

INFRASTRUCTURE TOOLKIT for FARMERS

A Building Guide for Cost Effective Structures Used to Clean Vegetables

Created in partnership with Global Growers and AgLanta



This work is supported by the GA Small Farm Food Safety Campaign from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Questions?

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Rachael Shields
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Our Story

Global Growers launched Bamboo Creek Farm in 2012 as an educational farm site designed to support farmers who are launching new farm businesses. We specialize in providing production, marketing, and business support for international farmers who were resettled in Atlanta as refugees, bringing vast agricultural expertise and a steep learning curve for local culture and conditions.

In 2012, Global Growers installed our first wash stations at Bamboo Creek Farm. We were familiar with basic food safety principles, but this was before the Food Safety Modernization Act (FSMA) introduced new parameters.

In 2016, Global Growers renovated our wash and pack stations by modifying existing infrastructure, designing new elements, and increasing cold storage capacity. As an educational program, we viewed the redesign as a “teachable moment,” and partner farmers were closely involved in the process.

The goals of the new design are as follows:

- 1) Install a simple, low-cost design with readily available materials that can be easily replicated,
- 2) Increase efficiency and effectiveness of postharvest workflows, and
- 3) Ensure that it is compliant with food safety principles outlined by GAP (Good Agricultural Practices) and GHP (Good Handling Practices) to meet requirements of FSMA,

The mission of Global Growers is to increase the number of food producers who create access to healthy, sustainably-grown food and also to prepare farmers to be competitive in their local marketplace. We hope that this toolkit will support new and existing farmers in strengthening their businesses and that farmers will be able to access new markets and customers as a result. We recognize that the new regulations introduced by FSMA can be complicated, but we also believe in our collective creativity to view this as an opportunity to make improvements to our farm systems.

With gratitude to all the growers,

Robin Chanin
Executive Director and Co-Founder
Global Growers



HANDISTAND

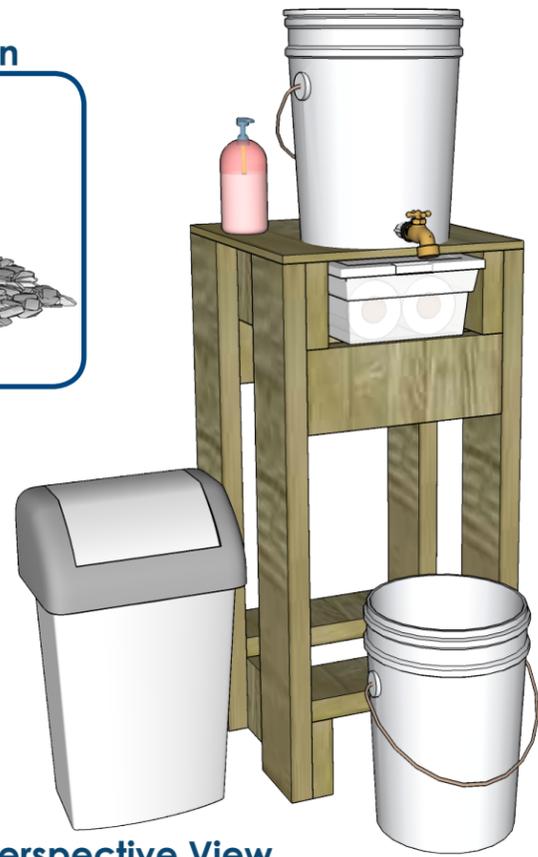


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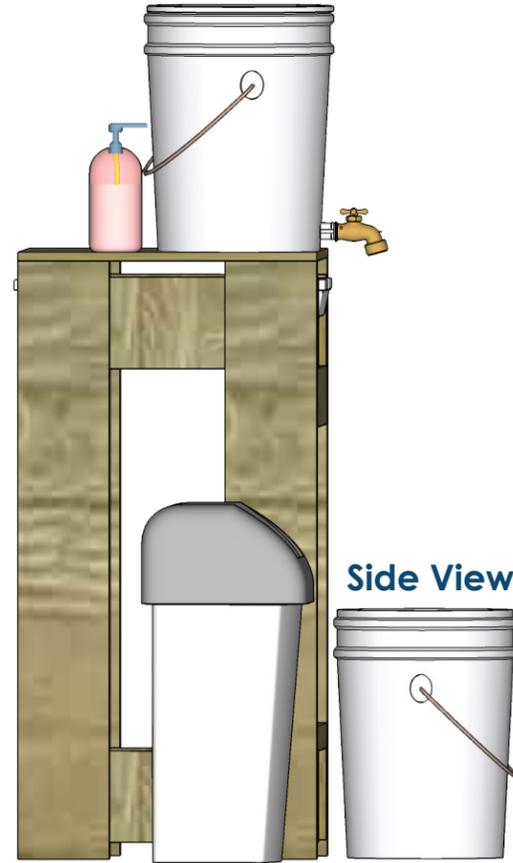
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Gravel Option

