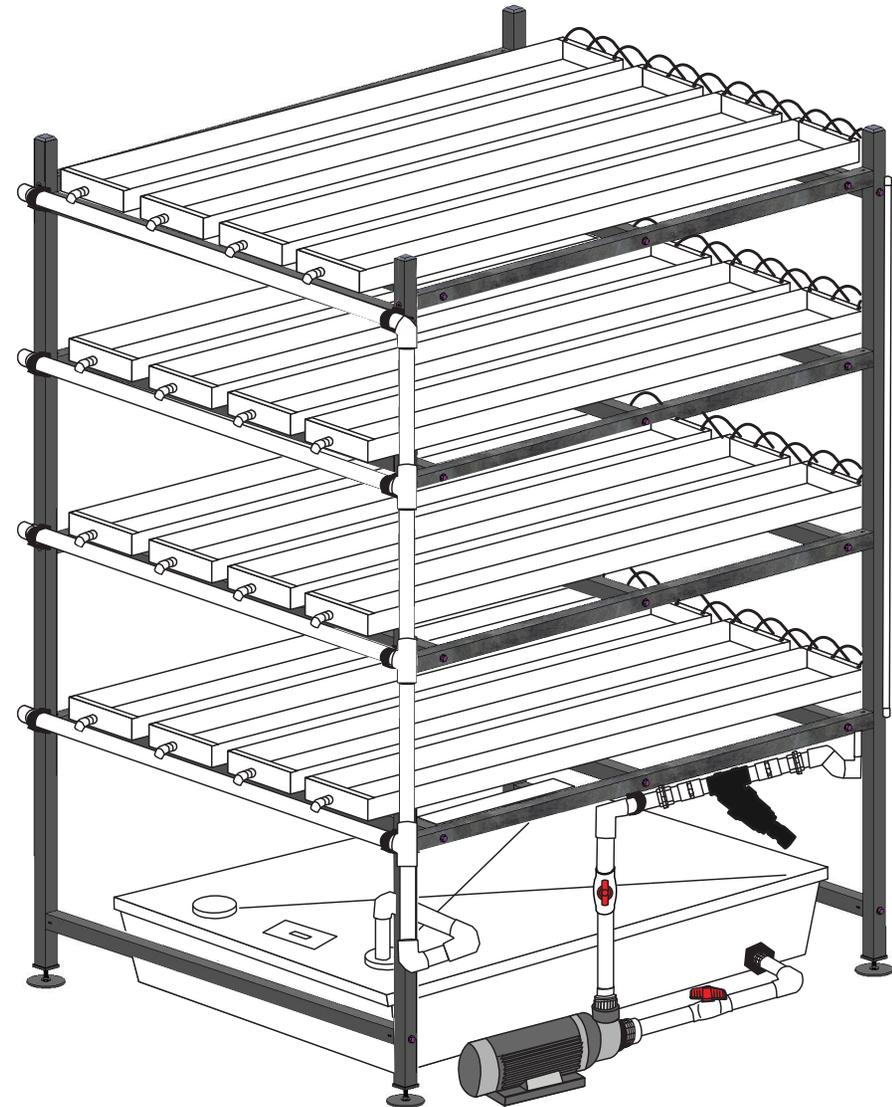




HydroCycle 9" Pro Vertical Microgreen System (5')



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WARNING: Cancer and Reproductive Toxicity - P65Warnings.ca.gov

Revision date: 05.23.23

STK#

115276

DIMENSIONS

51" W x 80" H x 58" L*

*Dimensions have been rounded and are approximate. Dimensions are of the frame only; they do not include adjustable feet or pvc plumbing and fixtures.

Important Information

READ THIS DOCUMENT BEFORE YOU BEGIN

Thank you for purchasing the vertical microgreen system. When properly assembled and maintained, this product will provide years of reliable service. These instructions include helpful hints and important information needed to safely assemble and properly maintain the system. Please read these instructions **before** you begin. If you have any questions during the assembly, contact Customer Service at 1.800.245.9881 for assistance.

SAFETY PRECAUTIONS

- Wear eye protection.
- Wear gloves when handling metal pipes.
- Use a portable GFCI (Ground Fault Circuit Interrupter) when working with power tools and cords.

REQUIRED TOOLS

The following list identifies the main tools needed to assemble the microgreen system. Additional tools and supports may be needed.

- Level (4'- recommended)
- Wrench set to set adjustable feet
- Ratchet with 1/2" socket to assemble frame
- 3/16" hex (Allen) wrench
- 5/16" drill bit
- Magnetic nut setter (5/16" x 2-9/16")
- Small hammer and gloves
- Cutting tool to cut pvc tubing
- Adjustable pliers
- 1-3/8", 2-1/4" and 2-1/2" hole saw bits
- Adjustable supports or saw horses for channel assembly.



ASSEMBLY PROCEDURE

Following the instructions as presented will help ensure the proper assembly of your microgreen system. The steps outlining the assembly process are as follows:

1. Verify that all parts are included in the shipment. Notify customer service for questions or concerns.
2. Read these instructions and all additional documentation included with the shipment **before** you begin.
3. Gather the tools and assistants.
4. For best results, assemble the components in the order they are presented in these instructions.
5. Read the care and maintenance information.

UNPACK AND IDENTIFY PARTS

The following steps will ensure that you have all the necessary parts **before** you begin assembly.

1. Unpack the contents of the shipment and place where you can easily inventory the parts. Refer to the Bill of Materials/Spec Sheets.
2. Verify that all parts listed on the Bill of Materials/Spec Sheets are present. If anything is missing or you have questions, consult the Pictorial Parts Guide and all diagrams for clarification, or contact Customer Service.

NOTE: At this time, you do not need to open the plastic bags containing smaller parts such as fasteners or washers (if equipped).

CARE AND MAINTENANCE

Proper care and maintenance of your microgreen system is important. Check the following items periodically to properly maintain your microgreen system.

- Check connections and all fasteners to verify that they remain tight.
- Do not climb or stand on the frame or channels at anytime.
- Verify that the supply lines and related fittings are clean and functioning properly.
- Replace all worn or damaged parts and fittings promptly.
- Repair all leaks immediately.
- If system is moved, inspect all parts and connections before reassembling and use.
- For replacement or missing parts, call 1.800.245.9881 for assistance.

QUICK START GUIDE

For a quick overview of this product, its components, and connection details consult the Quick Start Guide at the back of these instructions.



WARNING: All electrical wiring to be completed by a qualified electrician and according to recognized local building codes..

Important Information

PICTORIAL GUIDE

The following graphics and photos will help identify the different parts of the microgreen system. (Some parts are not shown.) To prevent mixing of fittings, select only those that are needed for each procedure. **Keep all fittings in the shipping bags until they are needed.**



112531 Timer*

ATTENTION: A timer is required to cycle the water pump on and off. If you did not purchase a timer, contact your sales representative to purchase the 112531 timer.

*Timer not included. Additional purchase required.



FALB34B



112838
Tek Screws



FAME51B



FAG338B



112772



112538 1" Hanger
112539 2" Hanger



WF6990
PVC Cement



WR1095
Tape



112509 CA4000
Instant Adhesive



111074



109242



110077



110829 Drill & Tap
Combo Pak



WF4790 (1)
Key Punch



111047



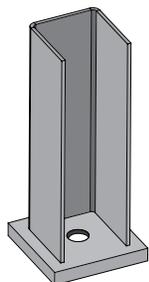
112770



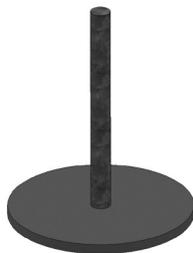
AC2804



110091 Clear Vinyl Tubing



112477



113030S01



110725
Air Pump



113536
Pump



Porthole Cover



Reservoir Cover



70 Gallon Reservoir

Important Information

PICTORIAL GUIDE (continued)



WF1386



111303



111698 Ratchet Clamp



WF8582



WF2392



WF3316



111045



WF3420



WF1576



111302



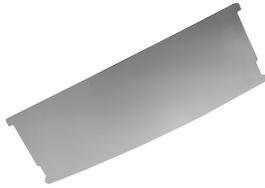
WF2193



WF1570



111029
End Cap w/ Outlet



111030
End Cap No Outlet



WF6692



WF1030



WF2190



WF1380



111046



WF6990
PVC Cement
and
113372 Purple
Primer

PVC PRIMER & PVC CEMENT

Follow all directions printed on pvc primer and cement containers. **Purple color of primer does not fade!** Use caution during application to reduce spills and over application at joints.

Prime all joints before assembly.

Assemble Frame

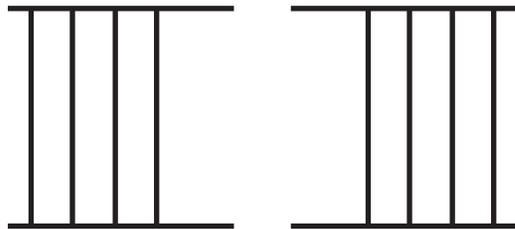
1

ASSEMBLE SIDE FRAMES

Assemble frame on a flat, level surface for best results.

Complete these steps:

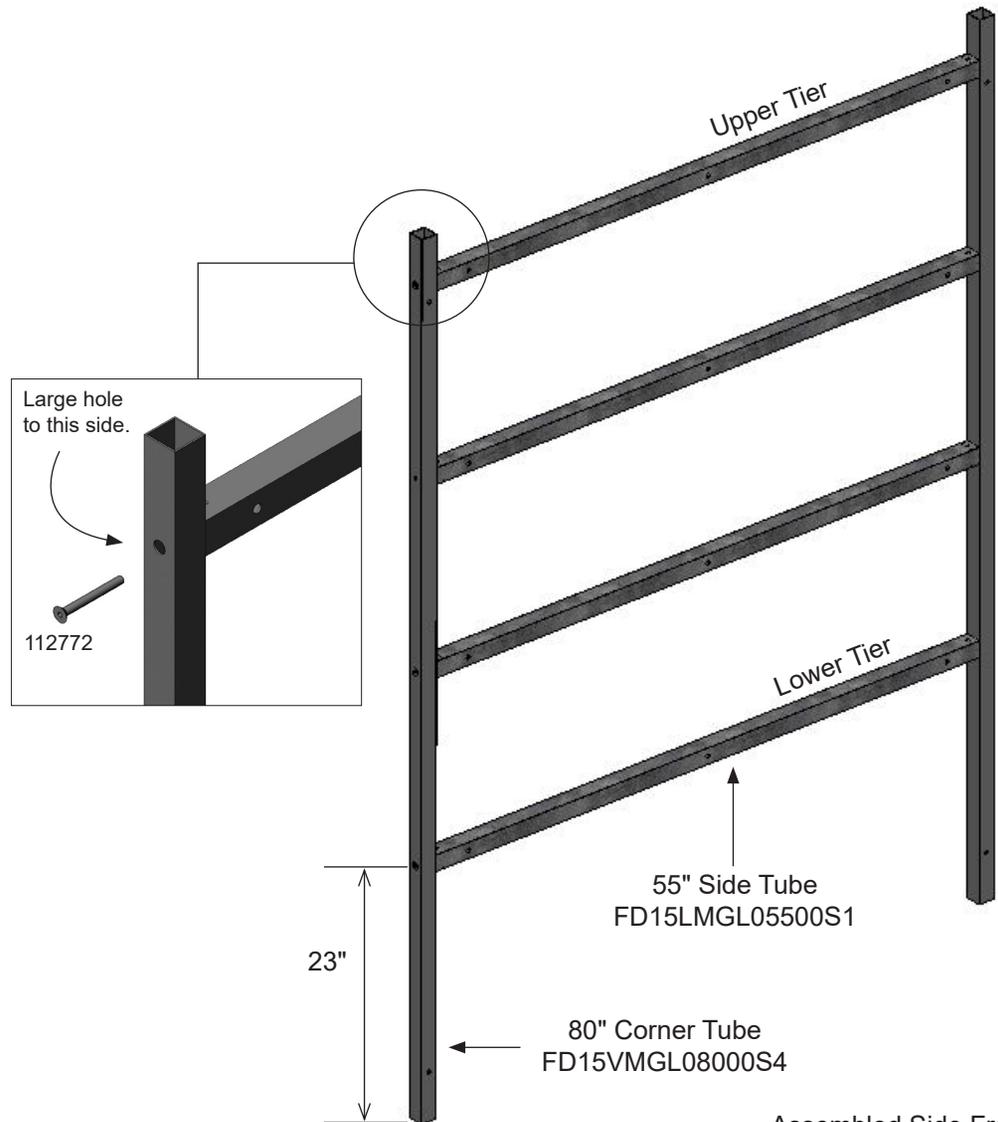
1. Review the frame diagram at the right (and at the back of this guide) and gather two (2) corner tubes and four (4) 55" side frame tubes to construct one side frame assembly.
2. Position the two (2) corner tubes so holes match up. The hole closest to the top end of each corner pipe is used to attach the upper side tube. Lower tier is approximately 23" from the end or bottom of the pipe. See diagram.
3. Take four (4) of the 55", side tubes and connect these to the corner tubes using the 112772 flat head bolts to assemble the first side frame.
4. With assistance, set the assembly aside and repeat the steps to assemble the remaining side frame.
5. Once both identical side frames are assembled, position these opposite each other. See diagram below.



Top view showing two assembled side frames.

6. Continue by installing the adjustable feet – Procedure 2.

ATTENTION: The vertical tubes include holes of two different diameters. Install the larger hole to the outside to allow the flat head bolt to sit flush with the tube surface when installed.



Assembled Side Frame

Assemble Frame

1

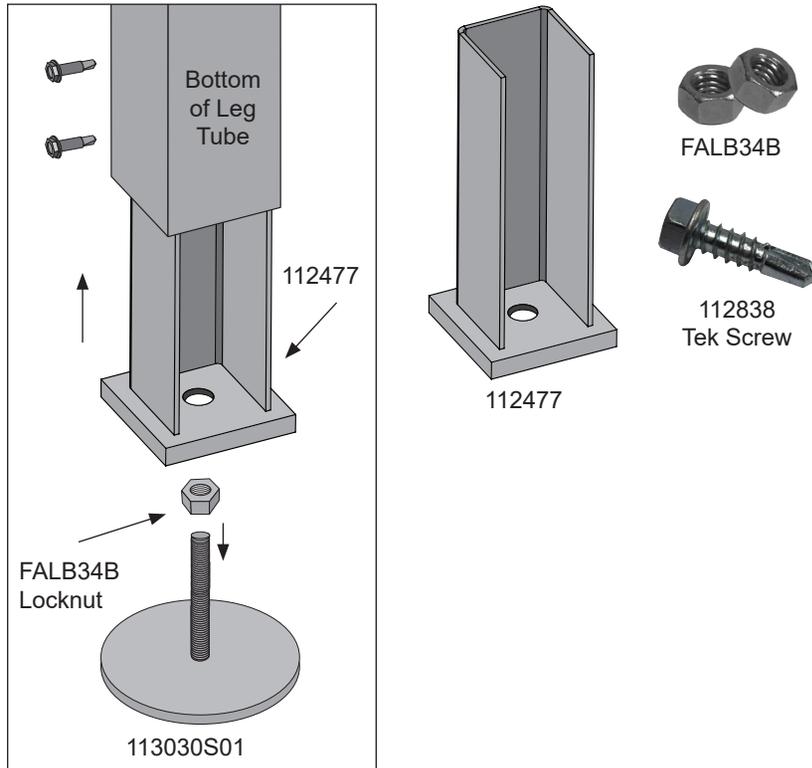
ASSEMBLE FRAME—INSTALL ADJUSTABLE FEET

Assemble frame on a flat, level surface for best results.

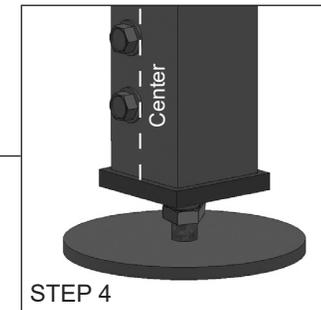
Side Frame Assembly
with Adjustable Feet

Complete these steps:

1. Add one FALB34B nut to threaded stud of each 113030S01 foot and attach one foot to each 112477 insert.



2. Slide one 112477 insert assembly into the bottom of each 80" vertical leg tube. Tap gently with a small hammer if needed to seat.
3. Secure each insert to each tube using two (2) 112838 Tek screws. **Install screws through leg tube and wall of the 112477 insert. Install screws to the left or right of the center line of the leg tube to prevent hitting the threaded shaft of the adjustable foot.**
4. Adjust 113030S01 foot so it is seated against threaded plate of insert and nut. See diagram.
5. Continue with main frame assembly – Procedure 3.



Assemble Frame

1

ASSEMBLE FRAME—continued

Assemble frame on a flat, level surface for best results. Assistants are required to complete the frame assembly.

Complete these steps to assemble the main frame.

1. With assistance, stand the two side frames as shown (Fig. 1).
2. Select four (4) remaining frame tubes (FD15CMGL04800S1) and place two of these at each end of side frames.

