

# Instruction Manual

## CB Evaporative Cooling System with Center Tank EC1683



## CB Evaporative Cooling System with Center Tank

Models: CB10 with EC1683



# CB Evaporative Cooling System with Center Tank

## Instructions for Use and Maintenance

### Thank You:

Thank you for purchasing a Munters CB Evaporative Cooling System. Munters equipment is designed to be the highest performing, highest quality equipment you can buy. With the proper installation and maintenance it will provide many years of service.

### Please Note:

To achieve maximum performance and insure long life from your Munters product it is essential that it be installed and maintained properly. Please read all instructions carefully before beginning installation.

### Warranty:

For Warranty claims information see the “Warranty Claims and Return Policy” form QM1021 available from the [Munters Corporation office at 1-800-227-2376](http://Munters Corporation) or by e-mail at [aghort.info@munters.com](mailto:aghort.info@munters.com).

### Conditions and Limitations:

- Products and Systems involved in a warranty claim under the “Warranty Claims and Return Policy” shall have been properly installed, maintained and operated under competent supervision, according to the instructions provided by Munters Corporation.
- Malfunction or failure resulting from misuse, abuse, negligence, alteration, accident or lack of proper installation or maintenance shall not be considered a defect under the Warranty.

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# Unpacking the Equipment

# 1.

Before beginning installation, check the overall condition of the equipment. Remove packing materials, and examine all components for signs of shipping damage. Any shipping damage is the customer's responsibility and should be reported immediately to your freight carrier. CB Evaporative Cooling System is shipped with all parts and accessories in one crate.

## 1.1 Parts List

Munters CB Evaporative Cooling Systems are configured in 10'L. modules or a bulk option of 480'L. giving you the option of a single house or an entire site. Each system requires an Ending Kit, Tank Kit and Pump, each ordered separately. CB Cooling System Legths up to 80'L. requires 1 Tank and Pump. Systems longer than 80'L. require 2 Tanks and Pumps.

For a 5'H. system order EC4405 Ending Kit, for a 6'H. system order EC4406 Ending Kit.

A 60'L. x 6'H. system would consist of (6) CB10, (1) EC4406 Ending Kit, (1) EC1683 Center Tank Kit and (1) Pump.

A four house site with (2) 80'L. x 5'H. would consist of (1) CB480, (16) CB10, (8) EC4405 Ending Kits, (8) EC1683 Center Tank Kits and (8) Pumps.

### Each CB10 System Includes:

Qty.	Cat. No.	Description
1	JP3028	8" Pipe with Cut Lines, PVC
1	EC2402	Drip Collector, 10'L., SS
1	EC2400	Distribution Cap, 10'L., SS
1	EC2401	Pad Retainer, 10'L., SS
2	EC2413	Pipe Support Bracket, PL
1	EC1498	Pipe, 1.5"Dia. x 10'-2 1/2"L., with Holes, PVC
1	HP1610	Hardware Package, CB10 Cooling Module

### Hardware Package (HP1610) for CB10

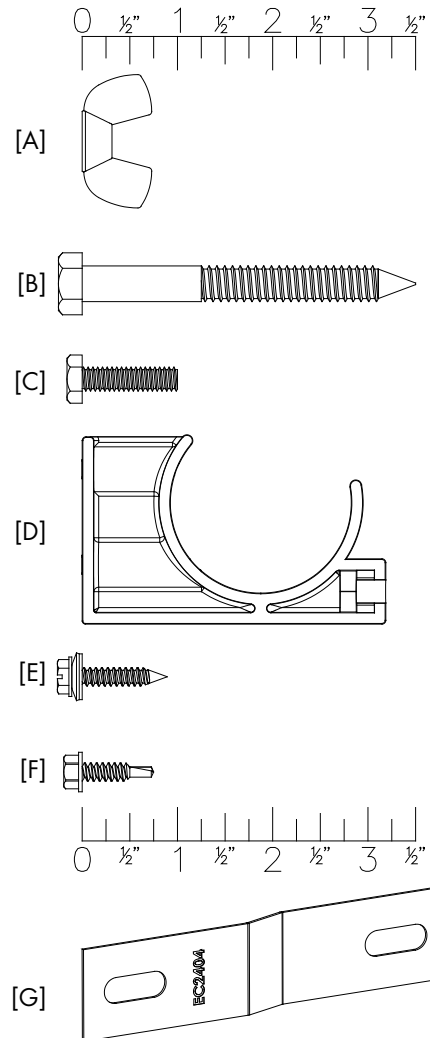
ID	Qty	Cat. No.	Description
[A]	7	KN2301	1/4"-20 Wing Nut, Type-A, NY, Natural Color
[B]	4	KS2462	3/8" x 3 1/2" Lag Screw, HOT DIP GALV.
[C]	7	KS1019	1/4"-20 x 1" Hex Bolt, SS
[D]	4	EC2410	Pipe Holder, 1.5"Pipe, PL
[E]	18	KS1404	#10-14 x 1" Seal Washer Polebarn Screw, ZP
[F]	1	KS2282	#10-16 x 3/4" HXWSR TEK Screw, SS

### Each EC4405/EC4406 Ending Kit Includes:

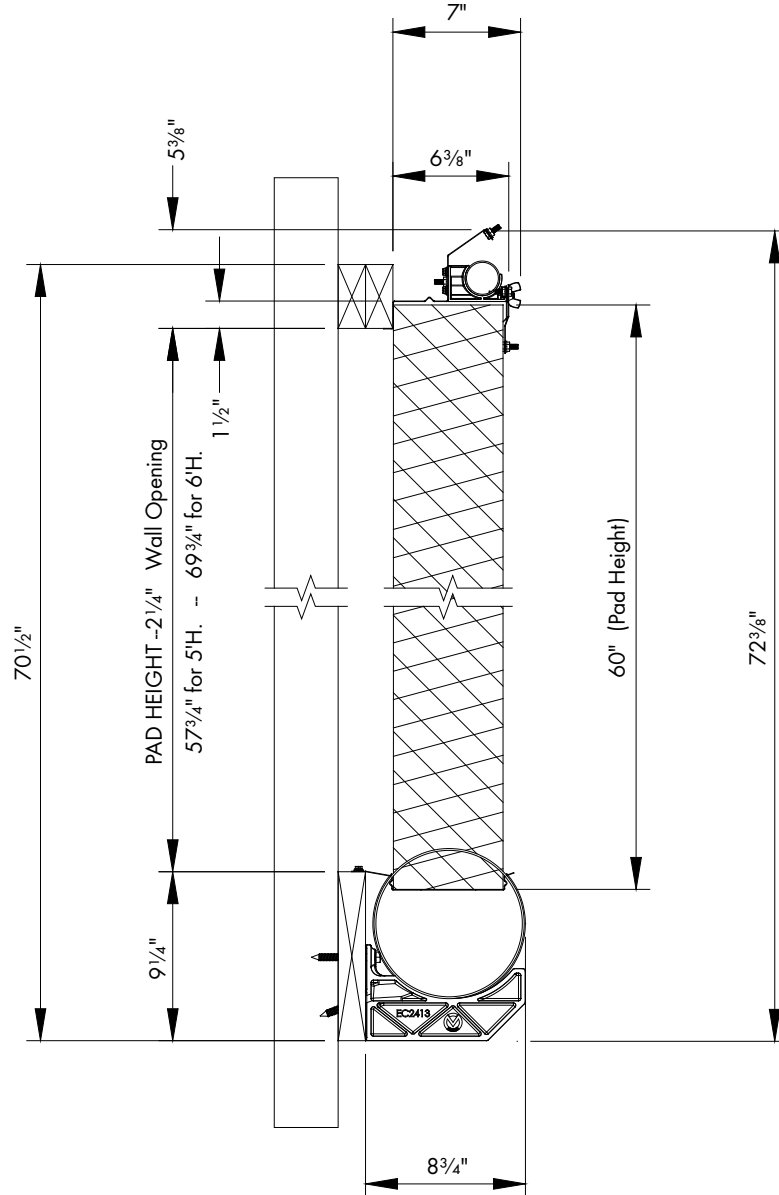
EC4405 Qty.	EC4406 Qty.	Cat. No.	Description
2	2	EC1400	End Panel for 5'H. System, SS
-	2	EC1412	End Panel Extension, 1'H., CB Cooling, SS
2	2	EC1359	1.5"Dia. x 59.5"L. Pipe Nipple, PVC
1	1	EC2413	Pipe Support Bracket, PL
1	1	HP1705/6	Hardware Package, Ending Kit, CB Cooling

### Hardware Package (HP1705/HP1706) for EC4405/EC4406

ID	HP1705 Qty.	HP1706 Qty.	Cat. No.	Description
[A]	4	8	KN2301	1/4"-20 Wing Nut, Type-A, NY, Natural Color
[B]	2	2	KS2462	3/8" x 3 1/2" Lag Screw, HOT DIP GALV.
[C]	4	8	KS1019	1/4"-20 x 1" Hex Bolt, SS
[E]	8	12	KS1404	#10-14 x 1" Seal Washer Polebarn Screw, ZP
[F]	2	2	KS2282	#10-16 x 3/4" HXWSR TEK Screw, SS
[G]	2	2	EC2404	End Panel Retainer Bracket, SS



1.2 Dimensions



# Installation Instructions

# 2.

## 2.1 Installation

### Step 1

Construct the framed opening to correct size according to Chart A (below) and your Cooling System size using a 2x10 across the bottom, 2x4's up the sides and a double 2x4 across the top.

See Figure 1A and 1B and Chart A.

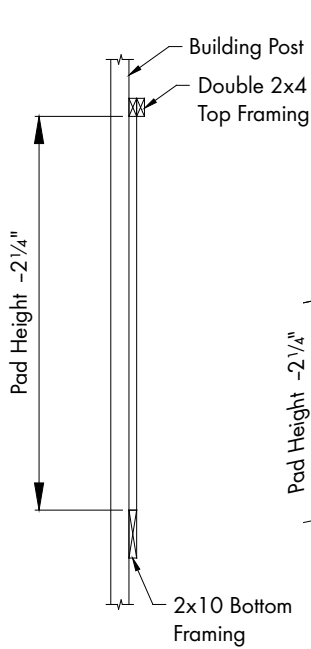


Figure 1A

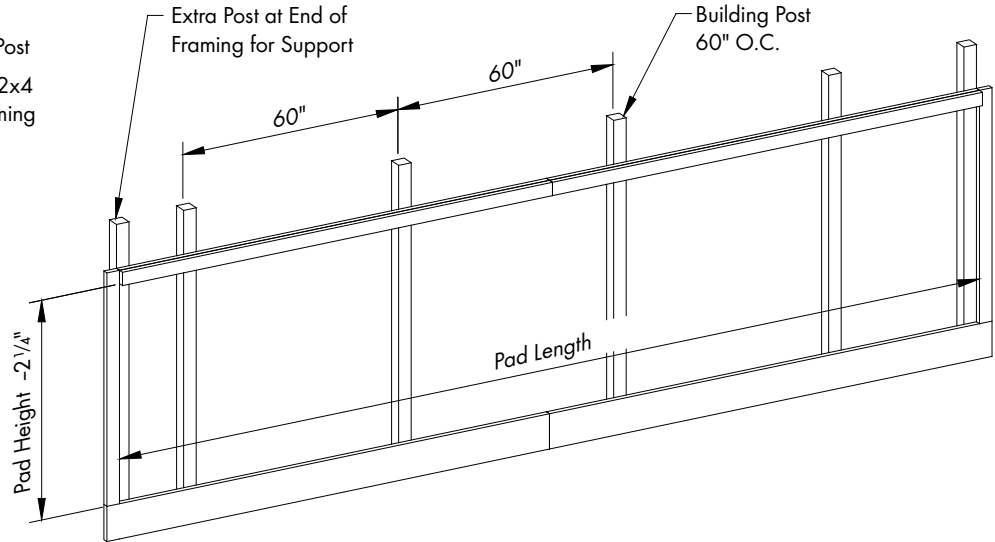


Figure 1B

Example	Length	Height
	Pad Length	Pad Height - 2 1/4"
80'L. x 5'H.	80'-0"	57 3/4"
60'L. x 6'H.	60'-0"	69 3/4"

Chart A

**Step 2**

The 8" Pipe Support Bracket should be installed every 60" O.C. into the building post, starting a maximum of 24" from the End Framing. The holes in Bracket should be aligned vertically with bottom flange flush with bottom of 2x10. Use holes in Bracket as a guide and pre-drill holes in the framing. Then fasten Bracket using Lag Screw [B]. See [Figure 2A and 2B](#).