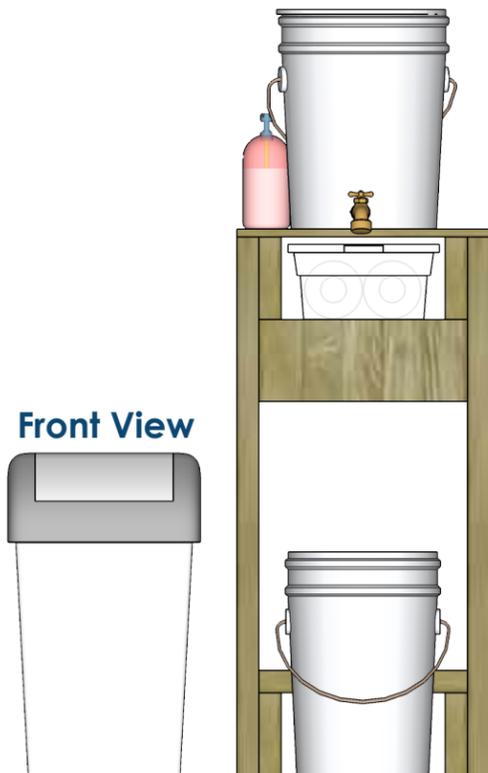


Perspective View

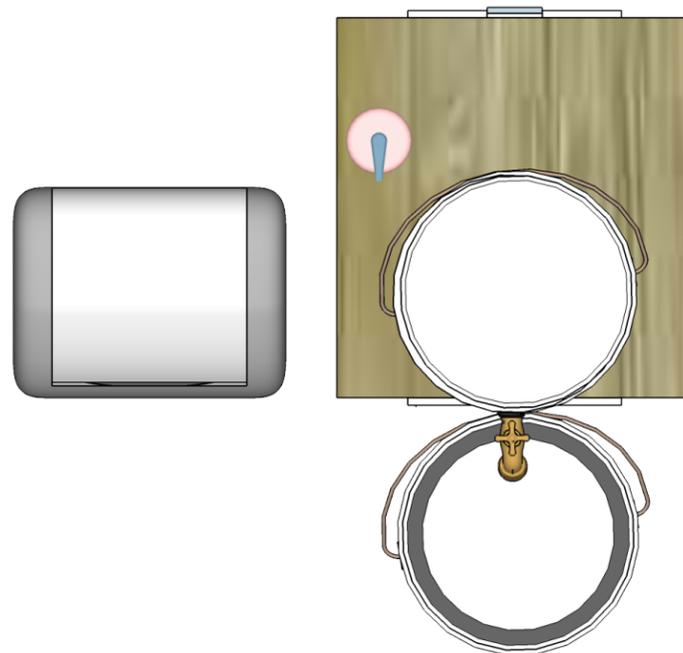


Side View

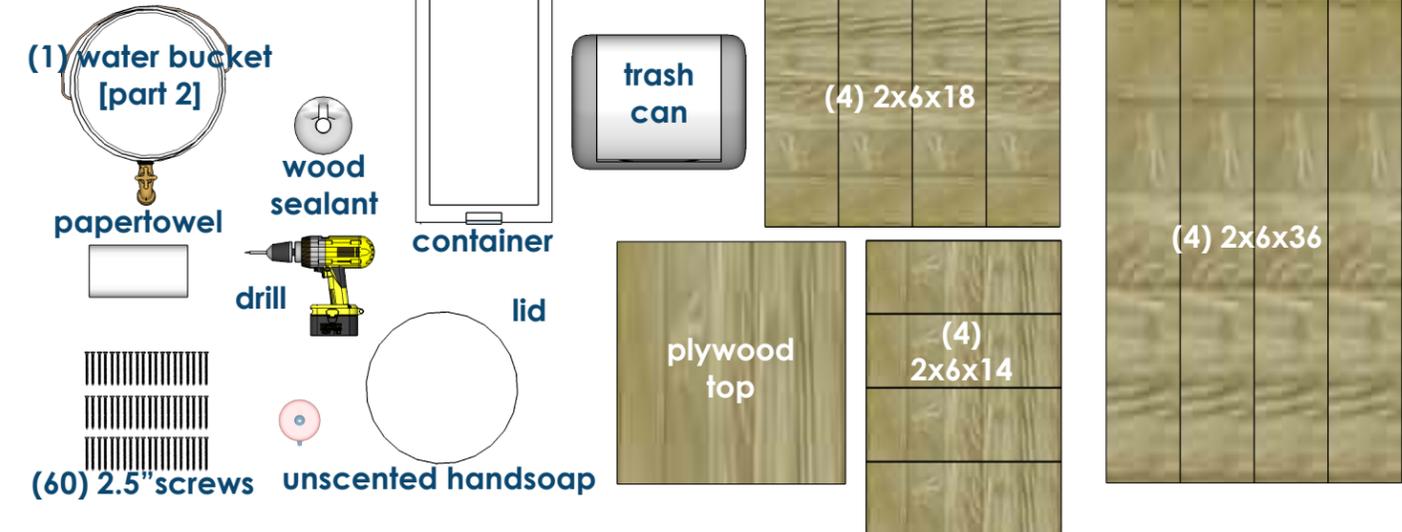
Front View



Top View



PART 1: PARTS



HAND STAND

The Hand Stand is a great amenity to disperse throughout a farm to keep hands washed. It is easily customizable so use whatever you have laying around to construct it.

STEPS:

- 1 To form a side take two 2x6x36s and screw two 2x6x18s on top. Repeat for the second side.
- 2 Attach the two sides together by screwing on two 2x6x14s for a base and two more 2x6x14s to form a shelf.
- 3 Screw on the top. Apply a food grade organic approved sealant.
- 4 Add potable water to the modified bucket and put the lid on. Place on top of the stand. Add a trash can with a lid and some weight. Add a soap dispenser with unscented hand soap. Finally, add a container with single-use paper towels.
- 5 Add a gravel base or a second bucket to catch the water. Don't allow water to pool under the stand.

