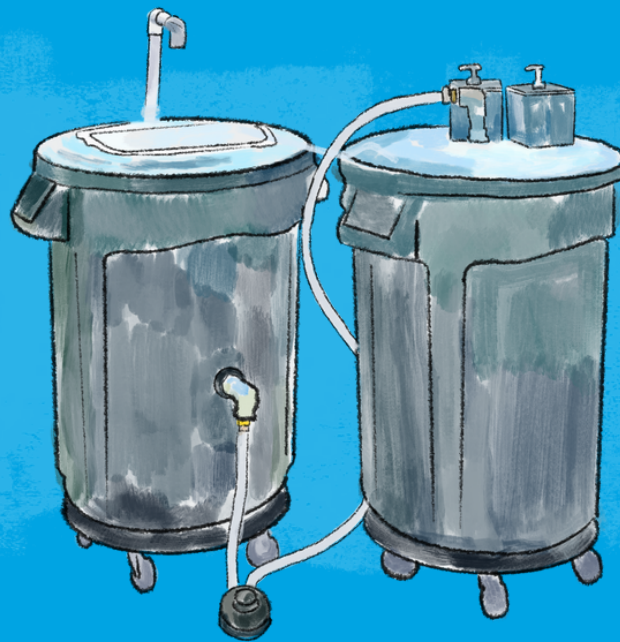




DIY Handwashing Toolkit



lavamae^x

In Partnership With



lovesinksin.org



Introduction

LavaMaex developed this DIY handwashing toolkit for communities looking to expand handwashing to people experiencing homelessness worldwide. Inspired by Love Beyond Walls, and a model co-created by students at the USC Annenberg School of Communication in partnership with Los Angeles Community Action Network, our handwashing station can hold enough water for up to **500 hand washes at a time**.

This DIY Toolkit is divided into three sections, to help you set up your Handwashing Station(s) as quickly and easily as possible:

1. Constructing the Handwashing Station

This section contains a detailed set of the tools and supplies you will need, and step-by-step instructions for constructing and connecting the core (and optional) components.

Construction takes approximately two hours.

2. Operating the Handwashing Station

This section contains a detailed set of guidelines and best practices for locating, setting up, operating and maintaining the Handwashing Station, including guidance on the handling of clean and grey water.

3. Resources

This section contains links to helpful resources, including our DIY video tutorial for constructing the Handwashing Station, an Excel version of the tools & supplies list, our COVID-19 instructional pamphlet, and contact information should you get stuck and need a hand!

Thank you for bringing handwashing to your community. You're taking a significant step to ensure that handwashing becomes available to everyone.



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Constructing The Handwashing Station



Tools & Supplies List



DIY Handwashing Station Tools

- [1/4" Ratcheting PVC Cutter](#)
- [1/4" Hole Saw Arbor](#)
- [3/4" Hole Saw](#)
- [2" Hole Saw](#)
- [Drill/Driver](#)
- [Drill Bit Set](#)
- [Dremel Rotary Saw](#)
- [Plastic Cutting Disks](#)
- [Hand Saw](#)
- [Phillips Screwdriver](#)
- [Tape Measure](#)
- [1/4" Socket \(for wrench\)](#)
- [Socket Wrench Ratcheting Tool](#)
- [Crescent Wrench](#)
- [Caulking Gun](#)

DIY Handwashing Station Parts

Core Parts

- (2) [32 Gallon Trash Bin with Lid](#)
- (2) [Trash Can Dolly](#)
- (10ft) [1/2" Vinyl Tubing](#)
- (1) [Galley Foot Pump**](#)
- (4) [Hose Clamp](#)
- (10ft) [3/4" PVC Pipe](#)
- (3) [1/2" Bulkhead Union Washer Fitting](#)
- (6) [1/2" x 3/4" PVC Male Reducer Adapter](#)
- (2) [3/4" Brass PEX Barb x 1/2" Male Pipe Thread Reducing Adapter](#)
- (1) [3/4" Slip Joint In Line Check Valve](#)
- (1) [Roll Plumbers Tape \(PTFE\)](#)
- (4) [3/4" 90 Degree PVC Elbow \(Slip x Slip\)](#)
- (2) [3/4" 90 Degree PVC Elbow \(Slip x FTP\)](#)
- (1) [2" ABS Drain](#)
- (1) [2" ABS 90 Degree Elbow](#)
- (1) [12 qt Dishpan \(15¾" x 12½" x 6"\)](#)
- (1) [Fresh Sink Chlorine Tablets](#)
- (2) [Electrical Junction Boxes](#)
- (6) [Bolts](#) & (6) [Nuts](#) (For Mounting Electrical Boxes and Plaque)