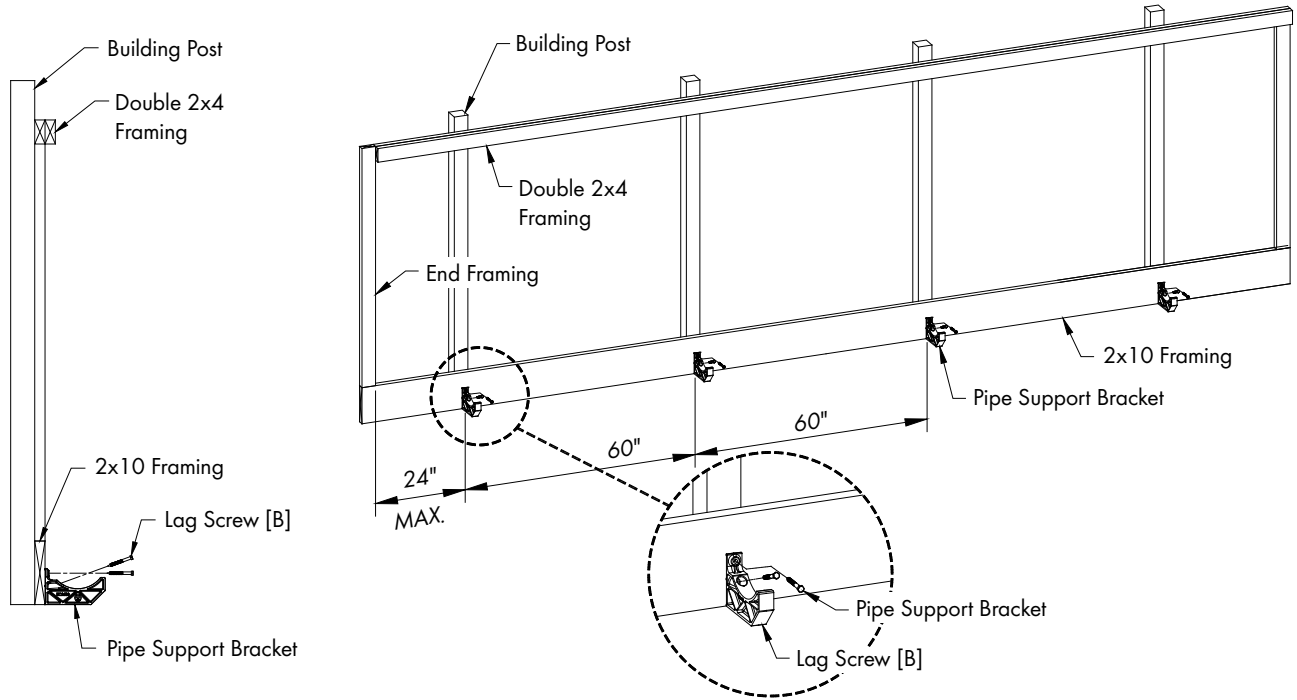


Figure 2A

Figure 2B

**Step 3**

Find the center of the cooling system and lay the 8"x8"x8" Tee on the ground between 2 Pipe Support Brackets. Position 2 full sections of 8" Pipe in the Pipe Support Brackets, one on each side of the 8" Tee, with the non-bell end towards the Tee and the Cut-Lines facing up. See [Figure 3](#).

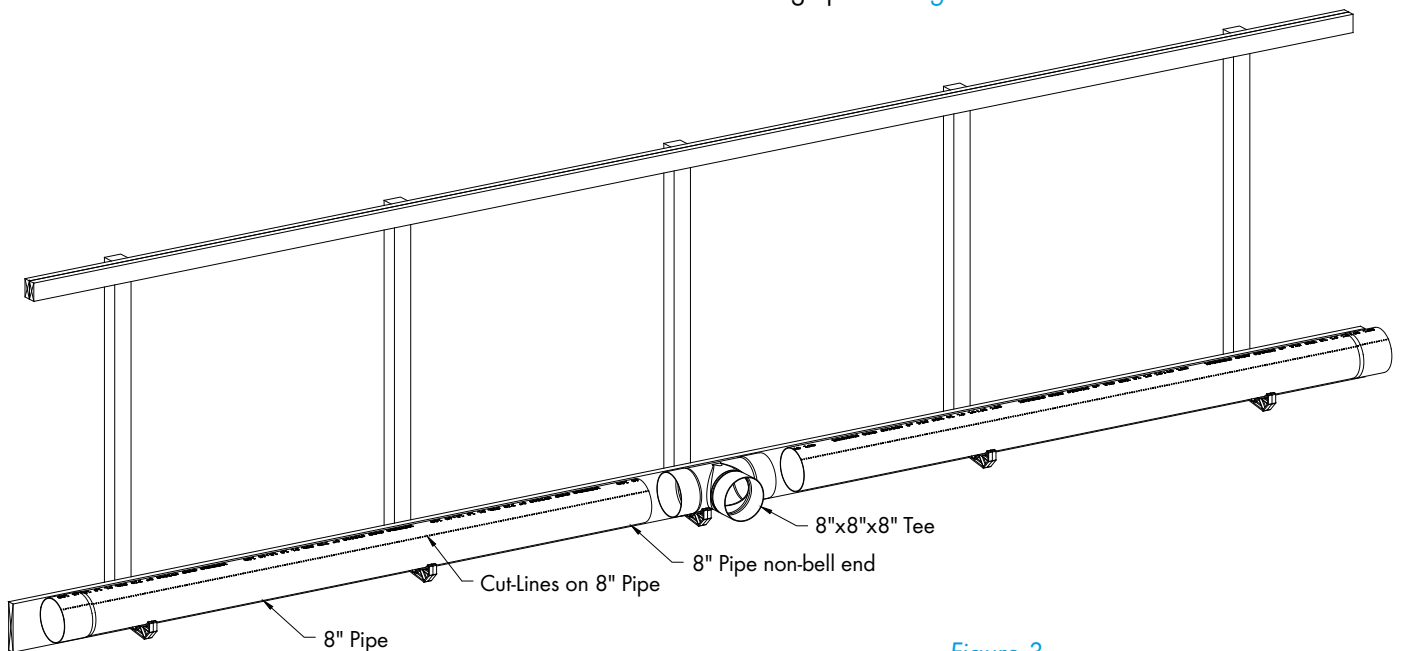


Figure 3

**Step 4**

With the 8" Pipe sitting in the Pipe Support Brackets, prepare the Pipe and Tee with PVC Pipe Primer (not provided), following the directions for use and drying. After priming, use heavy duty, heavy bodied PVC cement (not provided) for pipe 8" diameter or larger, in accordance to the PVC cement directions.

**Step 5**

Apply a generous amount of PVC cement to the inside of the bell end, and the outside of the non-bell end, and slide together, 5" deep making sure the Cut-Lines from each pipe line up. See Figure 4A. Continue for all sections of 8" Pipe making sure Cut-Lines from each pipe line up.

**Step 6**

At the ends of the cooling system, let the 8" Pipe extend past the End Framing and cut any excess 8" Pipe off so that it extend past the inside edge of Framed Opening 4". See Figure 4B.

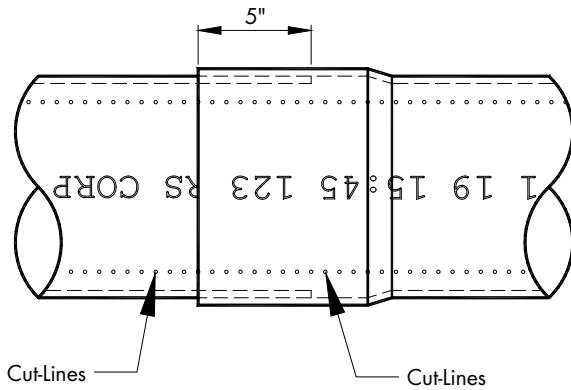


Figure 4A

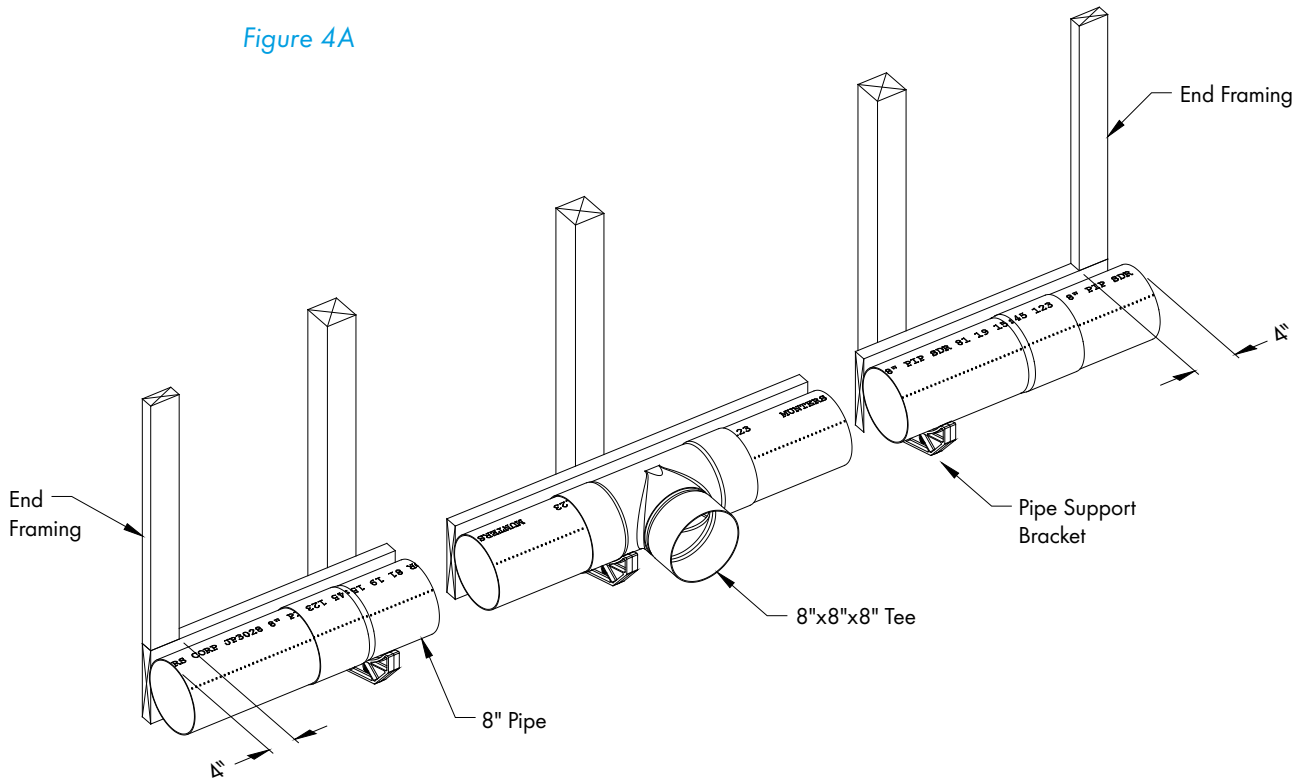


Figure 4B



**Step 7**

With the 8" Pipe sitting in the Pipe Support Brackets, positioned as stated in Step 6, mark a line between the Cut-Lines  $\frac{1}{4}$ " past the Framed Opening on each end of the pipe. Also, mark 2 lines across the Tee, between the Cut-Lines. See Figure 5A.

**Step 8A**

After the PVC cement has set-up, cut along the outside edge of the Cut-Lines and across the marks at each ends between the Cut-Lines. See Figure 5A. Remove the cut piece and any other debris from the remaining 8" Pipe.

