

# Galvanized Double Corrugated Grain Tanks



Grain Tank Assembly manual 21-27  
July 2014 v1.2

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## SAFETY

This Safety Alert symbol means  
**ATTENTION! BECOME ALERT!**  
**YOUR SAFETY IS INVOLVED!**



The Safety Alert symbol identifies important safety messages on the Meridian Grain Tank and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

### 3 Big Reasons

**Accidents Disable and Kill**  
**Accidents Cost**  
**Accidents Can Be Avoided**

### SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guide-lines:

**DANGER** - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations typically for machine components which, for functional purposes, cannot be guarded.

**WARNING** - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

**CAUTION** - Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

If you have any questions not answered in this manual, please contact your dealer or Behlen Industries.

(Telephone) 1-888-315-1035, (FAX) 204-725-4932. [www.meridianmfg.com](http://www.meridianmfg.com)

**YOU** are responsible for the **SAFE** operation and maintenance of your Meridian Hopper Cone. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the Grain Bin Cone be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE**

operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

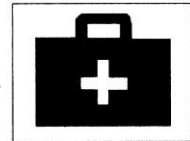
- Cone owners must give operating instructions to operators or employees before allowing them to operate the machine, and at least annually thereafter.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself/herself and bystanders to possible serious injury or death. Always be and stay alert to any possible unsafe operating or maintenance procedures or conditions.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety of the components and systems and could affect the life of the equipment, possibly invalidating the warranty coverage.
- Think SAFETY! Work SAFELY!

## GENERAL SAFETY

Read and understand the operator's Manual and all safety signs before operating, maintaining, adjusting or unplugging the Cone.



1. Have a first-aid kit available for use should the need arise and know how to use it.

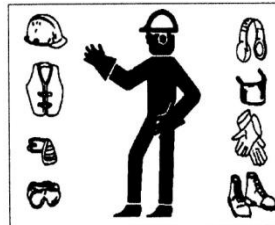


2. Have a fire extinguisher available for use should the need arise and know how to use it.



3. Wear appropriate protective gear. This list includes but is not limited to:

- A hard hat
- Protective shoes with slip resistant soles
- Protective goggles, glasses or face shield
- Heavy gloves
- Protective clothing
- Respirator




4. Install and secure all guards before starting.
5. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures. Lock-out tag-out all power sources before entering bin or working around loading/unloading equipment.
6. Clear the area of people, especially small children, before starting.
7. Review safety related items annually with all personnel who will be using or maintaining the bin.

## EQUIPMENT SAFETY GUIDELINES

1. Safety of the operator and bystanders is one of the main concerns in designing and developing a machine. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment. You, the operator, can avoid many accidents by observing the following precautions in this section. To avoid personal injury or death, study the following precautions and insist those working with you, or for you, follow them.
2. In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace the shield prior to use.
3. Replace any safety sign or instruction sign that is not readable or is missing. The location of such safety signs is located on one of the Hopper Cone Legs.
4. Never use alcoholic beverages or drugs which can hinder alertness or coordination while operating this equipment. Consult your doctor about operating this machine while taking prescription medications.
5. **Under no circumstances should young children be allowed to work with this equipment. Do not allow persons to operate or assemble this unit until they have read this manual and have developed a thorough understanding of the safety precautions and of how it works.** Review the safety instructions with all users annually.
8. This equipment is dangerous to children and persons unfamiliar with its operation. The operator should be a responsible, properly trained and physically able person familiar with farm machinery and trained in this equipment's operations. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question – **DON'T TRY IT.**
9. Do not modify the equipment in any way. Unauthorized modifications result in serious injury or death and may impair the function and life of the equipment.
10. In addition to the design and configuration of this implement, including Safety Signs and Safety Equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence, and proper training of personnel involved in the operation, transport, maintenance, and storage of the machine. Refer also to Safety Messages and operation instruction in each of the appropriate sections of the auxiliary equipment and machine Manuals. Pay close attention to the Safety Signs affixed to the auxiliary equipment and the machine.

## SAFETY TRAINING

1. Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator or bystander.
2. In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of this equipment.
3. It has been said, "The best safety feature is an informed, careful operator." We ask you to be that kind of an operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. Accidents can be avoided.
4. Working with unfamiliar equipment can lead to careless injuries. Read this manual, and the manual for your auxiliary equipment, before assembly or operating, to acquaint yourself with the machines. If this machine is used by any person other than yourself, it is the machine owner's responsibility to make certain that the operator, prior to operating:
  - a. Reads and understands the operator's manuals.
  - b. Is instructed in safe and proper use.
5. Know your controls and how to stop augers, conveyors and any other auxiliary equipment quickly in an emergency. Read this manual and the one provided with your other equipment.
6. Train all new personnel and review instructions frequently with existing workers. Be certain only a properly trained and physically able person will operate the machinery. A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death. If the elderly are assisting with farm work, their physical limitations need to be recognized and accommodated.

## SAFETY SIGNS

1. Keep safety signs clean and legible at all times.
2. Replace safety signs that are missing or have become illegible.
3. Replaced parts that displayed a safety sign should also display the current sign.
4. Safety signs are available from your authorized Distributor or Dealer Parts Department or the factory.

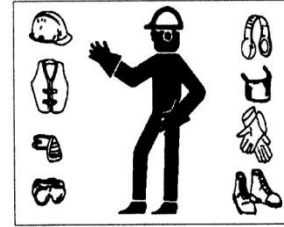
### How to Install Safety Signs:

- Be sure that the installation area is clean and dry.
- Be sure temperature is above 50°F (10°C).
- Determine exact position before you remove the backing paper.
- Remove the smallest portion of the split backing paper.
- Align the sign over the specified area and carefully press the small portion with the exposed sticky backing in place.
- Slowly peel back the remaining paper and carefully smooth the remaining portion of the sign in place.
- Small air pockets can be pierced with a pin and smoothed out using the piece of sign backing paper.

## PREPARATION

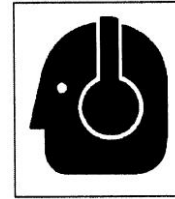
1. Never operate the Grain Bin and auxiliary equipment until you have read and completely understand this manual, the auxiliary equipment Operator's Manual, and each of the Safety Messages found on the safety signs on the Bin and auxiliary equipment.

2. Personal protection equipment including hard hat, safety glasses, safety shoes, and gloves are recommended during assembly, installation, operation, adjustment, maintaining, repairing, removal, or moving the implement. Do not allow long hair, loose fitting clothing or jewellery to be around equipment.



### 3. **PROLONGED EXPOSURE TO LOUD NOISE MAY CAUSE PERMANENT HEARING LOSS!**

Motors or equipment attached can often be noisy enough to cause permanent, partial hearing loss. We recommend that you wear hearing protection on a full-time basis if the noise in the Operator's position exceeds 80db. Noise over 85db on a long-term basis can cause severe hearing loss. Noise over 90db adjacent to the Operator over a long-term basis may cause permanent, total hearing loss.



**NOTE:** Hearing loss from loud noise (from tractors, chain saws, radios, and other such sources close to the ear) is cumulative over a lifetime without hope of natural recovery.

4. Clear working area of debris, trash or hidden obstacles that might be hooked or snagged, causing injury, damage or tripping.

5. Operate only in daylight or good artificial light.

6. Be sure machine is properly anchored, adjusted and in good operating condition.

7. Ensure that all safety shielding and safety signs are properly installed and in good condition.

8. Before starting, give the machine a "once over" for any loose bolts, worn parts, cracks, leaks, frayed belts and make necessary repairs. Always follow maintenance instructions



## OPERATING SAFETY

1. Make sure that anyone who will be operating the Grain Bin or working on or around the unit reads and understands all the operating, maintenance and safety information in the operator's manual.
2. Keep all bystanders, especially children, away from the Grain Bin when loading or unloading is being done, or when authorized personnel are carrying out maintenance work.
3. Do not crawl under the opened unloading chute to inspect for a suspected blockage. This is an unsafe practice. Caked or impacted product could suddenly break loose and cause facial and/or eye injury.
4. Do not attempt to enter the Grain Bin through the top loading hatch. This opening is designed for loading the Cone only and not for human entry.
5. Use the inspection manway only for entry into the Grain Bin and only when the Grain Bin is empty for cleaning purposes.
6. If you enter the Grain Bin, make sure that there is no possibility that either the loading or unloading auger could be started up. Lock out the power sources for the augers and have a responsible, trained person close at hand to keep unauthorized individuals away from the work area.
7. Establish a lock-out tag-out policy for the work site. Be sure all personnel are trained in and follow all procedures. Lock-out tag-out all power sources before entering Grain Bin or working around loading/unloading equipment.
8. Enter the empty Cone with extreme caution and wear protective clothing, goggles for eye protection and a properly filtered respirator mask for lung protection. It is also good safety practice to connect a safety line to yourself and a secure attachment point outside the Grain Bin before entering the enclosed area.
9. Do not enter the bin from the top loading hatch or the inspection manway at the bottom of the bin to break loose impacted, caked or bridged material. You could fall through the bridged material if you are trying to clear it from the top. Or have it cave in on you from the bottom. Either situation could result in you being buried in the falling material and suffocating.
10. If material is bridged or caked causing a blockage. Use a long pole, a length of board or a stick to break the material loose.
11. Review safety related items annually with all personnel who will operating, using or maintaining the Bin.

## MAINTENANCE SAFETY

1. Good maintenance is your responsibility. Poor maintenance is an invitation to trouble.

2. Follow good shop practices.

- Keep service area clean and dry.
- Be sure electrical outlets and tools are properly grounded.
- Use adequate light for the job at hand.



3. Do not crawl under the opened unloading chute to inspect for a suspected blockage. This is an unsafe practice. Caked or impacted product could suddenly break loose and cause facial and/or eye injury.

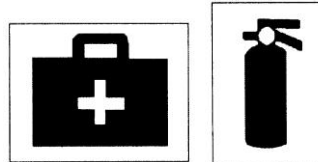
4. If you enter the Grain Bin, make sure that there is no possibility that either the loading or unloading auger could be started up. Lock out the power sources for the augers and have a responsible, trained person close at hand to keep unauthorized individuals away from the work area.

5. Review safety related items annually with all personnel who will be operating, using or maintaining the Grain Bin.

6. Enter the empty Cone with extreme caution and wear protective clothing, goggles for eye protection and a properly filtered respirator mask for lung protection. It is also good safety practice to connect a safety line to yourself and a secure attachment point outside the Grain Bin before entering the enclosed area.

7. Use personal protection devices such as eye, hand, breathing and hearing protectors, when performing any service or maintenance work.

8. A fire extinguisher and first aid kit should be kept readily accessible while performing maintenance on this equipment.



9. Periodically tighten all bolts, nuts and screws to ensure the unit is in a safe condition.

10. When completing a maintenance or service function, make sure all safety shields and devices are installed before placing unit in service.

## LOCK-OUT TAG-OUT SAFETY

1. Establish a formal Lock-Out Tag-Out program for your operation.

2. Train all operators and service personnel before allowing them to work around the Grain Bin.

3. Provide tags at the work site and a sign-up sheet to record tag out details

## SAFETY SIGN LOCATIONS

The types of safety signs are located on the Walk-In Door of the Grain Bin and are shown in the illustration below. Good safety requires that you familiarize yourself with the various safety signs, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS

REMEMBER – If safety signs have been damaged, removed, become illegible or parts replaced without signs, new signs must be applied. New signs are available from your authorized dealer.

 <p>This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.</p>										
	 <p><b>YOU CAN SUFFOCATE UNDER GRAIN IN THIS BIN</b></p> 									
<p>GRAIN STORAGE TANKS ARE DESIGNED TO BE CENTER UNLOADED. OFF-CENTER OR SIDE UNLOADING CAUSES ADDITIONAL FORCES WHICH COULD BE DAMAGING TO THE SIDEWALLS. CONSULT THE FACTORY FOR APPROVAL OF ANY DEVIATIONS.</p>	<p><b>DO NOT ENTER WHEN THIS BIN IS BEING LOADED OR UNLOADED</b></p>									
<p><b>WARNING</b></p> <p>Adequate roof ventilators must be installed when fans are used to aerate the grain. Consult your Behlen Industries Dealer for determining roof vent requirements. Please consult your fan supplier for proper ventilation requirements.</p>	<p><b>— IF YOU <u>MUST</u> ENTER THE BIN —</b></p> <ol style="list-style-type: none"><li>1. SHUT OFF AND LOCK OUT ALL POWER.</li><li>2. USE A SAFETY HARNESS AND SAFETY LINE.</li><li>3. WEAR A DUST RESPIRATOR.</li><li>4. AVOID THE CENTER OF THE BIN.</li><li>5. STATION A PERSON TO HELP FROM OUTSIDE THE BIN.</li></ol>									
	<p><b>— THE DANGER IS FROM —</b></p> <table border="0"><tr><td data-bbox="950 1052 1117 1073">FLOWING GRAIN</td><td data-bbox="1133 1052 1154 1073">AND</td><td data-bbox="1198 1052 1349 1073">CRUSTED GRAIN</td></tr><tr><td></td><td></td><td></td></tr><tr><td>FLOWING GRAIN TRAPS AND SUFFOCATES</td><td></td><td>CRUSTED GRAIN COLLAPSES AND SUFFOCATES</td></tr></table>	FLOWING GRAIN	AND	CRUSTED GRAIN				FLOWING GRAIN TRAPS AND SUFFOCATES		CRUSTED GRAIN COLLAPSES AND SUFFOCATES
FLOWING GRAIN	AND	CRUSTED GRAIN								
										
FLOWING GRAIN TRAPS AND SUFFOCATES		CRUSTED GRAIN COLLAPSES AND SUFFOCATES								

Meridian Manufacturing Group strives to incorporate safety into its products, be it during handling, erection, or operation. Caution or warning signs must be heeded and recommended procedures should be followed in order to make a Safety Program effective.

Safe working conditions, safe working methods and safe products should always be of prime concern to contractors, erectors and manufacturers.




Contractors and/or erectors must also assume responsibilities of providing safe working conditions and practices during the assembly or erection of the products.

Employers are obligated to familiarize themselves with the requirements of the Workplace Safety and Health Standards in their province and put them into practice. Local codes should also be checked into.

In the United States, Federal safety standards Department of Labour. Employers are obligated to requirements of the standard and put them into practice. State or Local codes should also be checked into.



(O.S.H.A.) have been established by the familiarize themselves with the

 Watch for this symbol. It points out important **“ATTENTION - BE ALERT — YOUR SAFETY**



safety precautions. It means **IS INVOLVED.”**

Several decals are attached to the equipment at various places to call your attention to its message concerning your personal safety. Read and heed the message and be alert to the possibility of personal injury or fatality.

It is your responsibility as an owner, operator or and to make these known to all other personnel take any necessary safety precautions that may be



supervisor to know what hazards exist working in the area, so that they too may required.



If the decals become detached, contact your Meridian Manufacturing representative or Behlen Industries for replacement decals.

Guards and Shields are provided for your protection. machine is in operation.



Keep them in place and secure while the

Replace safety shields that may have been damaged or removed for servicing purposes and fasten securely before operating machinery.

Before you perform any service on the equipment, disconnect switch is locked in the off position.



make certain that the main power

Keep children and any unauthorized persons away from any hazard areas.

Keep hands, feet and clothing away from moving parts. Loose clothing can become entangled in rotating parts and cause serious injury.

Be aware of the danger that is present when loading or unloading a grain bin. Grain that has bridged or tunneled may suddenly break loose and trap a person inside the bin. Death by suffocation can result. Avoid entering the bin until the grain is removed.

Ladders as well as walking and working surfaces should have safety cages and hand rails for safe use. Life lines may be used where danger of falling exists.

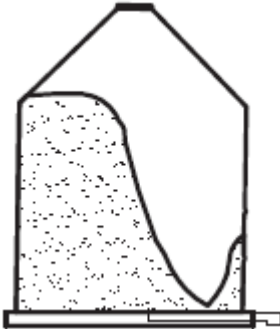
# GRAIN TANK OPERATION

## Loading and Unloading

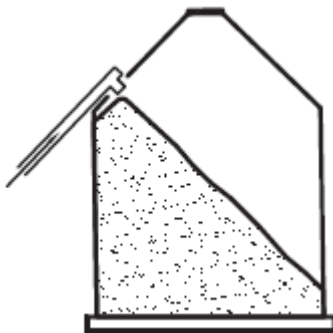
Meridian Grain Tanks are designed to be center loaded and unloaded.

### Incorrect

#### Side Loading



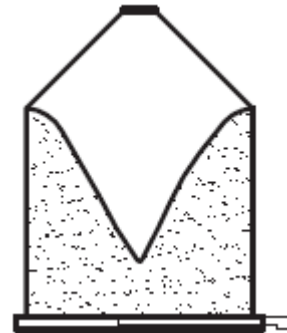
Side unloading at floor or wall.  
Excessive down pressure causes buckles.