FIG. 1

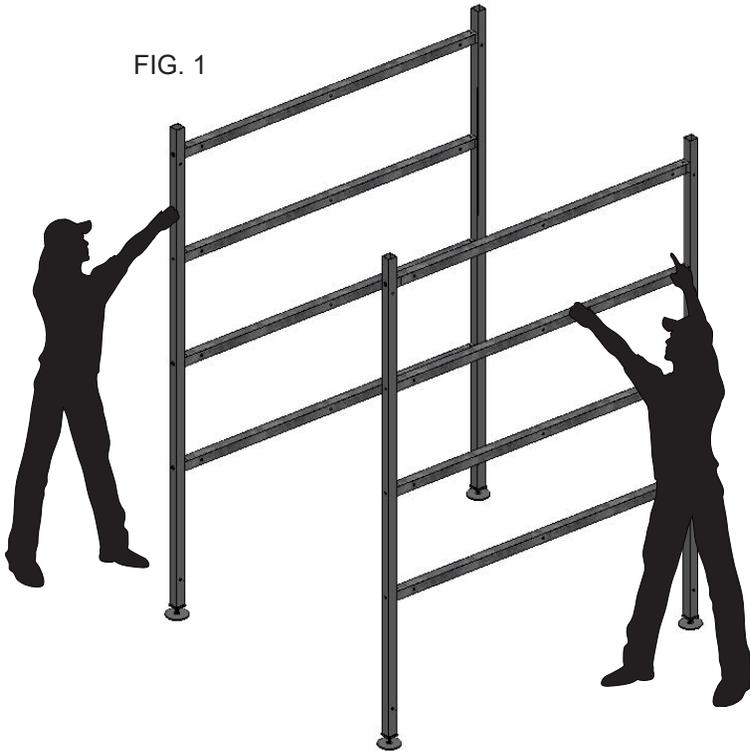
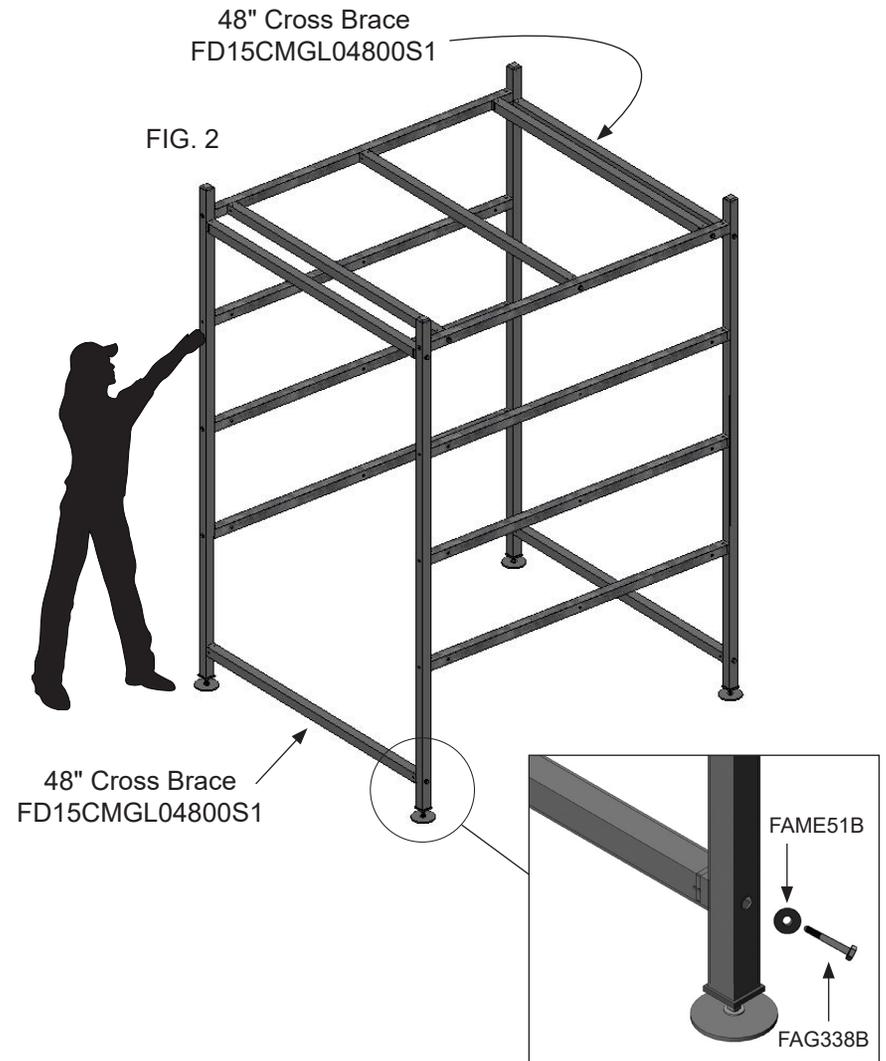


FIG. 2



FAG338B



FAME51B

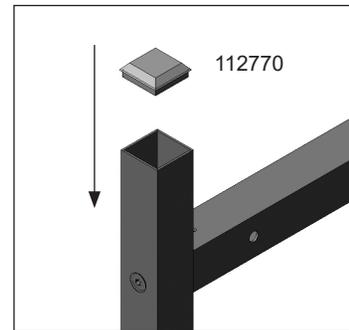
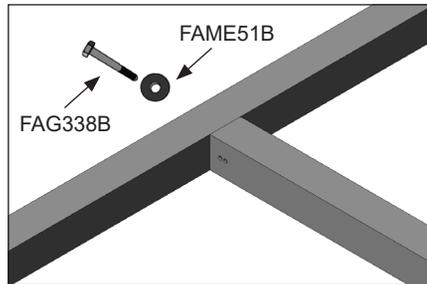
3. Using FAG338B (5/16" x 3") hex head bolts and FAME51B flat washers, attach cross braces between side frame tubes (Fig. 2) at each end.

Assemble Frame

1

ASSEMBLE FRAME—continued

- Continue by installing all remaining cross braces between the side tubes at each level using hex head bolts and flat washers.
- Complete the frame assembly by installing 112770 finishing plugs. **Check all fasteners to ensure they are all tight.**
- Continue with next procedure.



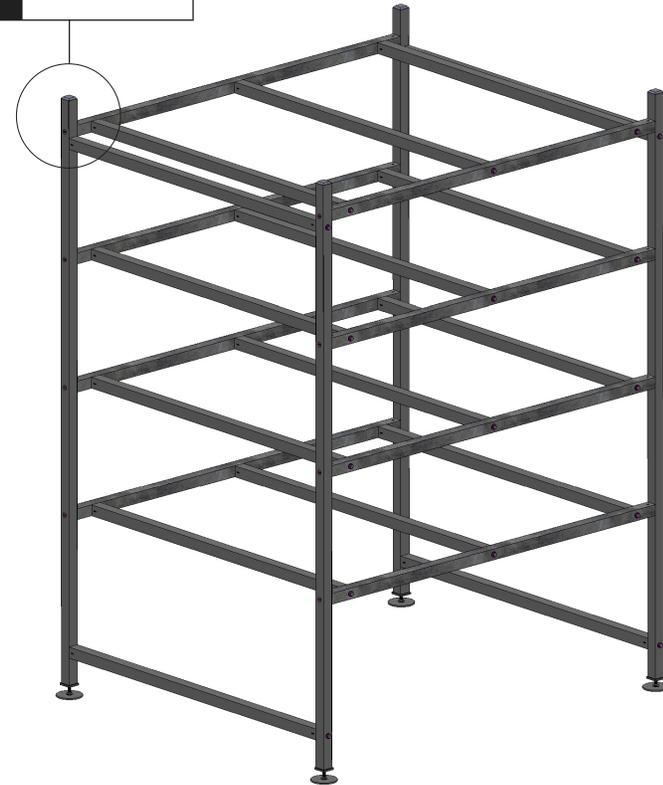
FAG338B



FAME51B



112770



Assemble Channels

2

ASSEMBLE THE CHANNELS

Required parts:

- 111030 End Cap (plain)
- 9/32" Drill Bit and Drill

Complete these steps to prepare the 111030 end caps:



111030

ATTENTION: Complete this procedure for the 111030 plain end caps only. Do not drill holes in the 111029 end caps, which have an outlet.



ATTENTION: Cover the vice jaws or use material to protect the end cap.

1. Gently clamp the 111030 end cap in a vice or similar device with the top, curved edge up.



2. Locate the middle of the end cap lip and mark the position using a pencil.



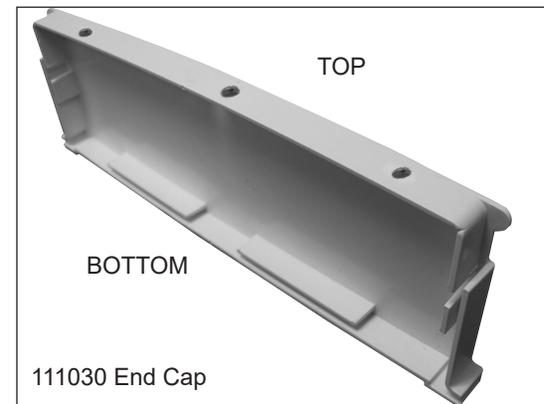
3. Evenly mark the remaining two hole positions.



4. Using a drill and a 9/32" bit, carefully drill holes in the top lip of the 111030 end cap.



5. Remove the loose end cap material from the drilled holes.



6. Repeat the steps to drill all remaining 111030 end caps. **Do not drill the 111029 end caps.**

Assemble Channels

2

ASSEMBLE THE GT80 CHANNELS (continued)

ATTENTION: Attach one 111029 end cap (with outlet) and one 111030 plain end cap to each GT80 channel.

1. Using the assembled frame as a bench, place one channel on a bench or saw horses.
2. Take the 112509 adhesive and attach the plain end cap (no outlet–111030) to the channel. Coat the end of the channel with adhesive *before* you install the end cap. See photos A & B. Also, apply adhesive to the connection on the inside of the channel. See photo E. Repeat for all channels.



Apply adhesive in a well-ventilated area. Read the container information for additional precautions.

3. Next, attach the 111029 end caps (with outlet). Coat the channel end with adhesive *before* you install the end cap. See photos C & D. Also, apply adhesive to the connection on the inside of the channel. See photo E. Repeat for all channels.
4. Carefully flip all channels over so the bottom is facing up. Apply adhesive along the edges to secure and seal end caps to each channel. Photo F shows an end cap with an outlet as an example.

NOTE: Coat all edges and seams of the end caps to prevent leaks.

5. Allow the adhesive to dry before moving the channels or testing the system.



Install 2" Pipe Hangers

3

INSTALL 2" DRAIN MANIFOLD HANGERS



112838
Tek Screw

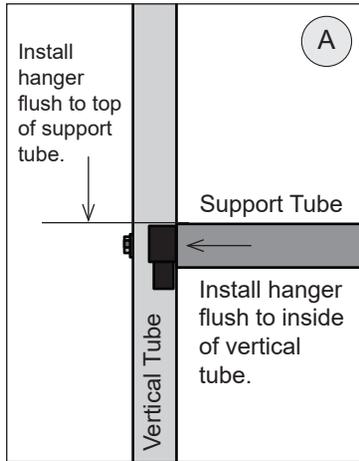


112539 2" Hanger

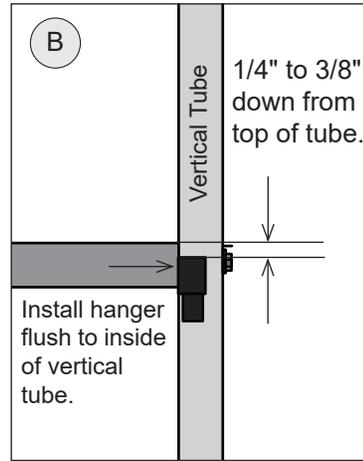
Complete these steps.

1. Determine which direction you want the drain manifold to slope toward and attach the high end pipe hanger first. See A.

NOTE: Attach 112539 hanger flush with the top edge of the channel support tube and flush with the inside edge vertical frame tube. Secure hangers to the frame using 112838 Tek screws and the nut setter.

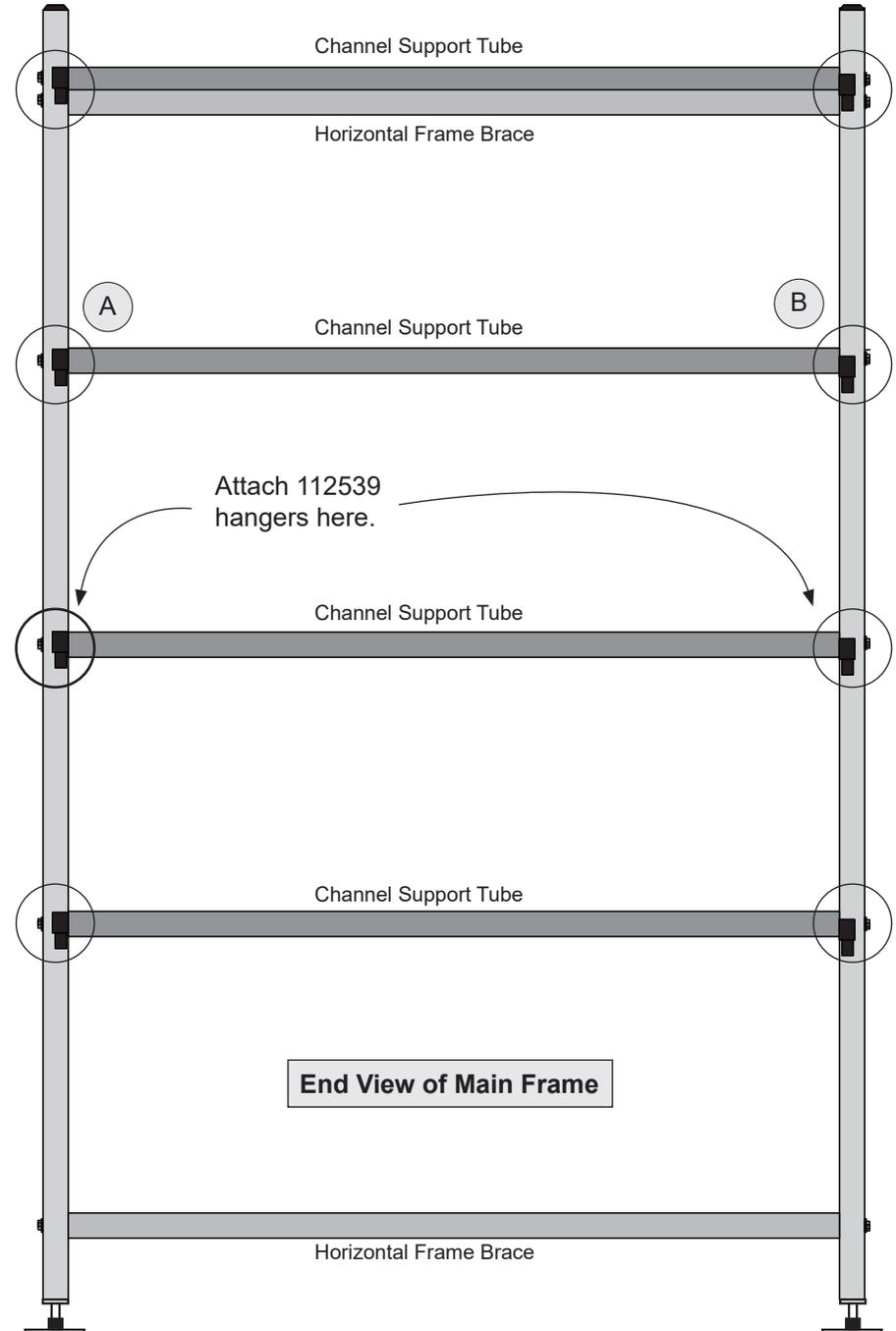
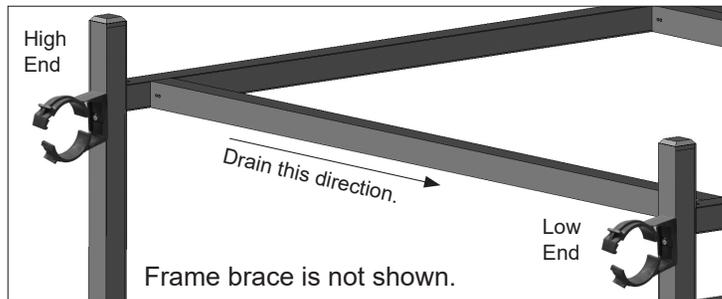


High End of Drain Manifold



Low End of Drain Manifold

2. Move to the low end and attach hangers 1/4" down from the top edge of the support tube and flush to the inside of the vertical frame tube. See B.
3. Repeat for all remaining 2" drain hangers.



Assemble and Attach 2" PVC Drain Manifold

4

ASSEMBLE AND ATTACH 2" PVC DRAIN MANIFOLD

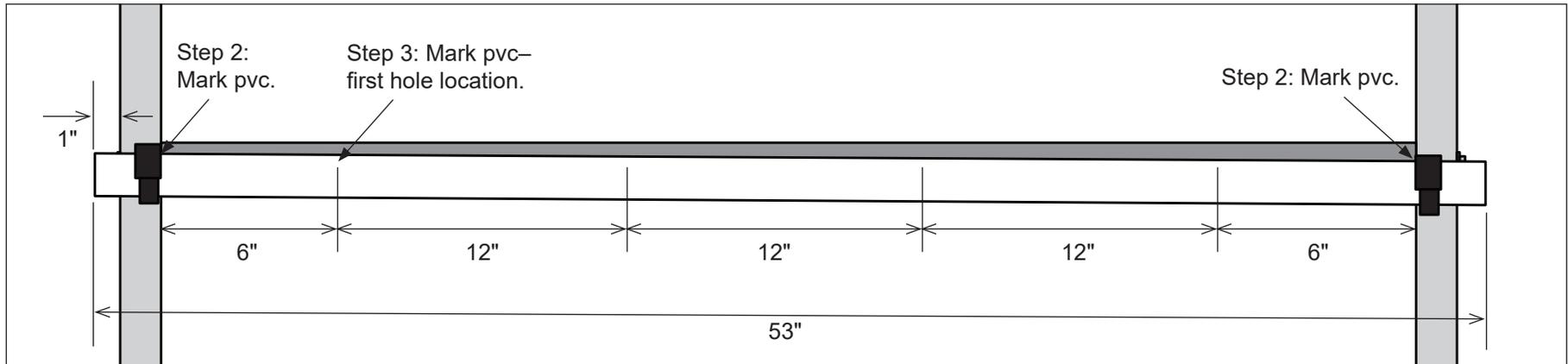
ATTENTION: During the assembly of the 2" drain manifold, dry fit all pvc tubing and fittings *before* applying the pvc adhesive.