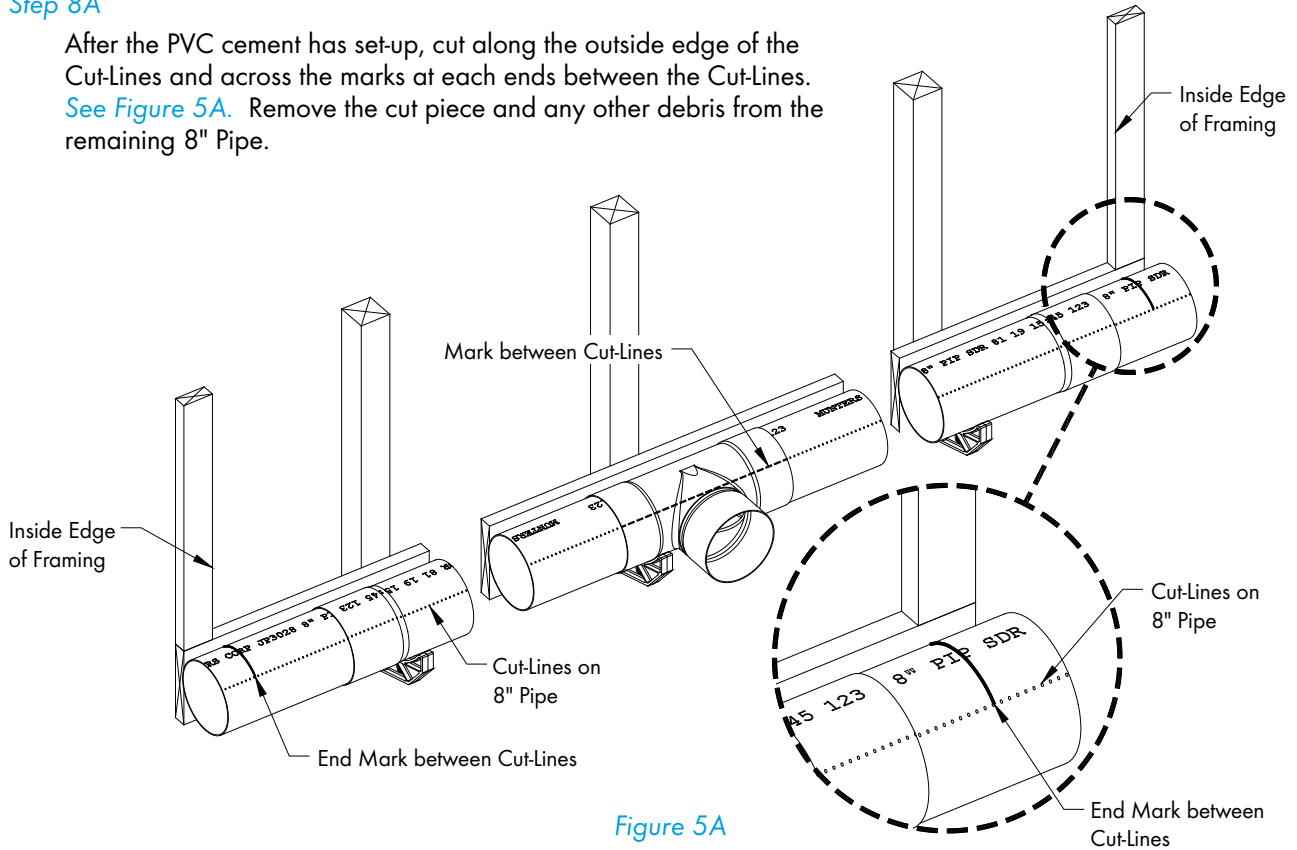


Figure 5A

**Step 8B**

Trim away a  $\frac{1}{2}$ " portion of the 8" Tee shown to allow room for the Drip Collector Flange. See Figure 5B. Remove the cut piece and any other debris from the remaining 8" Pipe.

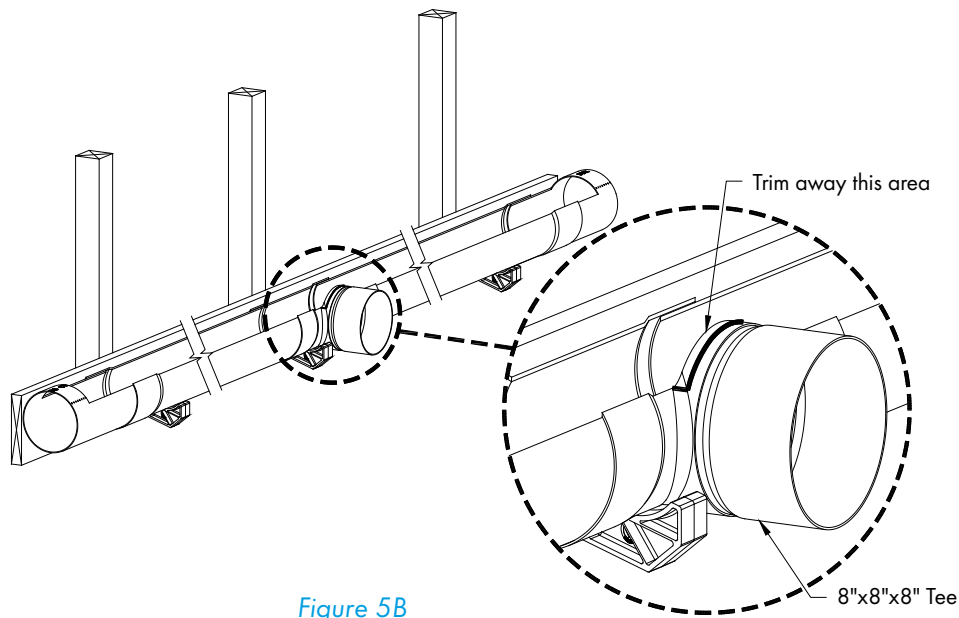


Figure 5B

**Step 9**

Make sure the cut-out opening in the 8" Pipe is facing up. Starting from the tank end install the Drip Collector into the 8" Pipe by inserting the side of Drip Collector with the flange into the pipe closest to framing and then snapping front of Drip Collector into the front of the 8" Pipe. See Figure 6A and 6B.

**Step 10**

Once Drip Collector is snapped into the 8" Pipe make sure Drip Collector and pipe is level and the flange is resting on top of 2x10 and Drip Collector is pushed up against the End Framing leaving a 1/4" gap between the end of the Drip Collector and the cut end of the 8" Pipe, then secure in place using (5) 1" Polebarn Screws [E]. See Figure 6B and 6C. Repeat for the remaining Drip Collectors, butting them up to one another.

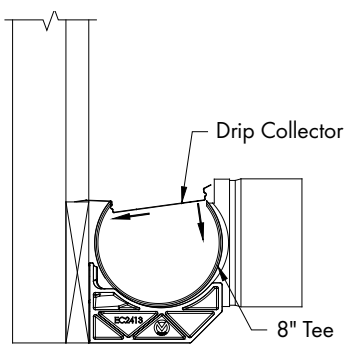


Figure 6A

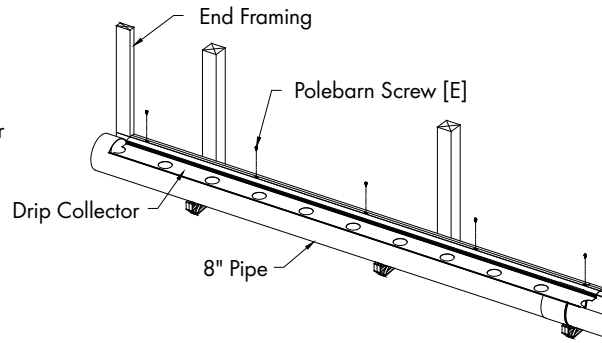


Figure 6B

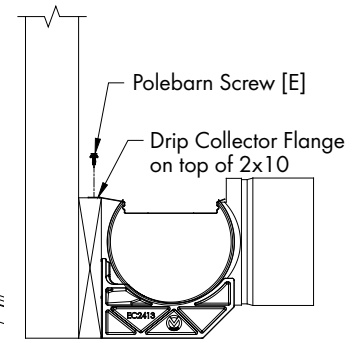


Figure 6C

**Step 11**

Locate the Distribution Cap and the plastic Pipe Holder. Fasten (4) Pipe Holders [D] to each Distribution Cap using (2) Polebarn Screws [E]. See Figure 7A and 7B. Make sure all the Pipe Holders are installed in the same direction.

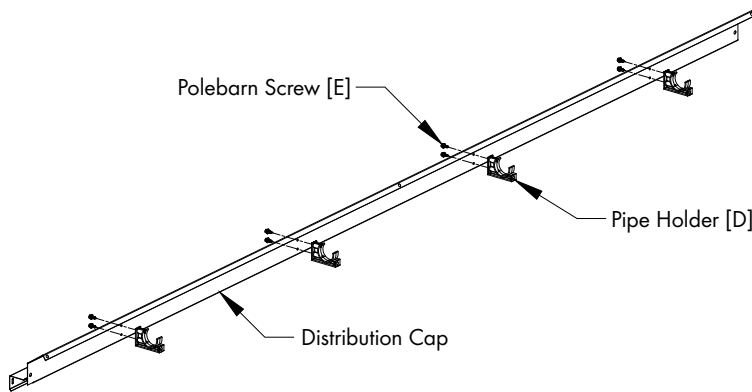


Figure 7A

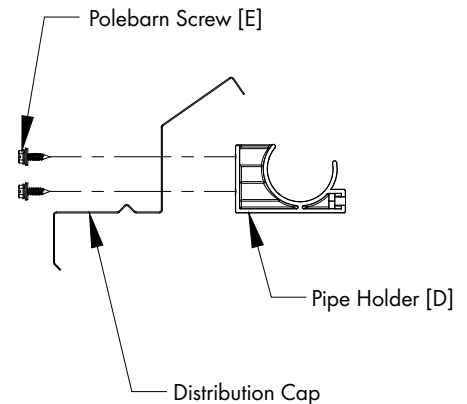


Figure 7B

**Step 12**

Snap a chalk line  $1\frac{1}{2}$ " above the bottom of the Top Framing. Then starting at the Tank End, hold the Distribution Cap up to the Top Framing so that the end is against the End Framing and the Long Edge of Cap is aligned with chalk line and loosely secure in place using (1) Polebarn Screw [E] in the end slots. See Figure 8A and 8B.

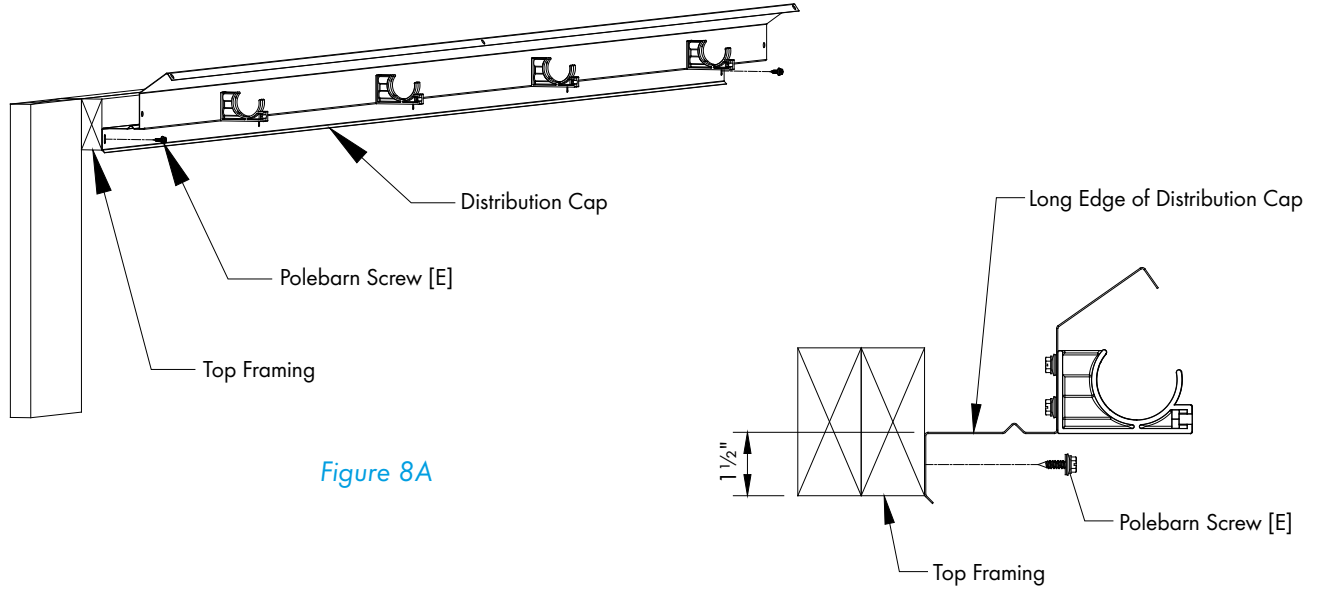


Figure 8A

Figure 8B

**Step 13**

After Distribution Cap is loosely secured to the Top Framing insert one piece of Cooling Pad at each end of the Distribution Cap. Use these pieces to adjust the height of the Distribution Cap. Distribution Cap should fit down tight to Cooling Pad. See Figure 9A and 9B. When the Distribution Cap is in place, make sure it is level, then tighten the (2) Polebarn Screws [E] and then install (3) Polebarn Screws [E] in the remaining slots.

