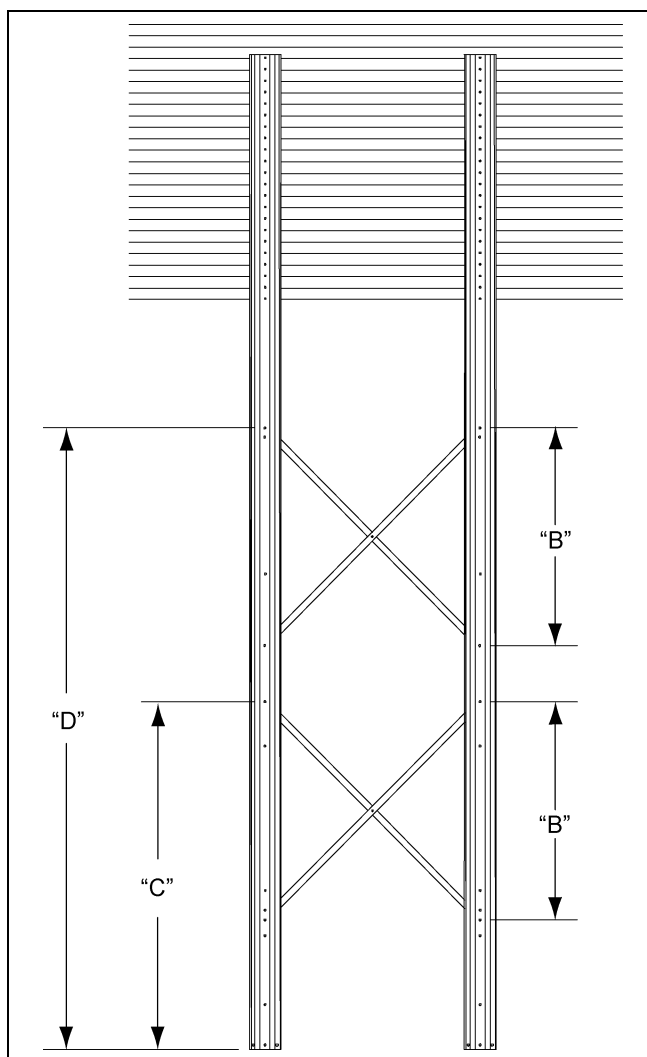


Figure 9J Typical 18' and 21' 45° and 12' and 15' 60° Bracing Layout

Leg Size Chart

Tank Size	Hopper	# of Rings	Length
12' Diameter Tank	45°	1-5 Rings	130-1/8"
12' Diameter Tank	45°	6-7 Rings	154-1/8"
12' Diameter Tank	60°	1-5 Rings	175-1/8"
12' Diameter Tank	60°	6-7 Rings	199-1/8"
15' Diameter Tank	45°	2-8 Rings	172-3/8"
15' Diameter Tank	60°	2-6 Rings	231"
18' Diameter Tank	45°	2-8 Rings	190-1/4"
21' Diameter Tank	45°	2-6 Rings	201-1/2"

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 [above](#) chart to find the correct number of rings the legs will cover. **Put all legs on, but do not tighten bolts until all braces are in place.** Be sure to put leg braces on properly. ([See Pages 55-58.](#))

Bracing Hole Layouts

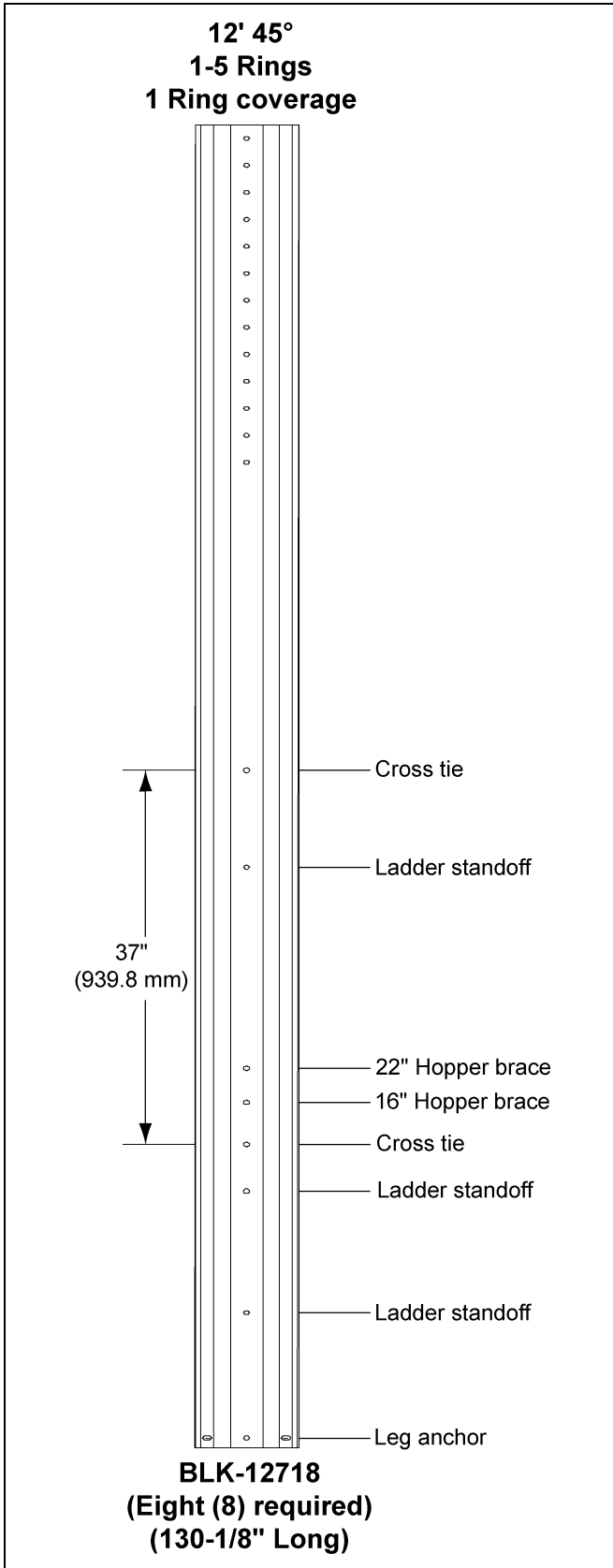


Figure 9K

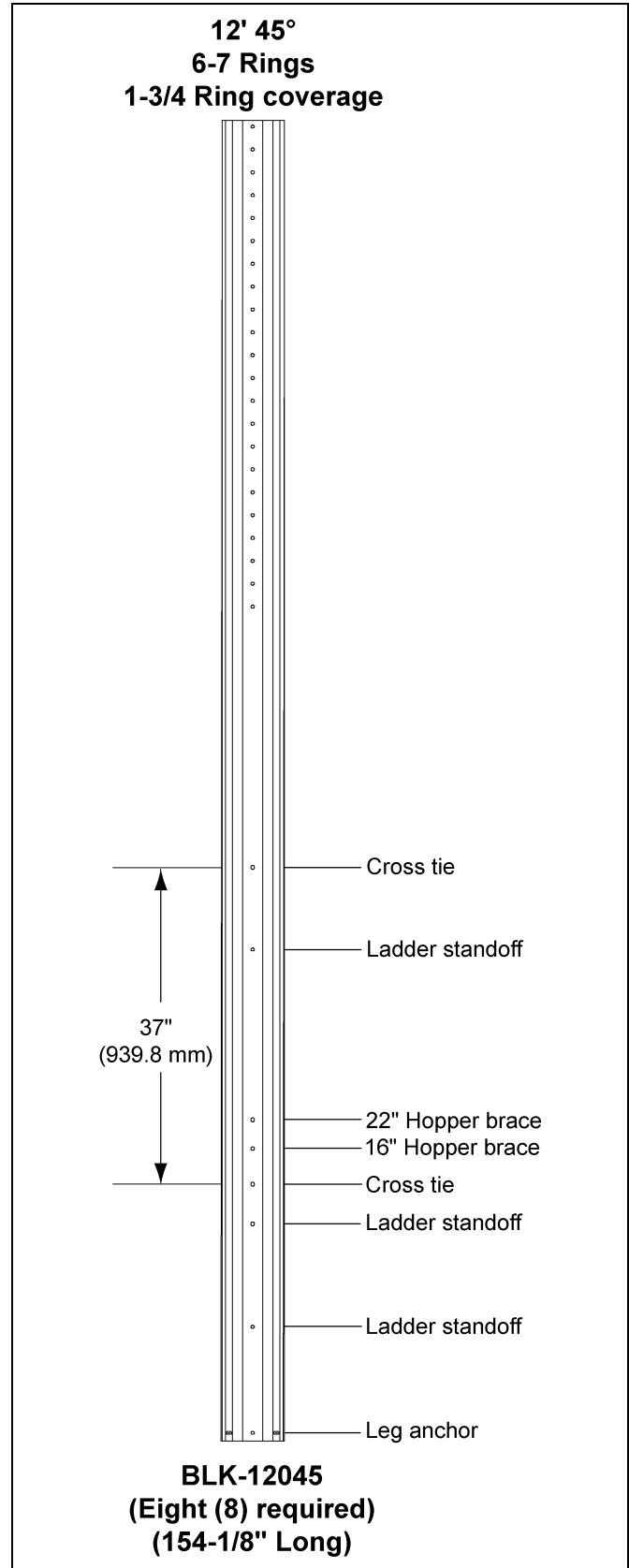


Figure 9L

Bracing Hole Layouts (Continued)

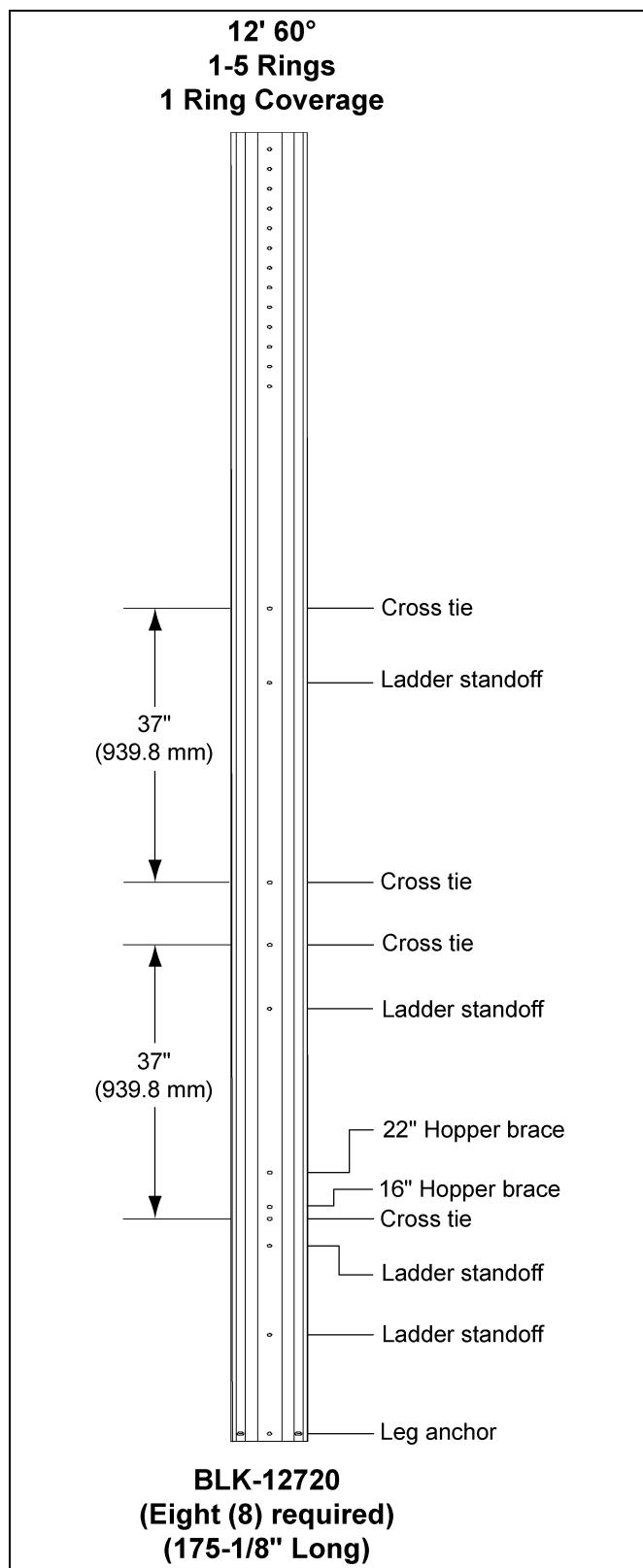


Figure 9M

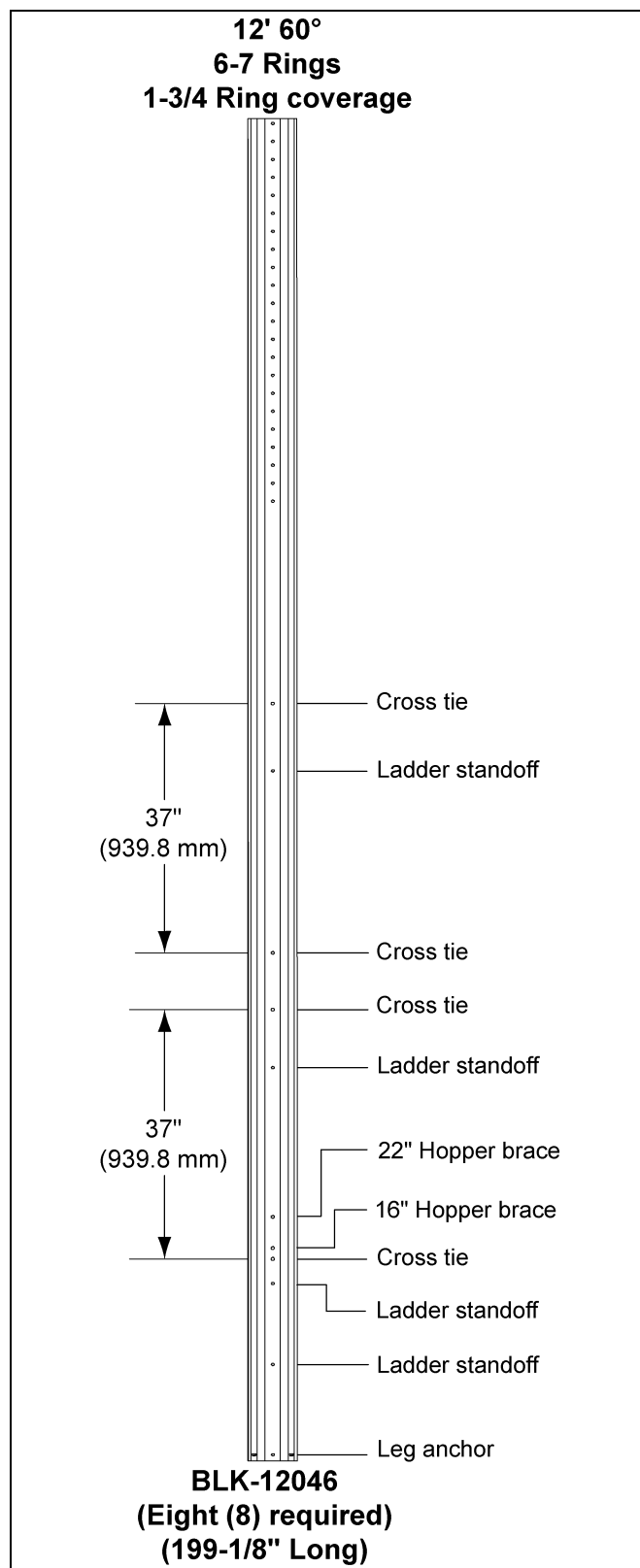


Figure 9N

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

Bracing Hole Layouts (Continued)

