Mr. GoodTower®

Rigging and Assembly Instructions

14', 28', 42' & 56' WIDE AT/UT/USS INDUCED DRAFT COOLING TOWERS

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Introduction

Thank you for purchasing your EVAPCO cooling tower, this manual will provide instructions for installation of the cooling tower. If you have purchased a model UT cooling tower or USS with the Super Low Sound Fan option, please be sure to pay attention to the proper rigging instructions for that special option enclosed herein. If any questions arise during the installation, please contact your local EVAPCO representative or us directly at our Global Headquarters location.

International Building Code Provisions

The International Building Code (IBC) is a comprehensive set of regulations addressing the structural design and installation requirements for building systems – including HVAC and industrial refrigeration equipment. As of June 2008, all 50 states plus Washington D.C. have adopted the International Building Code. The code provisions require that evaporative cooling equipment and all other components permanently installed on a structure must meet the same seismic design criteria as the building. The AT/UT/USS Series of Open Cooling Towers are IBC 2009 compliant up to 1g with standard construction and up to 5.12g with additional structural modifications.

All items attached to the Evapco AT/UT/USS cooling tower must be independently reviewed and isolated to meet applicable wind and seismic loads. This includes piping, ductwork, conduit, and electrical connections. These items must be flexibly attached to the Evapco unit so as not to transmit additional loads to the equipment as a result of seismic or wind forces.

Method of Shipment

All 14', 28', 42' and 56' wide units are shipped with the top section(s) separate from the bottom section(s). These sections have mating flanges and will join together in a waterproof joint when sealed and bolted together as described in the following instructions. Miscellaneous items, such as sealer, screws, drip channels, splash guards and any other required materials, are packaged and placed inside the pan for shipment. All 14' x 26' cells with the Super Low Sound Fan or Low Sound Fan option are shipped in (3) three sections. The fan section is shipped separate from the fill casing section.

Storage

Do not place tarps or other coverings over the top of the units if the units are to be stored before installation. Excessive heat can build up if the units are covered, causing possible damage to the PVC eliminators, PVC louvers, or PVC fill. **For extended storage beyond six months rotate the fan and fan motor shaft(s) monthly. The fan shaft bearings should also be purged and regreased prior to start-up if it has been stored.**

Structural Steel Support

All 14' wide units (models 114-024 through 314-978) will use two structural "I" beams running the length of the unit. The two beams will be located under the outer of the unit as shown in Figure 1a. All 28' wide units (models 228-324 through 428-952) will use three structural "I" beams running the length of the unit. Two of the three beams should be located underneath the outer flanges of the unit and the third beam should be located longitudinally along the center of the unit as shown in Figure 1b. Mounting holes, 3/4" in diameter, are located in the bottom flange of the unit to provide for bolting it to the structural steel (see certified recommended steel support drawing for exact bolt hole location). All 42' wide units (342-526 through 342-926) will use a 4 beam arrangement as shown in Figure 1c. All 56' wide units (models 456-526 through 456-926) will use a 5 beam arrangement as shown in Figure 1d. **Bolt the bottom sections to the steel support before rigging the top sections.**

Beams should be sized in accordance with accepted structural practices. See product catalog or steel support drawings for more information.

The supporting "I" beams should be level before setting the unit. Do not level the unit by shimming between the bottom flange and the beams as this will not provide proper longitudinal support.

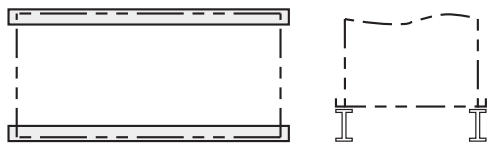


Figure 1a - Structural Steel Support on 14' Wide Unit

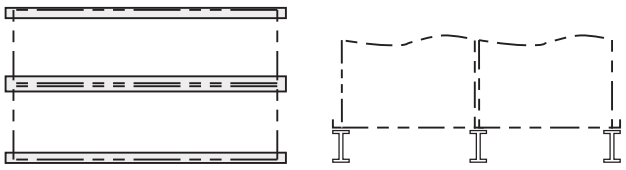


Figure 1b - Structural Steel Support on 28' Wide Units

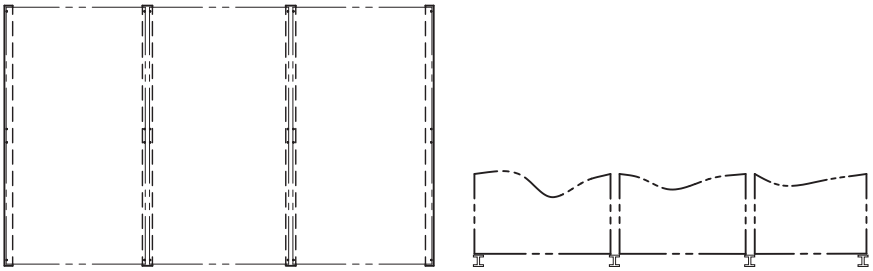


Figure 1c - Structural Steel Support on 42' Wide Unit

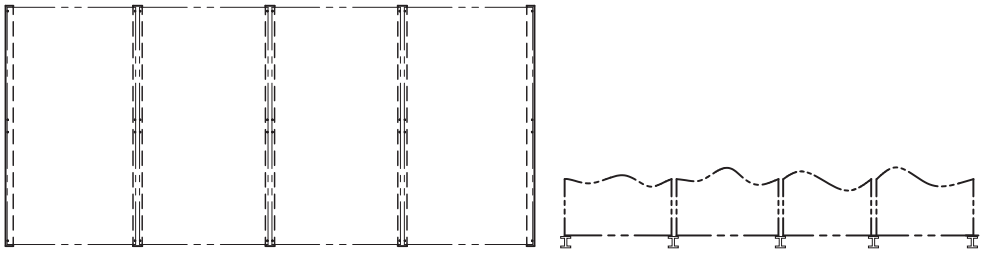


Figure 1d - Structural Steel Support on 56' Wide Units

Rigging Bottom Section

Lifting Bottom Section

Lifting Ears are located 2/3 down on vertical posts of the bottom section for lifting and final positioning purposes as shown in Figure 2. The hook of the crane must be a minimum dimension of "H" above the top of the section being lifted to prevent undue strain on the lifting devices. See Table 1 for the minimum "H" dimension. These lifting devices should not be used for extended lifts or where any hazard exists unless safety slings are employed under the section. **(See "Extended Lifts" on page 8 for proper arrangement.)** Bolt the bottom section to the steel support before rigging the top section.

Model No.	Min. "H" Dim.
All 14' x 24' Cells	17 Feet
All 14' x 26' Cells	22 Feet

Table 1 – Minimum "H" Dimension for Bottom Sections

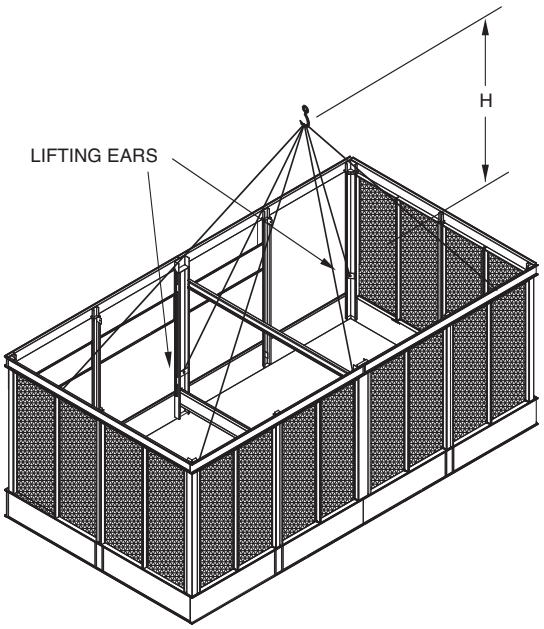


Figure 2 - 14' Wide Bottom Section

Joining Multi-Cell Units Bottom Sections

Models 214-0148 through 214-1248, 314-0172 through 314-1272, 214-552 through 214-952 and 314-578 through 314-978

Models 214-0148 through 214-952 have two bottom sections which are shipped separately and furnished with a connecting equalizer flume between cells. Models 314-0172 through 314-978 have three bottom sections which are shipped separately and are furnished with two connecting equalizer flumes between them. In addition to the equalizer flume(s), these units are provided with drip channels and splash guards to keep water from exiting between the cells. 14' wide units have a single horizontal drip channel assembly and two vertical splash guards (one for each side) per flume box. The equalizer flume is factory installed on one section for field connection to the other. It is important to connect the equalizer flume to balance the water level in the pans for proper pump suction operation. The following procedures are to be performed in sequence.