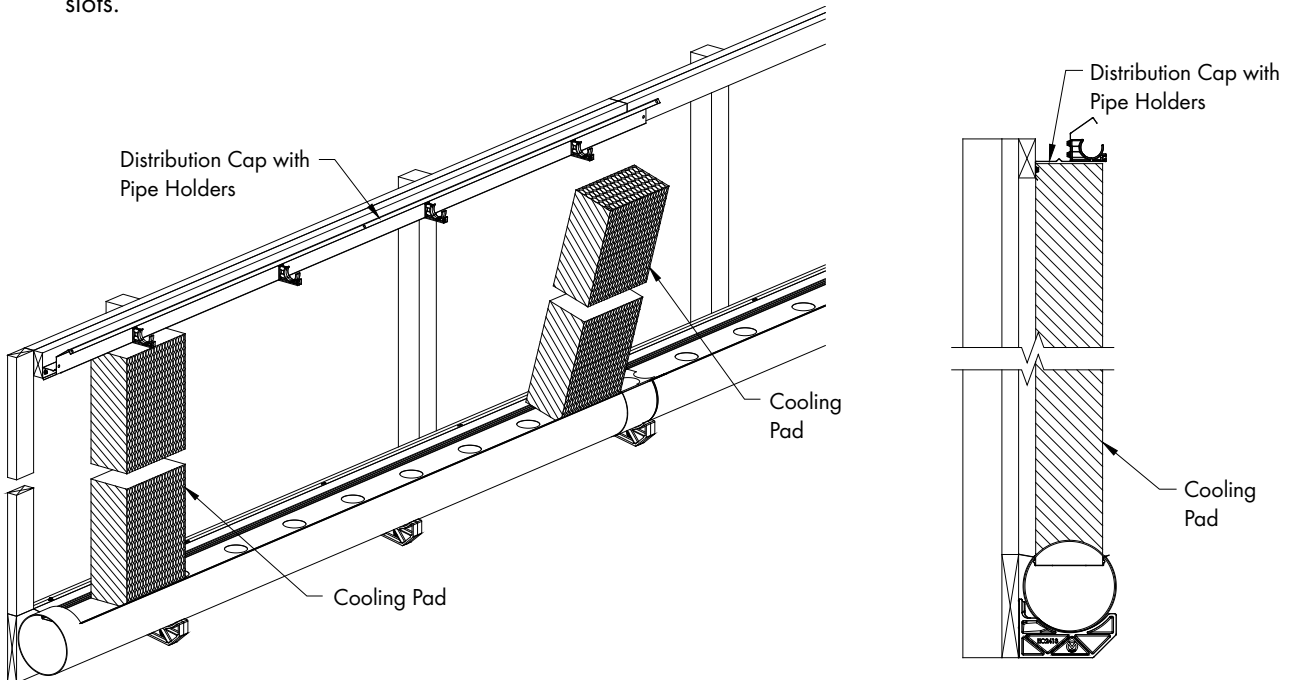


Figure 9A

Figure 9B

**Step 14**

Install the remaining Distribution Cap by butting the Mounting Flange of the next one up to the previous one, with the Splash Guard overlapping the previous one. Make sure Distribution Cap is level and securing in place with (5) Polebarn Screws [E]. See Figure 10. Then fasten the two Distribution Caps together using (2) Hex Bolts [C] and Wing Nuts [A].

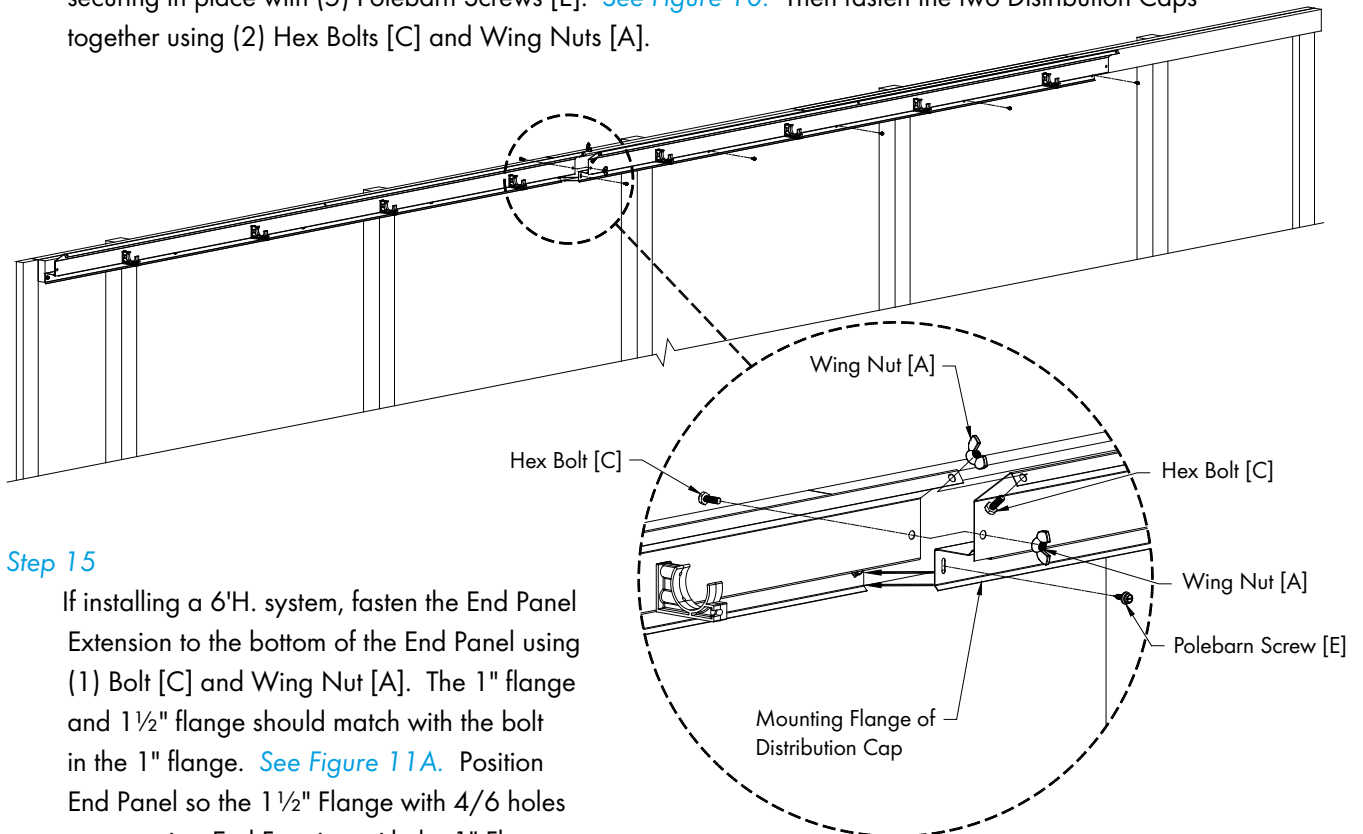


Figure 10

**Step 15**

If installing a 6'H. system, fasten the End Panel Extension to the bottom of the End Panel using (1) Bolt [C] and Wing Nut [A]. The 1" flange and 1 1/2" flange should match with the bolt in the 1" flange. See Figure 11A. Position End Panel so the 1 1/2" Flange with 4/6 holes rests against End Framing with the 1" Flange away from the framing and the bottom tab sticking into the slot between the end of the Drip Collector and the end of the slot in the 8" Pipe. Push the End Panel up against the Drip Collector at the bottom and the Distribution Cap at the top and attach to End Framing with (4/6) Polebarn Screws [E]. See Figure 11B. Repeat for opposite End Panel.

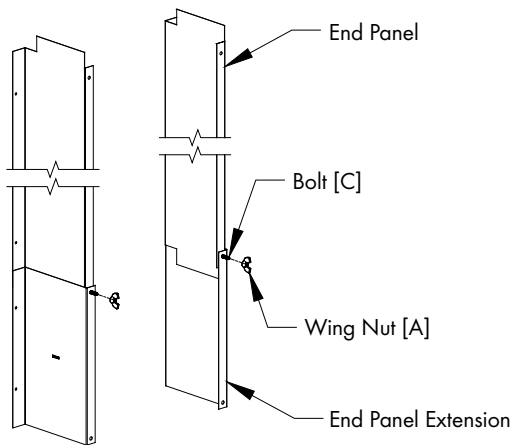


Figure 11A

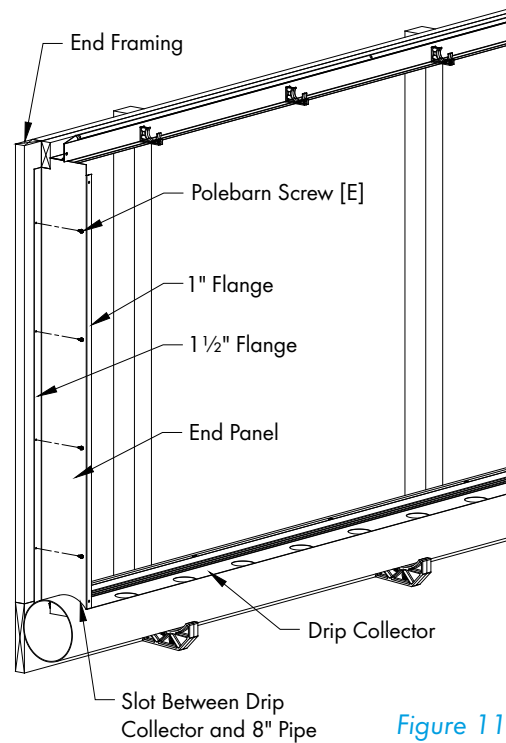


Figure 11B

**Step 16**

Insert (1) Hex Bolt [C] into each Pipe Holder Bracket down the length of the system. See Figure 12.

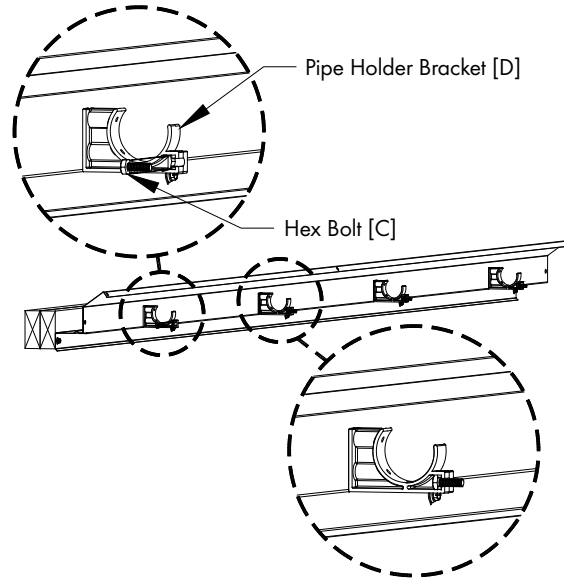


Figure 12

**Step 17**

Find the 1½" Slip Tee, it will be mounted directly above the 8"x8"x8" Tee (centered). Then working each way from 1½" Tee, assemble Distribution Pipe into Tee and then each other keeping the holes aligned. Secure pipes together using (1) TEK Screw [F] at each joint. At each end of the system install Slip Cap on end of pipe and secure with (1) TEK Screw [F]. Snap the Distribution Pipe into the Pipe Holder Brackets with the holes rotated 45°, so they are pointing toward the Splash Guard. See Figure 13A, 13B and 13C.