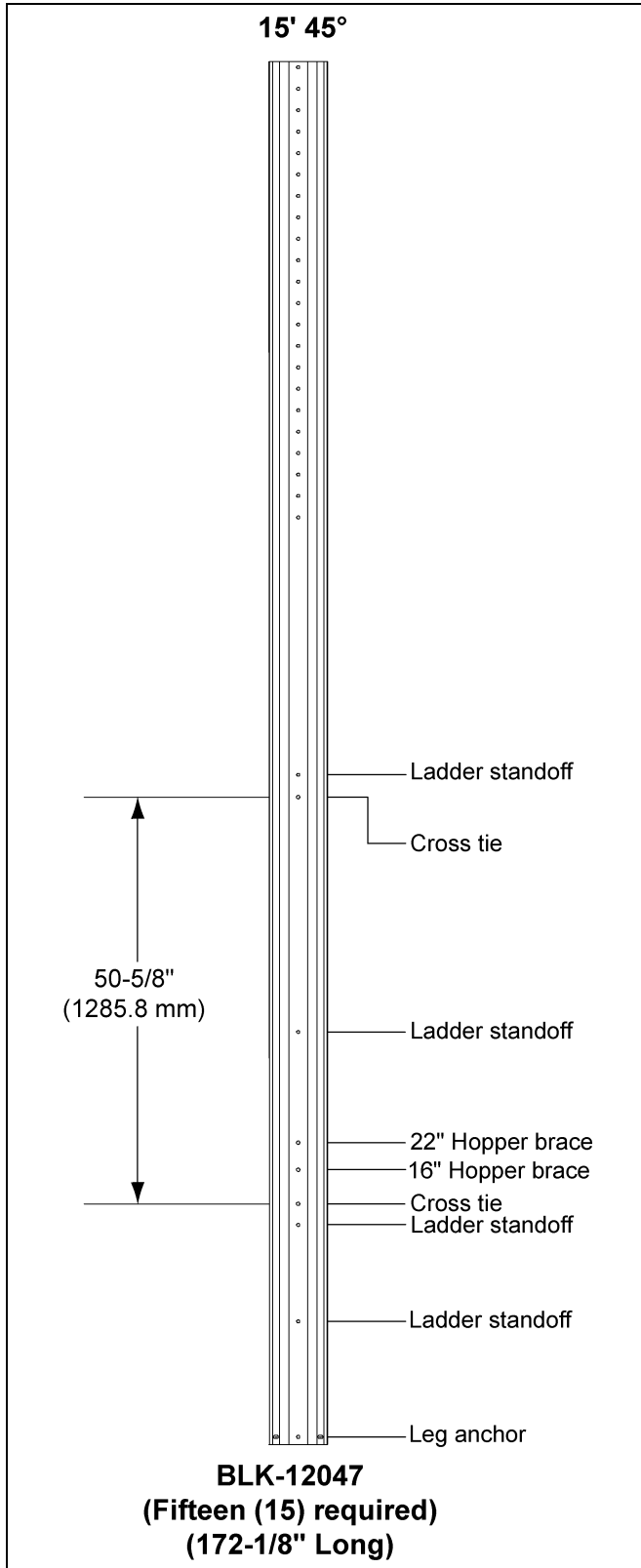


Figure 90

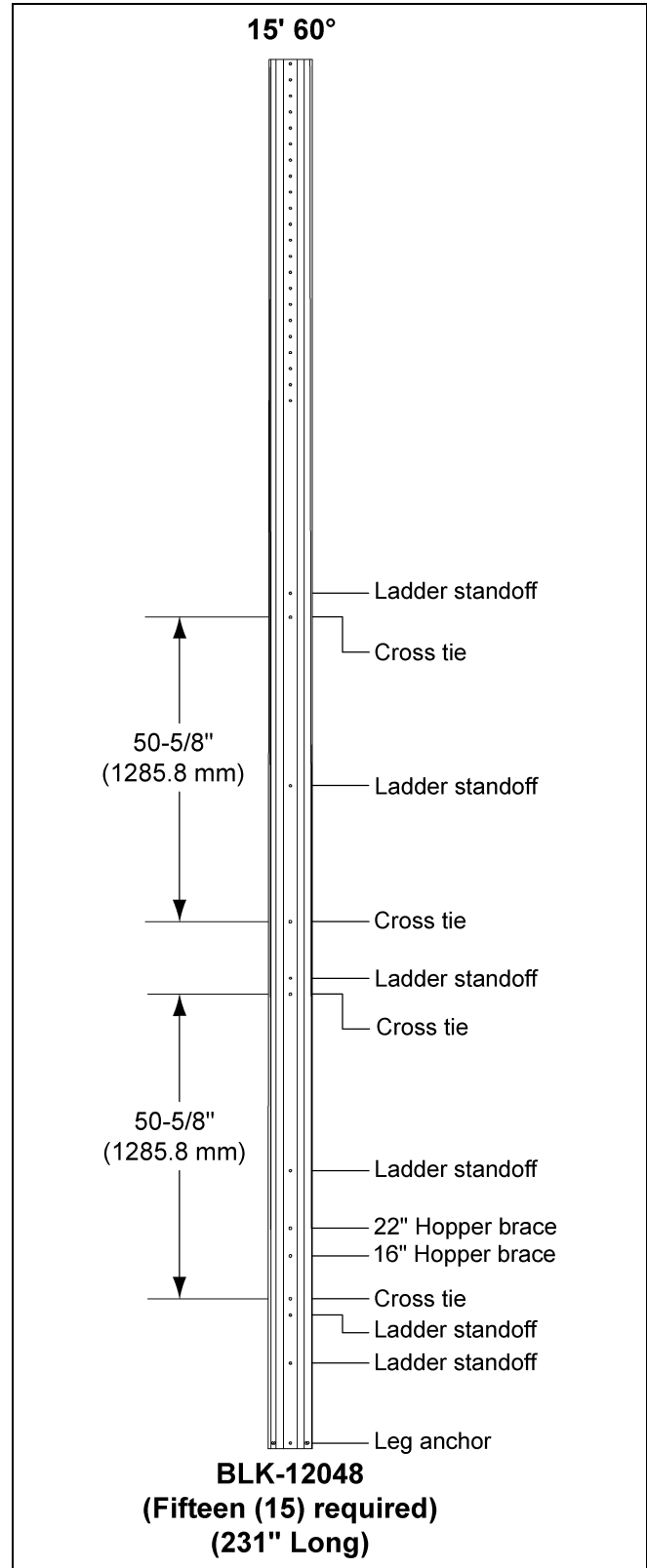


Figure 9P

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

Bracing Hole Layouts (Continued)

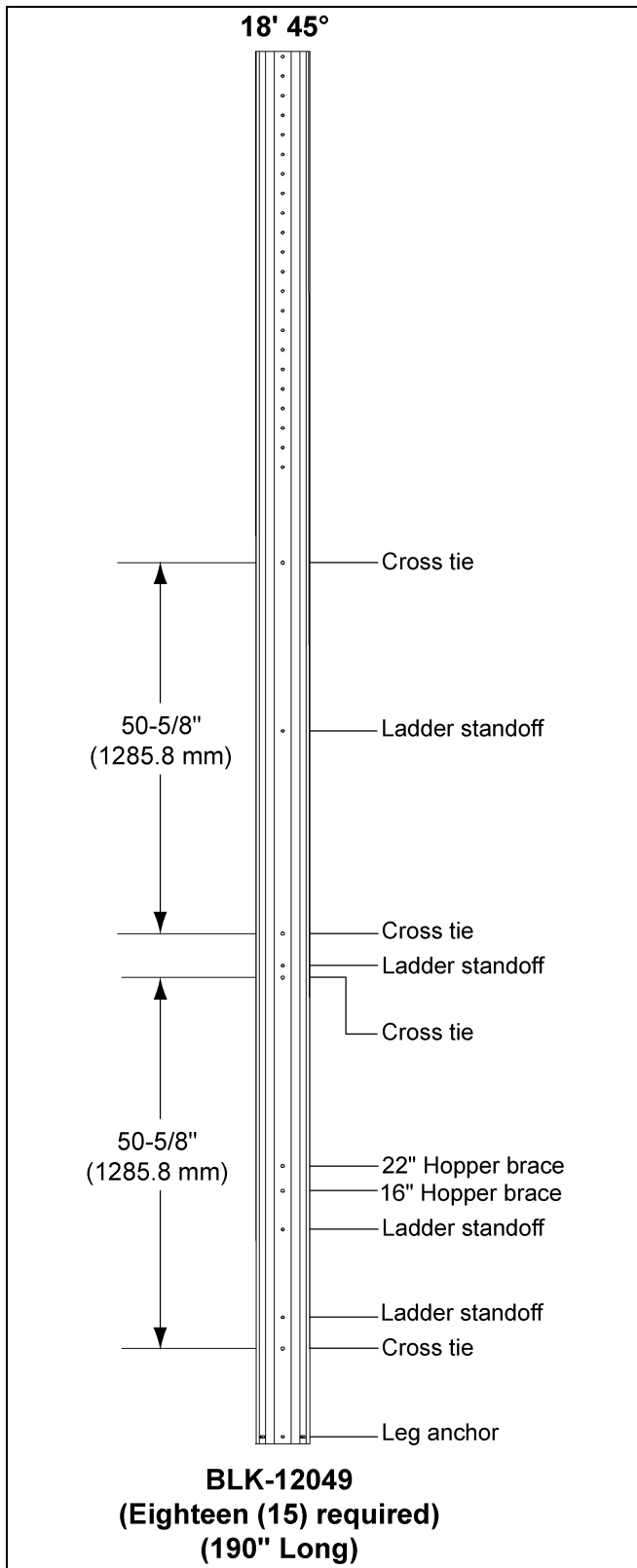


Figure 9Q

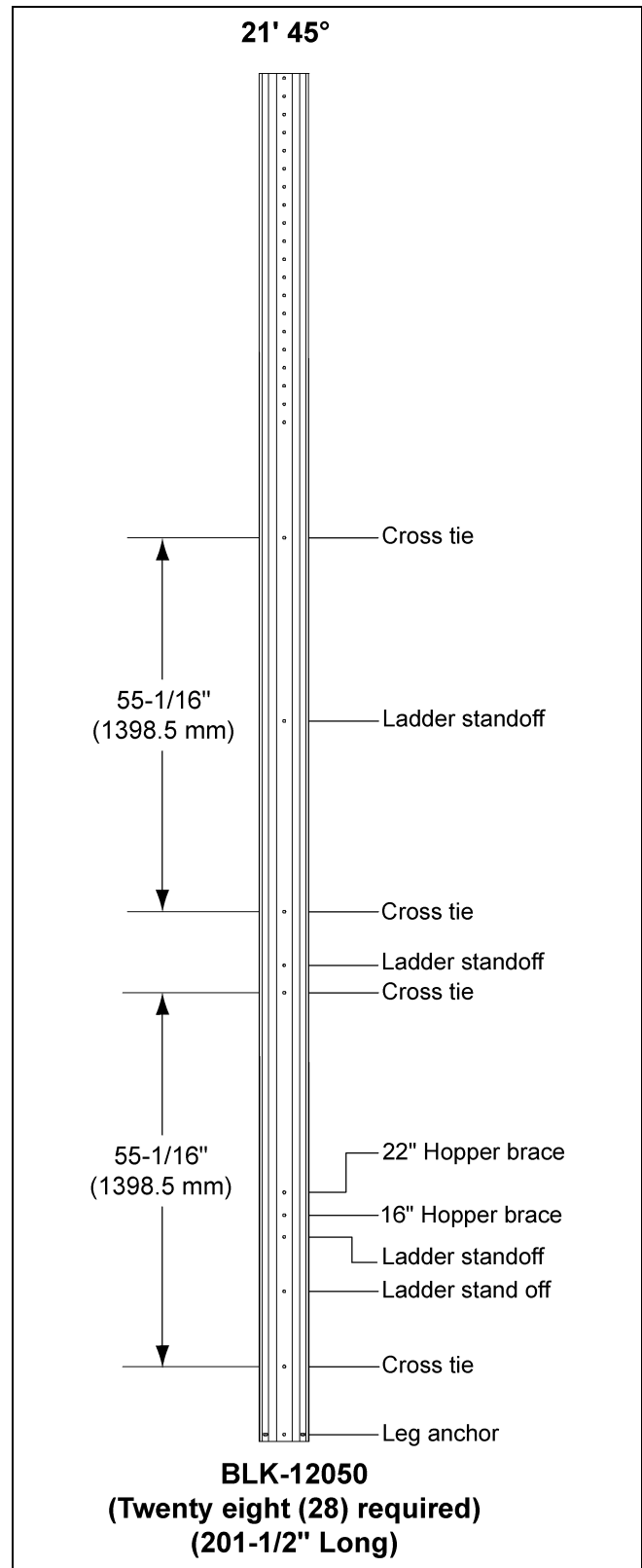


Figure 9R

All leg to sidewall holes (22 at 2.666" spacing on 18'; 20 at 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 chart [below](#) for the quantities required.

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.

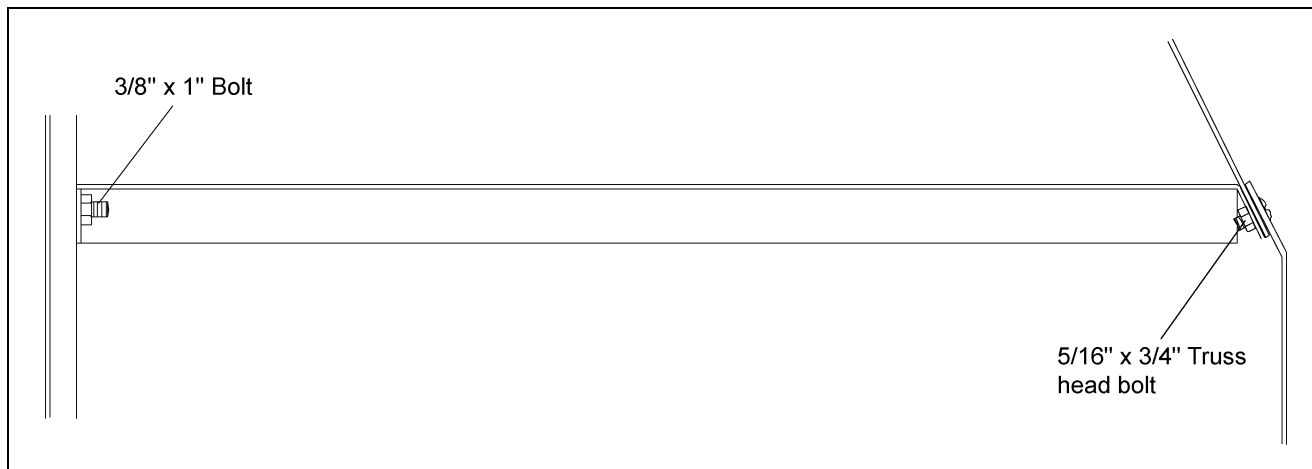


Figure 9S

Description	16" Hopper Brace Part #	22" Hopper Brace Part #	Qty
12' Diameter 45° Hopper	BLK-12115	BLK-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

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.

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

10. Ladder

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. (See [Figure 10A.](#)) Continue with standoff located on every horizontal seam. Ladder support ring should be located between two (2) 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.