Complete these steps:

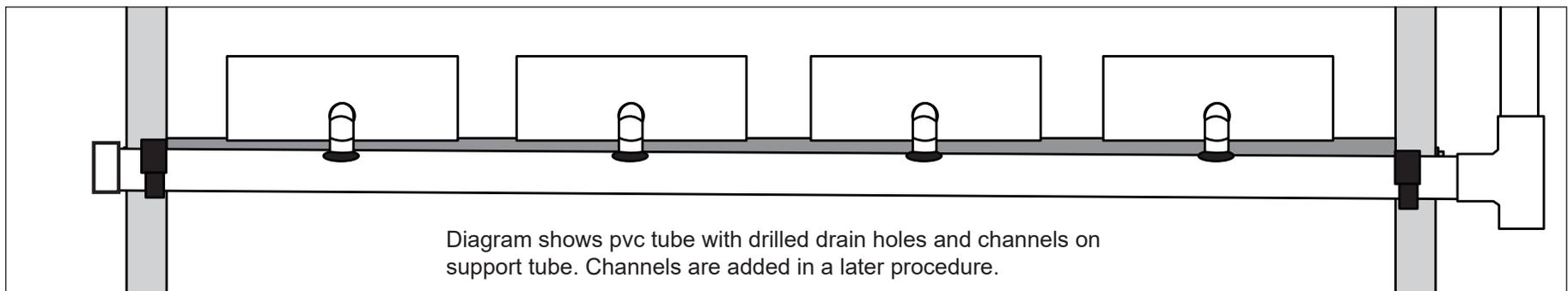
1. Cut one piece of 2" pvc pipe to 53" and snap it into the hangers at one level of the frame.

ATTENTION: Center the pvc pipe so 1" extends past the outer edge of the vertical frame tube at each end.

2. Rotate the pipe in the hangers so the printing on the pvc is centered on top. (Printing is used to maintain alignment when drilling holes.) Mark the inside edge of each hanger on the pvc pipe as shown. Marks are used to realign pipe with the hangers after drilling.
3. At one end of the pipe, measure 6" *in from the hanger* and mark. This is the position of the first drain hole.
4. From the mark in Step 3, measure and mark the on-center locations for the drain elbows of all channels. See diagram for on-center dimension.



ATTENTION: Check hole positions *before* the next step! There should be four (4) hole positions marked on the tube when finished. Holes should be evenly spaced and equal distance from each end of the pvc tube. Measure and remark if holes are not marked correctly.



Assemble and Attach 2" PVC Drain Manifold

4

ASSEMBLE AND ATTACH 2" PVC DRAIN MANIFOLD—continued

- After confirming hole positions, use a 1-3/8" hole saw bit to drill the four (4) holes in the 2" tube. Example shows using a step bit to drill the holes. Keep all holes aligned during this step. Use the printing on the pipe if possible.

NOTE: Pvc pipe can remain clamped in the hangers, or it can be removed and drilled off the rack. If you leave it clamped to the rack, block the center of the pipe or have an assistant hold it to prevent damage to the pipe hangers. For best results, drill pvc in a drill press if possible.

To release the pvc pipe from the clamps, press the pipe into the hanger and use a small screw driver to release the hanger jaws. Hangers will release easily. Be careful not to damage the locking teeth of the hanger jaws.

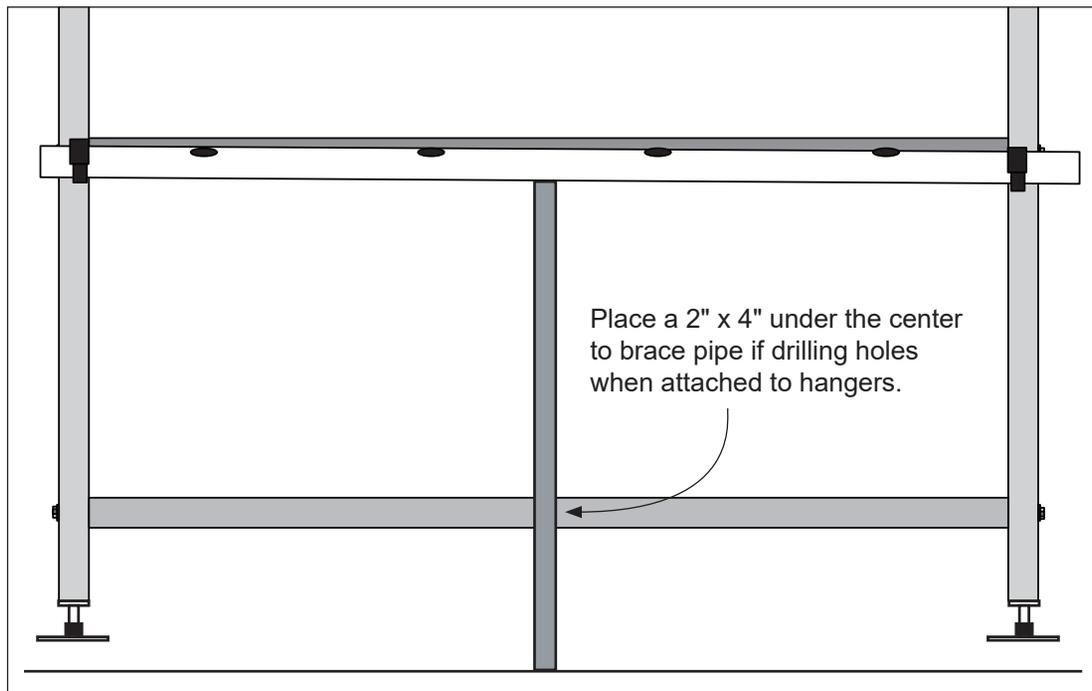


Photo shows using a step bit to drill holes in the pvc pipe.



Photo shows using a hole saw bit to drill holes in pvc pipe.

- After drilling the pipe, remove all pvc debris and clean inside the tube. If pipe was drilled on the rack, remove it from the lower level and install at the upper level after cleaning. Use the lower level hangers to hold and drill the pipe. Diagram below shows top view of pvc pipe after drilling drain holes.



- Repeat these steps to prepare, drill, and clean the remain three (3) horizontal 2" pvc drain pipes.

Assemble and Attach 2" PVC Drain Manifold

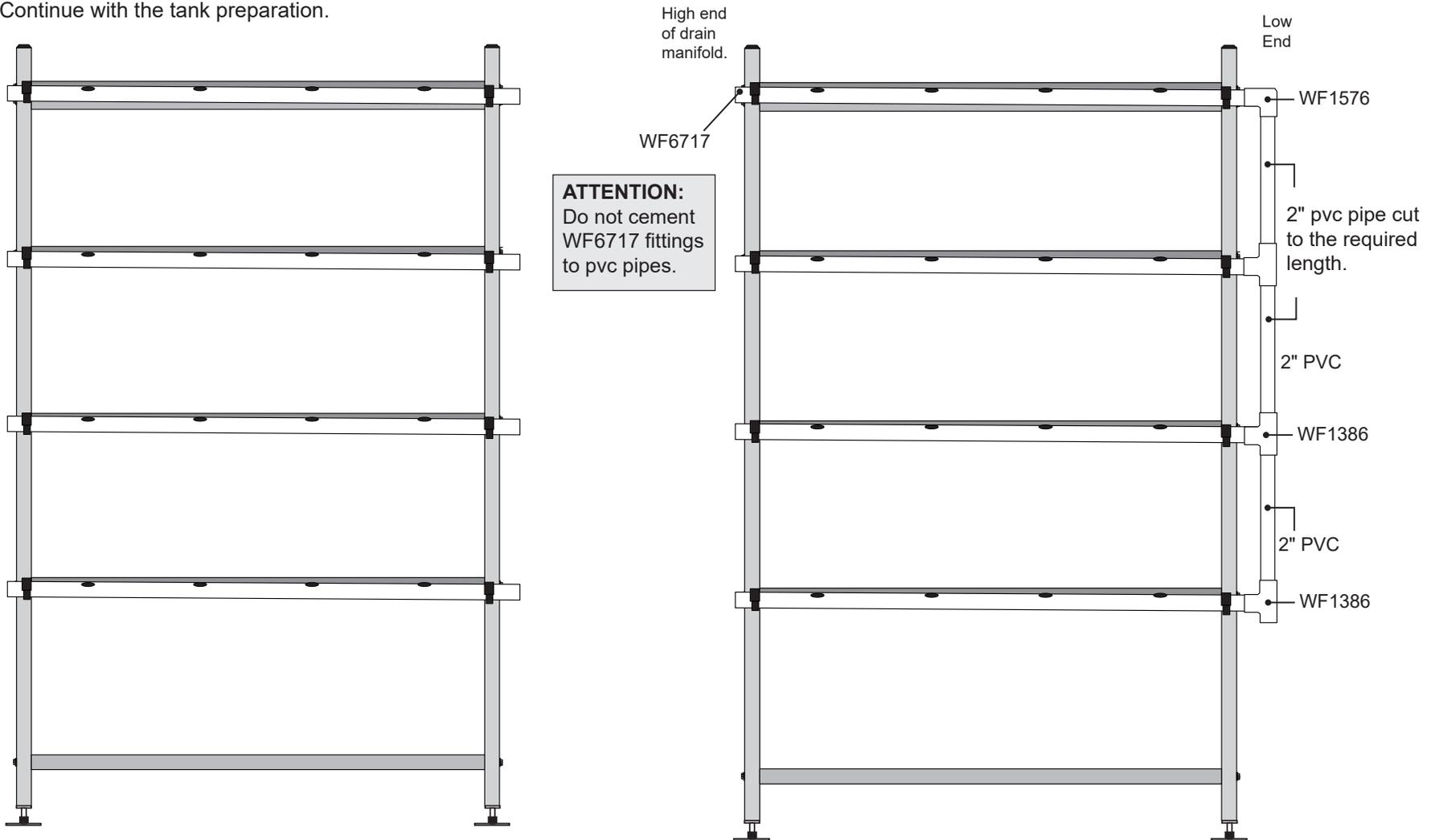
4

ASSEMBLE AND ATTACH 2" PVC DRAIN MANIFOLD—continued

- Attach all prepared pvc tubes to the frame. Align marks made in Step 2 with the installed hangers. See left diagram below.
- Assemble the remainder of the main drain manifold as shown in the right diagram below. Dry fit all components before you permanently secure using pvc primer and WF6990 pvc cement. Apply according to instructions on containers.

ATTENTION: Do not cement the WF6717 slip caps to horizontal tubes. These caps are removed to periodically clean the drain manifold as needed.

- Continue with the tank preparation.



Reservoir and Lid Preparation

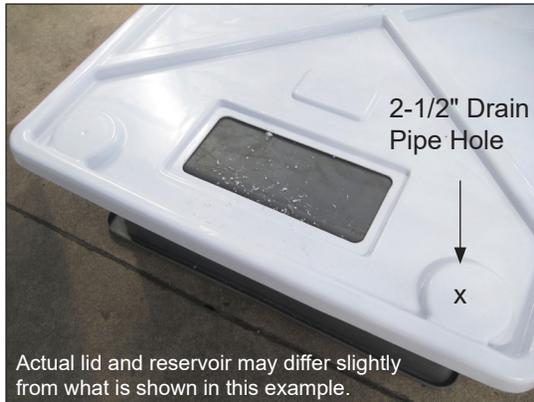
5

DRILL RESERVOIR AND LID AND INSTALL FITTINGS

Required tools: Drill, 5/16" drill bit, 2-1/4" and 2-1/2" hole saw bits

ATTENTION: Actual reservoir and lid may differ from photo model. Procedures are similar.

1. Identify corner you want to drill the drain hole in reservoir lid. (When reservoir is in position under frame, this is the corner closest to drain manifold outlet.) Drill drain hole **using a 2-1/2" hole saw**. Do not drill cover over reservoir. Debris can damage pump and clog the filter once system is operating.
2. Next, using a 5/16" drill bit, drill hole through the lid for air pump tubes. See photo below.



STEP 1: X marks hole location based on reservoir design and position. *Drill one 2-1/2" drain hole in corner.*



Move cover off reservoir. Place on support to drill the 2-1/2" drain hole.



Photo shows sample reservoir with drain hole in lid.



STEP 2: Drill holes for air pump tubes using a 5/16" drill bit. Drill cover off reservoir.



Photo shows drain hole in reservoir lid with reservoir in position under frame.

ATTENTION: Actual lid and reservoir may differ. Raised areas may not be present on actual lid. Drill holes as directed and in same area on the lid.

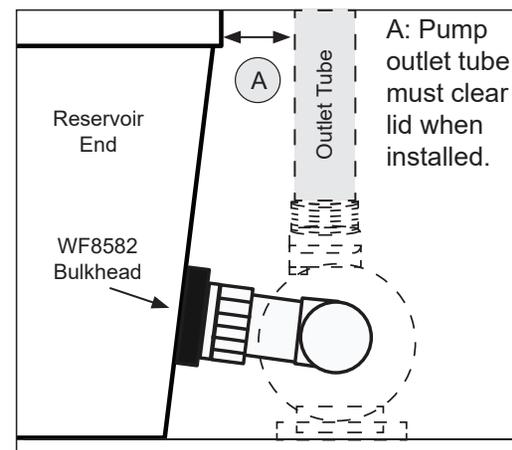
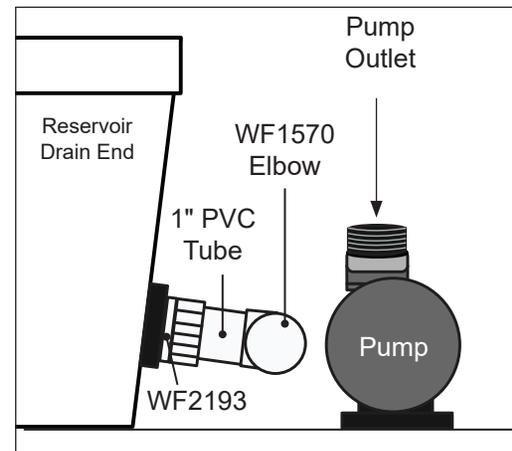
Reservoir and Lid Preparation

5

DRILL RESERVOIR AND LID AND INSTALL FITTINGS—continued

- Review diagrams in Quick Start section (back of guide) to determine on which side of the reservoir you want to install pump and related fittings.
- Take a WF2193 adapter, a WF1570 elbow, and a 1-1/2" to 2" section of 1" pvc tubing and dry fit together. See photos. Do not cement at this time. Thread assembly into WF8582 bulkhead fitting and place assembly against side of reservoir to judge bulkhead fitting and pump position.

NOTE: Pvc tube must be short enough to keep bulkhead fitting low on side of reservoir and long enough to allow top outlet of pump to clear tank. **Shorten pvc tube as needed to keep bulkhead fitting low on reservoir while still allowing pump to remain flat on floor.**



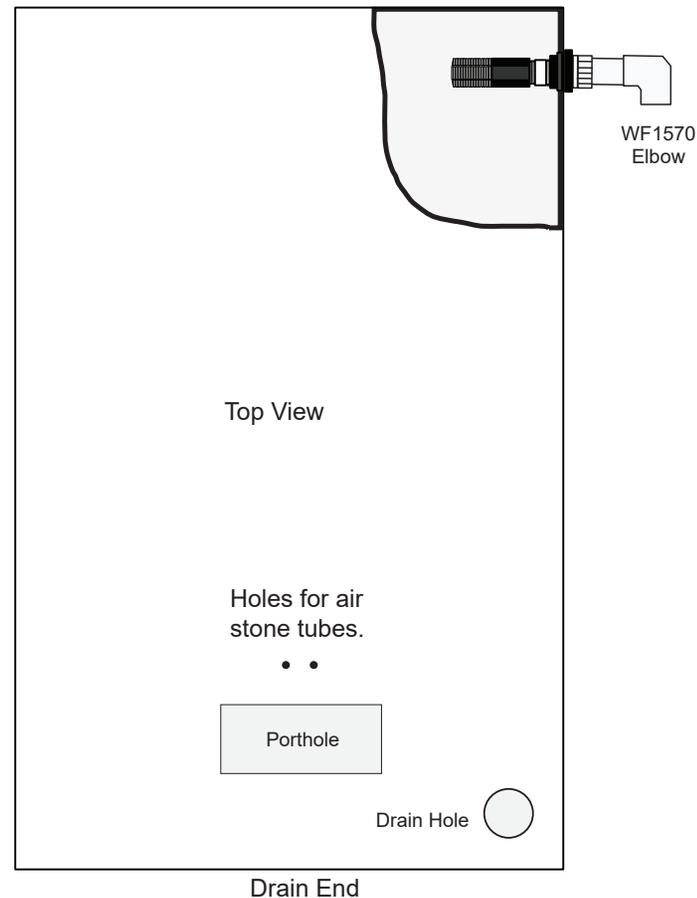
- Raise or lower assembly on side of reservoir as needed to align elbow with intake port of pump. Adjust as needed to ensure pump is set as close to reservoir as possible without contacting lid when supply plumbing is installed. Mark fitting location on side of reservoir and drill bulkhead fitting hole using a **2-1/4" hole saw bit**. Review all photos and diagrams as needed for details. **Pump outlet pvc tube must clear edge of reservoir lid.**

Reservoir and Lid Preparation

5

DRILL RESERVOIR AND LID AND INSTALL FITTINGS—continued

6. After drilling hole in reservoir, attach the WF2392 bushing, 111302 extension, and 111303 screen to threaded body of WF8582 bulkhead as shown below in left column. Hand tighten until snug. *Do not tighten with tools.*
7. Attach fitting assembly to reservoir. Install hex nut and thin flat washer (if equipped) outside reservoir. Install screen, extension, and thick rubber seal inside reservoir. Tighten until snug using large adjustable pliers.
8. Disassemble WF2193 adapter, WF1570 elbow, and section of 1" pvc tubing from previous page and reassemble using pvc primer and pvc cement to secure all pvc joints. Wrap adapter threads with sealing tape and attach assembly to installed bulkhead. Tighten until snug. Hold bulkhead if needed when tightening the connection.
9. Continue with the next procedure.



