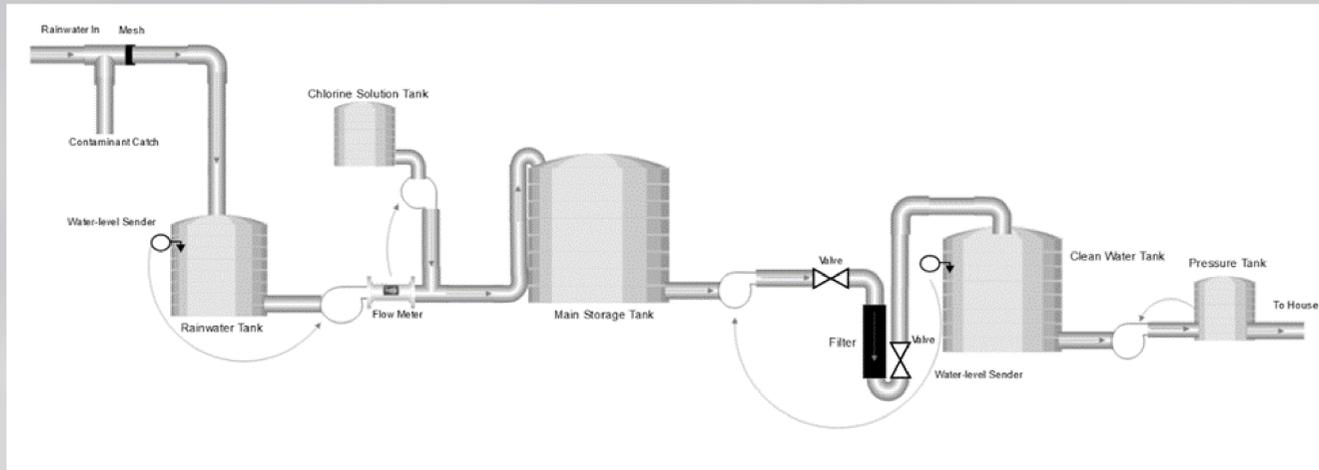


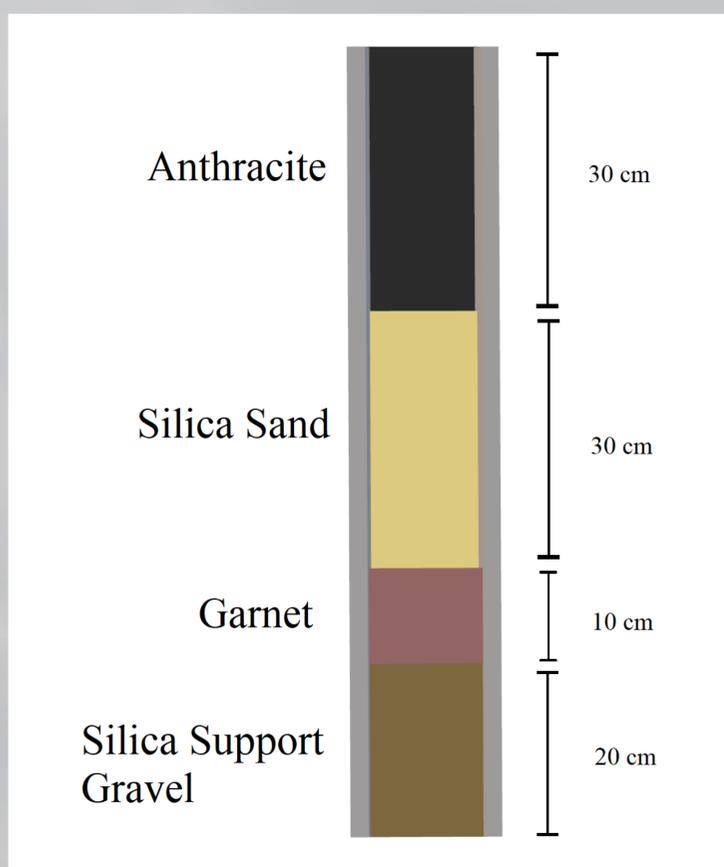
# HYDROCLEAN WATER SOLUTIONS

CARROLL COLLEGE ASCE



## OVERALL SYSTEM DESIGN

The overall system design as seen above works as follows. Water flows through the gutters across the contaminant catch (top left). Most of the large particles will drop out at this point. Water then flows into the rainwater tank before it is pumped out into the main storage tank (middle) as it is being diluted with chlorine from the chlorine solution tank. From the main storage tank it is then pumped through the granular media filter into the clean water tank (right). From the clean water tank it will be pumped into a pressurized tank for household purposes.



## FILTER DESIGN

The granular media filter is designed to be easily removable from the main system for maintenance via quick disconnect PVC fittings on either side of the filter. The filter itself consists of 4 inch PVC pipe with #40 wire mesh on either side of the filter material which should only let 1.5% to 5% of our smallest graded material through. The material itself includes silica support gravel, garnet filter sand, silica sand, and anthracite (a high grade coal). The filter material ranges from the smallest particle sizes in our chosen garnet of 0.45 mm to the largest particle size in the silica support gravel of about 1 cm.

## COST

The overall cost for the system comes out to \$13,581 which 66% comes from tank costs. This comes from the assumption that the users will not be filling the tank with water from sources other than rain. This cost does not include continual operation cost.

## MAINTENANCE

The system should require a small amount of continual maintenance including:

- Releasing the contaminant catch monthly
- Cleaning gutter guards when needed
- Backwashing the filter monthly
- Refilling the chlorine solution tank bi-annually