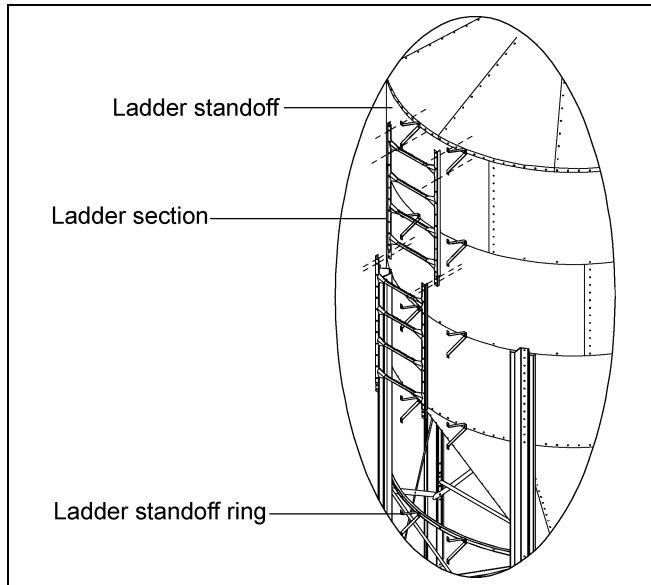


Figure 10A *Ladder Standoff Detail*

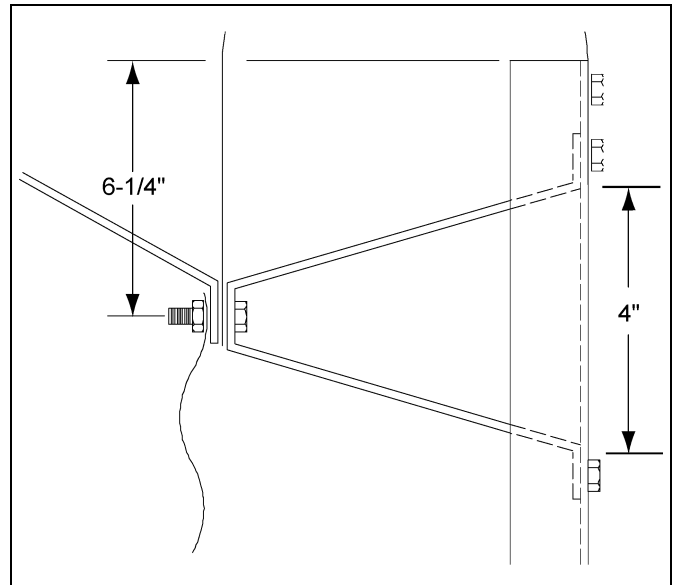


Figure 10B

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

Ladder Standoff Ring Chart

Tank Diameter	Ladder Standoff Ring Part #	Qty Required 45°	Qty Required 60°
12'	BLK-10150	3	3
15'	BLK-11814	3	4
18'	BLK-11814	3	-
21'	BLK-11815	3	-



Figure 10C

Ladder Safety Cage

Ladder and Safety Cage Usage Chart (Number in Chart Specifies Ring Size)

Ladder Package #	Safety Cage #	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.

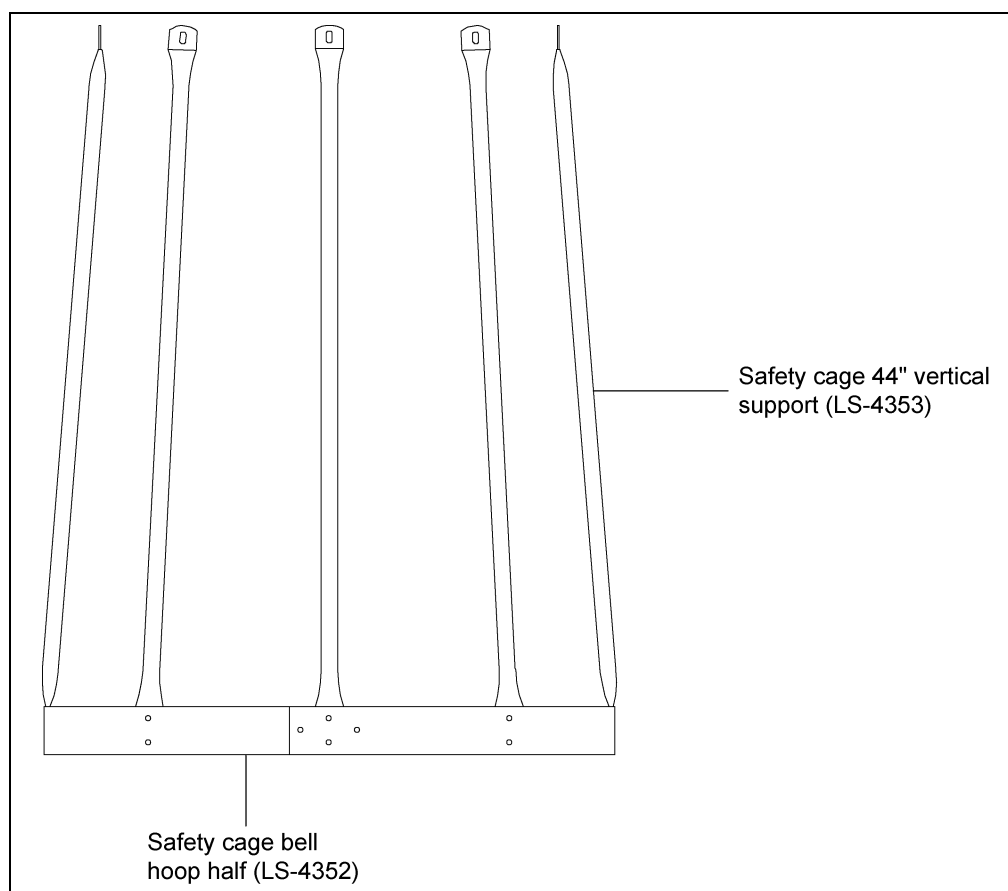


Figure 10D

10. Ladder

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 *in Figure 10F*. Refer to [Page 61](#) 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 (2) 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 the safety cage package are two (2) bell hoop halves ([See Page 61](#)) 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.

