Improving Handwashing Stations

Introduction

Handwashing has been shown to be one of the most effective ways to reduce the risk of transmission of human pathogens between people. But, sometimes we are inconveniently far from the closest wash room and sink. Hand washing stations provide a portable means of washing hands on farms, at farmers' markets, and at recreational sites.

This guide was motivated by a desire to improve current handwashing station practice with a focus on minimizing or even removing all contact between the user's hands and surfaces of the station.

The key design features of a handwashing station include:

- **Clean supply water** that is safe and of adequate sanitary quality.
- **Hands free operation of water** which allows thorough washing of hands with full attention and also prevents cross contamination via faucet handle and other surfaces.
- **Gray water collection for controlled disposal** to prevent direct discharge of used water on the ground in order to minimize cross contamination and pollution.
- **Hands free dispensing of soap** to avoid cross contamination.
- **Touchless or low contact paper towel dispenser** to prevent cross contamination.
- **Paper towel receptacle** with a liner and a closing lid to ensure waste is contained.
- **Sturdy construction** leading to durable use over a long lifetime. Consider weather resistant materials or paint to prolong the life of the unit.
- **Stable design** that won't tip over and which keeps parts intact.
- **Portable** so that it can be easily moved to where it is needed.
- **Easy to maintain** so that it remains useful and pleasant to use.
- **Cleanable** so that the handwashing station itself can be kept in hygienic condition. Surfaces should be smooth and cleanable and materials should be compatible with water and soap.

Stations destined for farmers market and PYO may also want to consider:

- **Family friendly** design (e.g. height or stool) that ensures a child could use the station with little or no assistance.
- **ADA compliant** and otherwise designed to allow improved access and use by those with physical disabilities.

The CDC's "Five Steps to Wash Your Hands the Right Way"

Washing your hands is easy, and it's one of the most effective ways to prevent the spread of germs. Clean hands can stop germs from spreading from one person to another and throughout an entire community—from your home and workplace to childcare facilities and hospitals.

Follow these five steps every time.

1. **Wet** your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. **Lather** your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
3. **Scrub** your hands for **at least 20 seconds**. Need a timer? Hum the "Happy Birthday" song from beginning to end twice.
4. **Rinse** your hands well under clean, running water.
5. **Dry** your hands using a clean towel or air dry them.

From https://www.cdc.gov/handwashing/when-how-handwashing.html

Putting it into Practice

The following pages provide a general approach to a touchless handwashing station and two specific build plans. The build plans include (1) a DIY framed stand and (2) a purchased stand.

