

# **ASSEMBLY MANUAL FOR LADDERS, SAFETY CAGES, & PLATFORMS FOR THE FOLLOWING TANKS**

**2.66" INSIDE STIFFENED FLAT BOTTOM TANKS**

**2.66" OUTSIDE STIFFENED FLAT BOTTOM TANKS**

**4.00" INSIDE STIFFENED FLAT BOTTOM TANKS**

**4.00" OUTSIDE STIFFENED FLAT BOTTOM TANKS**

**2.66" COMMERCIAL HOPPER TANKS**

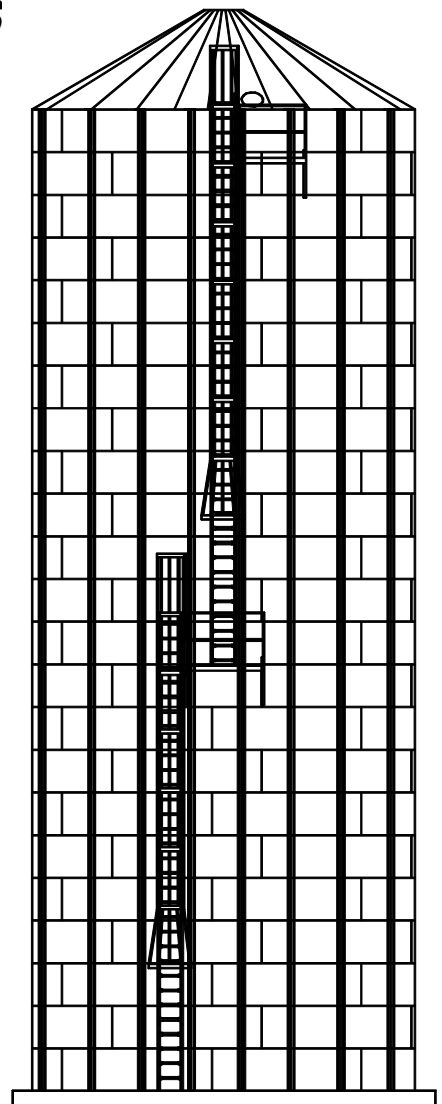
**4.00" FARM-COM HOPPER TANKS**

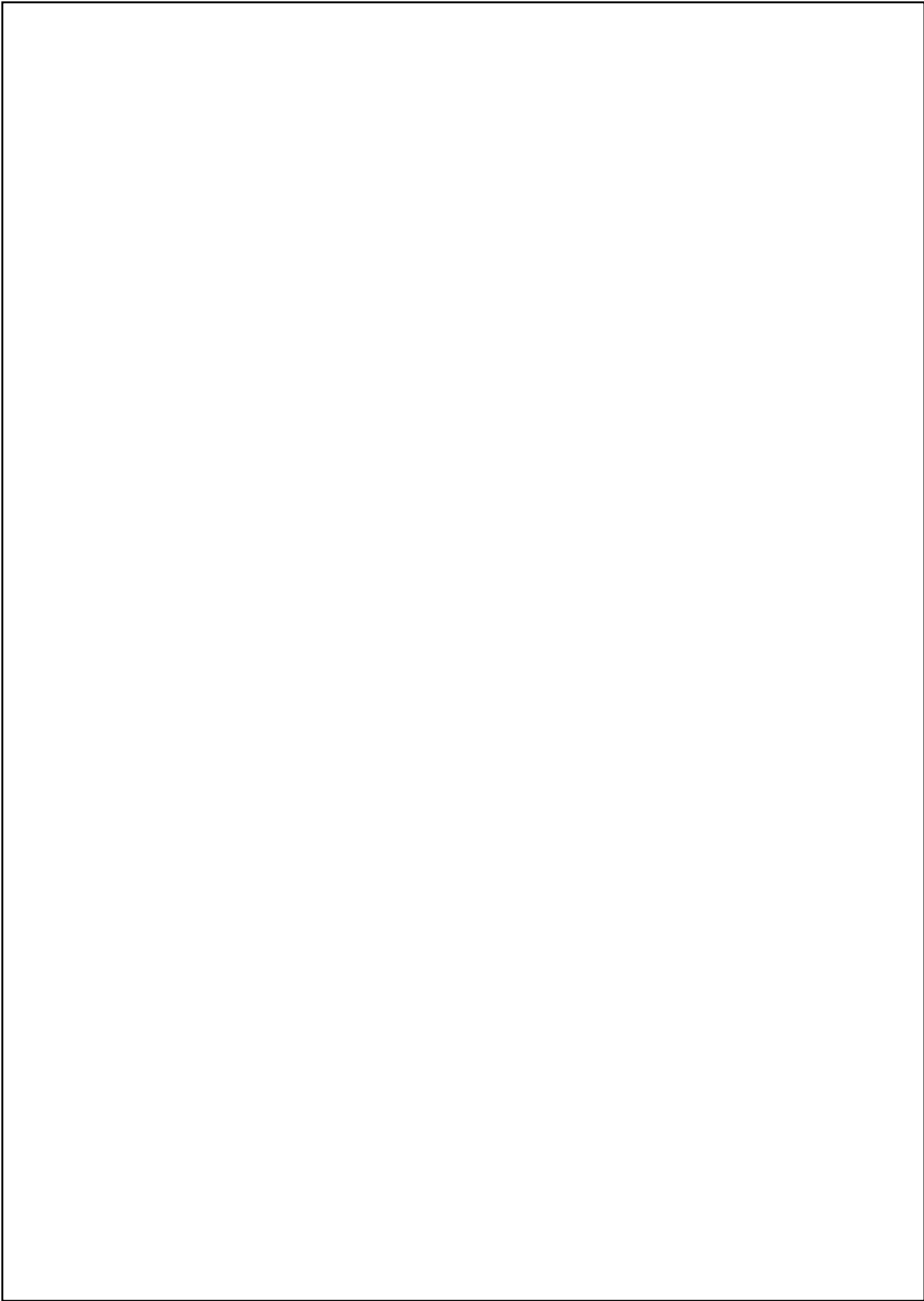
Owner's Manual

Manual# PNEG-384

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REVISED: 10/2000





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# Safety

## General Safety Statement

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

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

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

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

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.



### Safety Alert Symbol

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

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



## WARNING

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



## CAUTION

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

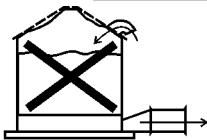
## CAUTION

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

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## Roof Damage Warning and Disclaimer

### CAUTION!



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

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

ATTENTION: The decal shown below should be present on the inside of the door cover of the two ring, 24" porthole door cover and the roof manway cover.

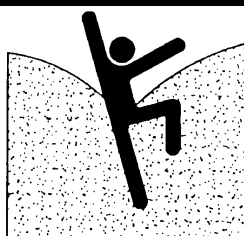
Grain Systems  
1004 East Illinois Street  
Assumption, Il. 62510-0020  
(217) 226-4421



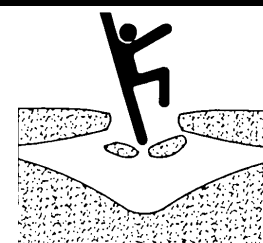
# DANGER



Rotating flighting can kill or dismember.



Flowing material can trap and suffocate.



Crusted material can collapse and suffocate.

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

If you must enter this bin:

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

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

DC-552



**THIS SECTION  
FOR 2.66"  
CORRUGATED  
GRAIN BINS  
  
INSIDE STIFFENED**

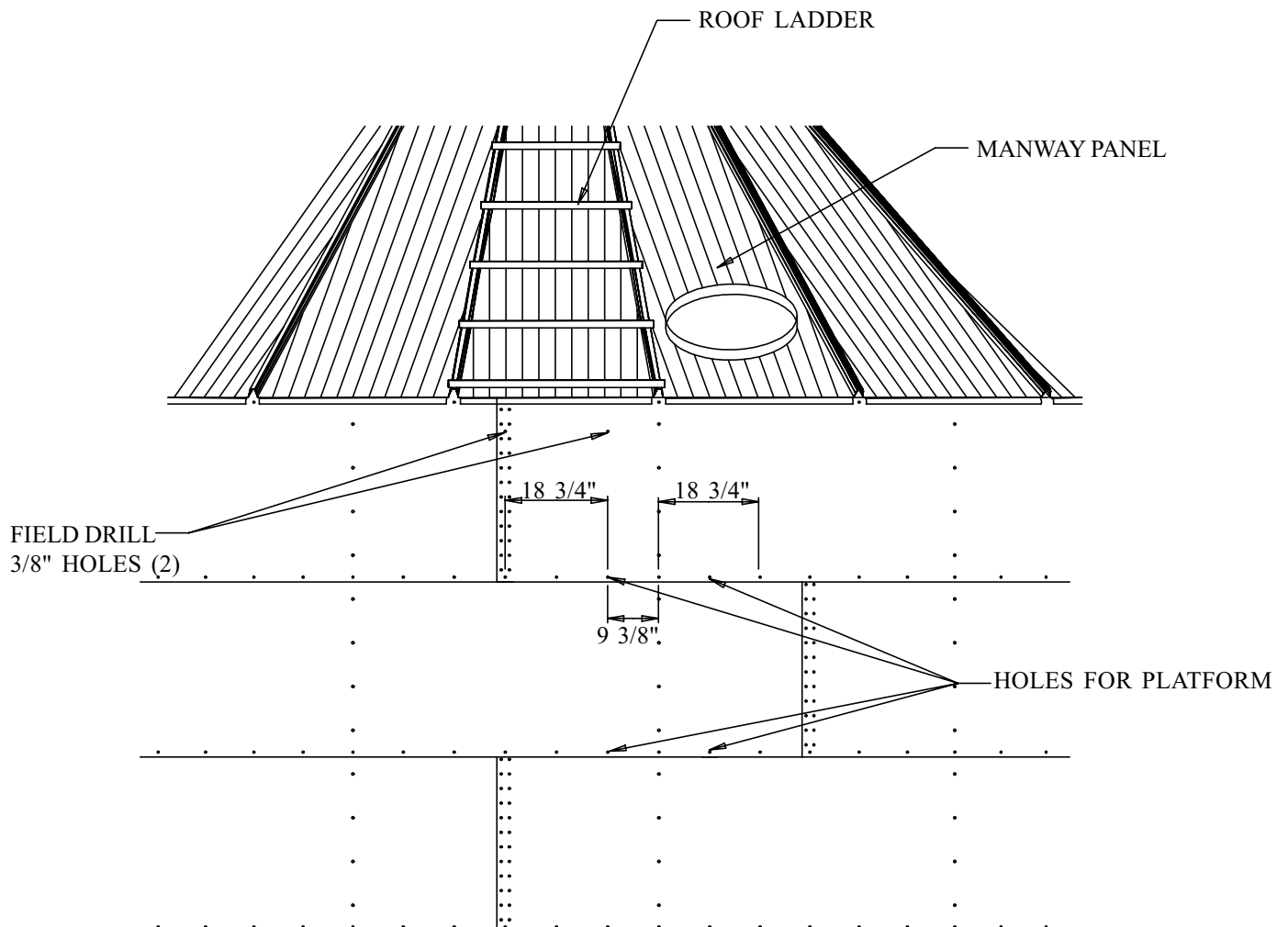


## LADDER SAFETY CAGE, AND PLATFORM INSTRUCTIONS

All packages have been structured with the correct components for each ring height grain bin from 6 rings to 34 rings. Be sure and follow the complete instruction sheets for correct placement of parts. Failure to do so may result in improper fit of parts or shortage of parts. Read through the complete set of instructions before proceeding with erection of grain bin. Considerable thought must be given as to location of ladders and platforms in relation to other equipment and structures.

### STARTING LOCATION OF LADDERS

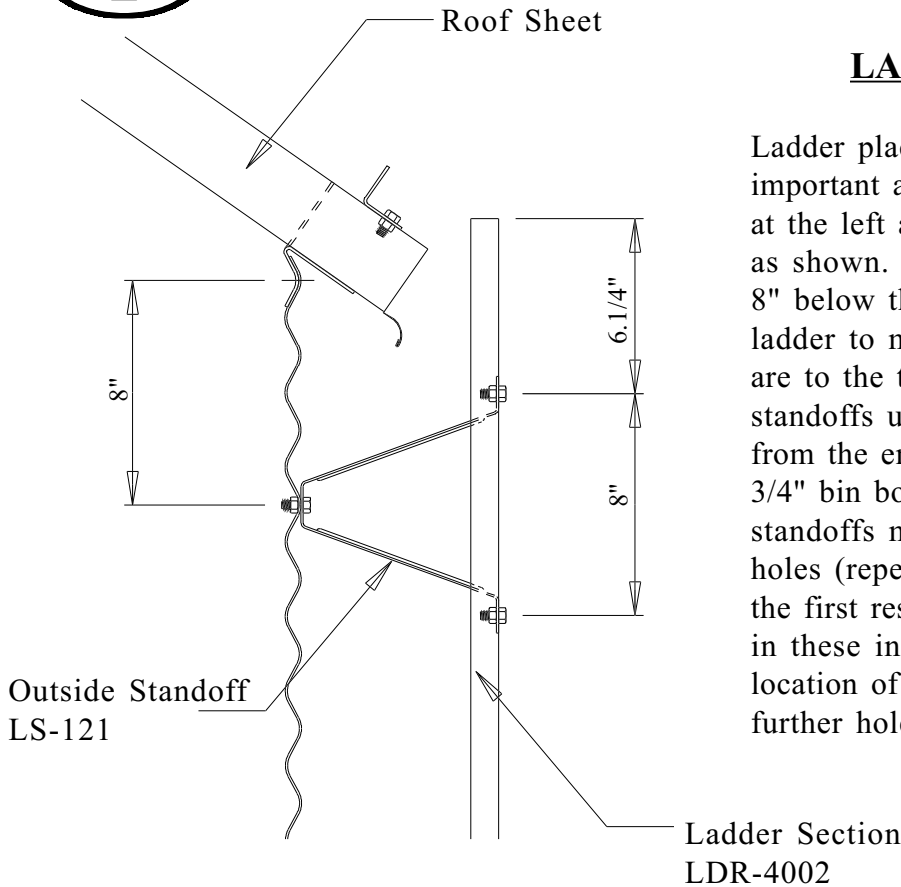
Ladder placement is very critical as to assure proper fit of all parts later on as safety cage is bolted in place. Locate the proper place for the roof ladder and manway this will establish the location of the ladder. Ladder must be centered directly below the roof ladder. Refer to the diagram below for proper location of field drilled holes ( $3/8$ ""). Holes must be  $18\ 3/4$ " apart and  $8$ " below the top horizontal row of holes directly in line with the holes to be used for the platform mounting angle. Platform must be located  $9\ 3/8$ " to the right of the ladder holes. All of these dimensions are very critical to assure proper fit of all parts!





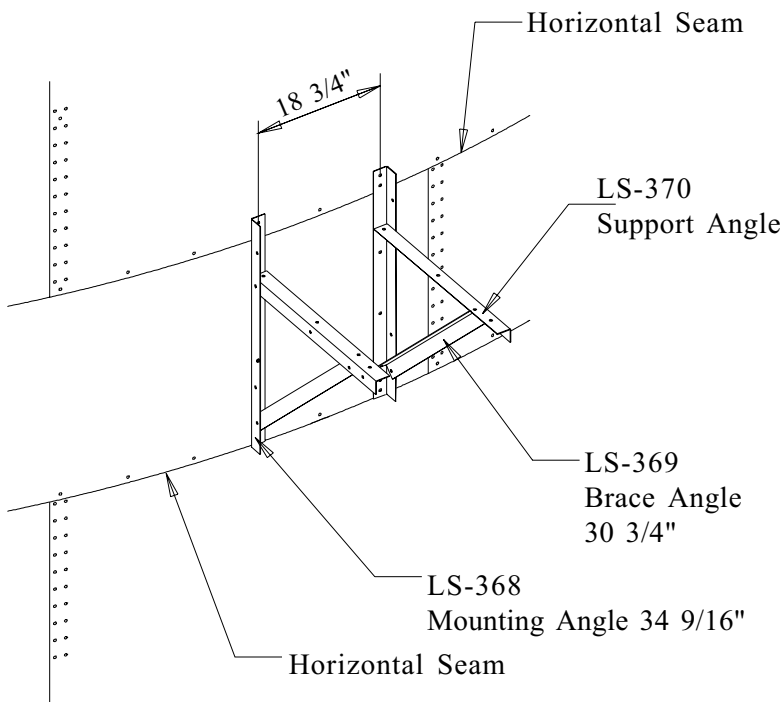
### LADDER PLACEMENT

Ladder placement on the grain bin is very important at this time. Refer to the diagram at the left and follow the correct dimensions as shown. Ladder standoff must be located 8" below the horizontal seam. Check your ladder to make sure the ladder rung dimples are to the top surface. Attach ladder to the standoffs using the holes located 6 1/4" from the end of ladder section. Use 5/16" x 3/4" bin bolts for these connections. Now all standoffs must be located in horizontal seam holes (repeating every 32") until reaching the first rest platform. Refer to the section in these instructions that references the location of intermediate rest platforms for further hole locations.

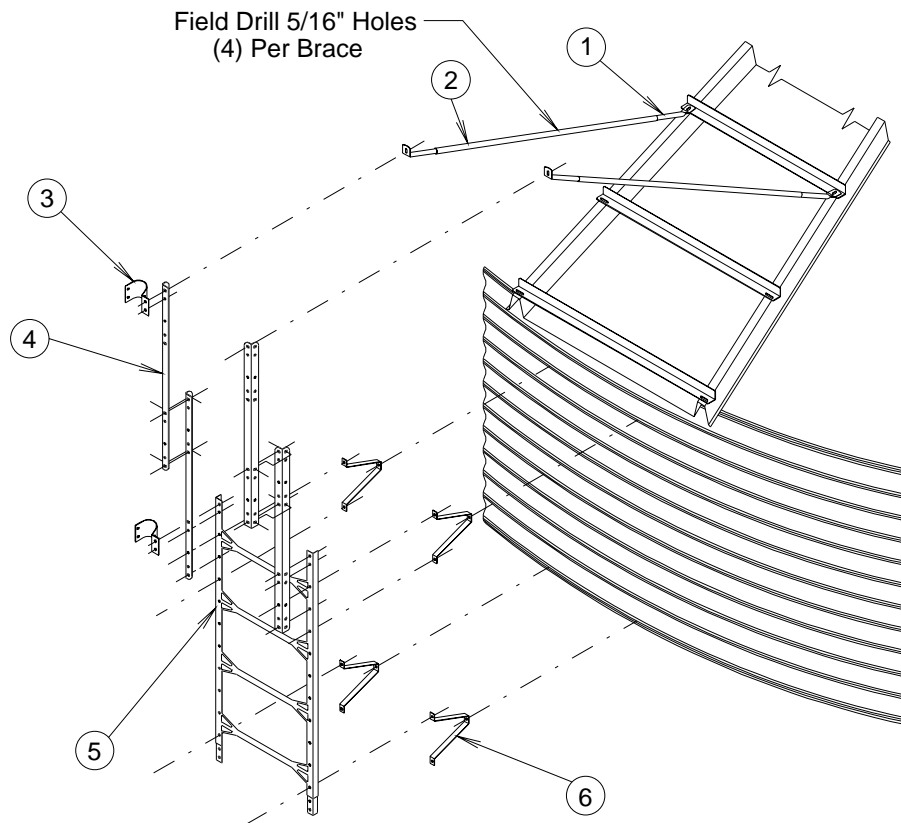


### PLATFORM SUPPORT ASSEMBLY

When starting the platform support, you must attach the mounting angle to the sidewall of the grain bin. Refer back to the first page for the correct holes to be used by the platform. Attach the angle using 5/16" x 3/4" bolts and nuts, tighten at this time. Next, bolt the support angle to the mounting angle again using the proper holes. Attach the brace angle to the mounting angle as shown in the diagram at left. Use 5/16" x 3/4" bolts and nuts for all connections.







Note: Reference previous page for the first ladder standoff starting location.

REF. NO.	DESCRIPTION	PART NO.
1	END TUBE	LS-6616
2	CENTER TUBE	LS-6615
3	SAFETY CAGE BRACKET	LS-4349
4	SAFETY CAGE EXT. RAIL	LS-4355
5	LADDER SECTION	LDR-4002
6	OUTSIDE STANDOFF	LS-121

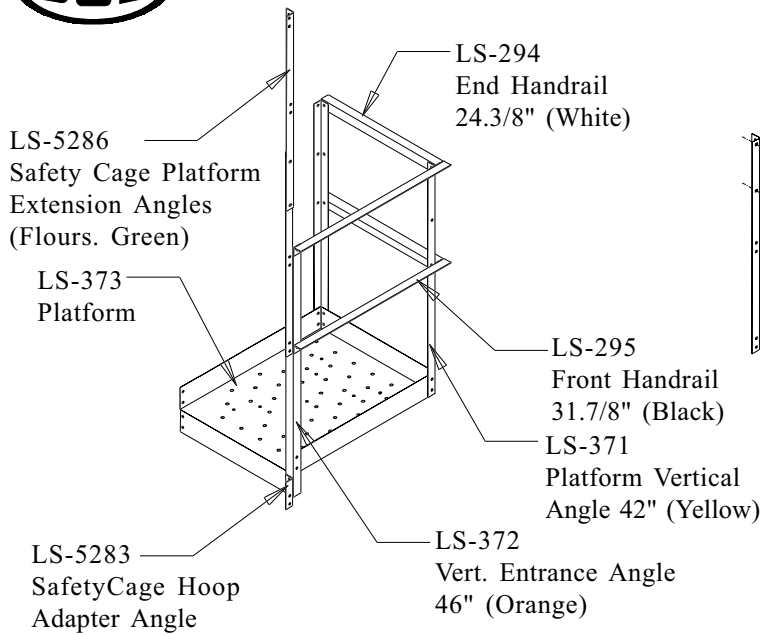
**EXTENSION RAILS**

Extension rails are provided to extend the side rails of the ladder above the eave of the roof and to support the safety cage at that point. Four rails have been provided, two for each side of the ladder. Refer to diagram above for proper location and assembly of the extension rails in relation to the ladder. Use 5/16" x 3/4" bolts and nuts to attach the ladder. Tighten the bolts at this time.

**EAVE ADJUSTABLE BRACES**

After extension rails are firmly attached, the adjustable braces must be attached at this time. A larger diameter tube and two smaller diameter tubes are used to make up one adjustable brace. Slip the smaller tubes inside the larger tube and attach one smaller tube to the top of the extension rail. Adjust the other smaller tube so the bottom of the flattened tube reaches the roof rib. Field drill four 5/16" holes through both large and small adjustable tubes and bolt together using 1/4" x 1.1/2" bolts and nuts. This will keep the adjustable brace from slipping.

Attach the safety cage brackets to the extension rail and ladder as shown in the diagram. Brackets must be placed every 44". This will occur at every ladder joint. Use 5/16" x 3/4" bolts and nuts.



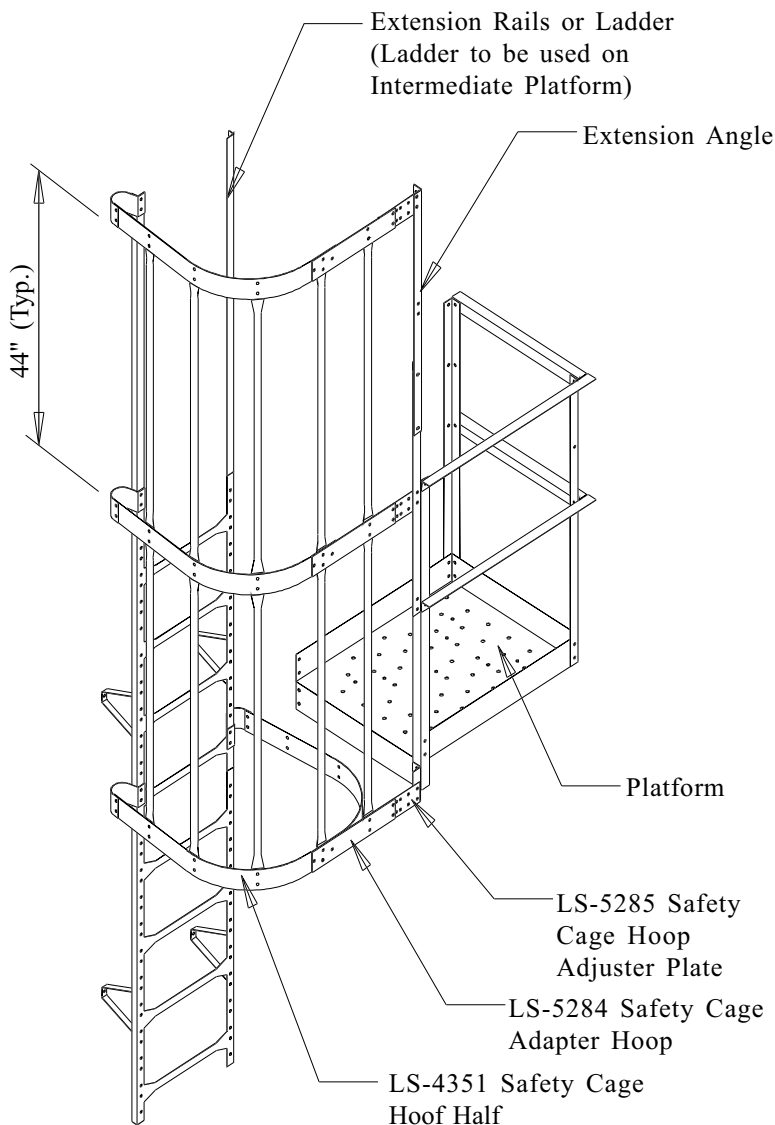
**EXTENSION ANGLE DETAIL**

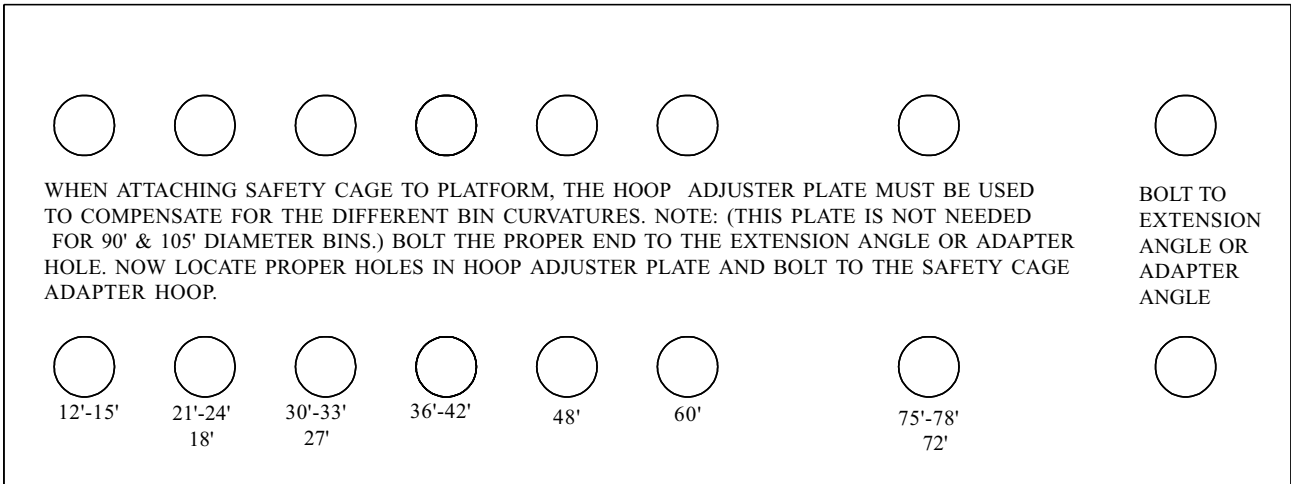
**PLATFORM AND HANDRAIL ASSEMBLY**

Start by attaching the platform itself to the platform support using 5/16" x 3/4" bolts and nuts. Place all the vertical angles in place, making sure to place the vertical entrance angle to the left front corner of the platform. After all vertical angles are in place attach front and side handrails as shown in the diagram. Use 5/16" x 3/4" bolts and nuts in all connections.