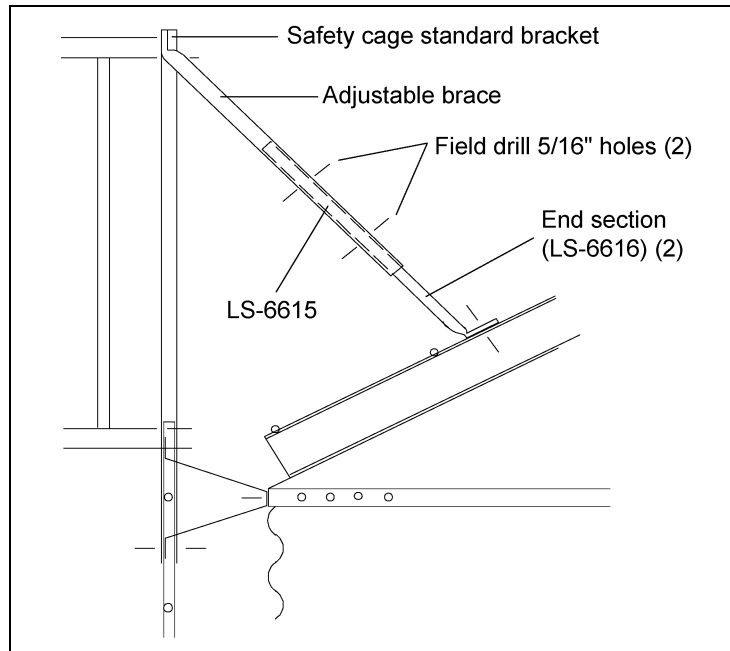


Figure 10E *Side View*

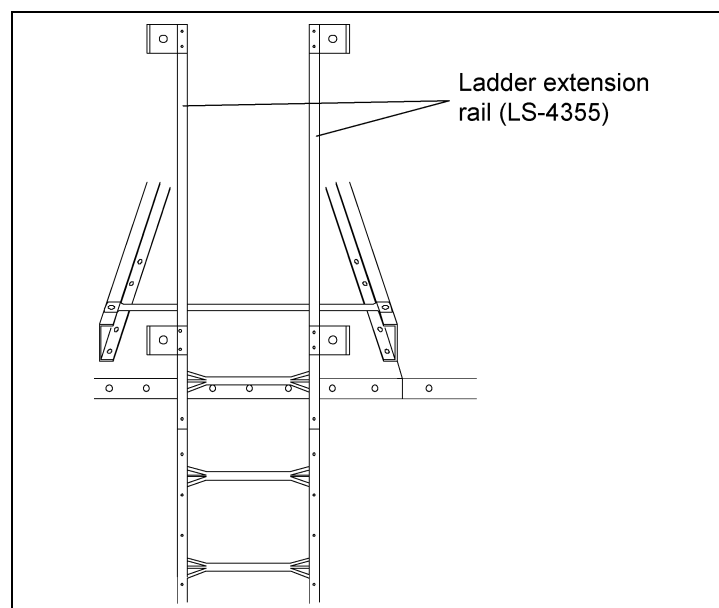


Figure 10F *Front View*

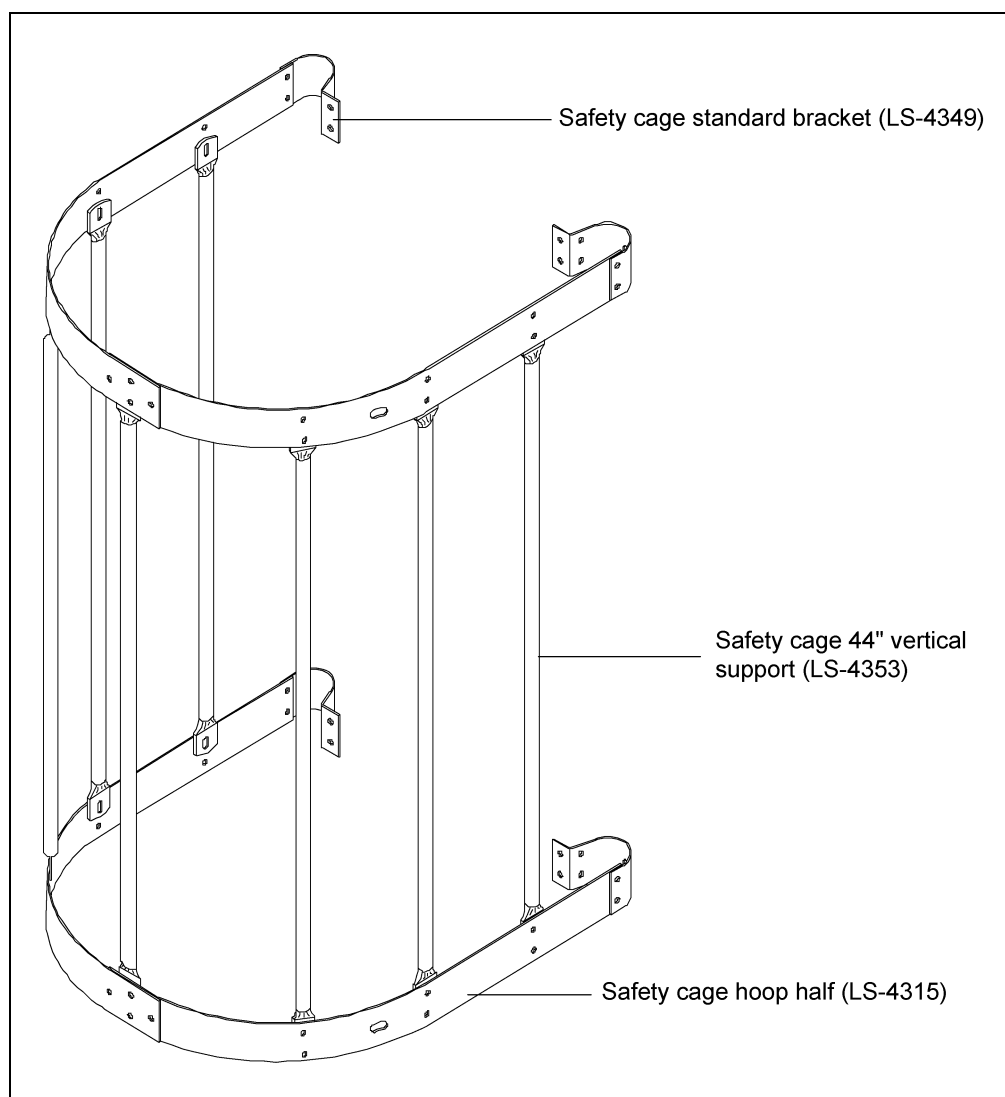


Figure 10G

Safety Cage Assembly

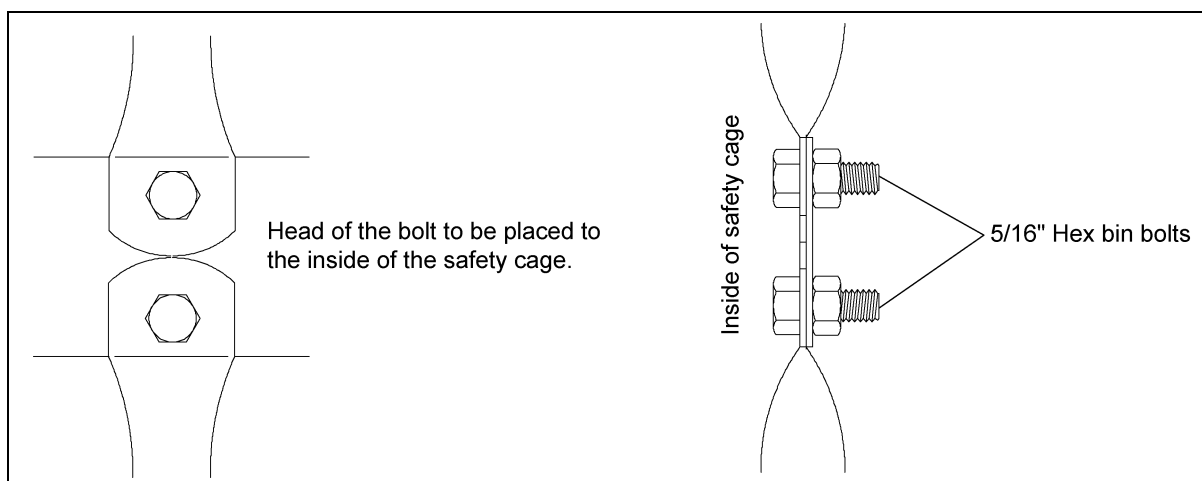


Figure 10H

10. Ladder

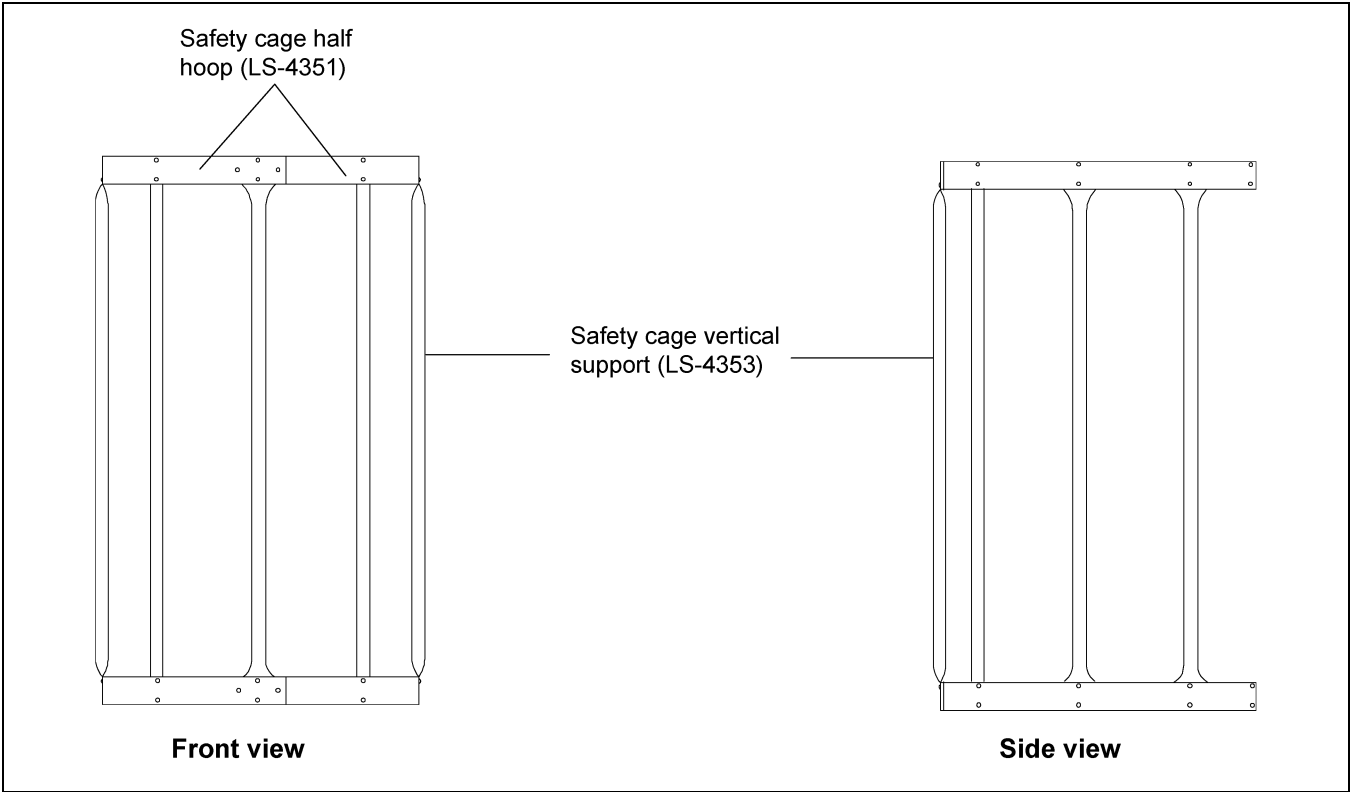


Figure 10I

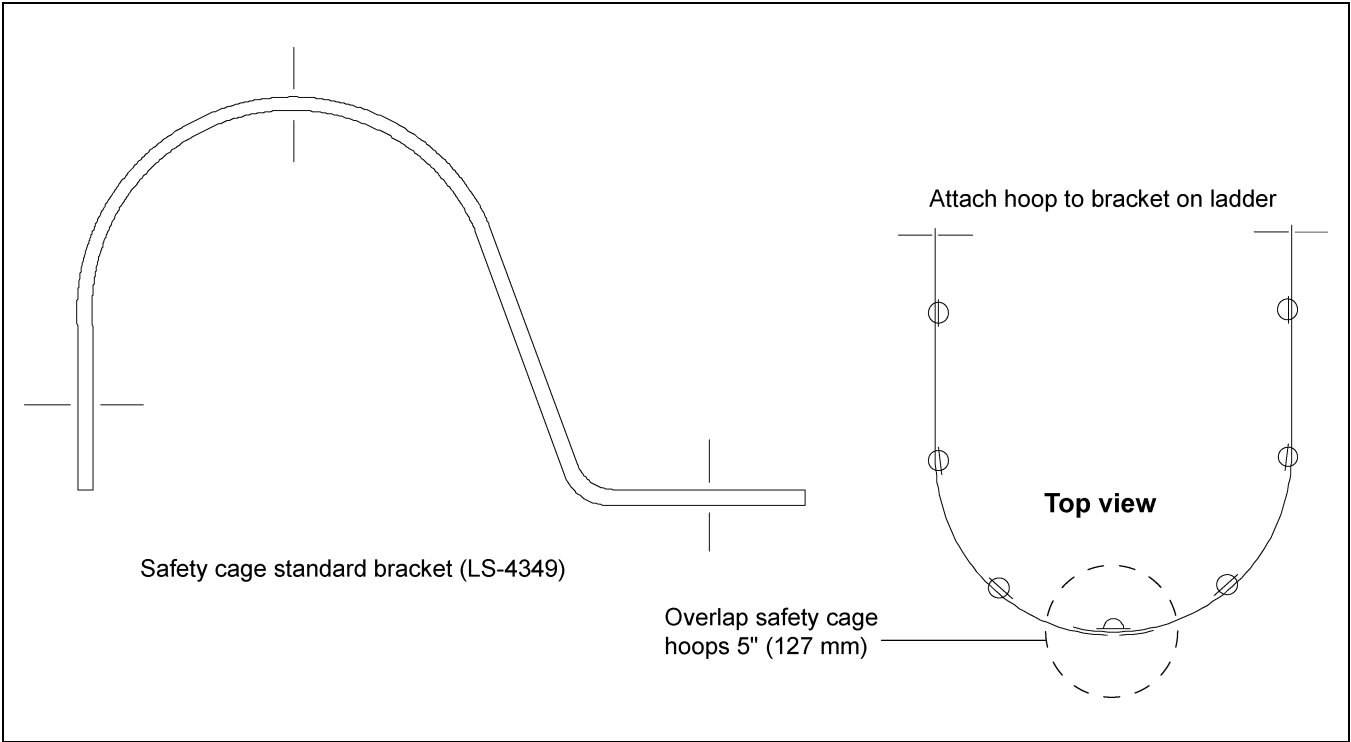


Figure 10J

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, electrification may occur.



All usual and customary precautions must be taken to ensure 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. (See Figure 11A.)

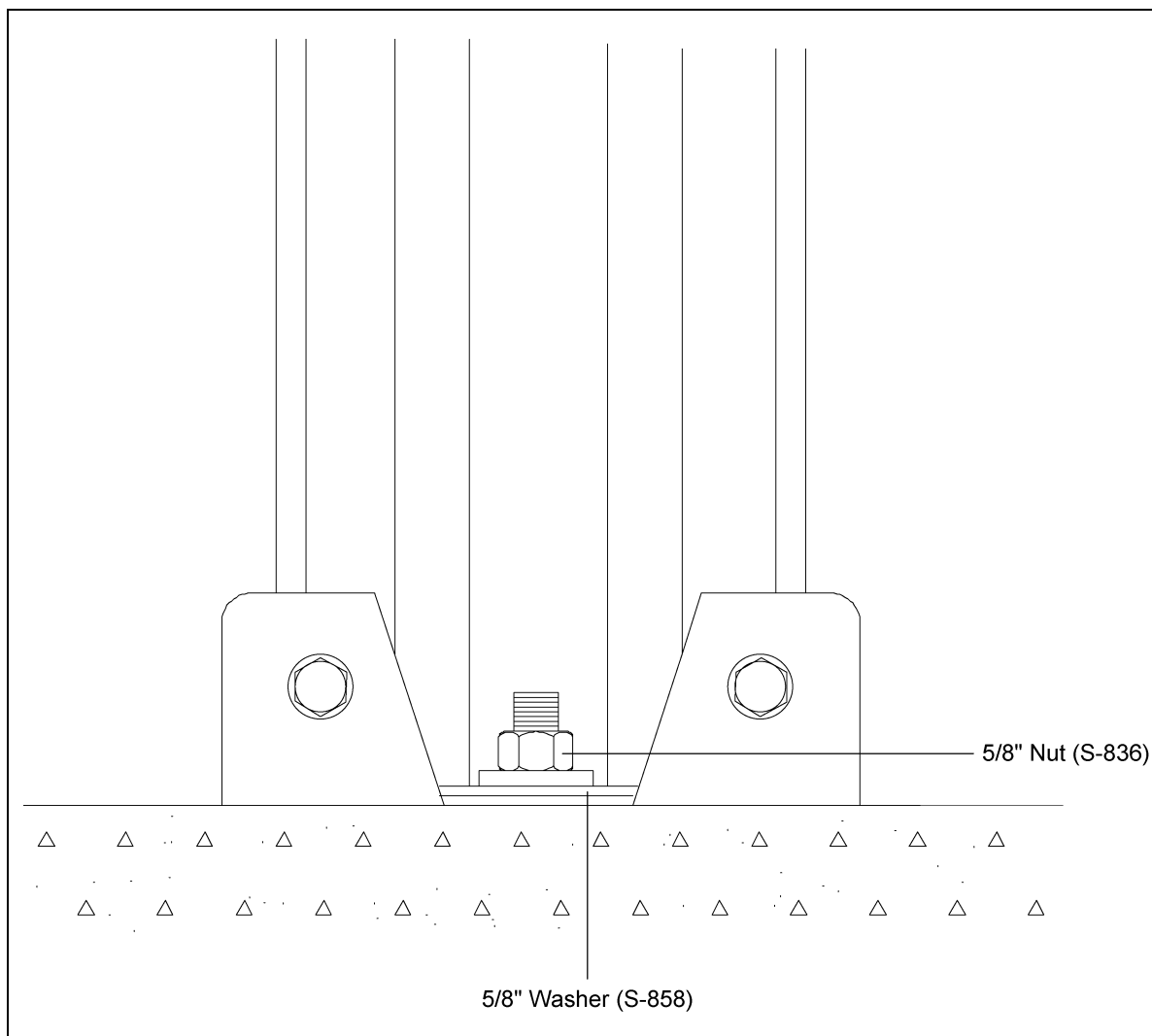


Figure 11A Leg Base Detail

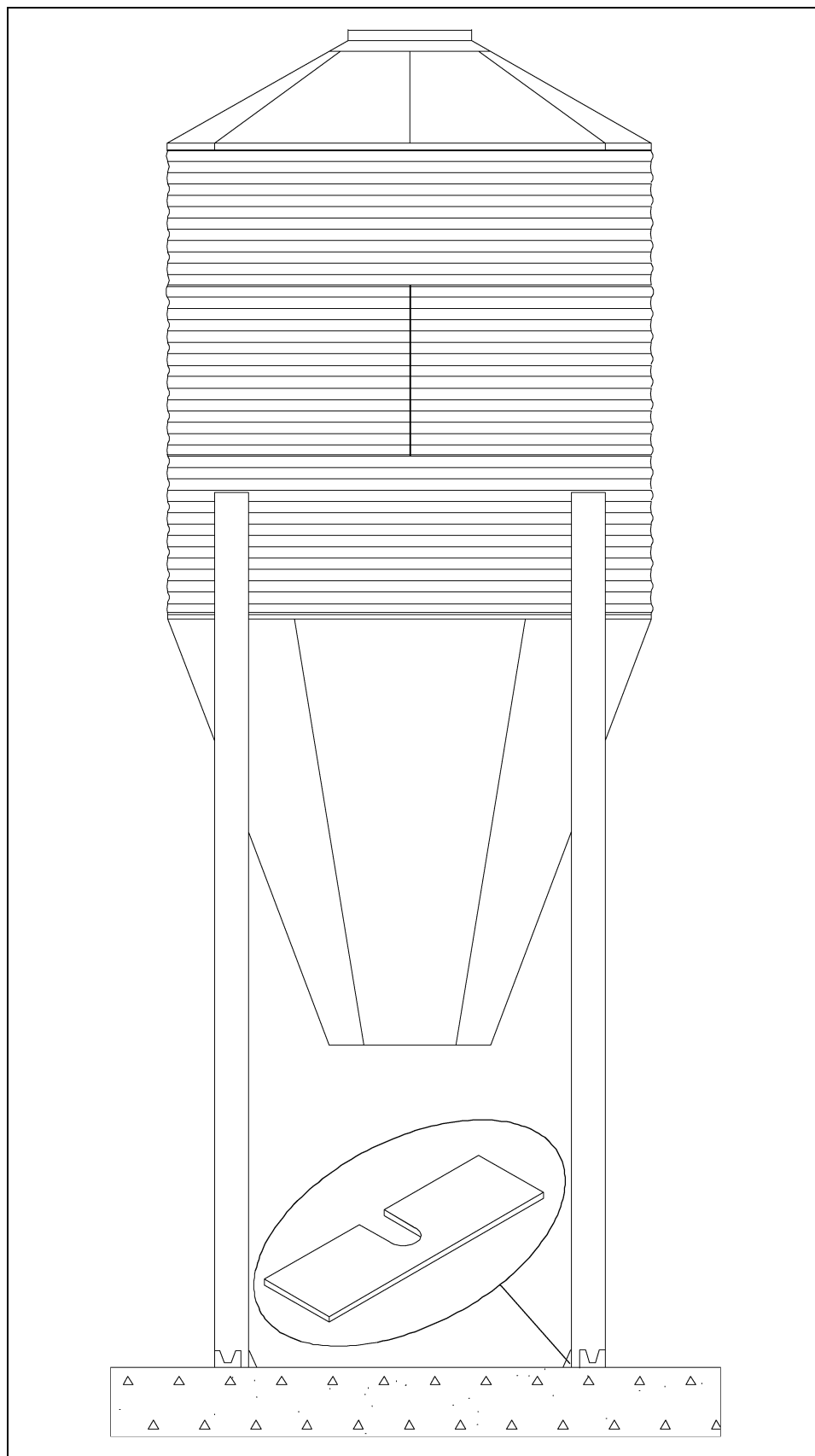


Figure 11B

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.

NOTE: Grounding rod must be placed a minimum of 24" from concrete.

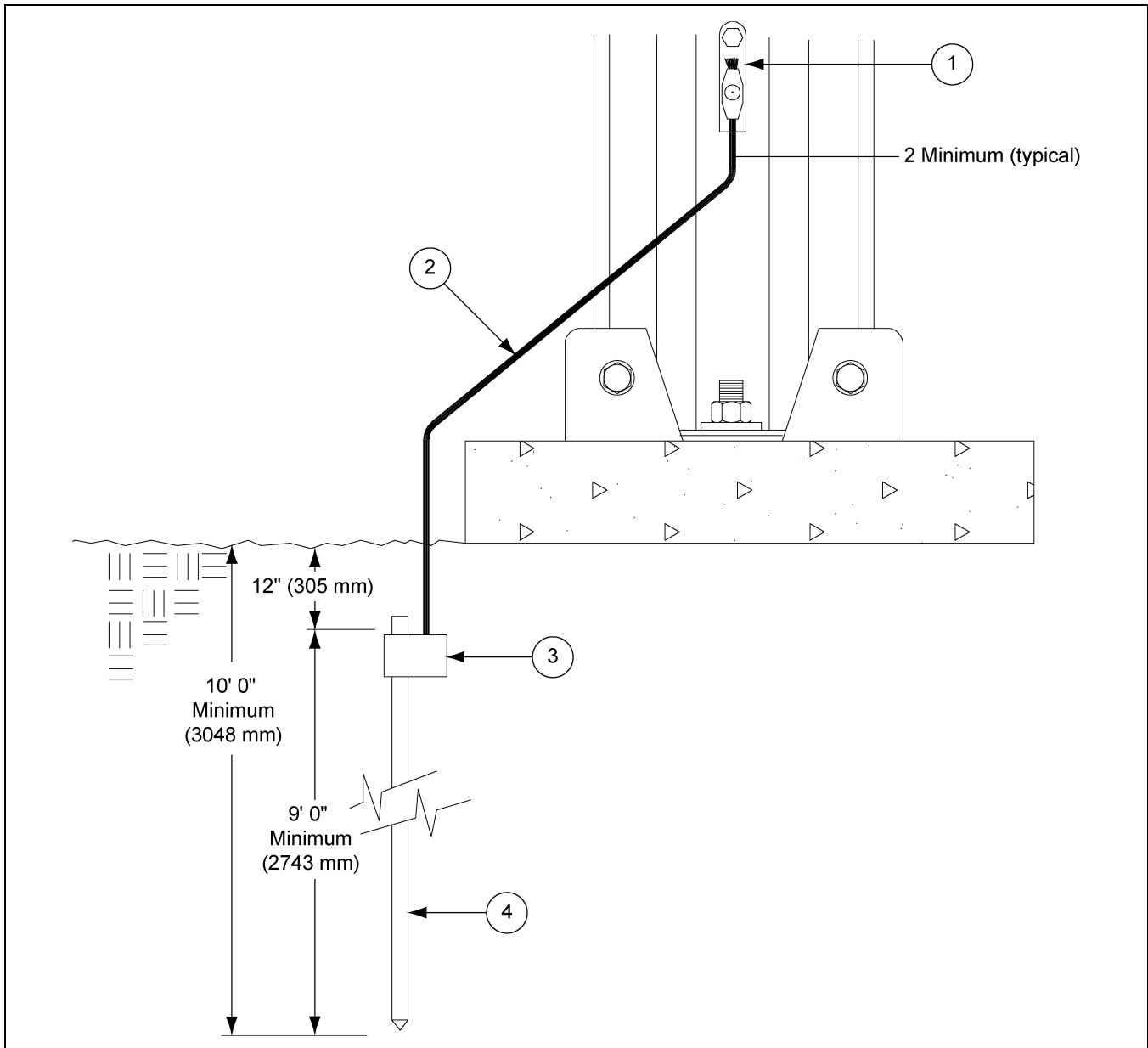


Figure 12A

Ref #	Description
1	Cable Clamp
2	5' (1524 mm) Copper Cable (Plain or Jacketed)
3	Ground Rod Clamp
4	Ground Rod 1/2" x 10' (3048 mm)

Pneumatic Fill Kit Assembly

NOTE: Inlet and exhaust parts from roof eave upward supplied with kit.