**see pg. 20 to create your own.

Gluing Components

- (8oz) [Clear PVC Cement Black](#)
- (4oz) [ABS Cement](#)
- (1) [Clear Silicon Waterproof Sealant](#)
- (1) [Clear Silicone Caulking](#)
- (1) [Caulking Gun](#)

Accessories

- (2) [16oz Bottles Hand Soap](#)
- (1) [Plaque](#) (for signage)
- (1) [Paper Towel Holder](#)
- (4) [8oz Bottles Hand Sanitizer](#)

[Download Excel file for budgeting](#)



Core Components: Fresh Water Bin



Tools

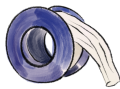
- Power Drill
- Tape Measure
- PVC Cutting Tool
- ½" Hole Saw

Parts

- 32 gallon trash bin with lid
- PTFE tape
- ½" Bulkhead Union Washer Fitting
- (2) ½" x ¾" PVC Male Reducer Adapters
- PVC pipe
- ¾" 90 Degree PVC Elbow (Slip x FTP)
- ¾" Brass PEX Barb x ½" Male Pipe Thread Reducing Adapter



32 gallon trash bin



PTFE tape



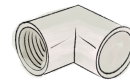
½" Bulkhead Union Washer Fitting



½" x ¾" PVC Male Reducer Adapters



PVC pipe



¾" 90 Degree PVC Elbow (Slip x FTP)



¾" Brass PEX Barb x ½" Male Pipe Thread Reducing Adapter

Fresh Water Bin Instructions

1. Decide where you would like the plumbing to come out of the lid of your bin. In our bin, we chose the center. Once you have decided the location of the hole, use a ½" hole saw with your power drill to cut the hole.
2. Separate the two pieces of the ½" Bulkhead Union Washer Fitting, leaving one washer per piece. Push the piece with the threading through the hole you have cut and screw the other side on, on the underside of the lid.
3. Wrap a few layers of PTFE tape around the threaded areas of two ½" x ¾" PVC Male Reducer Adapters
4. Screw one ½" x ¾" PVC Male Reducer Adapter into the top and bottom sides of the Bulkhead Union Washer Fitting.
5. Cut a 3" piece of ¾" PVC pipe with the PVC cutting tool and slide it into the ½" x ¾" PVC Male Reducer Adapter that is on the top of the lid.



Fresh Water Bin, Cont'd



6. Slide a $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x FTP) onto the 3" piece of PVC pipe.
7. Wrap a few layers of PTFE tape around the threaded areas of $\frac{3}{4}$ " Brass PEX Barb x $\frac{1}{2}$ " Male Pipe Thread Reducing Adapter and screw into the $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x FTP)
8. Place the lid to the side.
9. With a tape measure, measure the distance from the top of the bin to $\frac{1}{2}$ " above the bottom of the bin. This measurement will be the length you cut the $\frac{3}{4}$ " PVC pipe. You want the pipe to be cut at an angle and stop $\frac{1}{2}$ " before hitting the bottom of the bin. This is to prevent sediment from being picked up by the pipe when pulling fresh water.
10. Using the measurement from step 9, use the PVC cutting tool to cut the PVC pipe at an angle.
11. Slide the non-angled portion of the PVC pipe into the $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapter that is on the underside of the lid
12. Place the lid back on the bin.

Tip: To make sure the $\frac{3}{4}$ " PVC pipe isn't hitting the bottom of the bin, press on the lid and try to feel if the PVC pipe is hitting the bottom of the bin. You can also try lifting the lid on one side and peeking in to view. If it's too long, simply cut more of the pipe with the PVC cutting tool.