Assemble and Install Nutrient Supply Manifold

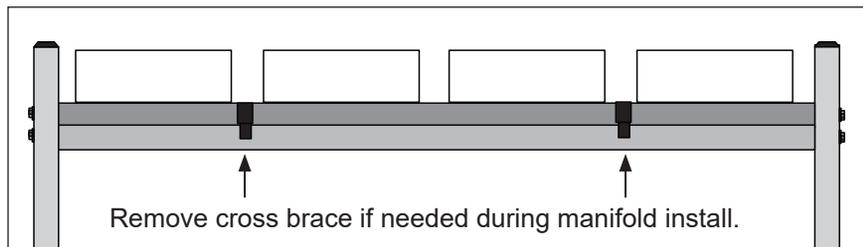
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS

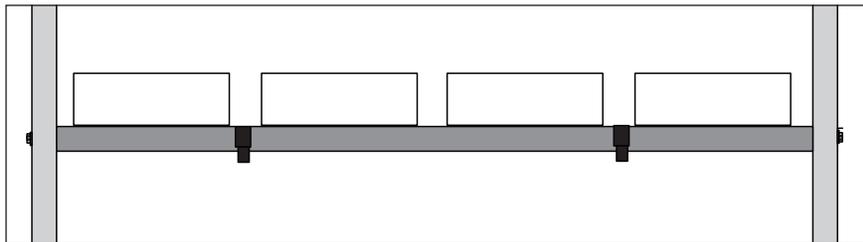
Complete these steps:

1. Gather the parts and construct one (1) upper manifold pipe and three (3) lower manifold pipes. **Dry fit all parts. Do not cement at this time.**

ATTENTION: Cut the 1" pvc pipe short enough to allow approximately 1/2" clearance at each end when fittings are installed.

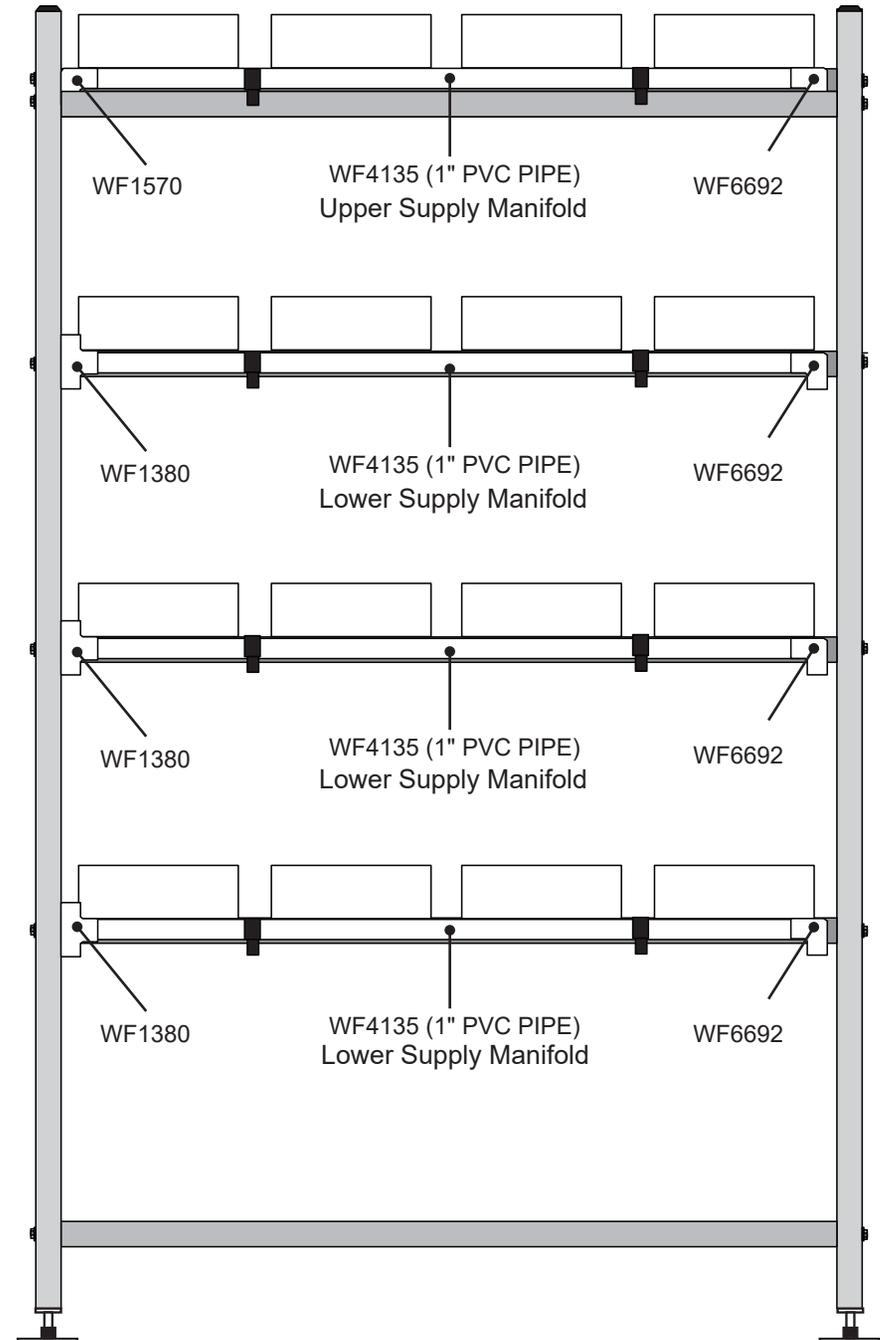


One (1) Upper Supply Manifold:
Elbow at each end.



Three (3) Lower Supply Manifolds:
Tee at one end; elbow at the other.

2. Snap the upper manifold into place on the frame. (Remove cross brace if needed for easier installation.) Snap the lower manifolds into place on the lower three levels.

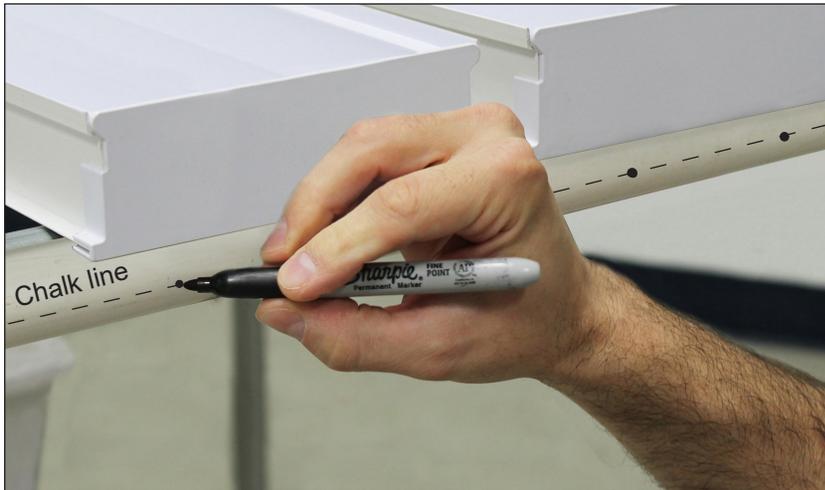


Assemble and Install Nutrient Supply Manifold

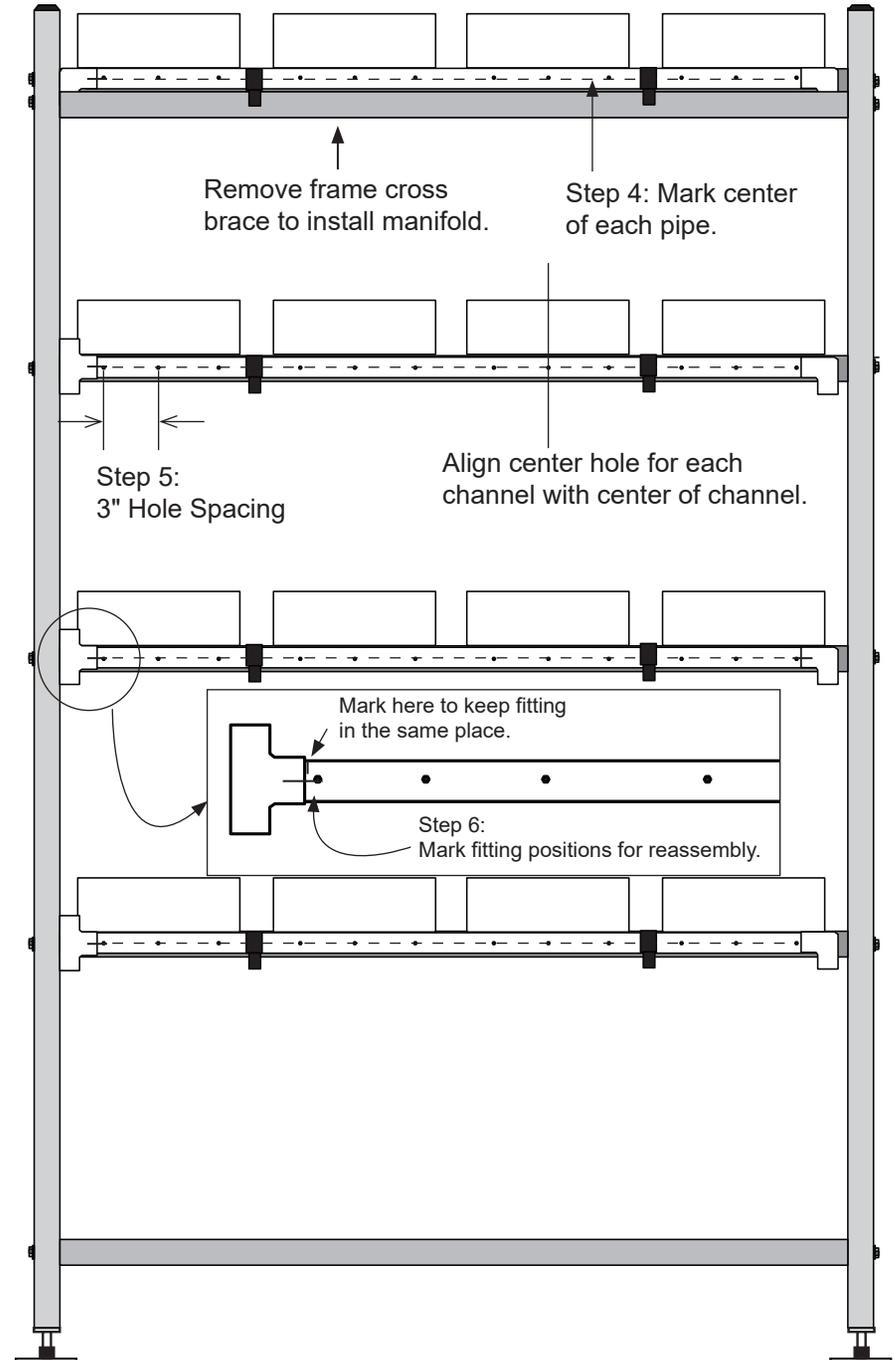
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS— CONTINUED

3. Align and evenly space all channels at each level. Channels will run parallel with each other and the 55" frame tubes. Insert drain elbows into drain manifold to keep channels in place.
4. With all manifolds snapped into place on the frame, mark the center of each manifold along its length using a chalk line. You can also rotate the pvc pipe so the printing shows. Use non-permanent chalk.



5. Using a marker, mark three (3) hole locations on each manifold pipe for each channel. Mark holes in the center of the manifold pipe. **Space holes 3" apart.**
6. After holes are marked, mark each fitting to more easily reassemble the manifolds after drilling the holes and cleaning the pipe.
7. Once the manifolds are marked, carefully remove each manifold from the frame. Use a small screwdriver to carefully release the jaws of the pipe hangers. If desired, mark the frame level (1, 2, or 3) on each of the lower manifolds to reinstall them in the same location.



Assemble and Install Nutrient Supply Manifold

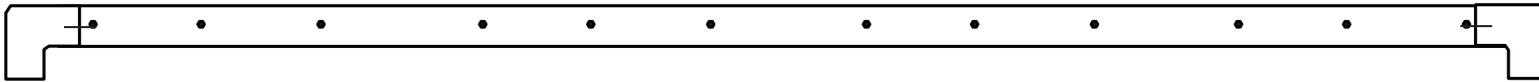
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED



110829
Drill & Tap
Combo Pak

8. Choose one manifold and place it on a flat surface with the marks facing up. Upper manifold is shown below.



9. Using the drill bit from the 110829 drill and tap combo pak, drill a hole at each of the marks. For best results, drill the manifold using a drill press. Repeat this step to drill the remaining supply manifolds.
10. After drilling the holes in all manifolds, use the tap from the combo pak to tap threads in each hole. Use a reversible drill. Do not use a drill press. Slowly turn tap into the hole. Do not allow it to bottom out in the pvc tube. After tapping the hole, reverse the drill and back the tap out. Keep the drill steady and straight during this process.

ATTENTION: Use a reversible, variable speed drill for this step! If one is not available, use a socket to hold the tap and turn it with a ratchet. Center tap in the hole and turn it slowly to tap threads. *Do not allow tap to contact the inside wall of the pvc tube.* Once threads are tapped, slowly back tap out of hole while keeping drill straight.



11. Next, disassemble each manifold and clean the pvc pipe to remove debris from inside the tube. **Keep parts for each manifold together.**

Assemble and Install Nutrient Supply Manifold

6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED



WF4790
Key Punch

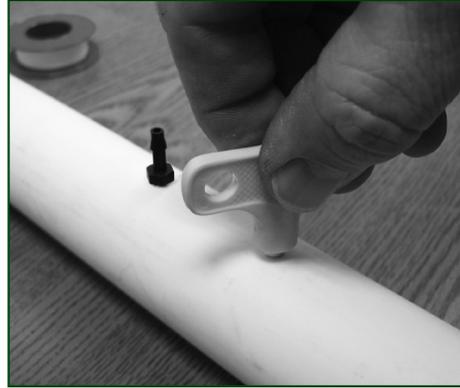


109242
Adapters

12. Wrap the threaded end of each 109242 adapter three or four times with the WR1095 tape. Wrap in a direction that will not loosen when adapter is installed. There are 48 adapters needed for this system.



Wrap threads of adapters with tape.

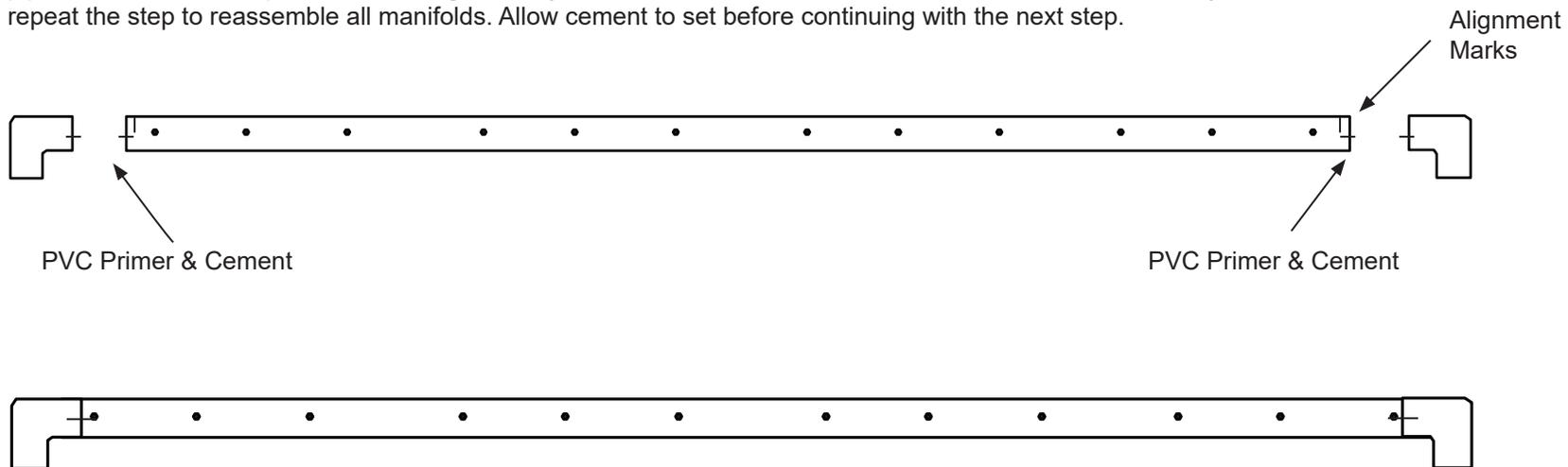


Install adapters using WF4790 key punch.