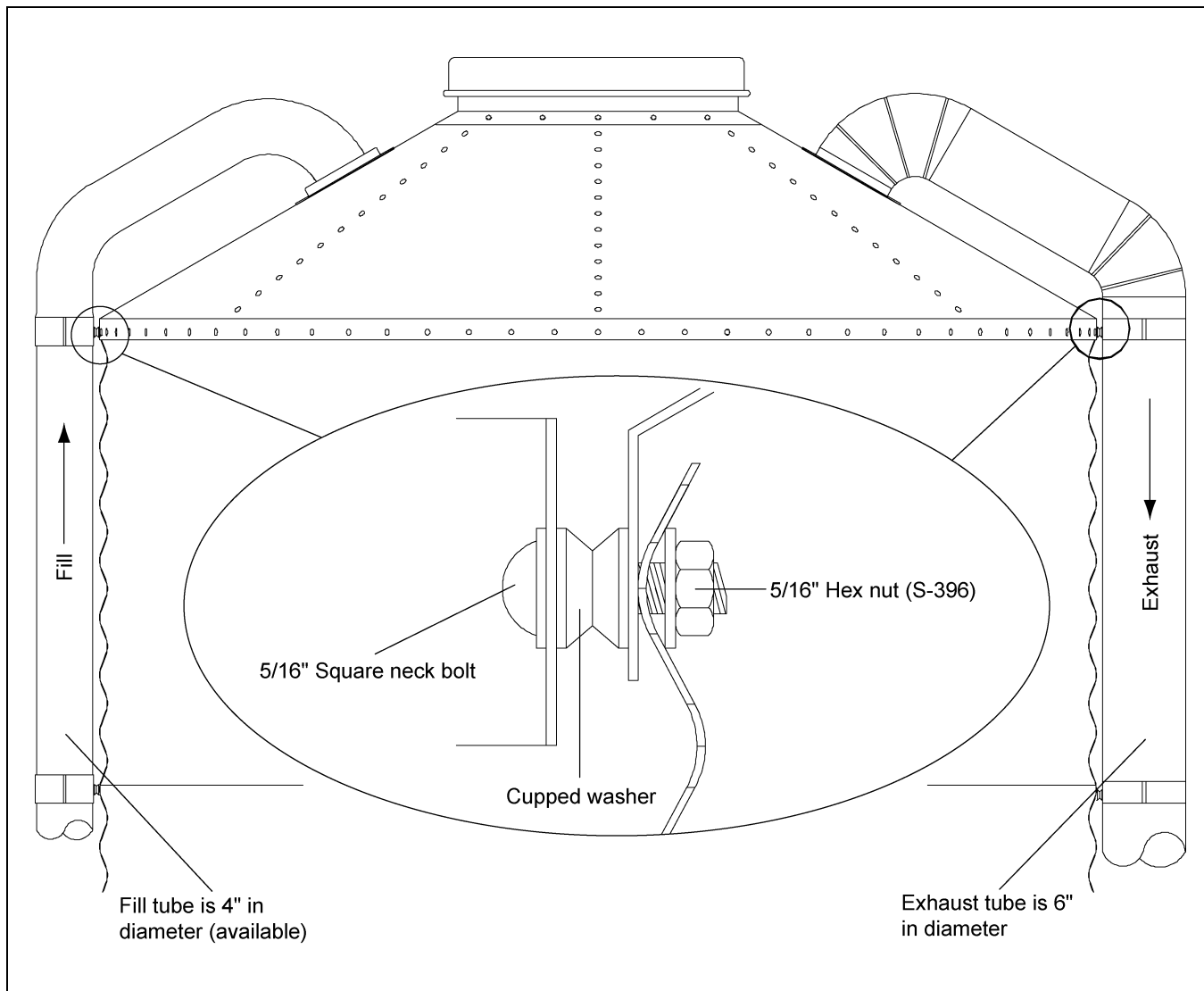


Figure 13A

Roof Panel

Identical pre-punched roof panels are available from GSI 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 in [Figure 13B](#) and [Figure 13C on Page 69](#). Caulk sufficiently to provide weather-tight seal.

Refer to “peak ring seal strip” installation procedure when installing pneumatic fill kits.

Abnormal pressure may require use of optional “Cap Hold-Down Package”. (BLK-10474)

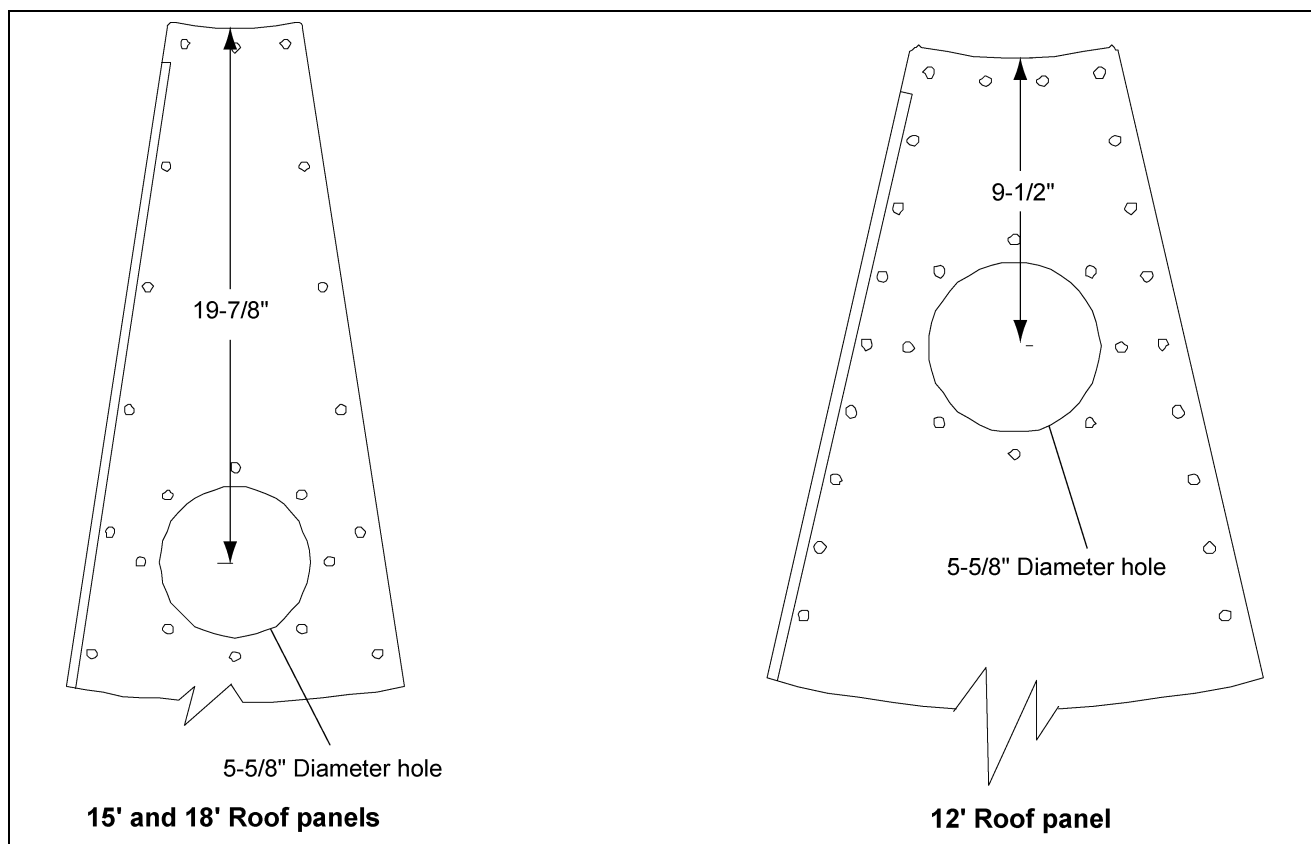


Figure 13B

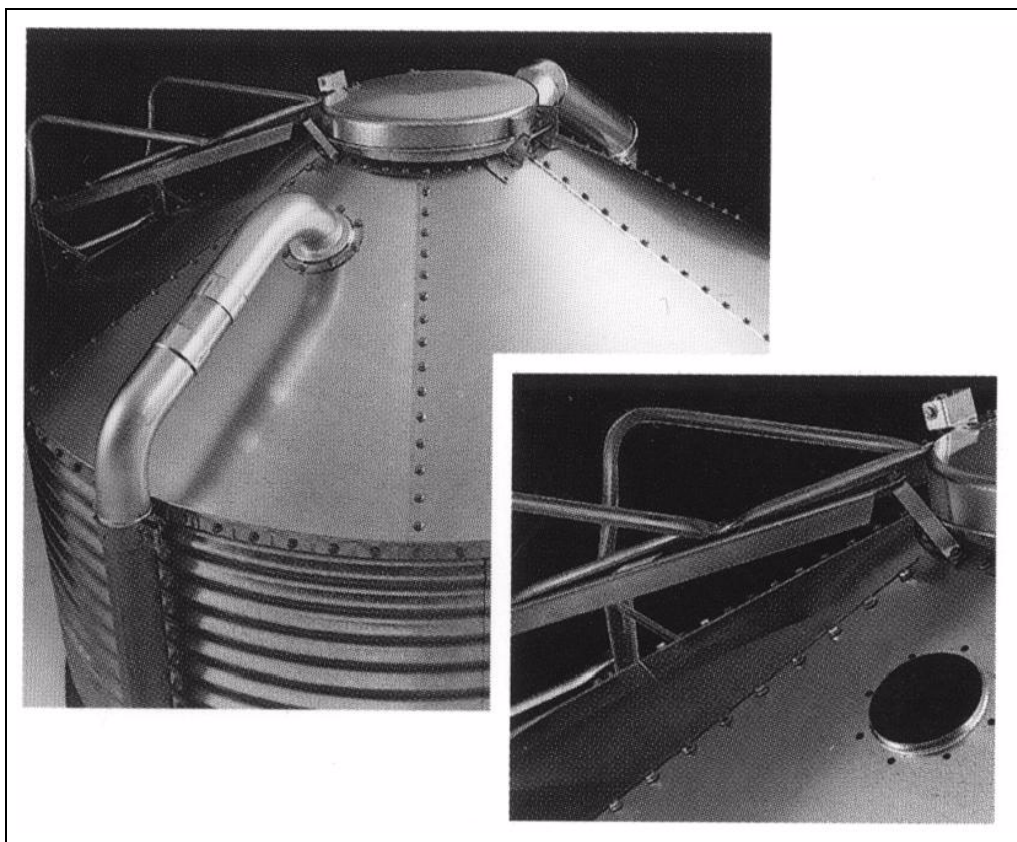
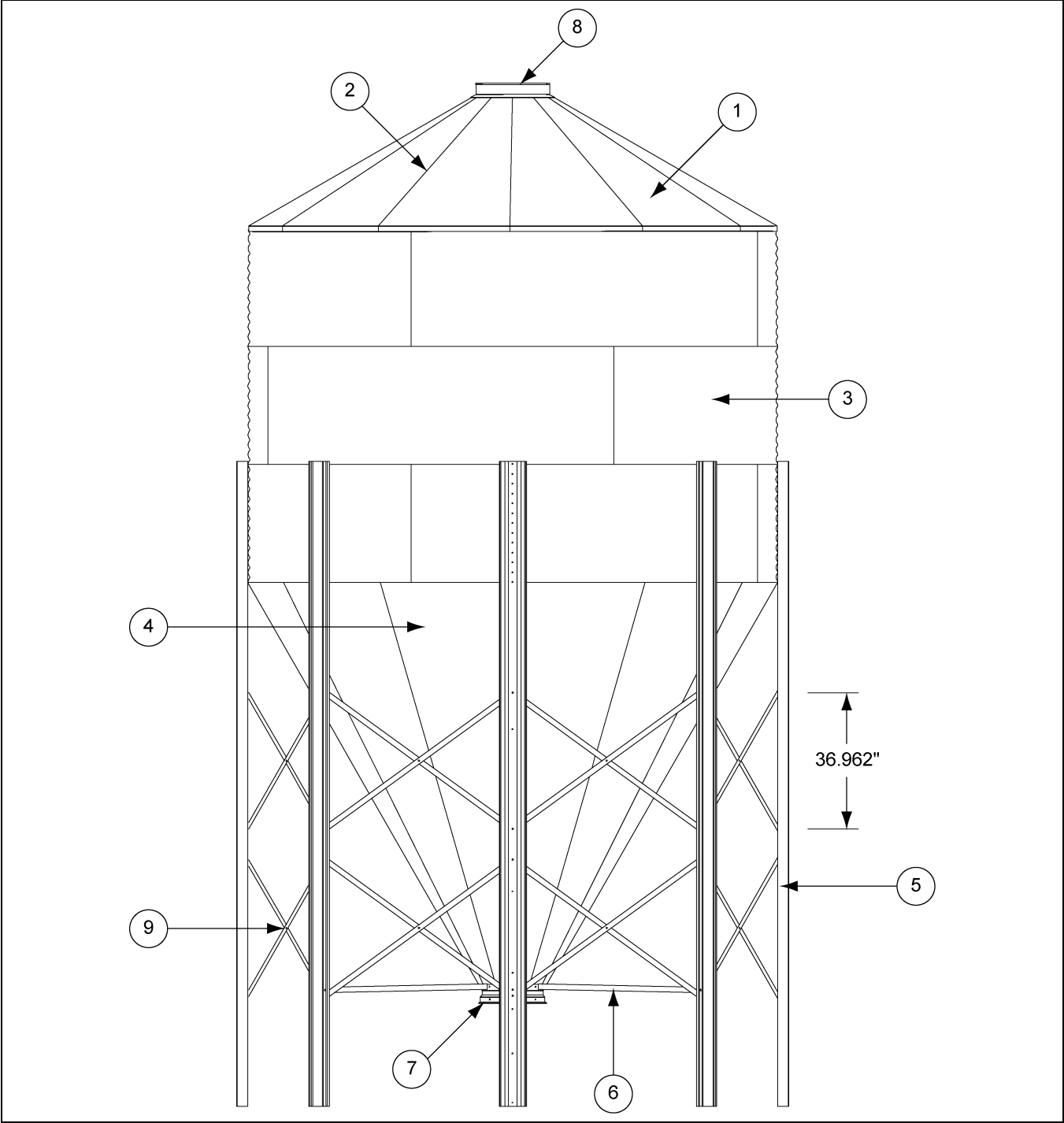


Figure 13C

NOTES

1. 12' Diameter 60° Hopper Bin Specifications - [\(See Pages 72-73.\)](#)
2. 12' Diameter 60° Hopper Bin Hardware Specification - [\(See Pages 74-75.\)](#)
3. 12' Diameter 45° Hopper Bin Specifications - [\(See Pages 76-77.\)](#)
4. 12' Diameter 45° Hopper Bin Hardware Specification - [\(See Pages 78-79.\)](#)
5. 15' Diameter 60° Hopper Bin Specifications - [\(See Pages 80-81.\)](#)
6. 15' Diameter 60° Hopper Bin Hardware Specification - [\(See Pages 82-83.\)](#)
7. 15' Diameter 45° Hopper Bin Specifications - [\(See Pages 84-85.\)](#)
8. 15' Diameter 45° Hopper Bin Hardware Specification - [\(See Pages 86-87.\)](#)
9. 18' Diameter 45° Hopper Bin Specifications - [\(See Pages 88-89.\)](#)
10. 18' Diameter 45° Hopper Bin Hardware Specification - [\(See Pages 90-91.\)](#)
11. 21' Diameter 45° Hopper Bin Specifications - [\(See Pages 92-93.\)](#)
12. 21' Diameter 45° Hopper Bin Hardware Specification - [\(See Pages 94-95.\)](#)

12' Diameter 60° Hopper Bin Specifications

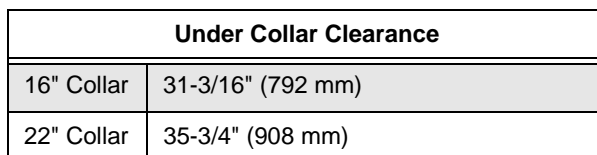


Under Collar Clearance	
16" Collar	31-3/16" (792 mm)
22" Collar	35-3/4" (908 mm)

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 details on [Page 28](#) for location of caulking.