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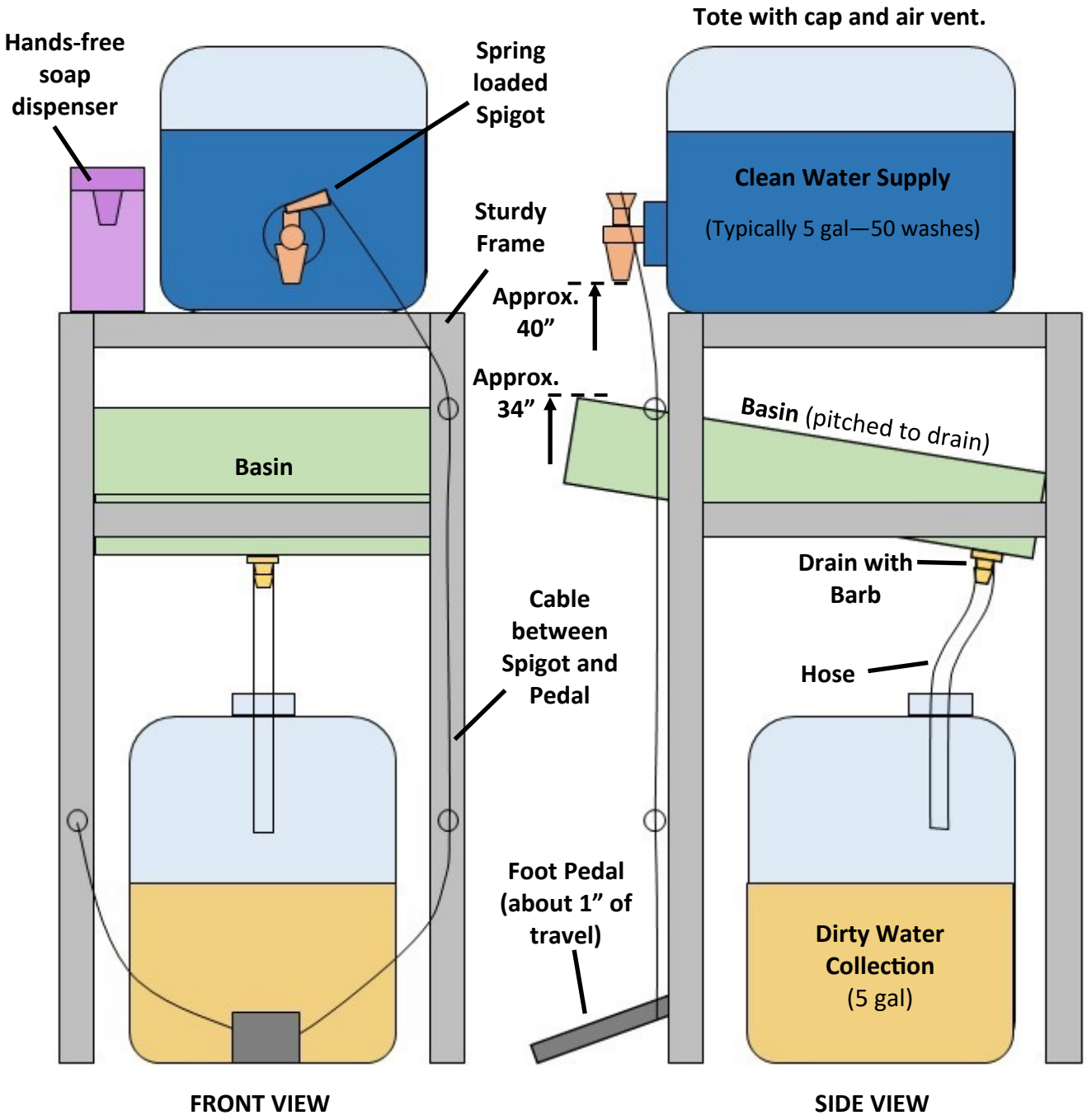
The Basic Parts and Pieces



Not shown—Paper towel dispenser and trash can. Extra totes of supply water can also be helpful to increase the number of washes between refills. Detailed parts lists for two sample assemblies follow.

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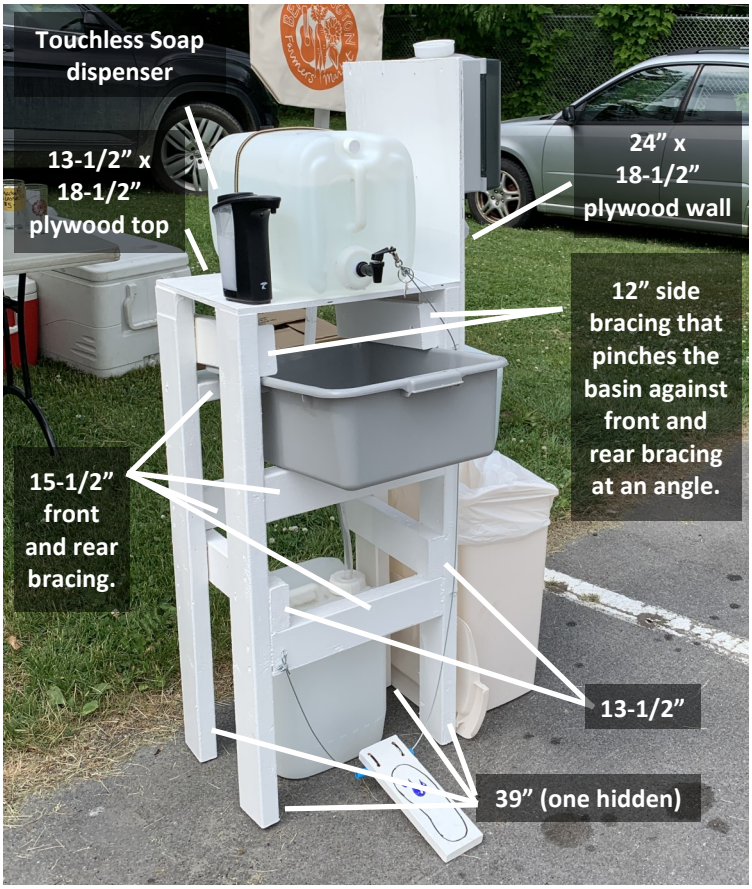

The high flow spring loaded toggle (HFSLT) valve used for the spigot has 3/4" UNF threads (straight) and the tote cap has 3/4" FPT (tapered). A 3/4" FPT to 1/2" FPT to 3/4 " MPT adapter works well to connect them with a layer of Teflon tape on the 3/4" MPT side of the adapter and 2 layers on the 3/4" UNF threads of the spigot. Also note that the tote cap has a 3/4" knockout that needs to be drilled for water to flow. We used a 3/16" hole to restrict water flow.