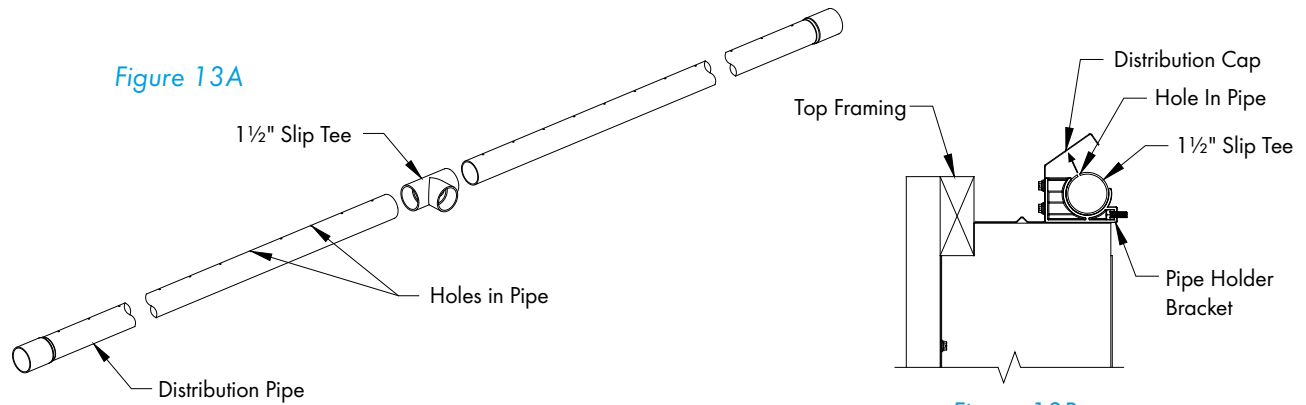


Figure 13B

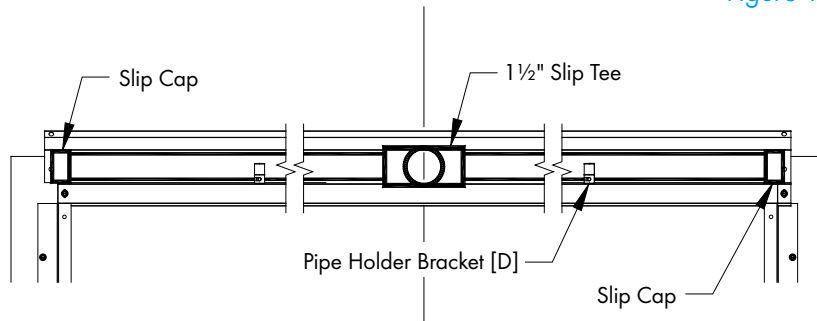


Figure 13C

**Step 18**

Insert the first piece of Cooling Pad and slide it tight up to the End Panel. Be sure the directional arrows on your Cooling Pad that should point upward and to the inside of the building. Making sure the pads are tight together, install the remaining Cooling Pads, stopping at the last 2 pads. See Figure 14.

**Step 19**

Slide the next to the last piece of pad tight to the End Panel. Measure the opening that is left for the last piece of pad at the top and bottom of the opening. If the opening is smaller than the width of the last piece of pad, then use a hand saw to trim the last piece of Cooling Pad to fit the opening. Insert the last piece of pad into the opening. See Figure 15.

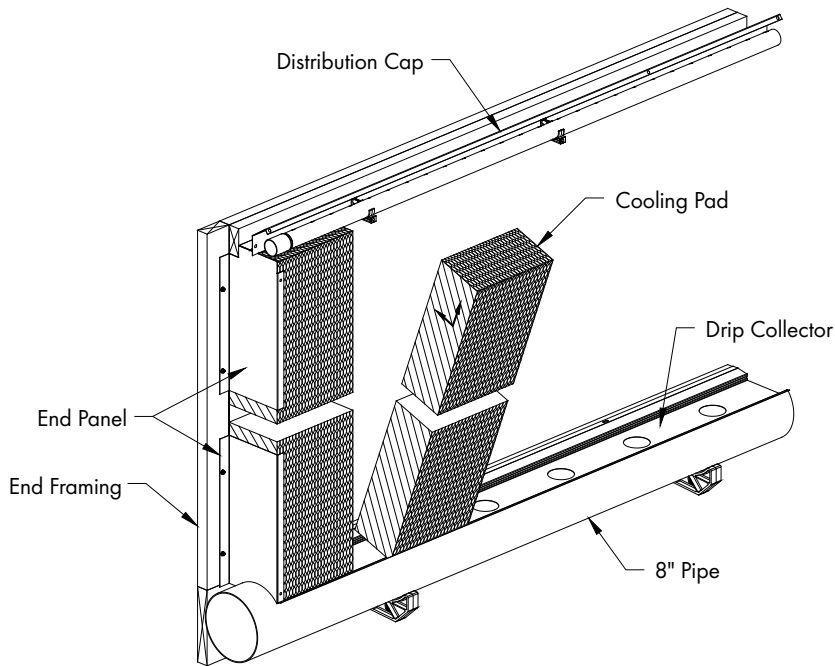


Figure 14

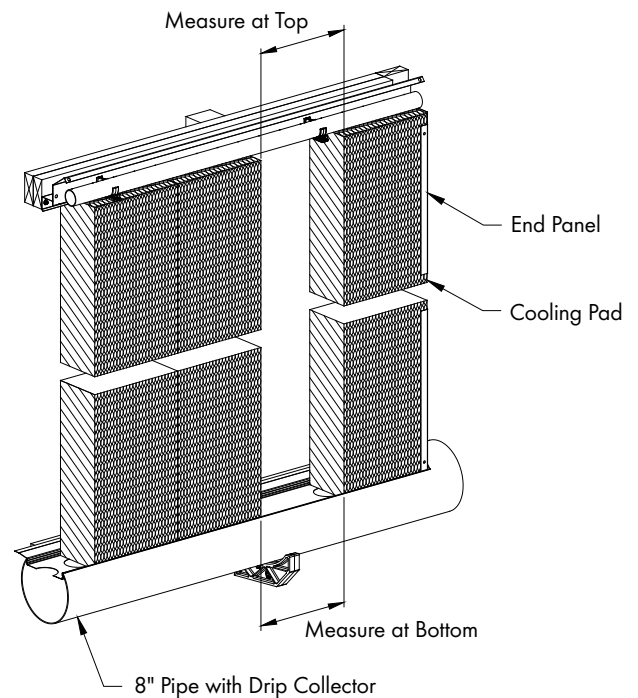


Figure 15

**Step 20**

Find the Pad Retainer and position it onto the bolts in the Pipe Holder Brackets and secure in place with (4) Wing Nuts [A]. See Figure 16A and 16B.

**Step 21**

Install the remaining Pad Retainers and secure in on bolts using Wing Nuts [A]. Where the next Pad Retainer overlaps the previous Pad Retainer secure with Hex Bolt [C] and Wing Nut [A] through slots. See Figure 16C. The Pad Retainer in the center where the 1 1/2" Tee is will need to be notched so it can be installed around the Tee and Supply Piping to be installed later. See Figure 16D.

Figure 16A

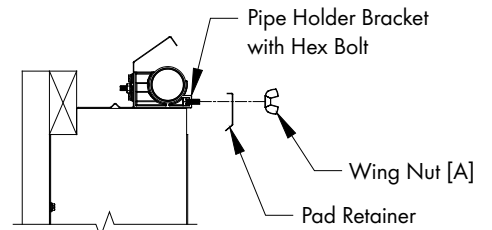
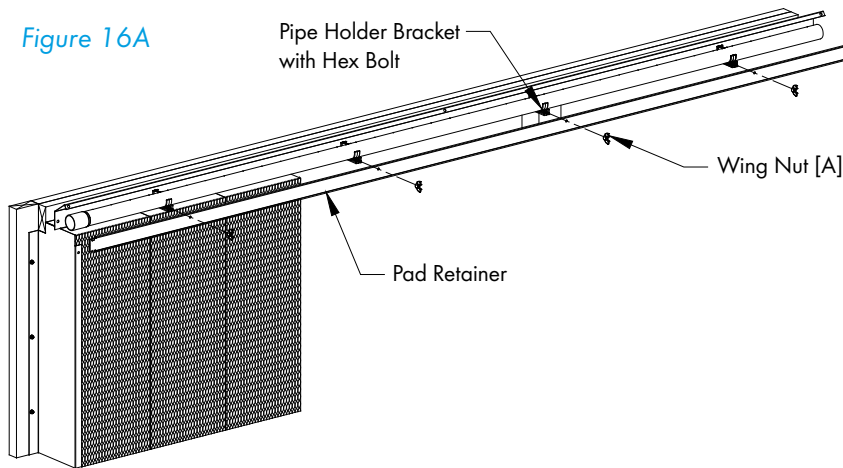


Figure 16B

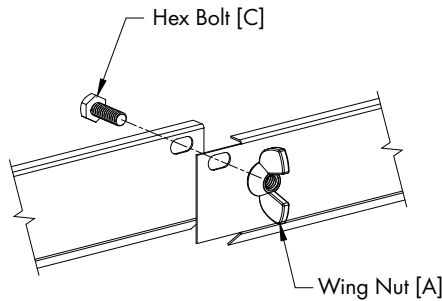


Figure 16C

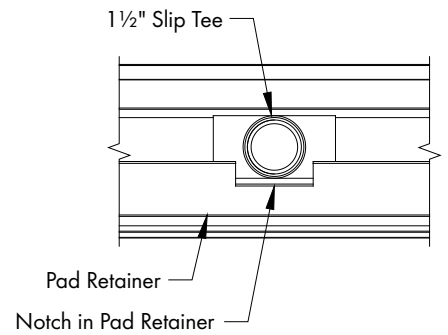


Figure 16D

**Step 22**

On each end of the system install an End Panel Retainer Bracket by inserting a Hex Bolt [C] in the hole in the End Panel and the slot in the Pad Retainer, then placing the Bracket over these 2 bolts and securing in place using Wing Nuts [A]. See Figure 17.

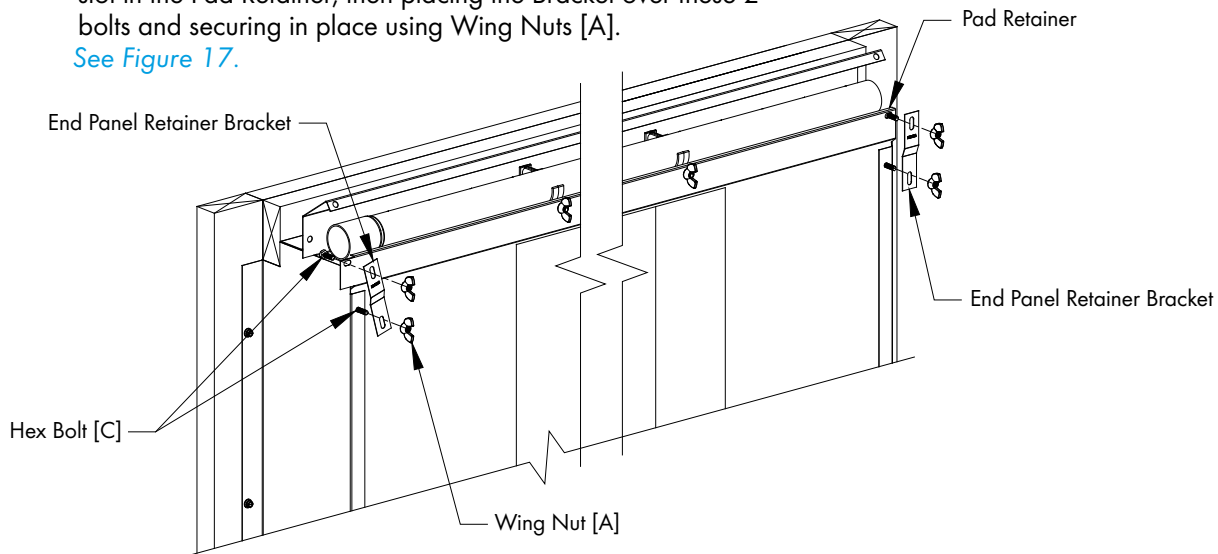


Figure 17

## 3.1 Black Poly Tank

### Step 23

Prepare the Black Poly Tank for attachment to the 8" Pipe by removing the flat interior surface of the 8" pipe area. Cut the flat end leaving a minimum of 1/4" lip around the edge. See Figure 18. DO NOT CUT the outer surface of the 8" pipe area, cutting the round surface will weaken the tank structure. See Figure 18.