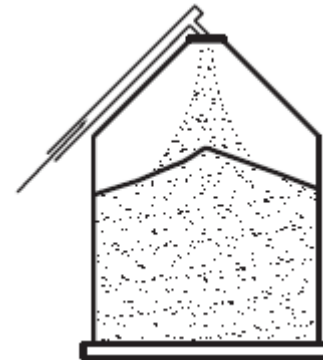
Uneven loading on sidewalls  
can cause storage bins to "lean".

### Correct

#### Center Loading



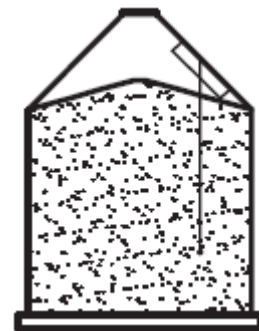
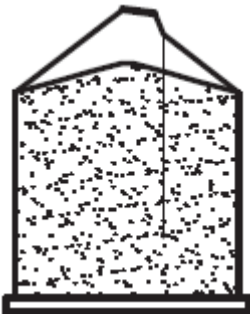
The storage bins are to be unloaded from the center unloading port until all possible grain has been removed by this port.



The storage bins are to be loaded through the center roof cap.

## External Loads

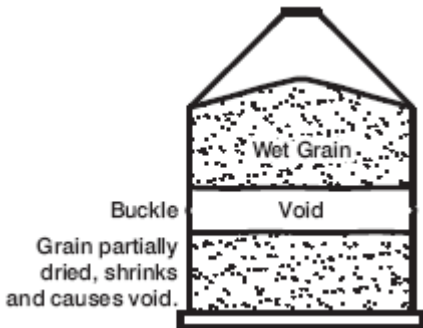
### Temperature Cable



## Material Stored

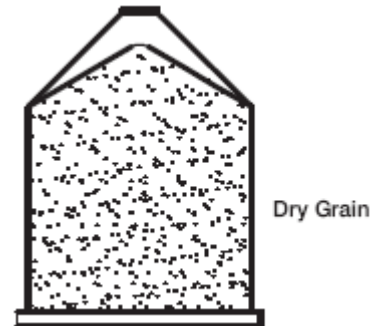
The storage bins are designed to store dry, free-flowing grain with a density of up to 50#/Ft<sup>3</sup>.

### Incorrect



The storage bins are to be unloaded from the center unloading port until all possible grain has been removed by this port.

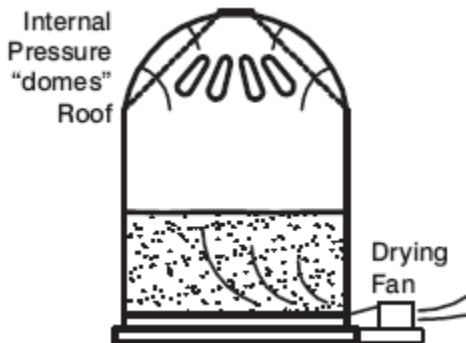
### Correct



## Ventilation

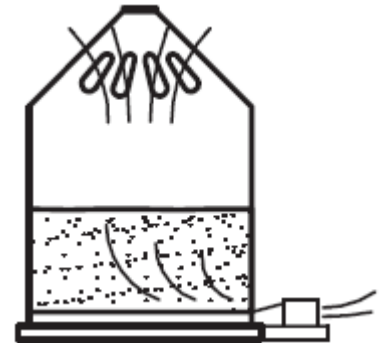
Adequate ventilating area must be provided to prevent a pressure build-up (or vacuum) in the roof area.

### **FAILURE TO OPEN ROOF DOORS WHEN FAN IS TURNED ON**

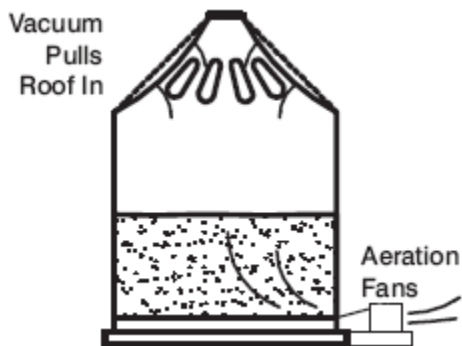


Grain bin roofs are not designed to withstand excessive air pressure differentials. General recommendations are that the minimum area for air escape should not be less than twice the cross sectional area of the

### **All Roof Vents Open**

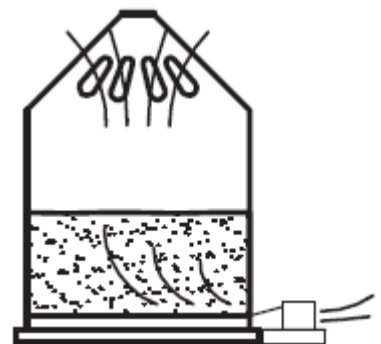


### **FAILURE TO HAVE ADEQUATE ROOF VENTS FOR AIR INLET**



**Maximum recommended pressure differential in the roof area is 1" of static.**

### **Adequate Roof Vents for Air Inlet**



Be alert to the possibility of a frost build-up on air passage screens to a point of complete blockage. This may occur with high relative humidity and near freezing temperatures. Precautionary measures must be taken to prevent this condition. Cross sectional area of the main duct of a properly designed air distribution system.

## REQUIRED TOOLS FOR ASSEMBLY

Hard Hat



Impact Wrench or Speed Wrench



Wrenches



Sockets



Hammer



Hearing Protection



Aligning Bars



Work Gloves



Steel Toe Work Boots



Safety Glasses



## SITE PREPARATION

Before selecting a site for your Meridian Grain Tank there are several items which should be taken into consideration:

- The site should be convenient and readily accessible to all necessary equipment for loading and unloading the grain from the tank.
- Remember that you may add more tanks in the future. Good planning on the initial installation may save time and money, if more tanks are planned.
- Fill earth shall be good soil with no rocks, refuse or vegetable matter.
- Fill shall be added in layers not to exceed four (4) inches, wet down and thoroughly compacted. Continue until finished grade is reached.
- Proper drainage of the immediate area is necessary.
- Local soil bearing values should be known before attempting the installation of the footings. The footings spread the concentrated load of the tank wall over an area of soil so that the unit pressure will come within allowable limits. Exceeding the limits can result in footing failure which in turn could cause a failure in the structure.

### Site Preparation for Hoppermount Grain Tanks

These are some items which should be taken into consideration to prevent failure due to improper site prep.

- It is our recommendation that a soil engineer be consulted when preparing sites and foundations for bin/cone combo to ensure capacity meets or exceeds the anticipated load in order to prevent any settling, which could result in bin failure.
- The following is a list of the bearing value of soils, but should not be used in lieu of professional consultation:

#### Bearing Value of Soils:

1. Dry consolidated clay
2. Compacted coarse to fine sand
3. Sandy clay
4. Silt
5. Stiff Clay
6. Soft Clay
7. Top Soil

#### Approx. Capacity

- 10,000 lbs. per sq. ft.
- 8,000 lbs. per sq. ft.
- 5,000-6,000 lbs. per sq. ft.
- 3,000-4,000 lbs. per sq. ft.
- 3,000 lbs. per sq. ft.
- 2,000 or less lbs. per sq. ft.
- 200-500 lbs. per sq. ft.

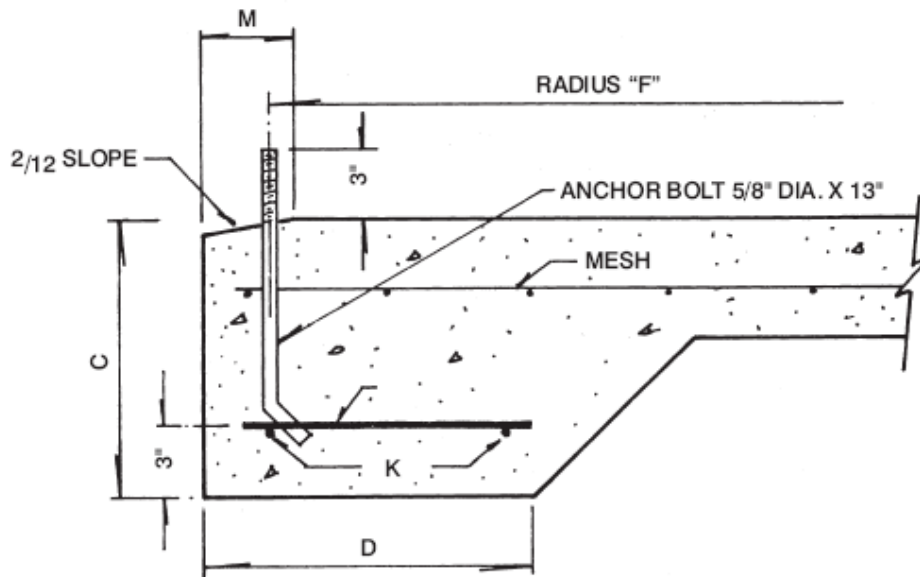
**Note:** Materials that may appear adequate can become unstable under varying conditions. Dry clay, for example, may lose all load bearing capacity if saturated with water. In general, a PROPERLY crushed rock base can be varied in depth in order to accommodate most load requirements.



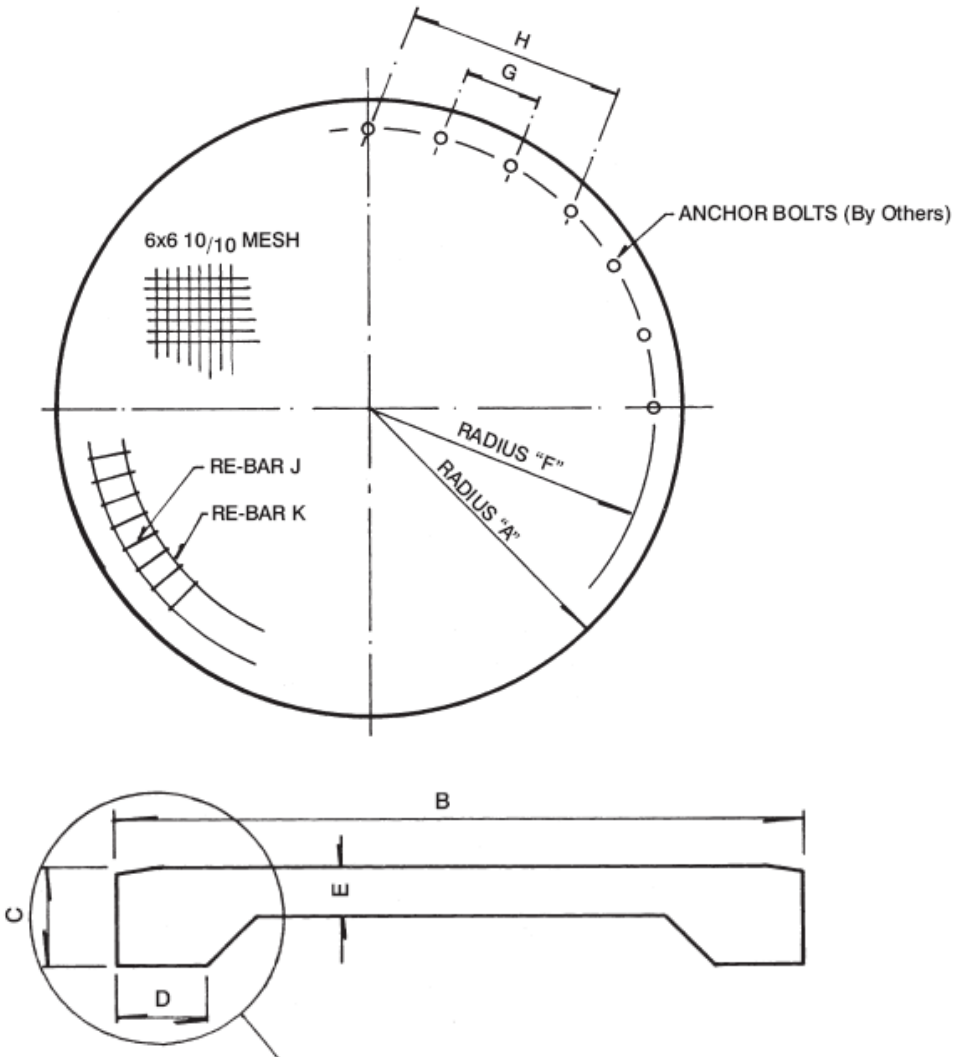
## CONCRETE DESIGN

The concrete details are designed for a 28 day minimum compressive strength of 2,500 lbs. per sq. in. If this value is unattainable, modifications will be necessary on the concrete requirements to compensate for existing conditions.

- It shall be the responsibility of the concrete contractor to check the local soil conditions to determine whether they comply with the necessary soil bearing values when using the concrete requirements set forth by Meridian Manufacturing.
- The suggested concrete footing is based on a “floating slab” design. If local codes require frost considerations, the proper footing will have to be used.
- The use of a polyethylene sheet, to act as a moisture barrier, is suggested. After the earth work has been completed and concrete forms have been put into place, cover the finished grade with 4 mil to 6 mil polyethylene sheet. Joints of sheets should be overlapped 8 to 10 inches.
- After installation of barrier, lay in mesh, re-bar and complete concrete work.
- If unloading tube or aeration system is to be used with tank, necessary provisions must be made.
- If the concrete floor should “slope in” from the tank walls, outside water may seep into the tank and cause grain spoilage. Extra care in final finish cannot be over-stressed.



# Concrete Design for Flat Bottom Bins



## Concrete Design Charts

Use this chart for minimum soil bearing capacity of 2000lbs. per Sq. Ft.

Model	Wall Height	Catalog Number	Radius A	Diameter B	Height C	Width D	Floor Thickness E	Anchor Bolt Radius F	Spacing G	Spacing H	Anchor Bolts Req.	Anchor Bolt Size	Re-Bars		Dim. M
													J	K	
H - 16	16'-4"	210722	8'-3"	16'-6"	10"	12"	5"	8'-0 1/4"	3'-10 1/16"	10'-7 5/8"	13	5/8" x 13"	5/8" x 12" @ 36"	-	4"
	20'-1"	210724				14"									
H - 19	16'-4"	210730	10'-1"	20'-2"	12"	14"	5"	9'-10 1/8"	3'-10 1/16"	10'-11 1/4"	16	5/8" x 13"	3/8" x 12" @ 24"	1/4" dia.	4"
	20'-1"	210732				14"									
	28'-10"	210734				16"									
H - 22	16'-4"	210744	11'-4"	22'-8"	12"	14"	5"	11'-0 13/16"	3'-10 1/8"	1'-0 13/16"	18	5/8" x 13"	3/8" x 14" @ 24"	1/4" dia.	4"
	20'-1"	210746				14"									
	23'-10"	210748				16"									
H - 27	16'-4"	210772	13'-9"	27'-6"	12"	14"	5"	13'-6 1/8"	3'-10 1/8"	1'-2 11/16"	22	5/8" x 13"	3/8" x 16" @ 18"	3/8" dia.	4"
	20'-1"	210774				16"									
	23'-10"	210776				18"									

Use this chart for minimum soil bearing capacity of 2000 lbs. per sq. ft.

Model	Wall Height	Catalog Number	Radius A	Diameter B	Height C	Width C	Floor Thickness E	Anchor Bolt Radius F	Spacing G	Spacing H	Anchor Bolts Req.	Anchor Bolt Size	Re-Bars			Dim. M	Rolls Mesh	Total Cu. Yds. Concrete
													J	K	L			
H - 27	27'-7"	210778	14'-1"	28'-2"	12"	28"	5"	13'-6 1/8"	3'-10 1/8"	11'-2 11/16"	22	5/8" x 13"	1/2" x 18"	3/8" x 20" 9 ea.	-	4"	780	14.61
	31'-4"	210780											26" x 18" c.c.					
	35'-1"	210782			58 ea.													
	38'-10"	210784			5/8" x 40" 18" c.c.	3/4" x 20" 5 ea.	23.93											
	42'-7"	210786			18"	42"	6"											

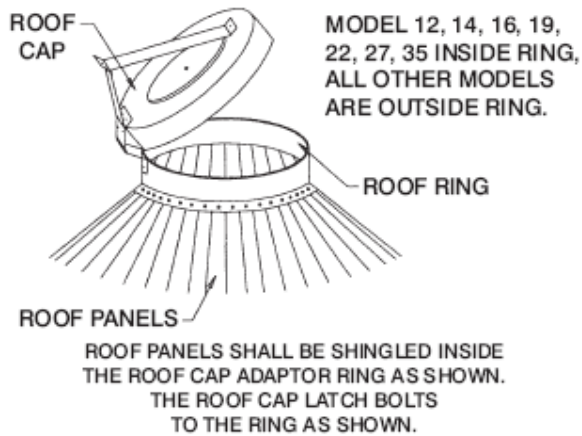
Use this chart for minimum soil bearing capacity of 3500lbs per sq. ft.