1. Install the bottom section with the factory installed flume box.
2. Clean the flanges on the equalizer flume on the end to be field connected. Apply a layer of sealer tape on the flange centered between the hole centers and the outside edge. Remove paper backing strip from the sealer tape (see Figure 3).
3. Clean the mating surface of the equalizer flume opening of any dirt, grease or moisture.
4. Rig the second bottom section adjacent to the equalizer flume on the steel support.
5. Align the bolt holes in the equalizer flume and equalizer opening with drift pins while drawing the second bottom section against the equalizer flume flange.
6. Install 3/8" bolts, nuts and washers in every hole around the equalizer opening and tighten.
7. Bolt the second bottom section to the steel support.
8. Place the drip channel over the adjoining pan section flanges. Turn around the retaining clips and re-install them using the same hardware. (see Figure 4)
9. Place the vertical splash guard in the bend of the vertical supports. On galvanized units, attach the vertical splash guard using 5/16" self-tapping screws. On stainless steel units, attach the vertical splash guard using 5/16" stainless steel nuts and bolts. (see Figure 3)

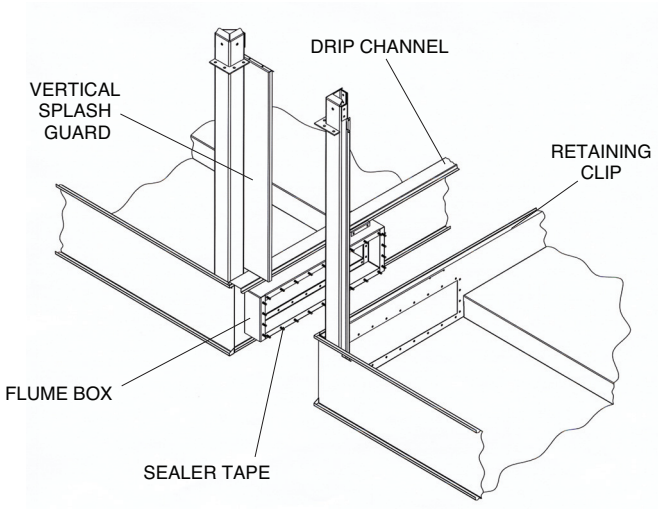


Figure 3 – Equalizer Flume Connection,

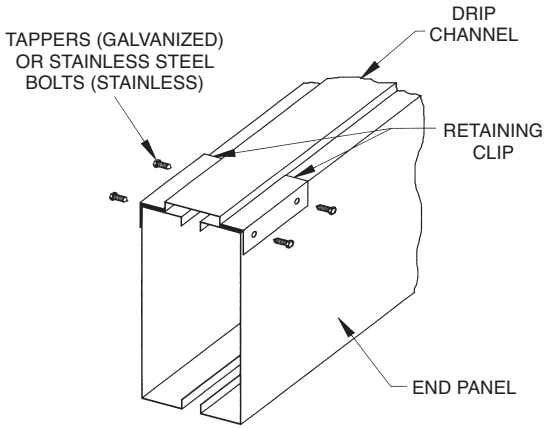


Figure 4 – Drip Channel Installation.

Joining Multi-Cell Units Bottom Sections

Models 228-0124 through 228-1024, 428-0148 through 428-1348, 228-526 through 228-926, 428-552 through 428-952, 456-526 through 456-926

On 28 and 56 foot wide models the equalizer flume is located on the sides of adjoining bottom sections. This flume box is shipped loose and must be installed to both bottom sections. In addition to the equalizer flume, these units are provided with drip channels and splash guards to keep water from exiting between the cells. The following procedure should be performed in order to assure proper assembly.

1. Install one bottom section of the unit on structural steel and secure as described earlier.
2. Clean the flanges of the equalizer flume to remove any dirt, grease and moisture. Apply a layer of sealer tape on one side panel centered over the flume box holes as shown in Figure 5. Remove paper backing strip from the sealer tape.
3. The side of the flume box which has studs installed in it should now be connected to the side panel. Push the studs through the sealer tape and holes of the side panel and secure with washers, lock washers and nuts.
4. Apply a layer of sealer tape on the equalizer flange, centered between the hole centers and the outside edge. Remove paper backing strip from the sealer tape.
5. Rig the second bottom section adjacent to the equalizer flume on the steel support as shown in Figure 6.
6. Align the bolt holes in the equalizer flume and equalizer opening with drift pins while drawing the second bottom section against the first as shown in Figure 5.
7. Install 3/8” bolts, nuts and washers in every hole around the equalizer opening and tighten.
8. Bolt the second bottom section to the steel support.
9. Remove the drip channel sections and fasten them together, end to end, by driving a self-tapping 5/16” screw through the section end with the larger hole into the mating end with the smaller hole. Stainless steel units will use 5/16” stainless steel nuts and bolts. (see Figure 7)
10. Place the drip channel assembly over the adjoining pan section flanges. Turn around the retaining clips and re-install using the same hardware. (see Figures 4 and 8)
11. Place the vertical splash guard in the bend of the vertical supports. Attach the vertical splash guard using 5/16” self-tapping screws. On stainless steel units, attach the vertical splash guard using 5/16” stainless steel nuts and bolts. (see Figure 8)

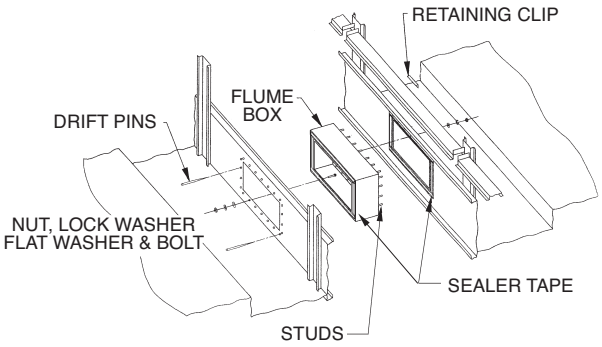


Figure 5 – Flume Assembly

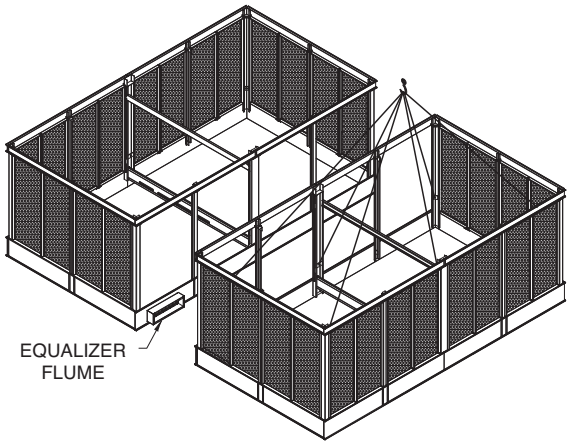


Figure 6 – Equalizer Flume Rigging Detail showing two bottom sections and one equalizer flume.

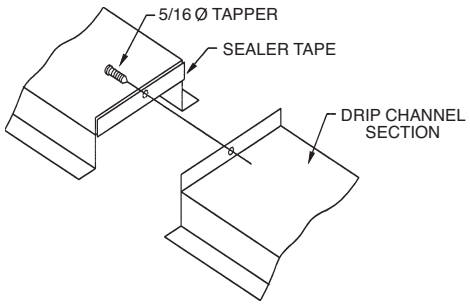


Figure 7 – Drip Channel Assembly

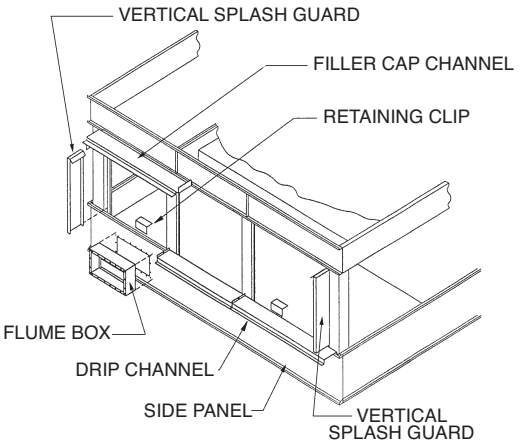


Figure 8 – Attachment of Drip Channel and Splash Guards

Optional Equalizer Blank-Off Plate For All Multi-Cell Units

An accessory is available to isolate the bottom sections for individual cell operation, periodic cleaning or maintenance. This optional equalizer blank-off plate is factory installed on the equalizer flume and secured by wing nuts. (see Figure 9)

For units not requiring the blank-off plate under normal operating conditions, remove the wing nuts, washers, plate and gasket. Reinstall washers and wing nuts for proper leakfree operation of the flume.