WR1095
Tape

13. Using the WF4790 key punch, carefully install the adapters in each of the manifold pipes. **Do not overtighten! Adapters will snap off. Once slight resistance is felt during installation, stop tightening the adapter.**
14. Apply pvc primer and cement to each end of one manifold pipe and fittings. Reassemble manifold using fittings for that pipe. Use the marks to position the fittings as they were before manifold was disassembled. Set the assembly aside and repeat the step to reassemble all manifolds. Allow cement to set before continuing with the next step.

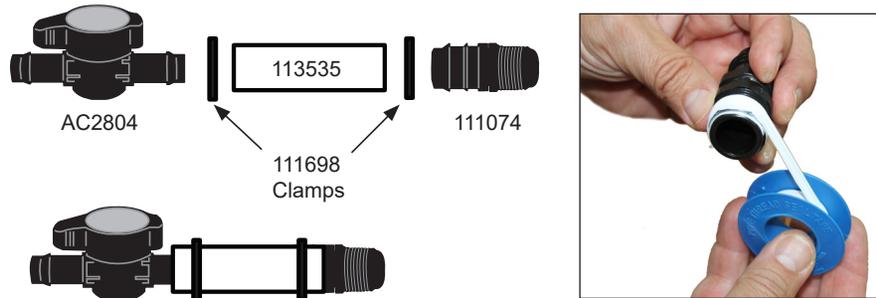


Assemble and Install Nutrient Supply Manifold

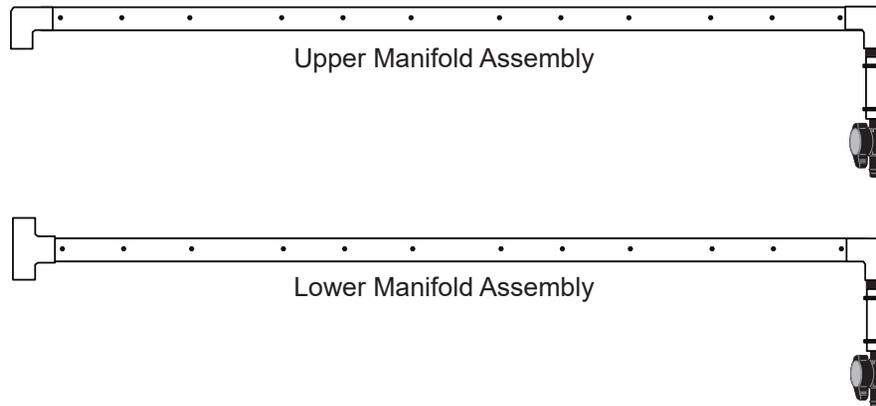
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED

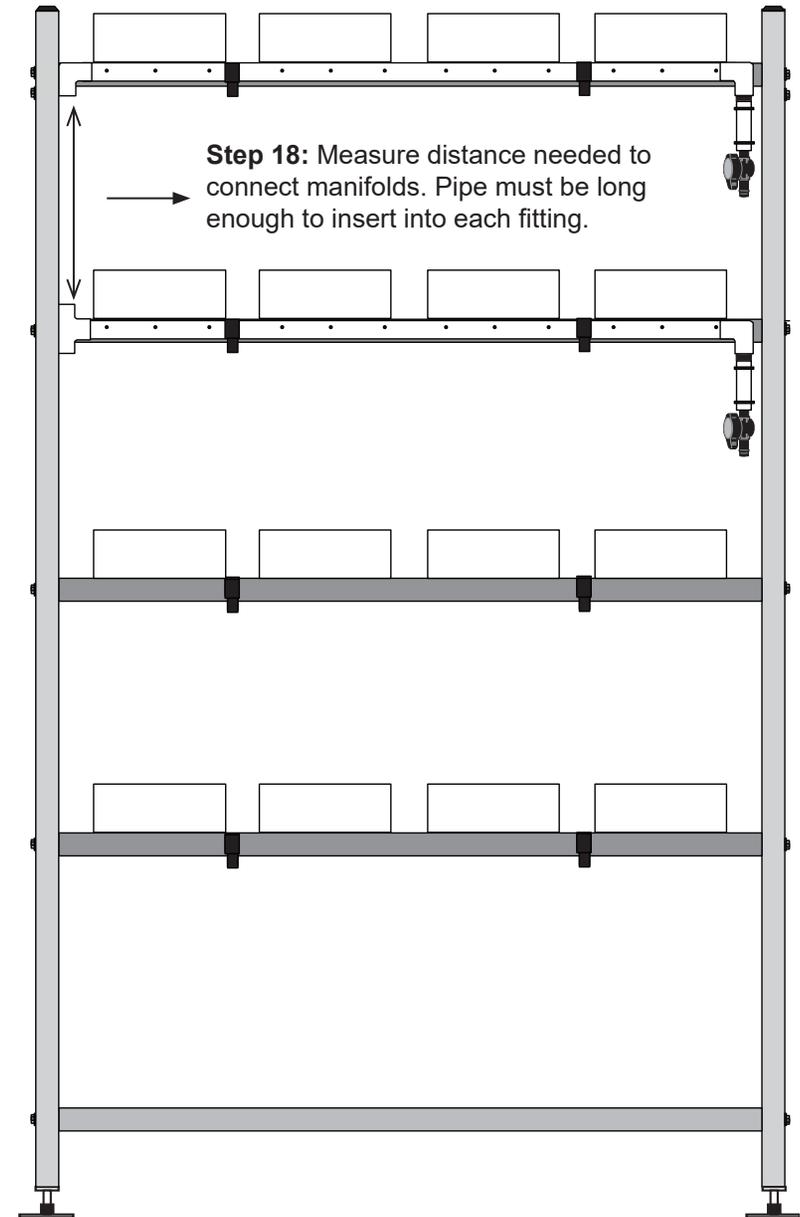
15. Assemble the four (4) valve assemblies as shown.



16. Wrap the threads of each 111074 adapter four or five times with the WR1095 thread sealing tape. Wrap in a direction that will not loosen when installed in the threaded elbows of the supply manifolds.
17. Take one valve assembly and thread it into the threaded elbow fitting at the end of a manifold assembly. Tighten until snug. Repeat to install all remaining valve assemblies. Valves will all be at the same end when manifolds are attached to the frame.



18. Snap the upper manifold and first lower manifold assemblies into place. Measure the length needed for the first vertical pvc pipe and cut a piece of 1" pvc pipe to that length. Remember to allow enough length for the pipe to connect the two supply manifolds. **Do not cut the pipe too short.** Dry fit the pipe before adding pvc primer and cement.

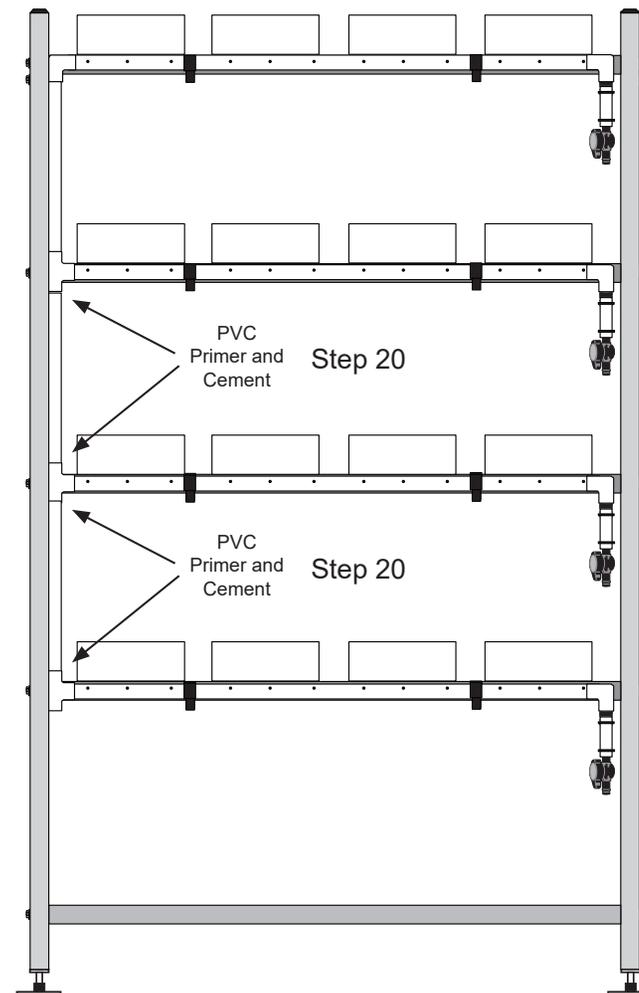
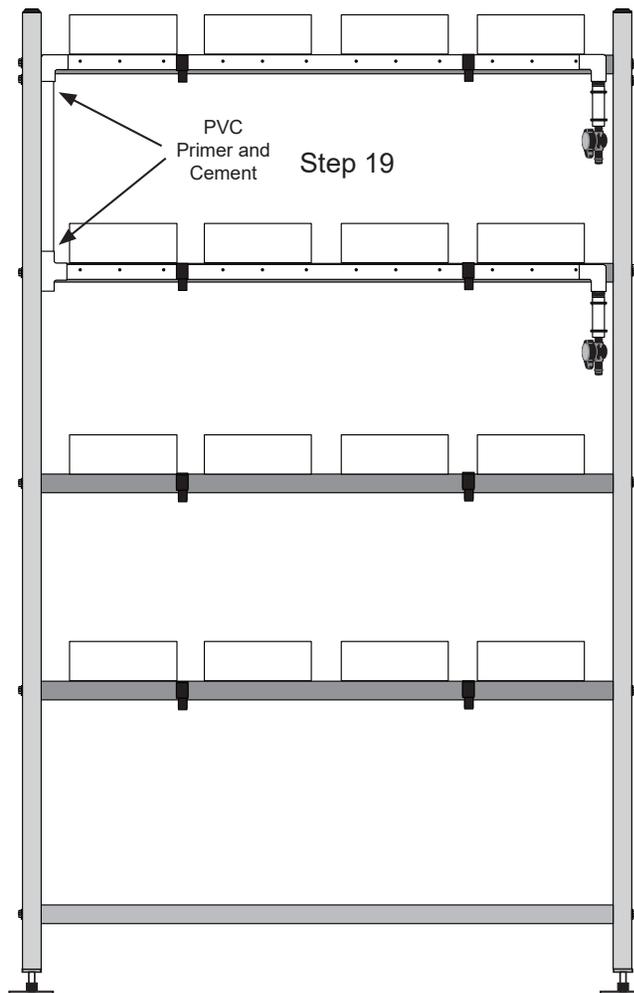
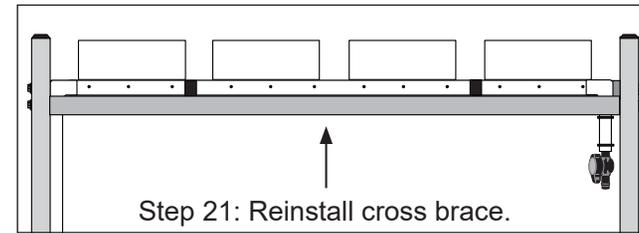


Assemble and Install Nutrient Supply Manifold

6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED

19. After confirming length, disassemble as needed to apply pvc primer and cement and reassemble. Remove and reinstall lower manifold as needed.
20. Continue working down the end frame and adding the 1" vertical manifold pipes. Dry fit all pipes before applying the pvc cement.
21. Reinstall frame cross brace if needed.
22. Continue with the next procedure.



Cut and Install 1/4" Nutrient Supply Tubes

7

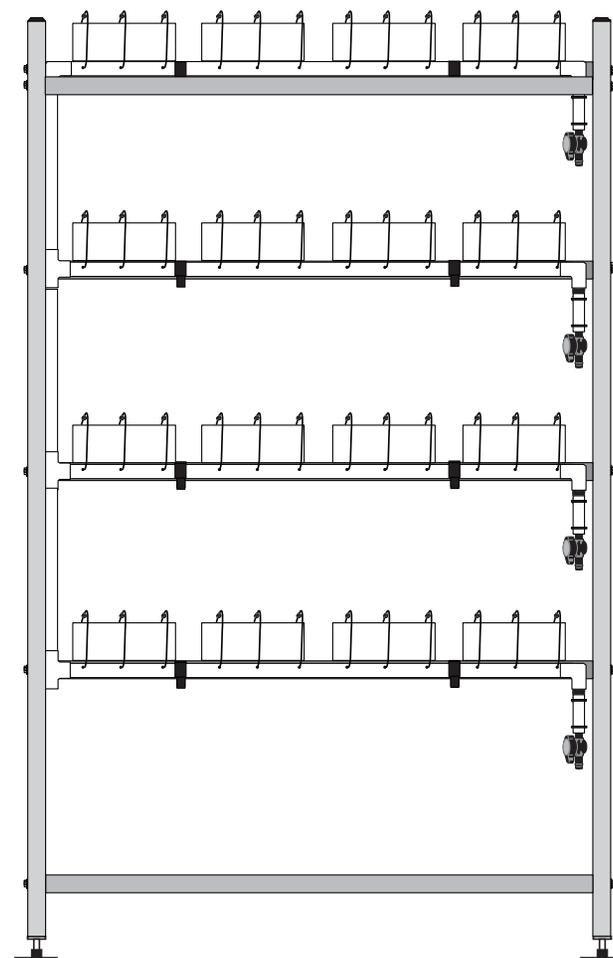
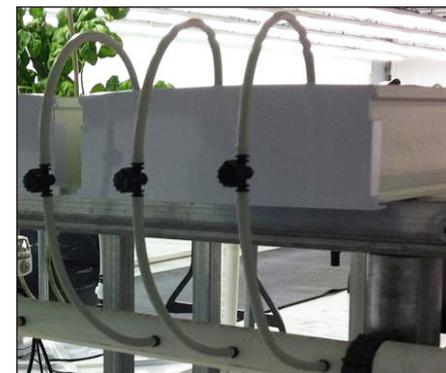
CUT AND INSTALL THE 1/4" MICRO TUBES

Complete these steps:

1. Using the 109170 tube cutter, cut a section of 111046 (1/4") micro tubing (*not to exceed 20"*) to determine how long you want each 1/4" supply tube to be.

ATTENTION: Use photos and diagram to decide where you want micro valve positioned in each supply tube for a uniform look. Location of micro valve in each supply tube should allow easy access to operate valve once installed.

2. Cut tube from Step 1 into two pieces—length may differ depending on valve position—and add 111047 micro valve. Check the fit on the system by holding the tube next to where it will be installed.
3. Adjust tube length and valve position as needed and create the remaining tube and valve assemblies by using the first one as the template.
4. Install each tube by sliding one end onto one 109242 adapter and inserting the remaining free end into the drilled hole of the 111030 end cap directly above that adapter. Wet the adapter and tube for easier installation.



Level Frame and Set Slope

8

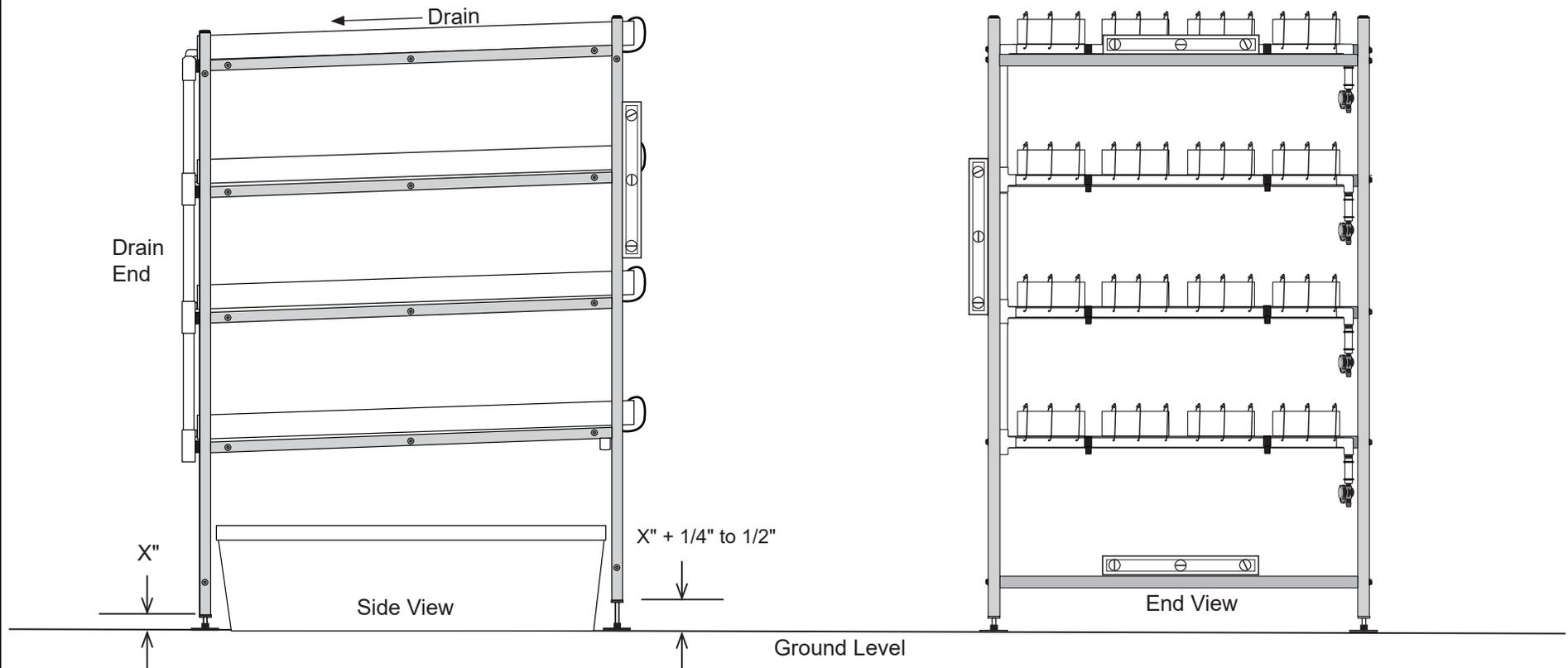
LEVEL FRAME AND SET SLOPE

To ensure that water flows through and properly drains from the plant channels, a **1/4" to 1/2" slope toward the drain end** of the system is required. Frame must also be level from side-to-side when viewed from the end.