Model	Wall Height	Catalog Number	Radius A	Diameter B	Height C	Width D	Floor Thickness E	Anchor Bolt Radius F	Spacing G	Spacing H	Anchor Bolts Req.	Anchor Bolt Size	Re-Bars			Dim. M	Rolls Mesh	Total Cu. Yds. Concrete
													J	K	L			
H - 27	27'-7"	210778	14'-1"	28'-2"	12"	16"	5"	13'-6 1/8"	3'-10 1/8"	11'-2 11/16"	22	5/8" x 13"	**	3/8" x 20" 9 ea.	-	4"	780	13.03
	31'-4"	210780				1/2" x 18" 18" c.c.												
	35'-1"	210782			58 ea.													
	38'-10"	210784			5/8" x 40" 18" c.c.	3/4" x 20" 5 ea.	21.17											
	42'-7"	210786			18"	28"	6"											

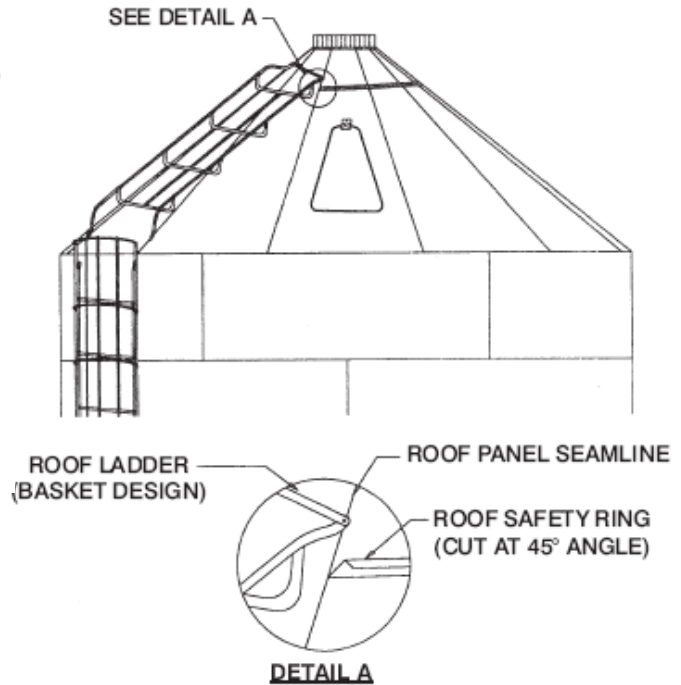
# ROOF ACCESSORIES

## ROOF RING & CAP

MODEL 12, 14, 16, 19, 22, 27, 35



## ROOF DETAIL



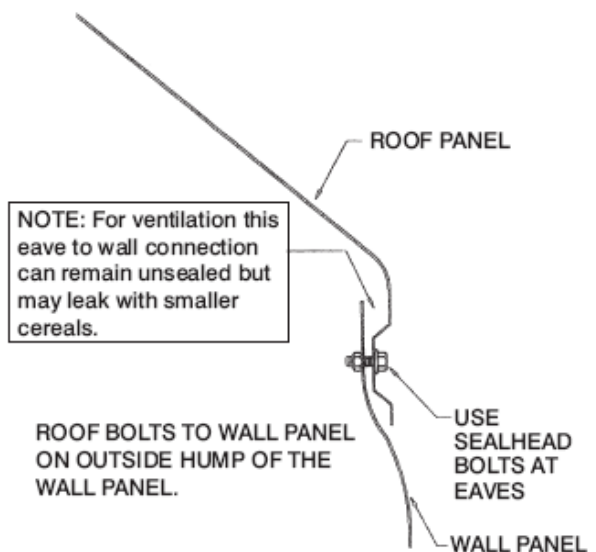
NOTE: CUT ROOF SAFETY RING 45° AT BOTH POINTS IN WHICH THE ROOF LADDER AND THE ROOF SAFETY RING MEET.

## ROOF SAFETY RUNG KIT

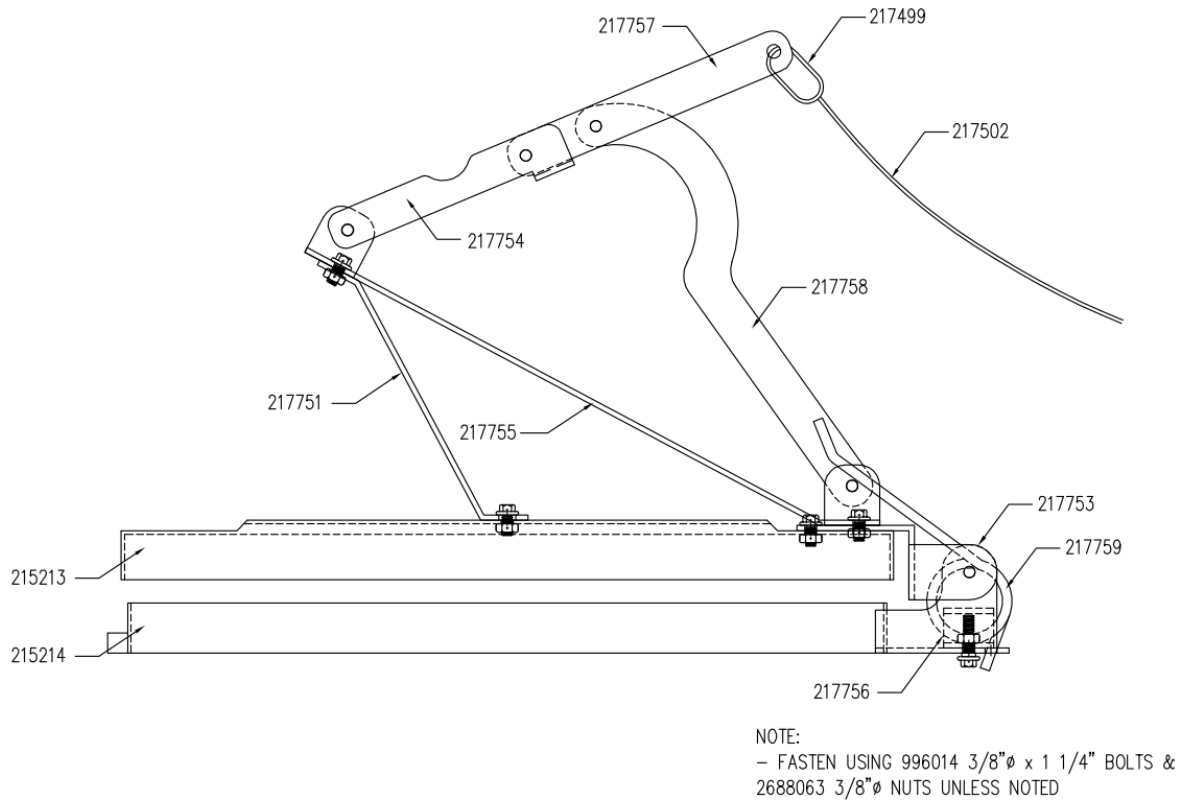
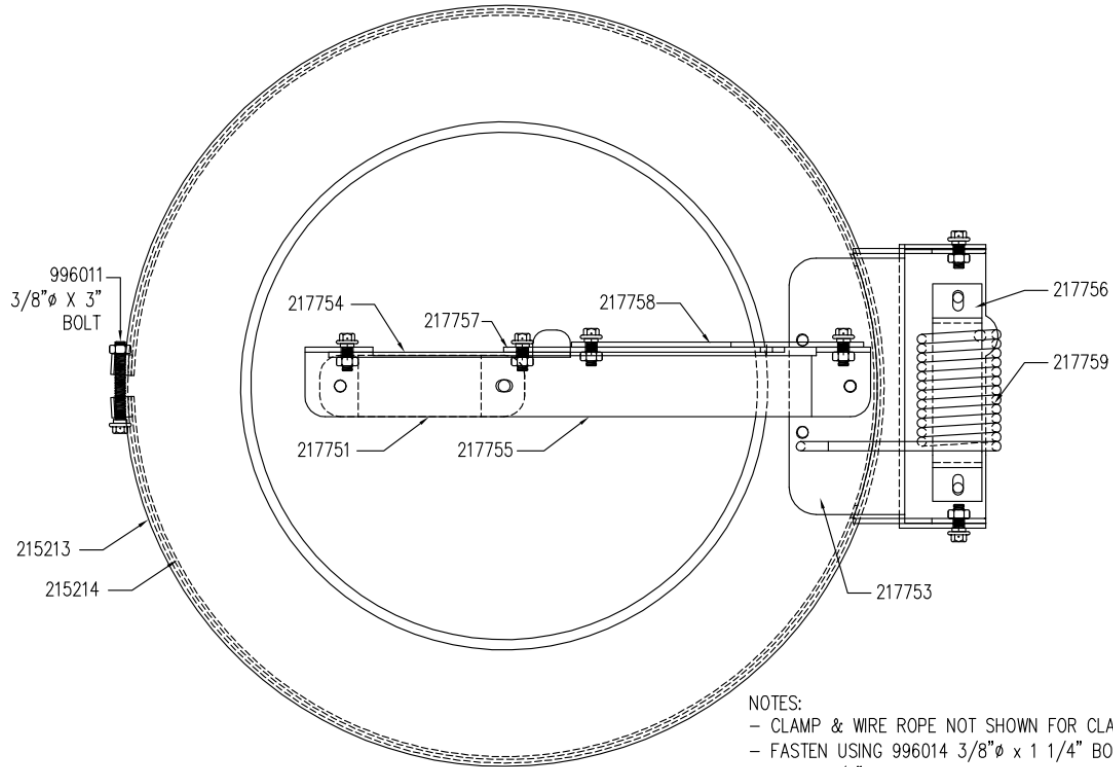
Model	Quantity	Part Number
12	20	217 350
14	24	217 350
16	26	217 350
19	32	217 350
22	36	217 350
27	44	217 350
35	56	217 350

NOTE: LOCATE MID-ROOF AT POINT WHERE THEY FIT WITH EXISTING BOLT HOLES. (see page 10 for detail)

## ROOF CONNECTION DETAIL



# Roof Cap Assembly



## Roof Assemblies

Part Description	Model 16 - 210916		Model 18 - 210918	
	Part No.	Part No.	No. Req'd	No. Req'd
Roof Panel	216519	27	217980	30
Roof Ring	216515	1	217981	1
Roof Cap	214212	1	214212	1
Roof Safety Ladder	994031M	1	994031M	1

Part Description	Model 19 - 210919		Model 22 - 210922		Model 27 - 210927	
	Part No.	No. Req'd	Part No.	No. Req'd	Part No.	No. Req'd
Roof Panel	217970	32	216279	36	216981	44
Roof Stiffener	216199	2	216198	2	216198	2
Roof Ring	217971	1	216525	1	216531	1
Roof Cap	214212	1	214212	1	214212	1
Roof Safety Ladder	994031M	1	994032M	1	994033M	1

### Roof Assembly Instructions

The roof can be installed on your Meridian Grain Tank in any of several ways. One method is to assemble the roof completely on the ground and lift it into place in one piece with a boom or crane. A large implement wheel (dump rake, etc.) is usually placed under the center of the roof for lifting in this manner. Insure that all accessories are installed before lifting.

One method of installing the roof on smaller tank sizes is to assemble it with the use of a scaffold built inside the tank. This scaffold should be high enough so that a man can easily reach the peak of the roof to assemble the ventilator assembly. When assembling the roof in place on the tank, block up the top end of the panels about 5'1" above the wall panels. With this arrangement, two or three panels can be interlocked and bolted together on the ground before lifting them into place.

The roof should be positioned so that the vertical distance between the eave line bolts and the top edge of the roof ring is as follows:

H-14 – 5'-0"  
 H-16 – 7'-4 1/2"  
 H-19 – 6'-0"  
 H-22 – 9'-0 3/4"  
 H-27 – 9'-3 7/8"

If difficulty in erecting tank roof is encountered, this height should be adjusted slightly.

#### Attention:

Only the erection of the 22' Grain Bin proceed from right to left (clockwise).

Once again erection proceeds from left to right, or counter-clockwise around the tank. It will be necessary to apply a bead of caulking, extending the full length of the roof panel. This bead shall be 5/16" in diameter for a distance of 18" up from the eave and 18" down from the peak while only a 3/16" diameter bead will be required the rest of the length of the panel. On the last panel, caulking should be applied inside both grooves. Be certain that this caulking is located between the bolt line and the outside weather, as was the case with the sealer on the wall panels.

The center of the roof panel should be over a wall panel joint. This is due to the fact that if a wall ladder is installed, it will be on the wall seamline and with a roof panel centered on this seamline, this allows the roof ladder to be directly over the wall ladder. The roof ladder will fit only in its proper location.

If wall ladders will not be used, the orientation of roof is not critical, as long as roof seam line does not fall on a vertical seam in the wall panels.

On Models H-22, H-27 "Z" stiffeners are used for additional support on the underside of seams where roof ladders are installed.

Attach the roof cap to center ring as shown in the details.

Normally no sealer is used at connection of roof and wall panels (eave line), to allow condensation, which may collect on inside surface of roof to escape to the outside. If small grain is to be stored above the eave line, a bead of caulking can be used to fill this space.

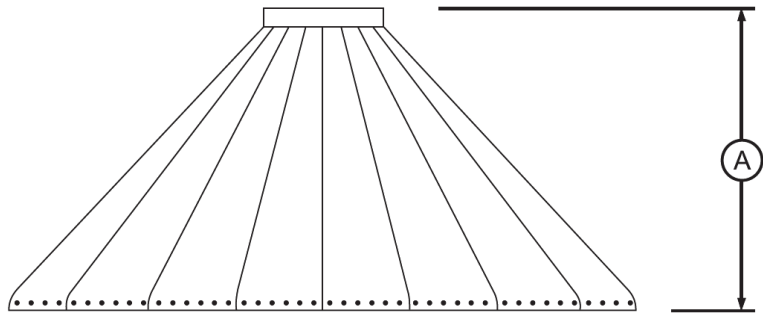
After all the roof panels are assembled, check to see that the top ring seamline holes are aligned. Apply a 5" strip of wall panel sealer to the roof cap ring joint and then bolt the ring together with a 3/8"x3/4" bolt. This bolt first goes through the roof cap latch bracket, then the roof cap ring and at last through the end of the roof panel seam line which bolts to the right hand end of the ladder rungs. Install the top 3/8"x3/4" bolt which completes the joint connecting the ring. Now finish bolting the ring to the outside of the top end of the roof panels. The roof cap is shipped fully assembled.

## ASSEMBLY TIPS

### Roof Assembly Tips

1. When assembling the Roof cone, the dimension (A) between the eave line bolts and the top of the roof ring should be as follows:

Tank Model	Dimension
12	5' - 8 1/2"
14	5' - 0"
16	7' - 4 1/2"
19	6' - 0"
22	9' - 0 3/4"
27	9' - 3 7/8"
35	11' - 10 3/4"
41	14' - 1 7/8"



If difficulty is encountered in assembly of the roof panels, adjust this dimension slightly. Also, bolting from the bottom of the roof panel up to the roof ring should prevent the flatter end portion of the roof panel from buckling.

2. When installing roof panels, lap the panels with visibly finished edge exposed to the environment. NOTE: This may require the direction of assembly to change from counter-clockwise to clockwise.
3. When installing hoppermount tank models on a welded cone (by others), ensure vertical seams on the 12GA panel ring are left loose to enable an easier fit.
4. Ensure that the roof ring is level during erection of the roof.
5. The roof safety ring on all models must be field modified for further safety. The last rung on either side of safety ring must be cut at a 45° angle to ensure that no sharp edge is close to the ladder at that connection. (see detail on page 12)
6. Roof access hatches should be located two panels over from the ladder location.

### Standard Assembly Tips

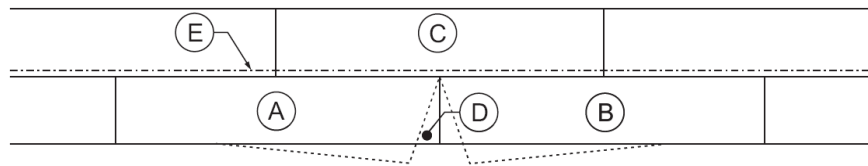
1. All stiffeners MUST be located inside the tank. Meridian accepts no responsibility for the performance of a tank where the stiffeners are located outside or omitted.

- When bolting anchor bolts, the bottom nut must remain loose until after the tank has been filled, to allow for setting.
- When bolting Horizontal tank panels together, a few simple steps can be taken to make a tighter seal. When bolting two panels together, snug up the smaller outside corrugations first. The panels will fit together much tighter this way.