*See page 2 for part 2: water bucket construction.

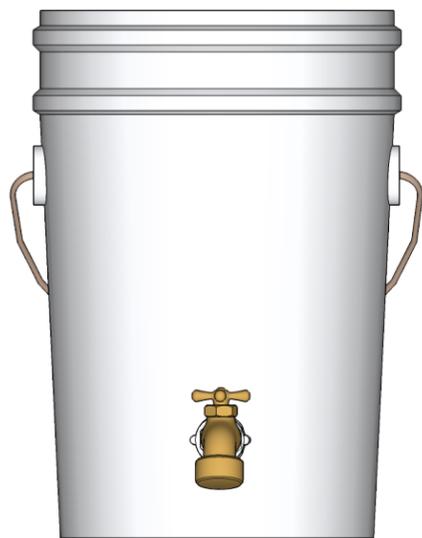
*Check with your 'Organic Certified' for guidelines on types of wood, sealants, etc.



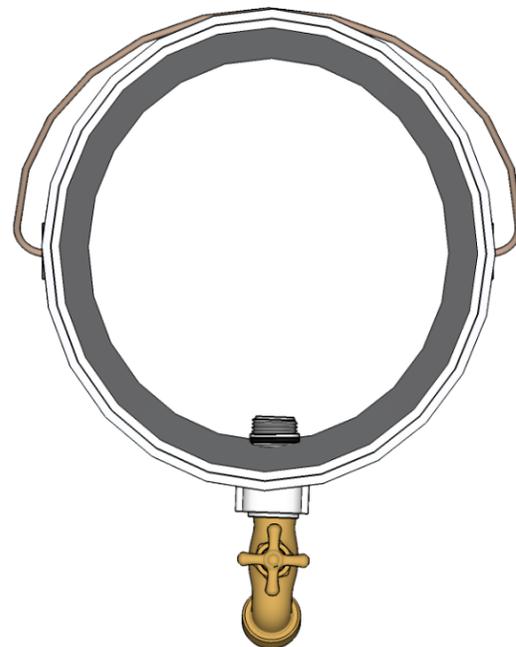
Perspective View



Side View



Front View



Top View

PART 2: PARTS



5 gallon bucket



1/2" hose bibb



1"x1/2" pvc bushing



hose washer



1" pvc hose adapter



drill



PTFE thread seal



1" steel locknut



1-1/4" drill bit



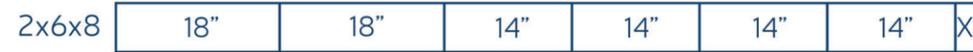
pvc cement

WATER BUCKET

STEPS:

- 1 Drill a hole in a 5 gallon bucket 1-1/2" from the bottom. Use a 1-1/4" drill bit for the job.
- 2 Apply PTFE thread tape to the 1/2" hose bibb threads.
- 3 Twist the 1" x 1/2" Schedule 40 PVC Bushing (Spigot x Thread) on. Apply PVC cement to attach the adapter to the bushing.
- 4 Cement on the 1" Schedule 40 adapter (slip x thread).
- 5 Screw the dried piece into the bucket. Place the hose washer and then the 1" rigid steel locknut on the inside to secure.