Congratulations, you finished construction of the freshwater bin!



Core Components: Dishpan & Faucet



Tools

- Marker
- Dremel Rotary Saw
- Plastic cutting disk (for dremel)
- Power drill
- ½" hole saw
- Tape measure
- PVC cutting tool

Parts

- 12qt Dishpan (15¾" x 12½" x 6")
- PTFE tape
- ½" Bulkhead Union Washer Fitting
- (2) ½" x ¾" PVC Male Reducer Adapters
- PVC pipe
- (2) ¾" 90 Degree PVC Elbow (Slip x Slip)



12qt Dishpan
(15¾" x 12½" x 6")



PTFE tape



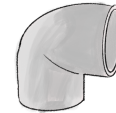
½" Bulkhead Union
Washer Fitting



½" x ¾" PVC Male
Reducer Adapters



PVC pipe



¾" 90 Degree PVC
Elbow (Slip x Slip)

Instructions

1. We recommend placing the 12qt dishpan (15¾" x 12½" x 6") in the center of the lid, but somewhat closer to where the guest will be washing their hands. This gives ample room for the dishpan and faucet. With a marker, trace the circumference of the sink basin on the top of the lid; you will be cutting along this line.

2. Place the dishpan to the side. You will need this part again to install the drain, in the next section; drain.

3. Use a handsaw or a dremel equipped with a plastic cutting disk to cut along the traced line on the lid. You may need to trim small pieces of the hole a few times in order to get it just right. The dishpan will not be glued in, so the goal is to get it to sit comfortably and securely in the lid while allowing easy removal for access to eliminate the grey water that will fill this bin.

4. Place the faucet at the "back" of the dishpan. There should be just enough room; approximately ½" between the dishpan and the faucet (the ½" Bulkhead Union Washer Fitting). Use the drill with a ½" hole saw to cut the hole for your faucet.



Dishpan & Faucet, Cont'd



It should look like this:



5. Install the Bulkhead Union Washer Fitting into the $\frac{1}{2}$ " hole you have drilled.
6. Wrap a few layers of PTFE tape around all threaded parts of two $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapters, then screw one into the top and one into the bottom of the Bulkhead Union Washer Fitting from step 5.
7. Using the PVC cutting tool, cut the $\frac{3}{4}$ " PVC pipe at the desired height for your faucet.
8. Slide that piece of PVC pipe into the $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapter that is on the top side of the lid.
9. Slide a $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip) onto the PVC pipe.
10. From the curved portion of the $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip), measure the horizontal distance to the drain, then use that measurement to cut a piece of PVC pipe with PVC cutting tool.
11. Slide the piece of PVC pipe into the $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip) from step 9.
12. Slide one last $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip) onto the open end of the PVC pipe to complete the faucet mechanism.
13. Place the lid with the faucet installed, to the side. You will need to measure the length of the dishpan, drain and elbow in order to know how far down the unit you need to place the plumbing so that it doesn't interfere with other parts, which we describe in the next section; drain.



Core Components: Drain



Tools

- Marker
- Dremel Rotary Saw
- Plastic Cutting Disk (for Dremel)

Parts

- 12qt Dishpan (15³/₄" x 12¹/₂" x 6") Sink Drain
- 2" 90 degree ABS elbow



Dishpan



Sink drain



2" 90 degree ABS elbow

Instructions

1. Place the drain in the middle of your dishpan. With a marker, trace the circumference of the portion of the drain that will go through the sink basin. You will cut along this line with the handsaw or dremel with a plastic cutting disk. The drain we used separates into two pieces so that the dishpan "sits" between the two components of the drain. Only cut the size of the portion of the drain that will go through the sink basin.
2. Use a hand saw or a dremel with a plastic cutting disk to cut along the traced line.
3. Insert the top part of the drain through the hole, then screw the lower part of the drain on the underside of the dishpan.
3. Slide the 2" ABS 90 Degree Elbow into the opening at the bottom of the drain (underneath sink basin.)

It should look like this:



Congratulations, you finished construction of the faucet and sink!