12' Diameter 60° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12272	12' 30° Roof Panel (20 Gauge)	12
1	BLK-12275	12' 40° Roof Panel (20 Gauge)	12
2	BLK-12286	12' 30° Roof Stiffener Channel (18 Gauge)	12
2	BLK-12287	12' 40° Roof Stiffener Channel (18 Gauge)	12
	12' Sidewall Sheet	4 per Ring	
3	SS40682012	20 Gauge (Top Punched Sidewall Sheet)	
3	SS41932012	20 Gauge (Top Punched Decal Sidewall Sheet)	
3	SS40692012	20 Gauge (Middle Punched Sidewall Sheet)	
3	SS40691812	18 Gauge (Middle Punched Sidewall Sheet)	
3	SS40691612	16 Gauge (Middle Punched Sidewall Sheet)	
3	SS40691512	15 Gauge (Middle Punched Sidewall Sheet)	
3	SS40701512	15 Gauge (Middle Leg Punched Sidewall Sheet)	
3	SS40701312	13 Gauge (Middle Leg Punched Sidewall Sheet)	
3	SS40721312	13 Gauge (Bottom Punched Leg Sheet)	
3	SS40721212	12 Gauge (Bottom Punched Leg Sheet)	
4	BLK-10155	12' 60° Offset Hopper Panel (14 Gauge)	12
5	BLK-12720	12' 60° (1-5 Ring) Leg 175-1/8" (12 Gauge) 1 Ring Coverage	8
5	BLK-12046	12' 60° (6-7 Ring) Leg 199-1/8" (10 Gauge) 1-3/4 Ring Coverage	8
6	BLK-12113	Hopper Brace for 16" Collar (Shown)	8
6	BLK-12114	Hopper Brace for 22" Collar	8
7	BLK-10587	16" 60° Hopper Extension Kit with Collar (Shown)	1
7	BLK-10342	22" 60° Hopper Collar (36 Holes)	1
8	BLK-11730	30° Roof Bulk Tank Peak Ring	1
8	BLK-12534	40° Roof Bulk Tank Peak Ring	1
9	BLK-12060	12' Inside Cross Tie Brace (67.788") (12 Gauge)	16
9	BLK-12061	12' Outside Cross Tie Brace (67.788") (12 Gauge)	16
N/S	BLK-11840A	12' 60° Hopper Reinforcement Angle (Optional)	12

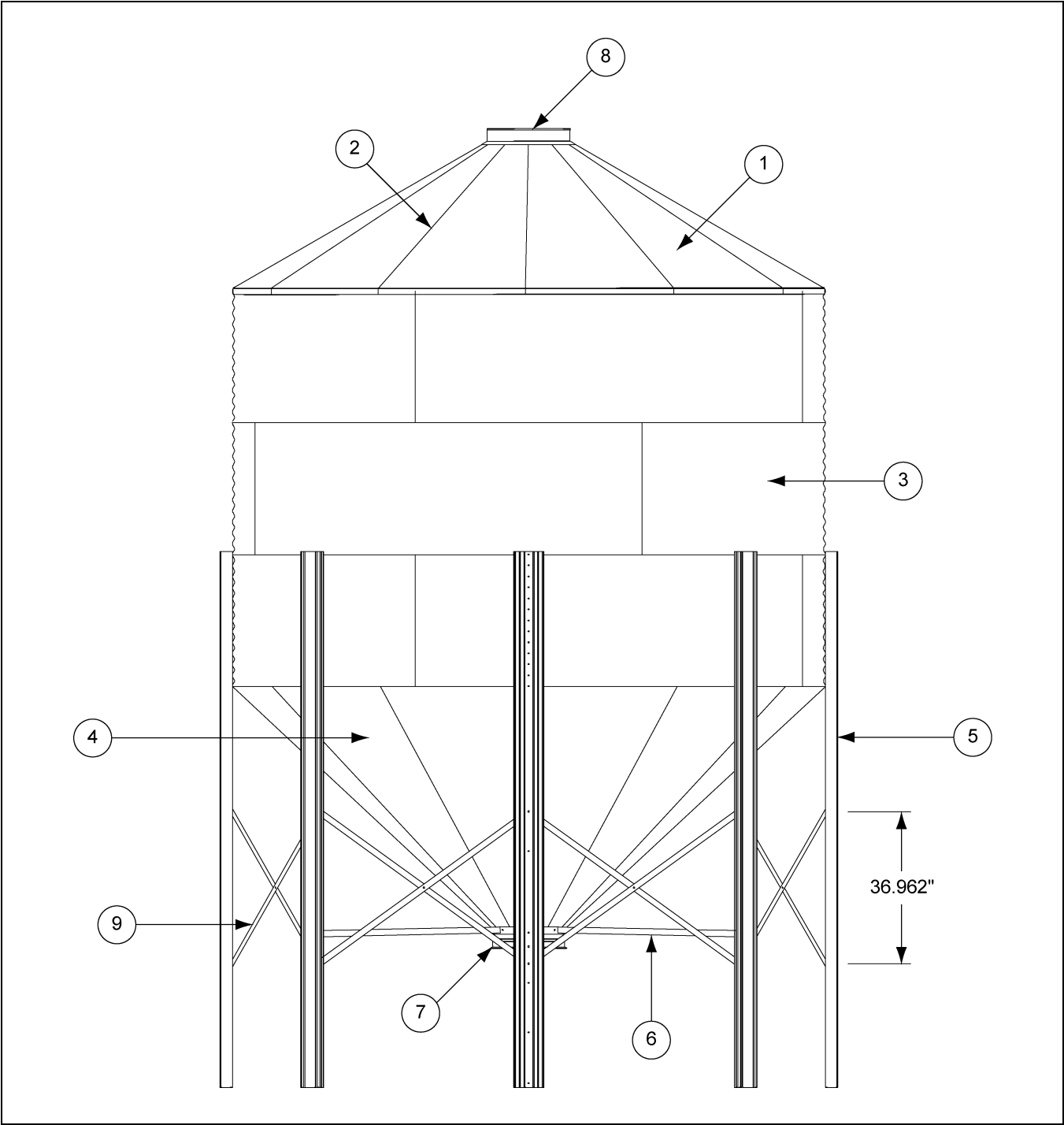


12' Diameter 60° Hopper Bin Hardware Specification Parts List

NOTE: Bolt listed first, nut second for each usage.

Ref #	Part #	Description	Qty
1	S-275	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
	S-396		36
2	S-275	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	240
	S-396		240
3	S-275	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	144
	S-396		144
4	S-275	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
5	S-275	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
6	S-275	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)	96 or 168
	S-396		96 or 168
7	S-277	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.)	288
	S-396		288
8	S-277	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.)	8
	S-396		8
	BLK-12483		8
9	S-4303	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.)	420
	S-3611		420
10	S-4303	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)	36
	S-3611		36
11	S-7927	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	8
	S-456		8
12	S-7927	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	48
	S-456		48

12' Diameter 45° Hopper Bin Specifications



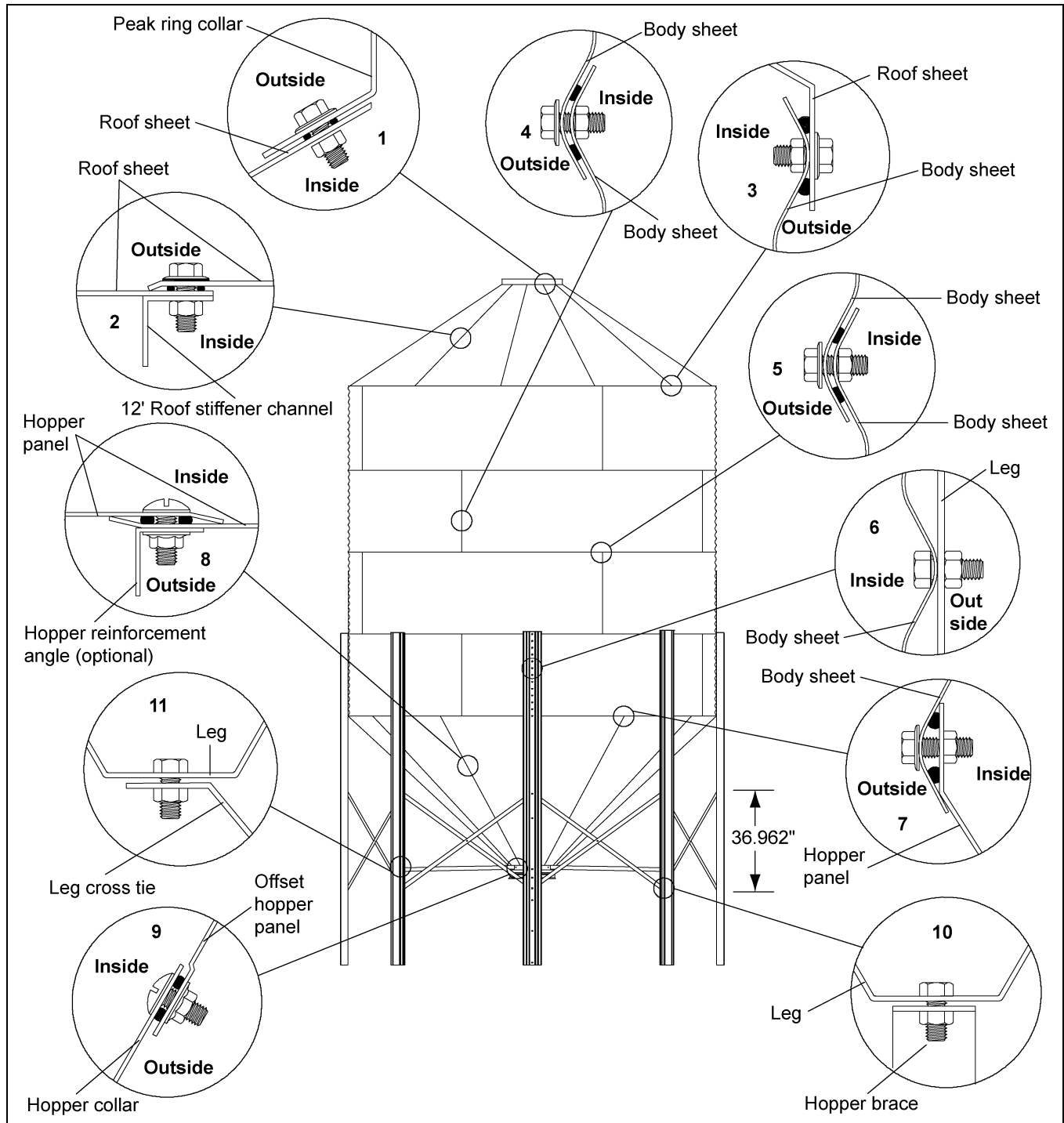
Under Collar Clearance	
16" Collar	34" (864 mm)
22" Collar	36-9/16" (929 mm)

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 details on [Page 28](#) for location of caulking.

12' Diameter 45° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12272	12' 30° Roof Panel (20 Gauge)	12
1	BLK-12275	12' 40° Roof Panel (20 Gauge)	12
2	BLK-12286	12' 30° Roof Stiffener Channel (18 Gauge)	12
2	BLK-12287	12' 40° Roof Stiffener Channel (18 Gauge)	12
	12' Sidewall Sheet	4 per Ring	
3	SS40682012	20 Gauge (Top Punched Sidewall Sheet)	
3	SS41932012	20 Gauge (Top Punched Decal Sidewall Sheet)	
3	SS40692012	20 Gauge (Middle Punched Sidewall Sheet)	
3	SS40691812	18 Gauge (Middle Punched Sidewall Sheet)	
3	SS40691612	16 Gauge (Middle Punched Sidewall Sheet)	
3	SS40691512	15 Gauge (Middle Punched Sidewall Sheet)	
3	SS40701512	15 Gauge (Middle Leg Punched Sidewall Sheet)	
3	SS40701312	13 Gauge (Middle Leg Punched Sidewall Sheet)	
3	SS40721312	13 Gauge (Bottom Punched Leg Sheet)	
3	SS40721212	12 Gauge (Bottom Punched Leg Sheet)	
4	BLK-10695	12' 45° Offset Hopper Panel (14 Gauge)	12
5	BLK-12045	12' 45° (1-5 Ring) Leg (154-1/8") (12 Gauge) 1 Ring Coverage	8
5	BLK-12045	12' 45° (6-7 Ring) Leg (154-1/8") (10 Gauge) 1-3/4 Ring Coverage	8
6	BLK-12115	Hopper Brace for 16" Collar (62.7") (Shown)	8
6	BLK-12116	Hopper Brace for 22" Collar (60.1")	8
7	BLK-10847	16" 45° Hopper Extension Kit with Collar (Shown)	1
7	BLK-10854	22" 45° Hopper Collar (36 Holes)	1
8	BLK-11730	30° Roof Bulk Tank Peak Ring	1
8	BLK-12534	40° Roof Bulk Tank Peak Ring	1
9	BLK-12060	12' Inside Cross Tie Brace (67.788") (12 Gauge)	8
9	BLK-12061	12' Outside Cross Tie Brace (67.788") (12 Gauge)	8
N/S	BLK-12021	12' Hopper Reinforcement Angle (Optional)	12

12' Diameter 45° Hopper Bin Hardware Specification



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

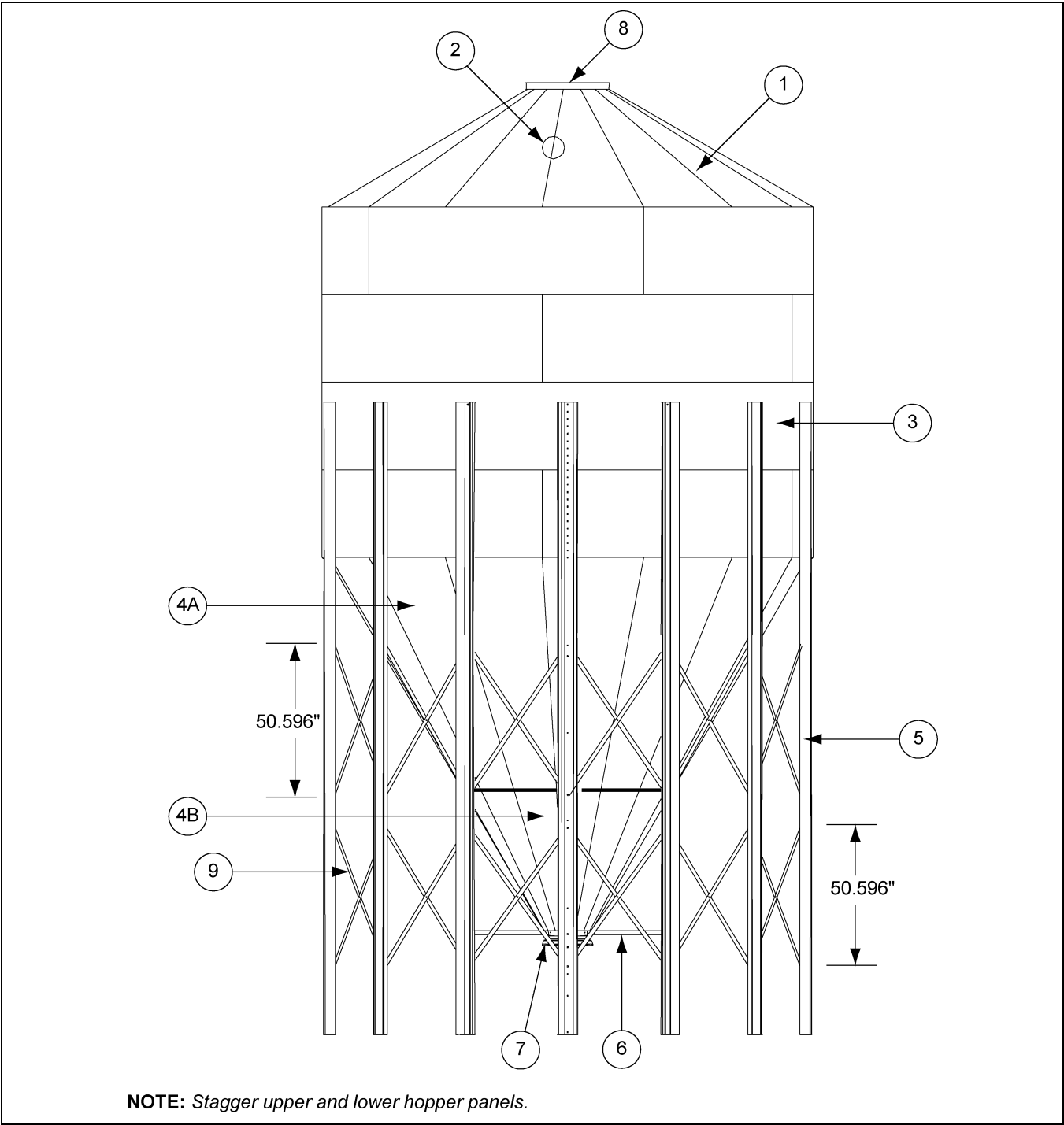
IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to details on [Page 28](#) for location of caulking.