**EAVE SAFETY CAGE & INTERMEDIATE REST PLATFORM**

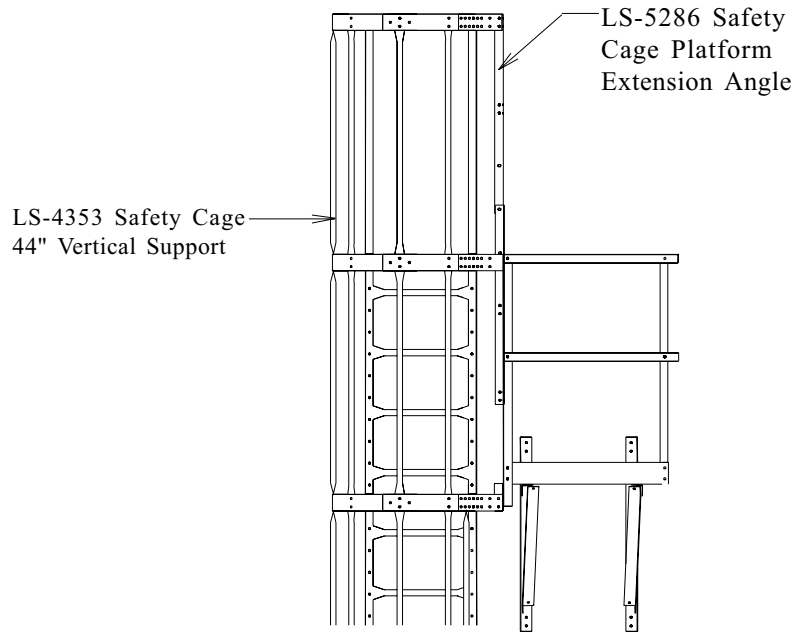
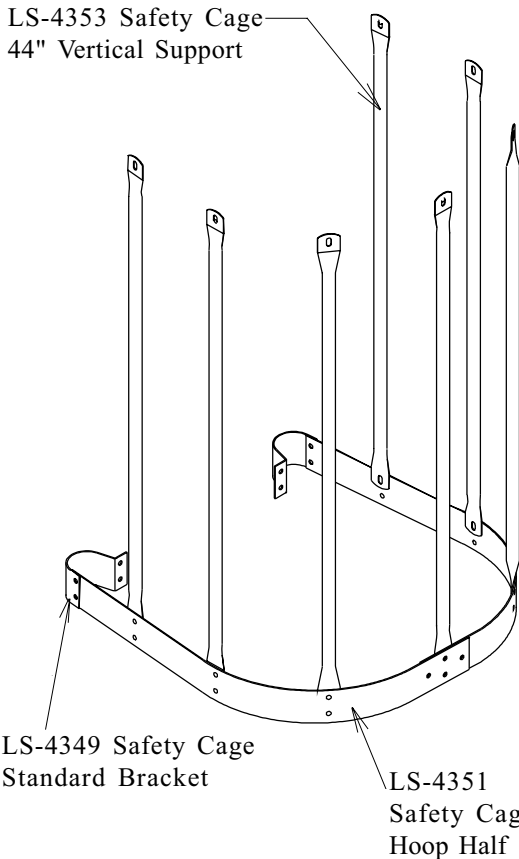
Before attaching any pieces to the ladder or platform some preassembly will be required. Take the safety cage hoop adjuster plate and the safety cage adapter hoop and bolt together using the proper holes, (as shown on following page.) Be sure the proper holes are used depending on the diameter of the grain bin. Be sure to use the 5/16" x 3/4" bolt with the head of the bolt to the inside of the safety cage. Using the improper holes will make the safety cage more difficult to assemble. You may now bolt this assembly to the safety cage hoop half, tighten bolts as you go. One of the assemblies will take 2 hoop halves and be positioned just below the platform as shown in the diagram. Take the assembly and attach to the safety cage bracket and to the platform extension angle or the hoop adapter angle. Refer to the diagram for more information. If holes don't align properly go back and make sure the ladder and platform are correctly positioned on grain bin in relationship to one another. Make any corrections necessary to complete the assembly as shown.





### **EAVE SAFETY CAGE**

After all three hoop assemblies are in place you may attach the 44" vertical supports from hoop to hoop. This will require 10 supports, 5 between each set of hoops. Again use the truss head bolts with bolt head to the inside of safety cage.



### **SAFETY CAGE EXTENSION**

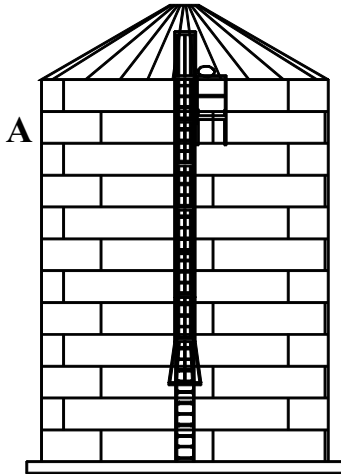
The safety cage extension package is designed to be added on to the bottom of the existing safety cage above it. Attach the vertical support pieces to the existing hoop halves above using the 5/16" x 3/4" bolt and nuts. Fasten the package to the safety cage brackets and attach the bottom of the vertical supports to the hoop halves and tighten bolts. Continue to use the extension packages as the usage chart reflect on the following page.

Whereas you formerly had all extension packages bundled and listed under the LS-6365LB part number you will now have a combination of LS-6366LB (A package of two (2) extension kits) and LS-6365LB (The original single extension kit).

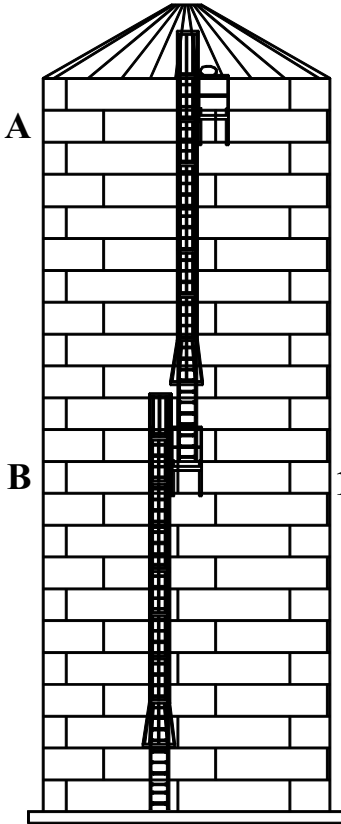
**2.66" INSIDE STIFFENED LADDER**  
**OFFSET AND PLATFORM LAYOUT**



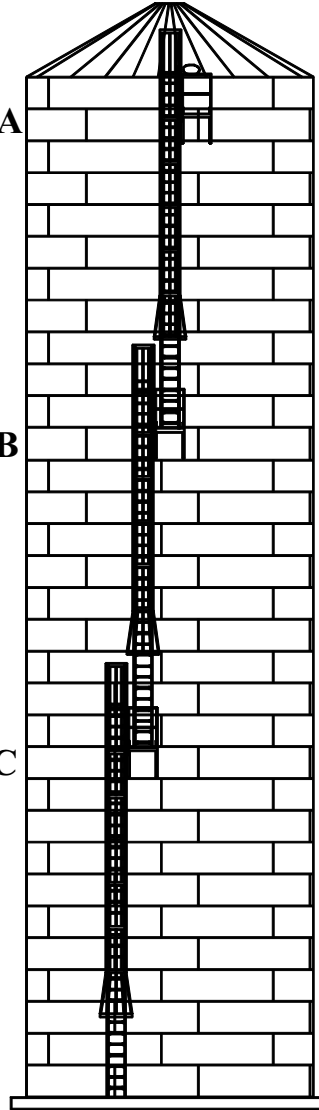
Ladders, Safety Cages & Platforms



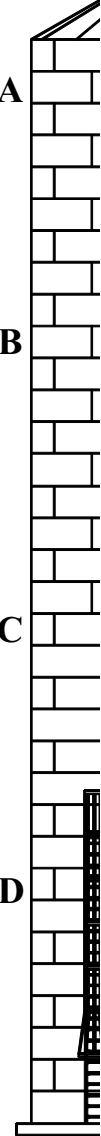
**12 RINGS**



**23 RINGS**



**32 RINGS**



**34 RINGS**

**2nd**

**10th**

**19th**

**27th**



**A**

ITEM	LDR-4019	6 RINGS	LDR-4020	7 RINGS	LDR-4021	8 RINGS	LDR-4022	9 RINGS	LDR-4023	10 RINGS	LDR-4024	11 RINGS	LDR-4025	12 RINGS	LDR-4026	13 RINGS	LDR-4027	14 RINGS	LDR-4028	15 RINGS	LDR-4029	16 RINGS	LDR-4030	17 RINGS	LDR-4031	18 RINGS	LDR-4032	19 RINGS	LDR-4033	20 RINGS	LDR-4034	21 RINGS	LDR-4035	22 RINGS	LDR-4036	23 RINGS	LDR-4037	24 RINGS	LDR-4038	25 RINGS	LDR-4039	26 RINGS	LDR-4030	27 RINGS	LDR-4031	28 RINGS	LDR-4032	29 RINGS	LDR-4033	30 RINGS	LDR-4034	31 RINGS	LDR-4035	32 RINGS	LDR-4036	33 RINGS	LDR-4037	34 RINGS
Platform Located in Ring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2									
Ladder Section (LDR-4002)	5	5	6	7	7	8	9	6	6	6	6	6	8	8	8	8	8	8	8	9	9	6	6	6	6	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9							
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
Safety Cage Extension	-	1	2	3	3	4	5	2	2	2	2	2	4	4	4	4	4	4	4	5	5	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3						
Platform Package	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
Eave Safety Cage (LS-5289)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						

**B**

Platform Located in Ring	9	9	9	9	9	11	11	11	11	13	13	9	9	9	9	12	12	12	12	12	12	10	10
Ladder Section (LDR-4002)	6	6	7	8	9	8	9	9	10	9	10	9	9	9	9	8	8	9	9	9	9	8	8
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety Cage Extension	1	1	2	3	4	3	4	4	5	4	5	4	4	4	4	3	3	4	4	4	4	3	3
Platform Package	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eave Safety Cage (LS-5289)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

**C**

Platform Located in Ring	18	18	18	18	20	20	22	22	22	19	19
Ladder Section (LDR-4002)	7	8	9	9	9	9	8	9	10	8	8
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1	1	1
Safety Cage Extension	2	3	3	4	3	4	3	4	5	3	3
Platform Package	1	1	1	1	1	1	1	1	1	1	1
Eave Safety Cage (LS-5289)	1	1	1	1	1	1	1	1	1	1	1

**D**

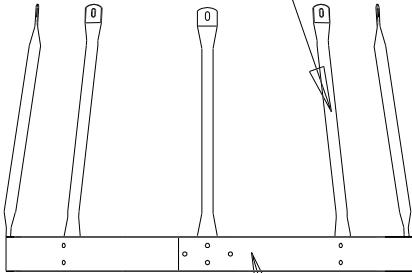
Platform Located in Ring	27	27
Ladder Section (LDR-4002)	7	8
Bell Safety Cage (LS-4364LB)	1	1
Safety Cage Extension	2	3
Platform Package	1	1
Eave Safety Cage (LS-5289)	1	1

**2.66" INSIDE STIFFENED LADDER OFFSET CHART**

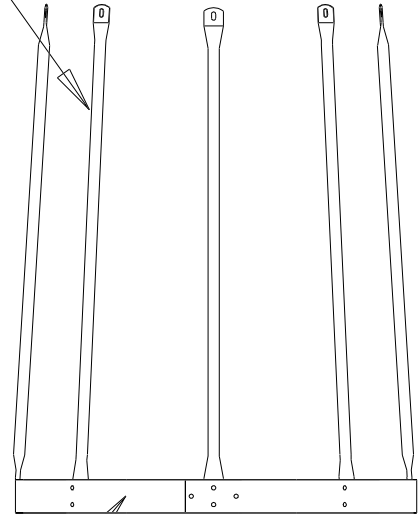
**LADDER, SAFETY CAGE, AND PLATFORM USAGE LOCATION CHART**  
 THE CHART ABOVE SHOULD BE IN CONJUNCTION WITH THE DIAGRAMS ON THE PREVIOUS PAGE. FOLLOW THE PROPER LETTER DESIGNATION FROM THE DIAGRAM TO THE CHART FINDING THE PROPER RING GRAIN BIN AND USE THE AMOUNTS OF LADDERS AND SAFETY CAGES SHOWN IN CHART BELOW. FOR SAFETY CAGE BELL SECTION SIZE (22" OR 44") SEE CHART ON FOLLOWING PAGE.



LS-4354 Safety Cage  
22" Vertical Support



LS-4353 Safety Cage  
44" Vertical Support



LS-4352 Safety Cage  
Bell Hoop Half (Red)

LS-4352 Safety Cage  
Bell Hoop Half (Red)

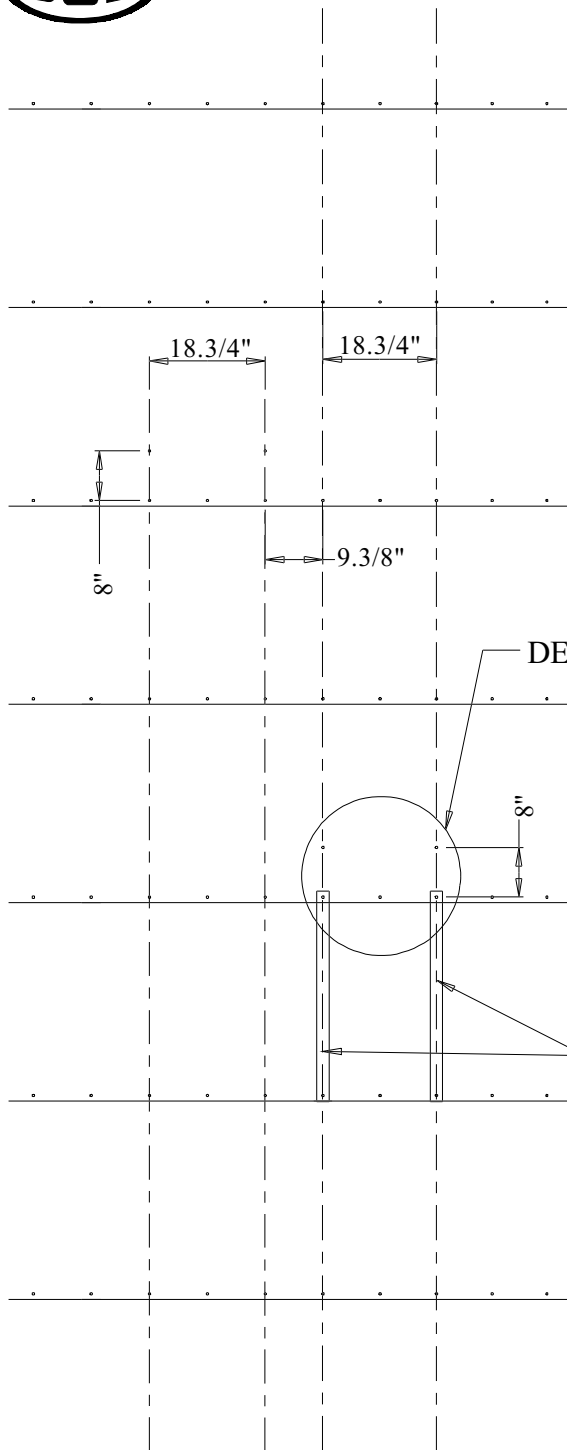
**SAFETY CAGE BELL SECTIONS (22" or 44")**

The safety cage bell section is to be used at the point of termination of the safety cage just above the rest platforms or the concrete. Refer to the usage chart at the bottom of the page to determine the correct bell section, attach the vertical supports to the existing hoop halves. Now, fasten the bell safety cage brackets (red) to the ladder (some field drilling may be necessary at this point.) Attach the special bell safety cage hoop halves to the bell brackets and attach the vertical supports to the bell hoop halves. The vertical supports will have to be bent at the flat area to allow for the angle of the bell section.

**BELL SAFETY CAGE LOCATION CHART**

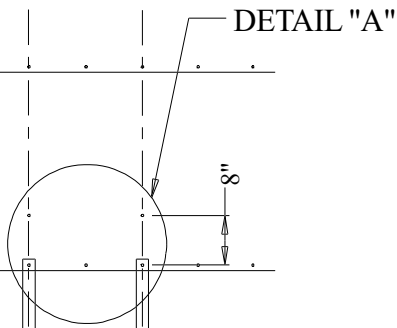
THE BELL SAFETY CAGE PACKAGE GOES ON THE BOTTOM OF A RUN OF SAFETY CAGE AND TERMINATES JUST ABOVE THE CONCRETE OR PLATFORM. THE CHART GIVES THE SIZE OF BELL SECTION (22" or 44") TO BE USED WITH THE RUN OF SAFETY CAGE STARTING AT THE TOP RING OF GRAIN BIN COMING DOWN AND ENDING JUST ABOVE THE PLATFORMS AND/OR CONCRETE. FOLLOW THE DIAGRAMS AND THE PROPER LETTER DESIGNATION AND REFERENCE THE CHART BELOW FOR PROPER SAFETY CAGE PLACEMENT.

ITEM	6 RINGS	7 RINGS	8 RINGS	9 RINGS	10 RINGS	11 RINGS	12 RINGS	13 RINGS	14 RINGS	15 RINGS	16 RINGS	17 RINGS	18 RINGS	19 RINGS	20 RINGS	21 RINGS	22 RINGS	23 RINGS	24 RINGS	25 RINGS	26 RINGS	27 RINGS	28 RINGS	29 RINGS	30 RINGS	31 RINGS	32 RINGS	33 RINGS	34 RINGS	
	LS-5293	LS-5294	LS5295	LS-5296	LS-5297	LS-5298	LS-5299	LS-5300	LS-5301	LS-5302	LS-5303	LS-5304	LS-5305	LS-5306	LS-5307	LS-5308	LS-5309	LS-5310	LS-5311	LS-5312	LS-5313	LS-5314	LS-5315	LS-5316	LS-5317	LS-5318	LS-5319	LS-6693	LS-6694	
SAFETY CAGE BELL SIZE	44	44	22	22	44	44	22	44	44	44	44	44	22	22	22	22	22	44	44	44	44	44	44	44	44	44	44	44	44	
								SAFETY CAGE BELL SIZE	22	44	22	22	22	22	44	44	44	44	22	22	22	22	22	22	22	44	44	44	22	22
																			SAFETY CAGE BELL SIZE	22	22	22	44	44	44	44	44	22	22	22
22" PACKAGE PART NUMBER IS LS-4363LB																														
44" PACKAGE PART NUMBER IS LS-4364LB																														
																											SAFETY CAGE BELL SIZE	44	44	

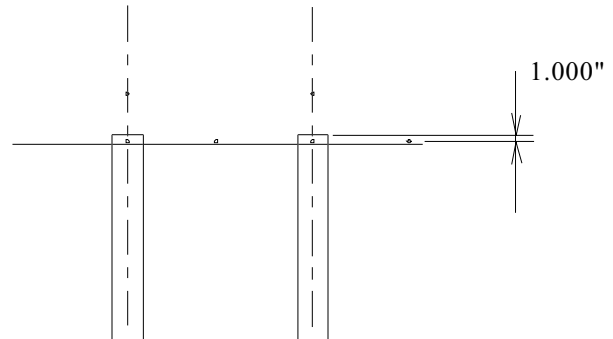


### **REST PLATFORM OFFSET LOCATION**

Follow the diagram at the left of the page very carefully to insure proper transition of ladder to platform to ladder offset. Some field drilling will be necessary at this point to locate the standoffs correctly. Pay special attention to the dimensions given. (Holes to be  $3/8"$  dia.) For platform support assembly reference the platform support assembly detail.



PLATFORM MOUNTING ANGLES



**DETAIL "A"**

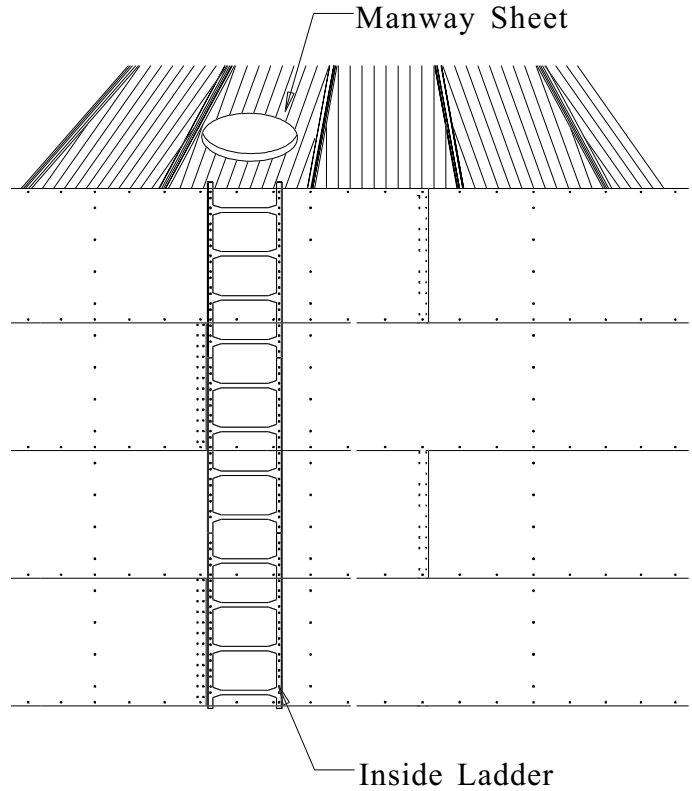
### **INTERMEDIATE SAFETY CAGE**

Follow the instructions referring to the eave safety cage package for this assembly. The only difference will be the extension rails in the eave safety cage package. This package will have the ladder instead.

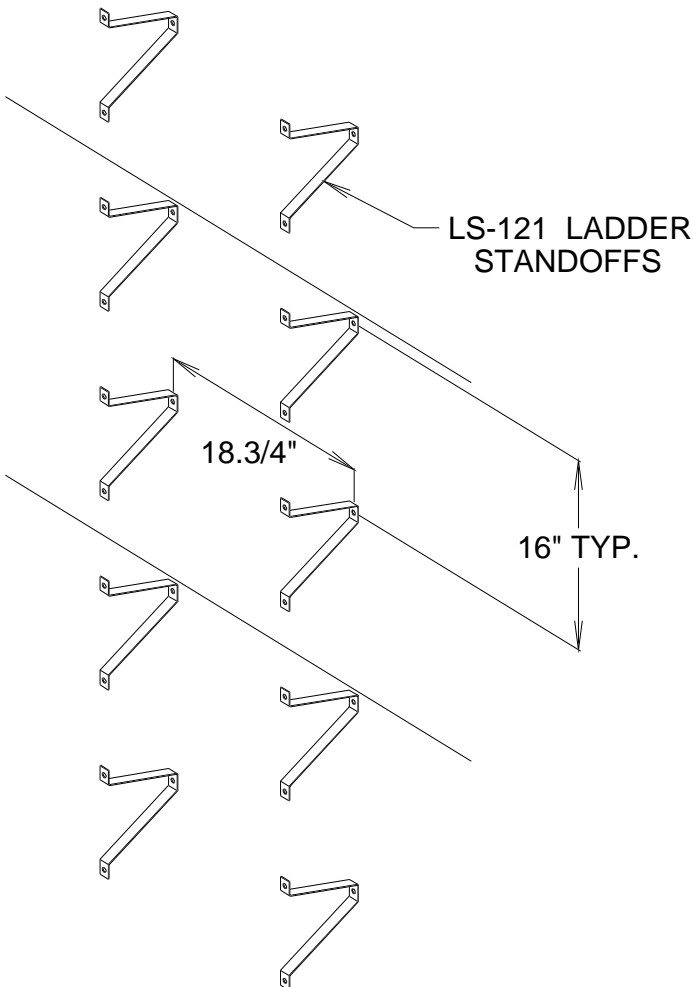


### INSIDE LADDER PLACEMENT

The inside ladder package includes the ladders and double the amount of standoffs. Begin by positioning the ladder directly under the manhole roof panel and place the standoffs every 16" vertically on the sidewall sheets using the horizontal seam holes for every other hole location. Use 5/16" x 3/4" bin bolts to attach the standoffs to the sidewall of the grain bin. Refer to the diagram on the right.



**INSIDE OF GRAIN BIN**



### INSIDE LADDER STANDOFFS REQUIREMENTS

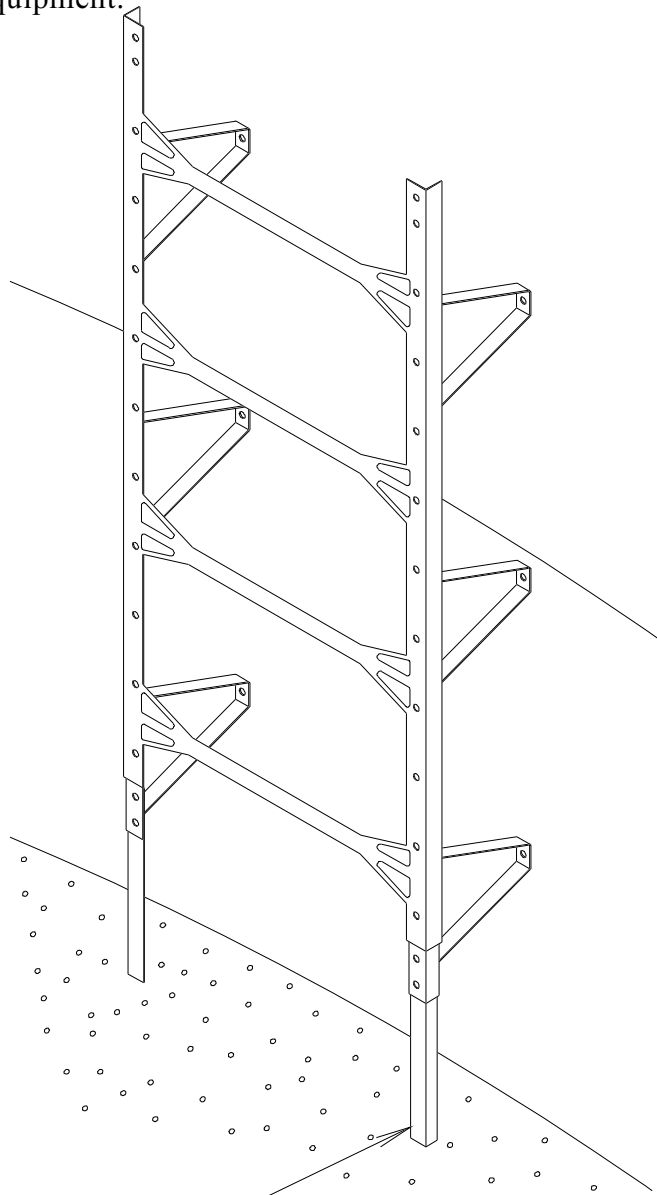
Field drilling will be necessary for the standoffs located in the middle of the sidewall sheet. Drill 2 holes 3/8" diameter directly in line with the horizontal seam holes 18 3/4" apart. Continue down the sidewall with standoffs at every 16" spacing. Refer to the diagrams at the left.