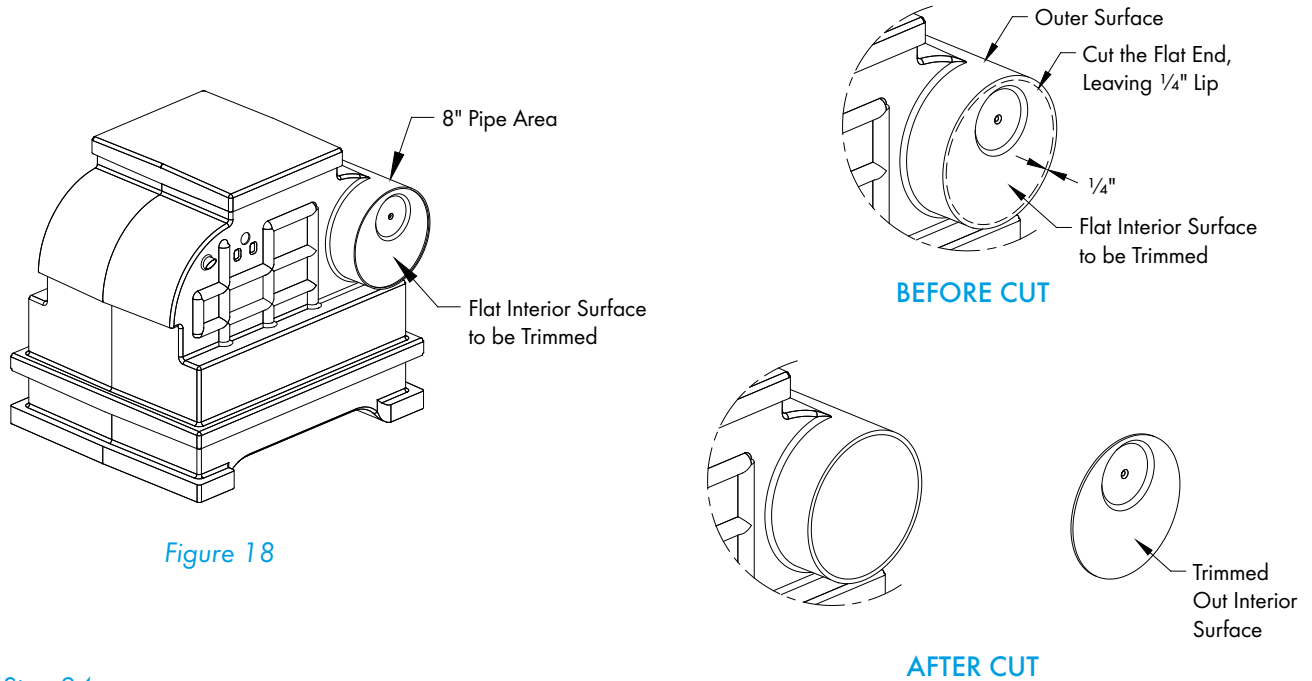


Figure 18

### Step 24

Install the 8" x 7.75"L. Pipe Nipple into the 8" Tee using PVC Primer and Glue. Then slide the Rubber Bellows Connector over 8" Pipe Nipple and over the trimmed out 8" pipe area of the Black Poly Tank and secure in place with the provided Hose Clamps positioned in the groove of the Rubber Bellows Connector. See Figure 19.

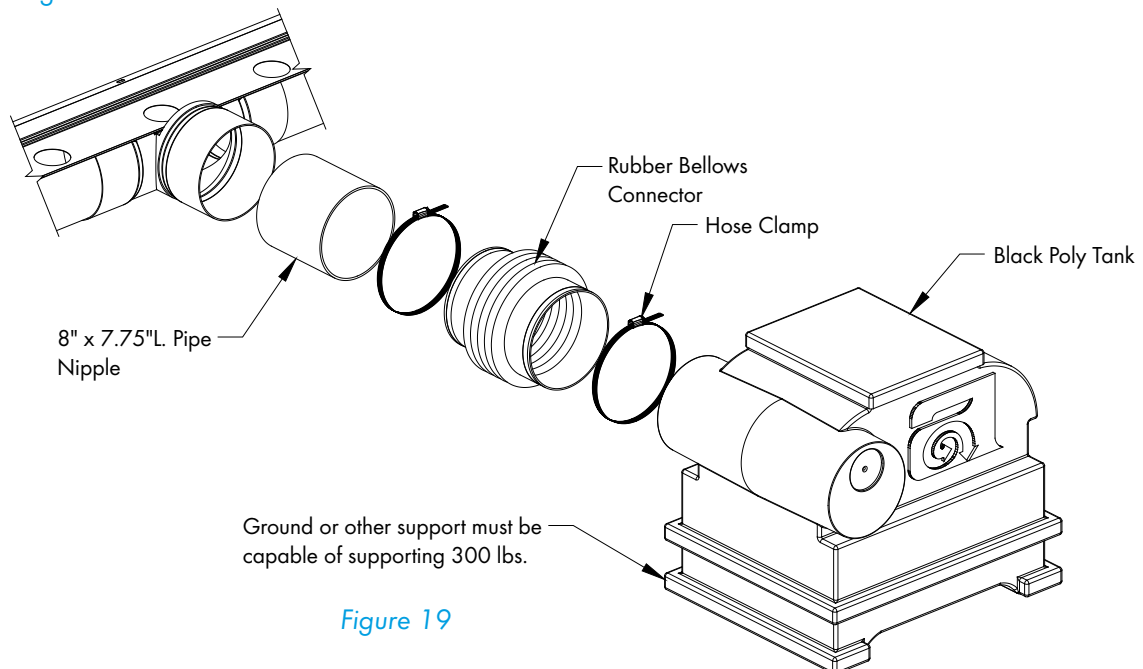


Figure 19



## Step 25

Clean any debris from inside the 8" Pipe. If needed flush-out the 8" Pipe with water before continuing. Position the Tank with Bellows Connector at the center of the system and slide the Rubber Bellows Connector over the 8" Pipe Nipple and secure in place with the Hose Clamp (provided). See Figure 20. On the each end of the system place the Black Rubber End Cap over the 8" Pipe and secure in place with Hose Clamp (provided). See Figure 20.

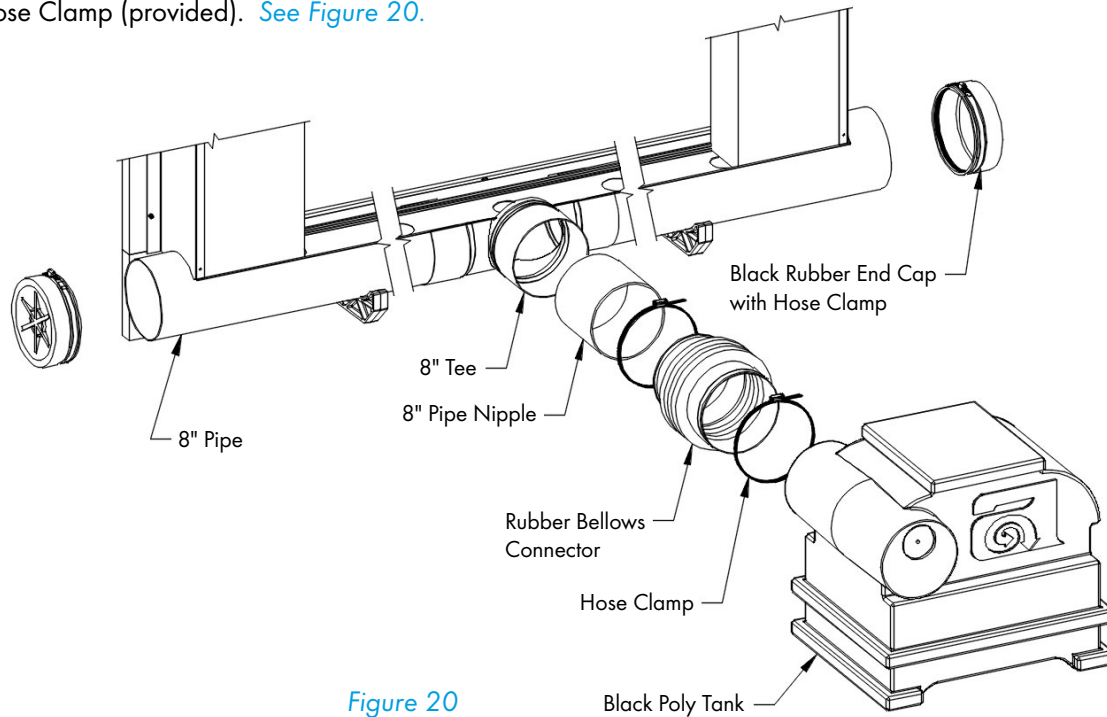


Figure 20

## Step 26

In some installations it may be necessary to bury or elevate the Black Poly Tank for proper alignment with the 8" Pipe. In either case the ground or support must be capable of supporting 300 lbs. If using the optional Cooling Tank Drain Kit, EC1630 for below grade or EC1635 for above grade, install it at this time, following the instructions included with the kit. See Figure 21.

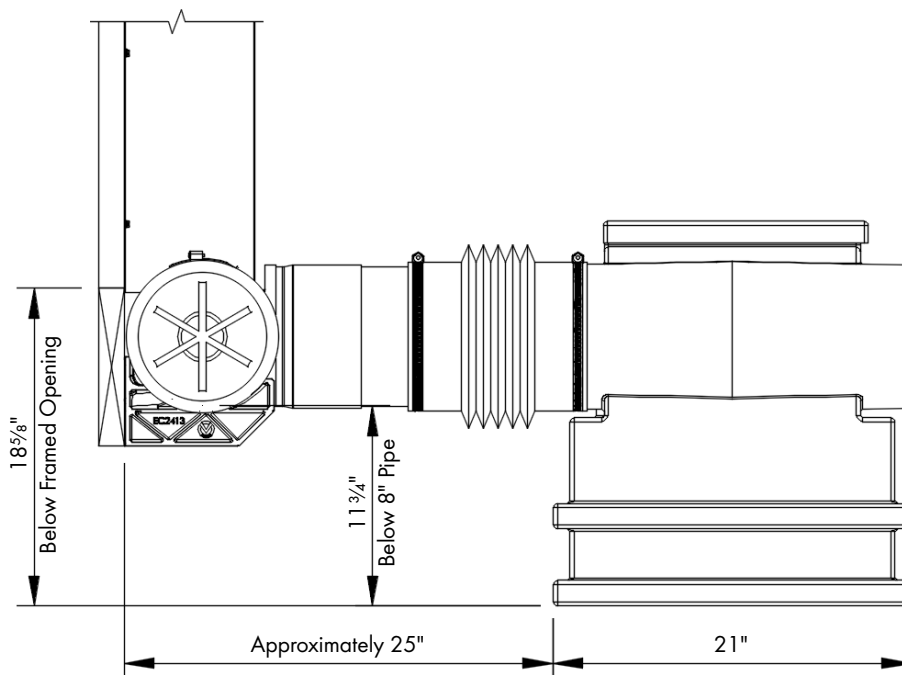


Figure 21

**Step 27**

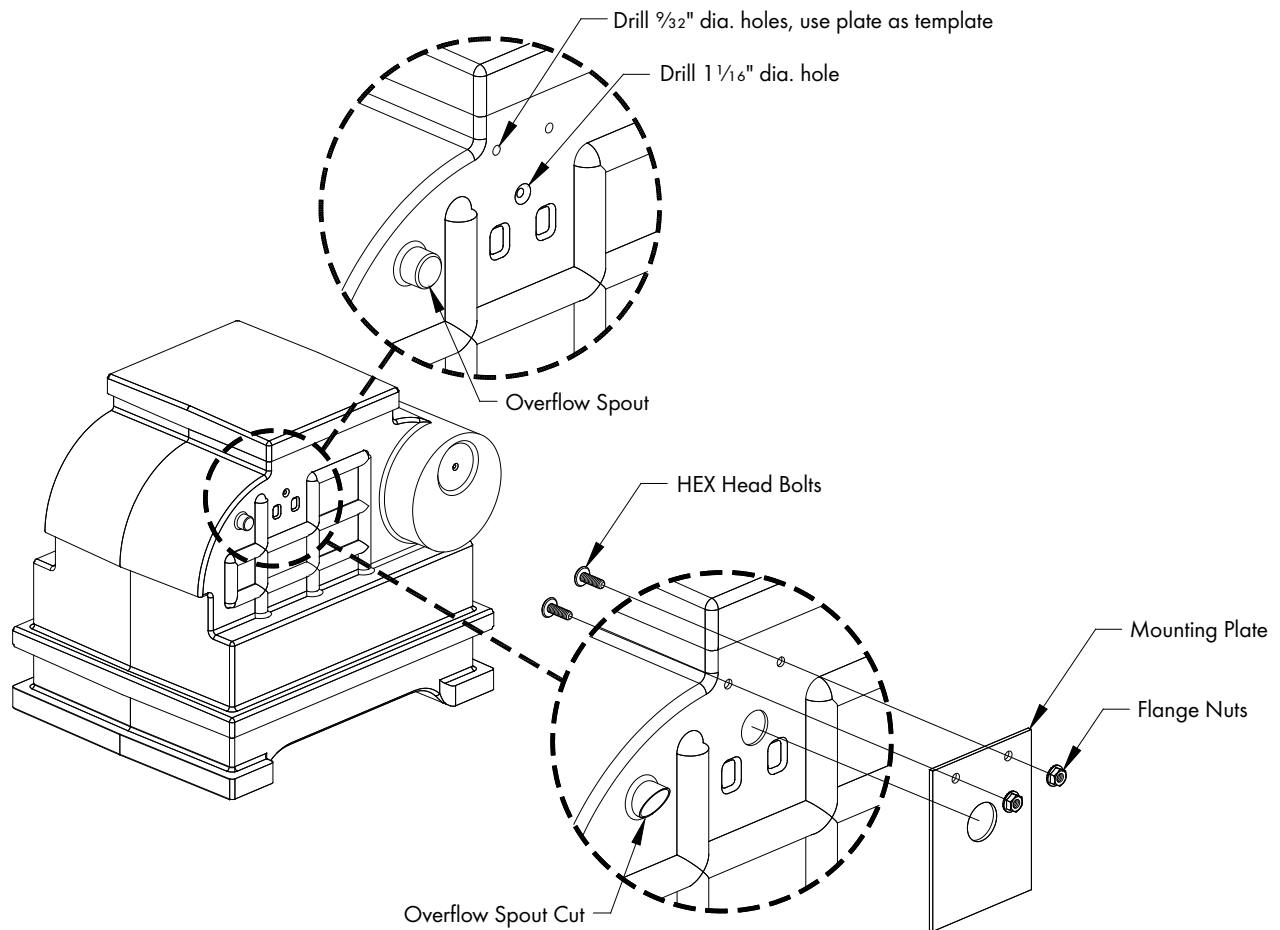
Cut overflow spout at an angle as shown. *See Figure 22.*

**Step 28**

Using the circular dimple in the tank, drill a 1 1/16" dia. hole for the float valve. *See Figure 22.*

**Step 29**

Hold the Mounting Plate up to the Tank and align the hole in the tank and mounting plate and mark the 2 smaller holes and drill (2) 3/32" dia. holes. Then attach mounting plate to tank using (2) HEX Head Bolts and Flange Nuts. *See Figure 22.*



*Figure 22*

## 3.2 Float Valve

### Step 30

Loosen or remove wing nut and bolt from Float/Valve Assembly and rotate the Float Assembly to the position shown and tighten wing nut. [See Figure 23A.](#)

### Step 31

Attach Float Valve Assembly to Tank using Washer, Nut and Garden Hose Adapter. [See Figure 23A and 23B.](#)

The ball of the Float Valve may need some adjustment to attain the proper water level in Tank. Proper water level should be approximately 4" below the top of the 8" Pipe or level with the opening in the overflow spout.

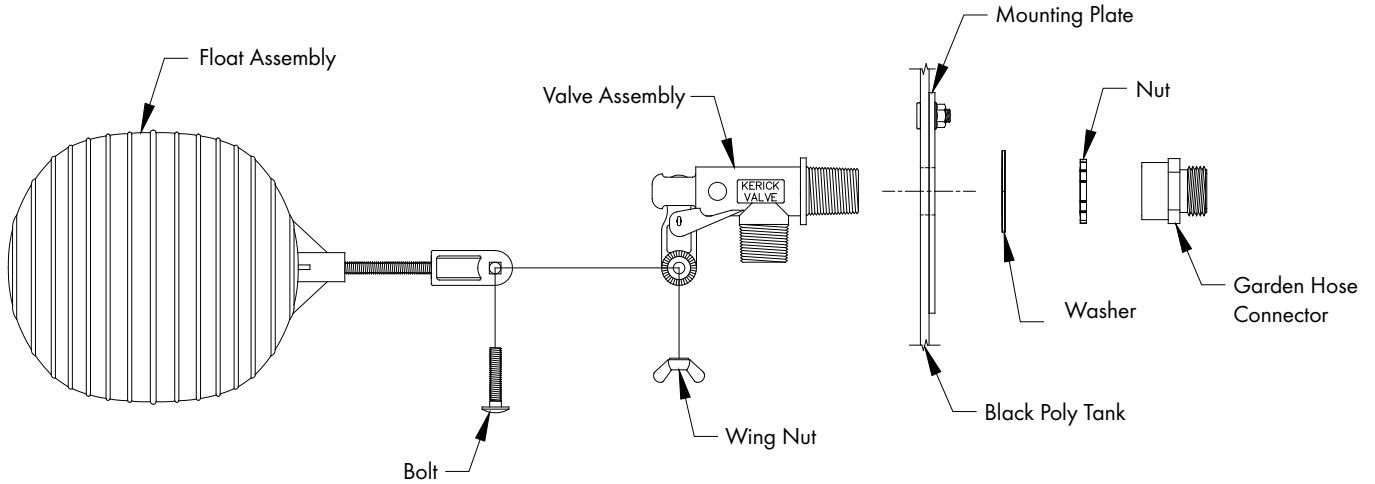


Figure 23A

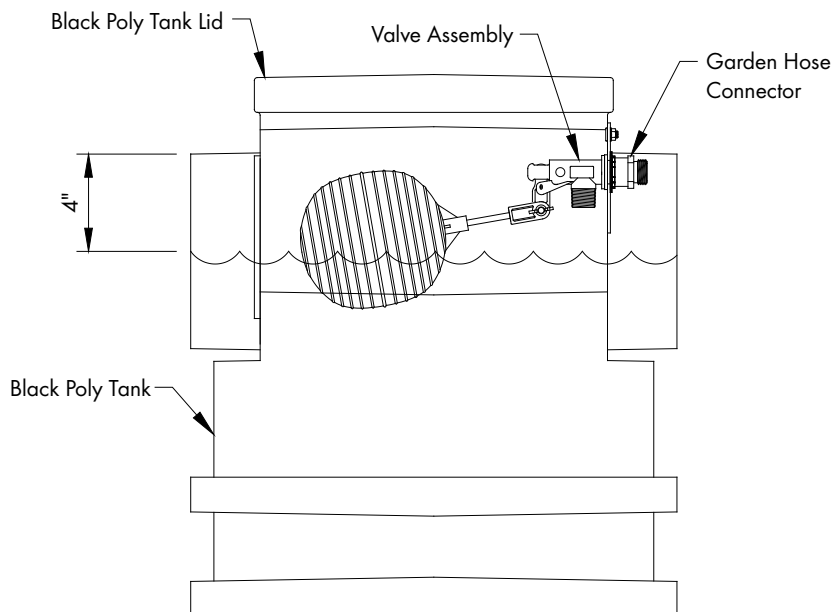


Figure 23B

**Step 32**

Cut Tank Lid to fit around the 1 1/2" water supply line connected to the pump. Make the cut match the location of the pump. See Figure 24.

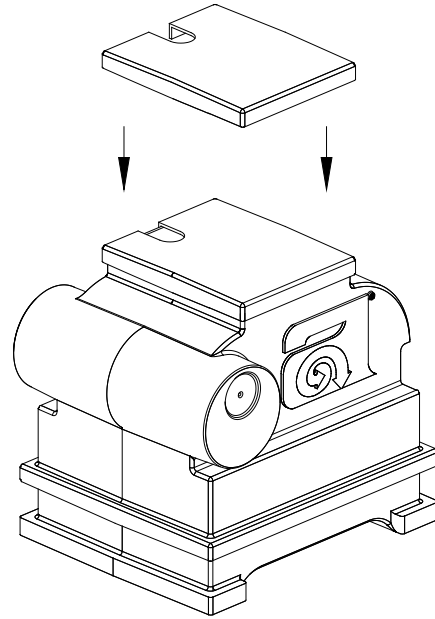


Figure 24

### 3.3 Optional Flush-out Kit (EC1507)

**Step 33**

If Flush-out Kit (EC1507) was purchased, remove TEK Screw and Pipe Cap from end of Distribution Pipe. Assemble Flush-out Kit piping as shown. See Figure 25. Installation of 90° elbow and (1) 1 1/2" x 10" pipe is optional, depending on the desired direction of water flow.

Flush-out Kit Assembly is now complete.