### Vertical Seam

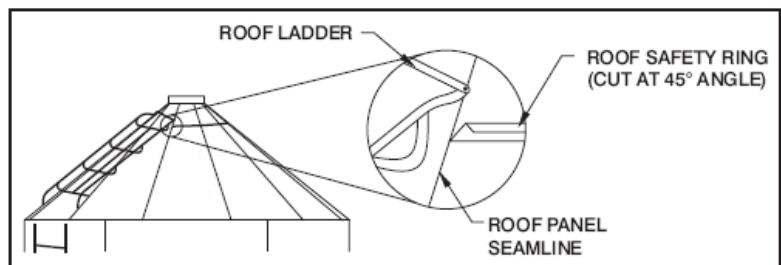
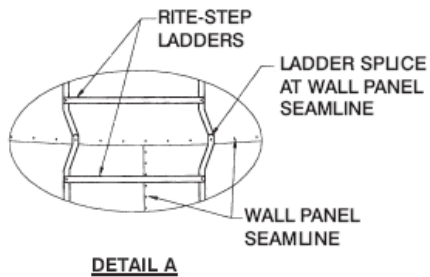
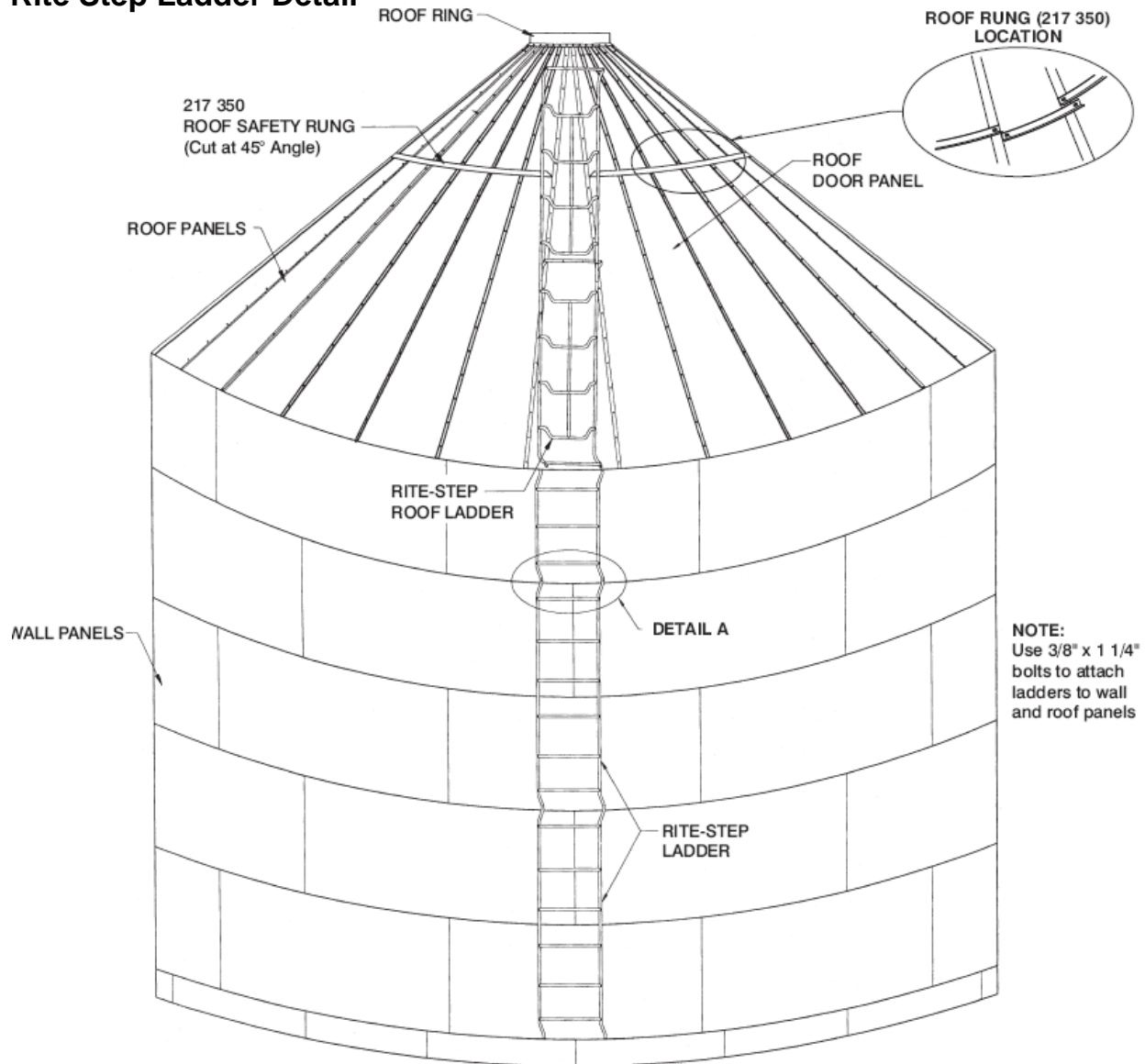


- When bolting adjacent Horizontal panels (A) & (B) onto panel ring (C), a bolt should be placed at location (D) before bolting seam lines (E). Otherwise panels (A) & (B) may spread as show.

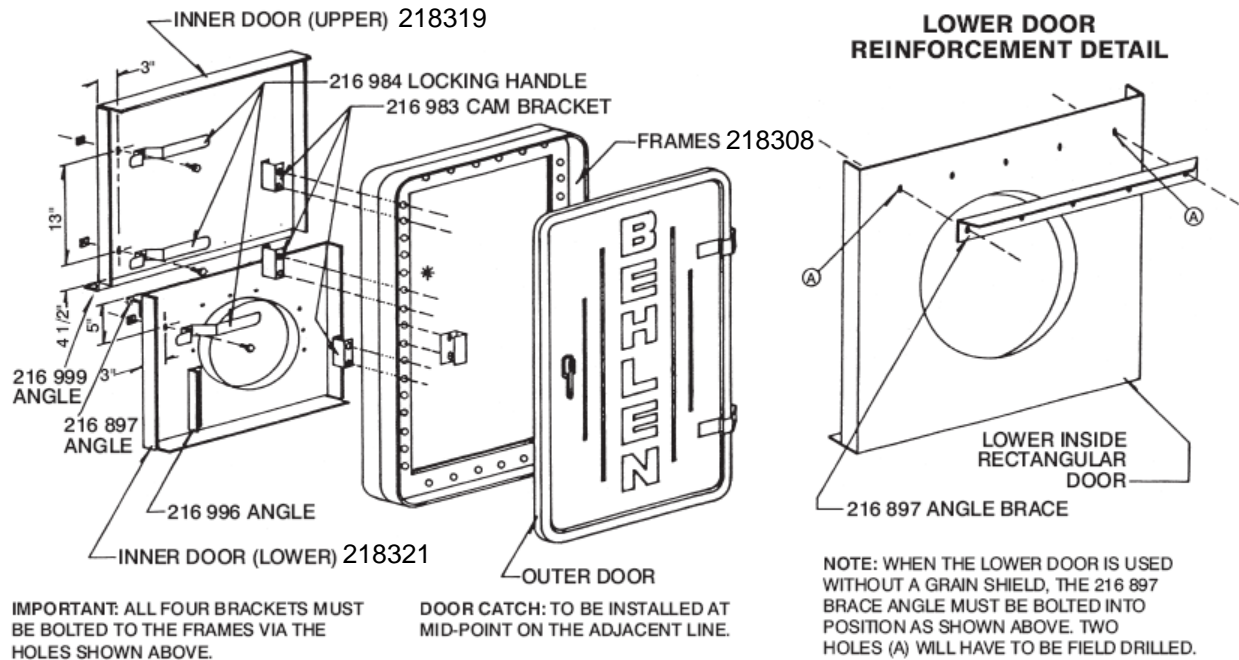




# Rite Step Ladder Detail



## Behlen Door Detail



<b>213100 - Rectangular Door Package, for tanks up to 20' High</b>		
<b>Item</b>	<b>Description</b>	<b>Quantity</b>
215333	Frame c/w inner doors	
-215118	Panel Door Ass'y Up/Inner Rect.	1
-215120	Panel Door Ass'y Low/Inner Rect.	1
-216983	Lock Cam Door Lock Inner Rect.	3
-216990	Hinge Bracket Door Frames	4
-218308	Frame In/Out Rect(B&w) 8GA Galv	1
218308	Frame In/Out Rect(B&w) 8GA Galv	1
219760	Kit Door Rect Behlen(12-27)	1
-215119	Door Ass'y Outer Rect	1
-215600	Door Safety Latch Assembly	1
-216897	Angle Brace Rect Door Lower	1
-216999	Angle Brace Rect Door Upper	1
-226253	Port Cover (Round & Rect Door)	1
219860	Bag Door Rect Hdw 12-16 *	1
-1708008	Handle Door c/w latch plate	1
-218205	Catch Lock Rect Door 12-16	1

- The overview above does not show any bolts for clarity
- Also available kit 213101, for tanks higher than 20'

# HORIZONTAL UNSTIFFENED TANKS

## Model 16, 19, 22

### Assembly Instructions

- Refer to General Considerations at the beginning of the book before proceeding.
- The method of erection used will determine the sequence of assembly, (i.e. from top down or bottom up). In general, the assembly of roof, wall panels, tank floor angle, anchor brackets, doors and other miscellaneous assemblies will be discussed in this manual.
- Lay out all materials and check against the packing list to see that all parts are present and in the correct quantities.

### Wall Panel Assembly

- When attaching the wall panels to the roof panels, do not locate the wall panel vertical seam directly below the roof ladder if a wall ladder will be used.
- Wall panels are assembled in a counter-clockwise direction to form a ring, being certain that laps are made according to the plan. Refer to illustrated section for details. The 15" base ring is assembled in a clockwise direction.
- The lightest gauge forms the uppermost ring, and ring gauges become progressively heavier going toward the bottom of the tank.
- The gauge of each panel of each panel is marked through color coding (See table below)

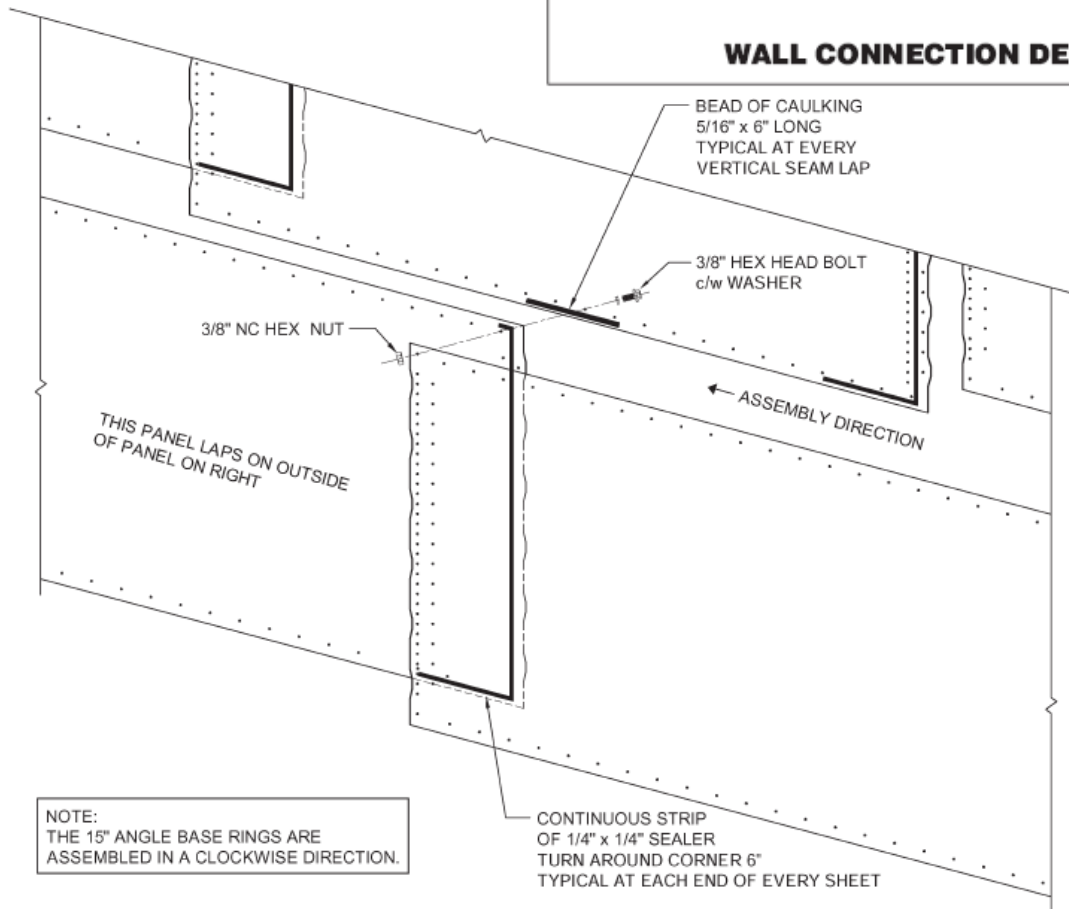
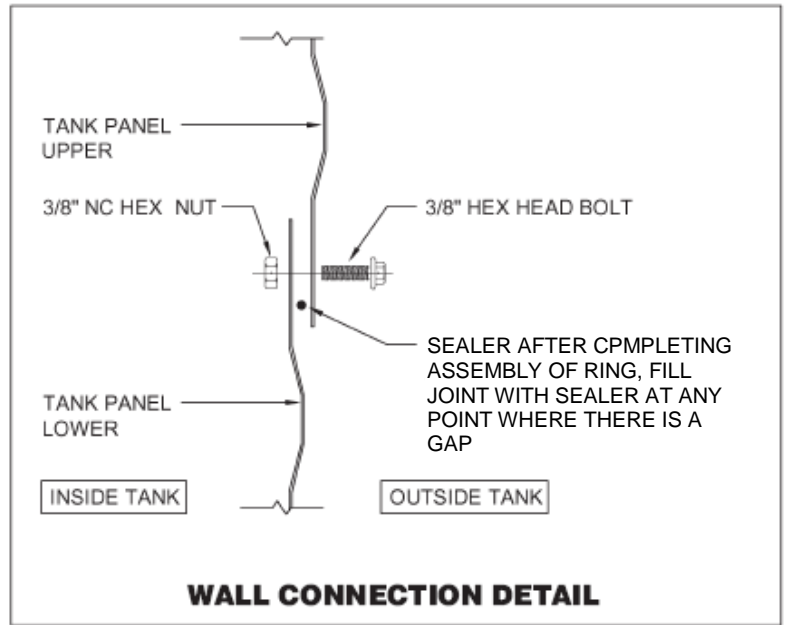
<b>Grain Bin Gauge Color Coding</b>	
<b>Gauge</b>	<b>Color</b>
22	Black
20	Red
18	Blue
16	Yellow
14	Brown
12	Orange

<b>Angle Base Ring and Splices overview</b>		
<b>Model</b>	<b>Angle Base Ring</b>	<b>Splice</b>
16	6 x 217183; 1 x 217184	7 x 217208
19	8 x 217496	8 x 217208
22	9 x 217185	9 x 217208
27 (unstiffened)	11 x 217189	11 x 217208

Sealer strip is placed between bolt holes and outside edge of panel on all vertical seams. (See Wall Connection Detail)

- Apply bead of caulking approximately 5/16" in diameter and 6" long to the horizontal seam at the point it crosses a vertical seam. When assembly of two rings is complete, check for any large gaps along the horizontal seam between bolts. If necessary, a bead of caulking should be applied. Refer to illustrated section for details. (See Vertical Seam Sealant Detail)