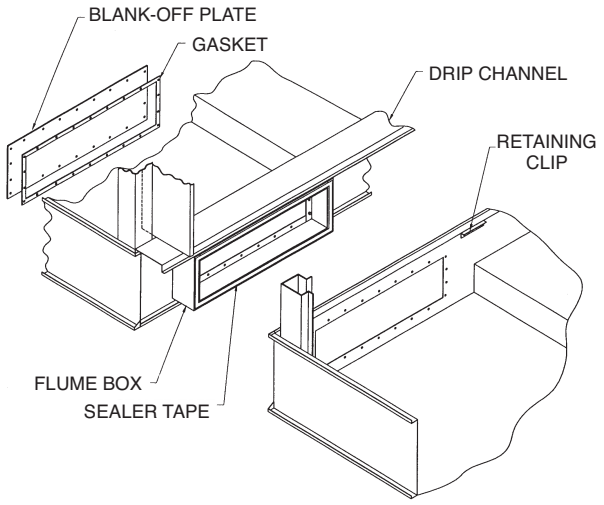


Figure 9 – Optional Blank-Off Plate on the Equalizer Flume

Application of Sealer Tape

Once the bottom section has been set on the supporting steel and bolted in place, the top flanges should be wiped down to remove any dirt or moisture. Sealer Tape should be placed over the mounting hole centerline on the side flanges. **Apply two strips of sealer tape**, one partially overlapping the other, on the end flanges (flanges with no bolt holes).

The sealer tape should overlap on the corners as shown in Figure 10. Do not splice the sealer tape along the end flanges and preferably not on the side flanges if it can be avoided. **Always remove the paper backing from the sealer tape.**

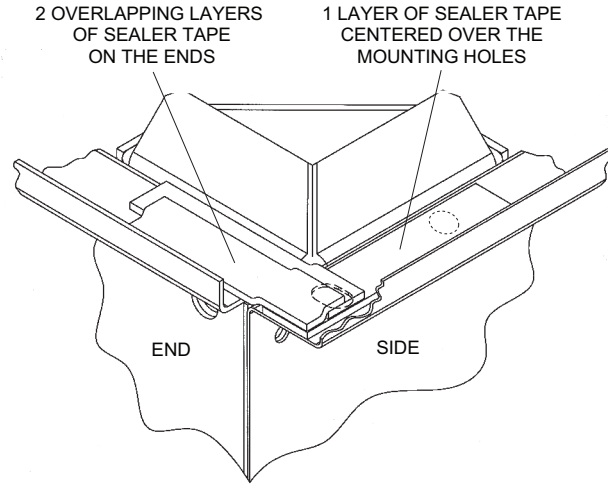


Figure 10 – Sealer Tape on Flange of Bottom Section

Models 428-0148 through 428-1248 and 428-526 through 428-926 have four top sections. In these cases, sealer tape must be applied to internal flanges as shown in Figure 11.

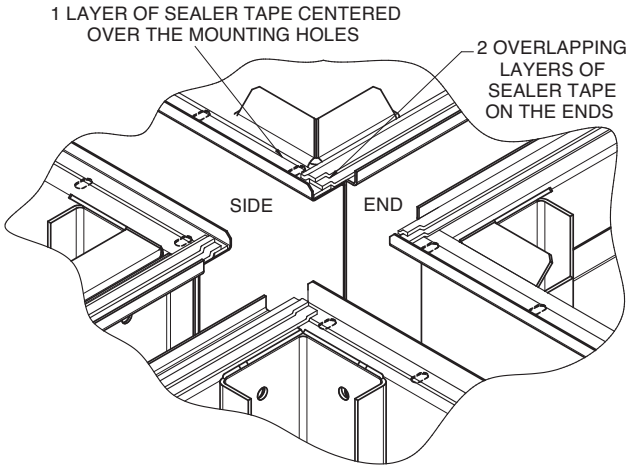


Figure 11 – Sealer Tape Detail for Center Joint of Units with Four Top Sections

Rigging Top Section

"U" bolts are provided in the four corners of the top section for lifting and final positioning (see Figures 12 and 12b). The hook of the crane must be a minimum dimension "H" above the top section being lifted to prevent undue strain on the "U" bolts. See Table 2 for the minimum "H" dimension.

Model No.	Standard Fan	Super Low Sound Fan
All 14' x 24' Cells	17 Feet	18 Feet
All 14' x 26' Cells	22 Feet	27 Feet

Table 2 – Minimum "H" Dimension for Top Sections

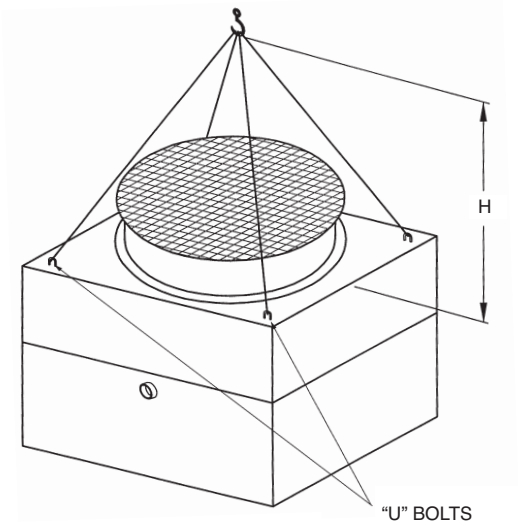


Figure 12 – Top Section of 24' Long Cell

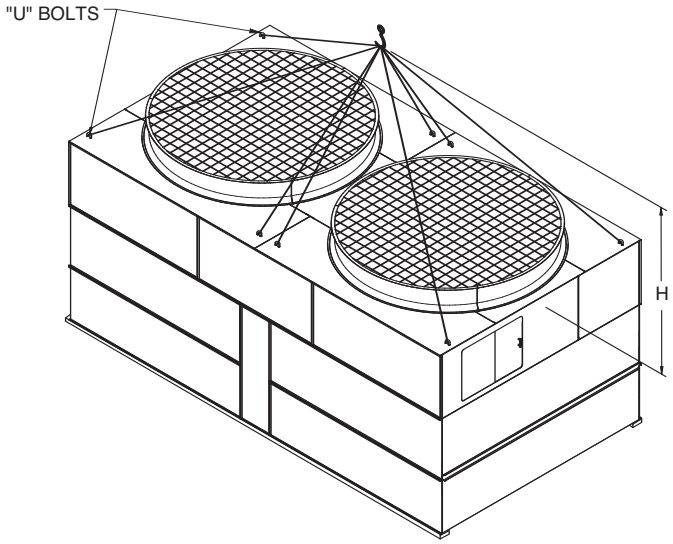


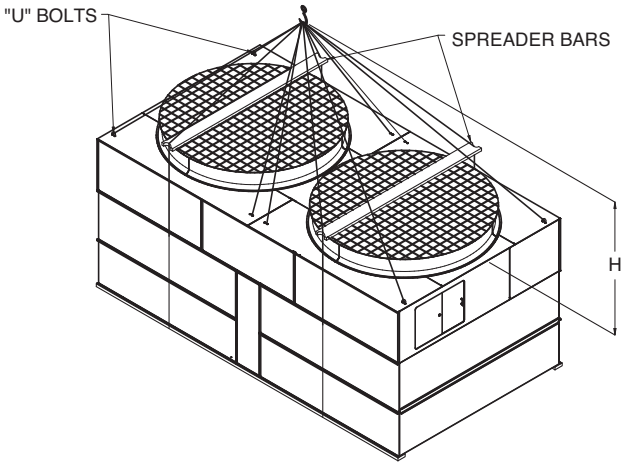
Figure 12b – Top Section of 26' Long Cell

Extended Lifts

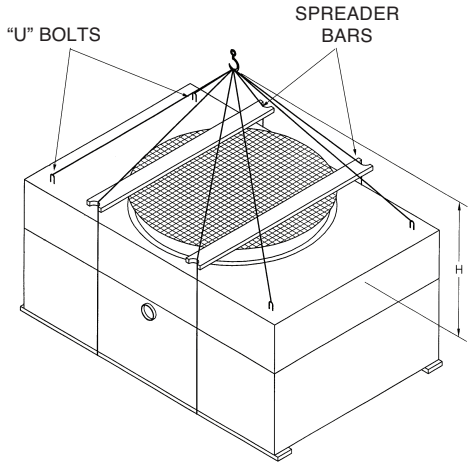
Important: The lifting devices and "U" bolts should be used for final positioning only and for lifting where no danger exists. If they are used for extended lifts, safety slings should be provided under the sections.