LUMBER CUTS



SHOPPING LIST

2	The Home Depot 5 Gal. Homer Bucket	\$3.25	\$6.50
1	5 Gal. Reusable Bucket Lid	\$1.68	\$1.68
1	Everbilt 1/2 in. Brass 1/4 Turn MPT x MHT Hose Bibb	\$9.31	\$9.31
1	1 in. Rigid Conduit Locknut (2-Pack)	\$0.81	\$0.81
1	1 in. Schedule 40 PVC Male Adapter	\$0.84	\$0.84
1	Hose Washer and O-Ring Combo Pack	\$1.19	\$1.19
1	1 in. x 1/2 in. PVC Sch. 40 SPG x S Reducer Bushing	\$0.97	\$0.97
1	8 oz. PVC Medium Gray Cement	\$5.29	\$5.29
1	1/2 in. x 260 in. PTFE Thread Seal Tape	\$0.86	\$0.86
1	Daredevil 1-1/4 in. x 6 in. Spade Bit	\$5.97	\$5.97
1	11.25 Gal. White Trash Can	\$7.97	\$7.97
3	2 in. x 6 in. x 8 ft. #2 and Better Kiln-Dried Heat Treated Spruce-Pine-Fir Lumber	\$7.50	\$22.50
1	#9 2-1/2 in. Phillips-Square Flat-Head Wood Screws (75-Pack)	\$4.69	\$4.69
1	Bounty Basic 1-Ply White Paper Towels	\$1.00	\$1.00
1	Nature Clean 16.8 oz. Unscented Liquid Hand Soap	\$5.24	\$5.24
1	Sterlite 6 Qt. Storage Box in White and Clear Plastic	\$0.98	\$0.98
1	Sanded Plywood (Common: 1/4 in. x 2 ft. x 2 ft.; Actual: 0.224 in. x 23.75 in. x 23.75 in.)	\$5.78	\$5.78
1	Howard 12 oz. Cutting Board Oil	\$8.98	\$8.98
		SUBTOTAL	\$90.56
		SALES TAX	\$6.12
		TOTAL	\$96.68