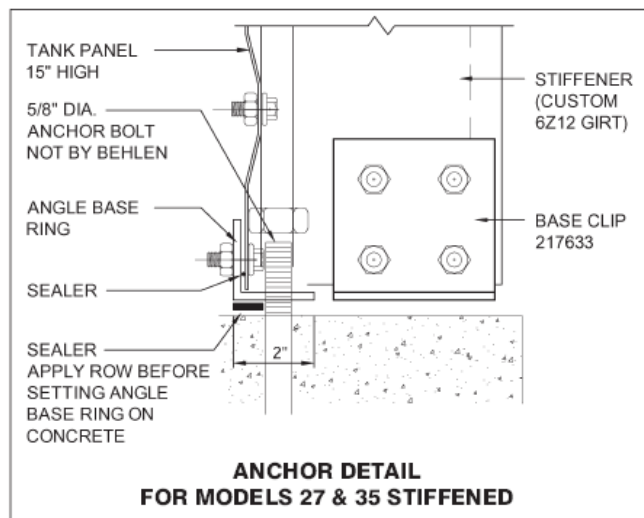
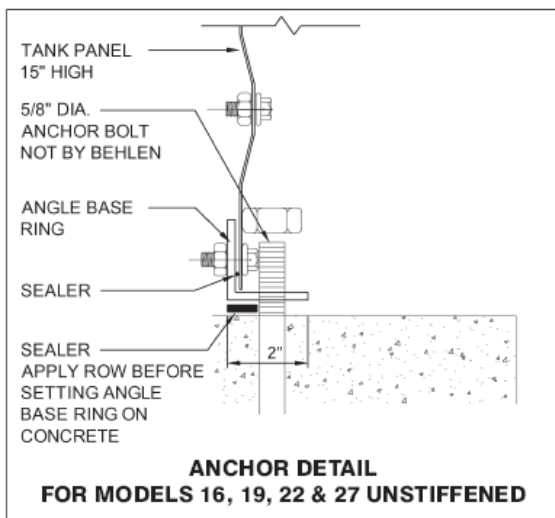
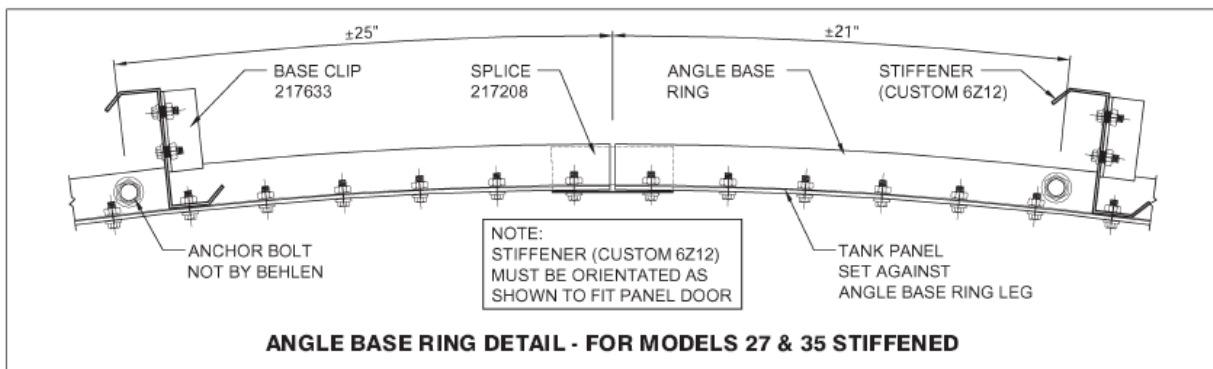
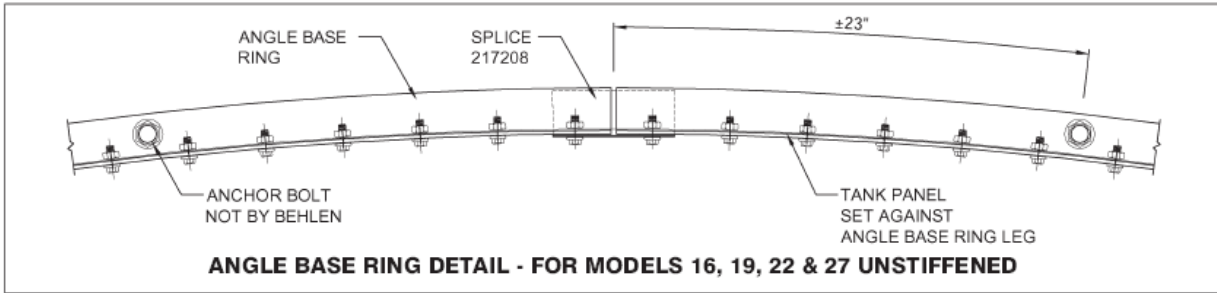
**NOTE:**  
USE HEX HEAD BOLTS & NUTS FOR  
AT ALL FASTENER LOCATIONS



**NOTE:**  
THE 15° ANGLE BASE RINGS ARE  
ASSEMBLED IN A CLOCKWISE DIRECTION.

## Tank Floor Angle

The tank floor angle must form a good seal between the tank and the concrete. To ensure this seal, a bead of caulking must be applied between the angle and the tank, as well as a 1/2" x 3/4" foundation tape between the angle and the concrete. Refer to the illustrated section for this detail.



## Wall Ladders

Wall ladders are optional accessory items, and are usually installed to gain access to roof ladders or to an access door in the sidewall of a tank. A ladder safety cage is suggested when heights greater than 30' are encountered. The ladder is usually started near the eave line and extended 3' to 5' from the foundation. Refer to illustrated section for details. Check O.S.H.A. Standards that may apply to your installation.

## Miscellaneous Items

Since some parts may be used on several tank models, they may contain additional bolt holes. If these extra holes are in a location where moisture may enter the tank, insert a bolt and nut to seal the hole.

When grain has been completely removed from the tank, carefully inspect the interior. If some grain clings to the wall or on the floor, this may be an indication of outside moisture entering the tank. Inspect all bolts for tightness and the seal of seams in these areas. Make necessary corrections.

If an aeration system is used in the tank, roof ventilators are necessary to allow for fresh air intake or exhaust. If roof ventilators are not used, the roof cap or roof door must be opened during aeration process. Failure to comply with this could result in a roof or wall failure due to pressure differential in the storage unit.

## Final Areas to Check

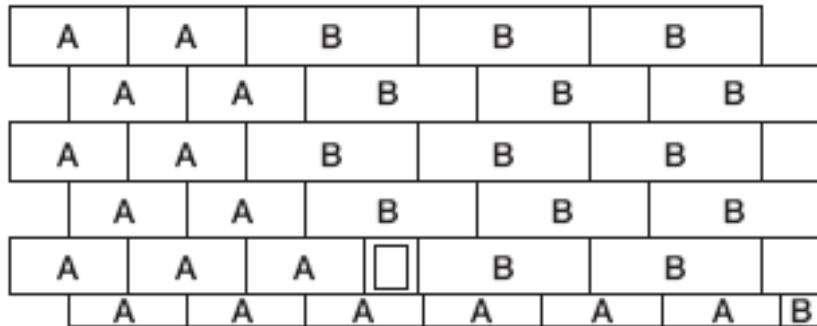
1. All bolts in position and fastened securely.
2. Sealer installed in proper places.
3. Door and lid hardware in position.
4. Proper drainage around foundation to prevent "washout".
5. If a sweep auger will be used in the tank, the pivot must be located in the center of the tank.
6. Proper ladders and safety cage installed when required.
7. All warning and safety decals are to be legible and properly displayed.
8. When electrical equipment is used with the tanks, proper grounding is to be installed.

# FLAT BOTTOM MODELS C/W DOOR

## Model 16 – Flat Bottom

### Panel Lay-out

		210722 16'x16'-4" (3,163bu)			210724 16'x20'-1" (3,785bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.
6	A				217284C	20	1
	B				217285C	20	3
	C				217284CDM	20	1
5	A	217284C	20	1	217086	18	2
	B	217285C	20	3	217087	18	3
	C	217284CDM	20	1			
4	A	217086	18	2	217086	18	2
	B	217087	18	3	217087	18	3
3	A	217086	18	2	217088	16	2
	B	217087	18	3	217089	16	3
2	A	217088	16	3	217090	14	3
	B	217089	16	2	217091	14	2
	D	218044	14	1	218044	14	1
1	A	217114	12	6	217114	12	6
	B	217116	12	1	217116	12	1



Note: Bottom Ring Is #1.

Panel "C" Replaces a Panel "A" in layout.

Panel "D" is the door-panel.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

## Packing Lists

210722 – Tank 16'x16'-4" (3,163bu)		
Part #	Description	Qty.
216519	Panel Roof Std 16' - Yellow	26
210722PK	Panel Pkg TankHU 16x16 3163 Bu	1
217183	Angle Base Ring H16 10GA Red*	6
217184	Angle Base Ring H16 10GA Red*	1
219760	Kit Door Rect Behlen(12-27)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
215333	Frame C/W Doors 16-22-27(Rect)	1
219732	Kit Roof Safety Rung M-16'(26)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
210722K	Kit Hardware 16 X 16'4 3163 Bu	1
226249	Shield Interior Grain (16)	1
3209010	Sealer 1/4 X 1/4 (30' Roll)	4
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2

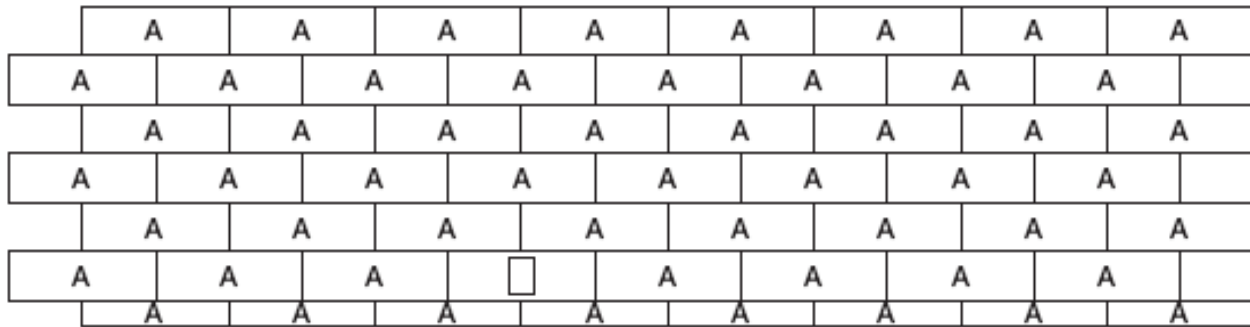
210724 – Tank 16'x20'-1" (3,785bu)		
Part #	Description	Qty.
216519	Panel Roof Std 16' - Yellow	26
210724PK	Panel Pkg TankHu 16x20 3785 Bu	1
217183	Angle Base Ring H16 10GA Red*	6
217184	Angle Base Ring H16 10GA Red*	1
219760	Kit Door Rect Behlen(12-27)	1
3209015	Kit Sealer 150' (5 Rls)	1
215333	Frame C/W Doors 16-22-27(Rect)	1
219732	Kit Roof Safety Rung M-16'(26)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
210724K	Kit Hardware 16 X 20'1 3785 Bu	1
226249	Shield Interior Grain (16)	1
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999801	Kit Bolt&nut 100 @ 3/4 Dt1500	3
214212	Kit Remote Control Cap Assy	1
995041M	Ladder Section 45 Red	1
995043M	Ladder Section 90 Yellow	2



## Model 19 – Flat Bottom

### Panel Lay-out

Ring		210730 19'x16'-4" (4,600bu)			210732 19'x20'-1" (5,540bu)			210734 19'x23'-10" (6,482bu)		
		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
7	A							217284C	20	7
	C							217284CDM	20	1
6	A				217284C	20	7	217086	18	8
	C				217284CDM	20	1			
5	A	217284C	20	7	217086	18	8	217088	16	8
	C	217284CDM	20	1						
4	A	217086	18	8	217088	16	8	217088	16	8
3	A	217088	16	8	217088	16	8	217090	14	8
2	A	217088	16	7	217090	14	7	217090	14	7
	D	218046	14	1	218046	14	1	218046	14	1
1	A	217118	12	8	217118	12	8	217118	12	8



Note: Bottom Ring Is #1.

Panel "C" Replaces a Panel "A" in layout.

Panel "D" is the door-panel.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

## Packing Lists

210730 – Tank 19'x16'-4" (4,600bu)		
Part #	Description	Qty.
217970	Panel Roof Std 19' – Red	32
217496	Base Ring M19 10GA Red	8
216199	Stiffener Roof M-19'	2
210730PK	Panel Pkg Tank Hu 19x16 4600 Bu	1
215333	Frame C/W Doors 16-22-27(Rect)	1
219760	Kit Door Rect Behlen(12-27)	1
3209015	Kit Sealer 150' (5 Rls)	1
219733	Kit Roof Safety Rung M-19'(32)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
210730K	Kit Hardware 19 X 16'4 4600 Bu	1
226249	Shield Interior Grain (16)	1
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999805	Kit Bolt&nut 500 @ 3/4 Dt1500	1
999801	Kit Bolt&nut 100 @ 3/4 Dt1500	3
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2

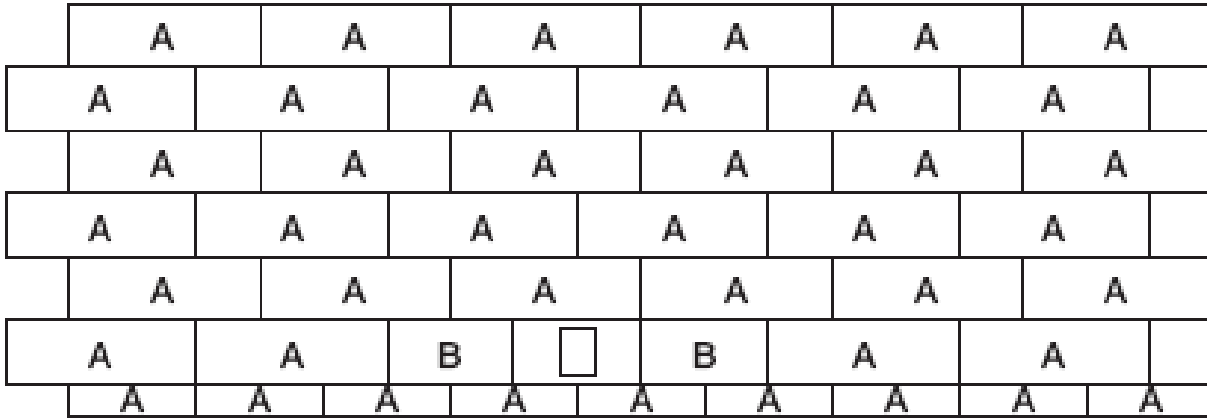
210732 – Tank 19'x20'-1" (5,540bu)		
Part #	Description	Qty.
217970	Panel Roof Std 19' - Red	32
217496	Base Ring M19 10GA Red	8
216199	Stiffener Roof M-19'	2
210732PK	Panel Pkg TankHu 19x20 5540 Bu	1
215333	Frame C/W Doors 16-22-27(Rect)	1
219760	Kit Door Rect Behlen(12-27)	1
3209016	Kit Sealer 180' (6 Rls)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999805	Kit Bolt&nut 500 @ 3/4 Dt1500	2
219733	Kit Roof Safety Rung M-19'(32)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
210732K	Kit Hardware 19 X 20'1 5540 Bu	1
226249	Shield Interior Grain (16)	1
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
214212	Kit Remote Control Cap Assy	1
995041M	Ladder Section 45 Red	1
995043M	Ladder Section 90 Yellow	2

<b>210734 – Tank 19'x23'-10" (6,482bu)</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217970	Panel Roof Std 19' - Red	32
217496	Base Ring M19 10GA Red	8
216199	Stiffener Roof M-19'	2
210734PK	Panel Pk TankHu 19x23 6482 Bu	1
215333	Frame C/W Doors 16-22-27(Rect)	1
219760	Kit Door Rect Behlen(12-27)	1
3209017	Kit Sealer 210' (7 Rls)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	4
219733	Kit Roof Safety Rung M-19'(32)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
210734K	Kit Hardware 19 X 23'10 6482 B	1
226249	Shield Interior Grain (16)	1
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	3

## Model 22 – Flat Bottom

### Panel Layout

		210744 22'x16'-4" (6,342bu)			210746 22'x20'-1" (7,553bu)			210748 22'x23'-10" (8,752bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
7	A							217286C	20	5
	C							217286CDM	20	1
6	A				217286C	20	5	217104	18	6
	C				217286CDM	20	1			
5	A	217286C	20	5	217104	18	6	217098	16	6
	C	217286CDM	20	1						
4	A	217104	18	6	217098	16	6	217098	16	6
3	A	217098	16	6	217098	16	6	217100	14	6
2	A	217100	14	4	217100	14	4	217100	14	4
	B	218072	14	2	218072	14	2	218072	14	2
	D	218046	14	1	218046	14	1	218046	14	1
1	A	217118	12	9	217118	12	9	217118	12	9



Note: Bottom Ring Is #1.

Panel "C" Replaces a Panel "A" in layout.

