UNIVERSITY OF OTTAWA.

uOttawa

Faculté de génie
Faculty of Engineering

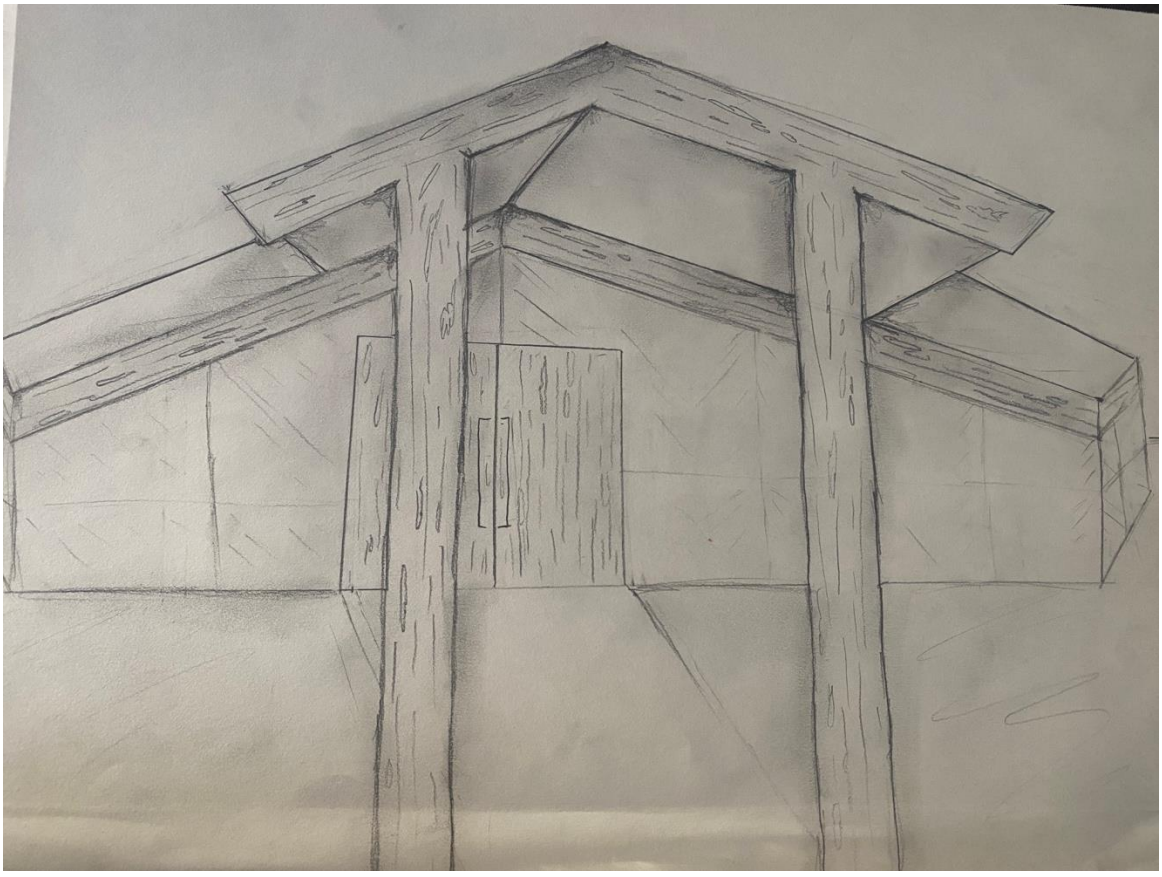
Arjun Jatania- 300242065
Blake Tubby- 300360343
Callan Underwood- 300152504
Moyosolaoluwa Diya - 300310926
Isla O'Connor- 300357687

INTRODUCTION:

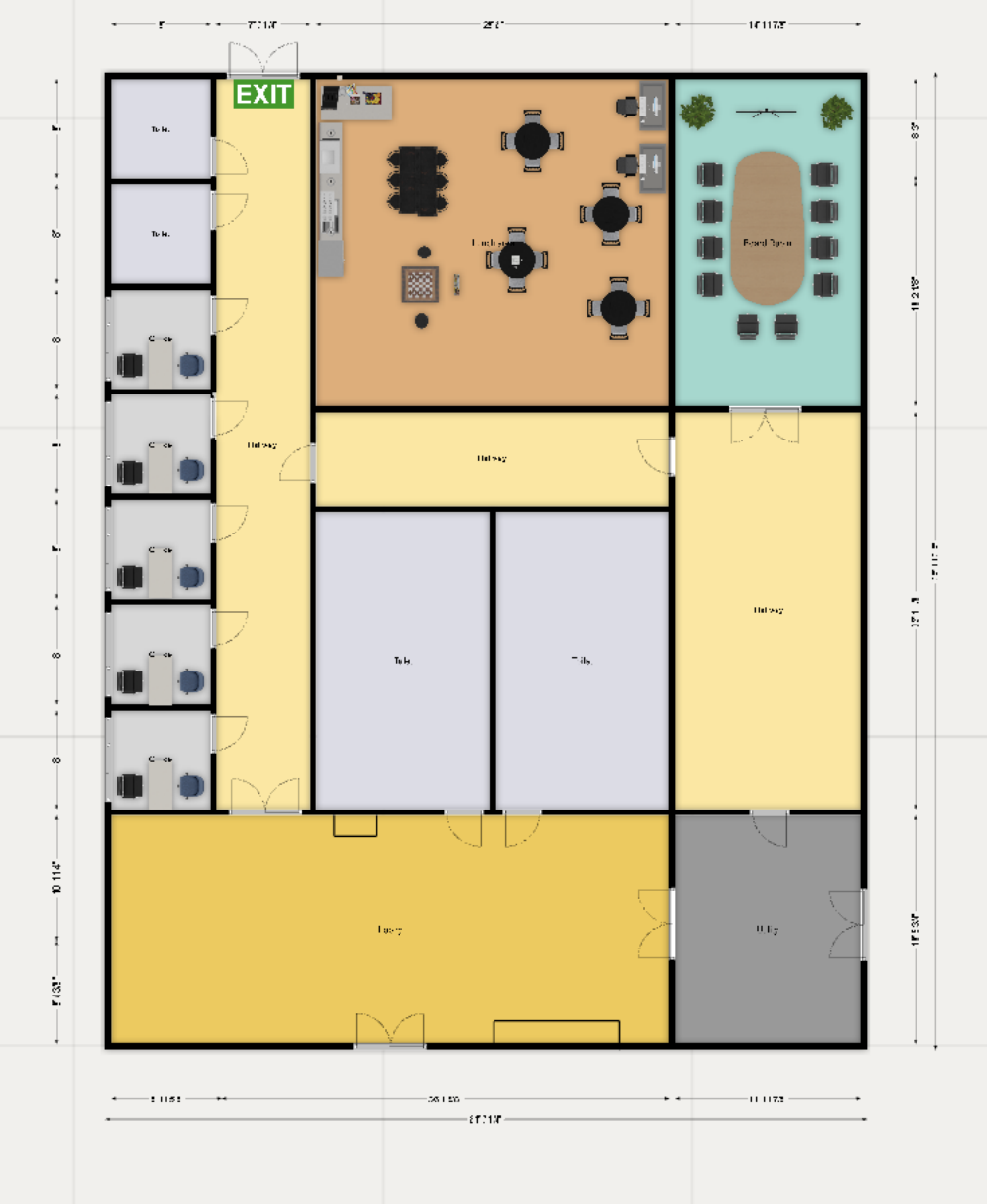
The aim of deliverable E is to have a coherent and detailed design of the building as well as to establish the prototype plans with the BOM (Bill of Material) of the building and prototype. These designs are based on deliverable D, accumulated brainstorming ideas and feedback from the client's meeting. In this document, the designs were analyzed efficiently to pick the best prototype plan and execution.