The preferred method for extended lifts is to use slings under the unit (see Figure 13). Spreader bars should always be used between the cables at the top of the section to prevent damage to the upper flanges or fan cylinders.

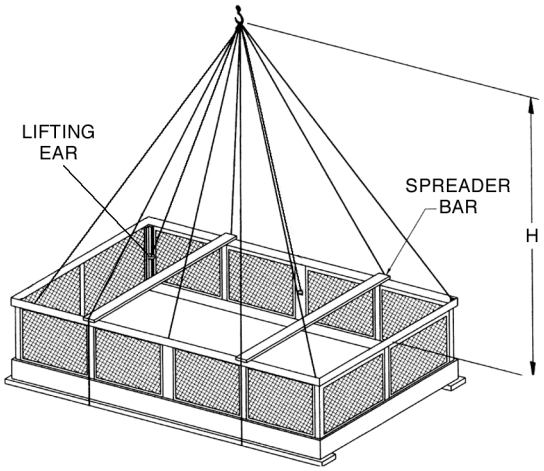
Safety slings and skids should be removed before final positioning of the unit.



14' x 26' AT/USS Top Section



14' x 24' AT/USS Top Section



14' x 24' & 14' x 26' AT/USS Bottom Sections

Figure 13 – Proper Rigging Method for Extended Lifts

Assembly of the Top Section to the Bottom Section

Before assembling the top section to the bottom section, remove any loose parts shipped in the pan. Wipe the flanges on the bottom of the top section. Check to see that the water distribution connection on the top section is in the correct position relative to the bottom section (see certified print). Units are also provided with matched markings on each section (i.e. A1 of bottom section should match up with A1 of top section).

Lower the top sections to within several inches of the bottom section making sure the two sections do not touch and that the sealer is not disturbed. Fasten all four corners with bolts, washers and nuts. Install the remaining bolts, washers and nuts, working from the corners toward the center. Fasteners must be installed in every hole on the side flange. Nuts and bolts can be driven upward through the mating flange if access is restricted. Galvanized units and stainless steel units will use 3/8" nuts and bolts. (see Figure 14)

NOTE: Drift pins provided in rigging box to assist with alignment.

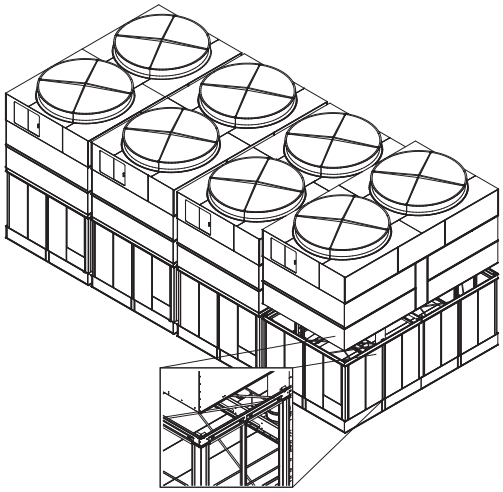


Figure 14 – Mating Upper Section to Bottom Section

Fan Sections Shipped Separate From Casing Sections

All 14 x 26 units with Super Low Sound Fan or Low Sound Fan option will have fan section shipped separate from fill casing.

For 14' x 24' sections to be rigged as a three-point lift, the two pick points are the U-bolts on the fan deck and the third is the lifting ear on the mechanical equipment support. (see Figure 15a)

For 14' x 26' fan sections to be rigged as a six-point lift, four pick points are the U-bolts on the fan deck and the other two are the lifting ears on the mechanical equipment supports. (See Figure 16a and 16b)

The hook of the crane must be a minimum dimension "H" above the top section being lifted to prevent undue strain on the "U" bolts. See Table 2 for the minimum "H" dimension.

For 14' x 24' casing sections to be rigged as a four-point lift, the pick points will be the 4 lifting points as shown in Figure 15b. For 14' x 26' casing sections to be rigged as a six-point lift, the pick points will be the six lifting points as shown on Figure 16c.The hook of the crane must be a minimum dimension "H" above the top section being lifted to prevent undue strain on the "U" bolts. See Table 1 for the minimum "H" dimension.

After rigging the installer will have to apply Sealer Tape over the mounting hole centerline on the side flanges and Apply two strips of sealer tape, one partially overlapping the other, on the end flanges (flanges with no bolt holes). The installer will then have to tapper (galvanized units) or bolt (stainless steel units) the end panels of the fan section to the end panels of the casing sections as well as all the side panel flanges, a task usually not required because it is a factory assembled. The fan screen will also have to be secured after rigging.

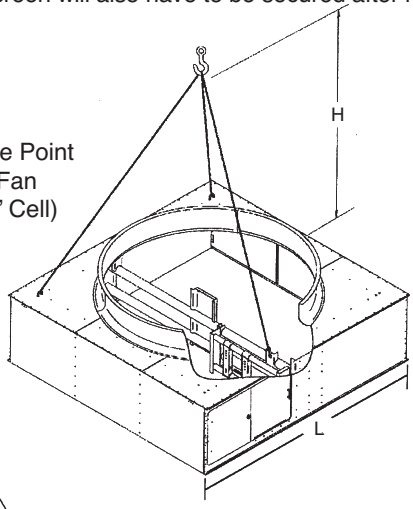


Figure 15a – Three Point Rigging of the Fan Section (14' x 24' Cell)

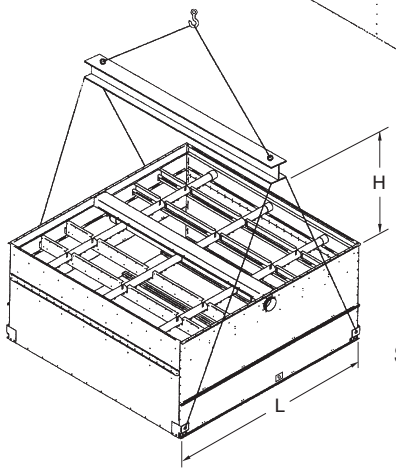


Figure 15b – Rigging of the Tower Casing Section with Added Ears (14' x 24' Cell)

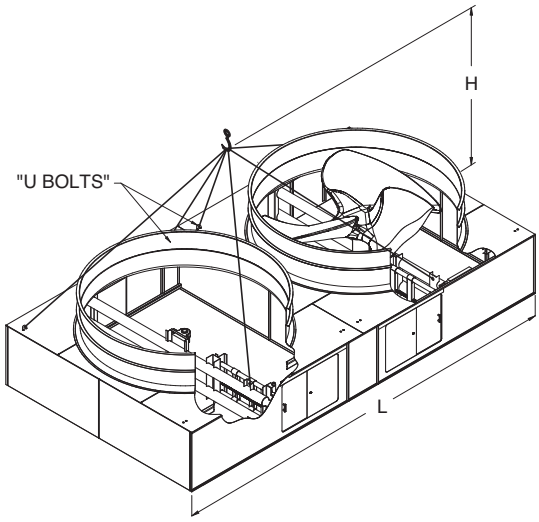


Figure 16a – Six Point Rigging of the Fan Section (14' x 26' Cell Side Fan Access)

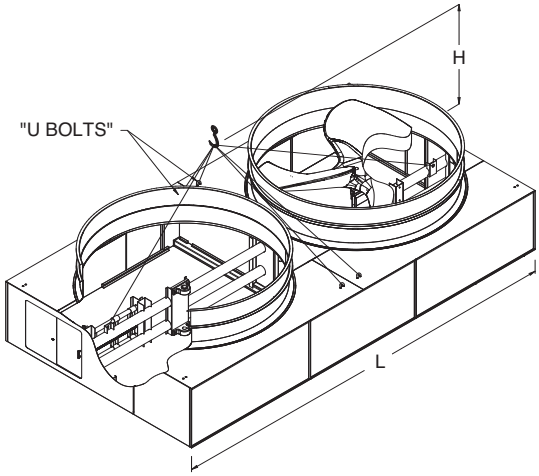


Figure 16b – Six Point Rigging of the Fan Section (14' x 26' Cell End Fan Access)

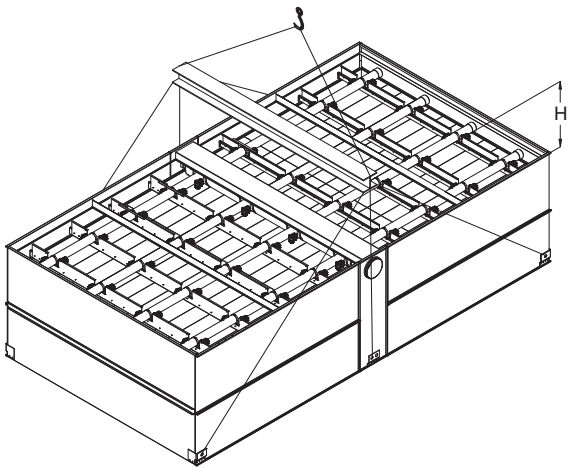


Figure 16c – Six Point Rigging of the Tower Casing Section (14' x 26' Cell)

All 28', 42' and 56' Wide Models

After the top sections have been secured to the bottom sections, a Filler Cap Channel should be installed between the top sections to prevent debris from entering the bottom sections. These sections are simply positioned over the mating flanges as shown in Figure 17. The Filler Cap Channel can be installed from inside the unit by inserting the channel through the space between the basin and casing sections. The channel does not require fastening.