Complete these steps:

1. Move frame to the location where it will be used if this has not been done.
2. At drain (low) end of frame, adjust the adjustable feet to lower that end as much as possible. Allow enough room between top of each foot and locking nut to make final adjustments and to lock feet in position. Set a level on the lower frame cross brace and check. Adjust side-to-side frame position so frame is level. See end frame diagram below.
3. Move to supply end of frame and raise that end to achieve required slope.
4. Level frame side-to-side after setting end-to-end slope.
5. Recheck frame slope. Verify that ends are level. Tighten locking nuts to secure feet.

ATTENTION: Example below shows a system setting on a level finished grade. If finished grade is sloped, make the necessary adjustments in calculations to account for any differences. When slope is properly set, frame should slope 1/4" to 1/2" from supply end down toward drain end.



Connect Main Pump to Supply Manifold

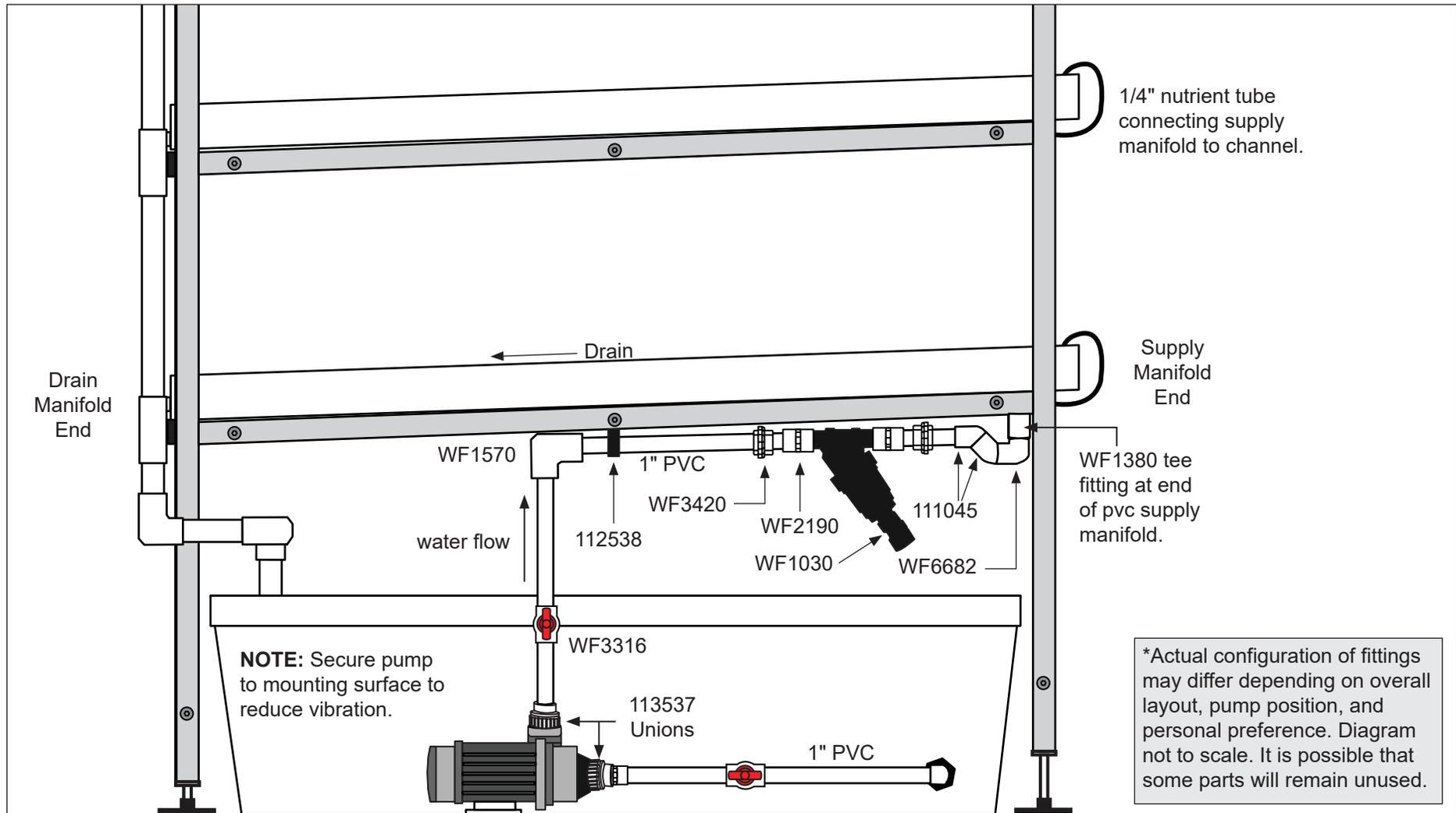
9

INSTALL MAIN PUMP & PLUMBING

Gather parts identified in the diagram and construct main pump supply plumbing. Review assembly and installation notes that follow before you begin. For best results, complete this procedure after setting frame slope.

- When possible, dry fit all connections before applying pvc primer and cement to better judge required length.
- Install the WF1030 Y-filter with the water-flow direction arrow pointing away from pump as shown.
- Position reservoir so pump and related plumbing remain under or aligned with frame.

WARNING: All electrical wiring to be completed by a qualified electrician according to recognized local building codes.



Assemble and Attach 2" PVC Drain Manifold

10

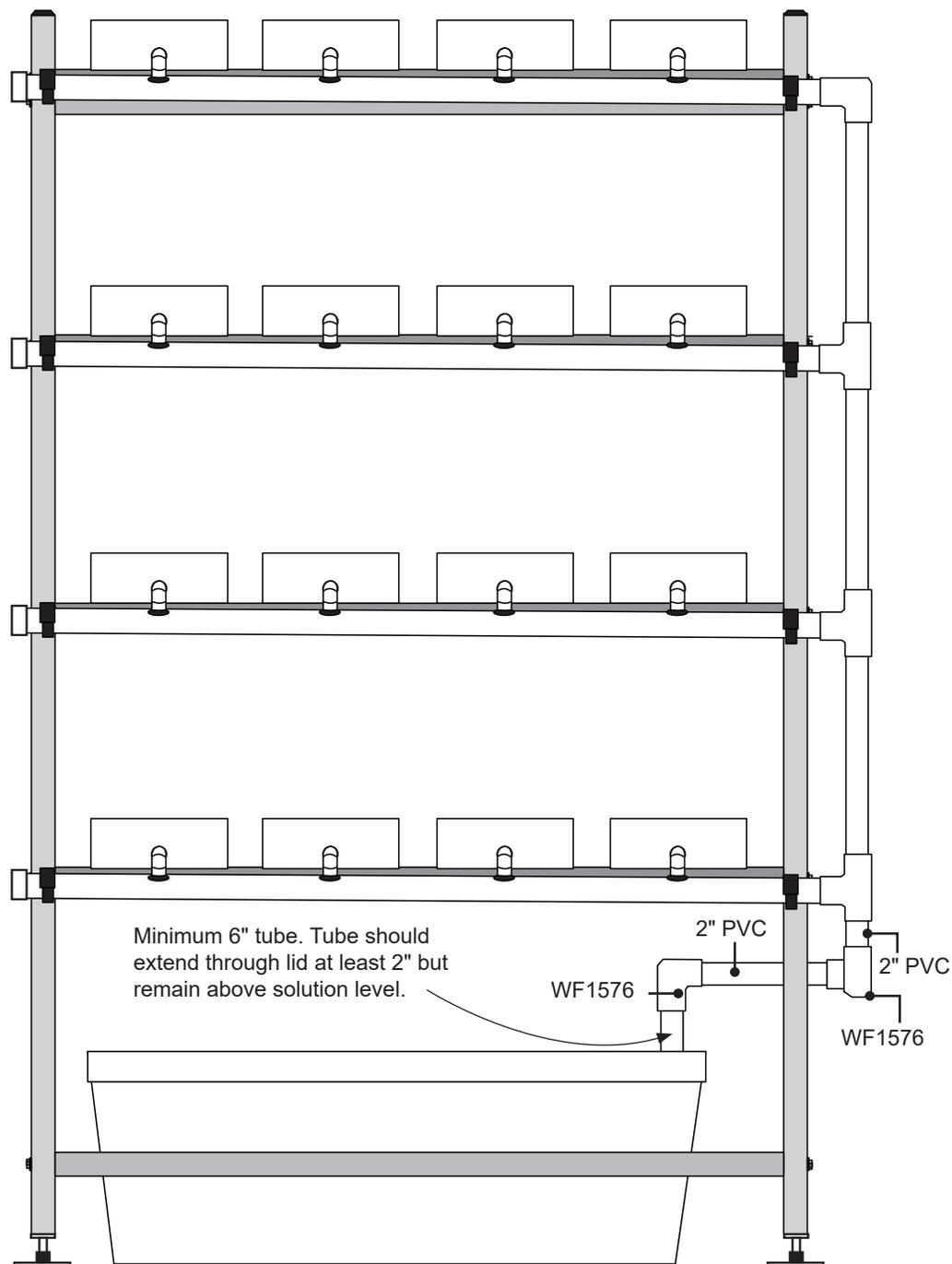
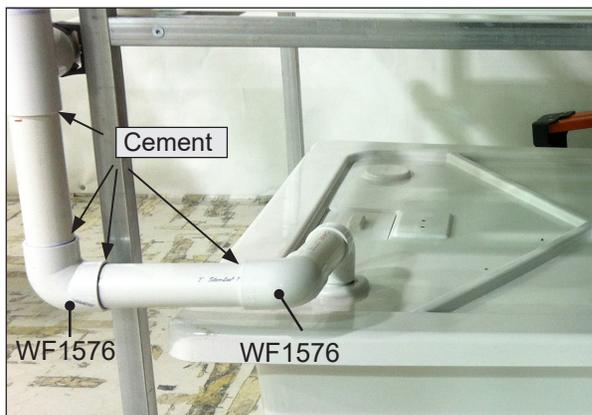
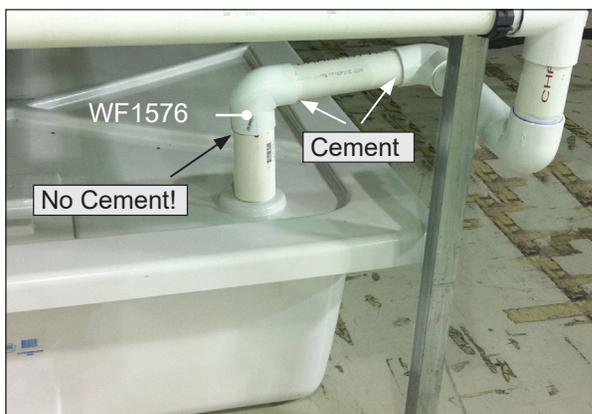
ASSEMBLE AND ATTACH PVC DRAIN MANIFOLD

Complete these steps:

1. Measure, cut, and dry fit the remaining sections of the 2" pvc drain manifold as shown in the photos below.
2. Once the fit is confirmed, disassemble and apply pvc primer and WF6990 cement to drain tubes and fittings. See below.

ATTENTION: Do not cement extension tube that extends through the lid from the WF1576 elbow. Extension tube must remain free to remove for routine tank maintenance.

3. Allow cement to set and continue with following procedure.



Install the Air Pump and Tubing

11

ATTENTION: Always position the air pump *above* the nutrient level to prevent siphoning of the reservoir.

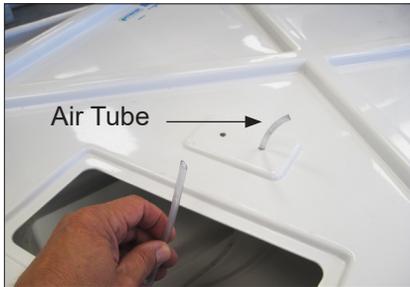
ATTACH AIR PUMP AND AERATOR STONES

For optimal system performance and to extend the life of nutrient solution through increased oxygenation, an aerator pump and aerator stones are included. Position stones on reservoir bottom opposite water pump. *Air pump must remain above nutrient level to prevent siphoning.*

1. Choose a position for the air pump and use it to determine length of each air tube. Cut two air tubes of equal length using 110091 tubing.

ATTENTION: Position air pump at a level that is **above the nutrient level at all times to prevent siphoning** of the reservoir in the event of a power outage.

2. Attach one stone to each line and set the stones in the reservoir.
3. Place reservoir cover on the reservoir and feed the tubing up through the access holes. Connect the free end of each tube to the air pump.
4. Place air pump in the position chosen in Step 1.



5. Connect air pump to power and test operation. Verify that air is filtering through each air stone. Monitor air pump regularly to ensure proper operation of aerator system.

NOTE: When system is fully operational, air pump will run continuously. **Do not connect air pump to any circuit controlled by a timer or shutoff switch.**

6. After testing air flow, turn off aerator pump until system is fully functional.



Basic System Check & Operation

12



WARNING: KEEP ALL ELECTRICAL CORDS AND CONNECTIONS OUT OF RESERVOIR. CONSULT THE SERVICES OF A QUALIFIED ELECTRICIAN TO ADEQUATELY AND SAFELY CONNECT PUMPS TO POWER.

ALL ELECTRICAL CIRCUITS SHALL BE DESIGNED IN ACCORDANCE WITH LOCAL AND REGIONAL BUILDING CODES AND STANDARDS.

Basic System Check and Operation

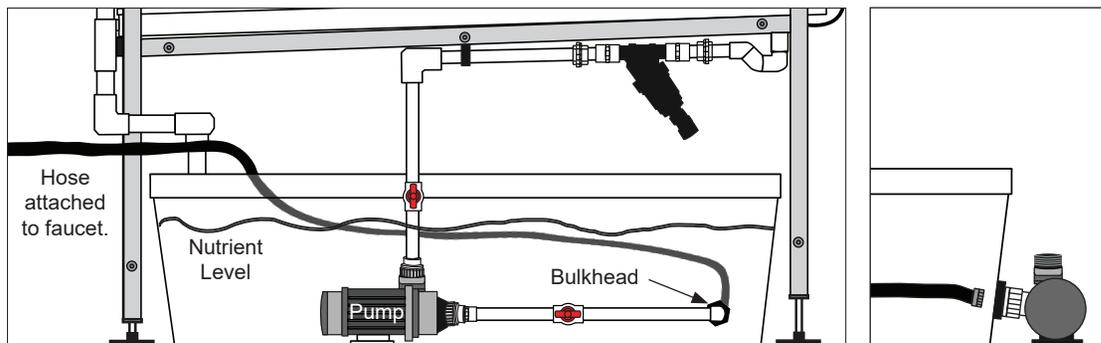
Complete these steps to check and start up the system:

1. Verify that all electrical cord ends are outside reservoir.
2. Ensure that all 1/4" supply tubes are fully inserted in channel lids and that all micro valves are open.
3. Verify that drain elbow of each channel is fully inserted into drain manifold.
4. Add water to reservoir through porthole until reservoir is at least half full.
5. Verify that 2" drain manifold extension pipe is inserted through reservoir lid.
6. Verify that the AC2804 valve at the end of each supply manifold is closed.
7. Open the two (2) WF3316 in-line ball valves. One is between reservoir and water pump; one is after/above water pump.
8. Turn on water and air pumps.
9. Check each channel to ensure that water is running out each 1/4" supply tube and drain end of each channel. If water flows from all tubes at all levels, continue with next step. If water is not flowing through all tubes, **turn off pump** and complete the "Prime the Pump" procedure that follows.



AC2804

WF3316



Prime the Pump

- a. Slide cover off reservoir, reach inside, and remove screen from bulkhead fitting. See diagram (left).
- b. Attach a hose to water faucet and place hose end in front of bulkhead fitting inside tank.
- c. Open hose faucet and turn on pump. Pump sound will change when pump is primed and pumping.
- d. Check all levels of system for water flow.
- e. Remove hose, reinstall screen, and set cover in place on reservoir.