MESH WASH TABLE

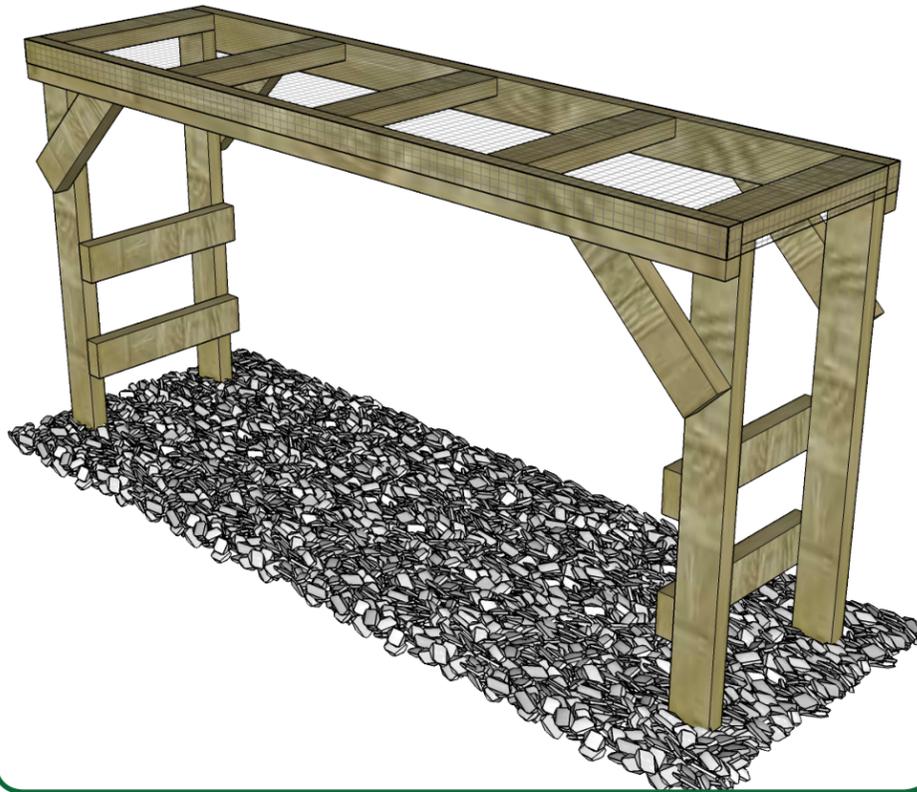


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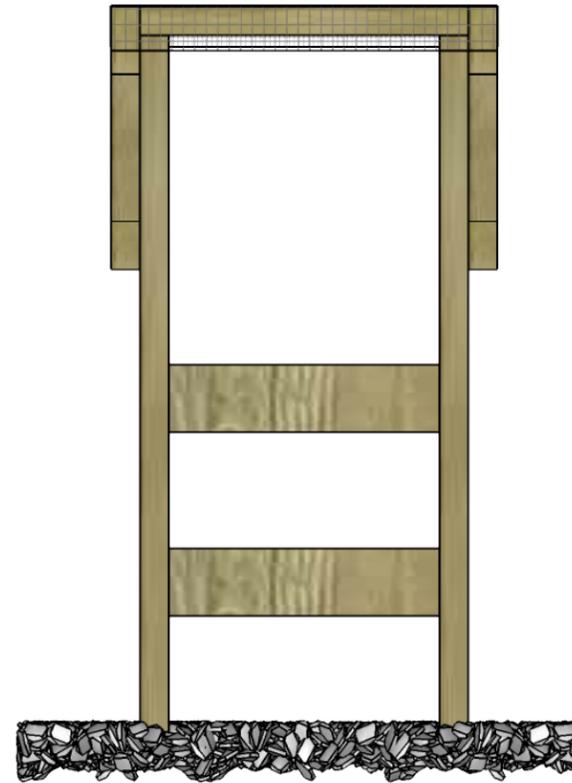
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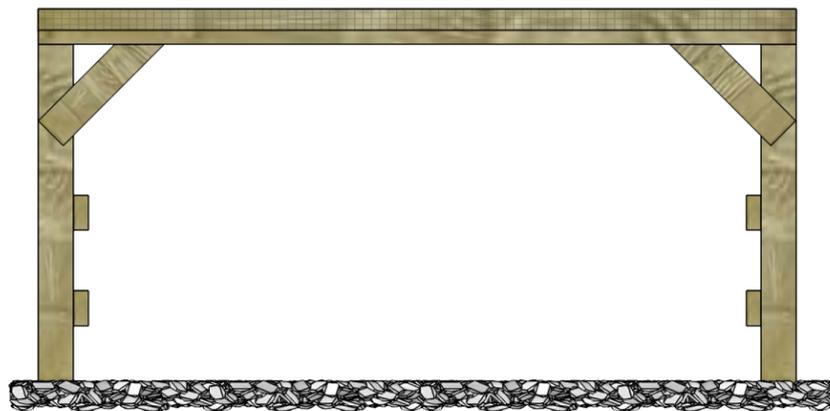
Perspective View



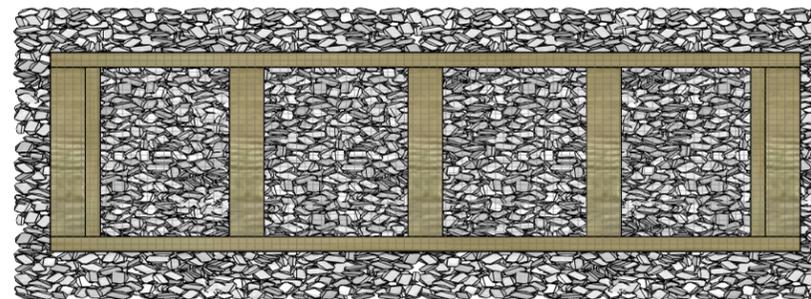
Side View



Front View



Top View



MESH WASH TABLE

Building a Mesh Wash Table is simple and provides a great place for washing crops. The plastic mesh doesn't rust and lasts a long time. Hose off crops and the water goes right through the table. It helps to organize clean from dirty crops and adding more tables makes expanding simple.

LUMBER CUTS

2x4x8

	72"		14"	\	X
--	-----	--	-----	---	---

2x4x8

	72"		14"	\	X
--	-----	--	-----	---	---

2x4x8

36"		36"		17"	\	X
-----	--	-----	--	-----	---	---

2x4x8

36"		36"		17"	\	X
-----	--	-----	--	-----	---	---

2x4x8

17"		17"		17"		17"		14"	\	X
-----	--	-----	--	-----	--	-----	--	-----	---	---

2x4x8

17"		17"		17"		17"		14"	\	X
-----	--	-----	--	-----	--	-----	--	-----	---	---

STEPS:

- 1** Lay out the two 2x4x72s and evenly arrange 5 of the 2x4x17s. Screw together to form the top.
- 2** Lay out two 2x4x36s and screw on two 2x4x17s to make a leg. Repeat for the other side.
- 3** Screw the legs to the table top.
- 4** Screw on 45 degree bracing pieces using 3" screws when screwing to the top.
- 5** Staple on the cut 76x24 plastic mesh to the top.
- 6** For food safety purposes lay down a bed of gravel to eliminate standing water. Other options include digging a trench or a concrete pad.

gravel



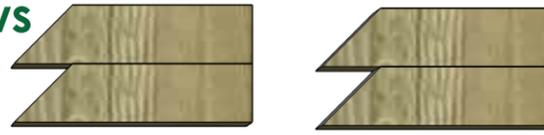
(8) 3"
screws



(52) 2.5"
screws



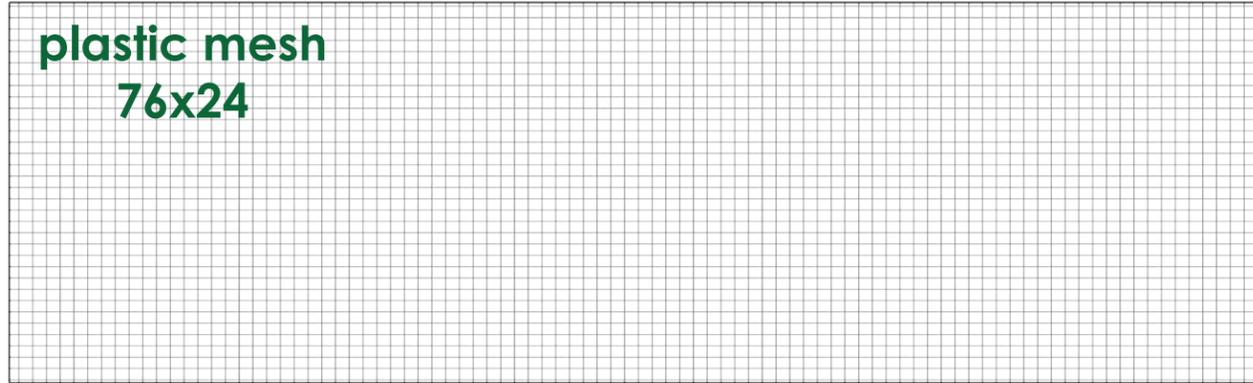
(4) 2x4x14



(2) 2x4x72



plastic mesh
76x24

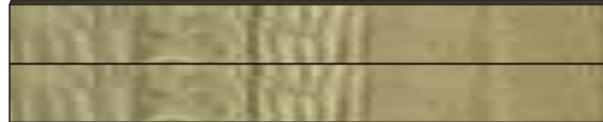


(9)
2x4x17

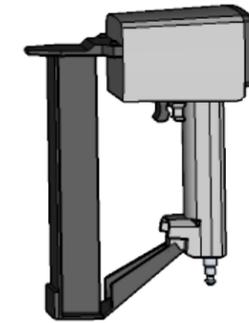


PARTS

(4) 2x4x36



TOOLS



staple gun



drill

SHOPPING LIST

QTY	DESCRIPTION	UNIT PRICE	TOTAL
6	2 in. x 4 in. x 96 in. Premium Kiln-Dried Whitewood Stud	\$3.61	\$21.66
3	Vigoro 0.5 cu. ft. All-Purpose Decorative Stone	\$3.88	\$11.64
1	Tenax 3 ft. x 15 ft. Plastic Black Hardware Net	\$31.98	\$31.98
1	#9 3 in. Phillips-Square Flat-Head Wood Screws (25-Pack)	\$1.99	\$1.99
1	#9 2-1/2 in. Phillips-Square Flat-Head Wood Screws (75-Pack)	\$4.69	\$4.69
		SUBTOTAL	\$71.96
		SALES TAX	\$5.04
		TOTAL	\$77.00