Core Components: Plumbing



Tools

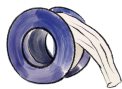
- Power drill
- 1/2" Hole Saw
- Tape Measure
- Marker
- PVC cutting tool

Parts

- Completed Sink Basin & Faucet
- 32 Gallon Trash Bin
- PTFE tape
- 1/2" Bulkhead Union Washer Fitting
- (2) 1/2" x 3/4" PVC Male Reducer Adapters
- PVC pipe
- 3/4" 90 Degree PVC Elbow (Slip x FTP)
- 3/4" Brass PEX Barb x 1/2" Male Pipe Thread Reducing Adapter
- 3/4" 90 Degree PVC Elbow (Slip x Slip)
- 1/2" Slip Joint In Line Check Valve



32 gallon trash bin



PTFE tape



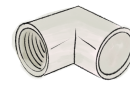
1/2" Bulkhead Union Washer Fitting



1/2" x 3/4" PVC Male Reducer Adapters



PVC pipe



3/4" 90 Degree PVC Elbow (Slip x FTP)



3/4" Brass PEX Barb x 1/2" Male Pipe Thread Reducing Adapter



3/4" 90 Degree PVC Elbow (Slip x Slip)



1/2" Slip Joint In Line Check Valve

Instructions

Note: In our model, the plumbing exits at the front of the grey water bin. It is very important that there is enough room inside of the bin for the plumbing to include the 3/4" Slip Joint In Line Check Valve sitting in a horizontal position. Your PVC piping also needs to go low enough in the bin to avoid hitting or touching the sink basin, drain, and elbow. Assuming your model will mirror ours, install plumbing as follows.



Plumbing, Cont'd



1. With a tape measure, measure the distance from the top of the sink basin to the lowest part of the 2" ABS 90 Degree Elbow.
 2. Add 1" to 2" to the measurement in step 1 and use the PVC cutting tool to cut a piece of $\frac{3}{4}$ " PVC pipe. Insert that piece into the $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapter that is screwed into the Bulkhead Union Washer Fitting on the underside of the lid.
 3. Slide a $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip) onto the end of the PVC pipe. The open side of this elbow should be facing the direction in which the plumbing will exit the unit.
 4. On the front side of your bin where the plumbing will exit, use the measurement from step 2 to measure from the top of the bin, down toward the ground. Place a mark with a marker.
 5. Tip the bin over on it's side. Using a drill equipped with the $\frac{1}{2}$ " hole saw to drill a hole where the mark is on the bin.
- Tip: For stability and to prevent the bin from moving when drilling, position the bin so that the opening is facing you, and use one foot to step on the inside of the bin.*
6. Install a $\frac{1}{2}$ " Bulkhead Union Washer Fitting into the hole, then wrap a few layers of PTFE tape around all threaded areas of two $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapters and screw one each into either side of the $\frac{1}{2}$ " Bulkhead Union Washer Fitting.
 7. With the PVC cutting tool, cut a 3" piece of PVC pipe. Slide that into the $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapter that is screwed into the Bulkhead Union Washer Fitting on the inside of the bin.
 8. Slide the $\frac{3}{4}$ " Slip Joint In Line Check Valve onto that piece of PVC pipe.

Important! There is an arrow on the In Line Check Valve. Make sure it is facing the faucet. The purpose of this piece is to prevent backflow of water inside of the unit so installing this piece incorrectly will prevent water from entering the bin properly and coming out of the faucet.

9. Measure the distance from the middle of the $\frac{3}{4}$ " Slip Joint In Line Check Valve to the curved portion of the $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip) from step 3.



Plumbing, Cont'd



10. Using that measurement, cut the $\frac{3}{4}$ " PVC pipe with the PVC cutting tool.

11. Slide one end of the piece of PVC pipe from step 2 into the $\frac{3}{4}$ " Slip Joint In Line Check Valve, and the other end into the $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x Slip) from step 3. This should complete the plumbing inside of the grey water bin.

Note: If the $\frac{3}{4}$ " PVC pipe from this step is too long, you can always trim it down a bit with the PCV cutting tool to ensure proper, comfortable fitting between all connections and pieces.