CAUTION: 14', 28', 42' and 56' Wide units cannot be rigged fully assembled.

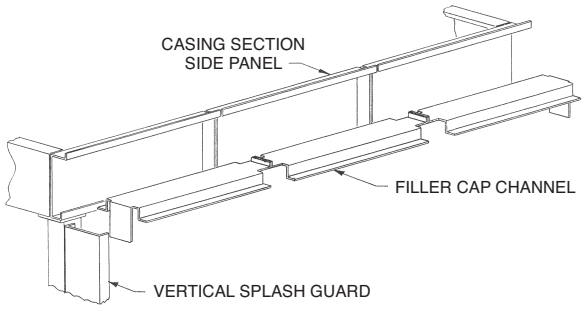


Figure 17 – Filler Cap Channel Assembly

Accessing Internal Mating Flanges on Units with Wind Panels or Water Tight Partitions

When wind panels or water tight partitions are supplied between bottom sections, the upper half of the partition must be lowered to gain access to the upper mating flanges. The upper partition can be lowered by removing the bolts along the bottom edge of the panel. Bolt access is from the inside of the unit. After the mounting flange bolts are installed, raise the upper partition and bolt it back into its original position. Seal the edges of the wind panel and bolt heads with the supplied caulk sealer. (see Figure 18)

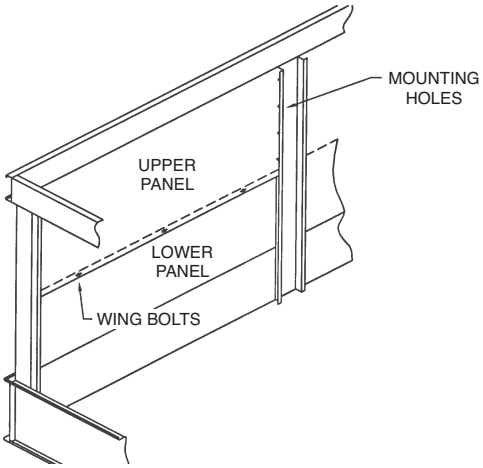


Figure 18 – Lowering of Water Tight Partitions

Mounting Fan Screens

WARNING: DO NOT WALK ON THE FAN SCREENS AT ANY TIME!

All 14', 28' 42' and 56' Wide Models

1. Set the support frame across the top of the discharge cylinder. (see Figure 19)
2. Place both halves of the fan screen on top of the support frame. Each half will be tagged to match markings on the cylinder. Align the eyelets of the fan screen with the holes on the cylinder perimeter.
3. Join the two screen halves with wire clips (see Figure 20). Space them evenly as shown in Figure 21.
4. At each hole, attach the fan screen to the discharge cylinder as shown in Figure 22. At the points where the support frame meets the cylinder, bolt the support frame to the cylinder together with the fan screen.

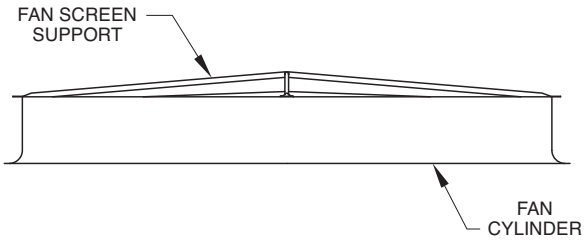


Figure 19 – Support Frame Installation

Figure 20 – Wire Clip Arrangement

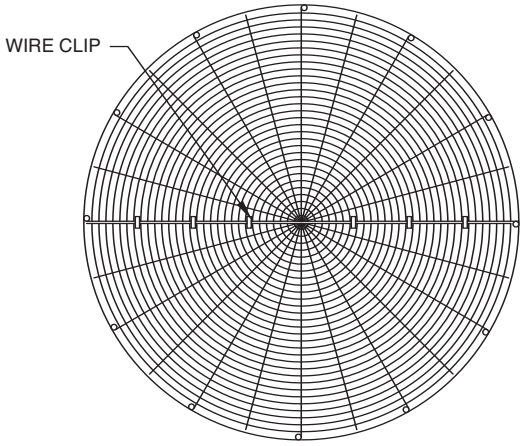


Figure 21 – Wire Clip Spacing

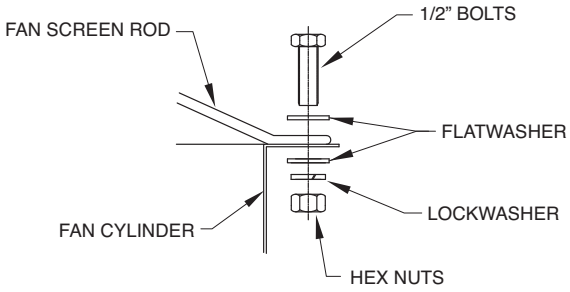


Figure 22 – Attachment of of Fan Screen to Discharge Cylinder

Optional Motor & Gear Box Davit

An accesory is available to aid the removal of fan motors and gear boxes. The assembly consists of a davit and a mounting base that is to be attached to the side of the unit next to the access door (see Figure 23). Both of these items will ship in the unit's basin. On multiple cell units, there will be a mounting base on each cell. Use the following procedure to install the mounting base.

1. Align the mounting channel with 3/8" bolts and flat washers to the mounting bracket (factory mounted).
2. Use 3/8" flat washers, lock washer and nuts to secure the mounting channel to the bracket. (see Figure 24)

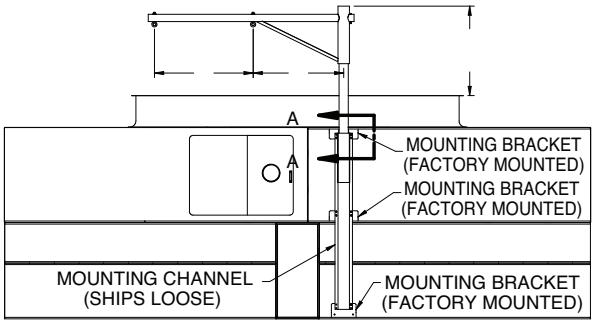


Figure 23a – Dual Point Davit Arrangement
(14' x 24' and 14' x 26' Cell Side Fan Access)

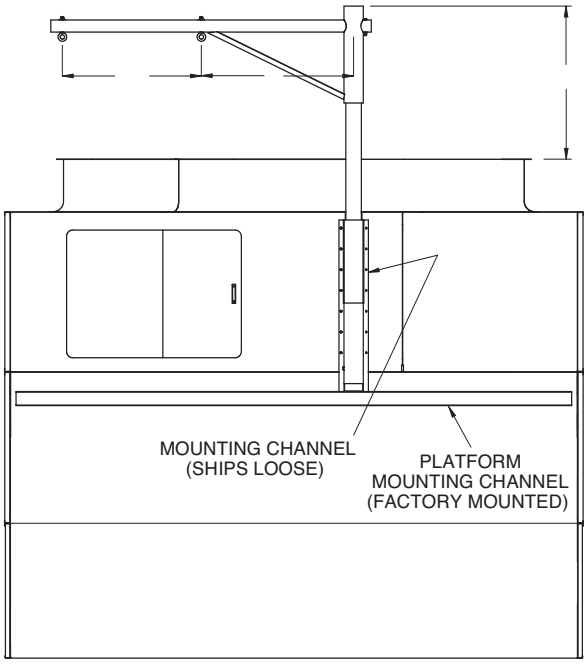


Figure 23b – Dual Point Davit Arrangement
(14' x 26' Cell End Fan Access)

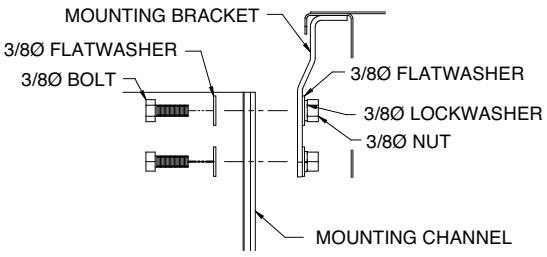


Figure 24 – Mounting Channel Installation

Assembly of Sloped Ladders

When sloped ladders are supplied with a unit, they are shipped in the basin of the unit. One sloped ladder will be provided for each cell. Assembly is identical for each cell. Sloped ladders are attached at a minimum of three points. Taller units will be attached at four points. At each point of attachment, the ladder will be fitted with a ladder bracket assembly. The ladder bracket assembly looks like a metal box and is shown in detail (component #4) in Figure 25 below. The upper two assembly brackets will be rigidly mounted to the ladder and are not adjustable. These two bracket define the slope of the ladder. The lower brackets are adjustable.