## INSIDE LADDER SUPPORTS

After completing the inside ladder it will be necessary to support the bottom of the ladder to the concrete. Depending on the actual installation, the amount of support may vary. The supports are not supplied by Grain Systems. Usually the supports can be made of 1" x 1" x 1/8" angle iron bolted directly to the ladder using 2 bolts 5/16" x 1". If a bin sweep is to be used in the grain bin, other considerations may be necessary to assure there is no interference with the equipment.



SUPPORTS ARE NOT SUPPLIED BY GSI



**THIS SECTION  
FOR 2.66"  
CORRUGATED  
GRAIN BINS  
  
OUTSIDE STIFFENED**

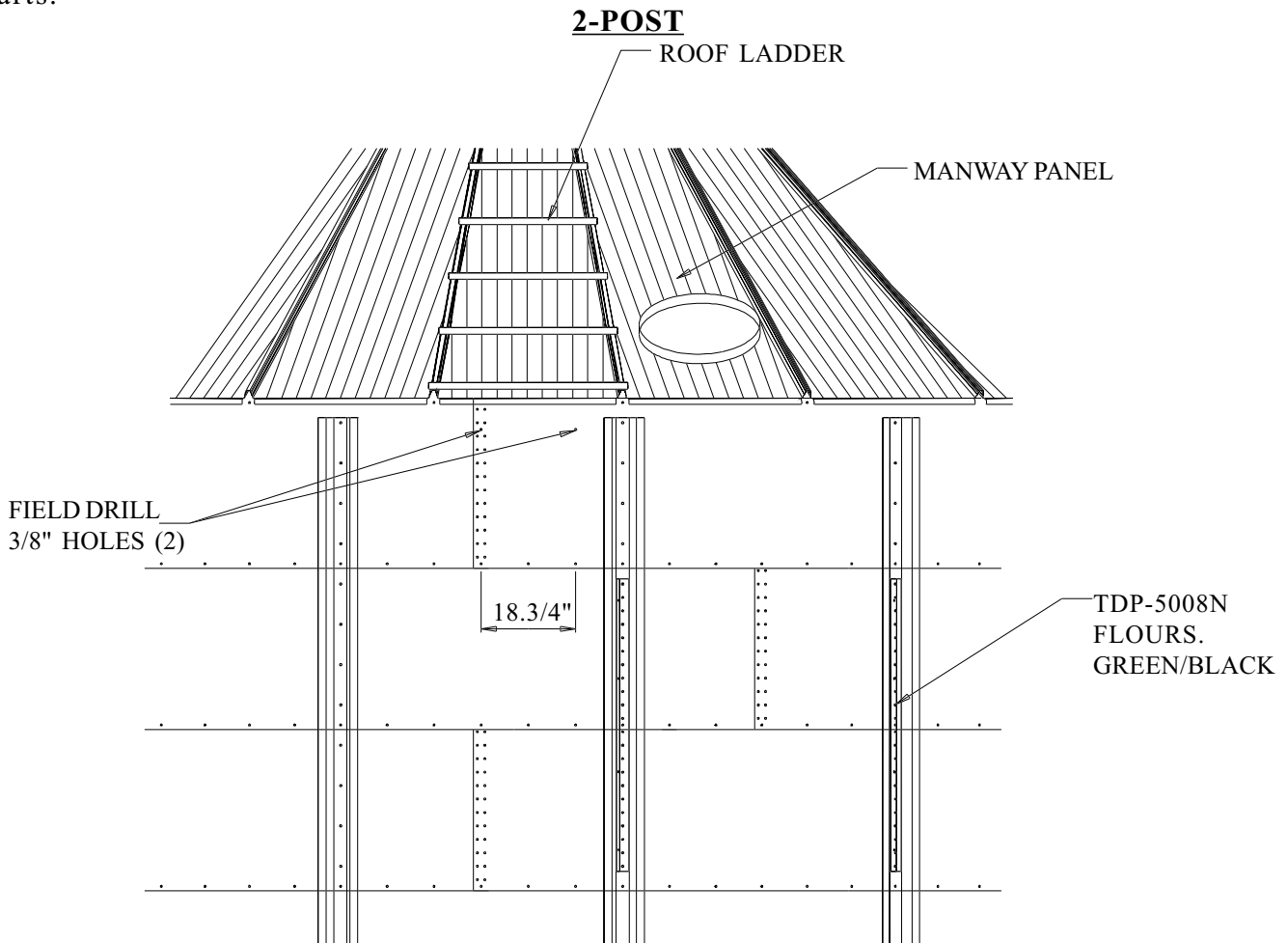


## **LADDER SAFETY CAGE, AND PLATFORM INSTRUCTIONS**

All packages have been structured with the correct components for each ring height grain bin from 25'-6" Eave to 91'-3" Eave. Be sure and follow the complete instruction sheets for correct placement of parts. Failure to do so may result in improper fit of parts or shortage of parts. Read through the complete set of instructions before proceeding with erection of grain bin. Considerable thought must be given as to location of ladders and platforms in relation to other equipment and structures.

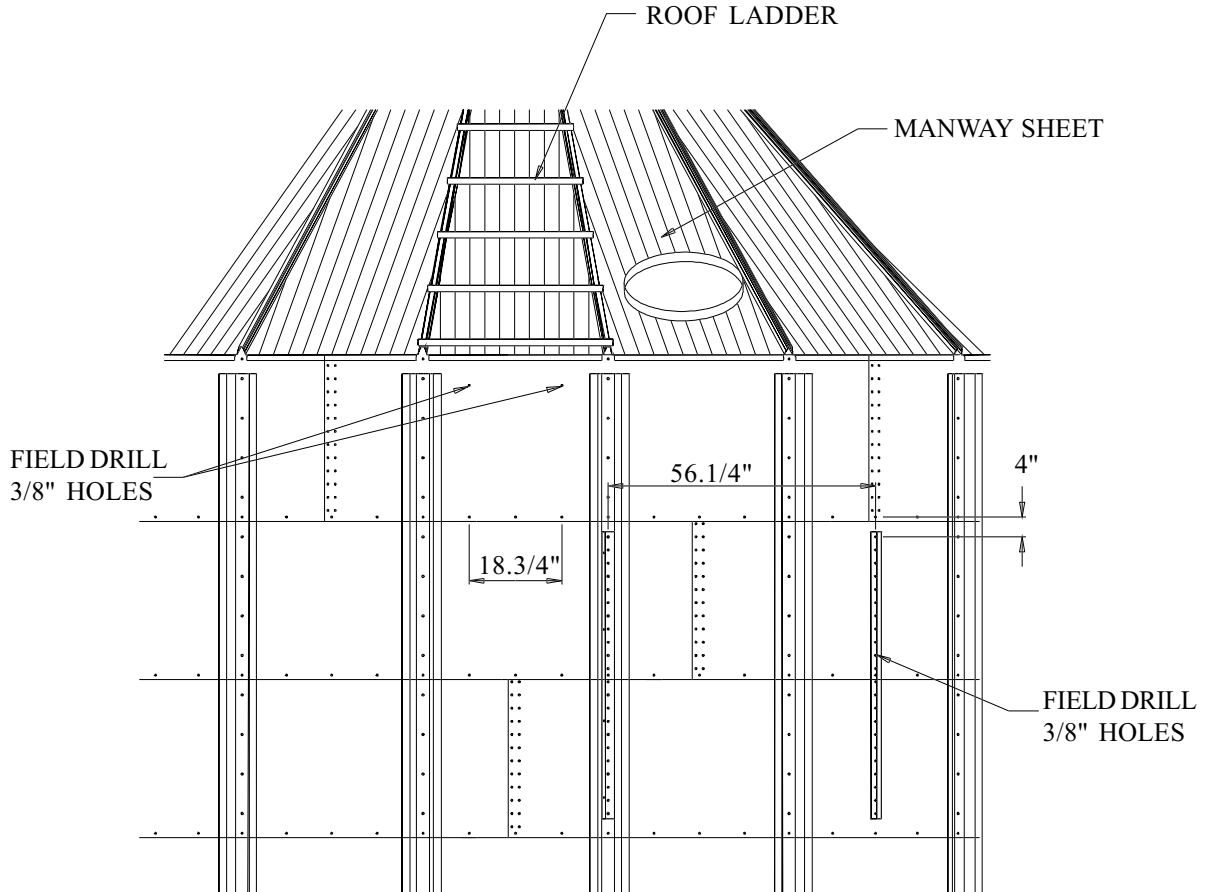
### **STARTING LOCATION OF LADDERS**

Ladder placement is very critical as to assure proper fit of all parts later on as safety cage is bolted in place. Locate the proper place of roof ladder and manway this will establish the location of the ladder. Ladder must be centered directly below the roof ladder. Refer to the diagram below for proper location of field drilled holes (3/8"). Holes must be 18 3/4" apart and 8" below the top horizontal row of holes directly in line with the holes pre-punched in the horizontal seam for the first 2 ladder standoff brackets. The diagrams also show that the platform uses stiffener holes. Both platform vertical support angles must be located in the stiffener holes on 2-post tanks and 1 vertical support angles in stiffener holes on 3-post tanks, as shown in details. These dimensions and locations are very critical to assure proper fit of all parts.



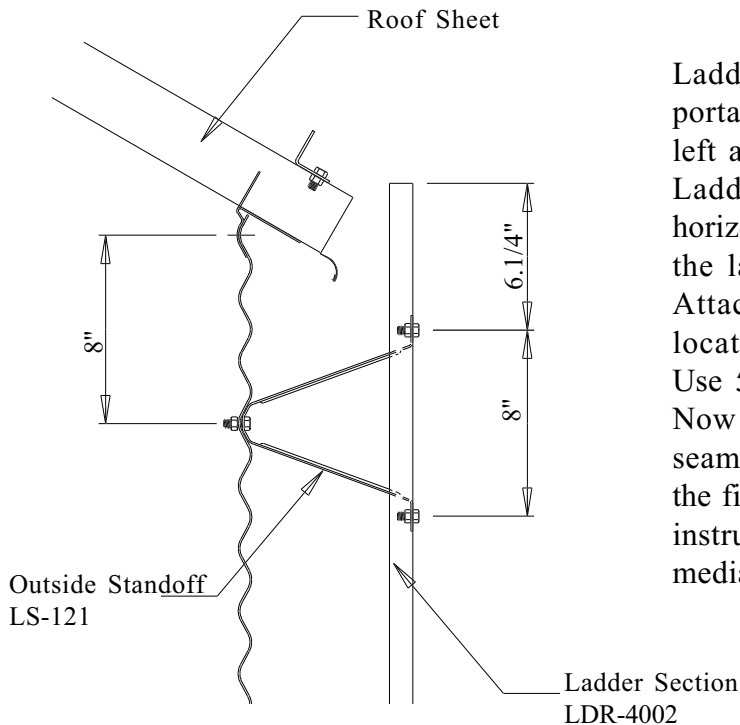


### 3 - POST



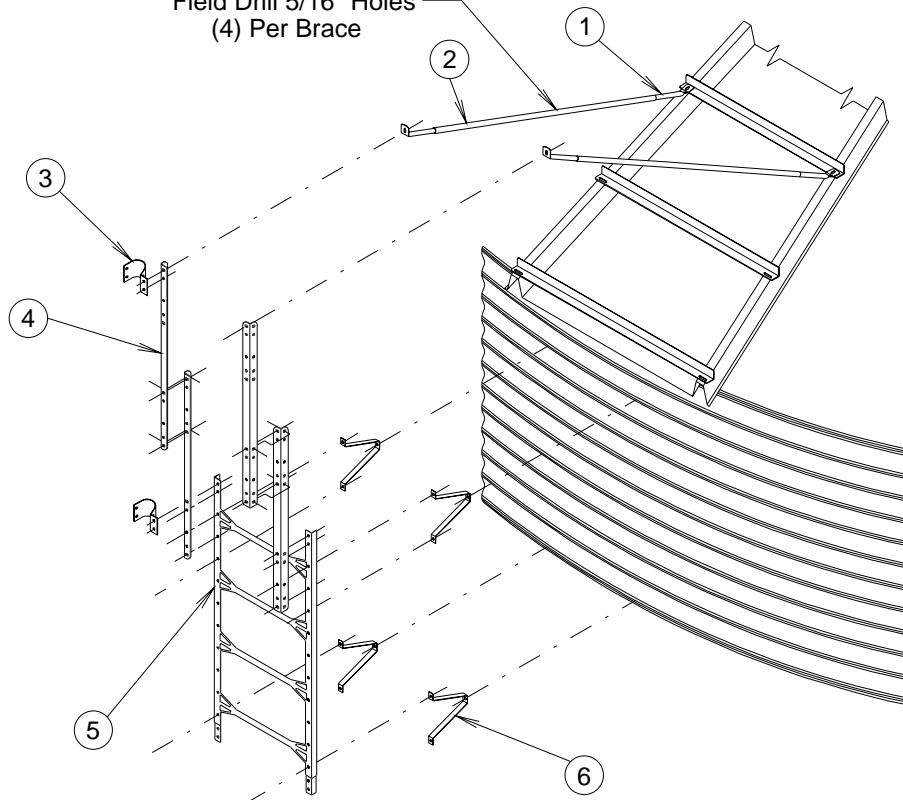
### LADDER PLACEMENT

Ladder placement on the grain bin is very important at this time. Refer to the diagram at the left and follow the correct dimensions as shown. Ladder standoff must be located 8" below the horizontal seam. Check your ladder to make sure the ladder rung dimples are to the top surface. Attach ladder to the standoffs using the holes located 6 1/4" from the end of ladder section. Use 5/16" x 3/4" bin bolts for these connections. Now all standoffs must be located in horizontal seam holes (repeating every 32") until reaching the first rest platform. Refer to the section in these instructions that references the location of intermediate rest platforms for further hole locations.





Field Drill 5/16" Holes  
(4) Per Brace



Note: Reference previous page for the first ladder standoff starting location.

REF. NO.	DESCRIPTION	PART NO.
1	END TUBE	LS-6616
2	CENTER TUBE	LS-6615
3	SAFETY CAGE BRACKET	LS-4349
4	SAFETY CAGE EXT. RAIL	LS-4355
5	LADDER SECTION	LDR-4002
6	OUTSIDE STANDOFF	LS-121

### **EXTENSION RAILS**

Extension rails are provided to extend the side rails of the ladder above the eave of the roof and to support the safety cage at that point. Four rails have been provided, two for each side of the ladder. Refer to diagram above for proper location and assembly of the extension rails in relation to the ladder. Use 5/16" x 3/4" bolts and nuts to attach the ladder. Tighten the bolts at this time.

### **EAVE ADJUSTABLE BRACES**

After extension rails are firmly attached, the adjustable braces must be attached at this time. A larger diameter tube and two smaller diameter tubes are used to make up one adjustable brace. Slip the smaller tubes inside the larger tube and attach one smaller tube to the top of the extension rail. Adjust the other smaller tube so the bottom of the flattened tube reaches the roof rib. Field drill four 5/16" holes through both large and small adjustable tubes and bolt together using 1/4" x 1.1/2" bolts and nuts. This will keep the adjustable brace from slipping.

Attach the safety cage brackets to the extension rail and ladder as shown in the diagram. Brackets must be placed every 44". This will occur at every ladder joint. Use 5/16" x 3/4" bolts and nuts.

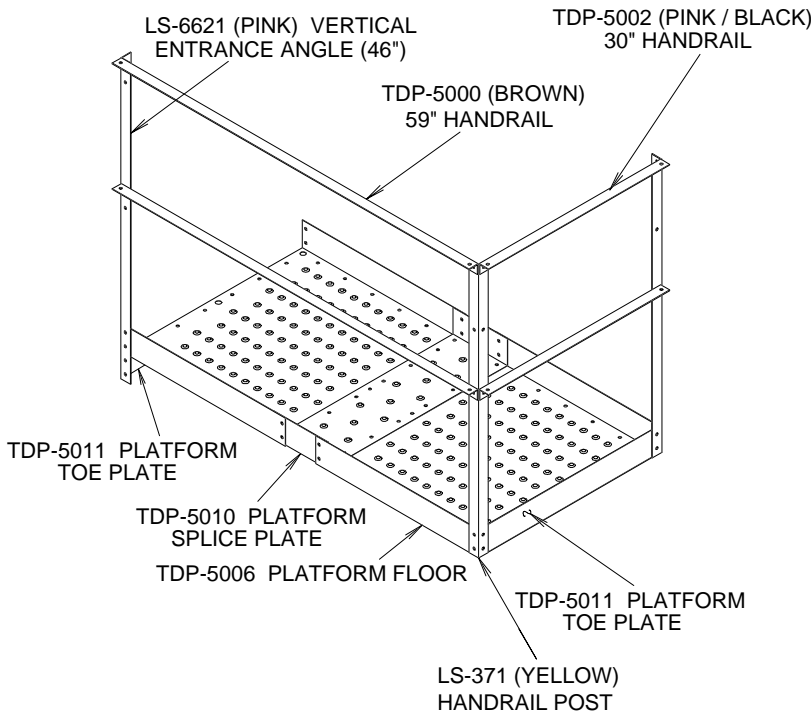


### PLATFORM ASSEMBLY

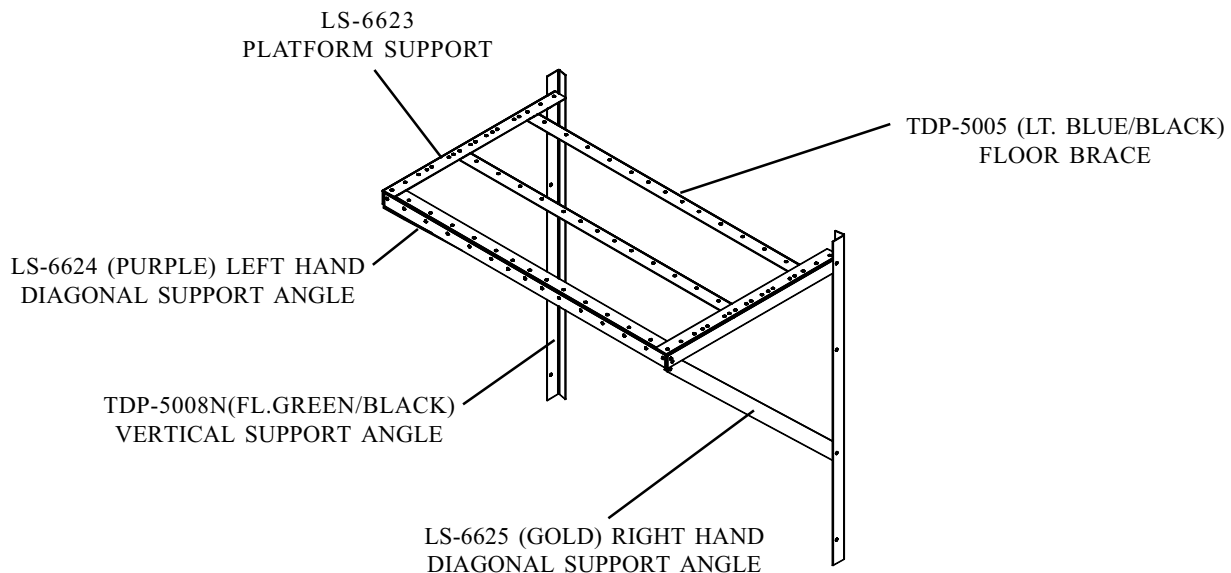
**NOTE: THE PLATFORM SUPPORTS SHOULD BE MOUNTED ON THE BIN FIRST. THE PLATFORM FLOOR SHOULD THEN BE ASSEMBLED ONTO THE SUPPORT FRAME.**

Assemble the platform support frame using 5/16" x 3/4" truss head bolts and nuts. When attaching vertical supports to stiffeners or sidewall, locate the vertical supports according to the instructions on previous pages.

Now, proceed to the platform floor and floor splice. Align holes on platform floor with the holes on platform supports and bolt together using 5/16" x 3/4" truss head bolts and nuts. Be sure and attach platform toe plates at the same time you attach the platform floor.



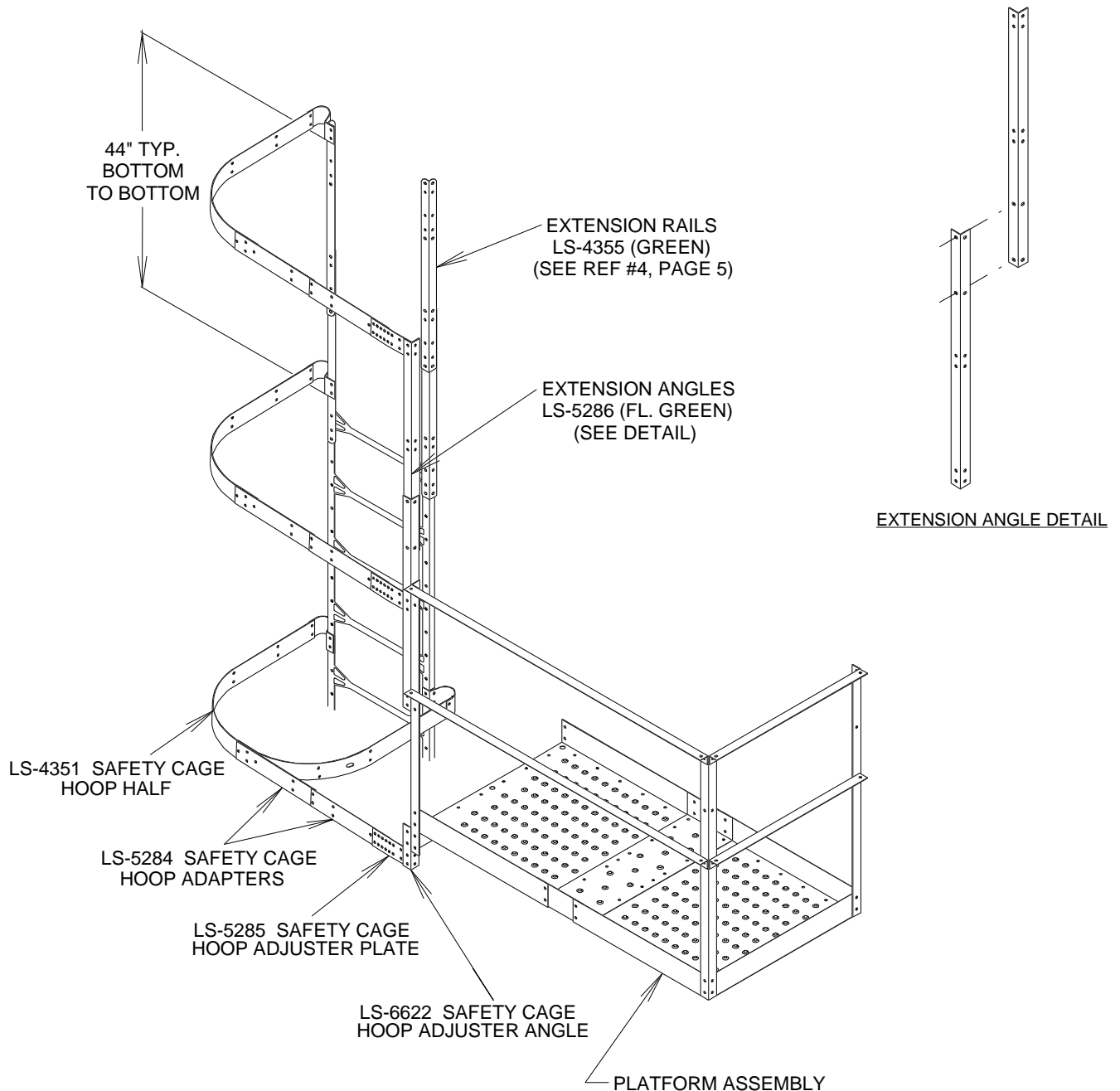
**NOTE:** On 18' and smaller 3 post tanks, move platform support angles and diagonal support angles away from wall and field drill vertical support angle to allow stiffener clearance.





## EAVE SAFETY CAGE

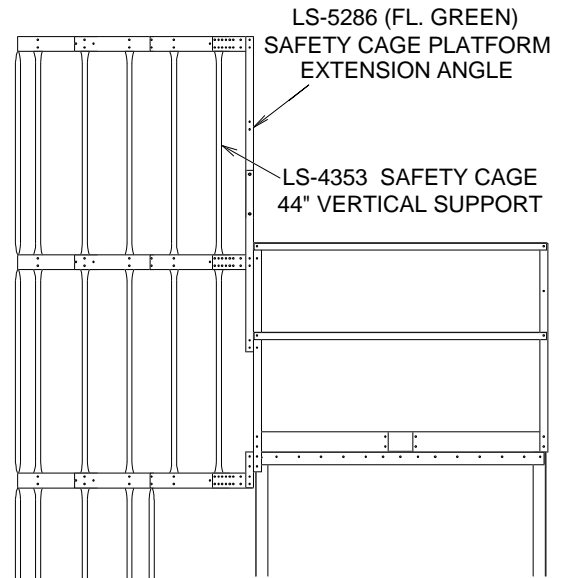
Before attaching any pieces to the ladder or platform, some preassembly will be required. Take the safety cage hoop adjuster plates and bolt them onto the extension angle as shown. Bolt the safety cage adapter hoops and safety cage hoop halves together using the proper holes, as shown. Be sure to use the 5/16" x 3/4" bolt with the head of the bolt to the inside of the safety cage. You may now bolt these assemblies to the safety cage brackets and hoop adjuster plates, tighten bolts as you go. One of the assemblies will take 2 hoop halves and be positioned just below the platform as shown in the diagram.





### VERTICAL SUPPORTS

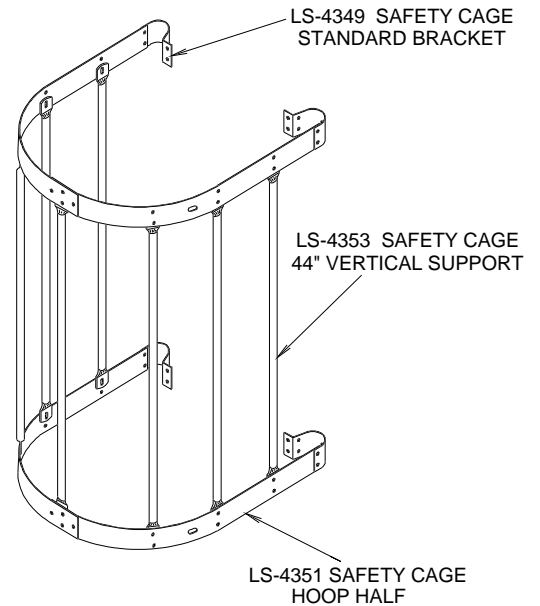
After all three hoop assemblies are in place you may attach the 44" vertical supports from hoop assembly to hoop assembly, as shown. This will require 14 supports, 7 between each set of hoops. Bolts should have the head of the bolt to the inside of the safety cage.



### SAFETY CAGE

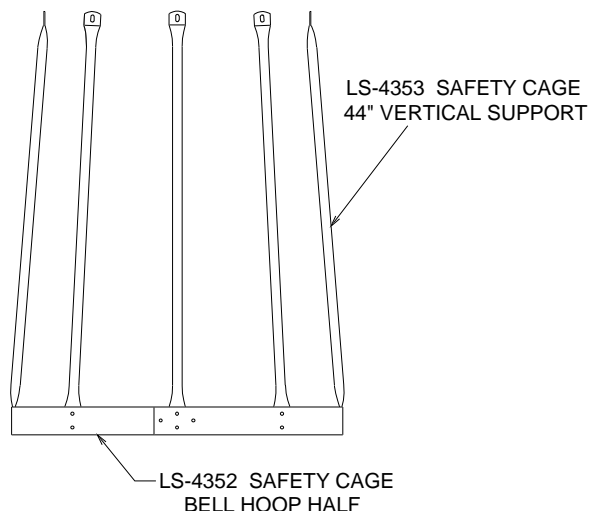
Attach the vertical support pieces to the existing hoop halves above using the 5/16" x 3/4" bolts and nuts (with the heads on the inside of the cage). Fasten two hoop halves together and to the safety cage brackets. Bolt the safety cage brackets to the ladder, the supports to the hoop halves and tighten bolts. Continue in the same manner.