12. With the PVC cutting tool, cut a 3" piece of PVC pipe. Slide that piece into the $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapter that is screwed into the Bulkhead Union Washer Fitting on the outside of the bin.

13. Slide a $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x FTP) onto the 3" piece of PVC pipe..

14. Wrap a few layers of PTFE tape around all threaded areas of a $\frac{3}{4}$ " Brass PEX Barb x $\frac{1}{2}$ " Male Pipe Thread Reducing Adapter, then screw into the $\frac{3}{4}$ " 90 Degree PVC Elbow (Slip x FTP).

Congratulations, you finished construction of the grey water bin!



Core Components: Soap Dispensers



Tools

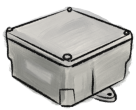
- Power drill
- 1/4" Hole Saw
- Phillips Drill Bit or Phillips Screwdriver
- 1/2" Socket Wrench
- Crescent wrench
- Caulking Gun

Parts

- 4"x4" Electrical Junction Box
- (4) 1/4"x 20 TPI Bolts & (4) Nuts (Two Nuts & Bolts For Each Dispenser)
- 32oz Hand Soap

Gluing Components

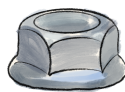
- Clear Silicone Caulking



Electrical Junction Box



Bolts



Nuts



32oz Hand Soap

Instructions

1. On the lid of your freshwater bin, decide where you would like the two electrical junction boxes to sit. Make sure it's level, while still being accessible to the user washing their hands. We recommend placing them on the side of the lid, nearest to the grey water bin or hand washing station.

2. With the electrical junction boxes in place, use a marker to mark through the (2) placement holders for each, then place the boxes to the side.

3. Using the power drill and a 1/4" size drill bit, drill (4) holes through the lid where the marks are. Then, make sure the (4) bolts are able to go through the holes you drilled.

Tip: Sometimes the holes are the right size, but it's difficult to push the bolts through. Push the bolt back and forth a few times through the holes to widen them a bit.

4. Put the electrical junction boxes back on the lid in the correct position, making sure the attachment tab holes line up with the pre-drilled holes.



Soap Dispensers, Cont'd



5. Push (4) $\frac{1}{4}$ " x 20 TPI bolts through the attachment tab holes and the screw in the holes on the bin lid.

6. Take the lid off of the bin and turn it sideways, in a position that allows you to screw the nuts on to the bolts. Tighten as much as you can by hand.

7. Use a wrench to hold the head of the bolt (top of lid) and a socket wrench ratcheting tool with $\frac{1}{4}$ " socket to tighten the nut on the bolt (underside of lid) as much as possible.

Note: We recommend using nuts and bolts for attachment instead of glue because it ensures stability, durability, and longevity.

8. With the soap dispensing pump in hand, stand it up inside of the empty electrical junction box to determine how much, if any, of the straw on the pump needs to be cut. Using a marker to mark the place you would like to cut the straw may help. We removed about 2" of material from The Right to Shower dispensing pump so that the straw stopped $\frac{1}{4}$ " before the bottom of the electrical junction box. To cut the straw, use the PCV cutting tool or household scissors.

9. With a power drill and $\frac{1}{4}$ " hole saw, drill a hole through the center of the lid of the electrical junction box to allow the placement of the soap dispensing pump, then glue in place by using a caulking gun and clear silicone adhesive.

10. Push the $\frac{1}{4}$ " x 20 TPI bolts through the attachment tab holes and holes in the bin lid. Once the adhesive fully dries (check instructions for drying and curing time), fill the electrical junction box with 32oz of soap. Then, using a drill with a Phillips drill bit (or a Phillips screwdriver), tighten all four screws to attach the lid on to the electrical junction box.

Congratulations, you constructed the soap dispensers!



Connecting the Components: It's Alive!

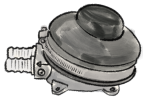


Tools

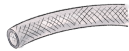
- Power drill
- Flathead attachment (for drill)
- PVC Cutting Tool

Parts

- Galley Pump
- 10ft Vinyl Tubing
- (4) Hose Clamps



Galley Pump



Vinyl Tubing



Hose Clamps

Instructions

Note: The galley pump (or pump mechanism) should be as close to the grey water bin as possible, in order for the user to be able to actively step on the pump while washing hands.