WASH BARREL

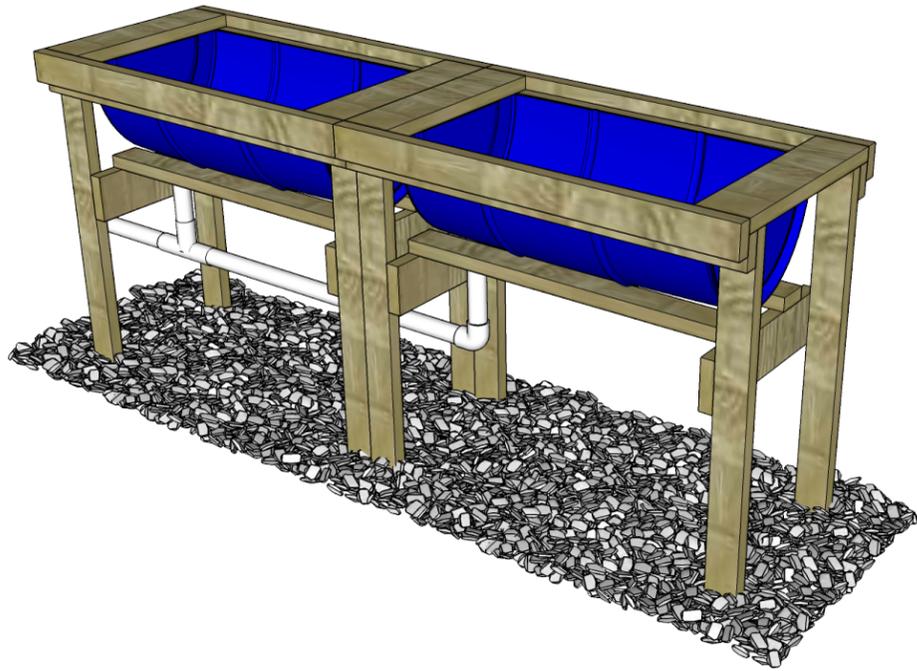


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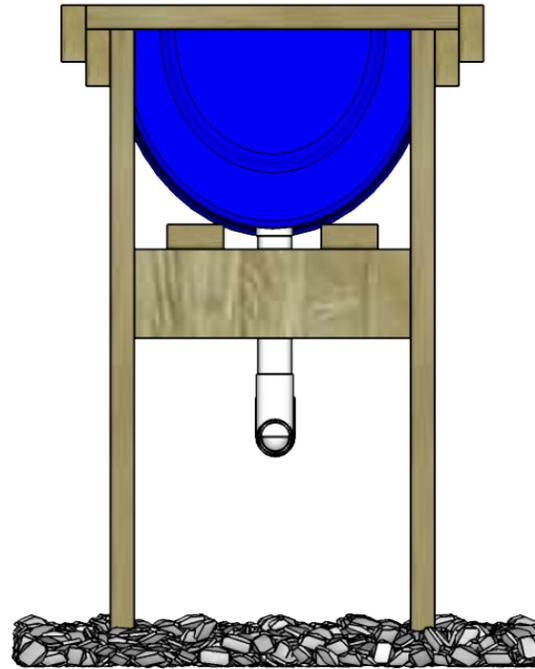
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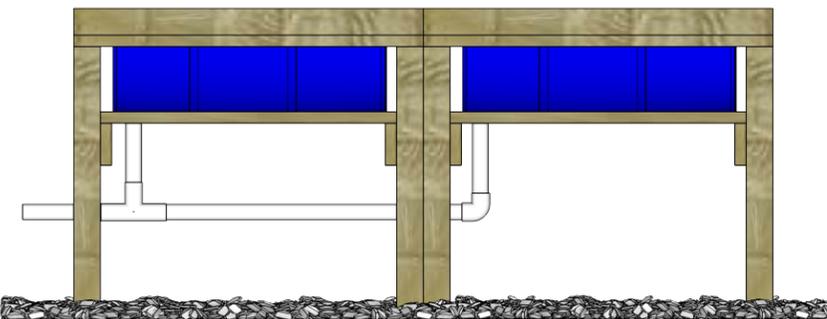
Perspective View



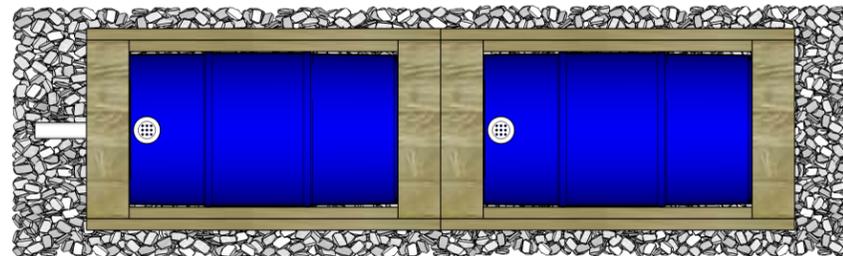
Side View



Front View



Top View



WASH BARREL

This is a great alternative to buying an expensive sink that still passes a GAP audit. Imagery shows how two sinks would connect, but take note the parts and steps are for the construction of only one sink.