DESIGN:

Exterior:



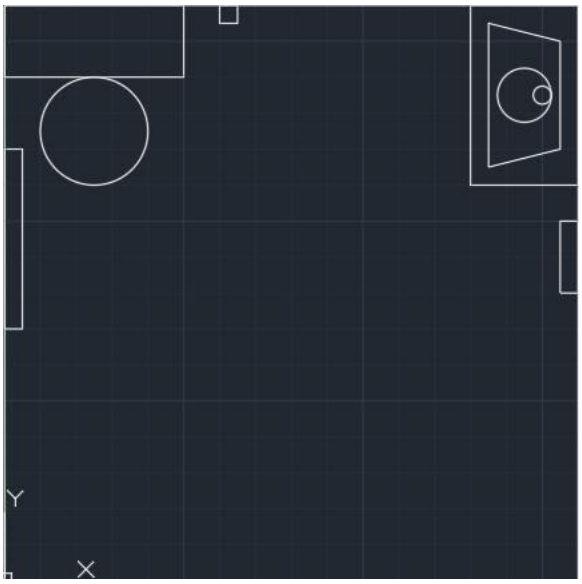
Floor plan with design:



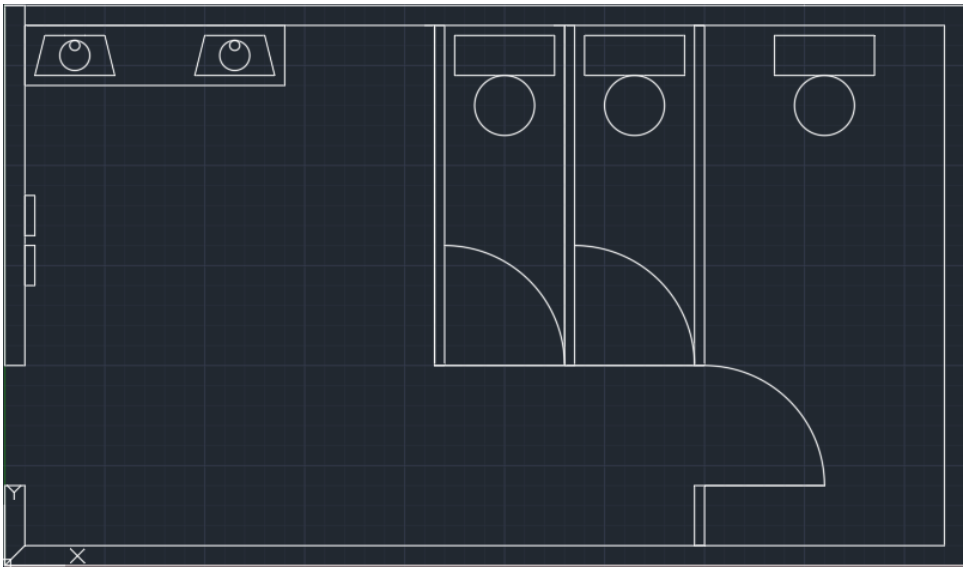
[Floorplan]

Toilets:

Small:



Large:



BOM:

Attached in this submission are the BOM of the building and the prototype. Some costs are estimated numbers as there is no definite cost for the materials since they come in ranges.

PROTOTYPE

PROTOTYPE MATERIALS:

For the prototype planning, the materials used include:

- Onshape (design software)
- Floor planner (design software)
- AutoCAD (design software)
- Backup Design Software: Blender
- Cardboard
- Hot glue

PROTOTYPE TEST PLAN 1

For the first Prototype, we plan to make a physical model of the structure and arrangement of the rooms. This test is to see how well put and organized the basic floorplan it is and how accessible the room will be from other rooms. Another reason is to see how walkable and spacious the rooms are. The stopping criteria is a confirmed 'yes' from every member that the objectives stated are achieved through dimensioning.

To build the prototype, cardboard and hot glue will be used especially for the rooms and lobby. As for the details in each room, scraps and cardboard will be used. The building will be done on a scale: of 5':1". The dimensions of the whole prototype will be 15.8 inches by 12.4 inches.

PROTOTYPE 2 AND 3

For prototypes 2 and 3, the building will be designed in one of the specified design software and printed using a 3D printer and PLA bought from MakerSpace. In case of setbacks, laser cutting will be used as a backup plan and if needed would use MDF bought from MakerSpace. All prototypes will be done on the same scale.

Risk Assessment and Contingency Plans

1. Risk: What if we don’t finish on time
   Contingency plan: Use the resources we have already finished, like our floor plan, AutoCAD subsystems, and 3D models.

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2. Risk: If we try to 3D print but it won't work.
   Contingency plan: We will laser-cut instead.

3. Risk: If one software (Auto CAD) doesn’t end up working for us
   Contingency plan: We have other software like Onshape, Blender, Solid Works etc. we learned about in our labs.