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Isolated Water Circulation and Filtration System

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PROBLEM/OPPORTUNITY

Problem

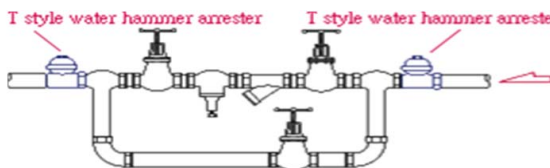
One big issue we are addressing is the large amount of greywater produced by average households around the country. Still, the main problem is that, in areas affected by drought such as California, people have little available clean water, and this system will greatly benefit these people directly. The Isolated water system uses a filtration combined of organic materials, soaps, dirt, foods and sink to filter out the grey used water. Since the water system is not connected with the local water system if there were a natural disaster the owner would have free access to a water source while the city water would be damaged and inaccessible.

(Focus on opportunity)

Our solution is to reduce grey water output in people's homes. The isolated water system would also act as a storage facility. This can be done by reusing water in your home through circulation, filtration, and chlorination processes. We thought that by introducing the isolated circulation system many people would benefit from it, especially the everyday citizen. These processes include, having two storage tanks, one with a smaller capacity for greywater (to prevent overflow), and another for holding the fully processed clean water. Between the two tanks, there is a filtration system composed of layers, from top to bottom, of sand, charcoal and gravel, with fine mesh filters on either end to hold things together while keeping larger contaminants from getting into tough to clean places. Water will be filtered simply through the force of gravity. After the basic filtration, chlorination will take place, where 5 teaspoons of chlorine powder per litre of water will be introduced. Our estimation for a suitable clean water tank is 5000 litres and to completely ensure the safety of the water about 38 millilitres of chlorine concentrate would be required.

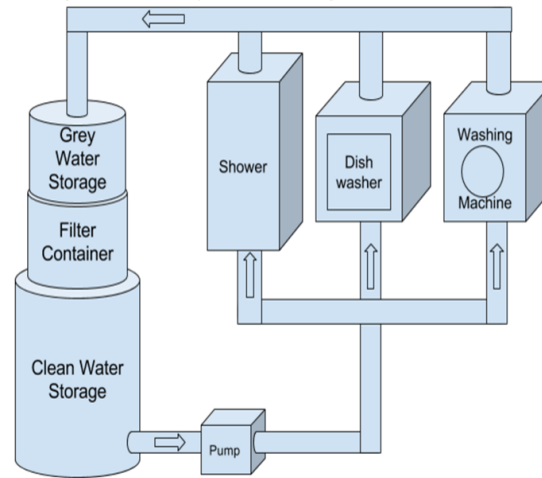
As an extra benefit of an isolated system, it is separate from other mass water supplies, protecting it from contaminants that could get in city/community water supplies. At the same time it can maintain a supply of freshwater during a disaster.

Figure 1: Connecting valves/taps



Source: www.ibyoutlet.com

Diagram of the system/ Design.



KEY OBSERVATIONS

- Water from the dishwasher, washing machine and shower are the best start for the isolating filtration tank.
- The filter used in this system is more efficient and cheaper compared to other filters.
- The amount of chlorine to be used to kill germs is determined by the capacity of the tank.
- It is easy to operate since there are taps that are connected in between the tanks and the entire system.
- Need to be careful on the amount of water getting into both tanks.
- Using a certain metal over another material such as plastic to get a more high quality product and safer use for certain environments.
- Contribute to being green and or going green.
- Saves homeowners money.
- Functions as well as a water storage.
- In a case of a natural disaster it is insured to contain fresh water during time of emergencies for household members.
- Can also connect with the heater in case there is a need of hot water.

RESULTS

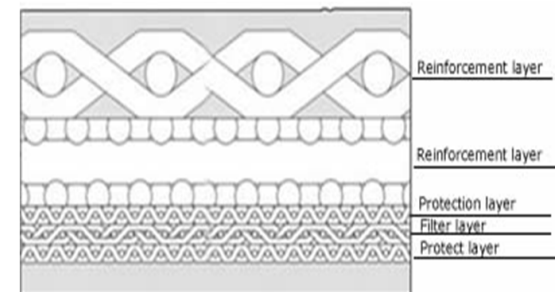
We compared our device with others and this is what we noticed:

Types Of Filters	Pros	Cons
Our Filter	<ul style="list-style-type: none"> • Inexpensive to purchase • Easy to maintain 	<ul style="list-style-type: none"> • Consumes time • Ignores some appliances
Pitcher/Large dispenser	<ul style="list-style-type: none"> • Available in various sizes • Inexpensive to purchase 	<ul style="list-style-type: none"> • Expensive to maintain • Consumes Time
Faucet Mounted	<ul style="list-style-type: none"> • Easy to install • Relatively inexpensive 	<ul style="list-style-type: none"> • Does not work in all faucet styles
Glass Beads	<ul style="list-style-type: none"> • More effective gravel substitute 	<ul style="list-style-type: none"> • Possibly higher cost
Solar-Powered Ozone Generator	<ul style="list-style-type: none"> • Highly effective at killing bacteria • Low running cost compared to chlorine 	<ul style="list-style-type: none"> • High initial cost • Complex/ more potential for failure

CONCLUSIONS

Why this system is ideal: This system is efficient for use. We believe that for those who will use this system will benefit especially during disaster. The isolation circulation of water system is one of the cheapest method to use for water storage that will save the amount of money(taxes) that people are paying. We believe we can make a change concerning our water utilization.

Figure 3: Example of how the filter will look like.



Source: www.sinteredfilter.org