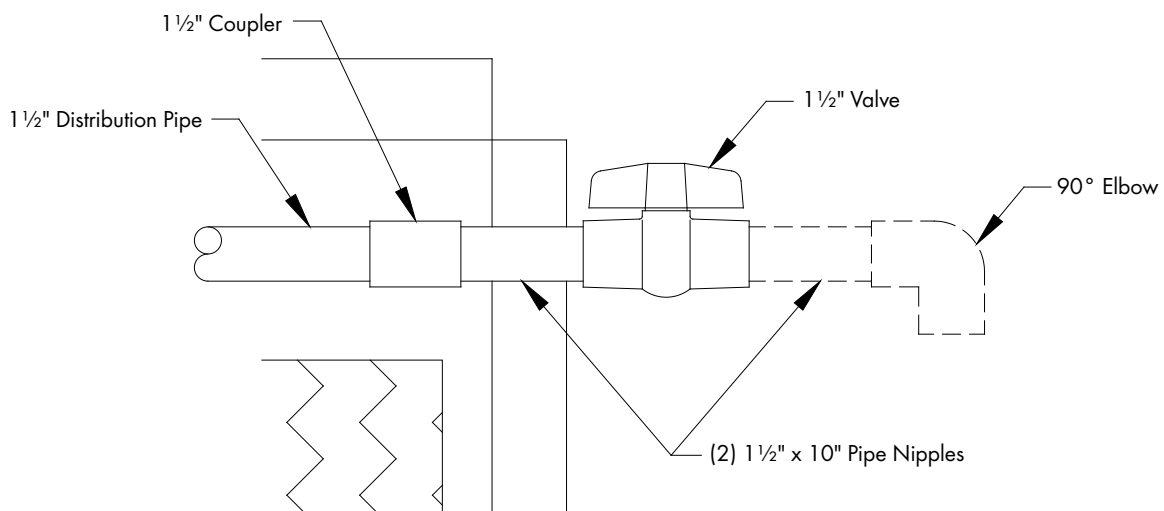


Figure 25

### 3.4 Plumbing Layout with Submersible Pump

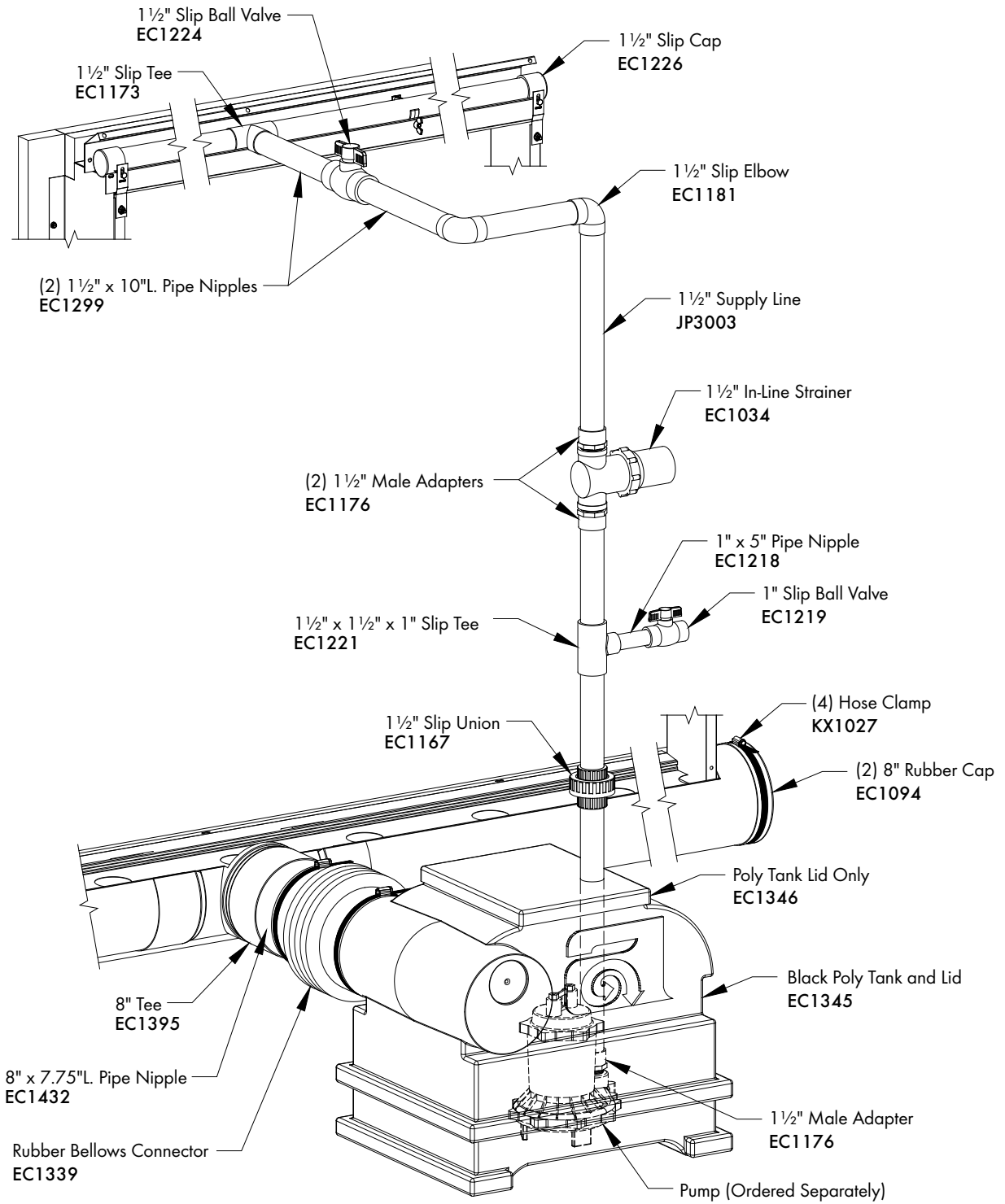


Figure 26

## 4.1 System Start-up

### Step 1

Flush-out 8" Pipe and Black Poly Tank of any debris before filling with water.

### Step 2

Prime pump with water.

### Step 3

Turn on the electrical power and fresh water supplies.

### Step 4

Activate the pump by setting the cooling thermostat below room temperature.

### Step 5

Open the flow control valve at each cooling panel enough to completely saturate the pad material.

### Step 6

Adjust the bleed-off valve to discharge water from the cooling system at a rate of 1 gallon per hour per linear foot of cooling system. For example: The bleed off rate for a CB705EF system (70'L.) would be 70 gallons per hour.

## 4.2 System Operation and Adjustment

### Step 1

Set the cooling setpoint on the temperature controller as shown on your Munters Corporation ventilation system drawing. If this is not available contact your Munters field representative for proper settings.

### Step 2

Adjust the flow control valve at each cooling panel to give the pad material a "shiny wet" surface. Pad material performs best when as much water as possible is used, but the flow should not be so great that water falls from the material.

### Step 3

If the pad material remains dry on one side (with fans running), even at full water flow, adjust the distribution pipe so that the distribution holes are pointing towards the splash deflector.

### Step 4

If water drips from the cooling panel's upper edge, the pad material may be loose in its frame. Correct this by tightening the wing nuts on the front of the pad retainer to press it more firmly against the pad material.

### Step 5

Water bleed-off is necessary to limit mineral deposits and other contaminants on the pad material by assuring the continuous addition of fresh water. The rate of, **1 gallon per hour per linear foot** of cooling system, should be considered only as a starting point in determining the required amount of bleed-off. Due to differences in water hardness, a trial and error process must be used to determine the correct rate for your location.

After the cooling system has operated for a week or 2, the sump water may become discolored or a light mineral coating may develop on the face of the pad material. If this occurs, increase the bleed-off rate slightly and observe the tendency of the coating to increase or stabilize. If after an extended period of time the mineral deposits become more visible, again increase the bleed-off rate.

Through this trial and error process a bleed-off rate will eventually be established at which the formation of new deposits will cease. Slightly increase the rate from this point to compensate for fluctuations in water hardness. The cooling system should now equalize and now more deposits should form.

## 5.1 Minimum Maintenance Schedule

To maintain your cooling system in top condition, the recommendations given in this chart should be treated as minimums. More frequent maintenance may be required at initial start-up, in certain climates, and in areas with hard water conditions.

	SCHEDULE		
	Weekly	Monthly	Yearly
Clean the foot valve or the pump filter screen		X	
Flush in-line strainer	X		
Check for dry streaks on pad material	X		
Clean debris from face of pad material	X		
Clean cooling control and sensor		X	
Clean cooling panel distribution pipe holes		X	
Clean cooling panel collection trough			X
Drain and clean sump tank		X	
Clean/check float valve		X	

## 5.2 Maintenance Checklist



Follow the guidelines below to prevent early pad failure and to get the maximum life from your pads.

1. Reduce the number of on-off cycles. Do Not use 10 minute cycle timers on pumps.
2. Shade the pads and sump to minimize algae growth.
3. Dry the pads out completely each night to kill algae. A 24 hour timer may be installed to shut pumps off at 10 PM and not allow them to come on until after 9 AM.
4. Bleed-off some water continuously to prevent concentration of minerals and dissolved chemicals in sump. Start with 1 gallon per hour for each linear foot of cooling system and adjust as necessary.
5. Drain and disinfect the water distribution system every three months to minimize algae, fungus and mineral build-up.
6. Run the recommended quantity of water over the pads. The pump must provide  $\frac{3}{4}$  gallon/minute for each linear foot of cooling system for 6" thick pad. For 4" thick pad, provide  $\frac{1}{2}$  gallon/minute for each linear foot of cooling system.
7. Periodically check for leaks in water distribution system.
8. Avoid harmful contaminants such as dust, fumes, fertilizers, harsh cleaners and water treatment chemicals.
9. Complete the items on the Maintenance Schedule listed above as required.

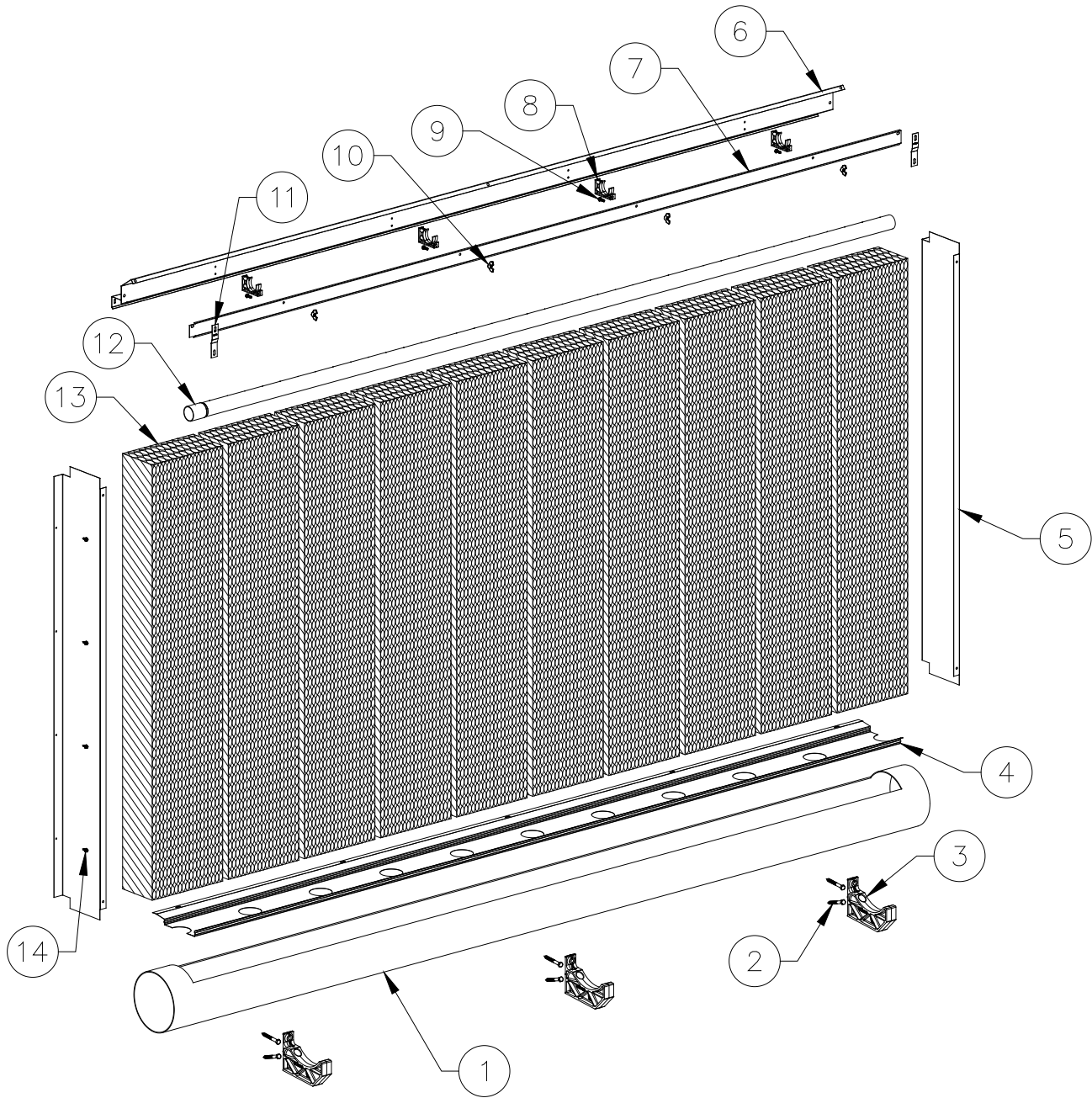


### Warning:

DO NOT add unapproved chemicals or commercial water treatments to the sump or supply water. If the above recommendations are followed and problems on the pad are observed such as algae growth, mineral deposits or softening of the pad material, contact Munters Corporation for further recommendations.

# Exploded View

# 6.





Item	Catalog No.	Description	Qty.
1	JP3028	8" Pipe with Cut Lines, PVC	varies/foot
2	KS2462	3/8" x 3 1/2" Lag Screw, HOT DIP GALV.	varies
3	EC2413	Pipe Support Bracket, PL	varies/foot
4	EC2402	Drip Collector, 10'L., SS	varies/foot
5	EC1400	End Panel for 5'H. System, SS	2
6	EC2400	Distribution Cap, 10'L., SS	varies/foot
7	EC2401	Pad Retainer, 10'L., SS	varies/foot
8	EC2410	Pipe Holder, 1.5" Pipe, PL	varies/foot
9	KS1019	1/4"-20 x 1" Hex Bolt, SS	varies/foot
10	KN2301	1/4"-20 Wing Nut, Type-A, NY, Natural Color	varies/foot
11	EC2404	End Panel Retainer Bracket, SS	2
12	EC1498	Pipe, 1.5"Dia. x 10'-2 1/2"L., with Holes, PVC	varies/foot
13*	CEL1545061260M1	CELdek® Pad Material	varies
14	KS1404	#10-14 x 1" Seal Washer Polebarn Screw, ZP	varies

\* Catalog Number changes depending on type and size of pad.

CB Evaporative Cooling System is developed and produced by Munters Corporation, Lansing, Michigan U.S.A. 1-800-227-2376



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