10. Check all plumbing connections—main supply line and filter—for leaks. Check all pump fittings for leaks.
11. Check all pvc fittings for leaks.
12. Look for bubbles in the reservoir to verify that the air is pumping to each air stone. Remember to always mount the air pump on a surface that is above the water level. Vibrations of air pump can cause it to move. Make sure pump does not fall into reservoir or other liquids.
13. Once system is checked and all adjustments made, it is ready to use.

Operational and Maintenance Information

General Cleaning and Maintenance Instructions

For optimal performance and to increase yields, check and clean the system periodically. Time between maintenance and cleaning depends on the growing environment and specific use of the system. Complete the following steps as needed to ensure that your system is working properly.

1. Inspect the frame and mounting screws to ensure they are tight and frame is not damaged.
2. Disconnect the main power supply to turn off all pumps. Remove the reservoir cover and inspect the inside of the reservoir. Reservoir should be cleaned each time the nutrient solution is changed. Keep the reservoir and porthole covers in place during operation to prevent light from entering the reservoir.
3. Check all plumbing and main supply connections to ensure that all are operating as designed. No leaks.
4. Replace worn or cracked supply tubes as needed.
5. Clean the drain tube if needed. Remove the end plugs and inspect the inside of the tube. Clean the drain tube by pulling or pushing a brush or cloth through the it. Rinse with clean water.

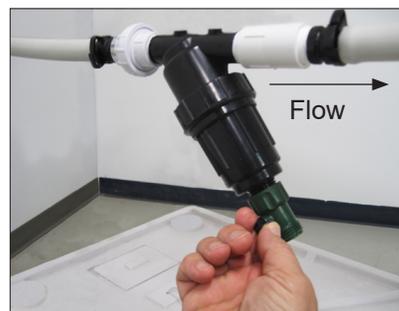
NOTE: Do not allow debris from the drain tube to contaminate the contents of the reservoir. Remove extension tube before cleaning.

6. With the pump off, disassemble the filter and clean the screen and housing. Reassemble for use. See procedure in the right column.

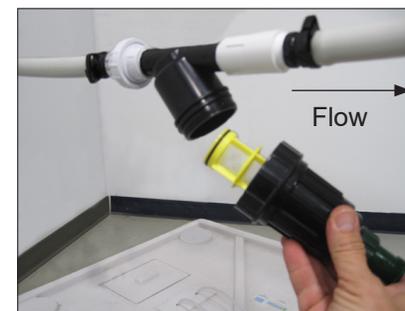
ATTENTION: Actual system may differ from the example shown. Photos are provided for filter cleaning only. They do not shown actual system.

Clean the Filter Screen and Housing

For best results, clean the filter screen regularly or when the flow rate changes unexpectedly. Complete these steps to clean the filter screen.



1. Shutoff the power to the nutrient pump. Open the valve on the filter to drain into a bucket.



2. Grip the filter housing and the main supply line and unscrew the housing. Do not apply force to the filter fittings.



3. Remove the screen from the housing. Using clean water, rinse the housing and the screen.



4. Insert the screen back into the housing, reassemble the filter, and *close the valve*.
5. Turn on the pump and check the flow from the supply tubes to each channel.
6. Check filter and fittings for leaks.

Operational and Maintenance Information

RESERVOIR CLEANING AND MAINTENANCE

Clean the reservoir periodically to maximize plant growth and to minimize system contamination. The steps that follow can be used to change nutrient solution and to pump the reservoir for cleaning and typical maintenance. *Cleaning the filter is strongly recommended after cleaning the reservoir.*



1. Turn off the nutrient pump and connect a garden hose to the shutoff valve of the filter. Place the end of the hose in a bucket or run it to the desired location.



2. Open the shutoff valve on the filter and turn the pump on to pump out the reservoir. Turn off the pump once the reservoir is empty.



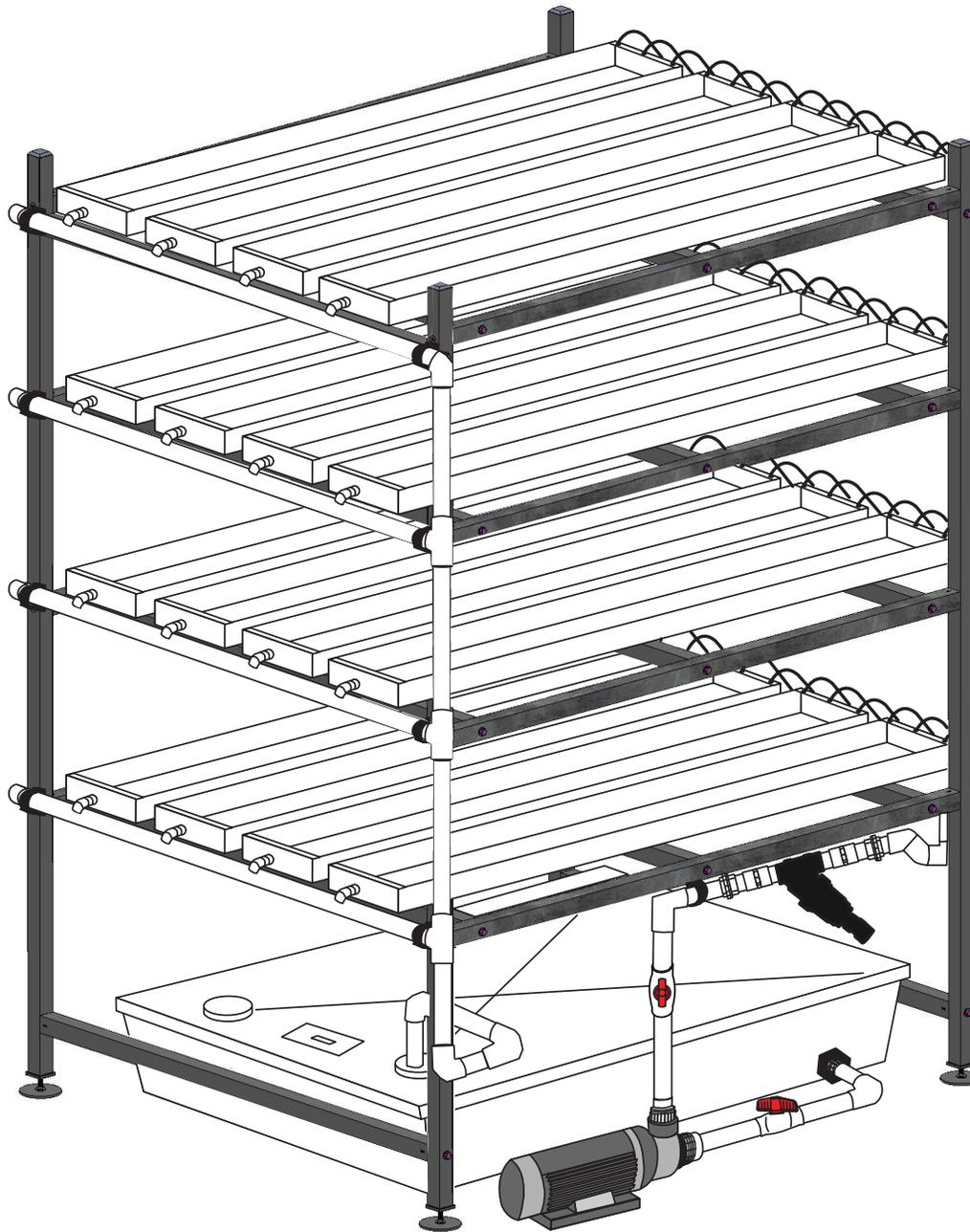
3. Clean reservoir. Repeat steps to pump it out if needed.
4. Close the shutoff valve.



5. Remove the hose and clean the filter. See previous page for filter cleaning procedure.
6. Refill the reservoir with nutrient solution. Turn on the pump to resume operation. Check all fittings, tubes, and filter for leaks.

Quick Start Guide

Sample System — Fully Assembled



ATTENTION: A timer is required to cycle the water pump on and off. If you did not purchase a timer, contact your sales representative to purchase the 112531 timer.

*Timer not included. Additional purchase required.



112531 Timer*

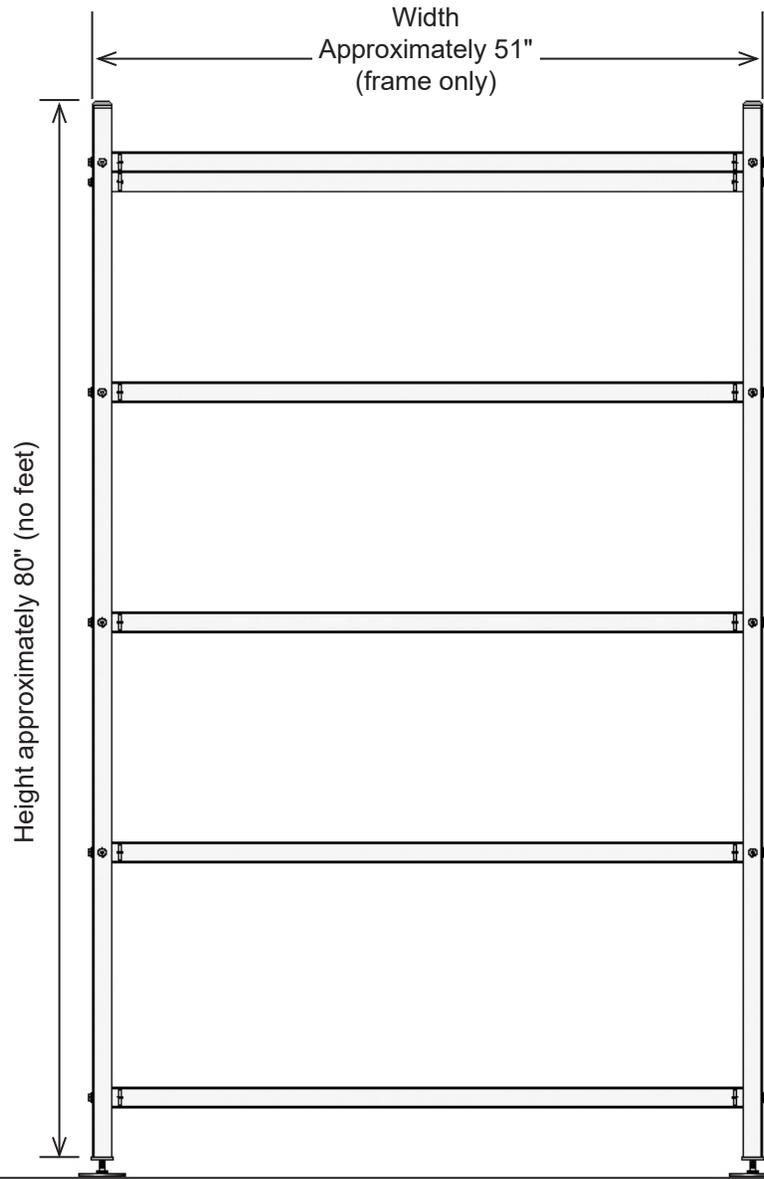
When set properly, the timer will allow pump to run long enough to ensure plants (and growing media) receive adequate nutrient solution each level.

Do not over water or allow growing media, seeds, or plants to dry out.

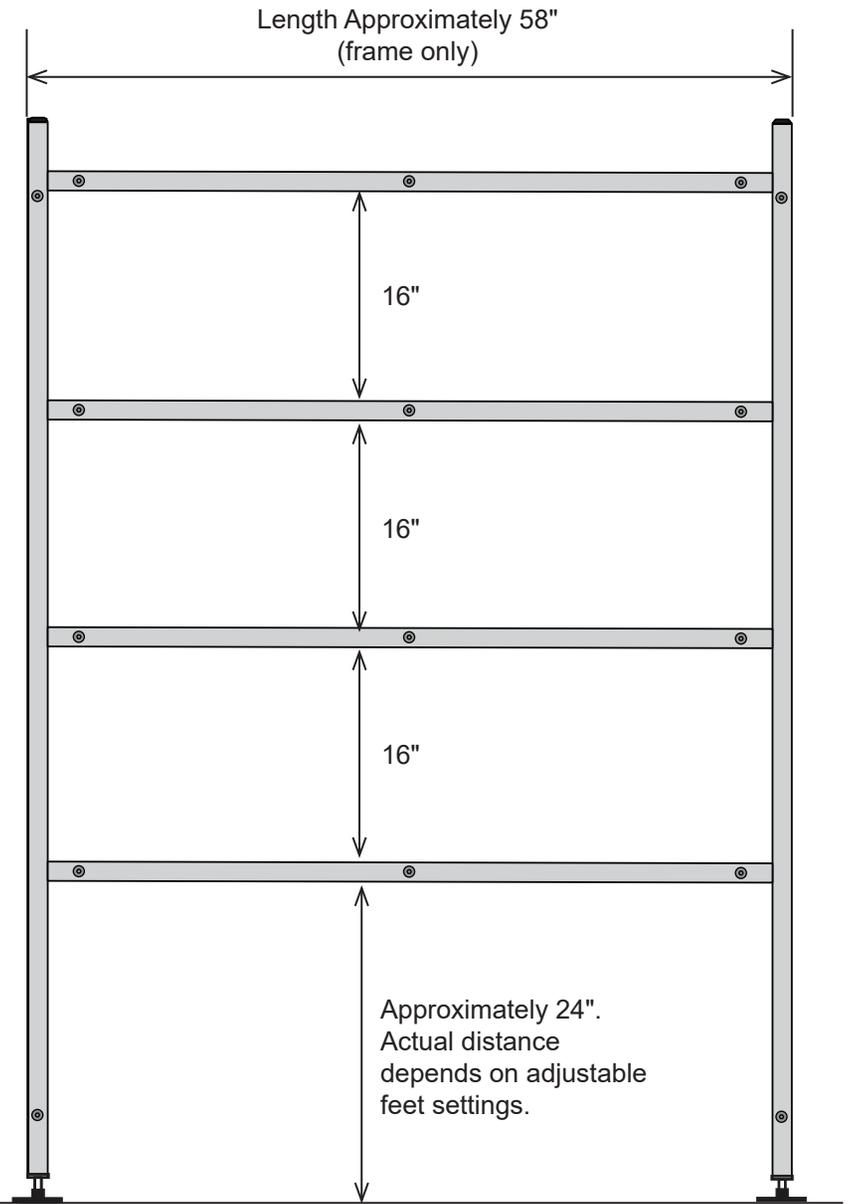
Adjust water flow as needed to prevent washing seeds out of NFT channels and into reservoir.

Frame Dimensions

End View—Frame (Width)

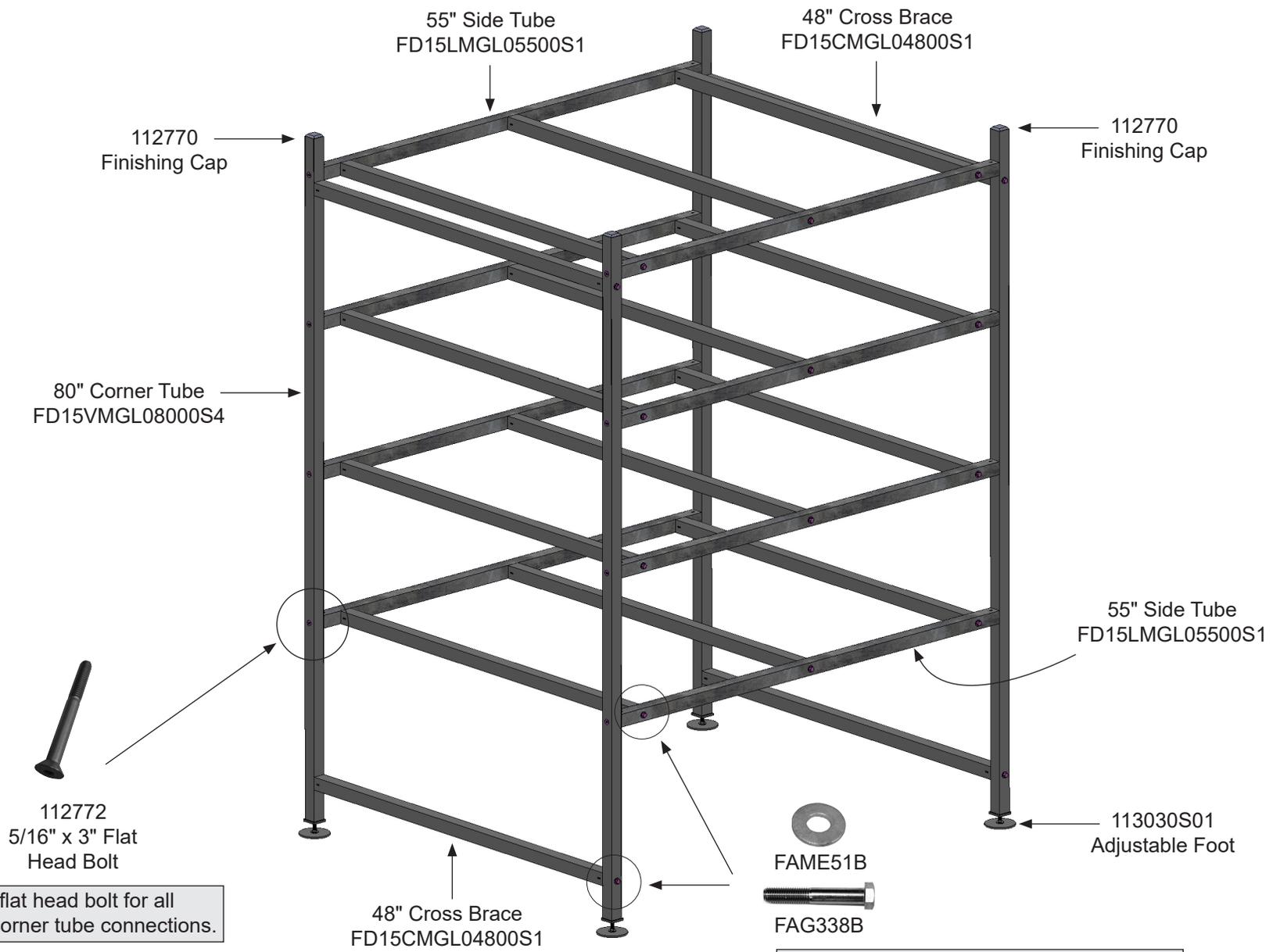


Side View—Frame (Length)



