GNG 1103

Engineering Design

Deliverable F

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# Introduction

Following the cost analysis of the three most suitable designs by their effectiveness and characteristics, the best solution was decided upon and selected to be prototyped. The first prototype was a basic simple 1:4 scale size of the actual model so that it can be represented in a 3D model to allow our engineering team to get a better grasp on whether or not this is the best possible solution. It also allowed the engineering team to obtain feedback from the customer on the solution.

# Discussion

Before the construction, questions that were asked were why are we building the prototype? What do we hope to learn from this prototype? And, when and how the information gathered from the first prototype will be implemented? Our engineering team decided that the first prototype would be used to obtain a 3D visual model of the design. Using this 3D model we would analyze it to determine its feasibility to meet the customer's needs.

The first prototype built to a 1:4 scale was used to determine what the customer thought of the design size and the amount of water required to make it effective. After talking with a potential customer we were able that to conclude that the size of our hydroponic system was bigger than he hoped it would be but was still acceptable. The main concern that the customer had shown was that the amount of water required to make the system work which is approximately 40 to 45 gallons, although this amount of water was just the initial amount required and would drop to approximately a gallon a day, he was still concerned. The other concern the customer had was that the hydroponic system was open topped with allowed some water to be lost due to evaporation.

Following the meeting with the customer the information gathered was discussed and solutions to the customer concerns were generated and will be implemented in the next design. To address the concern of the water we have decided to change the shape of our tank to a rectangular prism instead of the half cylinder design, this will not only decrease the water required but it will also decrease the size of the hydroponic system. To address the concern of the loss of water through evaporation we have decided that the best solution will be to make a clear plastic dome that would be placed over top of the plants to stop loss of water through evaporation and create condensation during the cooling process at night. This will assist in reducing the amount of water lost.

# Conclusion

After building and testing the first prototype our engineering team was able to take the feedback from the customer and find solutions to address their concerns. These solutions will be implemented in the next prototype which will allow us to do further analysis of whether or not it will meet the customer’s requirements.