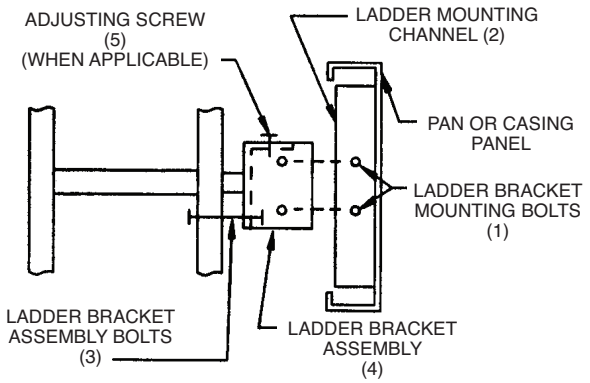


Figure 25 – Detail of Ladder, Ladder Bracket Assembly and Mounting Channel

To install the ladder assembly, follow the steps outlined below which refer to Figure 26:

1. Remove the ladder bracket mounting bolts (1) from the ladder mounting channels (2) on pan and casing sections.
2. Loosen, but do not remove, the ladder bracket and assembly bolts (3).
3. Slide the ladder bracket assembly (4) over the ladder mounting channels (2) located on the pan and casing sections. Do not remove the ladder bracket assembly (4) from the ladder.
4. Align the bolt holes and reinstall the ladder bracket mounting bolts (1) through the ladder bracket assembly and the ladder mounting channels (2).
5. Tighten all bolts.
6. Tighten the adjusting screw (5) in the adjustable mounting bracket where applicable.

NOTE: Upper section of unit must be properly oriented with respect to lower section. All mounting brackets must be on same side of unit. Refer to certified print for proper orientation.