Panel "D" is the door-panel.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

**Packing Lists**

<b>210744 – Tank 22'x16'-4" (6,342bu)</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216279	Panel Roof Std 22' - Blue	36
215333	Frame C/W Doors 16-22-27(Rect)	1
216198	Stiffener Roof M22-27	2
210744PK	Panel Pk TankHU 22x16 6342 Bu	1
217185	Angle Base Ring H22 10GA Red	9
219760	Kit Door Rect Behlen(12-27)	1
3209015	Kit Sealer 150' (5 Rls)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999805	Kit Bolt&nut 500 @ 3/4 Dt1500	1
3209400	Kit Base Tape M-22' (84')	1
219734	Kit Roof Safety Rung M-22'(36)	1
218308	Frame In/Out Rect(B&w) 8GA Galv	1
210744K	Kit Hardware 22 X 16'4 6342 Bu	1
217104	Panel Wall 11' 18 GA H22-27	6
226249	Shield Interior Grain (16)	1
995032M	Ladder Roof Safety 22' Orange	1
999032	Kit Ladder Roof 22'	1
999812	Kit Bolt&nut 500@1-1/4 Dt1500	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2

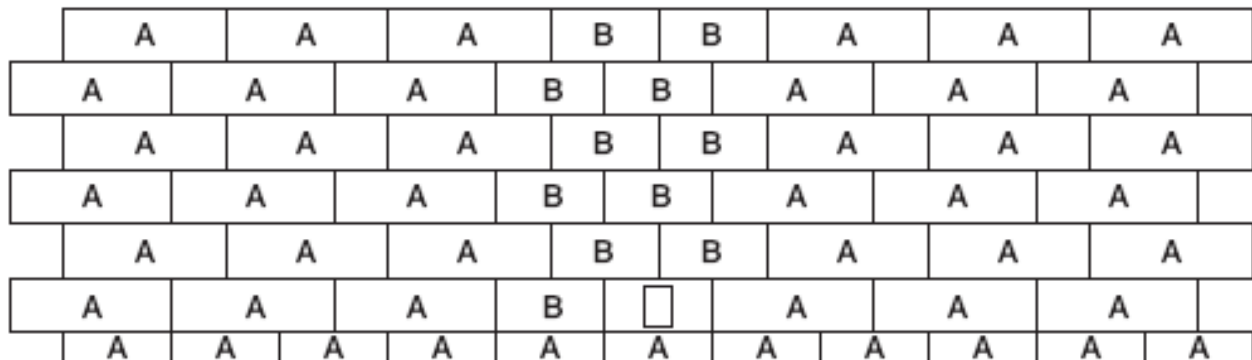
<b>210746 – Tank 22'x20'-1" (7,553bu)</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216279	Panel Roof Std 22' - Blue	36
215333	Frame C/W Doors 16-22-27(Rect)	1
216198	Stiffener Roof M22-27	2
210746PK	Panel Pkg TankHu 22x20 7553 Bu	1
217185	Angle Base Ring H22 10GA Red	9
219760	Kit Door Rect Behlen(12-27)	1
3209016	Kit Sealer 180' (6 Rls)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999805	Kit Bolt&nut 500 @ 3/4 Dt1500	2
999812	Kit Bolt&nut 500@1-1/4 Dt1500	
3209400	Kit Base Tape M-22' (84')	1
219734	Kit Roof Safety Rung M-22'(36)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
210746K	Kit Hardware 22 X 20'1 7553 Bu	1
226249	Shield Interior Grain (16)	1
999032	Kit Ladder Roof 22'	1
214212	Kit Remote Control Cap Assy	1
995032M	Ladder Roof Safety 22' Orange	1
995041M	Ladder Section 45 Red	1
995043M	Ladder Section 90 Yellow	2

<b>210748 – Tank 22'x23'-10" (8,752bu)</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216279	Panel Roof Std 22' - Blue	36
215333	Frame C/W Doors 16-22-27(Rect)	1
216198	Stiffener Roof M22-27	2
210748PK	Panel Pkg TankHu 22x23 8752 Bu	1
217185	Angle Base Ring H22 10GA Red	9
219760	Kit Door Rect Behlen(12-27)	1
3209017	Kit Sealer 210' (7 Rls)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	4
999812	Kit Bolt&nut 500@1-1/4 Dt1500	1
3209400	Kit Base Tape M-22' (84')	1
219734	Kit Roof Safety Rung M-22'(36)	1
218308	Frame In/Out Rect(B&W) 8GA Galv	1
210748K	Kit Hardware 22 X 23'10 8752 B	1
226249	Shield Interior Grain (16)	1
995032M	Ladder Roof Safety 22' Orange	1
995043M	Ladder Section 90 Yellow	3
999032	Kit Ladder Roof 22'	1
214212	Kit Remote Control Cap Assy	1

## Model 27 – Flat Bottom

### Panel Layout

Ring		210772 27'x16'-4" (9,413bu)			210774 27'x20'-1" (11,119bu)			210776 27'x23'-10" (12,990bu)		
		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
7	A							217286C	20	5
	B							218066C	20	2
	C							217286CDM	20	1
6	A				217286C	20	5	217104	18	6
	B				218066C	20	2	218068	18	2
	C				217286CDM	20	1			
5	A	217286C	20	5	217104	18	6	217106	16	6
	B	218066C	20	2	218068	18	2	218074	16	2
	C	217286CDM	20	1						
4	A	217104	18	6	217106	16	6	217108	14	6
	B	218068	18	2	218074	16	2	218076	14	2
3	A	217106	16	6	217108	14	6	217108	14	6
	B	218074	16	2	218076	14	2	218076	14	2
2	A	217108	14	6	217108	14	6	217110	12	6
	B	218076	14	1	218076	14	1	218078	12	1
	D	218046	14	1	218046	14	1	218048	12	1
1	A	217118	12	11	217118	12	11	217118	12	11



Note: Bottom Ring Is #1.

Panel "C" Replaces a Panel "A" in layout.

Panel "D" is the door-panel.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

## Packing Lists

210772 – Tank 27'x16'-4" (9,413bu)		
Part #	Description	Qty.
216981	Panel Roof Std 27' - Black	44
215333	Frame C/W Doors 16-22-27(Rect)	1
210772PK	Panel Pkg TankHU 22x16 9413 Bu	1
217186	Angle Base Ring H27 10GA Red	11
217208	Base Splice Ring M27	11
219760	Kit Door Rect Behlen(12-27)	1
219860	Kit Bag Door Rect Hdw 12-16 *	1
3209016	Kit Sealer 180' (6 Rls)	1
995053	Tube Caulking 10-23 (C)	14
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999805	Kit Bolt&nut 500 @ 3/4 Dt1500	2
999801	Kit Bolt&nut 100 @ 3/4 Dt1500	1
999811	Kit Bolt&nut 100@1-1/4 Dt1500	1
999812	Kit Bolt&nut 500@1-1/4 Dt1500	1
216198	Stiffener Roof M22-27	2
216531	Ring Roof M27 (Deep Rib) Black	1
219740	Kit Roof Behlen(12-16-19-22-27)	1
219735	Kit Roof Safety Rung M-27'(44)	1
218308	Frame In/Out Rect(B&w)8GA Galv	1
3209450	Kit Base Tape M-27' (84')	1
226249	Shield Interior Grain (16)	1
995033M	Ladder Roof Safety 27' Brown	1
999033	Kit Ladder Roof 27'	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2

210774 – Tank 27'x20'-1" (11,119bu)		
Part #	Description	Qty.
216981	Panel Roof Std 27' - Black	44
215333	Frame C/W Doors 16-22-27(Rect)	1
210774PK	Panel Pk Tank HU 27x20 11199 Bu	1
217186	Angle Base Ring H27 10GA Red	11
219760	Kit Door Rect Behlen(12-27)	1
3209017	Kit Sealer 210' (7 Rls)	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	4
216198	Stiffener Roof M22-27	2
219735	Kit Roof Safety Rung M-27'(44)	1
218308	Frame In/Out Rect (B&w) 8GA Galv	1
210774K	Kit Hardware 27 X 20'-1 11199	1
3209450	Kit Base Tape M-27' (84')	1
226249	Shield Interior Grain (16)	1
995033M	Ladder Roof Safety 27' Brown	1
999033	Kit Ladder Roof 27'	1
999812	Kit Bolt&nut 500@1-1/4 Dt1500	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2
995041M	Ladder Section 45 Red	1



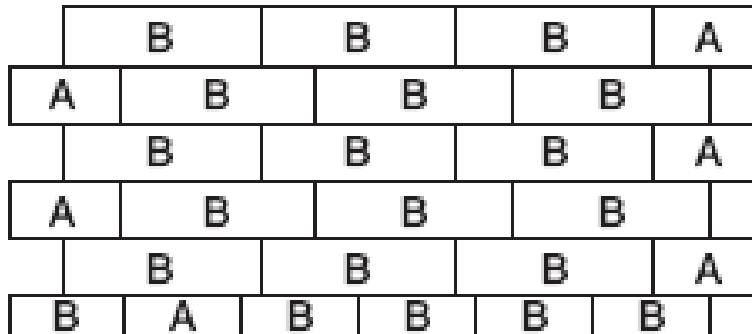
<b>210776 – Tank 27'x23'-10" (12,990bu)</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216981	Panel Roof Std 27' - Black	44
215333	Frame C/W Doors 16-22-27(Rect)	1
210776PK	Panel Pk TankHU 27x23 12990 Bu	1
217186	Angle Base Ring H27 10GA Red	11
216198	Stiffener Roof M22-27	2
218308	Frame In/Out Rect(B&w)8GA Galv	1
210776K	Kit Hardware 27 X 23'10 12990	1
226249	Shield Interior Grain (16)	1
219760	Kit Door Rect Behlen(12-27)	1
996403	Ladder Rail Wall 90	6
996416	Ladder Rail 27'	4
996417	Rung Brace 27'	2

# HOPPER BOTTOM MODELS

## Model 14 – Hopper Bottom

### Panel Layout

		210710H 14'x12'-7" (1,874bu)			210712H 14'x16'-4" (2,361bu)			210714H 14'x20'-1" (2,848bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
6	A									
	B							217341	20	3
	C							217340DM	20	1
5	A							217340	20	1
	B				217341	20	3	217341	20	3
	C				217340DM	20	1			
4	A				217340	20	1	217342	18	1
	B	217341	20	3	217341	20	3	217343	18	3
	C	217340DM	20	1						
3	A	217340	20	1	217342	18	2	217344	16	1
	B	217341	20	3	217343	18	3	217345	16	3
2	A	217342	18	1	217344	16	1	217346	14	1
	B	217343	18	3	217345	16	3	217347	14	3
1	A	217348	12	5	217348	12	5	217348	12	5
	B	217349	12	1	217349	12	1	317349	12	1



Note: Bottom Ring Is #1.

Panel "C" Replaces a panel "A" in layout.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

**Packing Lists**

<b>210710H – Tank HU 14x12 (1,874bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217960	Panel Roof Std 14' - Green	23
210710HPK	Panel Pkg Tank Hu 14x12	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
210710-HK	Kit Hardware 14'x 12' 7 Ho/Mt	1
219731	Kit Roof Safety Rung M-14'(24)	1
995030M	Ladder Roof Safety 12'/14'	1
999030	Kit Ladder Roof 12/14	1
214212	Kit Remote Control Cap Assy	1
995041M	Ladder Section 45 Red	1
995043M	Ladder Section 90 Yellow	1

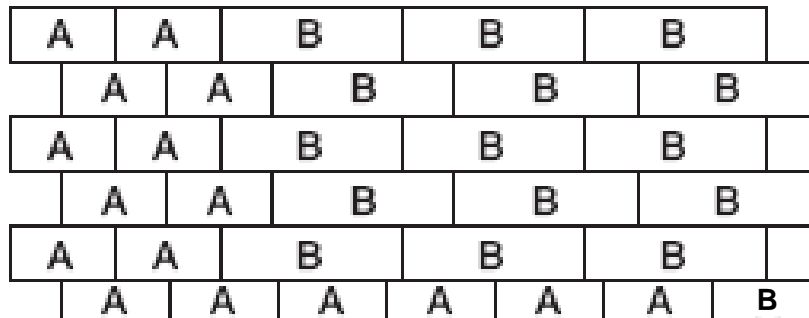
<b>210712H – Tank HU 14x16 (2,361bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217960	Panel Roof Std 14' - Green	23
210712HPK	Panel Pkg Tank Hu 14x16	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
210712-HK	Kit Hardware 14'x 16' 4 Ho/Mt	1
219731	Kit Roof Safety Rung M-14'(24)	1
995030M	Ladder Roof Safety 12'/14'	1
999030	Kit Ladder Roof 12/14	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2

<b>210714H – Tank HU 14x20 (2,848bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217960	Panel Roof Std 14' – Green	23
210714HPK	Panel Pkg Tank Hu 14x20	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999801	Kit Bolt&nut 100 @ 3/4 Dt1500	3
210714-HK	Kit Hardware 14'x 20' 1 Ho/Mt	1
219731	Kit Roof Safety Rung M-14'(24)	1
995030M	Ladder Roof Safety 12'/14'	1
999030	Kit Ladder Roof 12/14	1
214212	Kit Remote Control Cap Assy	1
995041M	Ladder Section 45 Red	1
995043M	Ladder Section 90 Yellow	2

## Model 16 – Hopper Bottom

### Panel Layout

		210720H 16'x12'-7" (2,537bu)			210722H 16'x16'-4" (3,163bu)			210724H 16'x20'-1" (3,785bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
6	A							217284C	20	1
	B							217285C	20	3
	C							217284CDM	20	1
5	A				217084C	20	1	217086	18	2
	B				217085C	20	3	217087	18	3
	C				217284CDM	20	1			
4	A	217284C	20	1	217086	18	2	217086	18	2
	B	217285C	20	3	217087	18	3	217087	18	3
	C	217284CDM	20	1						
3	A	217086	18	2	217086	18	2	217088	16	2
	B	217087	18	3	217087	18	3	217089	16	3
2	A	217086	18	2	217088	16	2	217090	14	2
	B	217087	18	3	217089	16	3	217091	14	3
1	A	217114	12	6	217114	12	6	217114	12	6
	B	217116	12	1	217116	12	1	217116	12	1



Note: Bottom Ring Is #1.

Panel "C" Replaces a panel "A" in layout.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

**Packing Lists**

<b>210720H – Tank HU 16x12 (2,537bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216519	Panel Roof Std 16' - Yellow	26
210720HPK	Panel Pkg Tank HU 16x12	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
210720-HK	Kit Hardware 16 X 12' 7 Hop/Mt	1
219732	Kit Roof Safety Rung M-16'(26)	1
3209010	Sealer 1/4 X 1/4 (30' Roll)	4
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
214212	Kit Remote Control Cap Assy	1
995041M	Ladder Section 45 Red	1
995043M	Ladder Section 90 Yellow	1

<b>210722H – Tank HU 16x16 (3,163bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216519	Panel Roof Std 16' - Yellow	26
210722HPK	Panel Pkg Tank HU 16x16	1
210722-HK	Kit Hardware 16x16 Hop/Mt	1
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

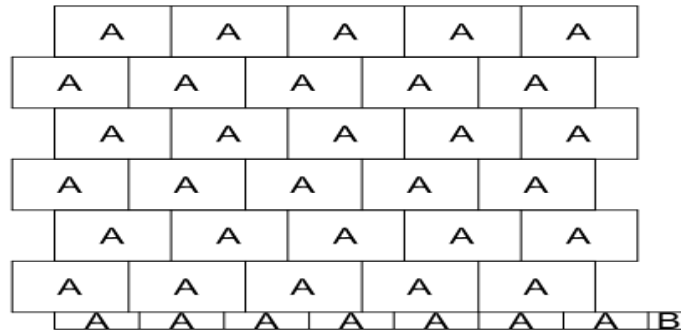
<b>210724H – Tank HU 16x20 (3,785bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216519	Panel Roof Std 16' - Yellow	26
210724HPK	Panel Pkg Tank Hu 16x20	1
210724-HK	Kit Hardware 16 X 20'1 Hop/Mt	1
996401	Ladder Rail Wall 45	2
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

# Model 18 – Hopper Bottom

## Panel Layout

		210708H 18'x16'-4" (3,896bu)			210718H 18'x18'-9" (4,400bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.
5	A	217285C	20	4	217285C	20	4
	C	217285CDM	20	1	217285CDM	20	1
4	A	217087	18	5	217087	18	5
3	A	217089	16	5	217089	16	5
2	A	217089	16	5	217089	16	5
1	A	217118	12	7	217093	12	5
	B	217116	12	1			

		210728H 18'x20'-1" (4,688bu)			210738H 18'x23'-10" (5,479bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.
7	A				217285C	20	4
	C				217285CDM	20	1
6	A	217285C	20	4	217087	18	5
	C	217285CDM	20	1			
5	A	217087	18	5	217089	16	5
4	A	217089	16	5	217089	16	5
3	A	217089	16	5	217091	14	5
2	A	217091	14	5	217091	14	5
1	A	217118	12	7	217118	12	7
	B	127116	12	1	217116	12	1



Note: Bottom Ring Is #1.