Whereas you formerly had all extension packages bundled and listed under the LS-6365LB part number you will now have a combination of LS-6366LB (A package of two (2) extension kits) and LS-6365LB (The original single extension kit).



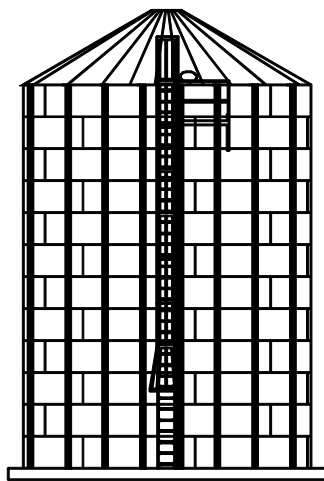
### 44" SAFETY CAGE BELL SECTION

The safety cage bell section is to be used at the point of termination of the safety cage just above the concrete or platform (generally 7 to 8 feet). Attach the vertical supports to the existing hoop halves. Attach the special bell safety cage hoop halves to the brackets and attach to the vertical supports. Fasten the safety cage brackets to the ladder (some field drilling may be required). Tighten all bolts at this time. The vertical supports will have to be bent at the flat area to allow for the angle of bell section.

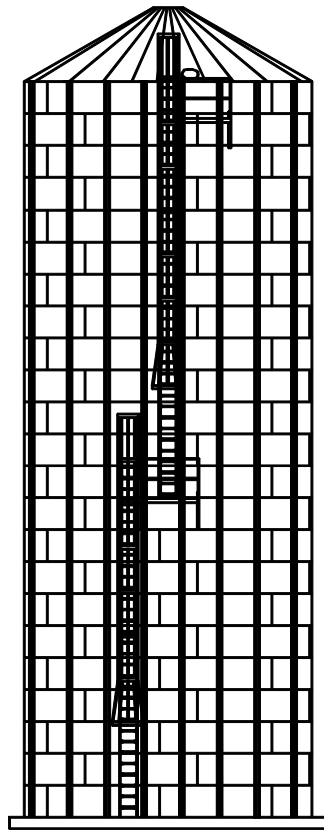




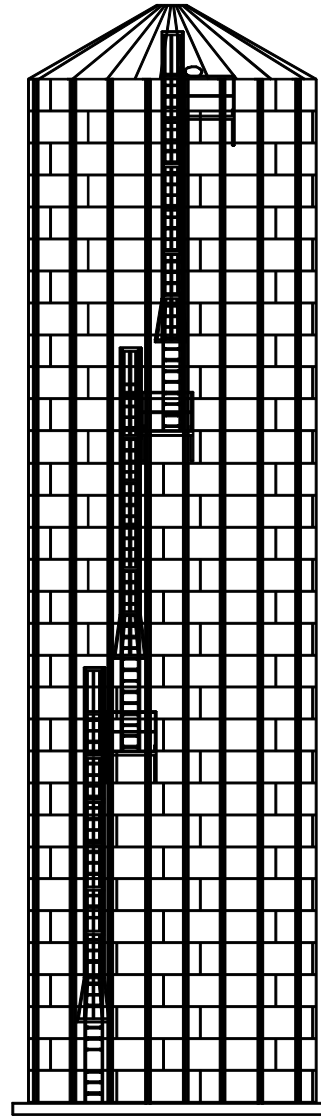
### 2.66" OUTSIDE STIFFENED LADDER OFFSET AND PLATFORM LAYOUT



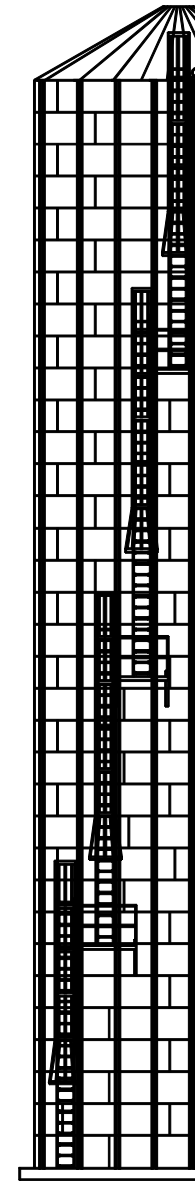
**12 RINGS**



**23 RINGS**



**32 RINGS**



**34 RINGS**

**2nd**

**10th**

**19th**

**27th**



Ladders, Safety Cages & Platforms



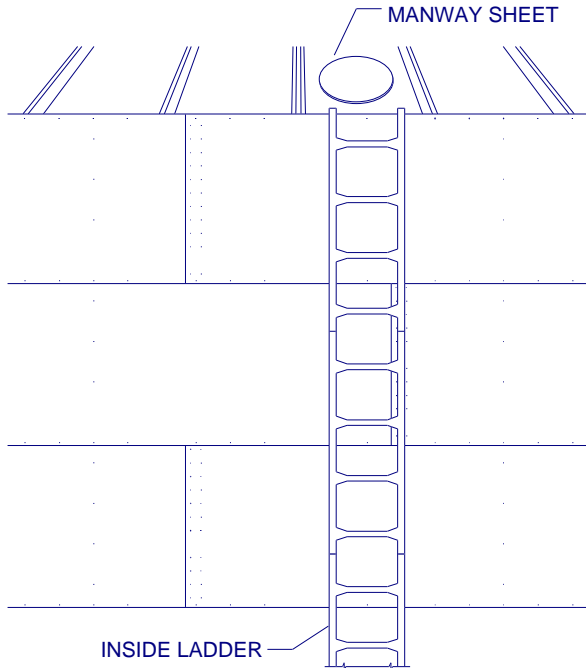
ITEM	LSO-25-06 25'-6" EAVE	LSO-29-02 29'-2" EAVE	LSO-32-10 12 RINGS 32'-10" EAVE	LSO-36-06 13 RINGS 36'-6" EAVE	LSO-40-02 15 RINGS 40'-2" EAVE	LSO-43-10 16 RINGS 43'-10" EAVE	LSO-47-06 17 RINGS 47'-6" EAVE	LSO-51-02 19 RINGS 51'-2" EAVE	LSO-54-10 20 RINGS 54'-10" EAVE	LSO-58-06 22 RINGS 58'-6" EAVE	LSO-62-02 23 RINGS 62'-2" EAVE	LSO-65-10 24 RINGS 65'-10" EAVE	LSO-69-06 26 RINGS 69'-6" EAVE	LSO-73-02 27 RINGS 73'-2" EAVE	LSO-76-10 29 RINGS 76'-10" EAVE	LSO-80-06 30 RINGS 80'-6" EAVE	LSO-84-02 32 RINGS 84'-2" EAVE	LSO-87-10 33 RINGS 87'-10" EAVE	LSO-91-03 34 RINGS 91'-3" EAVE
Ladder Section (LDR-4002)	7	8	5	5	6	6	7	7	8	8	6	6	7	7	7	7	8	7	7
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety Cage Extension	3	4	1	1	2	2	3	3	4	4	2	2	3	3	3	3	4	3	3
Platform Pkg. (LS-6618)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eave Sfty. Cage (LS-6619)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ladder Section (LDR-4002)			5	6	6	7	7	8	8	9	6	7	7	7	8	8	8	8	8
Bell Safety Cage (LS-4364LB)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety Cage Extension			1	2	2	3	3	4	4	5	2	3	3	3	4	4	4	3	3
Platform Pkg. (LS-6618)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Int. Sfty. Cage (LS-6620)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ladder Section (LDR-4002)											7	7	7	8	8	9	9	8	8
Bell Safety Cage (LS-4364LB)											1	1	1	1	1	1	1	1	1
Safety Cage Extension											3	3	3	4	4	5	5	3	3
Platform Pkg. (LS-6618)											1	1	1	1	1	1	1	1	1
Int. Sfty. Cage (LS-6620)											1	1	1	1	1	1	1	1	1
Ladder Section (LDR-4002)																		7	8
Bell Safety Cage (LS-4364LB)																		1	1
Safety Cage Extension																		2	3
Platform Pkg. (LS-6618)																		1	1
Int. Sfty. Cage (LS-6620)																		1	1

**2.66" OUTSIDE STIFFENED LADDER OFFSET CHART**

**LADDER, SAFETY CAGE, AND PLATFORM USAGE LOCATION CHART**

THE CHART ABOVE SHOULD BE IN CONJUNCTION WITH THE DIAGRAMS ON THE PREVIOUS PAGE. FOLLOW THE PROPER LETTER DESIGNATION FROM THE DIAGRAM TO THE CHART FINDING THE PROPER RING GRAIN BIN AND USE THE AMOUNTS OF LADDERS AND SAFETY CAGES SHOWN IN CHART BELOW. FOR SAFETY CAGE BELL SECTION SIZE (22" OR 44") SEE CHART ON FOLLOWING PAGE.





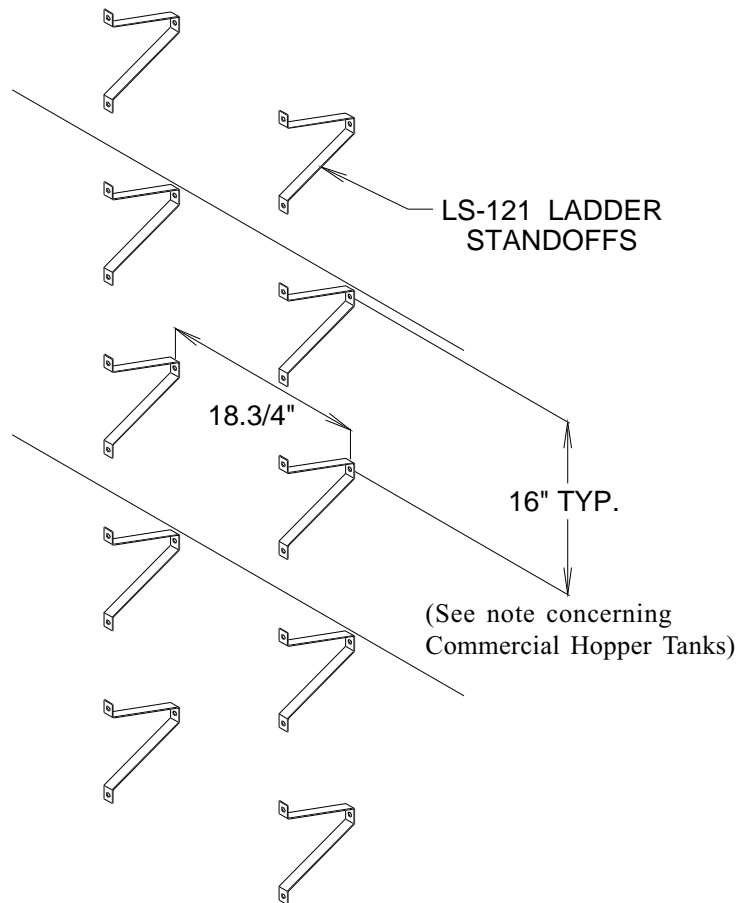
INSIDE OF GRAIN BIN

### INSIDE LADDER PLACEMENT

The inside ladder package includes the ladder and double the amount of standoffs as the outside ladder package. Begin by positioning the ladder directly under the manhole roof panel and place the standoffs every 16" vertically on the sidewall sheets using the horizontal seam holes for every other hole location. Use 5/16" x 3/4" bin bolts to attach the standoffs to the sidewall of the grain bin. Refer to the diagrams to the left and below.

### INSIDE LADDER STANDOFF REQUIREMENTS

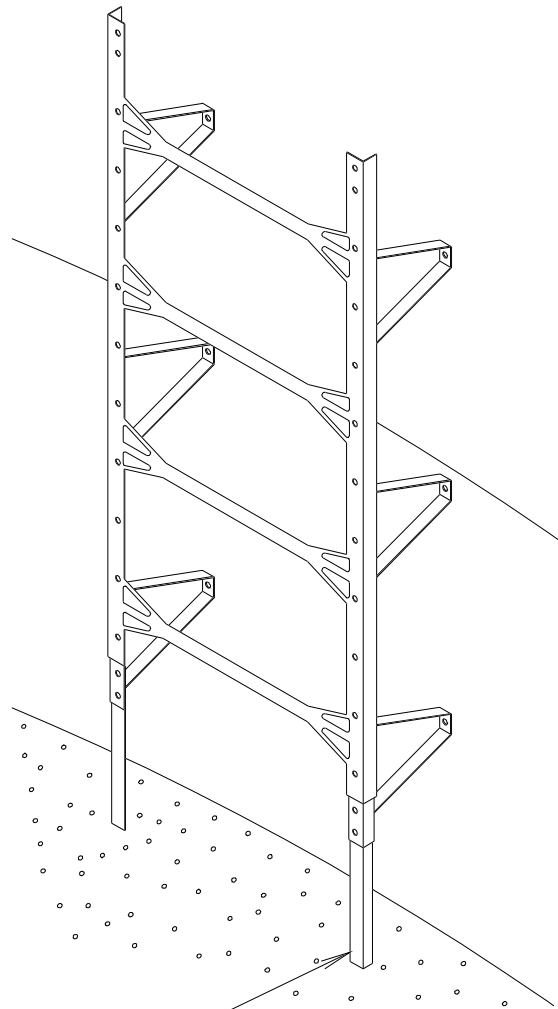
Field drilling will be necessary for the standoffs located in the middle of the sidewall sheet. Drill 2 holes 3/8" diameter directly in line with the horizontal seam holes 18.3/4" apart. Continue down the sidewall with standoffs at every 16" spacing. Refer to the diagram.





## INSIDE LADDER SUPPORTS

After completing the inside ladder it will be necessary to support the bottom of the ladder to the concrete. Depending on the actual installation, the amount of support may vary. The supports are not supplied by Grain Systems. Usually the supports can be made of 1" x 1" x 1/8" angle iron bolted directly to the ladder using 2 bolts 5/16" x 1". If a bin sweep is to be used in the grain bin, other considerations may be necessary to assure there is no interference with the equipment.



SUPPORTS ARE NOT SUPPLIED BY GSI



**THIS SECTION  
FOR 4.00"  
CORRUGATED  
GRAIN BINS  
  
INSIDE STIFFENED**

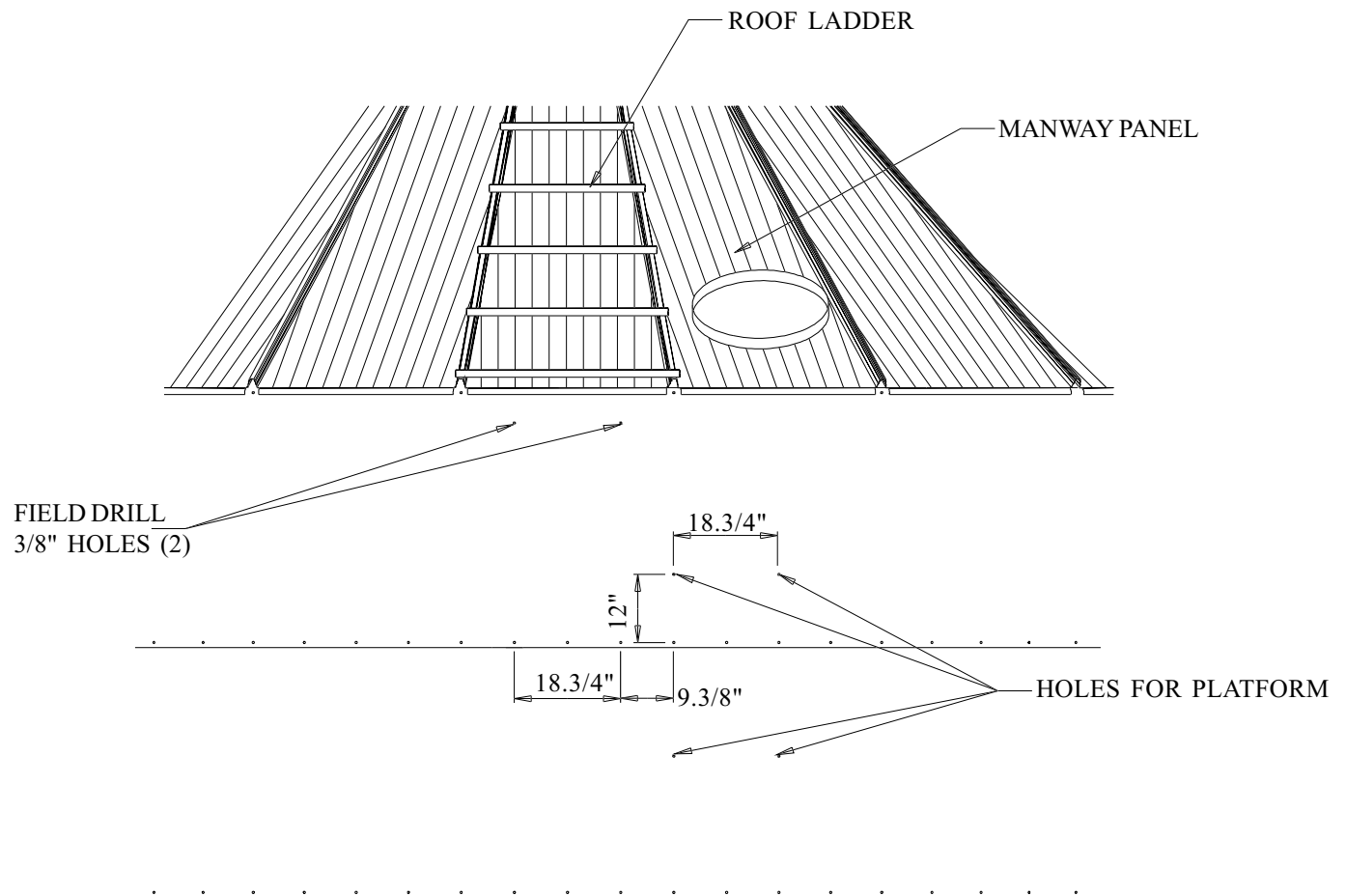


## LADDER SAFETY CAGE, AND PLATFORM INSTRUCTIONS

All packages have been structured with the correct components for each ring height grain bin from 4 rings to 24 rings. Be sure and follow the complete instruction sheets for correct placement of parts. Failure to do so may result in improper fit of parts or shortage of parts. Read through the complete set of instructions before proceeding with erection of grain bin. Considerable thought must be given as to location of ladders and platforms in relation to other equipment and structures.

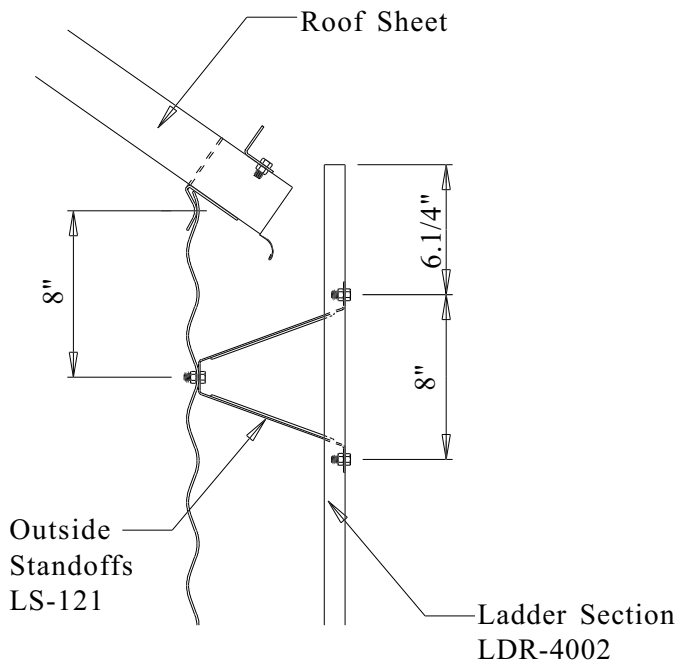
### STARTING LOCATION OF LADDERS

Ladder placement is very critical as to assure proper fit of all parts later on as safety cage is bolted in place. Locate the proper place for the roof ladder and manway this will establish the location of the ladder. Ladder must be centered directly below the roof ladder. Refer to the diagram below for proper location of field drilled holes ( $3/8$ " ). Holes must be  $18\ 3/4$ " apart and  $8$ " below the top horizontal row of holes directly in line with the holes to be used for the platform mounting angle. Platform must be located  $9\ 3/8$ " to the right of the ladder holes. All of these dimensions are very critical to assure proper fit of all parts!

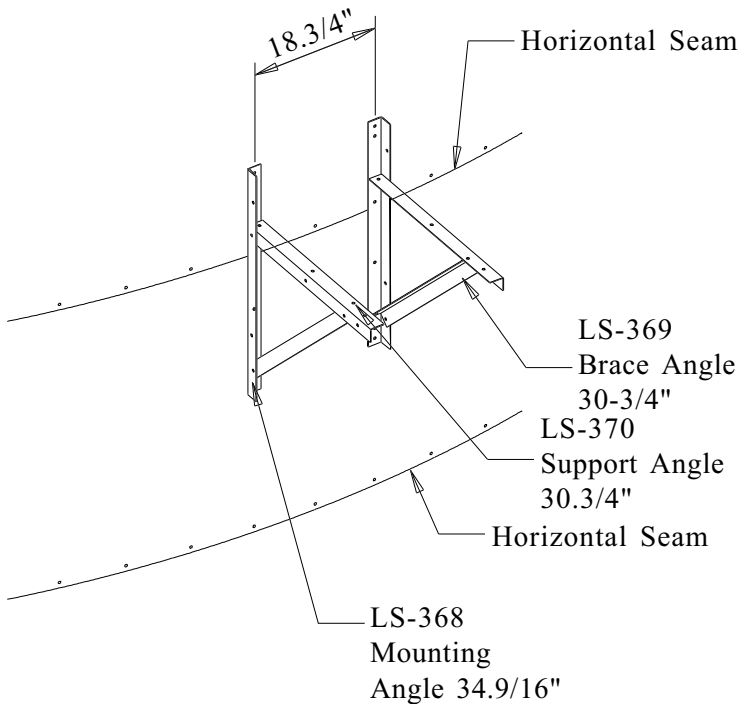




### LADDER PLACEMENT



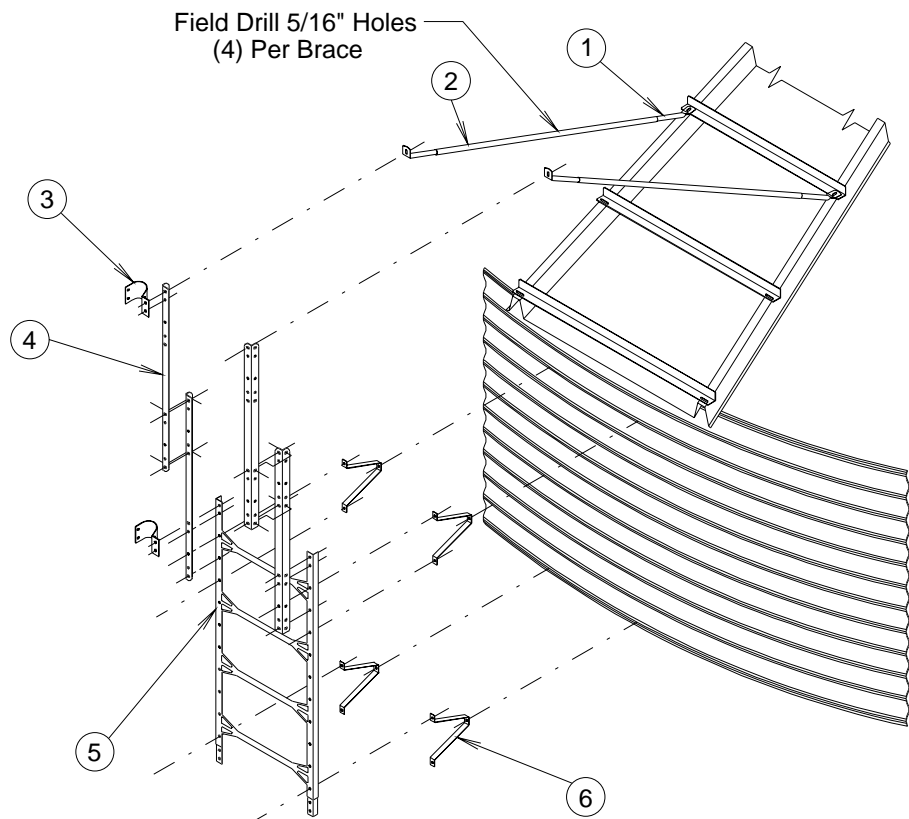
Ladder placement on the grain bin is very important at this time. Refer to the diagram at the left and follow the correct dimensions as shown. Ladder standoff must be located 8" below the horizontal seam. Check your ladder to make sure the ladder rung dimples are to the top surface. Attach ladder to the standoffs using the holes located 6 1/4" from the end of ladder section. Use 5/16" x 3/4" bin bolts for these connections. Now all standoffs must be located in horizontal seam holes (repeating every 44") until reaching the first rest platform. Refer to the section in these instructions that references the location of intermediate rest platforms for further hole locations.



### PLATFORM SUPPORT ASSEMBLY

When starting the platform support, you must attach the mounting angle to the sidewall of the grain bin. Refer back to the first page for the correct holes to be used by the platform. Attach the angle using 5/16" x 3/4" bolts and nuts, tighten at this time. Next, bolt the support angle to the mounting angle again using the proper holes. Attach the brace angle to the mounting angle as shown in the diagram at left. Use 5/16" x 3/4" bolts and nuts for all connections.





Note: Reference previous page for the first ladder standoff starting location.

REF. NO.	DESCRIPTION	PART NO.
1	END TUBE	LS-6616
2	CENTER TUBE	LS-6615
3	SAFETY CAGE BRACKET	LS-4349
4	SAFETY CAGE EXT. RAIL	LS-4355
5	LADDER SECTION	LDR-4002
6	OUTSIDE STANDOFF	LS-121

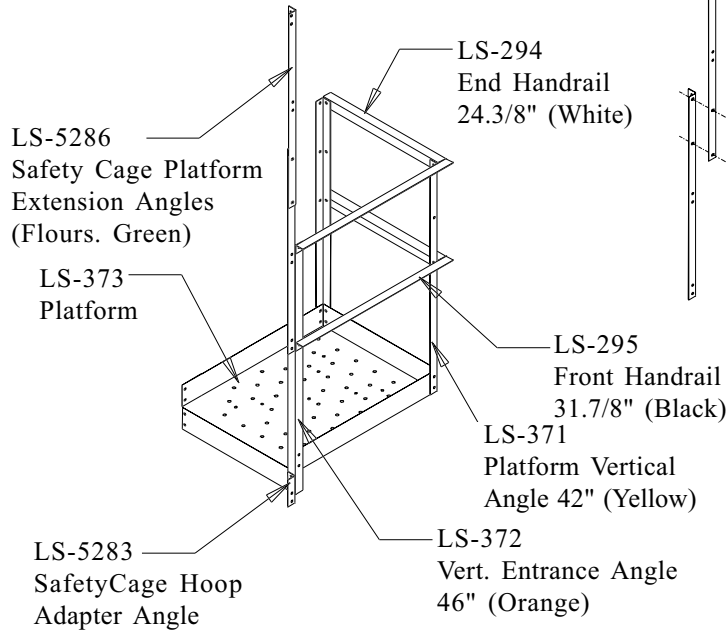
### **EXTENSION RAILS**

Extension rails are provided to extend the side rails of the ladder above the eave of the roof and to support the safety cage at that point. Four rails have been provided, two for each side of the ladder. Refer to diagram above for proper location and assembly of the extension rails in relation to the ladder. Use 5/16" x 3/4" bolts and nuts to attach the ladder. Tighten the bolts at this time.