1. With the PVC cutting tool, cut the necessary amount of tubing to go from the $\frac{3}{4}$ " Brass PEX Barb x $\frac{1}{2}$ " Male Pipe Thread Reducing Adapter on the front of the grey water bin to the pump mechanism on the ground.

Note: Make sure to attach the tubing to the outlet portion of the pump.

2. Slide two loose hose clamps on to the tubing and let them stay loose while following the next steps.

3. Attach one end of this piece of tubing to the $\frac{3}{4}$ " Brass PEX Barb x $\frac{1}{2}$ " Male Pipe Thread Reducing Adapter on the grey water bin, and the other end to the galley pump.

4. Slide two loose hose clamps on the remaining tubing and slide on to to the inlet portion of the galley pump, and the other end of the tubing on to the $\frac{3}{4}$ " Brass PEX Barb x $\frac{1}{2}$ " Male Pipe Thread Reducing Adapter on the top of the freshwater bin.

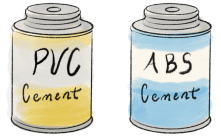
5. With the drill equipped with a flat head attachment, tighten one hose clamp over all four areas of connection.

This includes: Tubing over each $\frac{3}{4}$ " Brass PEX Barb x $\frac{1}{2}$ " Male Pipe Thread Reducing Adapter and tubing over each galley pump connection.

Congratulations, you connected the two bins!



Testing & Gluing



Before using any type of glue, test your handwashing station by washing your hands and making sure the parts and plumbing are working properly and check for leaks.

After everything operates perfectly, apply PVC cement glue to all pieces that slide into each other. For example, where a $\frac{3}{4}$ " PVC pipe slides into a $\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Male Reducer Adapter or where the $\frac{3}{4}$ " PVC pipe slides into the $\frac{3}{4}$ " Slip Joint In Line Check Valve.

Apply ABS cement to the portion of the 2" 90 degree elbow that slides into the 2" sink drain.

Apply clear silicone caulking to both sides of washers/gaskets on the Bulkhead Union Washer fitting located at the front of the grey water bin. This is crucial to provide a leak proof seal that will last.

Read instructions and labels for dry time, cure time, and warnings.



Optional Add-ons & Accessories



You may want to consider installing accessories on to your handwashing station for various reasons. Below are some ideas and suggestions.

Hand Sanitizer

If attainable, this is a great accessory to provide. Just like the soap, keep the sanitizer in a closed container that has a pump and can be securely attached to the lid of one of the bins.

Signage

We recommend attaching a sign to one of the units, explaining how to effectively wash your hands as well as how to properly use the galley foot pump is a functional and useful touch. This could also be a way to provide an inspirational message to your guests.

Paper Towel Dispenser

Having a way to dry hands is convenient, however consider ways to keep the paper towels sanitary on or near the bins, plan where guests will dispose waste, and how often paper towels need to be replaced.



Optional Add-ons & Accessories: Building Your Own Foot Pump



** This is an alternative to the galley pump and is not required; tools and parts are unique to this section.

Tools

- Flathead Screwdriver
- Crescent Wrench

Gluing Components

- Clear PVC Cement

Parts

- 3"x 3" 90 Degree PVC Mechanical Elbow
- (2) 3"x1½" ABS Spig. x Hub Flush Bushing
- (1) ½"x½" PVC Reducer Bushing
- (2) ½" ID Barb x ½" MIP Brass Hose Barb Adapter Fitting
- (1) ½"x¾" PVC Reducer Bushing
- ¾" Thread x Hose Nipple
- ¾" PVC In Line Check Valve (FIP x FIP)
- ¾"x½" PVC Reducer Bushing
- 10ft vinyl tubing
- PTFE Tape