LUMBER CUTS

2x4x8	46"	46"	
-------	-----	-----	--

2x4x8	46"	46"	
-------	-----	-----	--

2x4x8	39"	39"	X
-------	-----	-----	---

2x4x8	39"	39"	X
-------	-----	-----	---

2x4x8	39"	39"	X
-------	-----	-----	---

2x6x8	20"	20"	23"	23"	X
-------	-----	-----	-----	-----	---

STEPS:

- 1 To form the top, take two of the 2x4x46s and screw on two 2x6x23s. Screw on two more 2x4x46s to reinforce the sides.
- 2 To make a leg screw together two 2x4x39s with a 2x6x20. Repeat for the other leg.
- 3 Screw the legs to the top.
- 4 Screw on two 2x4x39s to form a base for the barrel.
- 5 Cut the barrel in half with a jigsaw. Cut a hole for the PVC drain. Start it with a drill and finish with a jigsaw.
- 6 Screw the barrel into the framework.
- 7 Place the drain and cement on a 8" PVC to clear the framework. Attach enough PVC piping for water to clear the area. Add drain cover.
- 8 If two sinks are desired repeat the steps and screw them together with a leftover piece of wood. Add a gravel base so water doesn't pool.

PARTS



drain cover



2" pvc drain

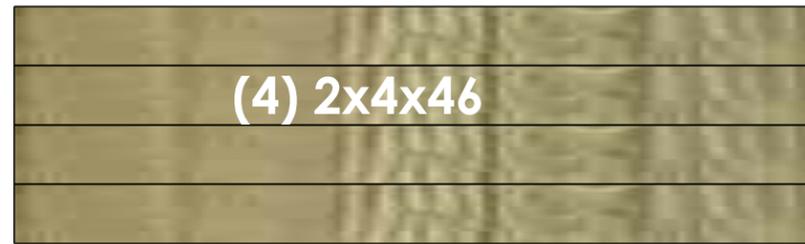
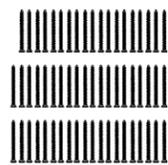


pvc cement

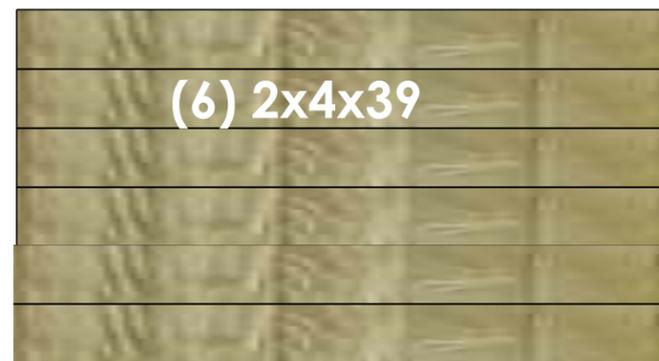


2"x 8" pvc

(62) screws



(4) 2x4x46



(6) 2x4x39



gravel



(2) 2x6x23

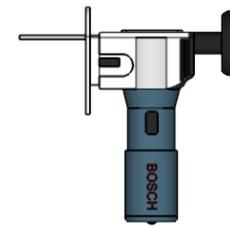


(2) 2x6x20



55 Gallon Barrel

TOOLS



jigsaw



drill

2nd sink attachment



pvc connection



SHOPPING LIST

1	Sioux Chief 2 in. Snap-in Drain	\$2.69	\$2.69
1	Danco 5 in. Flat Suction Sink Stopper in White	\$2.46	\$2.46
1	8 oz. PVC Medium Gray Cement	\$5.29	\$5.29
1	#9 2-1/2 in. Phillips-Square Flat-Head Wood Screws (75-Pack)	\$4.69	\$4.69
1	2 in. x 6 in. x 8 ft. #2 and Better Kiln-Dried Heat Treated Spruce-Pine-Fir Lumber	\$7.50	\$7.50
5	2 in. x 4 in. x 96 in. Premium Kiln-Dried Whitewood Stud	\$3.61	\$18.05
1	2 in. x 10 ft. 280-PSI Schedule 40 PVC DWV Plain End Pipe	\$8.44	\$8.44
3	Vigoro 0.5 cu. ft. All-Purpose Decorative Stone	\$3.88	\$11.64
1	55 Gal. Blue Industrial Plastic Drum	\$69.99	\$69.99
		SUBTOTAL	\$130.75
		SALES TAX	\$9.07
		TOTAL	\$139.82

Acknowledgements

The toolkit was led by the creativity and building expertise of Todd Eittreim, Global Growers' Farm Operations Manager, who led the design and build.

Beth Oleson and Brenden St. John of the Georgia Fruit & Vegetable Growers Association and Produce Food Safety Services provided guidance on food safety principles.

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The renderings were completed in partnership with the City of Atlanta's Office of Resiliency and a fellowship with the University of Georgia.