Full Frame Diagram

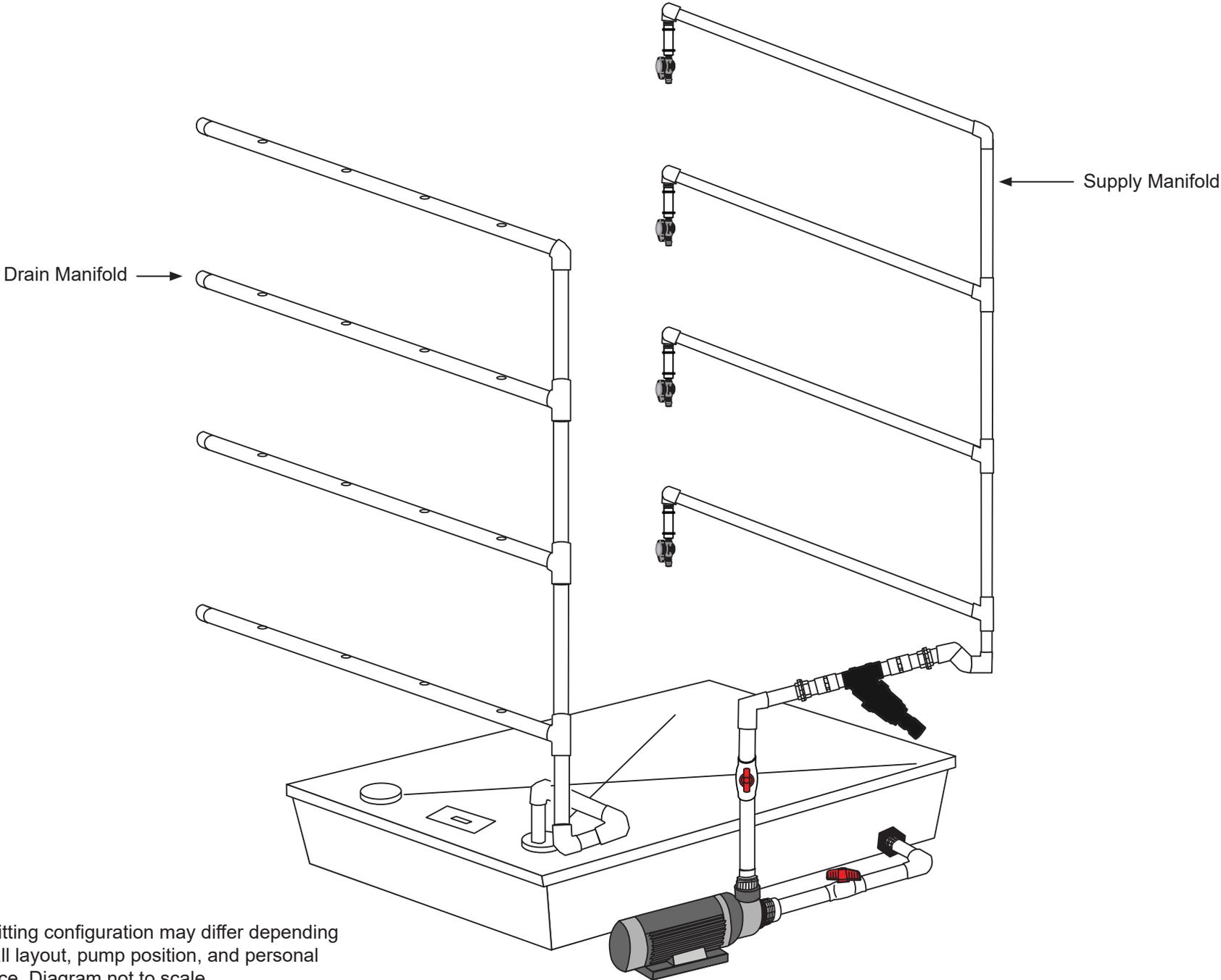
ATTENTION: The vertical tubes include holes of two different diameters. Install larger hole to the outside to allow flat head bolt to sit flush with tube surface when installed.



Use this flat head bolt for all vertical corner tube connections.

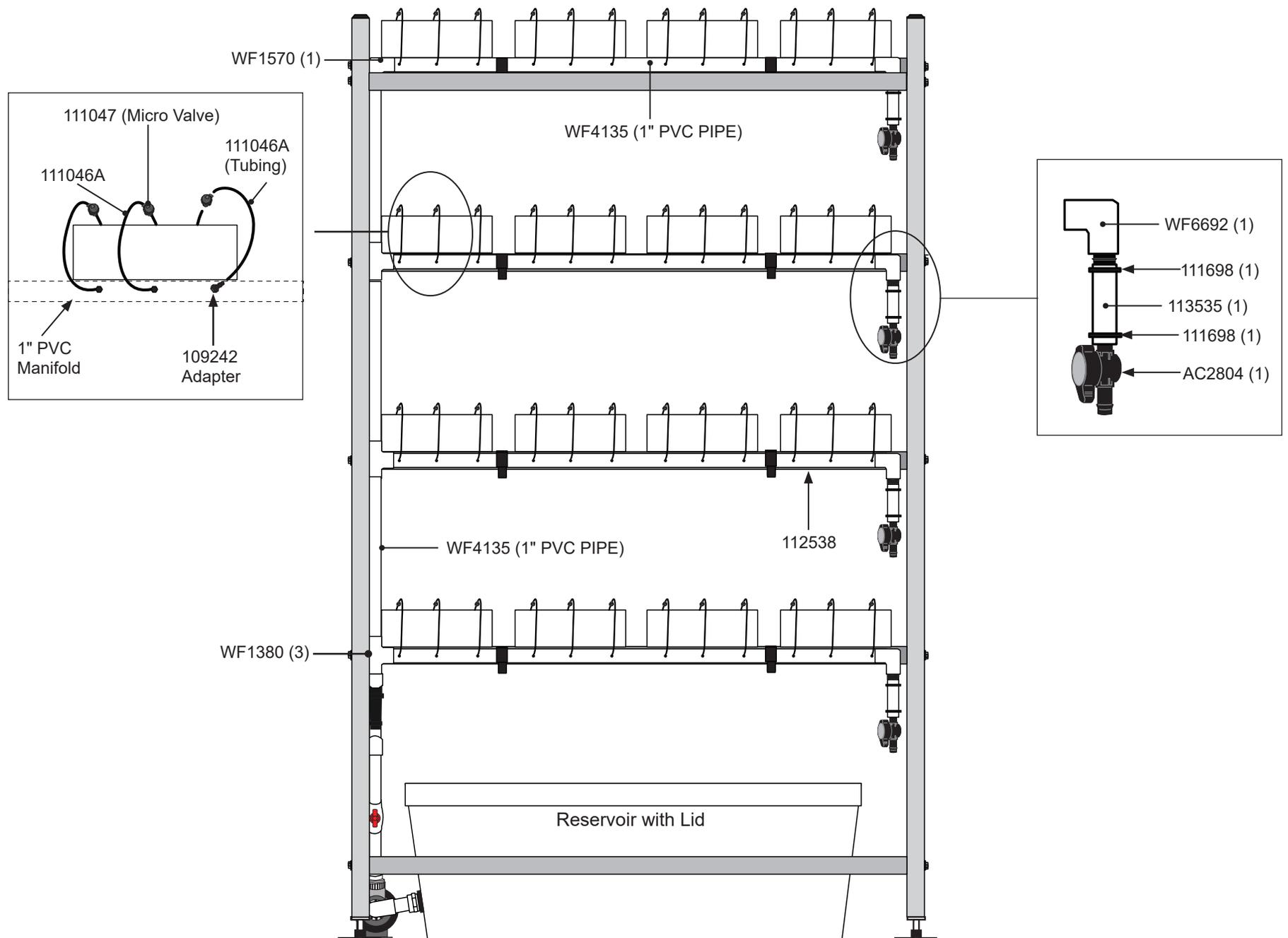
Use this hex bolt and washer combination for all cross brace connections.

Supply & Drain Manifolds Only*



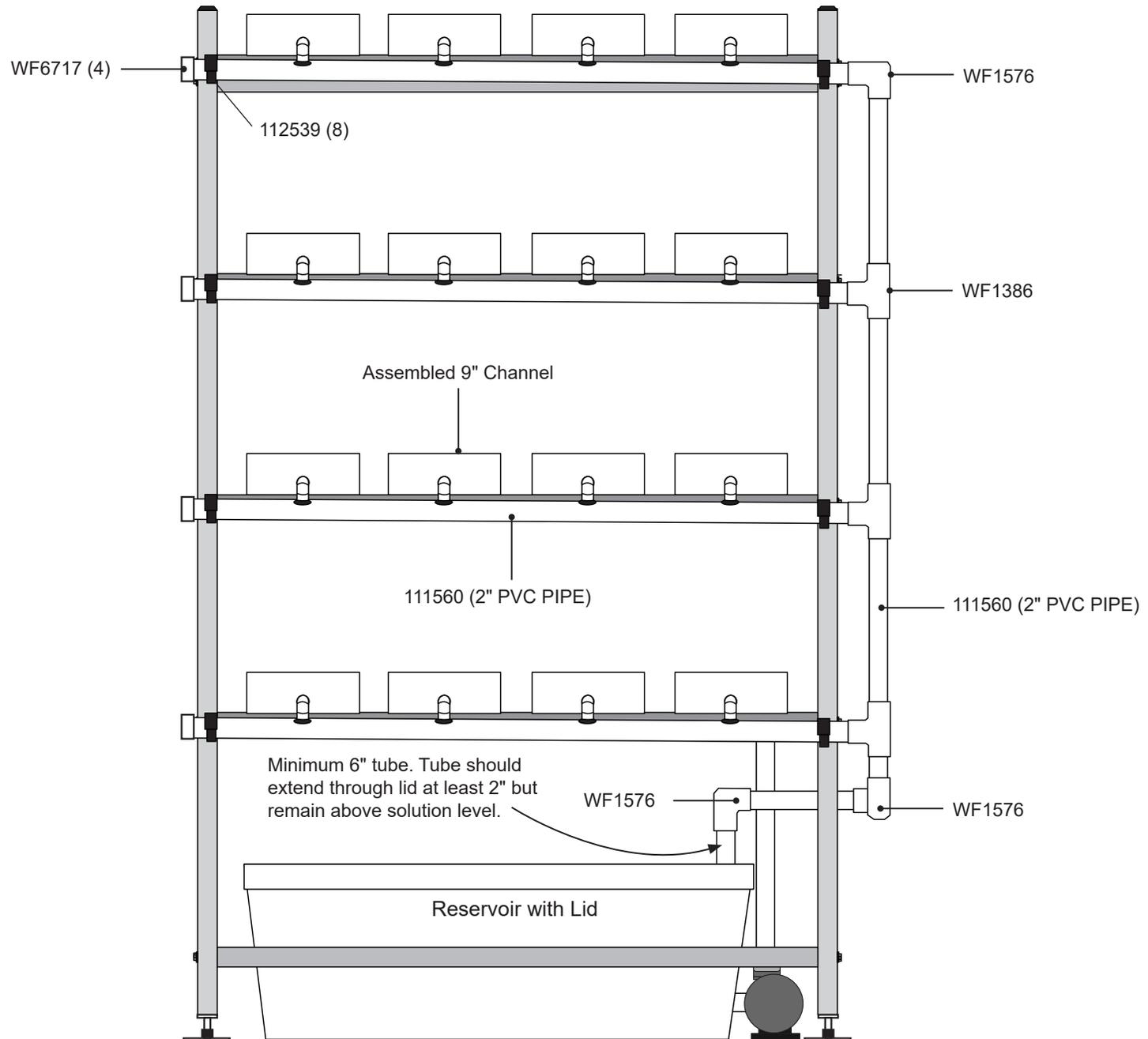
*Actual fitting configuration may differ depending on overall layout, pump position, and personal preference. Diagram not to scale.

End View — 1" Supply Manifold with Channels*

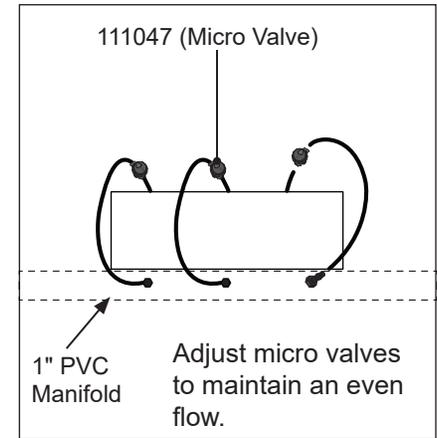
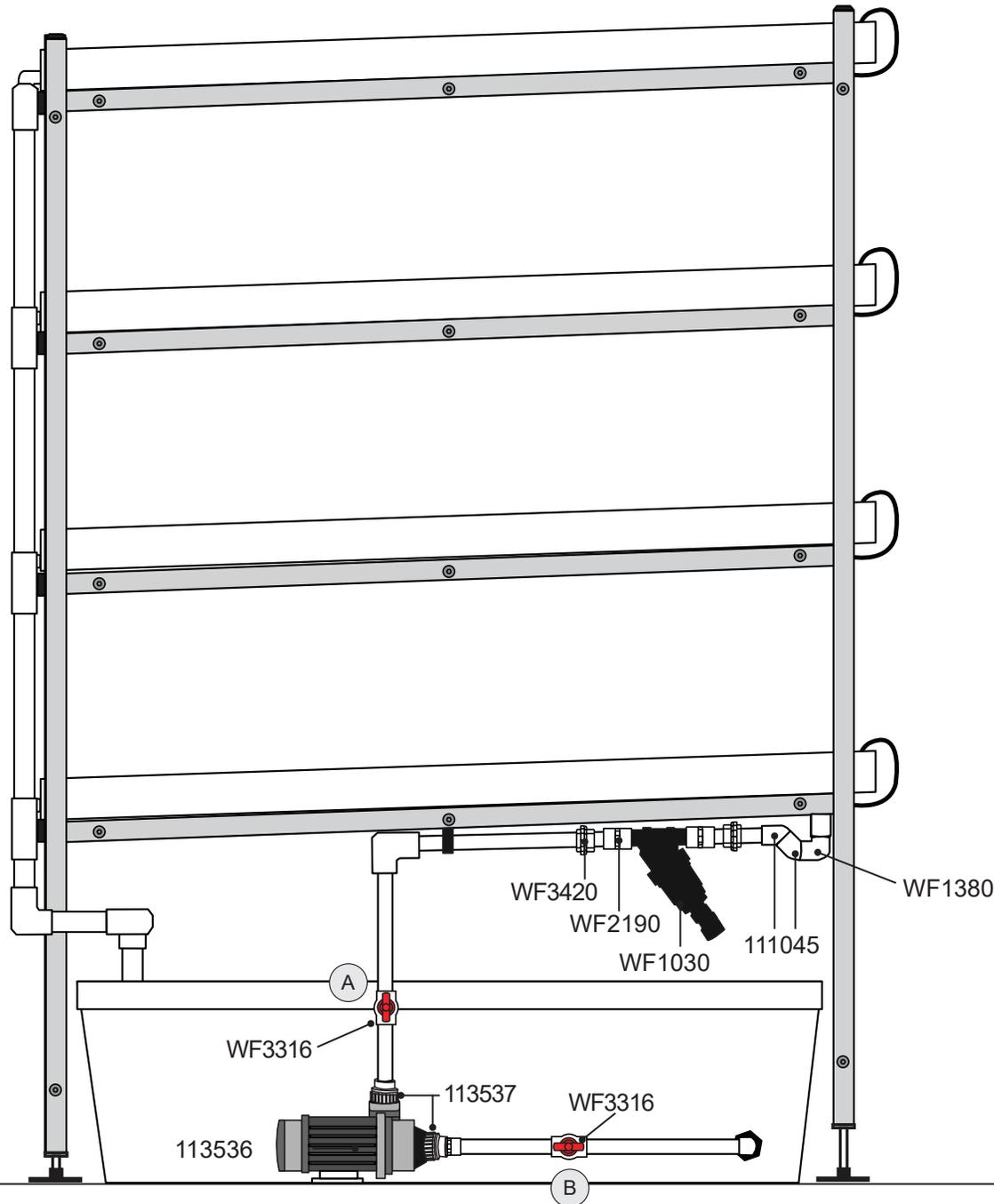


*Diagram not to scale.

End View — 2" Drain Manifold with Channels



Side View with Channels



ATTENTION: Use this information when system is in operation:

A: Adjust this valve to control nutrient flow to the channels.

B: This valve to remain fully open during operation. Close it to service or remove pump.



ATTENTION: WF3316 valves are shown in the "open" position during system operation. **Never close valves when system is in use.**

Actual tank and pump may differ from example shown.

*Diagram not to scale.