The foot pedal is connected to the spigot using a 2" snap ring. This allows for easy disassembly to change the water tote or to move the unit. A hole needs to be drilled near the far end of the toggle handle about halfway across the short side. The hole is 1/4", but should be piloted with a smaller bit to prevent cracking and ensure proper location of the hole.

The flush mount basin drain has a hose barb fitting that makes it easy to connect to a collection tote with a vinyl hose. The hose is passed through the tote cap where the 3/4" knockout has been removed. Label the totes "clean" and "dirty" to help ensure they are inly used for one purpose.

Bill of Materials

Items without a hyperlink are generally available at a local hardware store.

Qty	Item	Est. Cost
3	2"x4"x 8 ft dimensional lumber	$20
	Cut List: [39"] [15-1/2] [15-1/2] [13-1/2] [12] [39"] [15-1/2] [15-1/2] [13-1/2] [12] [39"] [39] [12] [5]	
1	13-1/2" x 18-1/2" 3/8" or 1/2" Plywood	$5
1	24" x 18-1/2" 3/8" or 1/2" Plywood	$5
2	5 gal carboy tote (supply and gray water) with 70 mm cap (3/4" NPT thread, knockout)	$22
1	Bus tray (basin)	$3
1	Basin drain fitting (flush mount)	$4
1	2 ft 5/8" / 3/4" Vinyl Hose / Tubing	$2
1	3/4" UNF HFSLT Valve (Spigot)	$1
1	3/4" MPT to 1/2" FPT adapter	$1
1	5 ft 3/32" 7x7 vinyl coated steel cable	$4
2	1/8" Galvanized Wire rope clip	$2
1	6" length of 1/2" PEX or PVC (pedal)	$1
1	Spigot cable latch—2" CRD snap ring	$2
1	Trash can (foot operated with lid)	$20
1	Paper towel dispenser	$16
1	Hands free soap dispenser	$35
Misc	Fasteners (deck screws)	$2
Misc	Teflon tape	$1
Total		**$146**

Commercial soap dispensers were hard to find at the time of this build. This is a 400 mL residential, battery powered touchless soap dispenser. It's a little slow and you have to get close to the nozzle, but it works.

Basin height is important for comfortable use and in order to meet ADA accessibility specifications. With wheels installed the middle shelf should be 27" above the ground and handle installed directly above that. This results in a basin top height of 34". The top and bottom shelf should be installed all the way up and down respectively.

A rubber strap secures the water jug and "jack chain" is used to hang the back of the basin to pitch the water toward the drain.

The foot pedal is assembled by creating a loop in the cable. The left side is attached to the frame and the right side is threaded up to the spigot. The cable runs between the wires on the middle shelf or through screw eyes / bolts.

Bill of Materials

Items without a hyperlink are generally available at a local hardware store.

Qty	Item	Est. Cost
1	Wire Rack Cart	$51
1	5 gallon carboy tote (supply water)	$12
1	Bucket "Lite latch" Lid	$4
1	5 gallon "Lite Latch" Bucket for Drain	$9
1	6 quart Oil drain pan (basin)	$4
1	Basin drain fitting (flush mount)	$4
1	1 ft 1/2"ID, 3/4" OD Vinyl Hose/Tubing	$1
1	3/4" UNF HFSLT Valve (Spigot)	$5
1	3/4" MPT to 1/2" FPT adapter	$1
1	5 ft 3/16" vinyl coated steel cable	$4
2	1/8" Galvanized Wire rope clip	$2
1	6" length of 1/2" PEX or PVC (pedal)	$1
1	Spigot cable latch—2" CRD snap spring	$2
1	Trash can (foot operated with lid)	$20
1	Paper towel dispenser	$16
1	Hands free soap dispenser	$35
2	¼"x3" Eyebolts and nuts	$2
2	1/4" Nuts & Washers	$2
1	12" Jack chain	$1
1	Teflon tape .	$1
1	35" Rubber Strap	$4
MISC	3"x3/4"x11" Board for Foot pedal, Zip ties...	$5
Total		**$186**