### **EAVE ADJUSTABLE BRACES**

After extension rails are firmly attached, the adjustable braces must be attached at this time. A larger diameter tube and two smaller diameter tubes are used to make up one adjustable brace. Slip the smaller tubes inside the larger tube and attach one smaller tube to the top of the extension rail. Adjust the other smaller tube so the bottom of the flattened tube reaches the roof rib. Field drill four 5/16" holes through both large and small adjustable tubes and bolt together using 1/4" x 1.1/2" bolts and nuts. This will keep the adjustable brace from slipping.

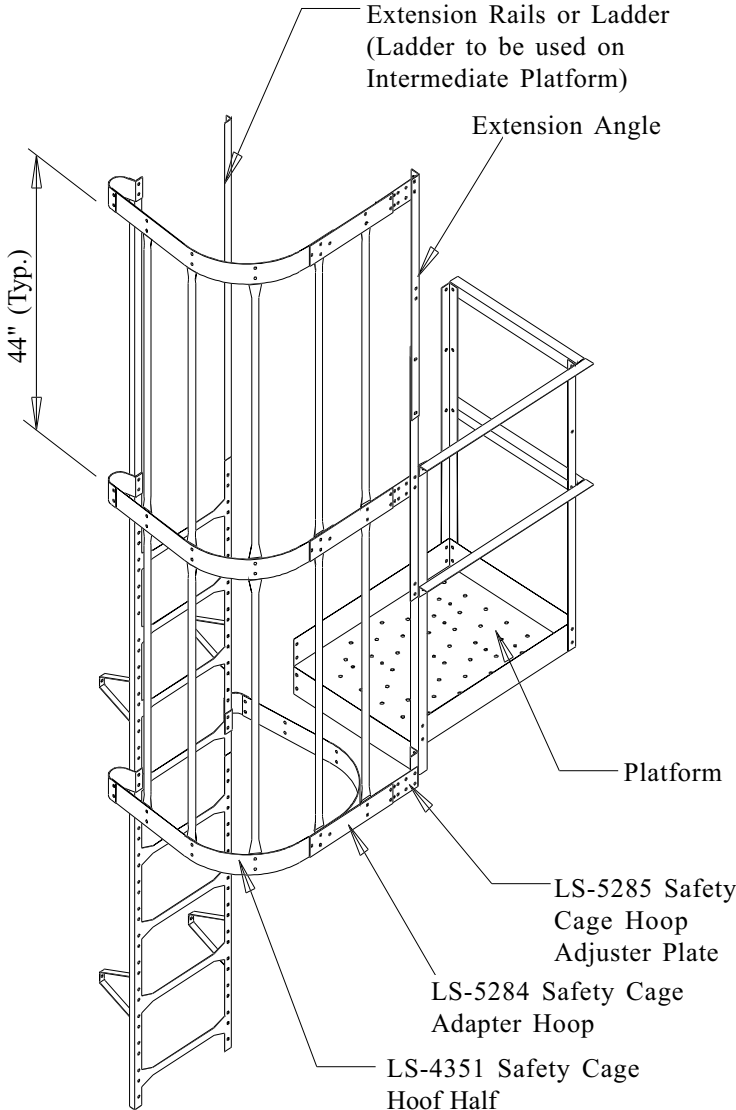
Attach the safety cage brackets to the extension rail and ladder as shown in the diagram. Brackets must be placed every 44". This will occur at every ladder joint. Use 5/16" x 3/4" bolts and nuts.



**EXTENSION ANGLE DETAIL**  
**PLATFORM AND HANDRAIL**  
**ASSEMBLY**

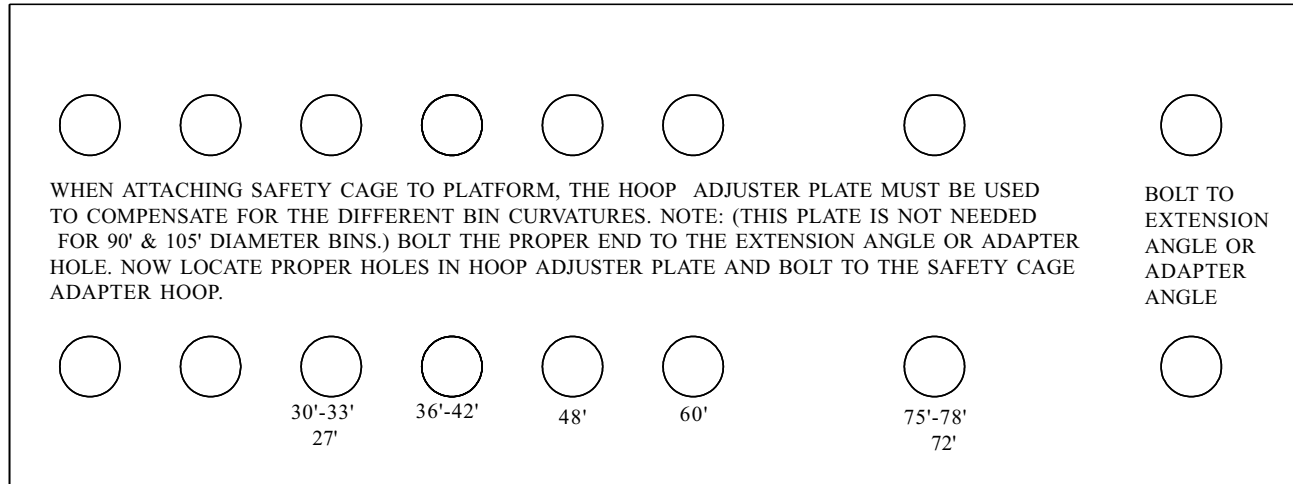
Start by attaching the platform itself to the platform support using 5/16" x 3/4" bolts and nuts. Place all the vertical angles in place, making sure to place the vertical entrance angle to the left front corner of the platform. After all vertical angles are in place attach front and side handrails as shown in the diagram. Use 5/16" x 3/4" bolts and nuts in all connections.

Safety cage platform extension angles and safety cage hoop adapter angle will be with the eave safety cage package. These can now be attached to the vertical entrance angle. Refer to the diagram at the left.



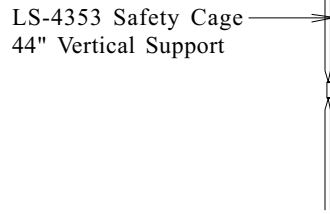
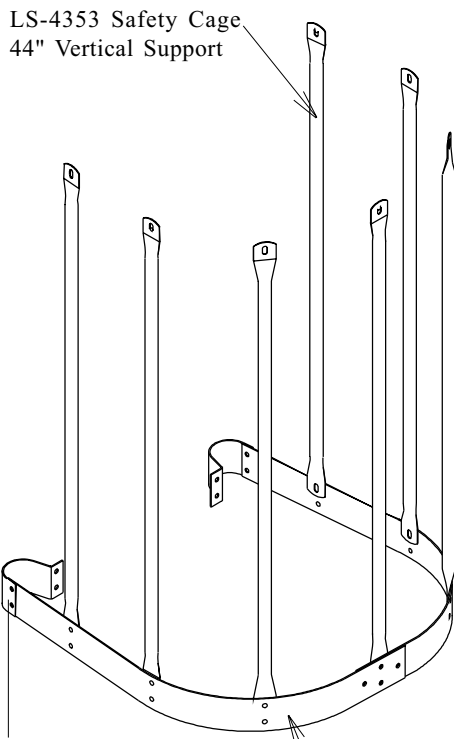
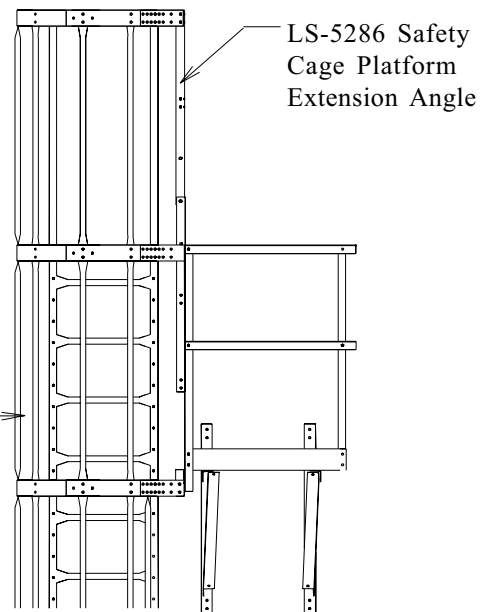
**EAVE SAFETY CAGE &**  
**INTERMEDIATE REST PLATFORM**

Before attaching any pieces to the ladder or platform some preassembly will be required. Take the safety cage hoop adjuster plate and the safety cage adapter hoop and bolt together using the proper holes, (as shown on following page.) Be sure the proper holes are used depending on the diameter of the grain bin. Be sure to use the 5/16" x 3/4" bolt with the head of the bolt to the inside of the safety cage. Using the improper holes will make the safety cage more difficult to assemble. You may now bolt this assembly to the safety cage hoop half, tighten bolts as you go. One of the assemblies will take 2 hoop halves and be positioned just below the platform as shown in the diagram. Take the assembly and attach to the safety cage bracket and to the platform extension angle or the hoop adapter angle. Refer to the diagram for more information. If holes don't align properly go back and make sure the ladder and platform are correctly positioned on grain bin in relationship to one another. Make any corrections necessary to complete the assembly as shown.



### EAVE SAFETY CAGE

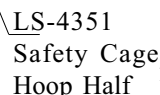
After all three hoop assemblies are in place you may attach the 44" vertical supports from hoop to hoop. This will require 10 supports, 5 between each set of hoops. Again use the truss head bolts with bolt head to the inside of safety cage.



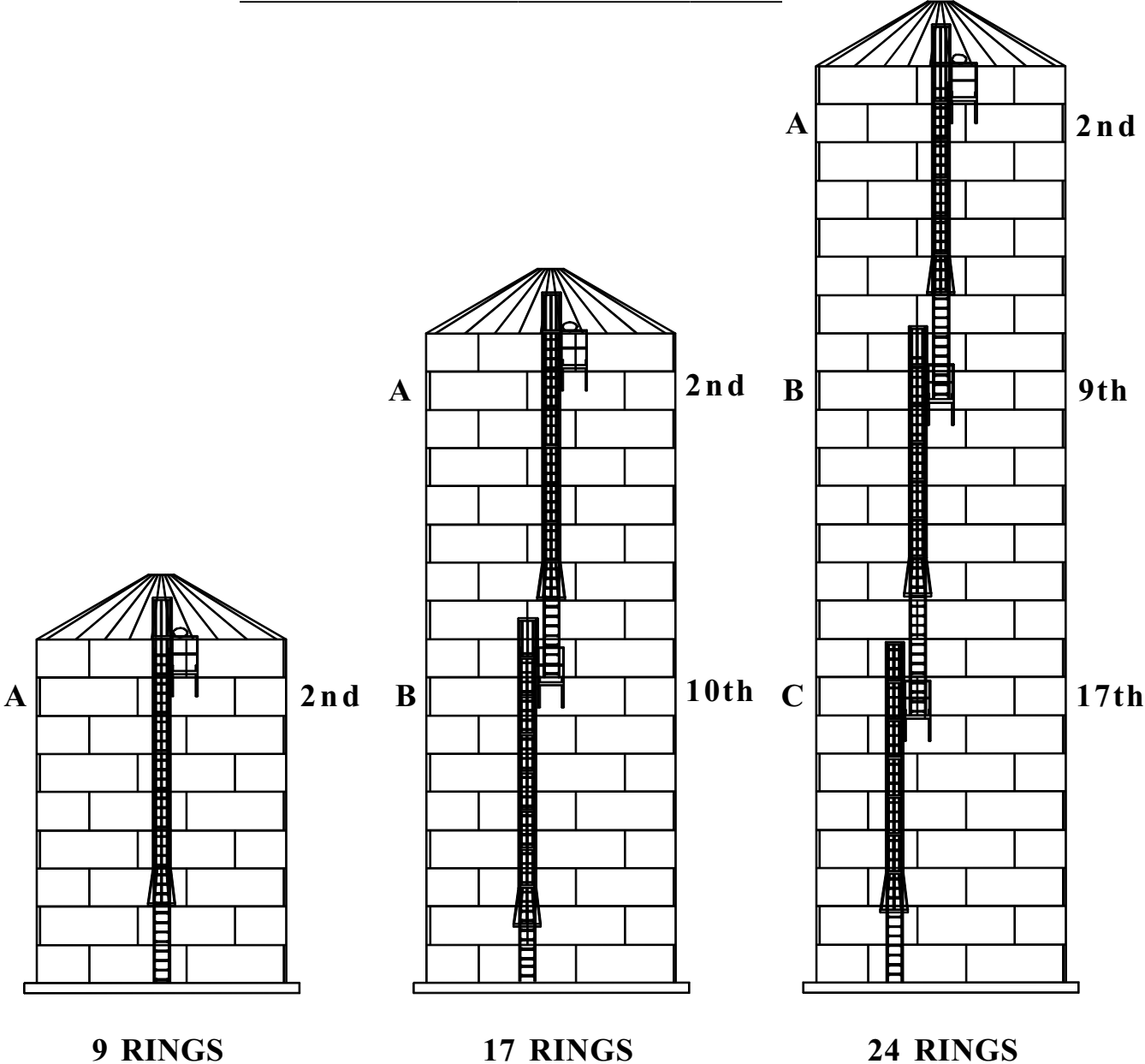
### SAFETY CAGE EXTENSION

The safety cage extension package is designed to be added on to the bottom of the existing safety cage above it. Attach the vertical support pieces to the existing hoop halves above using the 5/16" x 3/4" bolt and nuts. Fasten the package to the safety cage brackets and attach the bottom of the vertical supports to the hoop halves and tighten bolts. Continue to use the extension packages as the usage chart reflect on the following page.

Whereas you formerly had all extension packages bundled and listed under the LS-6365LB part number you will now have a combination of LS-6366LB (A package of two (2) extension kits) and LS-6365LB (The original single extension kit).



**4.00" INSIDE STIFFENED LADDER  
OFFSET AND PLATFORM LAYOUT**



Ladders, Safety Cages & Platforms



ITEM	LDR-4019	4 RINGS	LDR-4020	5 RINGS	LDR-4021	6 RINGS	LDR-4022	7 RINGS	LDR-4023	8 RINGS	LDR-4024	9 RINGS	LDR-4025	10 RINGS	LDR-4026	11 RINGS	LDR-4027	12 RINGS	LDR-4028	13 RINGS	LDR-4029	14 RINGS	LDR-4030	15 RINGS	LDR-4031	16 RINGS	LDR-4032	17 RINGS	LDR-4033	18 RINGS	LDR-4034	19 RINGS	LDR-4035	20 RINGS	LDR-4036	21 RINGS	LDR-4037	22 RINGS	LDR-4038	23 RINGS	LDR-4039	24 RINGS
	Platform Located in Ring		Ladder Section (LDR-4002)		Bell Safety Cage (LS-4364LB)		Safety Cage Extension		Platform Package		Eave Safety Cage (LS-5289)		Platform Located in Ring		Ladder Section (LDR-4002)		Bell Safety Cage (LS-4364LB)		Safety Cage Extension		Platform Package		Int. Safety Cage (LS-5290)		Platform Located in Ring		Ladder Section (LDR-4002)		Bell Safety Cage (LS-4364LB)		Safety Cage Extension		Platform Package		Int. Safety Cage (LS-5290)							
Platform Located in Ring	1-2	4	1-2	5	1-2	6	1-2	7	1-2	8	1-2	9	1-2	6	1-2	7	1-2	7	1-2	8	1-2	8	1-2	9	1-2	9	1-2	6	1-2	7	1-2	7	1-2	8	1-2	8	1-2	9	1-2	9		
Ladder Section (LDR-4002)	4	5	6	7	8	9	6	6	7	7	8	8	9	9	6	7	7	8	8	9	9	10	10	8	8	9	9	8	8	9	9	9	9	9	9	10	10					
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Safety Cage Extension	-	1	2	3	4	5	2	2	3	3	4	4	5	5	2	3	3	4	4	5	5	2	2	3	3	4	4	3	3	4	4	5	5	5	2	2						
Platform Package	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Eave Safety Cage (LS-5289)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
Platform Located in Ring													6-7	6-7	7-8	7-8	8-9	8-9	9-10	9-10	6-7	7-8	7-8	8-9	8-9	9-10	9-10															
Ladder Section (LDR-4002)													6	7	7	8	8	9	9	10	8	8	9	9	10	10																
Bell Safety Cage (LS-4364LB)													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1															
Safety Cage Extension													-	1	2	3	4	5	2	2	3	3	4	4	5	5	2															
Platform Package													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1															
Int. Safety Cage (LS-5290)													1	1	1	1	1	1	1	1	1	1	1	1	1	1	1															
Platform Located in Ring															12-13	13-14	14-15	15-16	15-16	16-17	17-18																					
Ladder Section (LDR-4002)															8	8	8	8	9	9	9																					
Bell Safety Cage (LS-4364LB)															1	1	1	1	1	1	1																					
Safety Cage Extension															3	3	3	3	4	4	4																					
Platform Package															1	1	1	1	1	1	1																					
Int. Safety Cage (LS-5290)															1	1	1	1	1	1	1																					

**4.00" INSIDE STIFFENED LADDER OFFSET CHART**

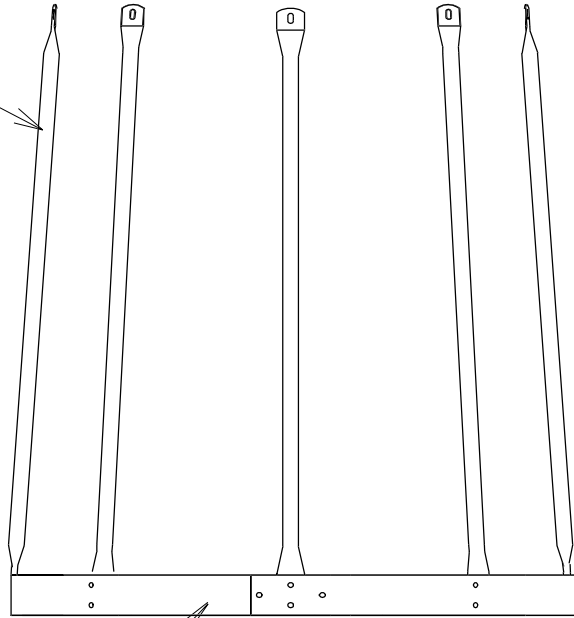
**LADDER, SAFETY CAGE, AND PLATFORM USAGE LOCATION CHART**

THE CHART ABOVE SHOULD BE IN CONJUNCTION WITH THE DIAGRAMS ON THE PREVIOUS PAGE. FOLLOW THE PROPER LETTER DESIGNATION FROM THE DIAGRAM TO THE CHART FINDING THE PROPER RING GRAIN BIN AND USE THE AMOUNTS OF LADDERS AND SAFETY CAGES SHOWN IN CHART.



## SAFETY CAGE BELL SECTIONS

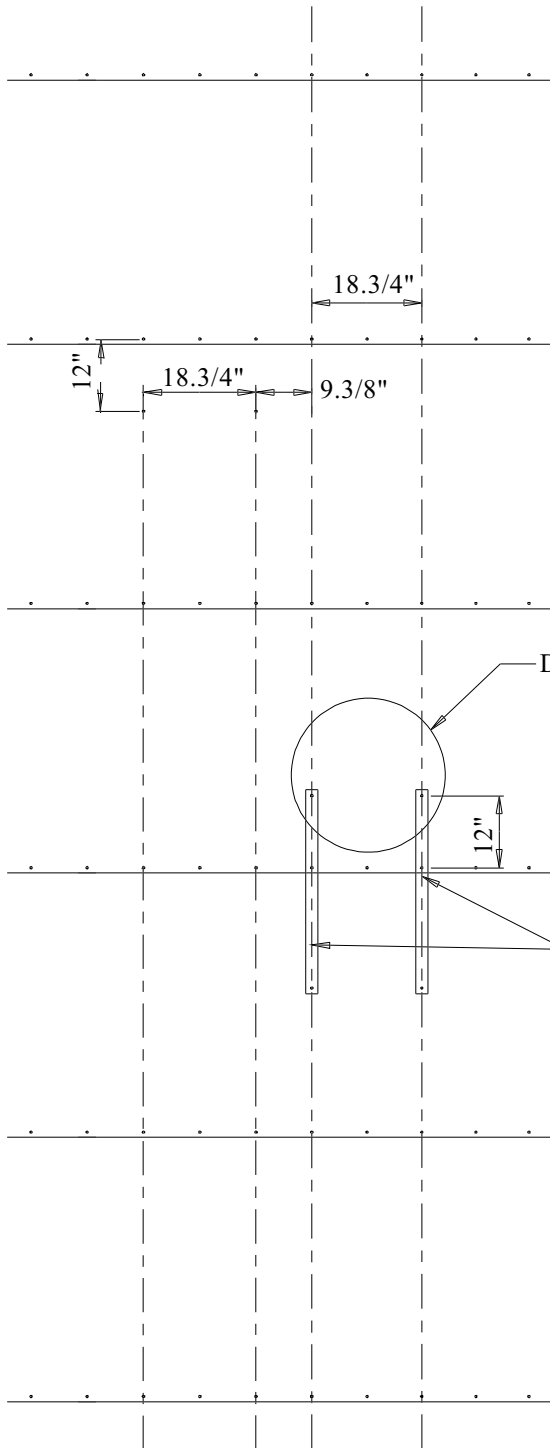
LS-4353 Safety Cage  
44" Vertical Support



LS-4352 Safety Cage Bell Hoop Half (Red)

## SAFETY CAGE BELL SECTIONS

The safety cage bell section is to be used at the point of termination of the safety cage just above the rest platforms or the concrete. Attach the vertical supports to the existing hoop halves. Now, fasten the bell safety cage brackets (red) to the ladder (some field drilling may be necessary at this point.) Attach the special bell safety cage hoop halves to the bell brackets and attach the vertical supports to the bell hoop halves. The vertical supports will have to be bent at the flat area to allow for the angle of the bell section.

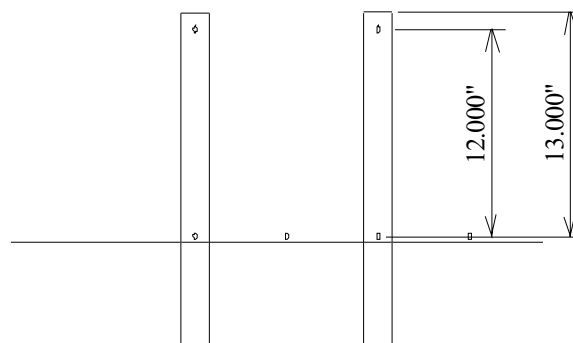


### **REST PLATFORM OFFSET LOCATION**

Follow the diagram at the left of the page very carefully to insure proper transition of ladder to platform to ladder offset. Some field drilling will be necessary at this point to locate the standoffs correctly. Pay special attention to the dimensions given. (Holes to be 3/8" dia.)

DETAIL "B"

PLATFORM MOUNTING ANGLES



**DETAIL "B"**

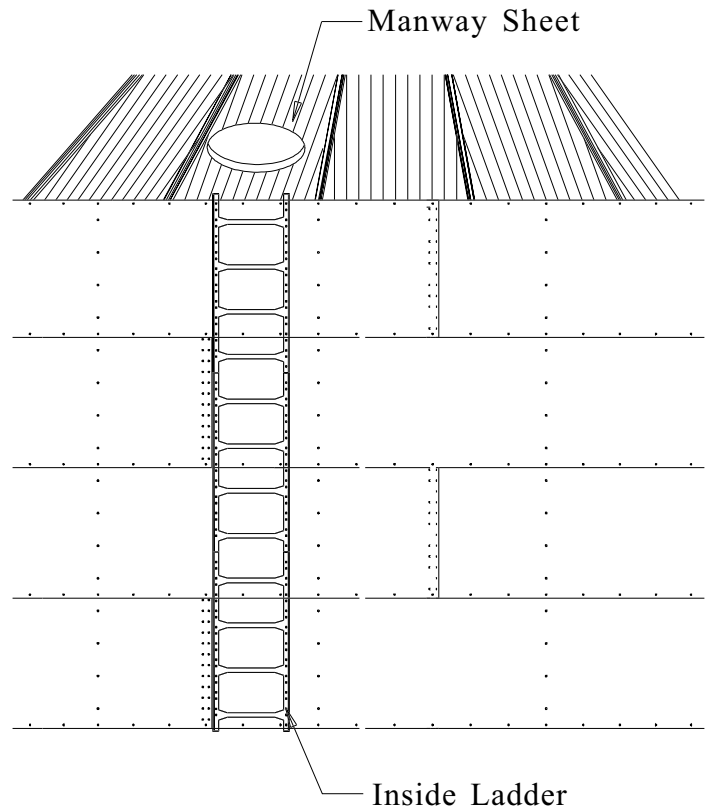
### **INTERMEDIATE SAFETY CAGE**

Follow the instructions referring to the eave safety cage package for this assembly. The only difference will be the extension rails in the eave safety cage package. This package will have the ladder instead.

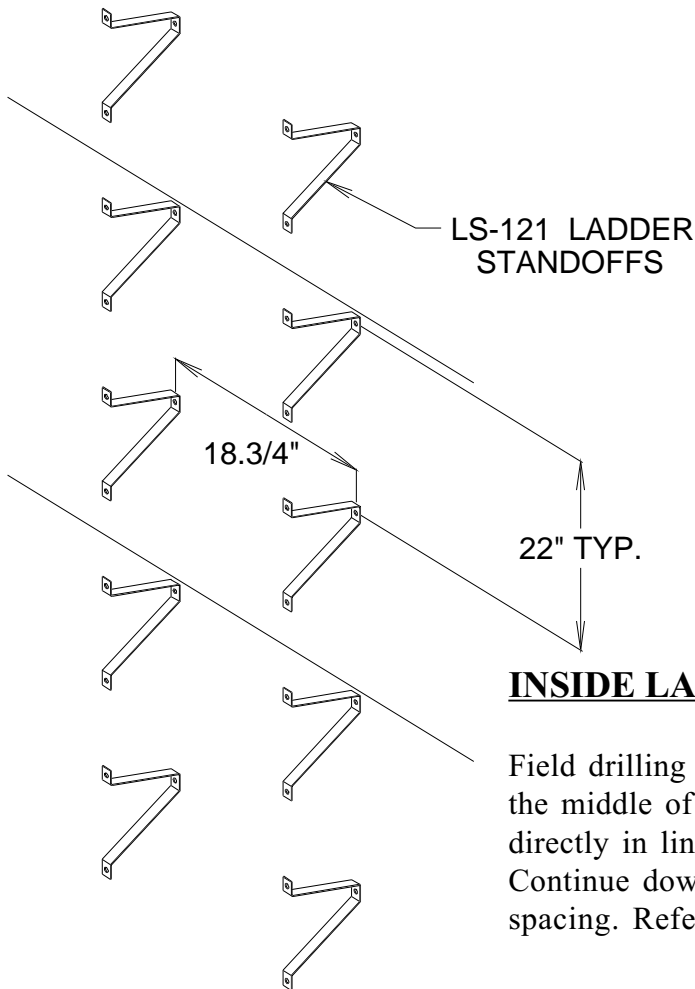


### INSIDE LADDER PLACEMENT

The inside ladder package includes the ladders and double the amount of standoffs. Begin by positioning the ladder directly under the manhole roof panel and place the standoffs every 22" vertically on the sidewall sheets using the horizontal seam holes for every other hole location. Use 5/16" x 3/4" bin bolts to attach the standoffs to the sidewall of the grain bin. Refer to the diagram on the right.