Panel "C" Replaces a panel "A" in layout.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

**Packing Lists**

<b>210708H – Tank HU 18x16'-4" (3,896bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217980	Panel Roof Std 18' - Brown	30
210708HPK	Panel Pkg Tank Hu 18x16	1
999812	Kit Bolt&nut 500@1-1/4 Dt1500	1
999870	Kit Bolt&nut 750 @ 3/4dt1500	2
999801	Kit Bolt&nut 100 @ 3/4 Dt1500	1
210708-HK	Kit Hardware 18'x16' 4 Hop/Mt	1
219733	Kit Roof Safety Rung M-19'(32)	1
995031M	Ladder Roof Safety 16'/19'	1
999031	Kit Ladder Roof 16/19	1
214212	Kit Remote Control Cap Assy	1
995043M	Ladder Section 90 Yellow	2

<b>210718H – Tank HU 18x18'-9" (4,400bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
210718HPK	Panel Pkg Tank Hu 18x19	1
210718-HK	Kit Hardware 18'x 18'-9 Hop/Mt	1
217980	Panel Roof Std 18' - Brown	30
996401	Ladder Rail Wall 45	2
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

<b>210728H – Tank HU 18x20'-1" (4,688bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217980	Panel Roof Std 18' - Brown	30
210728HPK	Panel Pkg Tank HU 18x20	1
210728-HK	Kit Hardware 18'x20'-1 Hop/Mt	1
996401	Ladder Rail Wall 45	2
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

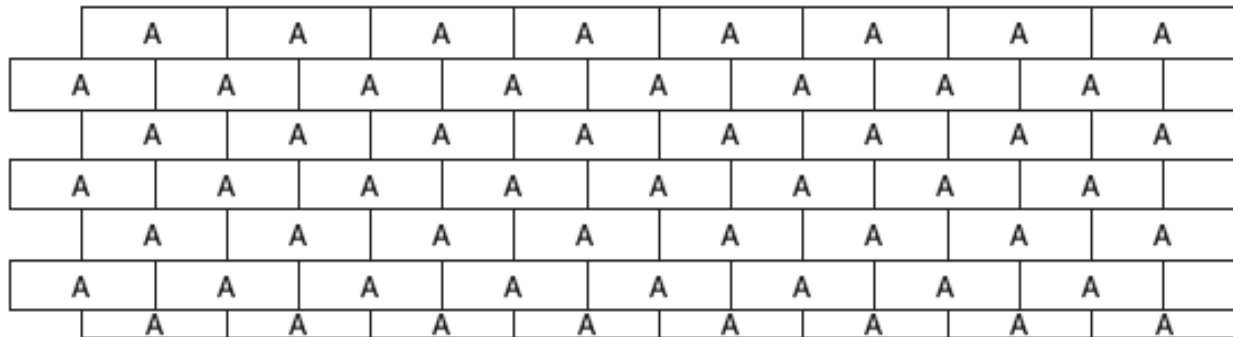
<b>210738H – Tank HU 18x23'-10" (5,479bu) Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217980	Panel Roof Std 18' - Brown	30
210738HPK	Panel Pkg Tank HU 18x24	1
210738-HK	Kit Hardware 18'x 23'-10 Ho/Mt	1
996401	Ladder Rail Wall 45	2
996402	Ladder Rail Wall 60	2
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1



## Model 19 – Hopper Bottom

### Panel Layout

		210730H 19'x16'-4" (4,600bu)			210732H 19'x20'-1" (5,540bu)			210734H 19'x23'-10" (6,482bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
7	A							217284C	20	7
	C							217284CDM	20	1
6	A				217284C	20	7	217086	18	8
	C				217284CDM	20	1			
5	A	217284C	20	7	217086	18	8	217088	16	8
	C	217284CDM	20	1						
4	A	217086	18	8	217088	16	8	217088	16	8
3	A	217088	16	8	217088	16	8	217090	14	8
2	A	217088	16	8	217090	14	8	217096	12	8
1	A	217118	12	8	217118	12	8	217118	12	8



Note: Bottom Ring Is #1.

Panel "C" Replaces a panel "B" in layout.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.



**Packing Lists**

<b>210730H – Tank HU 19x16 4,600 bu. Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217970	Panel Roof Std 19' - Red	32
216199	Stiffener Roof M-19'	2
210730-HK	Kit Hardware 19 X 16'4 Hop/Mt	1
210730HPK	Panel Pkg Tank Hu 19 x 16	1
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

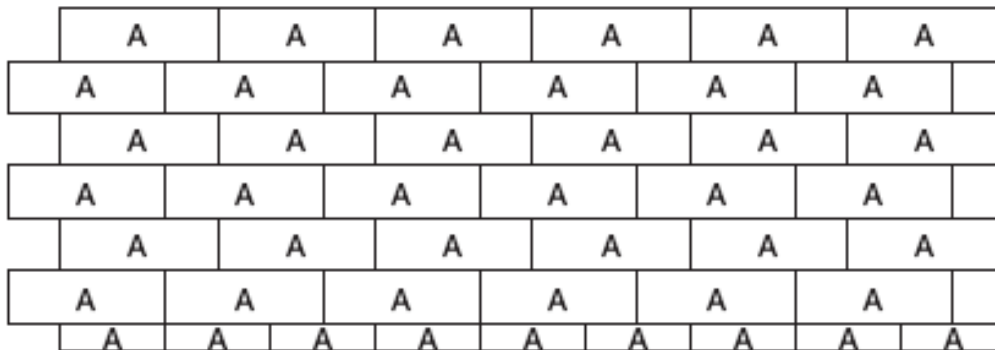
<b>210732H – Tank HU 19x20 5,540 bu. Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217970	Panel Roof Std 19' - Red	32
216199	Stiffener Roof M-19'	2
210732HPK	Panel Pkg Tank Hu 19x20	1
210732-HK	Kit Hardware 19 X 20'1 Hop/Mt	1
996401	Ladder Rail Wall 45	2
996403	Ladder Rail Wall 90	4
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

<b>210734H – Tank HU 19x23 6,482 bu. Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
217970	Panel Roof Std 19' – Red	32
216199	Stiffener Roof M-19'	2
210734HPK	Panel Pkg Tank HU 19x23	1
210734-HK	Kit Hardware 19 X 23'10 Hop/Mt	1
996403	Ladder Rail Wall 90	6
996411	Ladder Rail 16/19	2
996412	Rung Brace 16/19	1

## Model 22 – Hopper Bottom

### Panel Layout

		210744H 22'x16'-4" (6,342bu)			210746H 22'x20'-1" (7,553bu)			210748H 22'x23'-10" (8,752bu)		
Ring		Part	GA	Qty.	Part	GA	Qty.	Part	GA	Qty.
7	A							217286C	20	5
	A							217286CDM	20	1
6	A				217286C	20	5	217104	18	6
	C				217286CDM	20	1			
5	A	217286C	20	5	217104	18	6	217098	16	6
	C	217286CDM	20	1						
4	A	217104	18	6	217098	16	6	217100	14	6
3	A	217098	16	6	217100	14	6	217100	14	6
2	A	217100	14	6	217100	14	6	217110	12	6
1	A	217118	12	9	217118	12	9	217118	12	9



Note: Bottom Ring Is #1.

Panel "C" Replaces a panel "A" in layout.

Bushel capacities based on 1.25 cu. Ft. bushel. 5% allowance made for compaction.

**Packing Lists**

<b>210744H – Tank HU 22x16 6,342 bu. Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216198	Stiffener Roof M22-27	2
216279	Panel Roof Std 22' - Blue	36
210744HPK	Panel Pkg Tank HU 22x16	1
210744-HK	Kit Hardware 22 X 16'4 Hop/Mt	1
996403	Ladder Rail Wall 90	4
996413	Ladder Rail 22'	2
996414	Rung Brace 22'	1

<b>210746H – Tank HU 22x20 7,553 bu. Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216198	Stiffener Roof M22-27	2
216279	Panel Roof Std 22' - Blue	36
210746HPK	Panel Pkg Tank Hu 22x20	1
210746-HK	Kit Hardware 22'x 20' Hop/Mt	1
996401	Ladder Rail Wall 45	2
996403	Ladder Rail Wall 90	4
996413	Ladder Rail 22'	2
996414	Rung Brace 22'	1

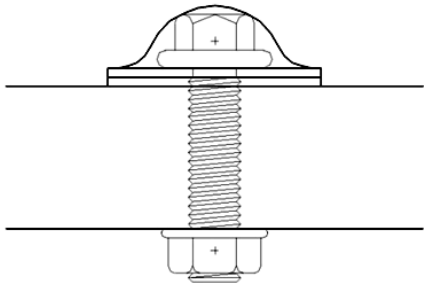
<b>210748H – Tank HU 22x23 8,752 bu. Hopper Bottom</b>		
<b>Part #</b>	<b>Description</b>	<b>Qty.</b>
216198	Stiffener Roof M22-27	2
216279	Panel Roof Std 22' - Blue	36
210748HPK	Panel Pkg Tank HU 22x23	1
210748-HK	Kit Hardware 22 X 23'10 Hop/Mt	1
996403	Ladder Rail Wall 90	6
996413	Ladder Rail 22'	2
996414	Rung Brace 22'	1

# LADDERS

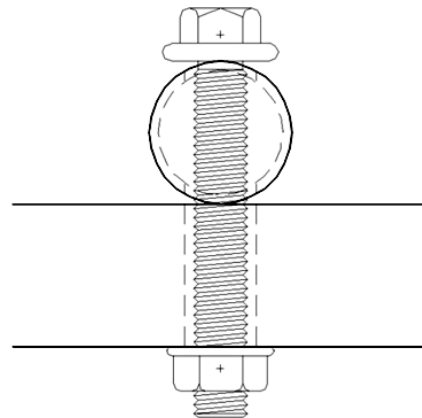
## Bolt Connection Details

Letters listed on the assembly drawings where 2 pieces join indicate the type of connection.

The connection types are illustrated below.



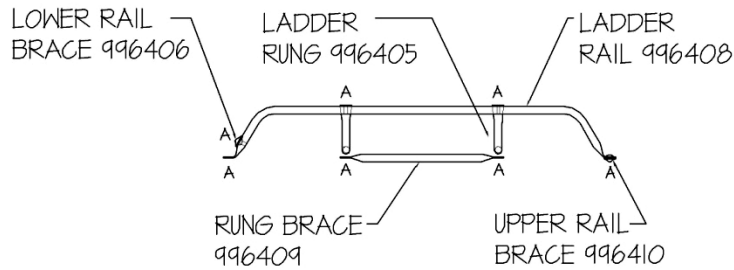
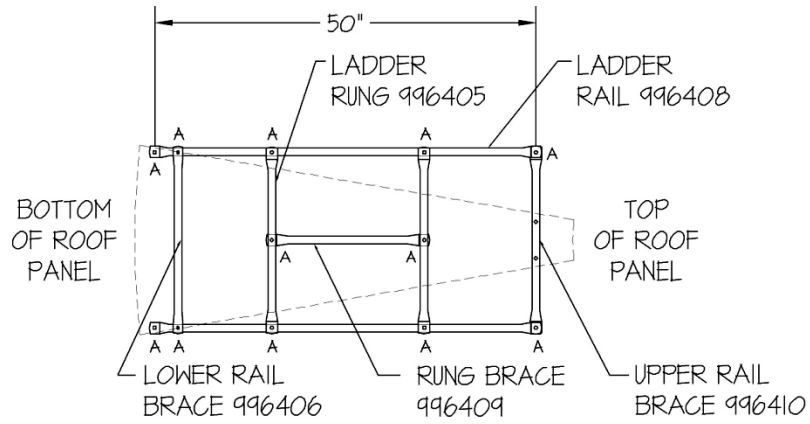
BOLT 3/8"x1 1/2"  
996006  
CONNECTION "A"



BOLT 3/8"x2 1/4"  
996008  
CONNECTION "B"

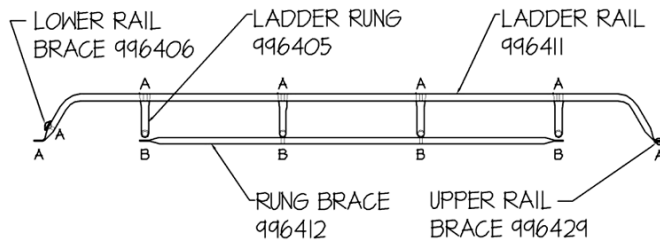
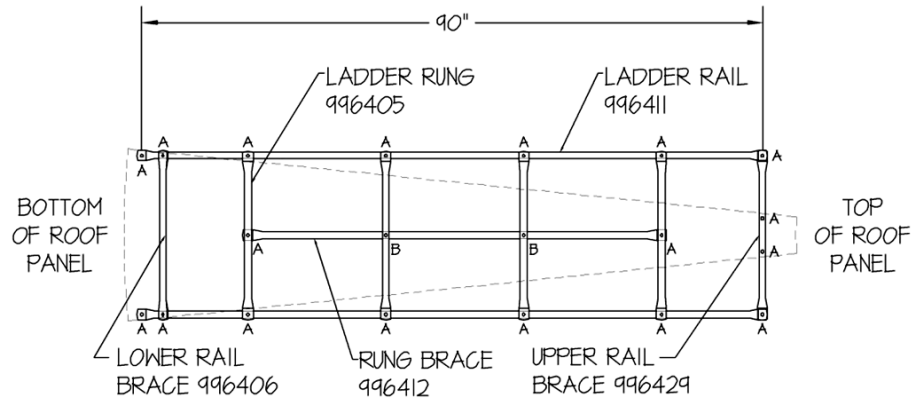
## 12' & 14' Roof Ladder Assembly