Instructions

- 1.) Insert the 3"x 1½" PVC Reducer Bushing into one end of the 3"x 3" 90 Degree PVC Mechanical Elbow, then tighten the band clamp with a flathead screwdriver.
- 2.) Place clear PVC cement around the portion of the 1½"x½" PVC Reducer Bushing that fits into the 3"x1½" PVC Reducer Bushing and insert.
- 3.) Wrap a few layers of PTFE tape around the threaded areas of the ½" ID Barb x ½" MIP Brass Hose Barb Adapter Fitting and screw into the 3" x 1½" PVC Reducer Bushing.
- 4.) Into the empty end of the 3" x 3" 90 Degree PVC Mechanical Elbow, insert a 3" x 1½" PVC Reducer Bushing and tighten the band clamp with a flathead screwdriver.
5. Place clear PVC cement around the portion of the 1½" x ¾" PVC Reducer Bushing that fits into the 3" x 1½" PVC Reducer Bushing and insert.



Building Your Own Foot Pump, Cont'd



6. Wrap a few layers of PTFE tape around all threaded areas of the $\frac{3}{4}$ " Thread x Hose Nipple and screw into the $1\frac{1}{2}$ " x $\frac{3}{4}$ " PVC Reducer Bushing.

7. Screw the $\frac{3}{4}$ " PVC In Line Check Valve (FIP x FIP) on to the $\frac{3}{4}$ " Thread x Hose Nipple.

*Important! There is an arrow on the In Line Check Valve. Make sure that the arrow is facing **away** from the pump assembly. The purpose of this piece is to prevent backflow of water inside of the unit so installing this piece incorrectly will prevent water from entering*

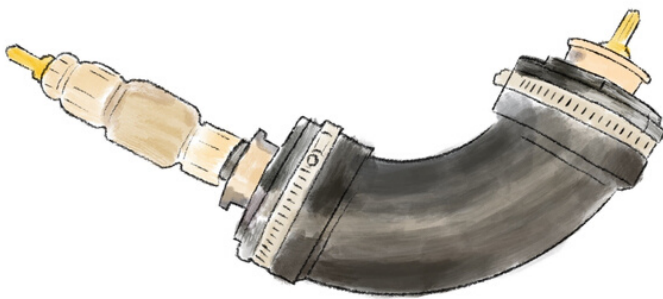
8. Wrap a few layers of PTFE tape around the threaded areas of the $\frac{3}{4}$ " x $\frac{1}{2}$ " PVC Reducer Bushing

9. Wrap a few layers of PTFE tape around the threaded areas of the $\frac{1}{2}$ " ID Barb x $\frac{1}{2}$ " MIP Brass Hose Barb Adapter Fitting and screw into the $\frac{3}{4}$ " x $\frac{1}{2}$ " PVC Reducer Bushing.

10. Starting with the end closest to the pump and ending with the barb fitting, tighten all parts with a wrench.

Note: The pump is operated by pressing your foot down on the 3" rubber elbow. This system needs to be filled with water and primed before it will work properly.

It should look like this:

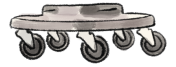




Operating the Handwashing Station



Situating & Setting Up



Make sure to choose a location for the bins that's accessible and high trafficked by many people, such as an encampment, transitional housing area or shelter, a highly frequented park, etc.

Keep in mind, you will also need to choose your location based on where freshwater can be easily accessed; and there is a designated place to dump, nearby. The bins are difficult to move when full, therefore rolling them long distances is not recommended; especially with contaminated grey water.

We recommend rolling or placing the two bins closely together, to avoid tripping on the tubing/connector which is placed between the two bins. The close proximity of the bins will also allow people to easily access the soap on the freshwater bin.

Once the bins are in their appropriate location, fill up the freshwater bin by lifting the lid and pouring the water inside. There are many ways you can fill up the bin - we recommend filling with a garden hose, but you can also use buckets to fill it as well.

We also recommend priming the handwashing station by fully pressing down on the galley pump 10-15 times, or until water comes out of the faucet. We also recommend testing the hand soap dispenser, to ensure it's working properly.



Maintenance & Cleaning



The 32 gallon bins we used for the handwashing station can offer approximately 500 hand washes, so the freshwater bin may only need to be filled every few days, depending on the amount of usage.

Regardless of how often the bins need to be refilled or emptied, they should be maintained and cleaned every day to ensure cleanliness and prevention of the spread of germs. When handling either bin, be sure to wear gloves and a mask, and remove/discard these items after use. We recommend the following to maintain and clean the bins.