12' Diameter 45° Hopper Bin Hardware Specification Parts List

NOTE: Bolts listed first, nuts second for each usage.

Ref #	Part #	Description	Qty
1	S-275	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
	S-396		36
2	S-275	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	240
	S-396		240
3	S-275	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	144
	S-396		144
4	S-275	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
5	S-275	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
6	S-275	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)	96 or 168
	S-396		96 or 168
7	S-277	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.)	288
	S-396		288
8	S-4303	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.)	300
	S-3611		300
9	S-4303	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.)	36
	S-3611		36
10	S-7927	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	8
	S-456		8
11	S-7927	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	24
	S-456		24

15' Diameter 60° Hopper Bin Specifications

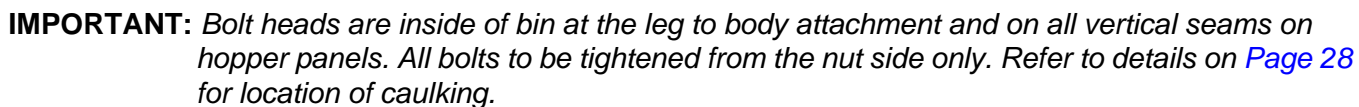


Under Collar Clearance	
16" Collar	33" (838 mm)
22" Collar	37-9/16" (954 mm)

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 details on [Page 28](#) for location of caulking.

15' Diameter 60° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12278	15' 30° Roof Panel (20 Gauge)	18
2	BLK-12288	15' 30° Roof Stiffener Channel	18
	15' Sidewall Sheet	5 per Ring	
3	HT38742015	20 Gauge (Top Punched Sidewall Sheet)	
3	HT38752015	20 Gauge (Top Punched Decal Sidewall Sheet)	
3	HT43421815	18 Gauge (Top 3 Leg Punched Sidewall Sheet)	
3	HT43431815	18 Gauge (Top 3 Leg Punched Decal Sidewall Sheet)	
3	SS00151815	18 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911815	18 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	SS00151615	16 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911615	16 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	SS00151415	14 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911415	14 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	HT43691415	14 Gauge (Bottom 3 Leg Punched Sidewall Sheet)	
3	HT43691215	12 Gauge (Bottom 3 Leg Punched Sidewall Sheet)	
4A	BLK-11209	15' 60° Upper Hopper Panel (14 Gauge)	18
4B	BLK-11210	15' 60° Lower Hopper Panel (16 Gauge)	9
5	BLK-12048	15' 60° Leg 231.00" (10 Gauge)	15
6	BLK-12117	Hopper Brace for 16" Collar (Shown)	3
6	BLK-12119	Hopper Brace for 22" Collar	3
7	BLK-10587	16" 60° Hopper Extension Kit with Collar (Shown)	1
7	BLK-10324	22" 60° Hopper Collar (36 Holes)	1
8	BLK-11730	Bulk Tank Peak Ring	1
9	BLK-12062	15' Inside Cross Tie Brace (64.4") (12 Gauge)	30
9	BLK-12063	15' Outside Cross Tie Brace (64.4") (12 Gauge)	30

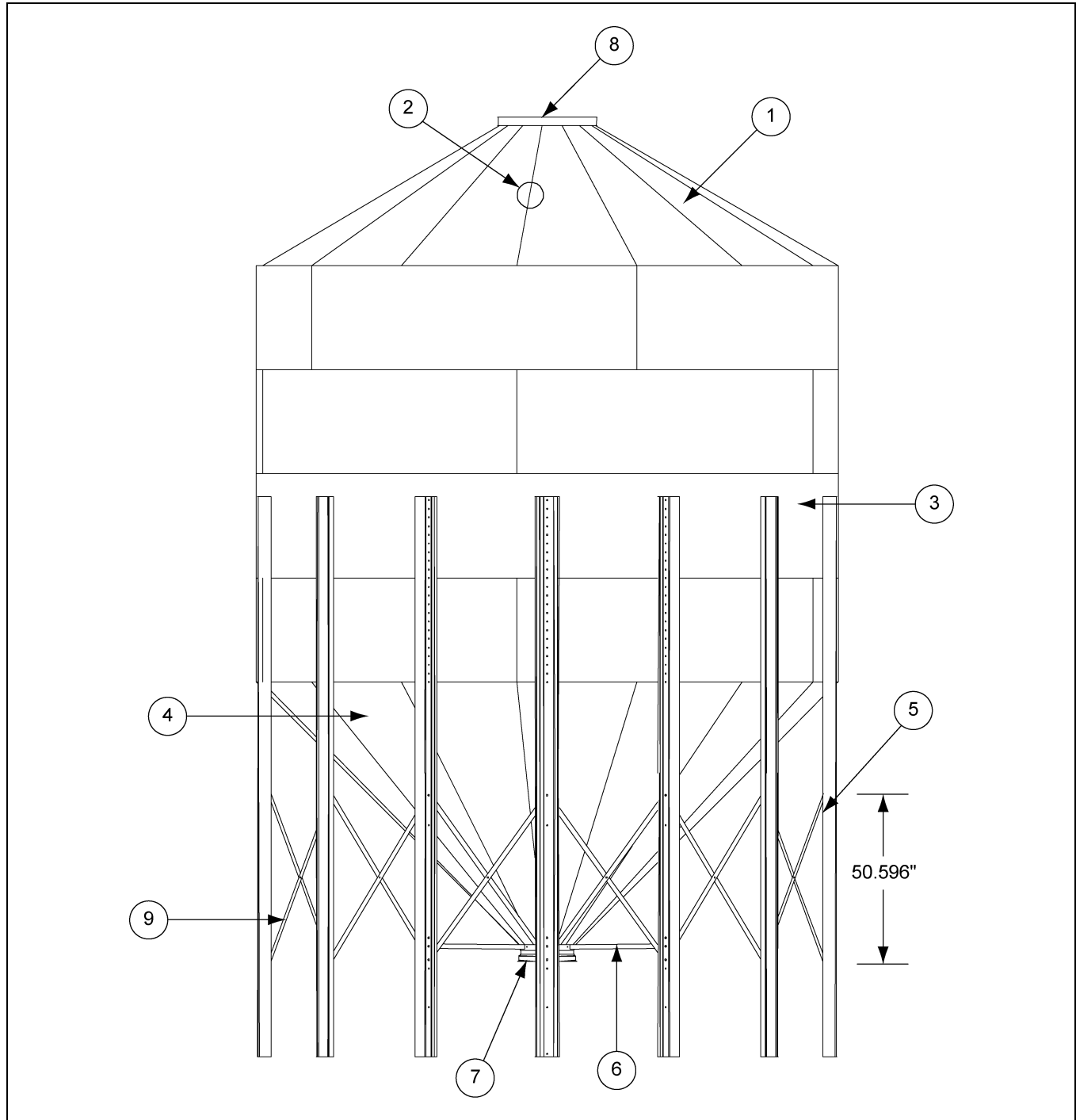


15' Diameter 60° Hopper Bin Hardware Usage Parts List

NOTE: Bolts listed first, nut second for each usage.

Ref #	Part #	Description	Qty
1	S-275	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
	S-396		36
2	S-275	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	414
	S-396		414
3	S-275	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	180
	S-396		180
4	S-275	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
5	S-275	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
6	S-275	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)	330
	S-396		330
7	S-277	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.)	360
	S-396		360
8	S-277	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.)	15
	S-396		15
	BLK-12483		15
9	S-4303	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.)	850
	S-3611		850
10	S-4303	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.)	36
	S-3611		36
11	S-7927	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	3
	S-456		3
12	S-7927	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	90
	S-456		90

15' Diameter 45° Hopper Bin Specifications



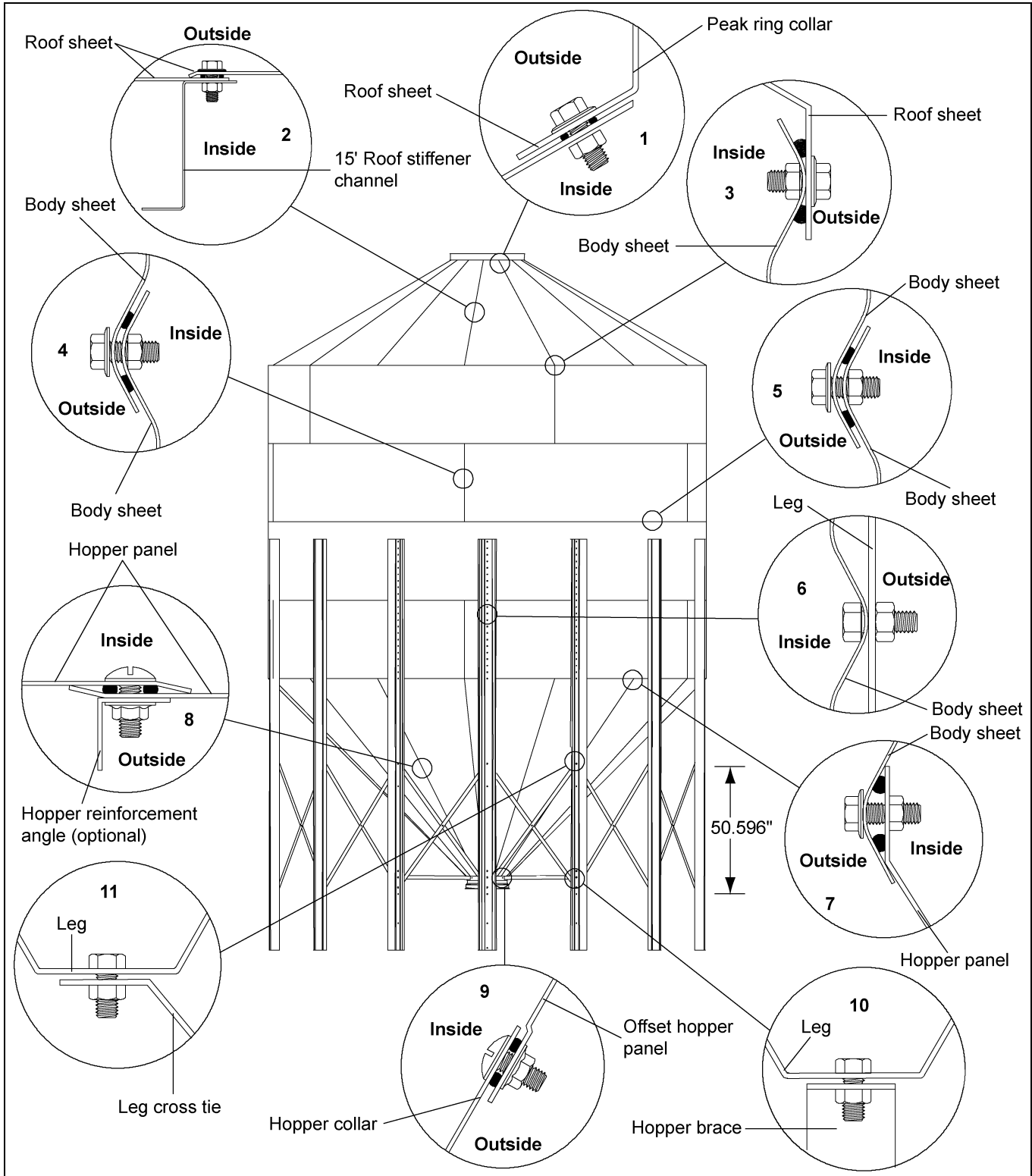
Under Collar Clearance	
16" Collar	34-1/16" (865 mm)
22" Collar	36-5/8" (930 mm)

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 details on [Page 28](#) for location of caulking.

15' Diameter 45° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12278	15' 30° Roof Panel (20 Gauge)	18
2	BLK-12288	15' 30° Roof Stiffener Channel	18
	15' Sidewall Sheet	5 per Ring	
3	HT38742015	20 Gauge (Top Punched Sidewall Sheet)	
3	HT38752015	20 Gauge (Top Punched Decal Sidewall Sheet)	
3	HT43421815	18 Gauge (Top 3 Leg Punched Sidewall Sheet)	
3	HT43431815	18 Gauge (Top 3 Leg Punched Decal Sidewall Sheet)	
3	SS00151815	18 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911815	18 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	SS00151615	16 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911615	16 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	SS00151415	14 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911415	14 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	HT43691415	14 Gauge (Bottom 3 Leg Punched Sidewall Sheet)	
3	HT43691215	12 Gauge (Bottom 3 Leg Punched Sidewall Sheet)	
4	BLK-10845	15' 45° Hopper Panel (14 Gauge)	18
5	BLK-12047	15' 45° Leg 172-1/8" (10 Gauge)	15
6	BLK-12118	Hopper Brace for 16" Collar (Shown)	3
6	BLK-12120	Hopper Brace for 22" Collar	3
7	BLK-10847	16" 45° Hopper Extension Kit with Collar (Shown)	1
7	BLK-10854	22" 45° Hopper Collar (36 Holes)	1
8	BLK-11730	Bulk Tank Peak Ring	1
8	BLK-12062	15' Inside Cross Tie Brace (64.4") (12 Gauge)	30
9	BLK-12063	15' Outside Cross Tie Brace (64.4") (12 Gauge)	30

15' Diameter 45° Hopper Bin Hardware Specification



Under Collar Clearance	
16" Collar	34-1/16" (865 mm)
22" Collar	36-5/8" (930 mm)

15' Diameter 45° Hopper Bin Hardware Usage Parts List

NOTE: Bolts listed first, nuts second for each usage.