**INSIDE OF GRAIN BIN**



### INSIDE LADDER STANDOFFS REQUIREMENTS

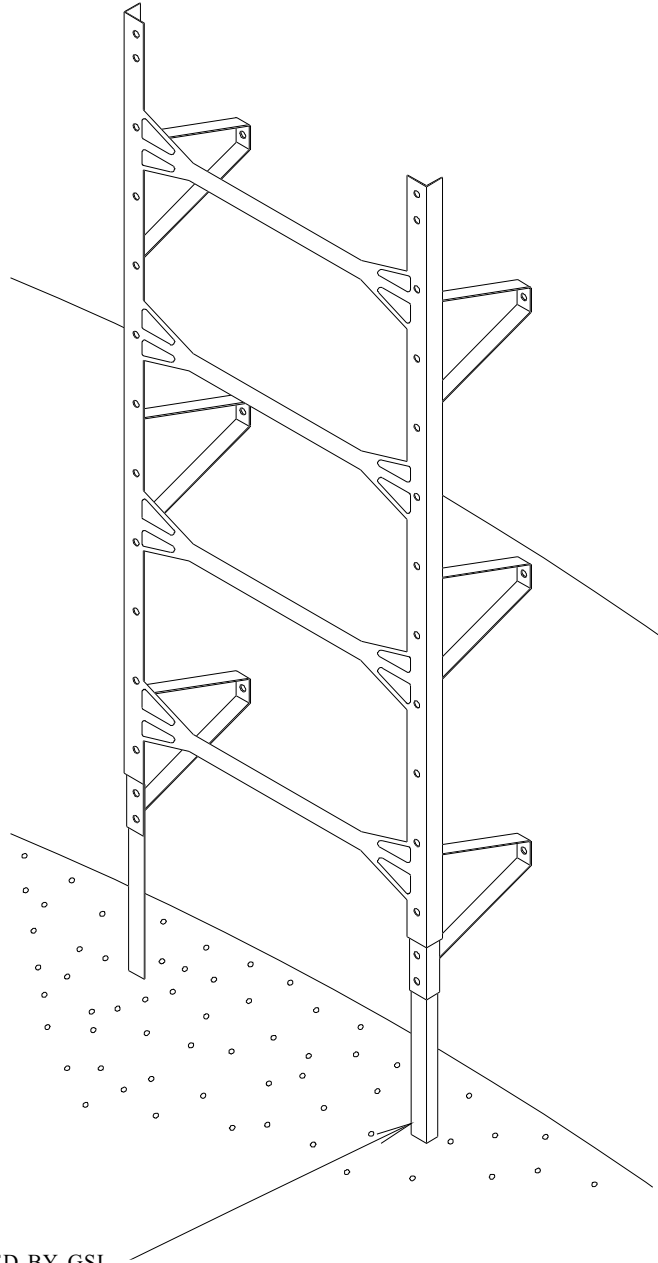
Field drilling will be necessary for the standoffs located in the middle of the sidewall sheet. Drill 2 holes 3/8" diameter directly in line with the horizontal seam holes 18 3/4" apart. Continue down the sidewall with standoffs at every 22" spacing. Refer to the diagrams at the left.





## INSIDE LADDER SUPPORTS

After completing the inside ladder it will be necessary to support the bottom of the ladder to the concrete. Depending on the actual installation, the amount of support may vary. The supports are not supplied by Grain Systems. Usually the supports can be made of 1" x 1" x 1/8" angle iron bolted directly to the ladder using 2 bolts 5/16" x 1". If a bin sweep is to be used in the grain bin, other considerations may be necessary to assure there is no interference with the equipment.





**THIS SECTION  
FOR 4.00"  
CORRUGATED  
GRAIN BINS  
  
OUTSIDE STIFFENED**

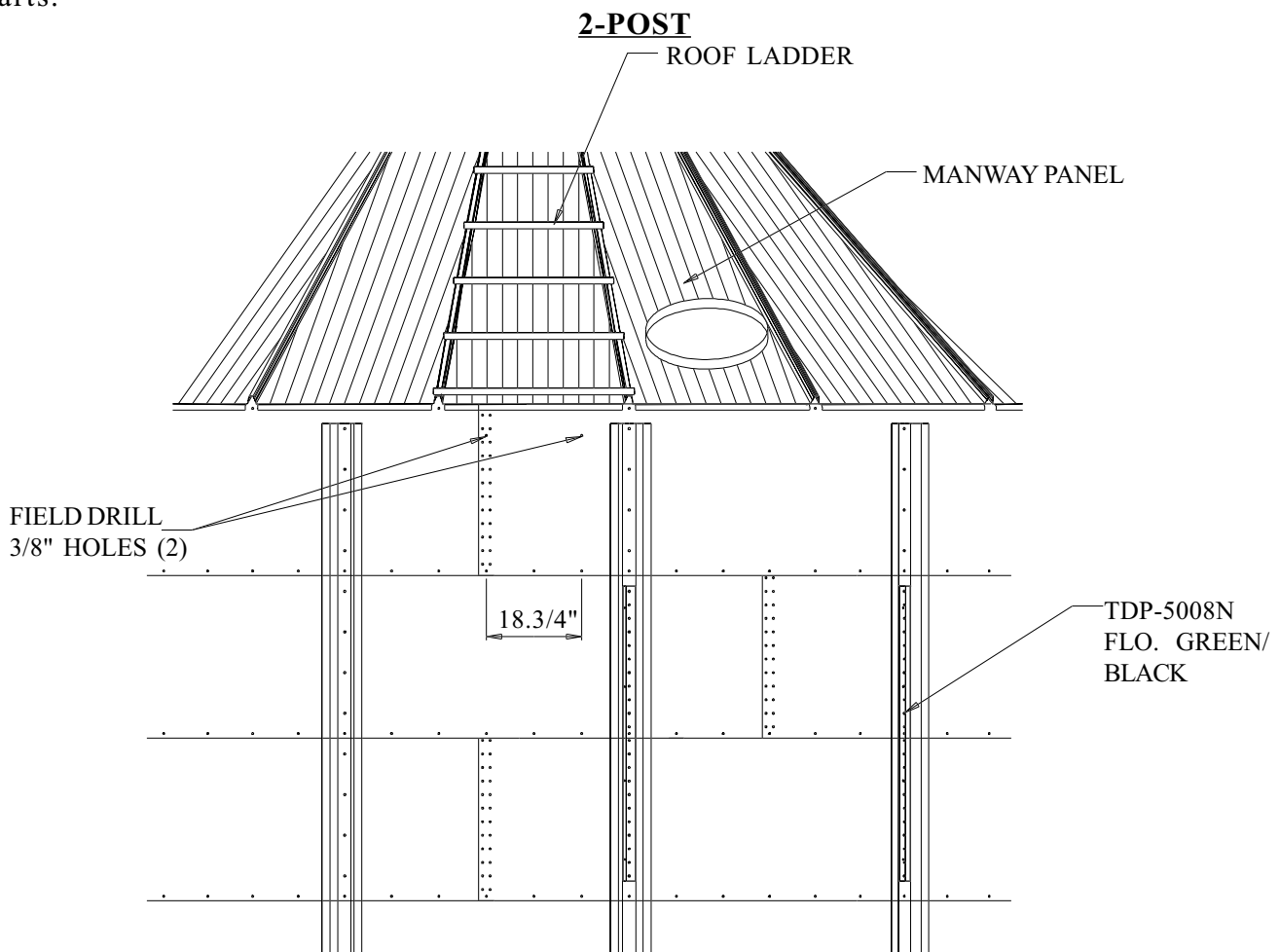


## LADDER SAFETY CAGE, AND PLATFORM INSTRUCTIONS

All packages have been structured with the correct components for each ring height grain bin from 9 ring to 14 ring. Be sure and follow the complete instruction sheets for correct placement of parts. Failure to do so may result in improper fit of parts or shortage of parts. Read through the complete set of instructions before proceeding with erection of grain bin. Considerable thought must be given as to location of ladders and platforms in relation to other equipment and structures.

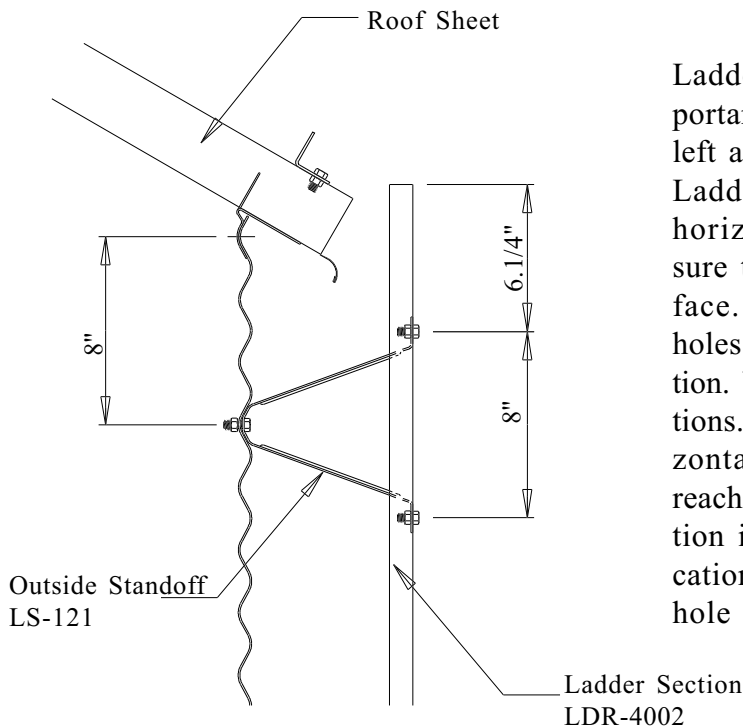
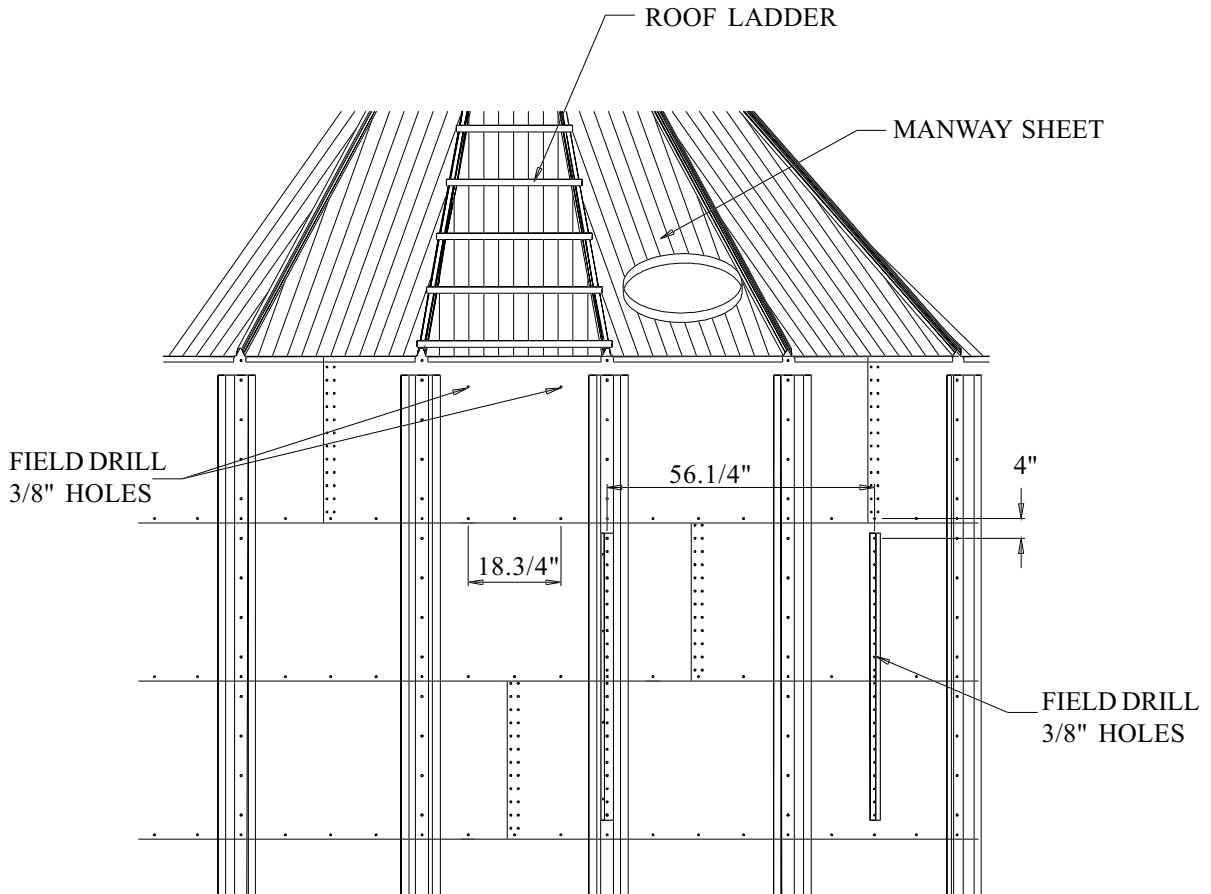
### STARTING LOCATION OF LADDERS

Ladder placement is very critical as to assure proper fit of all parts later on as safety cage is bolted in place. Locate the proper place of roof ladder and manway this will establish the location of the ladder. Ladder must be centered directly below the roof ladder. Refer to the diagram below for proper location of field drilled holes ( $3/8$ "). Holes must be  $18\ 3/4$ " apart and 8" below the top horizontal row of holes directly in line with the holes pre-punched in the horizontal seam for the first 2 ladder standoff brackets. The diagrams also show that the platform uses stiffener holes. Both platform vertical support angles must be located in the stiffener holes on 2-post tanks and 1 vertical support angles in stiffener holes on 3-post tanks, as shown in details. These dimensions and locations are very critical to assure proper fit of all parts.



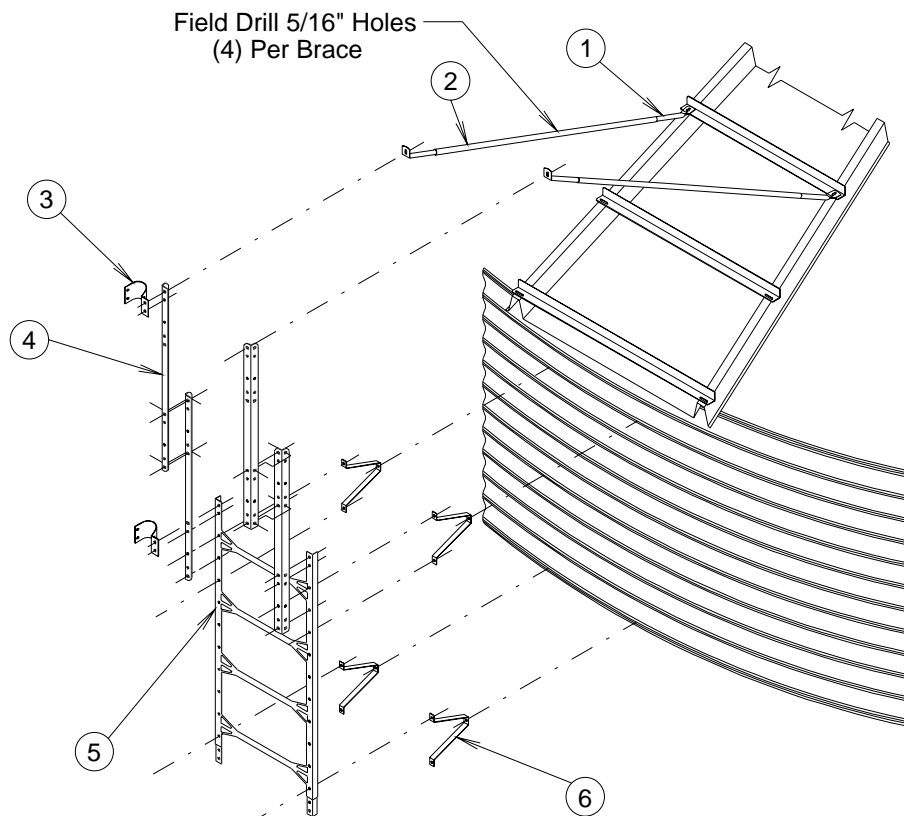


### 3 - POST



### LADDER PLACEMENT

Ladder placement on the grain bin is very important at this time. Refer to the diagram at the left and follow the correct dimensions as shown. Ladder standoff must be located 8" below the horizontal seam. Check your ladder to make sure the ladder rung dimples are to the top surface. Attach ladder to the standoffs using the holes located 6 1/4" from the end of ladder section. Use 5/16" x 3/4" bin bolts for these connections. Now all standoffs must be located in horizontal seam holes (repeating every 44") until reaching the first rest platform. Refer to the section in these instructions that references the location of intermediate rest platforms for further hole locations.



REF. NO.	DESCRIPTION	PART NO.
1	END TUBE	LS-6616
2	CENTER TUBE	LS-6615
3	SAFETY CAGE BRACKET	LS-4349
4	SAFETY CAGE EXT. RAIL	LS-4355
5	LADDER SECTION	LDR-4002
6	OUTSIDE STANDOFF	LS-121

Note: Reference previous page for the first ladder standoff starting location.

### **EXTENSION RAILS**

Extension rails are provided to extend the side rails of the ladder above the eave of the roof and to support the safety cage at that point. Four rails have been provided, two for each side of the ladder. Refer to diagram above for proper location and assembly of the extension rails in relation to the ladder. Use 5/16" x 3/4" bolts and nuts to attach the ladder. Tighten the bolts at this time.

### **EAVE ADJUSTABLE BRACES**

After extension rails are firmly attached, the adjustable braces must be attached at this time. A larger diameter tube and two smaller diameter tubes are used to make up one adjustable brace. Slip the smaller tubes inside the larger tube and attach one smaller tube to the top of the extension rail. Adjust the other smaller tube so the bottom of the flattened tube reaches the roof rib. Field drill four 5/16" holes through both large and small adjustable tubes and bolt together using 1/4" x 1.1/2" bolts and nuts. This will keep the adjustable brace from slipping.

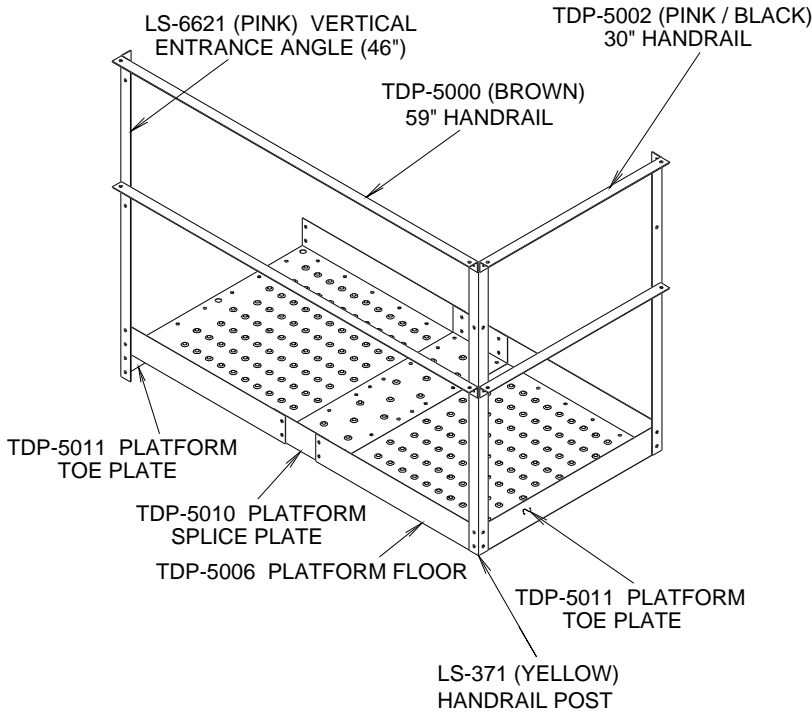
Attach the safety cage brackets to the extension rail and ladder as shown in the diagram. Brackets must be placed every 44". This will occur at every ladder joint. Use 5/16" x 3/4" bolts and nuts.



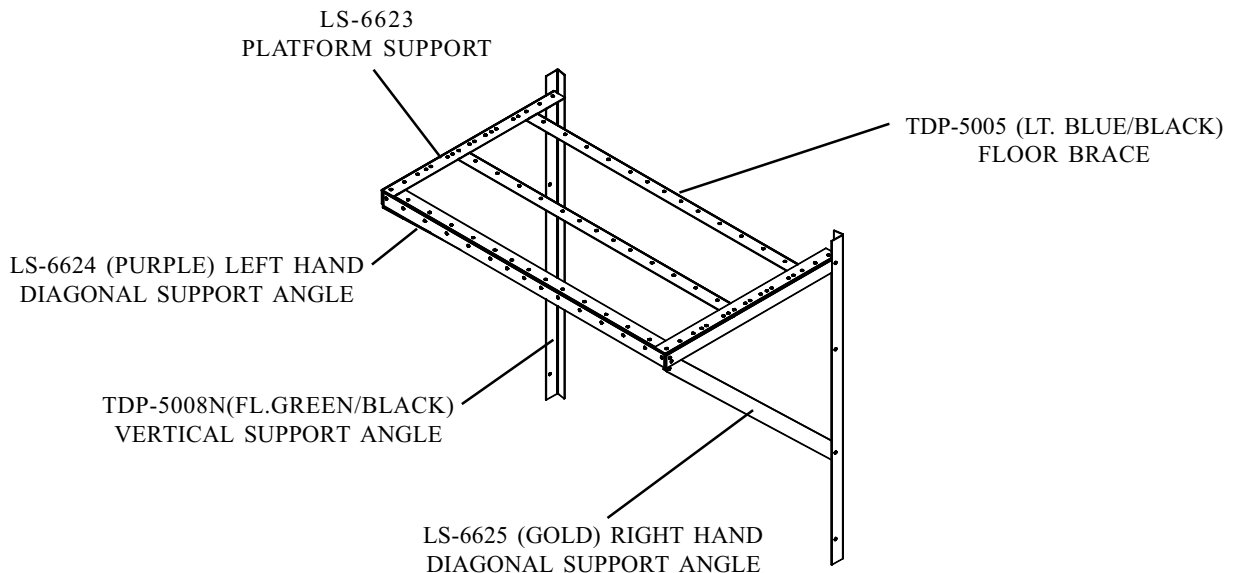
### PLATFORM ASSEMBLY

**NOTE: THE PLATFORM SUPPORTS SHOULD BE MOUNTED ON THE BIN FIRST. THE PLATFORM FLOOR SHOULD THEN BE ASSEMBLED ONTO THE SUPPORT FRAME.**

Assemble the platform support frame using 5/16" x 3/4" truss head bolts and nuts. When attaching vertical supports to stiffeners or sidewall, locate the vertical supports according to the instructions on previous pages. Now, proceed to the platform floor and floor splice. Align holes on platform floor with the holes on platform supports and bolt together using 5/16" x 3/4" truss head bolts and nuts. Be sure and attach platform toe plates at the same time you attach the platform floor.



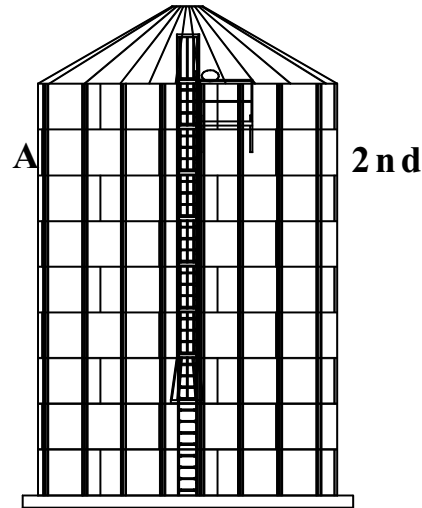
**NOTE:** On 18' and smaller 3 post tanks, move platform support angles and diagonal support angles away from wall and field drill vertical support angle to allow stiffener clearance.



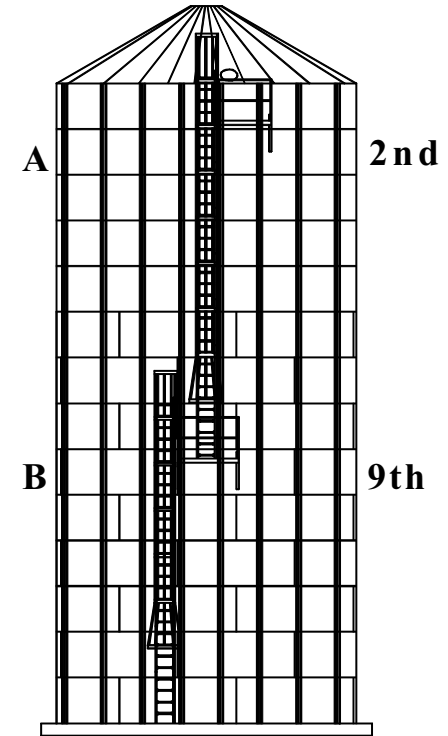
### 4.00" OUTSIDE STIFFENED LADDER OFFSET AND PLATFORM LAYOUT



ITEM	6 RINGS		7 RINGS		8 RINGS		9 RINGS		10 RINGS		11 RINGS		12 RINGS		13 RINGS		14 RINGS	
	LDR-4019	LDR-4020	LDR-4021	LDR-4022	LDR-4023	LDR-4024	LDR-4025	LDR-4026	LDR-4027	LDR-4028	LDR-4029	LDR-4030	LDR-4031	LDR-4032	LDR-4033	LDR-4034	LDR-4035	LDR-4036
<b>A</b> Platform Located in Ring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ladder Section (LDR-4002)	5	5	6	7	7	8	9	6	6									
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1									
Safety Cage Extension	-	1	2	3	4	5	2	2	3									
Platform Package	1	1	1	1	1	1	1	1	1									
Eave Safety Cage (LS-5289)	1	1	1	1	1	1	1	1	1									
<b>B</b> Platform Located in Ring	9																	
Ladder Section (LDR-4002)	6																	
Bell Safety Cage (LS-4364LB)	1																	
Safety Cage Extension	1																	
Platform Package	1																	
Eave Safety Cage (LS-5289)																		



**9 RINGS**



**14 RINGS**

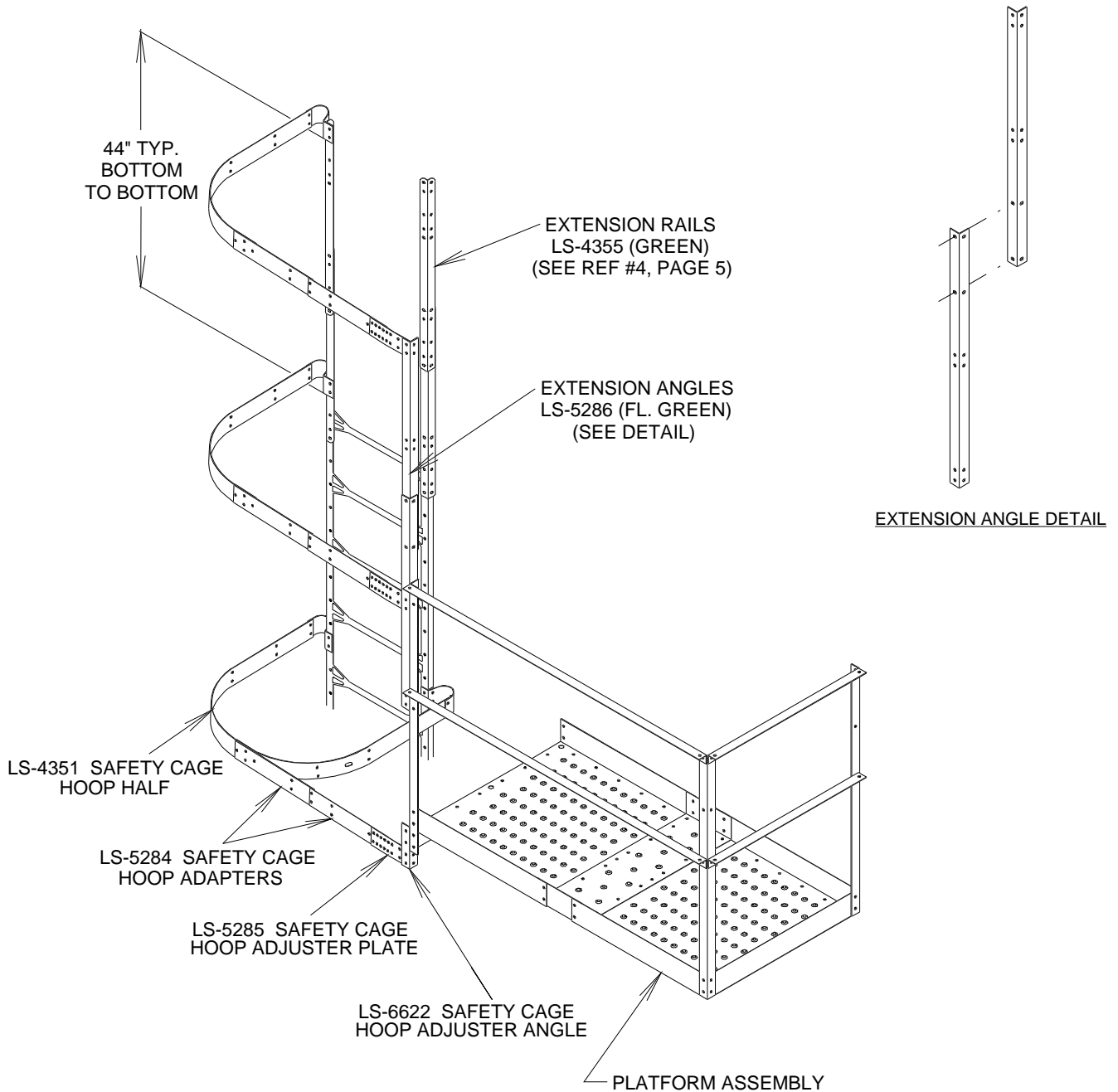
**LADDER, SAFETY CAGE, AND PLATFORM USAGE LOCATION CHART**

THE CHART ABOVE SHOULD BE IN CONJUNCTION WITH THE DIAGRAMS ON THE PREVIOUS PAGE. FOLLOW THE PROPER LETTER DESIGNATION FROM THE DIAGRAM TO THE CHART FINDING THE PROPER RING GRAIN BIN AND USE THE AMOUNTS OF LADDERS AND SAFETY CAGES SHOWN IN CHART.