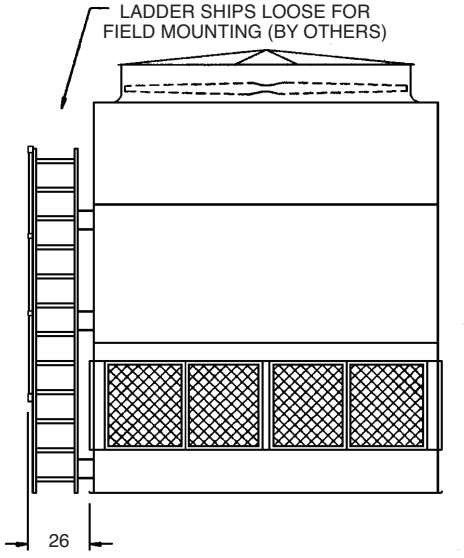


Figure 26 – End View of Ladder Assembly

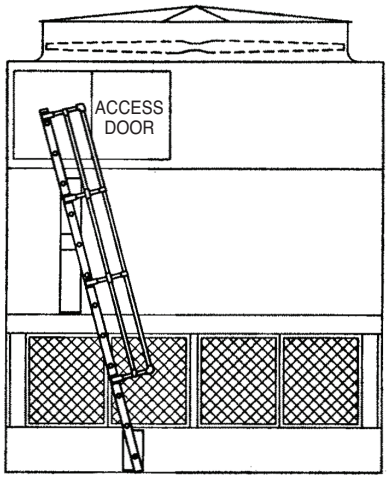


Figure 26b – Side View of Ladder Assembly

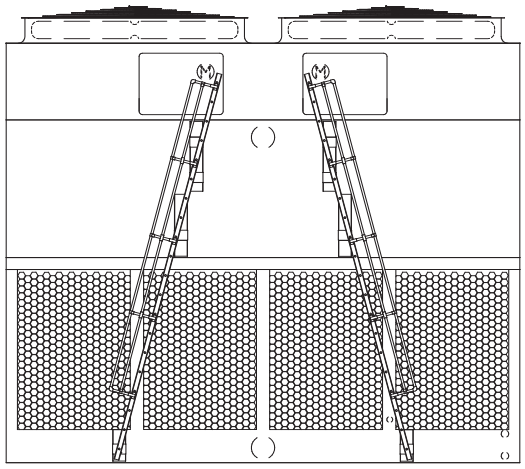


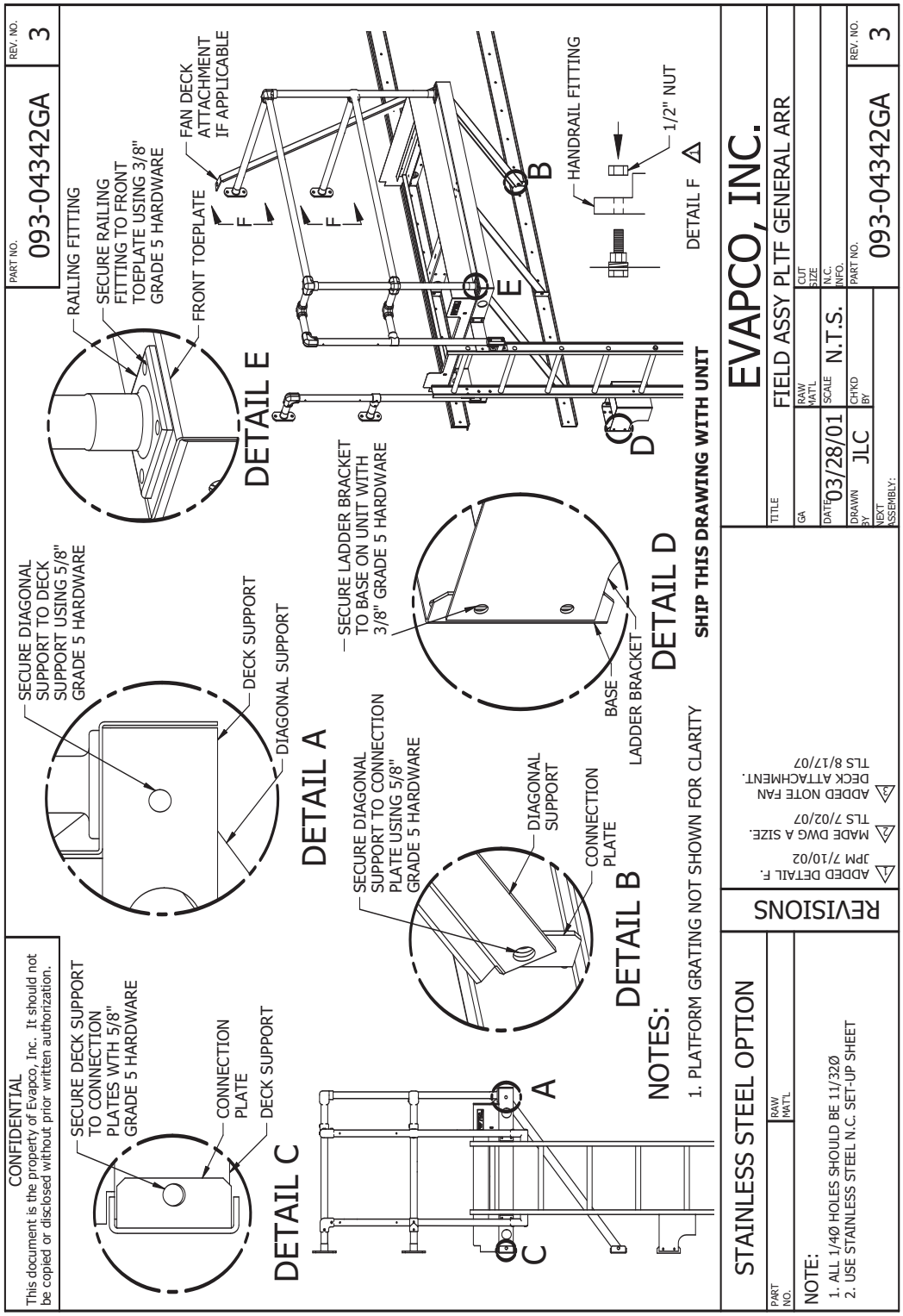
Figure 26c – 14 x 26 Side View

Field Assembly of Working Platform and Ladder

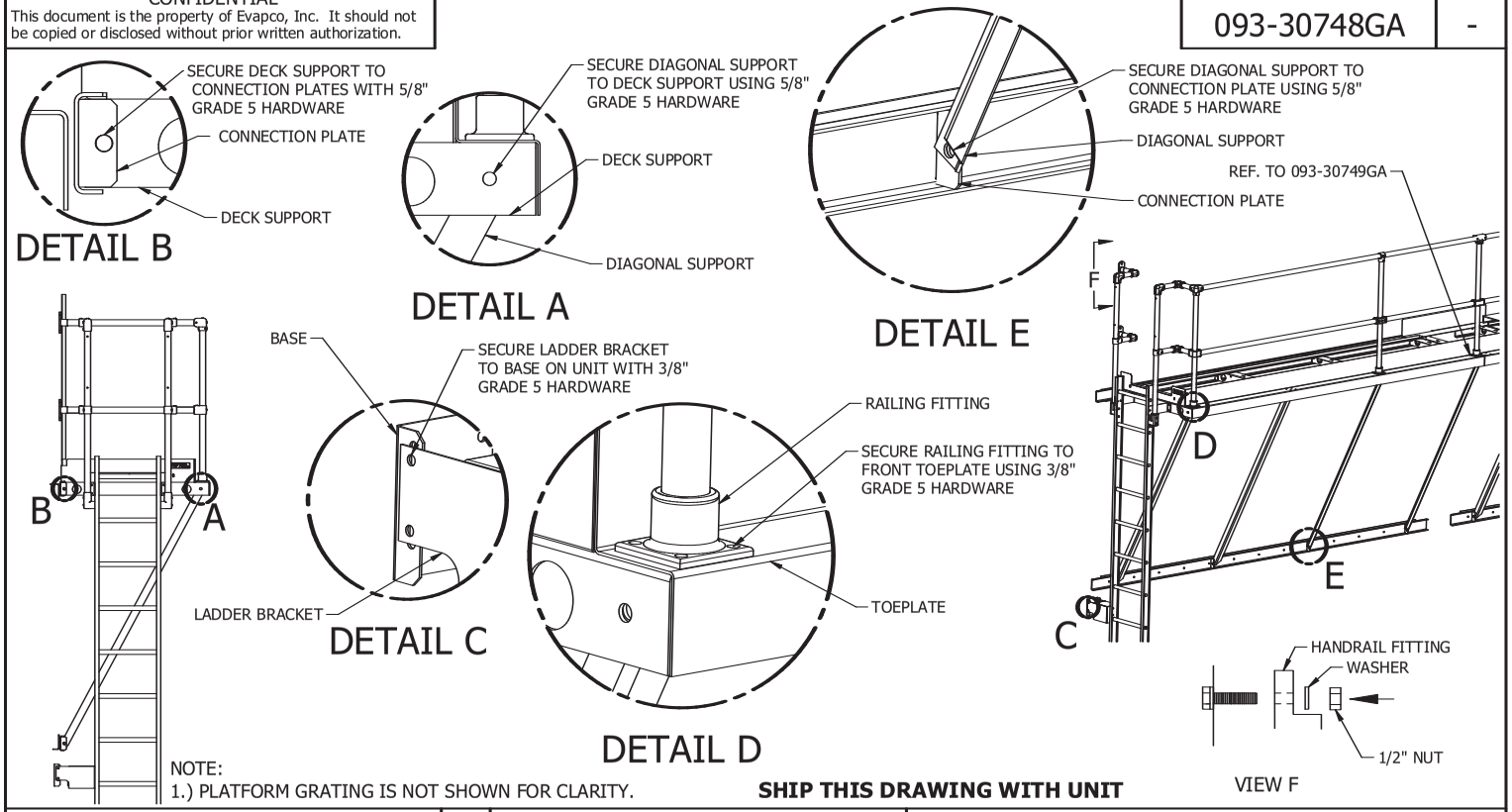
The working platform/ladder assemblies are shipped in the basin of the unit. In some cases they are shipped separately due to basin accessories that interfere with storage. The platform is partially assembled prior to shipment for minimal field assembly.

For 14' and 28' wide units, there will be one working platform/ladder assembly per fan section (see page 14 below). See pages 15-16 for 42' and 56' wide arrangements.

The platform and ladder assembly should be attached after the unit is fully rigged following the instructions below.



PART NO.	REV. NO.
093-30748GA	-



NOTE:
1.) PLATFORM GRATING IS NOT SHOWN FOR CLARITY.

SHIP THIS DRAWING WITH UNIT

STAINLESS STEEL OPTION

PART NO.	RAW MAT'L

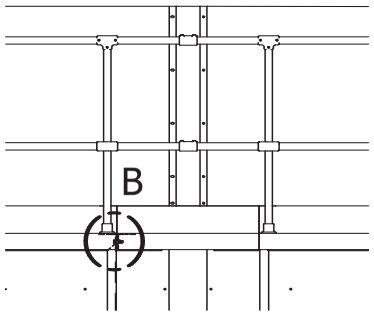
NOTE:
1. ALL 1/4Ø HOLES SHOULD BE 11/32Ø
2. USE STAINLESS STEEL N.C. SET-UP SHEET

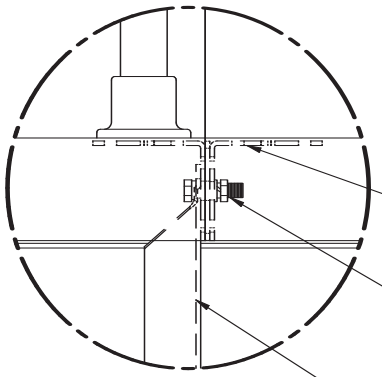
REVISIONS

EVAPCO, INC.

TITLE: FIELD ASSY PLTF GENERAL ARR		
GA	RAW MAT'L	CUT SIZE
DATE 11/22/11	SCALE N.T.S.	N.C. INFO.
DRAWN BY AWR	CH'KD BY	PART NO. 093-30748GA / REV. NO. -
NEXT ASSEMBLY:		

PART NO.	REV. NO.
093-30749GA	-





DETAIL B

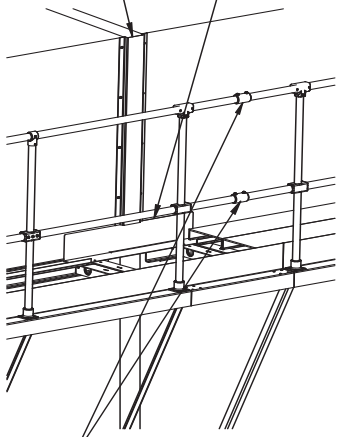
DECK SUPPORT SPACER SECTION

SECURE DIAGONAL SUPPORT TO BOTH DECK SUPPORTS USING 5/8" GRADE 5 HARDWARE

DIAGONAL SUPPORT

SAFETY CHANNEL:
RESTS ON TOP OF BACK SPACER TOEPLATE
GALVANIZED UNITS ATTACH USING
5/16" SELF-TAPPING SCREWS
STAINLESS STEEL UNITS ATTACH USING
5/16" STAINLESS STEEL NUTS AND BOLTS

BACK SPACER TOEPLATE



SLIDE RAILING COUPLING TO ENGAGE BOTH RAILS AND TIGHTEN

NOTE:
1.) PLATFORM GRATING IS NOT SHOWN FOR CLARITY.
2.) REPEAT THIS PROCESS WITH ALL SPACER PLATFORM SECTIONS

SHIP THIS DRAWING WITH UNIT

STAINLESS STEEL OPTION

PART NO.	RAW MAT'L

NOTE:
1. ALL 1/4Ø HOLES SHOULD BE 11/32Ø
2. USE STAINLESS STEEL N.C. SET-UP SHEET

REVISIONS

EVAPCO, INC.

TITLE: FIELD ASSY SPACER PLTF GENERAL ARR		
GA	RAW MAT'L	CUT SIZE
DATE 11/23/11	SCALE N.T.S.	N.C. INFO.
DRAWN BY AWR	CH'KD BY	PART NO. 093-30749GA / REV. NO. -
NEXT ASSEMBLY:		

Field Assembly of the Bottom Inlet Option

An option is available which locates the hot water inlet connection on the bottom of the unit. There is a bottom inlet connection assembly that ships loose and requires field installation. Follow these assembly instructions to complete the bottom inlet connection installation.