Check the water levels of each bin, daily:

- Fill the freshwater bin as needed, to ensure it's filled to the top.
- Empty the grey water, daily.

Clean the outside of each bin, daily:

- As a reminder, sanitation must be performed DAILY.
- Use a bleach solution ($\frac{1}{2}$ cup of bleach per gallon of water) and paper towels (disposable rags or blue automotive paper towels are best) to wipe down the outside of the bins, the entire faucet, sink basin, and soap/hand sanitizer dispensers.
- Monitor and refill soap levels with each sanitation.

Clean the inside of each bin, daily:

Fresh sink chlorine tablets kill bacteria in water. We highly recommend using these tablets for both the freshwater and grey water bins. They will protect the freshwater and kill or lessen the amount of the bacteria in the grey water, as well as preventing buildup in the plumbing.

Always wear gloves and a mask when dealing with this product, as it can cause physical harm to skin and will cause respiratory irritation upon dust inhalation.



Handling Grey Water



Before deployment of the units, there are a few key things to consider when deciding how to remove the grey water from the bin when it is full.

When the grey water bin is full, it will be risky to move or transport without putting yourself or others at a high risk of coming into contact with dangerous water. We recommend the use of a sump pump or siphoning pump system, but there are many options when it comes to removing the grey water from the bin.

The most ideal situation would be an area that has a sewage drop on the premises or a nearby sink to pump the grey water into - both via sump pump or siphoning pump. The location of your hand washing station should be near an area you can dispose of the grey water without posing a risk to the environment or society, while also being legal.

We relieved our grey water into a man-hole covered sewage line via sump pump, hose, and generator. A simpler and more inexpensive option is using a siphon pump, which you can find at your local hardware store.

Oftentimes you need a permit from your local city government in order to legally dump in the sewer lines, however, check your specific city's regulations regarding where grey water can be disposed of.

For example, some cities like LA have grey water cleanout holes in certain areas while other cities like San Francisco allow grey water to flow in sidewalk gutters.

Make sure to always wear gloves and a mask when dumping, and to hand sanitizer or wash your hands after removing gloves when the job is done. Protect yourself and others!





Staff/Volunteer Roles & Scheduling

We recommend utilizing staff/volunteers for the maintenance and cleaning of the units, with rotation of shifts and/or days per person.

Educating staff, supporters, and volunteers who will be maintaining the bins is critical; please download our COVID-19 pamphlet to place near the unit.

Utilize volunteers and staff:

- Have a rotation of consistent volunteers or staff who maintain the units and are dedicated to long-term support/maintenance of the units. Ensure that your staff/volunteers are healthy, have strong immune systems and are committed to ensuring longevity for this support to your community.
- Set up a consistent maintenance/cleaning schedule each week so all individuals know when to maintain the bins and where they will be located. **This is a vital step to ensure proper maintenance and care of the handwashing station.**
- When situating and sanitizing the bins, staff/volunteers must wear gloves at all times and refresh gloves throughout the cleaning process. Once the used grey water has been emptied, change gloves. **These measures are strictly related to public health; keeping volunteers and those around them healthy.** Repeat for each step following cleaning, disinfecting, and refilling. We want to ensure safety at all times for our volunteers and community members who will use the sinks. Masks are now highly recommended for any outdoor tasks as well. If you are unable to wear a traditional mask, a bandana or other item of clothing is suitable to wrap around the nose and mouth.
- After the bin maintenance has taken place, gloves need to be immediately discarded. Hands must be washed and/or sanitized before volunteers leave the hand washing station site.





Resources





Resources

DIY Video Tutorial

Watch our video tutorial and see the handwashing station being built step by step.

Tools & Supplies List

Download our supplies list as an Excel spreadsheet for budgeting.

COVID-19 Pamphlet

Download our COVID-19 pamphlet to place next to your handwashing station.

Contact Information

Questions? We'll help! Contact our representative Sam at sam@lavamaex.org.





Congratulations!

You finished building your DIY handwashing station.



Questions? Contact sam@lavamaex.org

