GNG 1103D

Deliverable E:Project Schedule and Cost

Hydroponics I -- Joseph, Gabe, Alana, Weeda, Lukas

Introduction

This deliverable aims to create a plan for the development of the design chosen in deliverable D. It is important to have such a plan as it will focus the work required to develop the chosen model without getting lost in needless hypotheses and testing. Furthermore, cost estimates for both the prototypes and the final model will ensure that the team does not overspend on any one part of the design process.

This deliverable builds off of the model chosen and refined in previous deliverables:

Specifications	Joe's Design 1
Cost ($CAD)	≈ $126.90
Weight (lbs)	≈ 28 lbs
Size (m)	1.5 x 1.2 x 0.25
Reservoir Size (liters)	≈ 18 L
Plant Slots	48
Style	NFT
Modularity	Portable

Figure 1: Estimations of Design Properties from Deliverable D

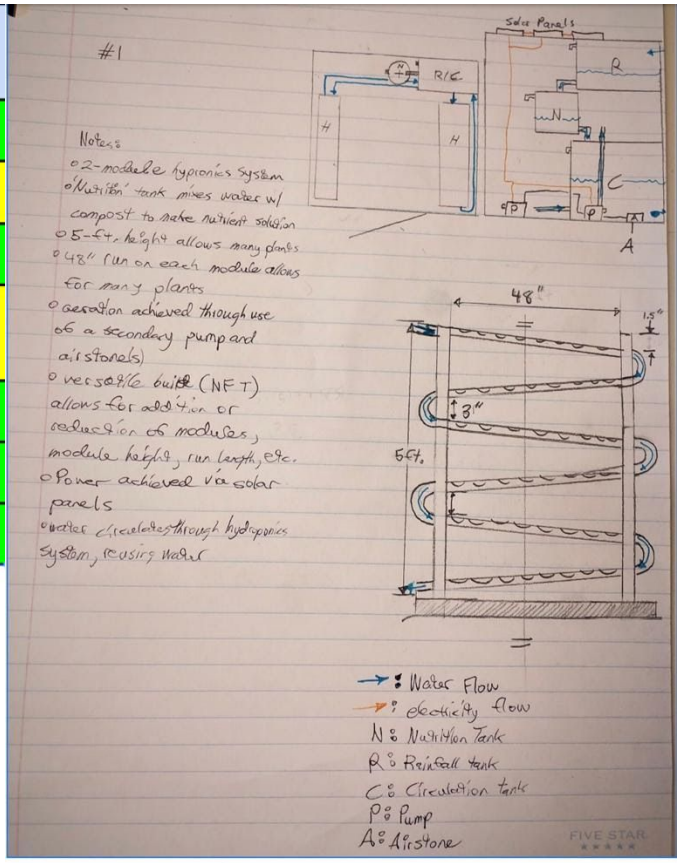


Figure 2: Design Outline from Deliverable D

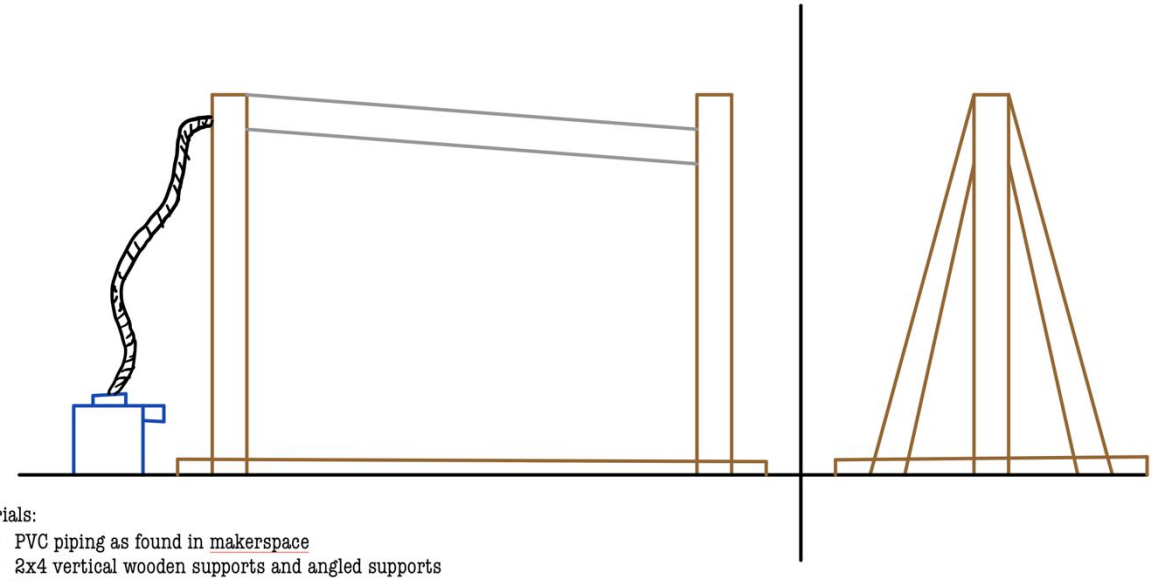
This document will give plans for the design of each prototype, as well as cost estimations and methodology for each aspect of the testing process. It will provide schedules for each part of the design process, as well as a list of criteria for the final design.