Ref #	Part #	Description	Qty
1	S-275	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
	S-396		36
2	S-275	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	414
	S-396		414
3	S-275	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	180
	S-396		180
4	S-275	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
5	S-275	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
6	S-275	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)	330
	S-396		330
7	S-277	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.)	360
	S-396		360
8	S-4303	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.)	720
	S-3611		720
9	S-4303	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.)	36
	S-3611		36
10	S-7927	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	3
	S-456		3
11	S-7927	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	45
	S-456		45

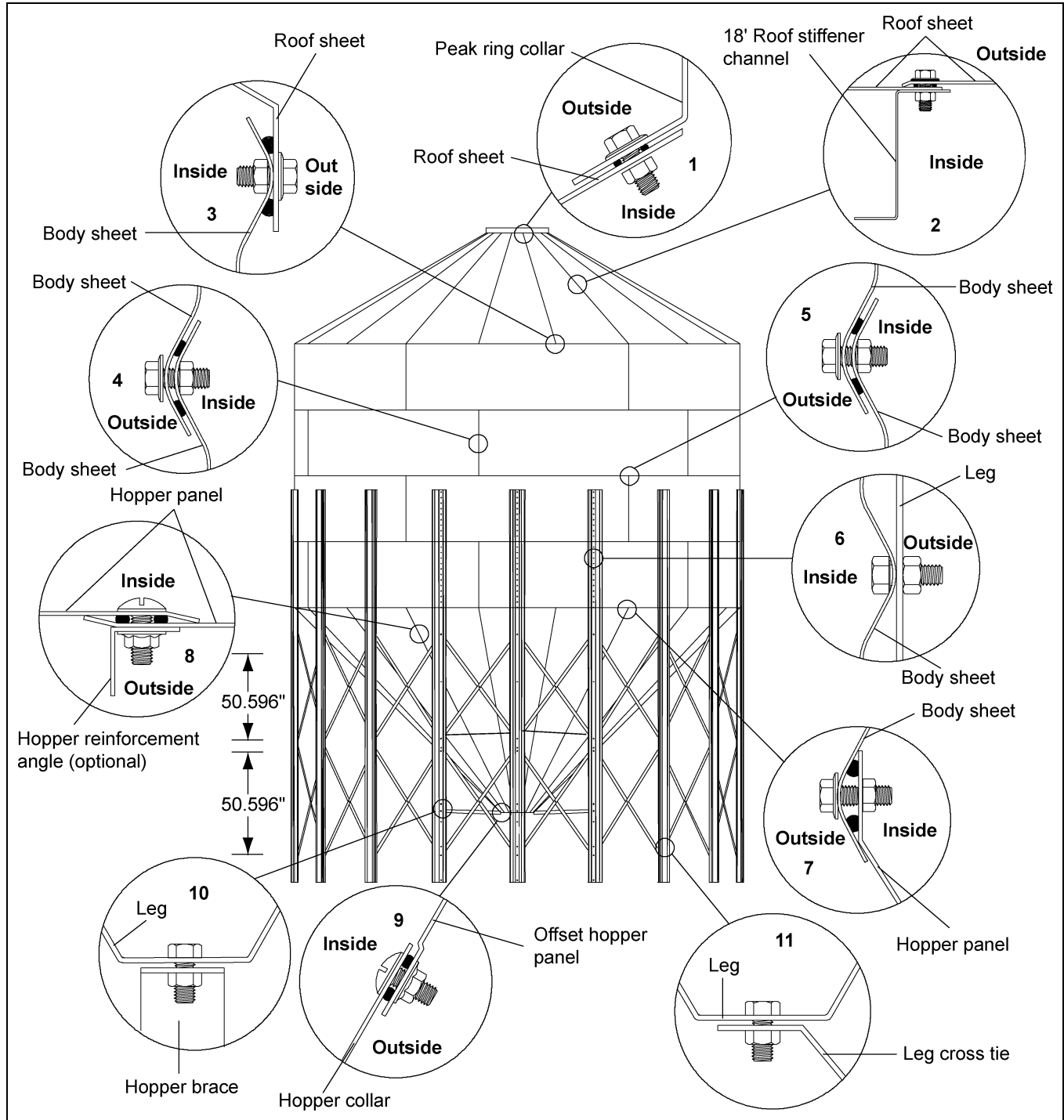


IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to details on [Page 28](#) for location of caulking.

18' Diameter 45° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
1	BLK-12281	18' 30° Roof Panel (20 Gauge)	18
2	BLK-12286	18' 30° Roof Stiffener Channel	18
	18' Sidewall Sheet	6 per Ring	
3	HT38742018	20 Gauge (Top Punched Sidewall Sheet)	
3	SS00152018	20 Gauge (Middle Punched Sidewall Sheet)	
3	SS00151818	18 Gauge (Middle Punched Sidewall Sheet)	
3	HT43421618	16 Gauge (Top 3 Leg Punched Sidewall Sheet)	
3	HT33911618	16 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	SS00151618	16 Gauge (Middle Punched Sidewall Sheet)	
3	HT33911418	14 Gauge (Middle 3 Leg Punched Sidewall Sheet)	
3	HT33921218	12 Gauge (Bottom 3 Leg Punched Sidewall Sheet)	
3	HT33921018	10 Gauge (Bottom 3 Leg Punched Sidewall Sheet)	
4A	BLK-11887	18' 45° Upper Hopper Panel (12 Gauge)	18
4B	BLK-10846	18' 45° Lower Hopper Panel (14 Gauge)	18
5	BLK-12049	18' 45° Leg (190.0") (10 gauge)	18
6	BLK-12121	Hopper Brace for 16" Collar (Shown)	3
6	BLK-12122	Hopper Brace for 22" Collar	3
7	BLK-10847	16" 45° Hopper Extension Kit w/ Collar (Shown)	1
7	BLK-10854	22" 45° Hopper Collar (36 Holes)	1
8	BLK-11730	Bulk Tank Peak Ring	1
9	BLK-12062	18' Inside Cross Tie Brace (12 Gauge)	36
9	BLK-12063	18' Outside Cross Tie Brace (12 Gauge)	36

18' Diameter 45° Hopper Bin Hardware Specification



Under Collar Clearance	
16" Collar	34-3/8" (873 mm)
22" Collar	36-15/16" (938 mm)

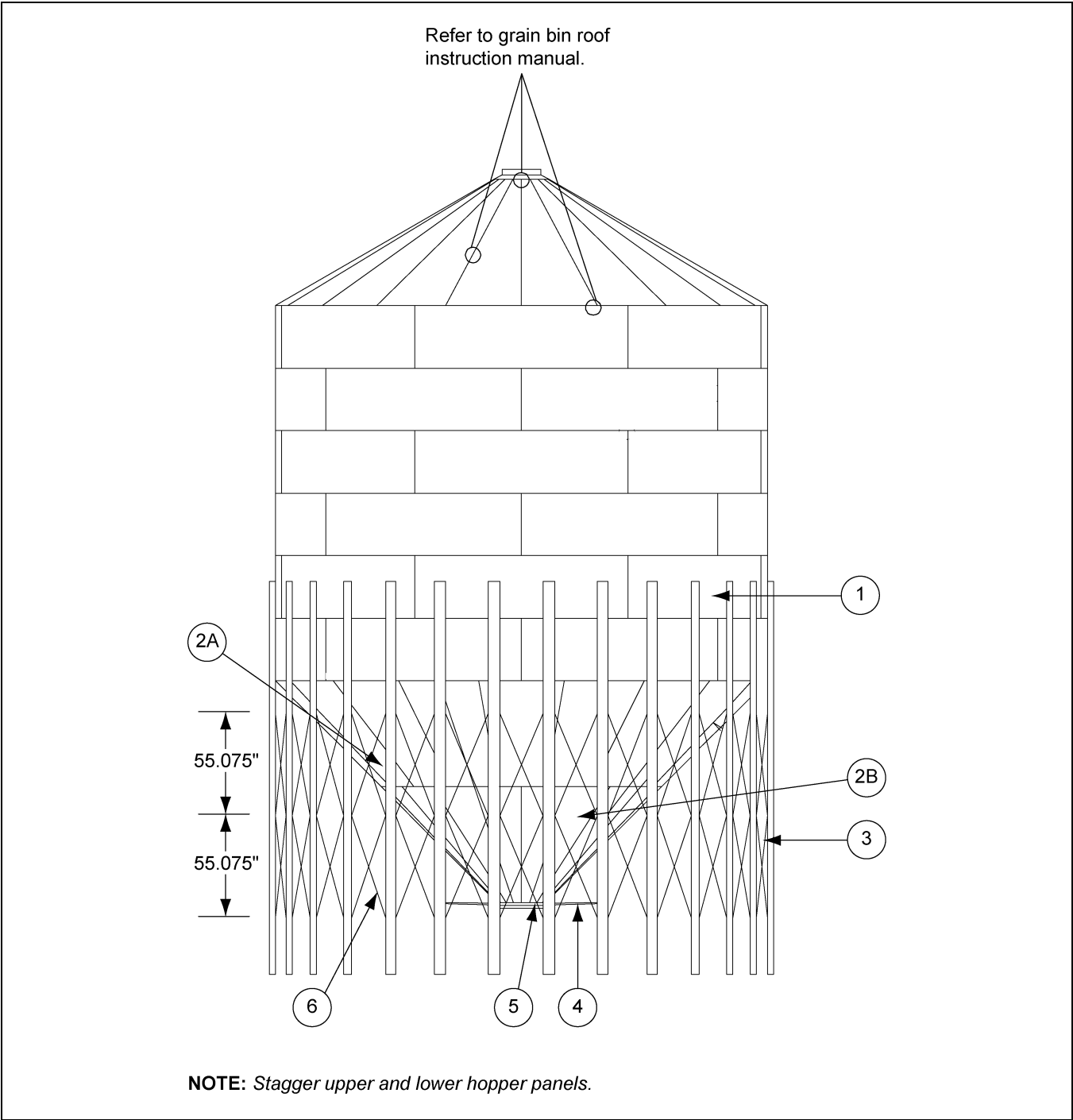
IMPORTANT: Bolt heads are inside of bin at the leg to body attachment and on all vertical seams on hopper panels. All bolts to be tightened from the nut side only. Refer to details on [Page 28](#) for location of caulking.

18' Diameter 45° Hopper Bin Hardware Usage Parts List

NOTE: Bolts listed first, nut second for each usage.

Ref #	Part #	Description	Qty
1	S-275	Bulk Tank Peak Ring to Roof Panels (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	36
	S-396		36
2	S-275	Roof Panel to Roof Panel (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	504
	S-396		504
3	S-275	Roof Panels to Top Sidewall Sheets (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	216
	S-396		216
4	S-275	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
5	S-275	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
6	S-275	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)	396
	S-396		396
7	S-277	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.)	288
	S-396		288
8	S-4303	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.)	1260
	S-3611		1260
9	S-4303	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.) (16" Shown.)	36
	S-3611		36
10	S-7927	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	3
	S-456		3
11	S-7927	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	108
	S-456		108

21' Diameter 45° Hopper Bin Specifications

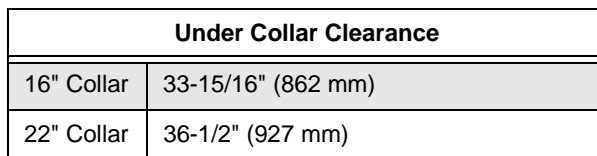


Under Collar Clearance	
16" Collar	33-15/16" (862 mm)
22" Collar	36-1/2" (927 mm)

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 details on [Page 28](#) for location of caulking.

21' Diameter 45° Hopper Bin Specifications Parts List

Ref #	Part #	Description	Qty
	Grain Bin Roof	Utilizes Grain Bin Style Roof, See 30° Grain Bin Roof Erection Manual	
	21' Body Sheets	7 per Ring	
1	SS22012021	20 Gauge (Decal Sheet)	
1	SS00152021	20 Gauge (Middle Sheet)	
1	SS00151721	17 Gauge (Middle Sheet)	
1	SS00151621	16 Gauge (Middle Sheet)	
1	SS60141621	16 Gauge (Middle Leg Sheet)	
1	SS60131021	10 Gauge (Bottom Sheet)	
2A	BLK-11244	21' 45° Upper Hopper Panel (12 Gauge)	18
2B	BLK-10846	21' 45° Lower Hopper Panel (14 gauge)	18
3	BLK-12050	21' 45° Leg 201-1/2" (10 Gauge)	28
4	BLK-12123	Hopper Brace for 16" Collar (Shown)	4
4	BLK-12124	Hopper Brace for 22" Collar	4
5	BLK-10847	16" 45° Hopper Extension Kit with Collar (Shown)	1
5	BLK-10854	22" 45° Hopper Collar (36 Holes)	1
6	BLK-12066	21' Inside Cross Tie Brace (12 Gauge)	56
6	BLK-12067	21' Outside Cross Tie Brace (12 Gauge)	56



21' Diameter 45° Hopper Bin Hardware Usage Parts List

NOTE: Bolts listed first, nut second for each usage.

Ref #	Part #	Description	Qty
	Grain Bin Roof Hardware	Utilizes Grain Bin Style Roof - See 30° Grain Bin Roof Instruction Manual.	
4	S-275	Vertical Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
5	S-275	Horizontal Sidewall Sheet Seams (Use 5/16" x 3/4" Hex Head Bin Bolts and 5/16" Hex Nuts.)	Varies
	S-396		Varies
6	S-275	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.)	532
	S-396		532
7	S-277	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.)	504
	S-396		504
8	S-4303	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.)	1700
	S-3611		1700
9	S-4303	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.)	36
	S-3611		36
10	S-7927	Hopper Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	4
	S-456		4
11	S-7927	Cross Tie Brace to Leg (Use 3/8" x 1" Flange Head Bolts and 3/8" Hex Nuts.)	168
	S-456		168

NOTES

GSI Group, LLC Limited Warranty

The GSI Group, LLC ("GSI") warrants products which it manufactures to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months after sale to the original end-user or if a foreign sale, 14 months from arrival at port of discharge, whichever is earlier. The end-user's sole remedy (and GSI's only obligation) is to repair or replace, at GSI's option and expense, products that in GSI's judgment, contain a material defect in materials or workmanship. Expenses incurred by or on behalf of the end-user without prior written authorization from the GSI Warranty Group shall be the sole responsibility of the end-user.

Warranty Extensions:

The Limited Warranty period is extended for the following products:

	Product	Warranty Period
AP Fans and Flooring	Performer Series Direct Drive Fan Motor	3 Years
	All Fiberglass Housings	Lifetime
	All Fiberglass Propellers	Lifetime
Cumberland Feeding/Watering Systems	Feeder System Pan Assemblies	5 Years **
	Feed Tubes (1-3/4" and 2.00")	10 Years *
	Centerless Augers	10 Years *
	Watering Nipples	10 Years *
Grain Systems	Grain Bin Structural Design	5 Years
Grain Systems Farm Fans Zimmerman	Portable and Tower Dryers	2 Years
	Portable and Tower Dryer Frames and Internal Infrastructure †	5 Years

* Warranty prorated from list price:
 0 to 3 years - no cost to end-user
 3 to 5 years - end-user pays 25%
 5 to 7 years - end-user pays 50%
 7 to 10 years - end-user pays 75%
 ** Warranty prorated from list price:
 0 to 3 years - no cost to end-user
 3 to 5 years - end-user pays 50%

† Motors, burner components and moving parts not included. Portable dryer screens included. Tower dryer screens not included.

GSI further warrants that the portable and tower dryer frame and basket, excluding all auger and auger drive components, shall be free from defects in materials for a period of time beginning on the twelfth (12th) month from the date of purchase and continuing until the sixtieth (60th) month from the date of purchase (extended warranty period). During the extended warranty period, GSI will replace the frame or basket components that prove to be defective under normal conditions of use without charge, excluding the labor, transportation, and/or shipping costs incurred in the performance of this extended warranty.

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH ABOVE. SPECIFICALLY, 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. The sole and exclusive remedy is set forth in the Limited Warranty, which shall not exceed the amount paid for the product purchased. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor.

GSI assumes no responsibility for claims resulting from construction 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 void the Limited Warranty.

This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained. This Limited Warranty extends solely to products manufactured by GSI.

Prior to installation, the end-user has the responsibility to comply with federal, state and local codes which apply to the location and installation of products manufactured or sold by GSI.

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 installations are made.

G S I G R O U P



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