Part# 994030M



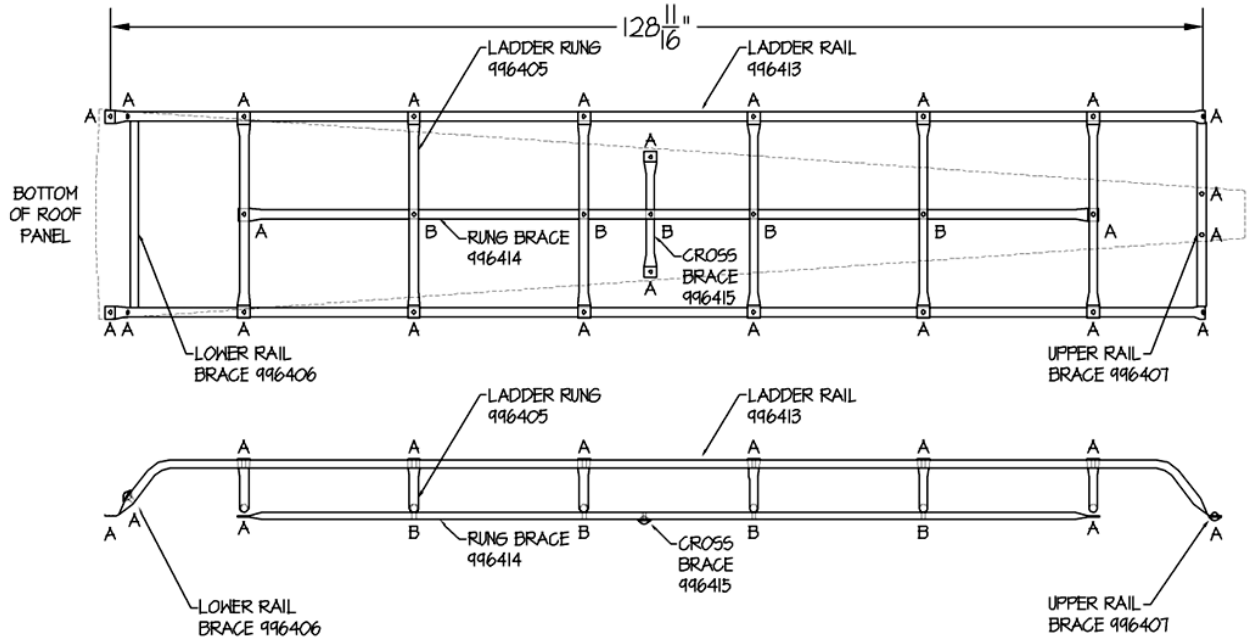
## 16' & 19' Roof Ladder Assembly

Part# 994031M



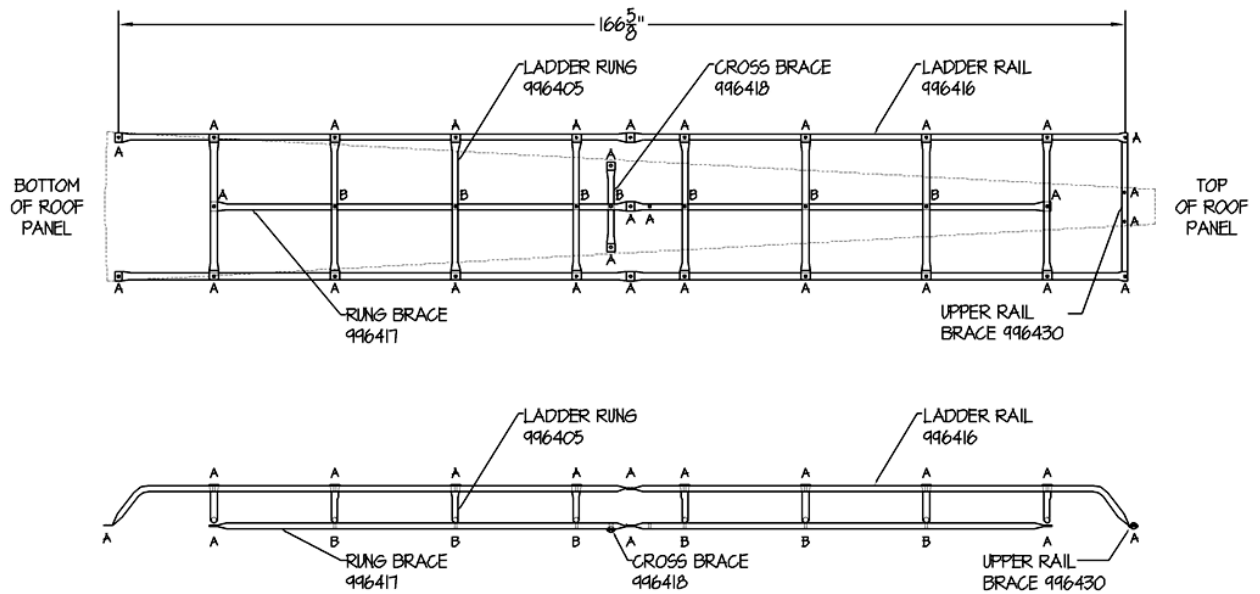
## 22' Roof Ladder Assembly

Part# 994032M



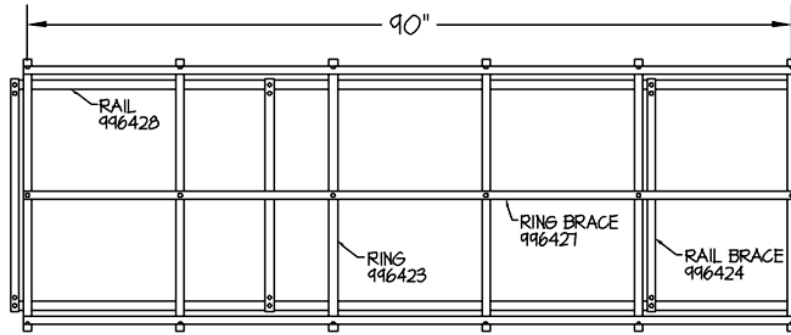
## 27' Roof Ladder Assembly

Part# 994033M

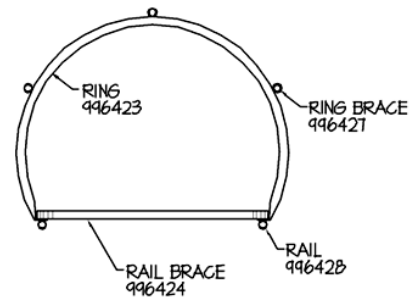
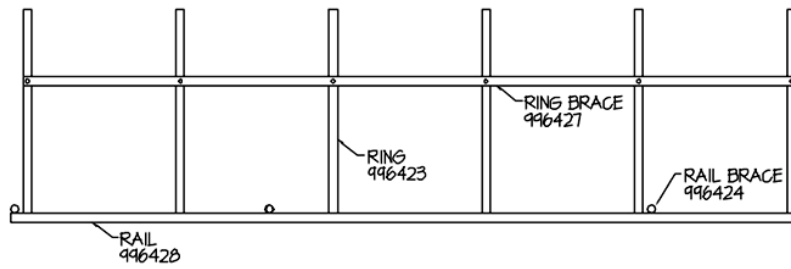


## 90" Upper/Middle Safety Cage Assembly

Part# 994035M

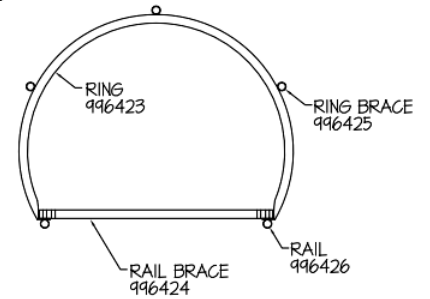
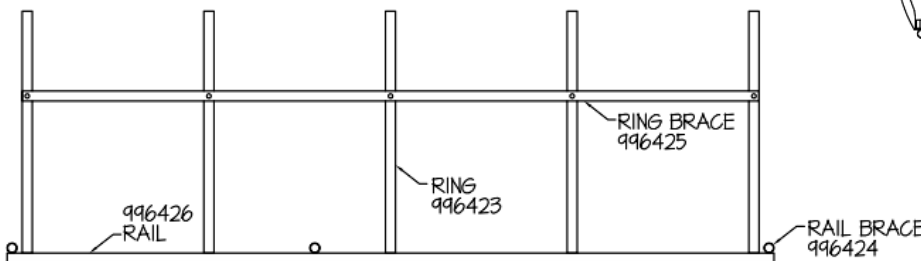
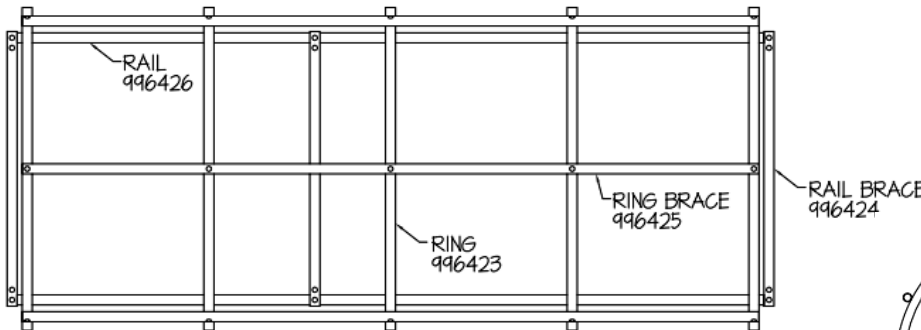


NOTE:  
ALL CONNECITONS ARE TYPE "B"



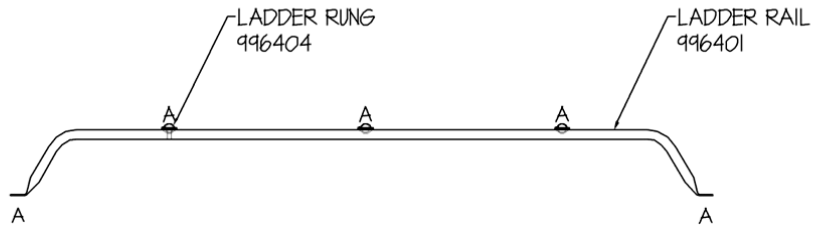
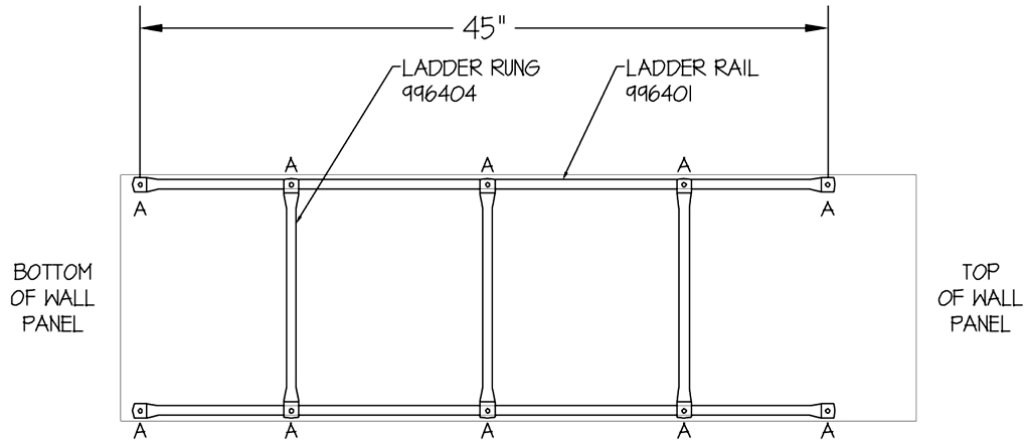
## 77" Lower Safety Cage Assembly

Part# 994036M



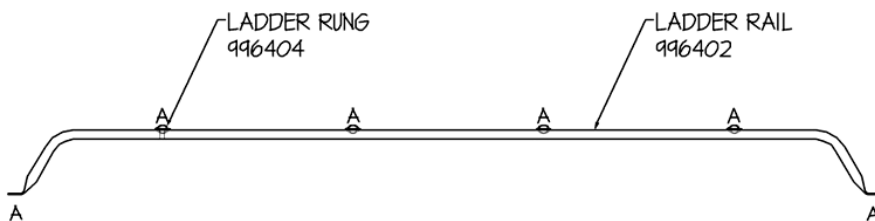
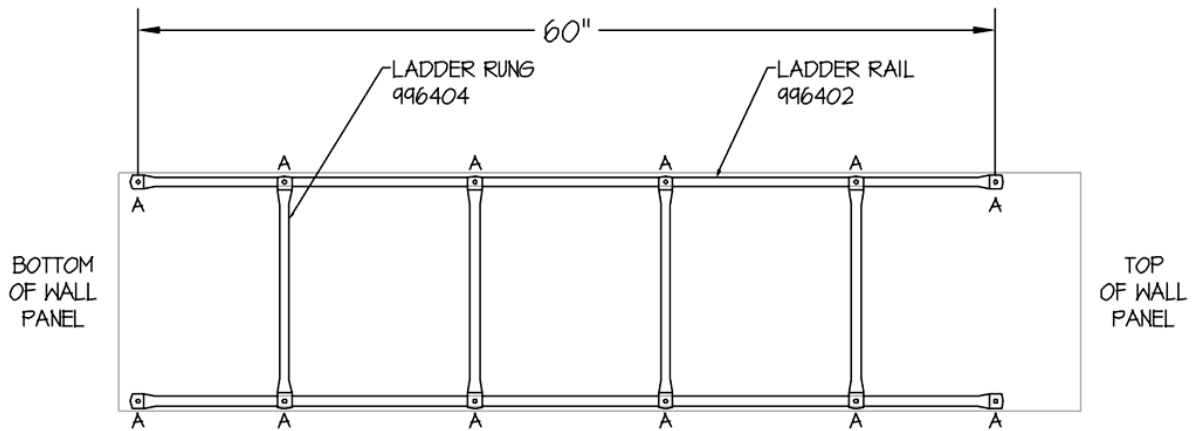
## 45" Ladder Assembly

Part# 995041M



## 60" Ladder Assembly

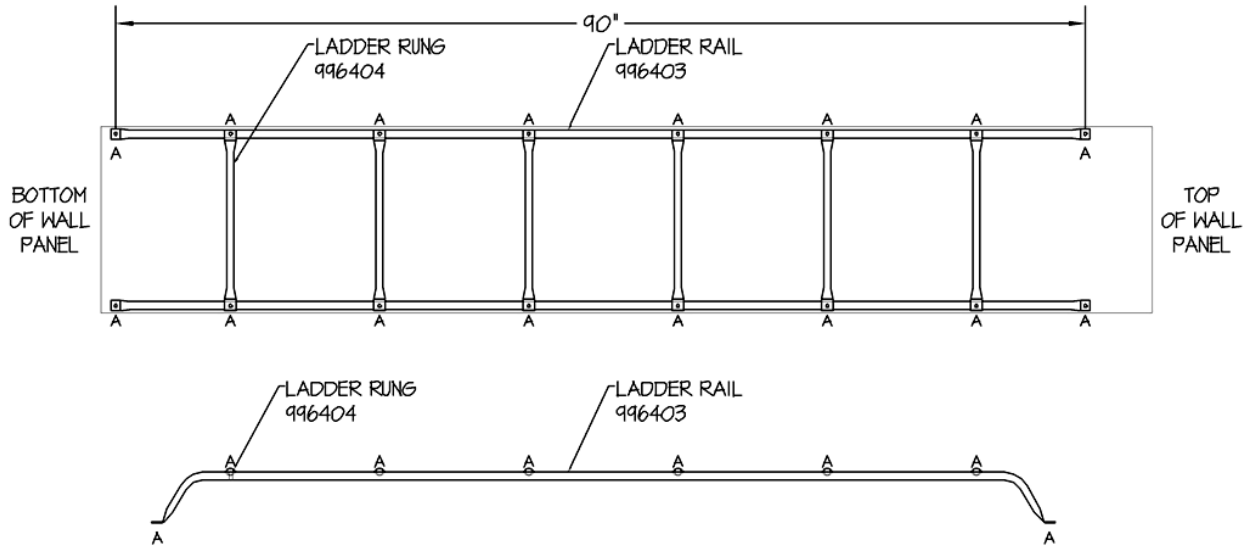
Part# 995042M





# 90" Ladder Assembly

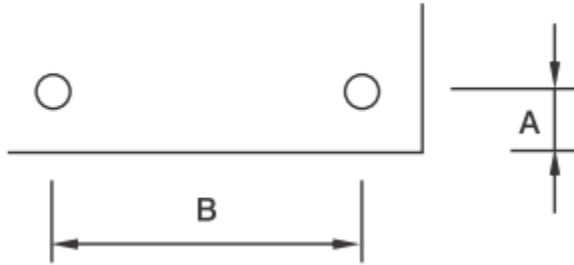
Part# 995043M



## HOPPER MOUNTING INFORMATION

The following information has been compiled to assist you in the manufacture of welded hopper cones for our various storage tanks.

The following diameters are taken from manufacturing drawings and indicate ideal situations. Because all bolt holes are 1/16" oversize, on a 16' dia. tank for example, with 156 bolts around the perimeter, stacking or spreading of wall sheets can affect the finish diameter.



Horizontal Tanks						
Tank Horizontal	Approximate Inside Diameter	Approximate Outside Diameter	"A"	"B"	Circumference	Bolts In Circumference
Model 12			3/4"	3.833"	460"	120
				3.833"	529"	138
Model 16	190 1/4"	190 3/4"	3/4"	3.833"	598"	156
Model 18	219 5/8"	220 1/8"	3/4"	3.833"	690"	180
Model 19	234 1/4"	234 3/4"	3/4"	3.833"	736"	192
Model 22	263 1/2"	264"	3/4"	3.833"	828"	216
Model 27	322 1/8"	322 5/8"	3/4"	3.833"	1012"	264
Model 35	410 1/4"	410 3/4"	3/4"	3.833"	1288"	336

Vertical Tanks					
Tank Vertical	Approximate Outside Diameter	"A"	"B"	Circumference	Bolts In Circumference
Model 12	146 3/8"	5/8"	3.833"	460"	120
Model 16	190 1/4"	5/8"	3.833"	598"	156
Model 22	263 7/16"	5/8"	3.833"	828"	216

On older vertical panel tanks without base rings, the bottom lip must be cut off and 7/16 dia. holes drilled at 3.833" o.c. around the perimeter, 5/8" from the bottom of the panel.

## WARRANTY

1. The manufacturer guarantees its products against any defects in materials or workmanship for a period of twelve (12) months from the date of purchase provided that the said products are set up according to its instructions and recommendations and provided- also that the said products are operated and used in proper conditions and according to its instructions and recommendations.
2. The manufacturer's responsibility and obligations under this warranty shall be limited to replacement of parts and shall not extend to parts, equipment or accessories that are component parts of manufacturer's products but that are manufactured by other manufacturers. Those manufacturers' warranty will apply to such parts, equipment or accessories.

Any parts set up by reason of the application of this warranty shall be amenable to the terms of this warranty except that the period of twelve (12) months applicable to such parts shall be peremptory and that upon termination of the said period, warranty shall be null and void, for any purpose whatsoever with respect to said parts or any parts substituted to it before the termination of the said period of twelve (12) months.

3. This warranty shall not extend to loss and damage to content of the products, neither to property or loss of revenue. Moreover it shall not extend to bodily injuries, including death, sustained by any person or animal.
4. The purchaser shall give notice to the manufacturer, without delay, of any damage or defects to products that he may ascertain before they be set up, otherwise this warranty will not apply to such damage or defects.
5. Any modification or incorporation whatsoever made to products, except those authorized or recommended by the manufacturer, shall void this warranty; this warranty shall not apply to damages resulting from improper installation or erection of products by purchaser.
6. This warranty is the sole and only warranty and it is in lieu of any other warranty, express or implied, statutory or not.
7. Any claim under this warranty shall be notified in writing to the manufacturer's head office within thirty (30) days from date of failure.

*Specifications and descriptions are subject to change without notice.*

Manufacturing Facility:  
BEHLEN Industries LP  
927 Douglas Street  
Brandon, Manitoba  
Canada R7A 7B3  
Phone: (204) 728-1188  
Fax: (204) 725-4932  
[www.meridianmfg.com](http://www.meridianmfg.com)