## EAVE SAFETY CAGE

Before attaching any pieces to the ladder or platform, some preassembly will be required. Take the safety cage hoop adjuster plates and bolt them onto the extension angle as shown. Bolt the safety cage adapter hoops and safety cage hoop halves together using the proper holes, as shown. Be sure to use the 5/16" x 3/4" bolt with the head of the bolt to the inside of the safety cage. You may now bolt these assemblies to the safety cage brackets and hoop adjuster plates, tighten bolts as you go. One of the assemblies will take 2 hoop halves and be positioned just below the platform as shown in the diagram.

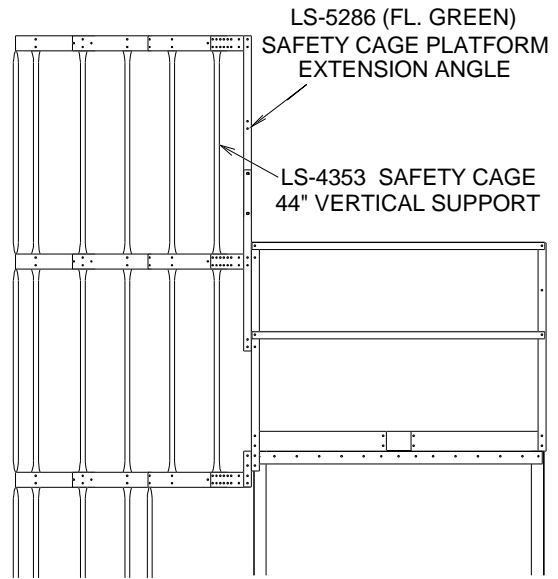






## VERTICAL SUPPORTS

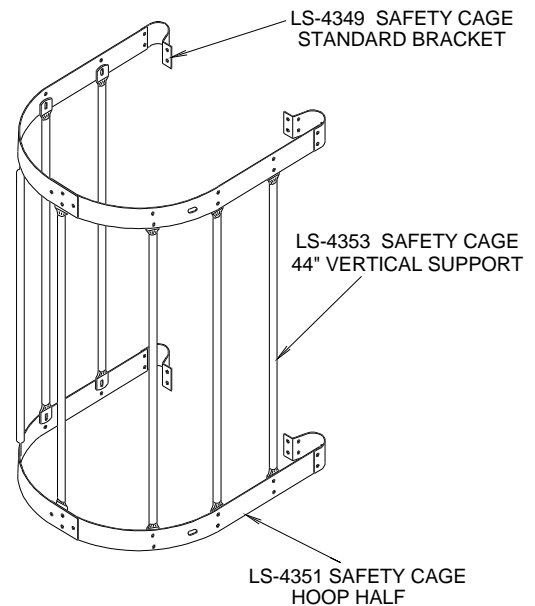
After all three hoop assemblies are in place you may attach the 44" vertical supports from hoop assembly to hoop assembly, as shown. This will require 14 supports, 7 between each set of hoops. Bolts should have the head of the bolt to the inside of the safety cage.



## SAFETY CAGE

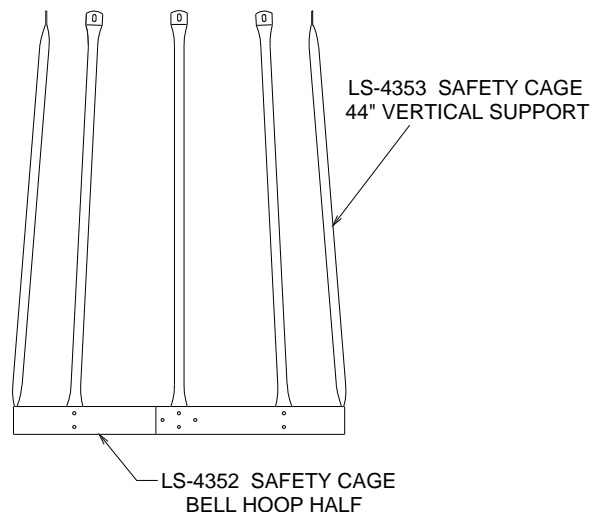
Attach the vertical support pieces to the existing hoop halves above using the 5/16" x 3/4" bolts and nuts (with the heads on the inside of the cage). Fasten two hoop halves together and to the safety cage brackets. Bolt the safety cage brackets to the ladder, the supports to the hoop halves and tighten bolts. Continue in the same manner.

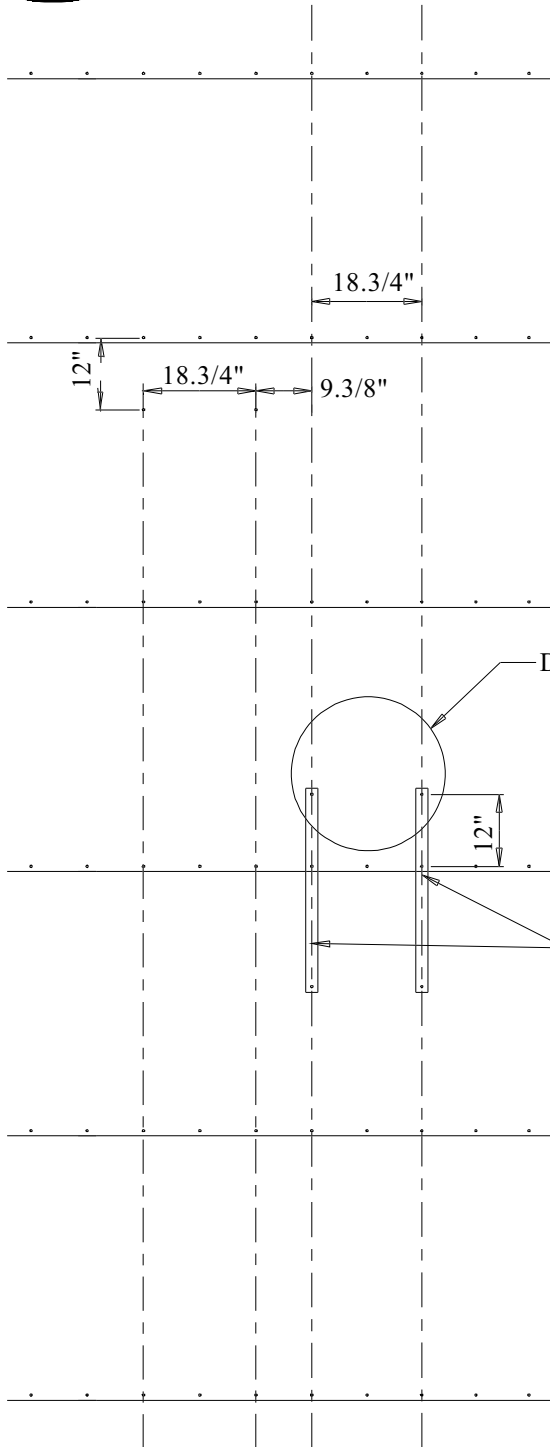
Whereas you formerly had all extension packages bundled and listed under the LS-6365LB part number you will now have a combination of LS-6366LB (A package of two (2) extension kits) and LS-6365LB (The original single extension kit).



## 44" SAFETY CAGE BELL SECTION

The safety cage bell section is to be used at the point of termination of the safety cage just above the concrete or platform (generally 7 to 8 feet). Attach the vertical supports to the existing hoop halves. Attach the special bell safety cage hoop halves to the brackets and attach to the vertical supports. Fasten the safety cage brackets to the ladder (some field drilling may be required). Tighten all bolts at this time. The vertical supports will have to be bent at the flat area to allow for the angle of bell section.



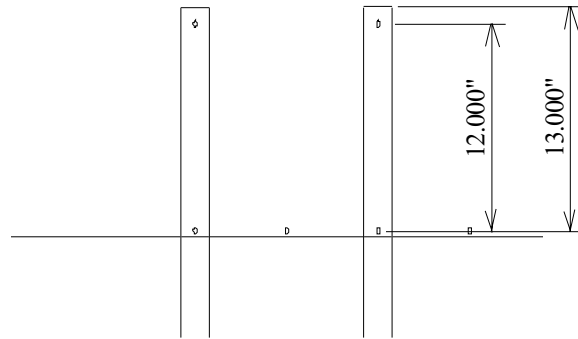


### REST PLATFORM OFFSET LOCATION

Follow the diagram at the left of the page very carefully to insure proper transition of ladder to platform to ladder offset. Some field drilling will be necessary at this point to locate the standoffs correctly. Pay special attention to the dimensions given. (Holes to be 3/8" dia.)

DETAIL "B"

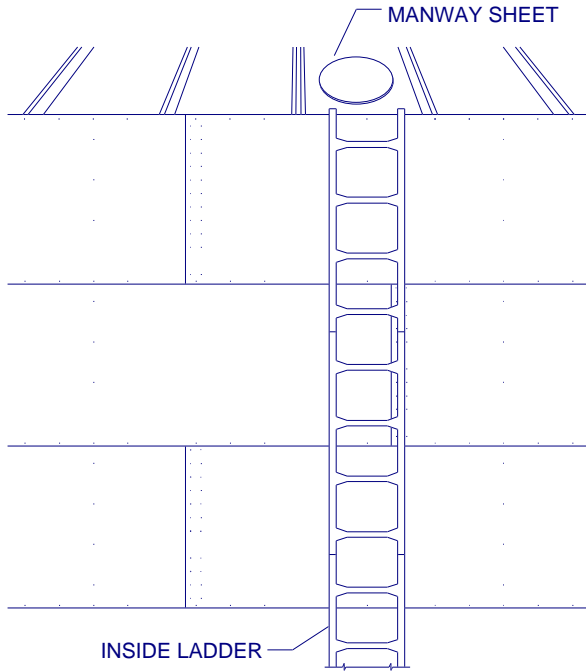
PLATFORM MOUNTING ANGLES



**DETAIL "B"**

### INTERMEDIATE SAFETY CAGE

Follow the instructions referring to the eave safety cage package for this assembly. The only difference will be the extension rails in the eave safety cage package. This package will have the ladder instead.



INSIDE OF GRAIN BIN

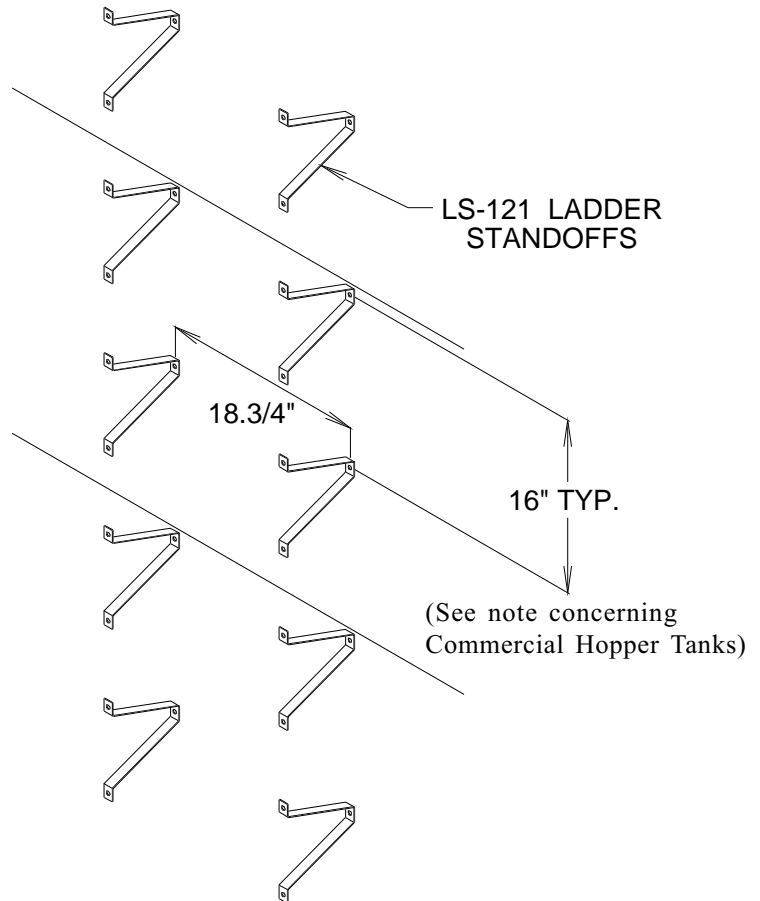
### INSIDE LADDER PLACEMENT

The inside ladder package includes the ladder and double the amount of standoffs as the outside ladder package. Begin by positioning the ladder directly under the manhole roof panel and place the standoffs every 22" vertically on the sidewall sheets using the horizontal seam holes for every other hole location. Use 5/16" x 3/4" bin bolts to attach the standoffs to the sidewall of the grain bin. Refer to the diagrams to the left and below.

### INSIDE LADDER STANDOFF REQUIREMENTS

Field drilling will be necessary for the standoffs located in the middle of the sidewall sheet. Drill 2 holes 3/8" diameter directly in line with the horizontal seam holes 18.3/4" apart. Continue down the sidewall with standoffs at every 22" spacing. Refer to the diagram.

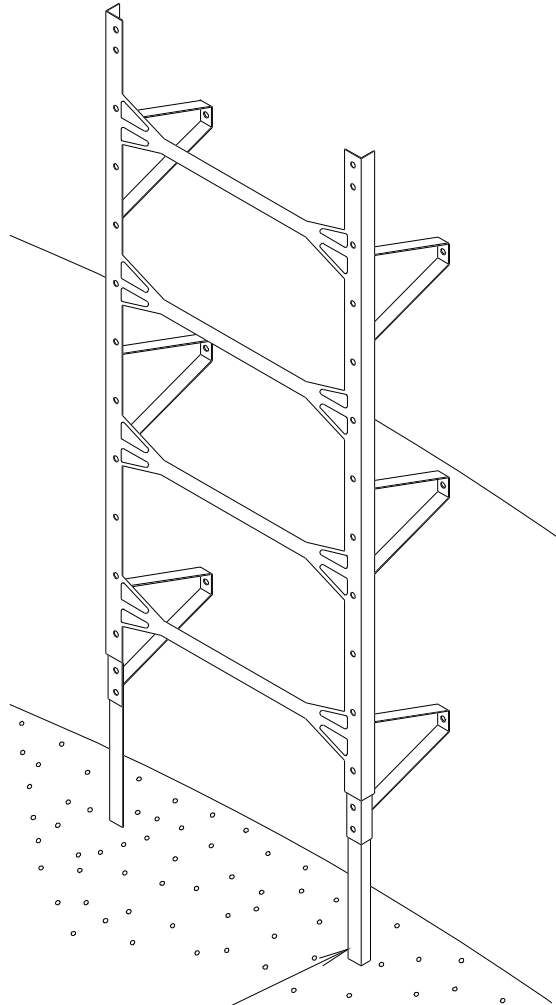
NOTE: In Commercial Hopper Tanks with inside ladders install brackets at 8" spacing in the bottom two rings.





## INSIDE LADDER SUPPORTS

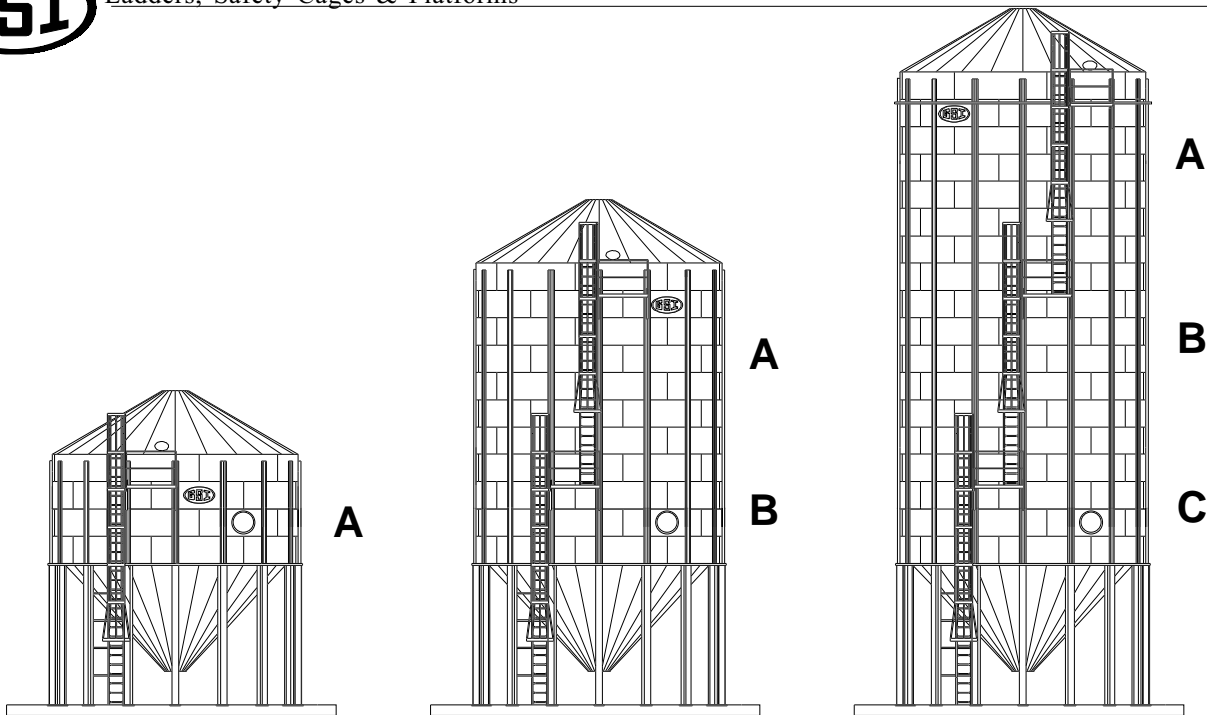
After completing the inside ladder it will be necessary to support the bottom of the ladder to the concrete. Depending on the actual installation, the amount of support may vary. The supports are not supplied by Grain Systems. Usually the supports can be made of 1" x 1" x 1/8" angle iron bolted directly to the ladder using 2 bolts 5/16" x 1". If a bin sweep is to be used in the grain bin, other considerations may be necessary to assure there is no interference with the equipment.



SUPPORTS ARE NOT SUPPLIED BY GSI



**THIS SECTION  
FOR 2.66" CORRUGATED  
COMMERCIAL HOPPER  
(NCHT) GRAIN BINS**



SECTION A

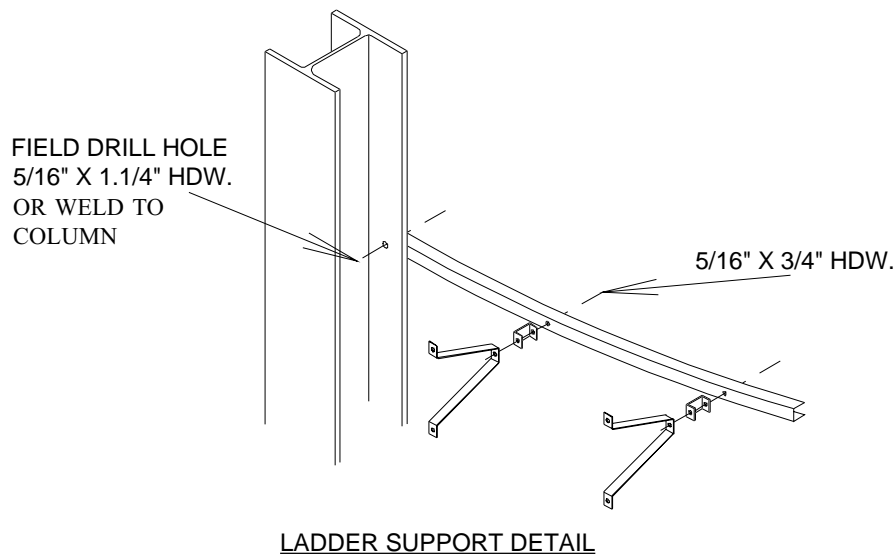
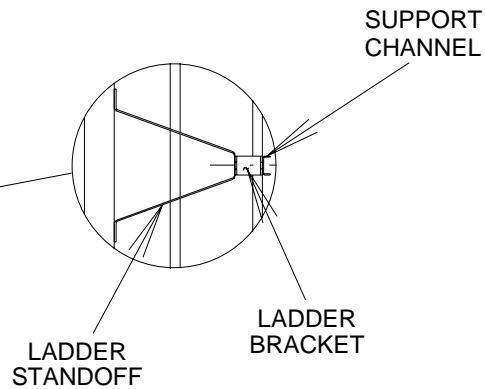
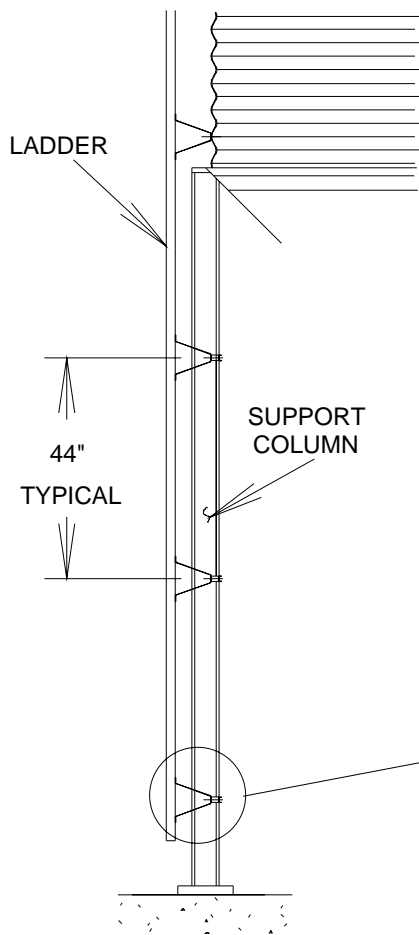
ITEM	LSO-25-06	25'-6" EAVE	LSO-29-02	29'-2" EAVE	LSO-32-10	32'-10" EAVE	LSO-36-06	36'-6" EAVE	LSO-40-02	40'-2" EAVE	LSO-43-10	43'-10" EAVE	LSO-47-06	47'-6" EAVE	LSO-51-02	51'-2" EAVE	LSO-54-10	54'-10" EAVE	LSO-58-06	58'-6" EAVE	LSO-62-02	62'-2" EAVE	LSO-65-10	65'-10" EAVE	LSO-69-06	69'-6" EAVE	LSO-73-02	73'-2" EAVE	LSO-76-10	76'-10" EAVE	LSO-80-06	80'-6" EAVE	LSO-84-02	84'-2" EAVE	
Ladder Section (LDR-4002)	7	8	5	5	6	6	7	7	8	8	6	6	7	7	8	8	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8		
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Safety Cage Extension	3	4	1	1	2	2	3	3	4	4	2	2	3	3	4	4	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4		
Platform Pkg. (LS-6618)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Eave Sfty. Cage (LS-6619)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Ladder Section (LDR-4002)			5	6	6	7	7	8	8	9	6	7	7	8	8	9	6	7	7	8	8	9	6	7	7	8	8	9	6	7	7	8	8	9	
Bell Safety Cage (LS-4364LB)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Safety Cage Extension			1	2	2	3	3	4	4	5	2	3	3	4	4	5	2	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Platform Pkg. (LS-6618)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Int. Sfty. Cage (LS-6620)			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ladder Section (LDR-4002)											7	7	7	8	8	9	9																		
Bell Safety Cage (LS-4364LB)											1	1	1	1	1	1	1																		
Safety Cage Extension											3	3	3	4	4	5	5																		
Platform Pkg. (LS-6618)											1	1	1	1	1	1	1																		
Int. Sfty. Cage (LS-6620)											1	1	1	1	1	1	1																		

NOTE:  
FIRST PLATFORM IS LOCATED  
IN THE SECOND RING FROM  
THE TOP.

