

# Deliverable H

## Prototype III



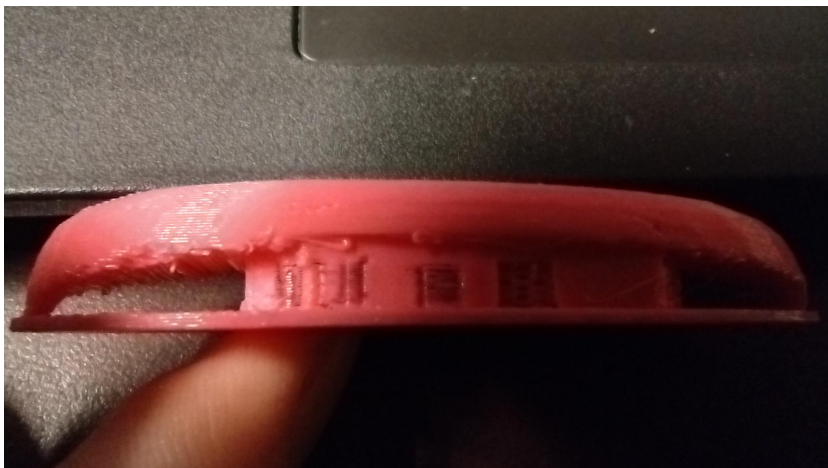
The prototype is a 3D printed scale model of the building. The model is 3' along its major axis, and 13/16'

along its minor axis. Therefore the model is at a 1:731 scale. The model was created in Blender, and then 3D printed at the Richard L'Abbé MakerSpace. As part of the printing process, there were structural supports under the various overhangs caused by the roof, however those were removed prior to the tests.

Many tests were conducted, to see how the shape of the roof and the walls would react under high stress.

Height Dropped (cm)	Observations
10	No damage
30	No damage
75	No damage
100	No damage
200	No damage

In addition, when placed under a force of 660N, there was no damage to the model either.



We have also received some feedback on this and earlier prototypes. The client responded that the canoe roof was a good idea, but cost may be a restrictive aspect. However, in our BOM, we are still at only around 60% of the budget, so the roof can be included. In addition, other

informal polling suggested that more windows be added to increase the amount of natural light, especially facing the long axes.

Taking information from previous prototypes, Prototype III has the latest corrections. In Prototype I, there was no space for utilities such as heating and cooling. In the latest prototype, although not visible, there is a utility room with access to the various machines that allow the building to function. In addition, using Prototype II, it was determined that the roof was satisfactory in draining water and the roof was not in danger of retaining pools of water that could have compromised the building's structural integrity.

Overall, Prototype III was a success and managed to retain its properties and shape under stress. Of course, because strength scales, and the material is slightly different, there are still conclusions to be drawn, that the structure is stable.

Over the course of the development process, our prototypes evolved from 3D models, to physical models. As we progressed through each step, our understanding of our product grew. However, it is important to note the hindrance to our development that resulted from receiving feedback later than expected. Nevertheless, the current prototype was the logical next-step as it allows for in-depth testing of a model that has the miniscule attributes associated with the shape that the last model lacked. Considering the last model was made of cardboard and only roughly formed the general shape of the model. And before that, the 3D model only allowed us to conceptualize ideas through prior understanding and assumptions. Both of which served useful at the time, but the current model allows us to be more comprehensive.

## **Wrike**

<https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=PtCisLRrN3uyb1sHRWfvQUrj85r0EBc2%7CIE2DSNZVHA2DELSTGIYA>