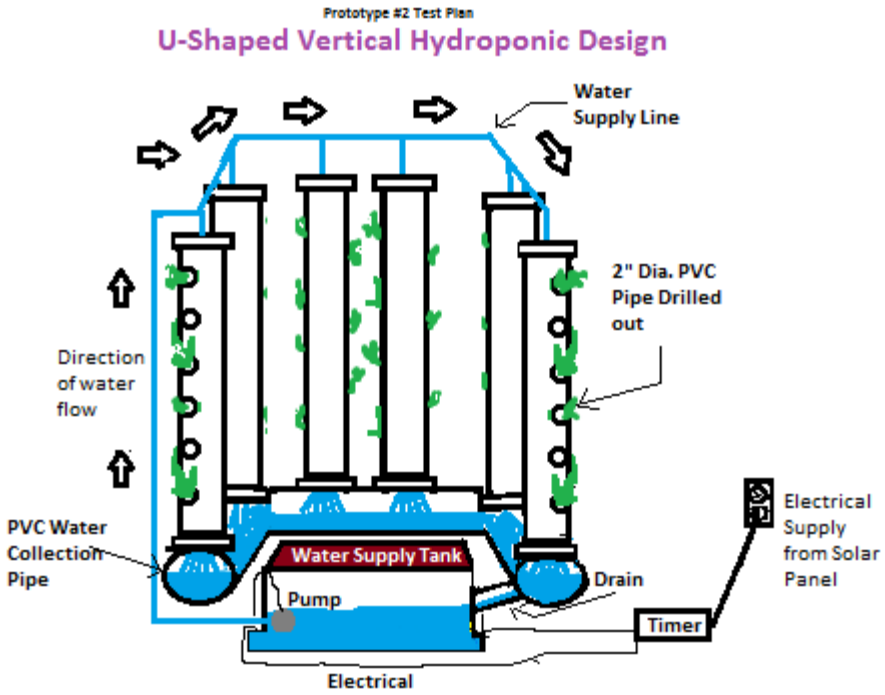
Project Deliverable G: Prototype II and Customer Feedback
GNG 1103 – Engineering Design
Faculty of Engineering – University of Ottawa



The purpose of prototype II is to build on what was learnt from our first prototype and to further prove our concept by expanding our system from the original 1 tower to 6 towers (which will be the final amount needed for the final product). For this phase of our testing we want to ensure that adequate water flow is received to the top of all 6 towers at approximately 6 ft up from the pump and that we are still achieving the same GPM to all towers as received in the first prototype.

Criteria to be met for prototype II.

- Build 6 PVC towers and attach to the PVC return drain.
- Place pump in reservoir and pump water up 6 ft through tubing and out of 6 tee connections, which will supply water to each tower, then measure water flow out of each tee.
- Test the manual timer to ensure that it will start and stop the pump as needed.
- Determine structural integrity of the PVC piping towers once assembled and define what is needed for the frame design.
- Ensure that the measurements of our final system will fit in both greenhouses and will be modular in design.

Testing done:

- Gallons per hour = 396
- Water pump was able to get the water up to the 6 ft mark once again.
- Good water pressure throughout 6 different tubes.
- Manual timer was able to turn on and off the pump at desired times.
- Assessed PVC tower structure and determined that we will need to build a bottom frame to angle the water back into the top of the water reservoir approx. 11 inches from the ground and that added support at the top will be needed to hold all towers in place and support the weight of the plants.

Customer Feedback:

- The customer feedback on the design and prototype was mostly positive. One concern from the customer was leaking of the system out the holes in the vertical PVC towers. This will be an item to be tested during the next prototype to ensure that the foam inserts used for holding the plants, will create the desired seal needed to prevent leakage in the system.
- Heating was another concern for the customer, in which we will look at the possibility of implementing a thermal battery into our design along with a water heater to control temperature.
- One proposed idea that we presented to the client was building a manual generator using a bicycle to convert mechanical energy into electrical energy. This would be created using a bicycle to manually turn a motor or alternator to generate power and store the energy in a battery. This idea was well liked by the client.

Photos