SECTION C



Bin Diameter	Hopper Slope	No. of Support Channels	Hopper Ladder Brackets
15'-21'	45	3	6
15'-18'	60	5	10
21'	60	6	12
24'	45	4	8
27'-30'	40	4	8
27'-30'	45	5	10
36'	40	5	10





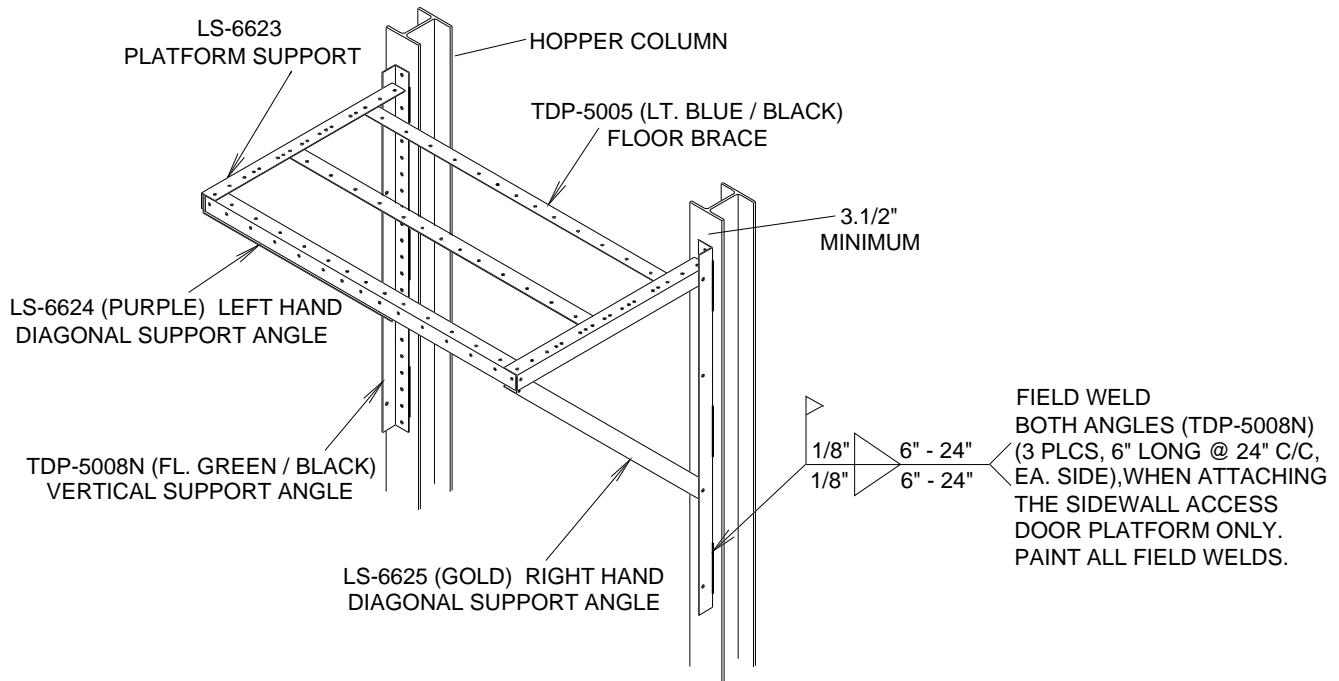
## ACCESS TO SIDEWALL DOOR ON COMMERCIAL HOPPER TANK

THE METHOD OF ACCESSING THE SIDEWALL DOOR WILL DEPEND ON HOW THE SYSTEM WAS ORDERED.

1. IF A SEPARATE ACCESS PACKAGE FOR THE SIDEWALL DOOR (ONE OF THE LSCHT PACKAGES) YOU WILL SIMPLY INSTALL THE SEPARATE RUN OF LADDER, HOPPER LADDER SUPPORTS AND PLATFORM AS SHOWN IN PREVIOUS DETAILS, WITHOUT REGARD TO THE STANDARD ROOF MANWAY LADDER PACKAGE.

2. IF THEY ARE USING THE LS0-ACESPLTF PACKAGE TO ACCESS YOUR SIDEWALL DOOR YOU MUST PRECISELY LAYOUT THE ROOF MANWAY AND SIDEWALL MANWAY LOCATIONS SO THAT THE SIDEWALL DOOR MAY BE ACCESSED FROM THE LADDER PATH OF ASCENT.

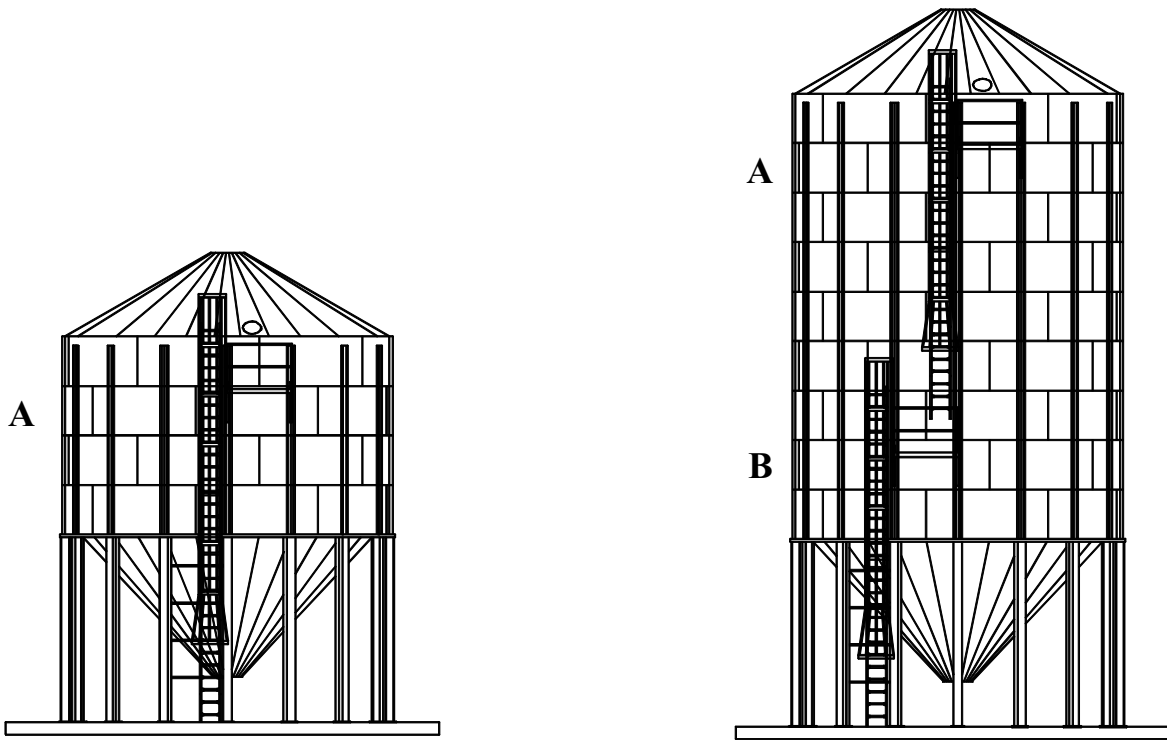
3. DOOR ACCESS PLATFORMS WILL BE MOUNTED DIRECTLY TO THE HOPPER TANK COLUMNS. (AS SHOWN BELOW).





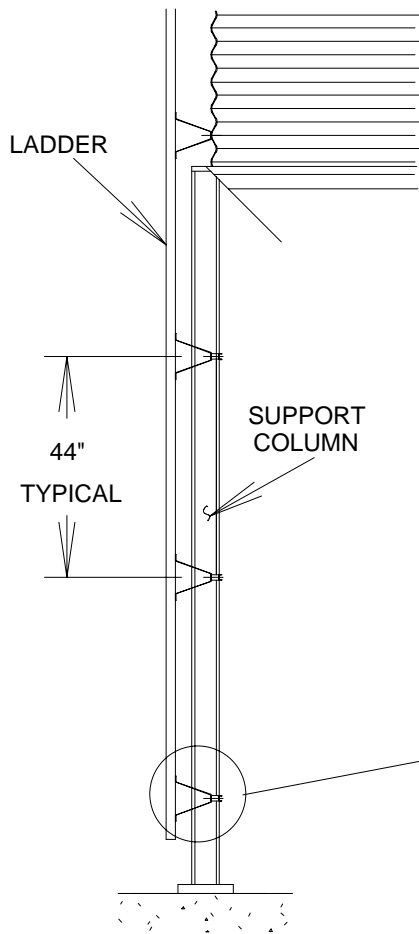


**THIS SECTION  
FOR 4.00" CORRUGATED  
FARM-COM HOPPER  
(FCHT) GRAIN BINS**

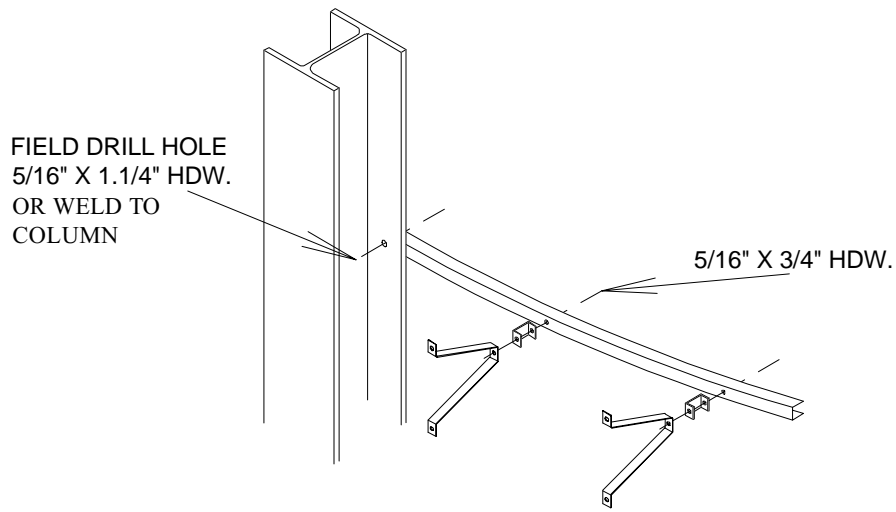
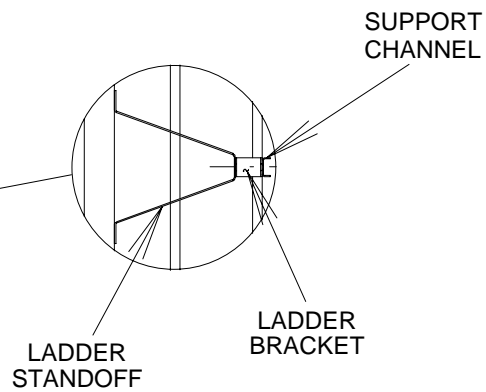


SECTION A

ITEM	LSO-25-06 25'-6" EAVE	LSO-29-02 29'-2" EAVE	LSO-32-10 32'-10" EAVE	LSO-36-06 36'-6" EAVE	LSO-40-02 40'-2" EAVE	LSO-43-10 43'-10" EAVE	LSO-47-06 47'-6" EAVE	
Ladder Section (LDR-4002)	7	8	5	5	6	6	7	
Bell Safety Cage (LS-4364LB)	1	1	1	1	1	1	1	
Safety Cage Extension	3	4	1	1	2	2	3	
Platform Pkg. (LS-6618)	1	1	1	1	1	1	1	
Eave Sfty. Cage (LS-6619)	1	1	1	1	1	1	1	
SECTION B			Ladder Section (LDR-4002)	5	6	6	7	7
			Bell Safety Cage (LS-4364LB)	1	1	1	1	1
			Safety Cage Extension	1	2	2	3	3
			Platform Pkg. (LS-6618)	1	1	1	1	1
			Int. Sfty. Cage (LS-6620)	1	1	1	1	1



Bin Diameter	Hopper Slope	No. of Support Channels	Hopper Ladder Brackets
15'-21'	45	3	6
15'-18'	60	5	10
21'	60	6	12
24'	45	4	8
27'-30'	40	4	8
27'-30'	45	5	10
36'	40	5	10



LADDER SUPPORT DETAIL



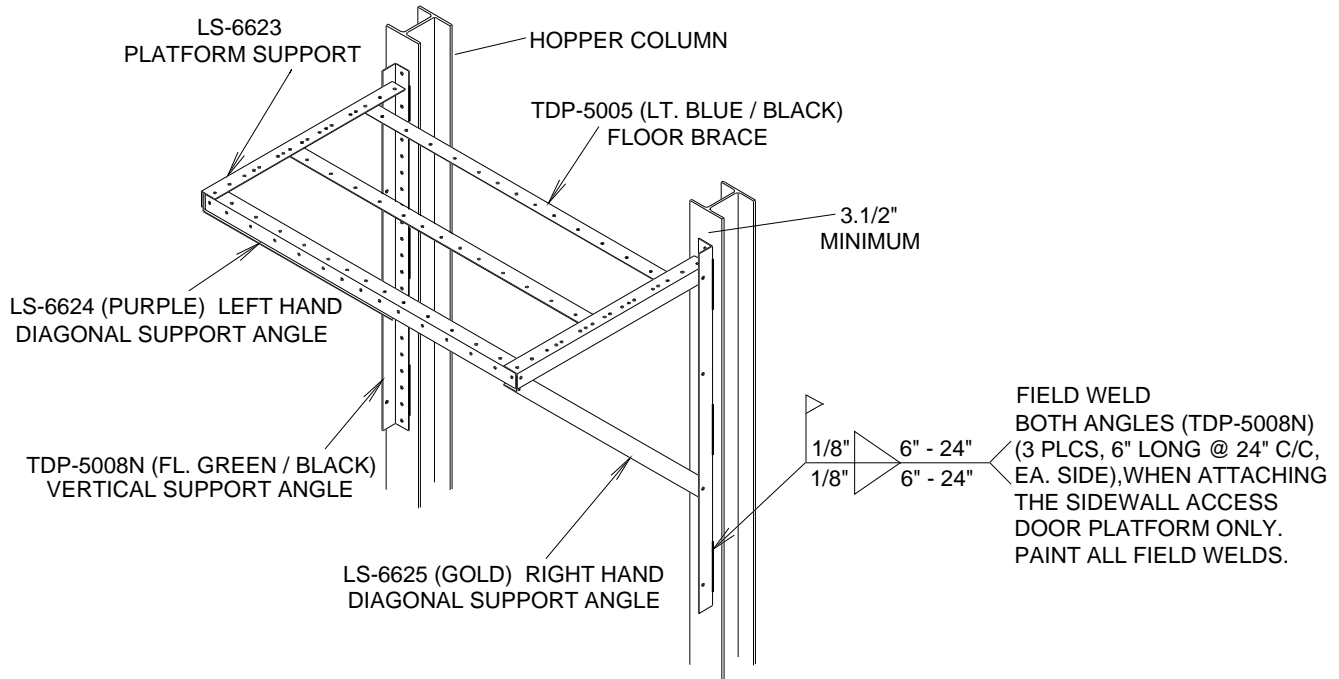
## ACCESS TO SIDEWALL DOOR ON COMMERCIAL HOPPER TANK

THE METHOD OF ACCESSING THE SIDEWALL DOOR WILL DEPEND ON HOW THE SYSTEM WAS ORDERED.

1. IF A SEPARATE ACCESS PACKAGE FOR THE SIDEWALL DOOR (ONE OF THE LSCHT PACKAGES) YOU WILL SIMPLY INSTALL THE SEPARATE RUN OF LADDER, HOPPER LADDER SUPPORTS AND PLATFORM AS SHOWN IN PREVIOUS DETAILS, WITHOUT REGARD TO THE STANDARD ROOF MANWAY LADDER PACKAGE.

2. IF THEY ARE USING THE LS0-ACESPLTF PACKAGE TO ACCESS YOUR SIDEWALL DOOR YOU MUST PRECISELY LAYOUT THE ROOF MANWAY AND SIDEWALL MANWAY LOCATIONS SO THAT THE SIDEWALL DOOR MAY BE ACCESSED FROM THE LADDER PATH OF ASCENT.

3. DOOR ACCESS PLATFORMS WILL BE MOUNTED DIRECTLY TO THE HOPPER TANK COLUMNS. (AS SHOWN BELOW).

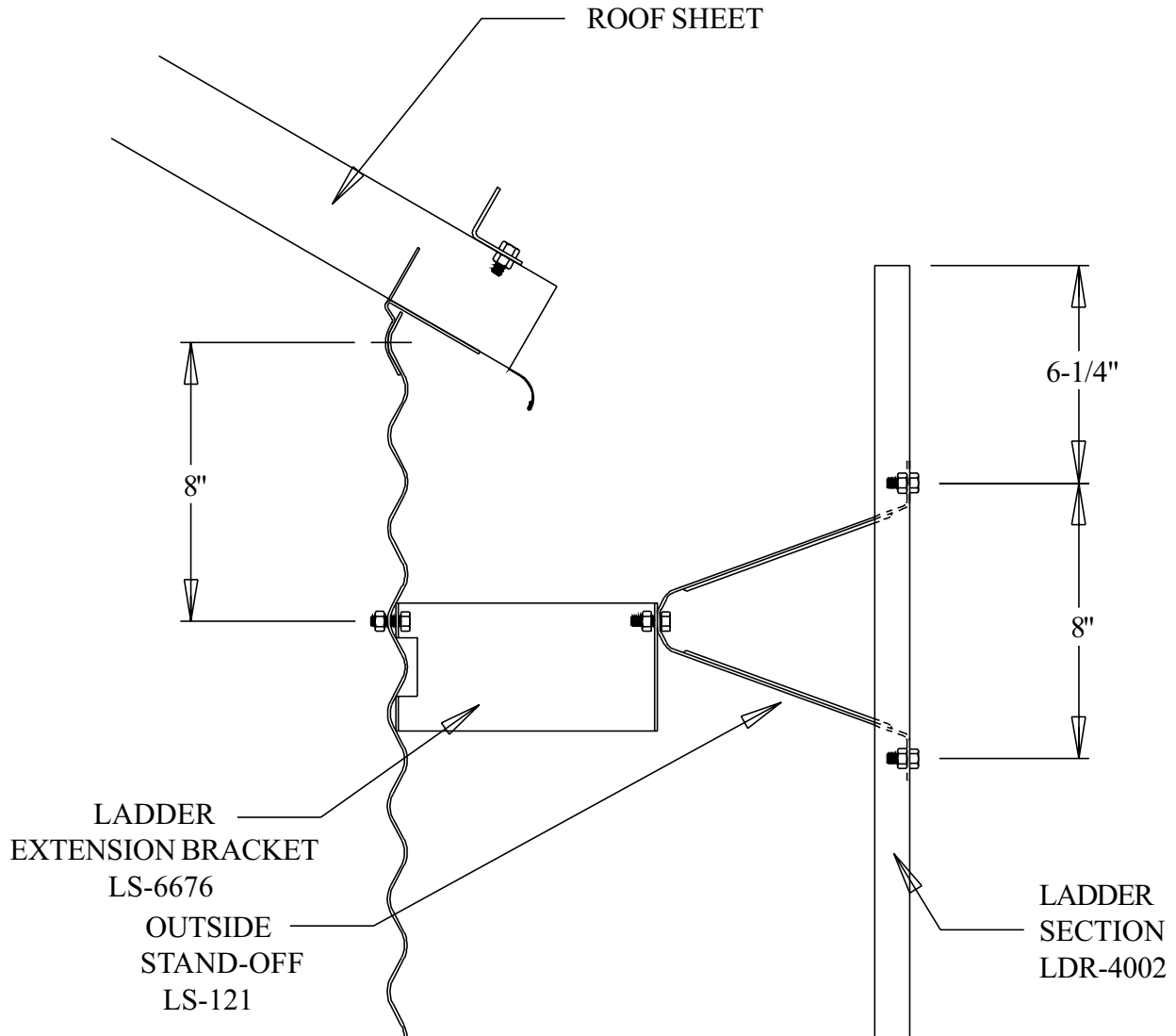




# **THIS SECTION FOR 2.66" CORRUGATED GRAIN BINS**

## **OPTIONAL - EXTENDED OUTSIDE STIFFENED LADDER AND PLATFORM INSTRUCTIONS FOR COMMERCIAL TANKS AND COMMERCIAL HOPPER TANKS**

**THE FOLLOWING PAGES SHOW AN OPTIONAL LADDER AND  
PLATFORM INSTRUCTIONS.  
IF YOU HAVE ANYTHING DIFFERENT FROM WHAT IS TALKED  
ABOUT IN THIS MANUAL PLEASE CALL GSI**

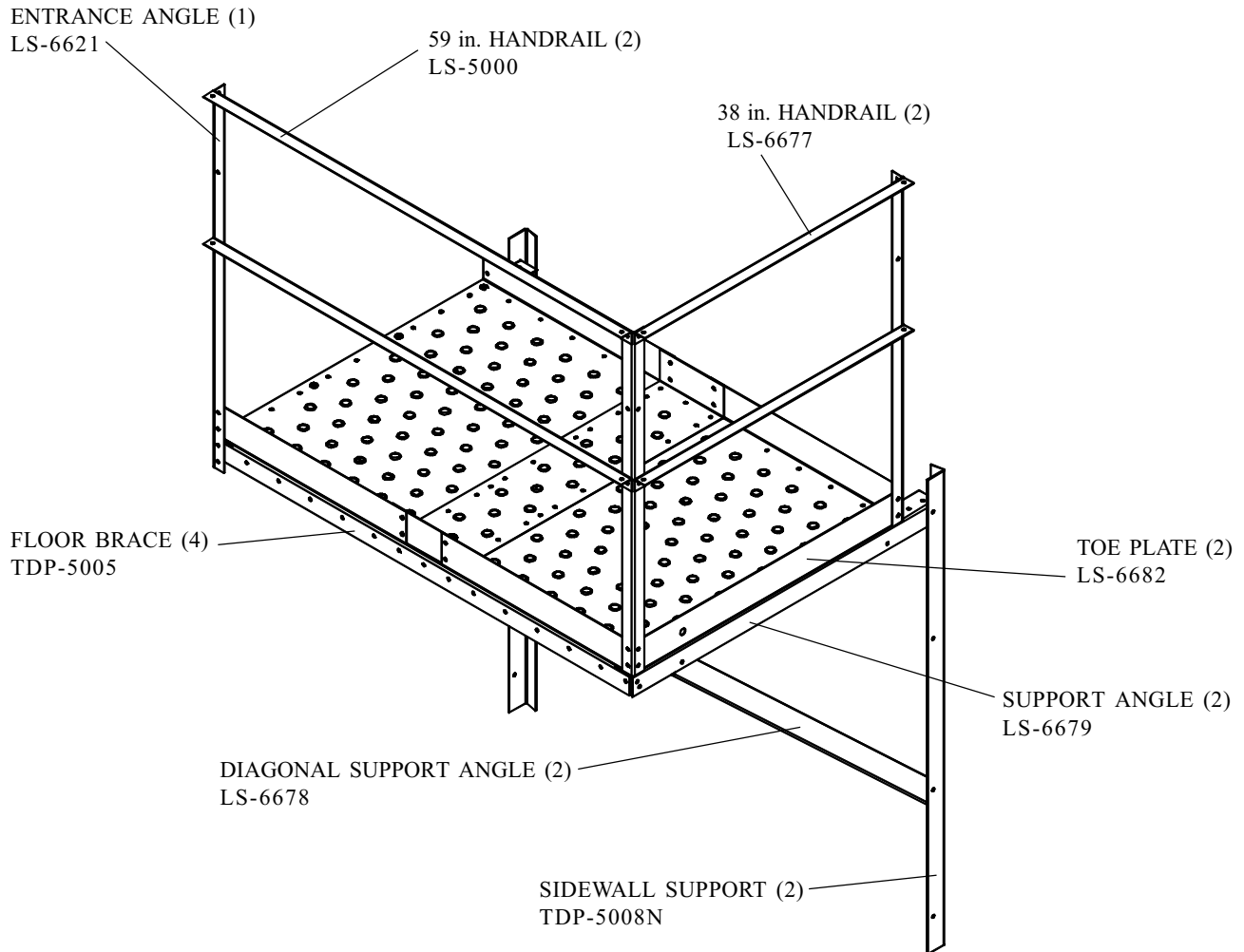


### **LADDER PLACEMENT**

Ladder placement on the grain bin is very important at this time. Refer to the diagram at the left and follow the correct dimensions as shown. Ladder extension must be located 8" below the horizontal seam. Check your ladder to make sure the ladder rung dimples are to the top surface. Attach standoffs to extension bracket on the upper bracket holes. Attach ladder to the standoffs using the holes located 6 1/4" from the end of ladder section. Use 5/16" x 3/4" bin bolts for these connections. Now all extension brackets must be located in horizontal seam holes (repeating every 32") until reaching the first rest platform. Refer to the section in these instructions that references the location of intermediate rest platforms for further hole locations.



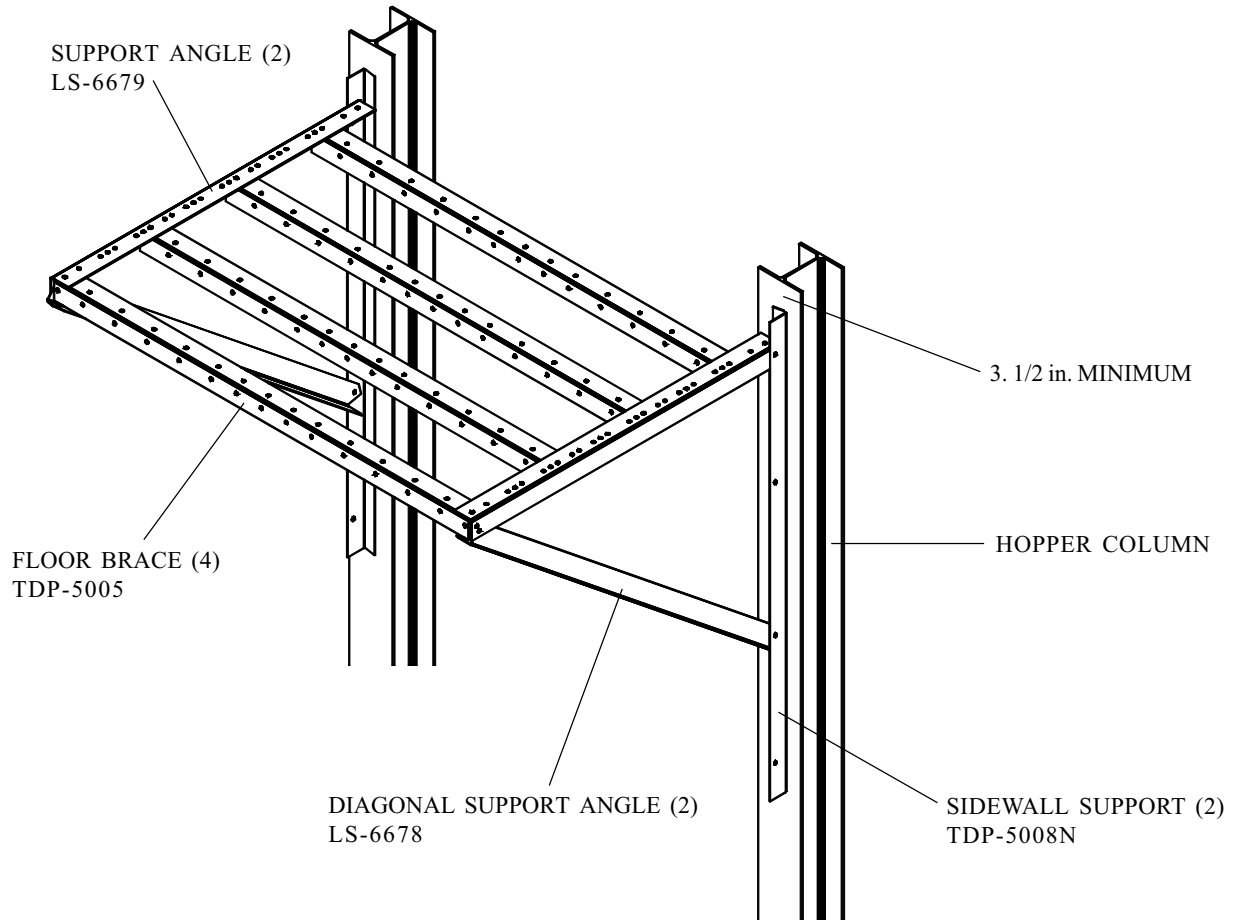
## PLATFORM PACKAGE LS - 6683



When starting the platform support, you must attach the mounting angle to the sidewall of the grain bin. Refer back to the first page for the correct holes to be used by the platform. Attach the angle using 5/16" x 3/4" bolts and nuts, tighten at this time. Next, bolt the support angle to the mounting angle again using the proper holes. Attach the brace angle to the mounting angle as shown in the diagram at left. Use 5/16" x 3/4" bolts and nuts for all connections.



### PLATFORM PACKAGE LS - 6683 CONNECTION TO A HOPPER TANK





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THE GSI GROUP

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