Prototype #1

Intro

This first build should be designed to some general parameters for the final design without costing any money. It will be designed out of the pipes and pumping systems which were found in the makerlab. A single run of PVC, supported by a simple wooden frame, will be built and a pump will be placed in a plastic bin to bring water up to the top of the run.

Design



Materials:

- PVC piping as found in makerspace
- 2x4 vertical wooden supports and angled supports
- Wide plywood base
- Various pumps and piping as found in makerspace

Notes;

- Dimensions are as in original design

Testing

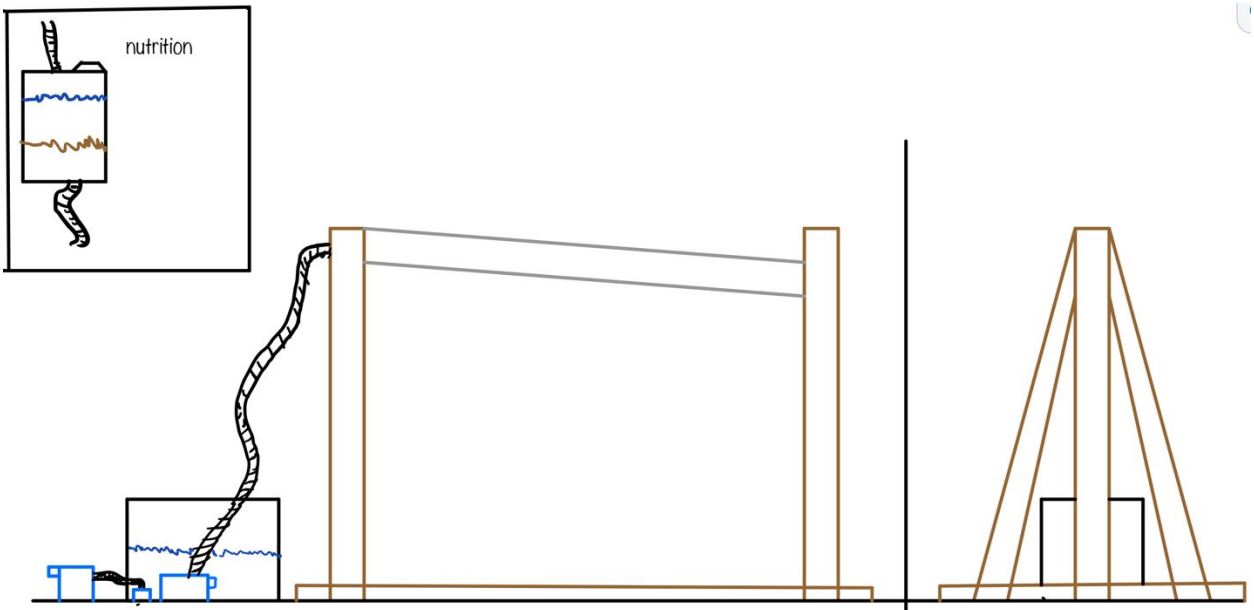
- What head height the given pumps can reach?
- What methods of fusing PVC piping will effectively eliminate leakage?
- What pipe tilt will ensure constant solution flow?
- What support structure is needed to protect the hydroponics from being tipped over?