Assembly Instructions (Refer to Figure 27) (read all instructions before proceeding):

1. Assemble the cooling tower in accordance with the unit Rigging & Assembly Instructions.
2. Find the bottom inlet connection assembly. The assembly, consisting of the pipe spool, flexible reinforced pipe connectors and pipe clamps, comes uninstalled, fastened securely inside the basin section. See Table 3 for details on the assembly.
3. Position the bottom inlet connection assembly over the lower pipe nipple on the basin section. (see Figure 27)
4. Loosen the pipe clamps and slip the pipe connector down over the lower pipe nipple.
5. Align the bottom inlet connection assembly with the upper pipe nipple on the unit fill section, loosen the pipe clamps and slip the connector up over the upper pipe nipple.
6. Tighten all pipe clamps. A ratchet wrench is recommended.
7. Repeat for multi-cell units.

Model No.	# Bottom Inlet Connection Assemblies	# Pipe Connectors	# Pipe Clamps
114-0124 to 114-1224	1	2	4
214-0148 to 214-1148	2	4	8
314-0172 to 314-1272	3	6	12
228-0124 to 228-0924	2	4	8
428-0148 to 428-1248	4	8	16
114-526 to 114-926	1	2	4
214-552 to 214-952	2	4	8
314-578 to 314-978	3	6	12
228-526 to 228-926	2	4	8
342-526 to 342-926	3	6	12
428-552 to 428-952	4	8	16
456-526 to 456-926	4	8	16

Table 3 – Bottom Inlet Connection Assembly Details

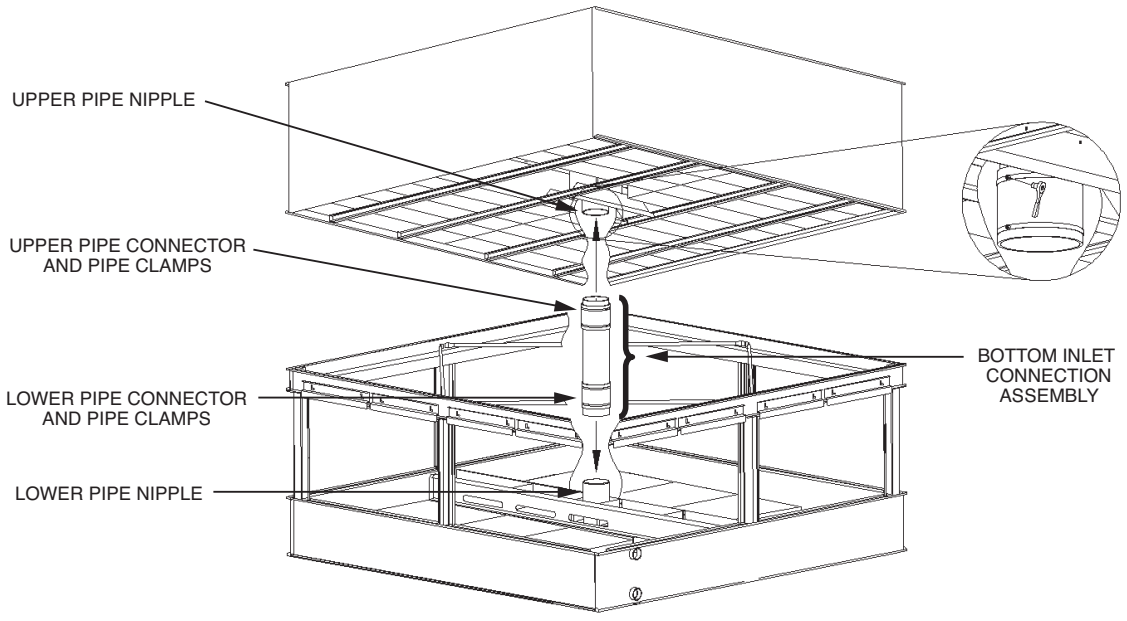


Figure 27 – Bottom Inlet Pipe Spool Installation

General Information - Start-up & Maintenance Start-up Details
Shipping Chocks and Debris

Remove any chocks that have been placed inside the unit for shipping purposes. Be sure to remove the chocks from between the fan and fan guard. Clean all debris from the pan prior to start-up. Close and secure all access doors.

Belt Tensioning and Sheave Alignment

ATs are equipped with a factory mounted motor on a sliding base with single bolt adjustment on each motor. Check the belt tension by applying moderate hand pressure to the center of the belt, it should deflect approximately 1/2". As a final check, confirm the sheave alignment by laying a straight edge from sheave to sheave. There should be four point contact. (see Figure 28) Adjust the position of the motor sheave as necessary.

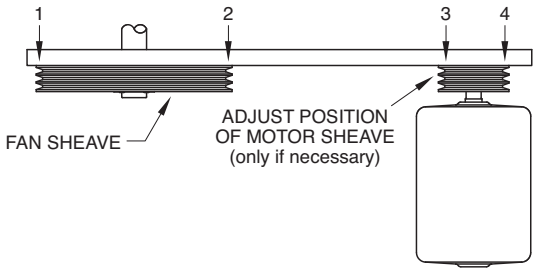


Figure 28 – Sheave Alignment Check

Bleed-off Line

Make sure a bleed line and valve are installed on the pump discharge side of the system piping to a convenient drain. The bleed-off valve should be open. For installation details, see the "Operation and Maintenance Instructions, Bulletin 113 (latest edition).

Strainer

Check the strainer(s) in the pan to make sure they are in the proper location over the pump suction, alongside of the anti-vortex hood. (see Figure 29)

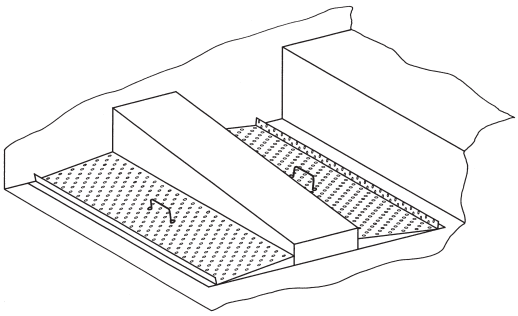


Figure 29 – Strainer Location

Adjustment of Float Valve

The float valve should be adjusted to maintain the proper water level as specified in the maintenance instructions. At start-up, the pan should be filled to the overflow level.

During operation, the water level will drop to no more than 5" below the overflow. The water level can be checked during operation by opening the removable louver section at the valve while the pump is running and the fans are off.

Screens

Protective fan screens are provided across the top of the fan cylinders of all models. Check and tighten all bolts.

Starting Sequence

Before starting the unit, check that all access openings, safety screens and covers are in place. Start the unit as outlined below:

1. Fill the pan to the overflow level.
2. Start the water pumps (by others). Check the water flow to the unit by checking the spray water pressure at the water inlet. It should be the same as the pressure indicated on the certified drawing.
3. Start the fans. Check the fans for proper rotation. Directional arrows are on the side of the fan cylinder.

NOTE: Do not operate the fans while the pump is off. Damage to the PVC fill can result during dry operation. Always start the water pumps first.

Maintenance

Once the installation is complete and the unit is turned on, it is important that it be properly maintained. Maintenance is not difficult or time-consuming but must be done regularly to assure full performance of the unit. Refer to the maintenance instructions enclosed with the unit for proper maintenance procedures.

Freeze Protection

Proper freeze protection must be provided if the unit is located in a cold climate. Refer to maintenance instructions as well as product bulletins for further information.

Rigging Parts List

The following table lists those parts which are shipped together with the unit(s) for field assembly and/or spare parts.

Model No.	# Sealer Tape	# Filler Cap Channels	# Vertical Splash Guards	# of Drip Channels
114-0124 to 114-1224	8	0	0	0
214-0148 to 214-1148	16	0	2	1
314-0172 to 314-1272	24	0	4	2
228-0124 to 228-0924	16	3	2	4
428-0148 to 428-1248	32	6	4	8
114-526 to 114-926	8	0	0	0
214-552 to 214-952	16	0	2	1
314-578 to 314-978	24	0	4	2
228-526 to 228-926	16	3	2	4
342-526 to 342-926	24	6	4	8
428-552 to 428-952	32	6	4	8
456-526 to 456-926	32	9	6	12

NOTES:
1. Drift Pins Provided in rigging box.

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