Prototype #2

Intro

This second prototype will be a build of the functional part of the system. The pump, aeration, and nutrition systems will be purchased based on the parameters found in prototype #1. The real systems will then be tested with the prototype #1 framework, and alterations to the final design will be made to compensate for the limitations of the functional system. The cost of this prototype will be 60$ at maximum.

Design



Materials:

- PVC piping as found in makerspace
- 2x4 vertical wooden supports and angled supports
- Wide plywood base
- Pump as determined
- Aeration system as determined
- Nutrition system as determined

Notes;

- Dimensions are as in original design

Testing

- What is the nutrient content of the compost test after sitting for 48 hours?
- What head height can the purchased pump reach?
- What are the dissolved oxygen (DO) levels throughout the hydroponics system?

Prototype #3

Intro

This last prototype will build the full hydroponics structure to the functional system of the second prototype. The power system will also be included. The cost of the full structure will be 40$.

Design

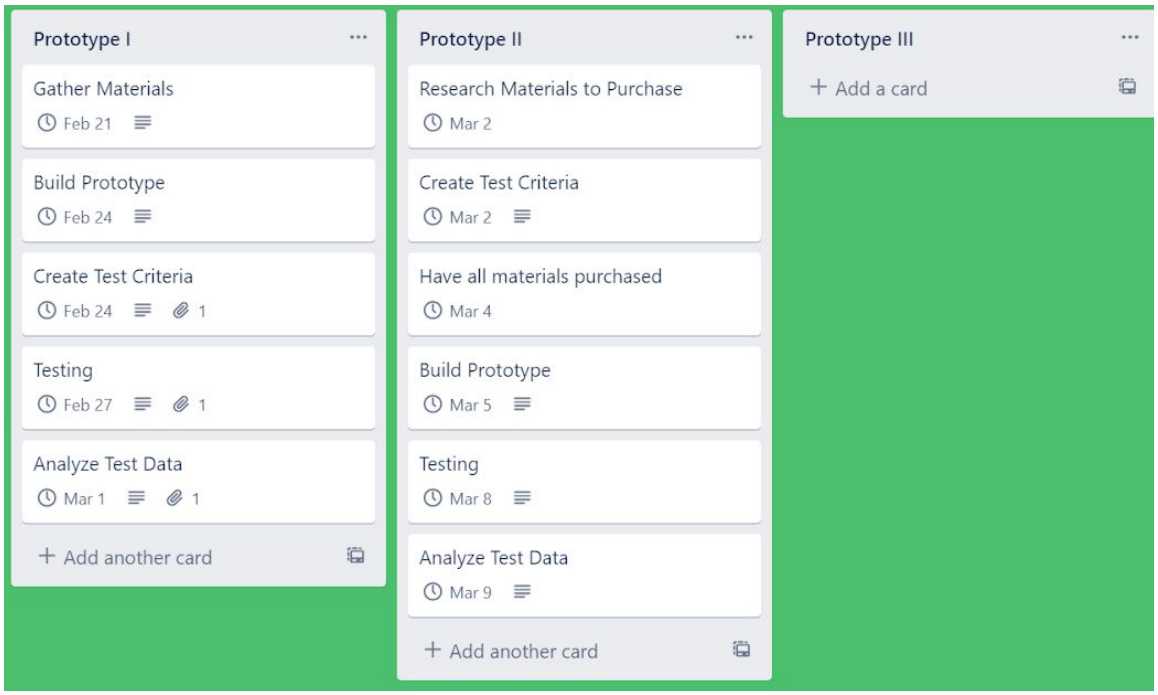
Will change according to the analysis of previous prototypes, but will likely resemble the chosen design from Deliverable D.

Testing

- All previous tests will be performed again.
- Will the hydroponics system fit within the greenhouse structure?

Schedule

Trello Tasks:



Trello Gantt Chart: