GNG 1103/2101

Design Project User and Product Manual

ENVIORNMENTAL MONITORING BUILDING PROPOSITION

Submitted by:

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Table 1. Acronyms

Acronym	Definition
BOM	Bill of Materials
CAD	Computer Aided Design
UPM	User Product Manual

Table 2. Glossary

Term	Acronym	Definition
Bill of Materials	BOM	Table or list containing cost of each component of a system.
Computer Aided Design	CAD	Refers to software programs that allow users to draft both 2D and 3D designs.
User Product Manual	UPM	Refers to the entire document

1 Introduction

This User and Product Manual (UPM) provides the information necessary for users to effectively use the Guardian Building (GB) and for prototype documentation.

Welcome to the User and Product Manual for the Guardian Building. This document serves as a comprehensive guide to help users understand and effectively utilize the Guardian Building. In this manual, we outline the fundamental functionalities, operating procedures, and safety precautions to ensure a seamless user experience.

Context and Assumptions

Our work assumes that users have access to the necessary equipment and tools specified in the manual.

Structure Overview

This document is organized into distinct sections to facilitate easy navigation and comprehension. It begins with an introduction, followed by detailed sections covering setup, operation, troubleshooting, maintenance, and a bill of materials. Each section is subdivided into clear, concise topics for enhanced accessibility.

Purpose and Scope

The primary purpose of this manual is to empower users with comprehensive knowledge and guidance on using the Guardian Building. It covers a wide scope of activities, including initial setup, day-to-day operation, maintenance procedures, and troubleshooting techniques.

Intended Audience

This manual is designed for users, technicians, and individuals responsible for the operation, maintenance, or troubleshooting of the Guardian Building. It caters to both novice users seeking basic instructions and experienced users looking for in-depth insights into the product's functionalities.

Security/Safety and Privacy Considerations

We prioritize user safety and privacy in the utilization of the Guardian Building. This manual includes detailed safety guidelines to ensure the secure and responsible use of the product. It also highlights potential risks and how to mitigate them for a secure user experience.

2 Overview

The Algonquins of Pikwàkanagàn had asked us to design them a building. This building was important, as it needed to be able to successfully accommodate the needs of the clients. The main use of this building is to act as a research and office center. There were many required specifications for this building. The building needed a lab with a mobile workspace, computers, and freezer storage, to allow for research of the surrounding biodiversity. It also needed many offices, a kitchenette, a boardroom, washrooms, and parking space. The building also needed to represent the Algonquins of Pikwàkanagàn's culture.

Our building is different than most other products for multiple reasons. One of these reasons is the shape of our building; it is rectangular-like, with one of the 4 surfaces being opened, and a big open space in the center, to allow for cultural activities. Another reason our building is different than the others is because of the cultural aspects included within the building. In the center of the open space lies a great fireplace, surrounded by many benches and a gazebo. Additionally, on the ceiling, there is a map of the territory and a medicine wheel. There are also murals located all over the building. Our building also has many windows, allowing for lots of natural sunlight. The loading dock, which is conveniently connected to the walk-in freezer, is easily accessible from the parking lot and has a large garage door to easily bring in products.

Key Features or Major Functions

- *Feature 1*: **Wheelchair accessible** - Offers wheelchair accessibility throughout the building.
- *Feature 2*: **Loading dock** - Provides loading dock to deliver materials, such as research material or furniture.

Architecture/Construction

The building is constructed with a combination of durable materials, including a steel frame for structural integrity. It is designed to optimize natural light utilization.

Special Conditions

The building is designed to withstand typical environmental conditions like varying temperatures and weather patterns. Many exits, which can be uses as emergency exits ensure safety during unforeseen events.

2.1 Conventions

There are no stylistic or command syntax conventions used within this document.

2.2 Cautions & Warnings

When using the Virtual reality (VR) system, the user must ensure that:

- There are no obstacles in the surrounding are, to prevent accidental tripping
- The user should not walk while wearing the VR headset

3 Getting started

As directed by our client, the subsystems were designed at the outset of the prototype systems. A lab, boardroom, workstation, kitchenette, bathrooms, and offices are among the early plans. The wall, door, decorations, and window elements of the Homestyler software are used to create these designs; however, only a small number of decorations can be added at first.
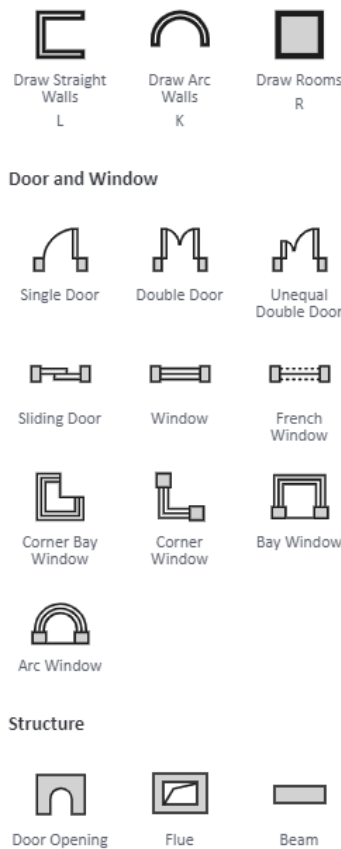
Figure 1: List of some Homestyler features

Three draft drawings were created once all the subsystems were finished in to create a unified, condensed building design. Since this building may become the final design, it is crucial to

develop the greatest alternative for a building through the usage of several original concepts. The first of three prototypes are based primarily on the finished design that is chosen. It is now necessary to furnish every subsystem with furnishings and decor. Test plans are carried out on each prototype, and input from many sources, including the client, Algonquin people, and friends, was received. An example of the prototype test plan can be seen in *Figure 24*.

The second prototype features the same building design concept from Homestyler, but it has been changed in response to feedback, giving the structure more cultural relevance and practicality.

The physical configurations of multiple selected subsystems were included in the third and final prototype. The bathrooms, kitchenette, lab, loading dock, mobile workstation, and workspace were the subsystems we chose. For increased interaction, 3-D renders and a virtual tour of the building design are also made. Examples can be found in *Section 4*.

3.1   Configuration Considerations

Physical prototypes are printed with 3D printers provided in a lab in the University of Ottawa. The system requires a file where a model of a subsystem exists. This model was made on the Onshape software.

An account is needed to use the Homestyler software, where it can be signed up with any email of desire. Initially, a free subscription with all necessary tools such as wall, window, door, and decorations are available to use. See tools in *Figure 1*. Create a workspace in Homestyler to begin designing; all options are displayed as the program is incredibly user-friendly.

Onshape requires an account, just like the Homestyler Software. Onshape uses computer-aided design (CAD), where you may model anything. When an account is created using student email, there is no requirement for subscriptions. Several capabilities are included in Onshape, including sketch, dimension, trim, and extrusion. But these are just a handful of the many features that are offered.

Figure 2: List of some Onshape features

3.2   User Access Considerations

The prototypes can be used by a variety of people, including clients who wish to modify our prototypes to their preferred style; academic instructors who wish to exhibit this to prospective students; and students who like to draw inspiration from our design for their own projects.

However, there are a few drawbacks to employing our techniques. Most of the designing is done with programs like Homestyler and Onshape, therefore for convenience of use, a reasonably capable desktop or laptop is needed. This brings us to our next limitation: to access sophisticated capabilities like 3D rendering, Homestyler requires a membership. Additionally needed for tangible models is a 3D printer. A 3D printer should be available to you if you are a university professor or student, but your options will be far more constrained if you are working alone.

3.3   Accessing/setting up the System

The physical prototype was created using a 3D printer. CAD program Onshape was used to create each subsystem. They were then exported to an SD card-equipped USB flash drive as an STL file. The procedure is then started by inserting the SD card into the 3D printer.

The Onshape software can be accessed using this link: Onshape. The Homestyler software can be accessed using this link: Homestyler. Like previously mentioned, an account can be created with any email. If you forget your password for any of the software, you can click the "forgot password" link, which opens a tab where you can enter your email address to receive a link to reset your password. You will find information on how to change your account password in this email.

Forgot your password?

Figure 3: Reset password on Onshape

Forget Password

Figure 4: Reset password on Homestyler

3.4   System Organization & Navigation

3.4.1   Physical prototype

Once the printing of the 3D prototype is over, small plastic acrylic hinges are used between the cover and the subsystem with Gorilla glue. The plastic hinge allows you to open and close the roof of the subsystem like a lid. Modelling clay was also used to sculpt certain objects such as the green wall or potted plants, though this is completely optional. In this project, each subsystem was

not connected to each other, and the furniture was printed together in the rooms. Thus, they are free to be manipulated and placed anywhere the user wishes.

3.4.2 Software prototype

You can access our software prototype using this link here or scanning the QR code in *Figure 5*. Once the system is launched, there are a few things to know such as the position of each room in the building and how to access each of them. Starting at the main entrance with its lounge, the washrooms are on the right side. The hallway beside the washrooms leads to the boardroom and the workspace. From the boardroom, it is possible to reach the workspace. The kitchenette is accessible from the workspace. Another hallway can be accessed from the workspace which leads to the offices and another lounge. Along this hallway, there are doors that lead to the outdoor community space. The laboratory is located at the end of the hallway. Connected to the laboratory is the loading dock with a walking freezer.

To navigate through the building, simply click on the arrow that indicates the room to visit like shown in *Figure 6*. Another way is to click on the switch button located on the bottom right of the screen as shown in *Figure 7*. This will display all the rooms in the building and allow direct access to them. More features and ways to navigate the prototype are described in Section 4.

3.5 Exiting the System

3.5.1 Physical prototype

For this project, the subsystems were not attached together, and the furniture was printed with the rooms. Thus, you can store the prototypes in boxes or on shelves as they are 3D models that do not require much maintenance. It is safe to stack the subsystems if necessary.

3.5.2 Software prototype

It is not necessary to save the virtual prototype after the tour is over. Simply click on the X beside the tab name to exit the virtual prototype as shown in *Figure 14*.

4 Using the System

In this subsection, we will be discussing how to use each of our prototypes and the features present within our prototypes.

4.1 Using Our Homestyler Prototype

In the web application Homestyler, we created a virtual tour that you can explore on your computer or mobile device. To access this tour, you can click the link here (https://panorama.homestyler.com/v2?m=np&id=vqhcVc9FjfxFYAtw1nhffv&locale=en_US) or you can scan the QR code below.

Figure 5: QR code of the virtual tour

This tour works on your local browser and once loaded, you will be loaded into the main entrance of our prototype.

Figure 6: Main entrance of the building

There are options to traverse to other rooms. You can enter another room by clicking on the white arrows on your screen or you can select a destination on the mini map in the top right corner, which shows the building's floor plan. Additionally, you can click the "switch" button in the bottom right corner and toggle a menu that will allow you to traverse each room with a menu.

Figure 7: Switch menu

Clicking on the arrows circled red will load other rooms.

To look around, drag your screen anywhere to view your surroundings. In addition, you can share with others by clicking the "share" button in the bottom right corner to share the url or the qr code with other people.
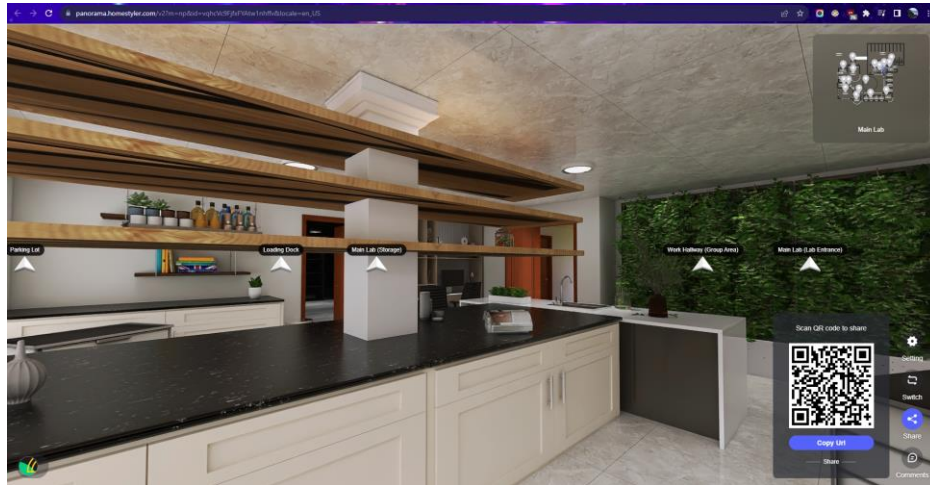
Figure 8: Sharing menu to share the tour in the bottom right

You can also comment on certain features you find appealing by clicking the comment button in the bottom right corner. Once clicked, the screen will stop rotating and a blue cursor will replace your mouse (no cursor in mobile version). You can click anywhere on your screen and write your name, and the comment based on the place you selected. Then, when you press confirm, your comment will appear for everyone to view who views the tour!
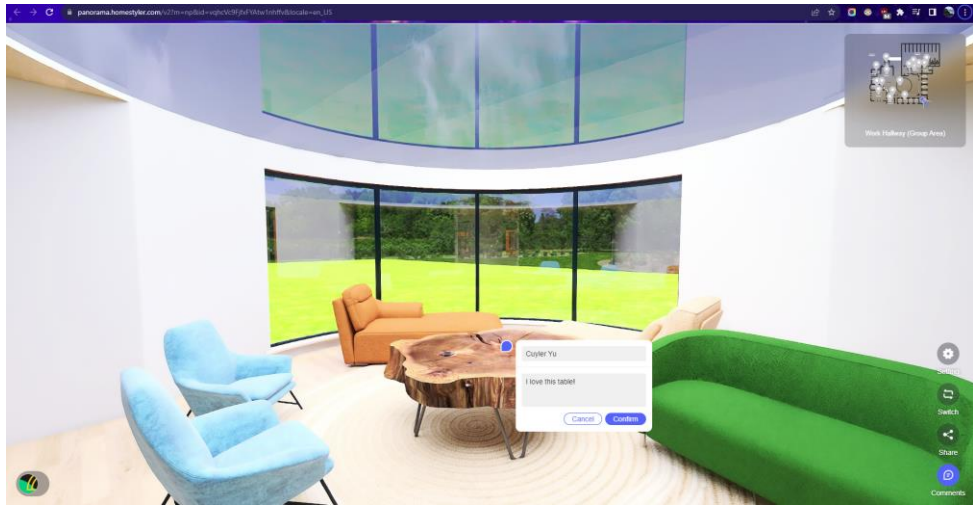
Figure 9: Adding a comment with the comment menu
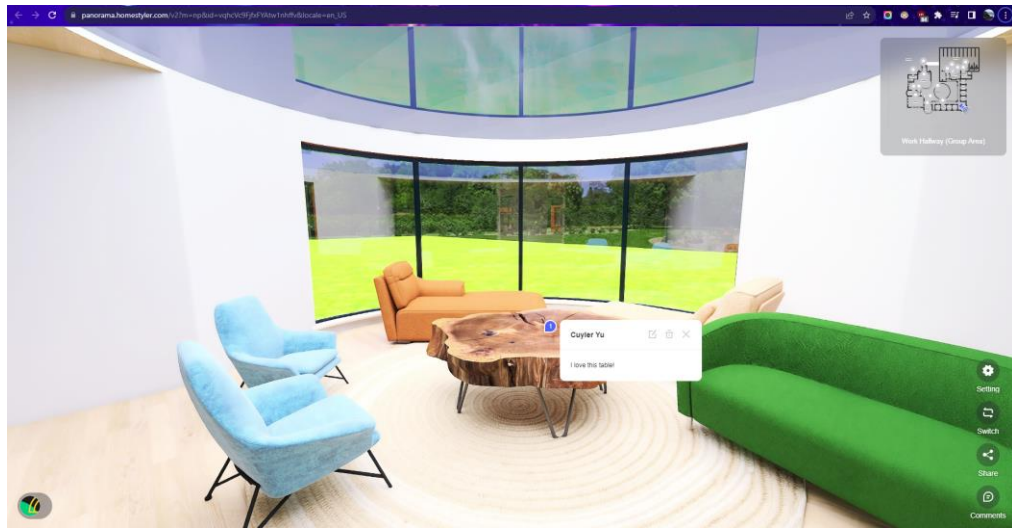
Figure 10: How comments appear in the tour

You can access the settings menu by clicking the settings icon in the bottom right corner. In this menu, you can toggle the "Display Floor Plan" option to show the top right minimap or not.

Figure 11: Settings menu in the bottom right corner

The "Auto Rotation" option turns off and on the autorotation of the tour and you can customize how fast the tour will spin. Toggling "VR" will turn the screen into two view ports. Our team has not tested the VR option on computer, but it is accessible on mobile devices if you have a headset to put your phone.
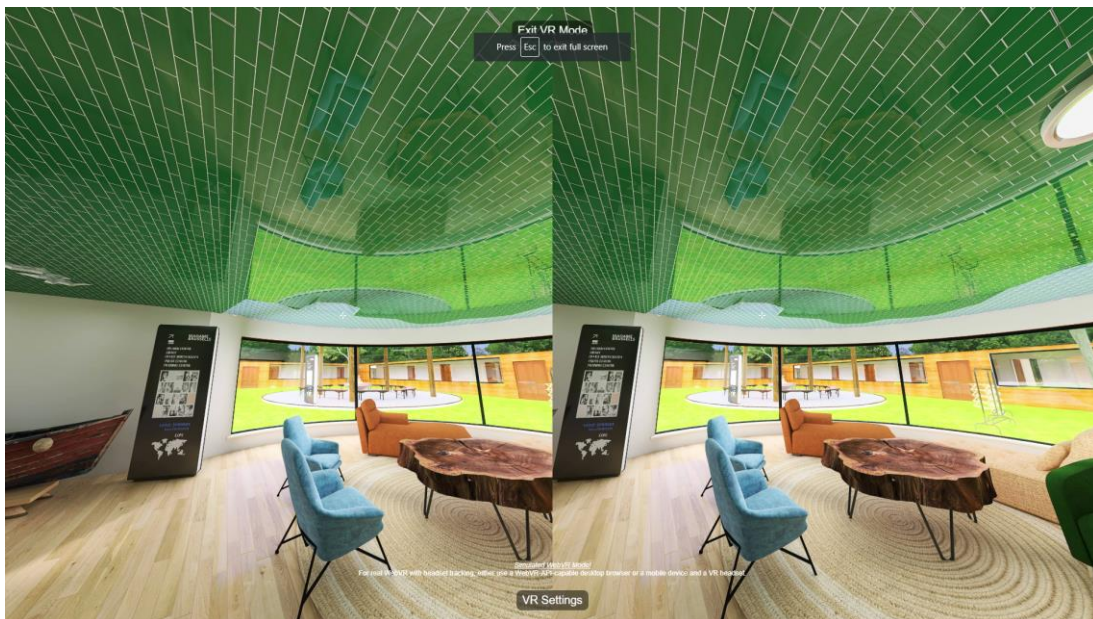
Figure 12: VR mode on desktop

Lastly, the "Tags" option will show the furniture and materials we used to construct this prototype through blue icons. You can click on them to see their exact name.
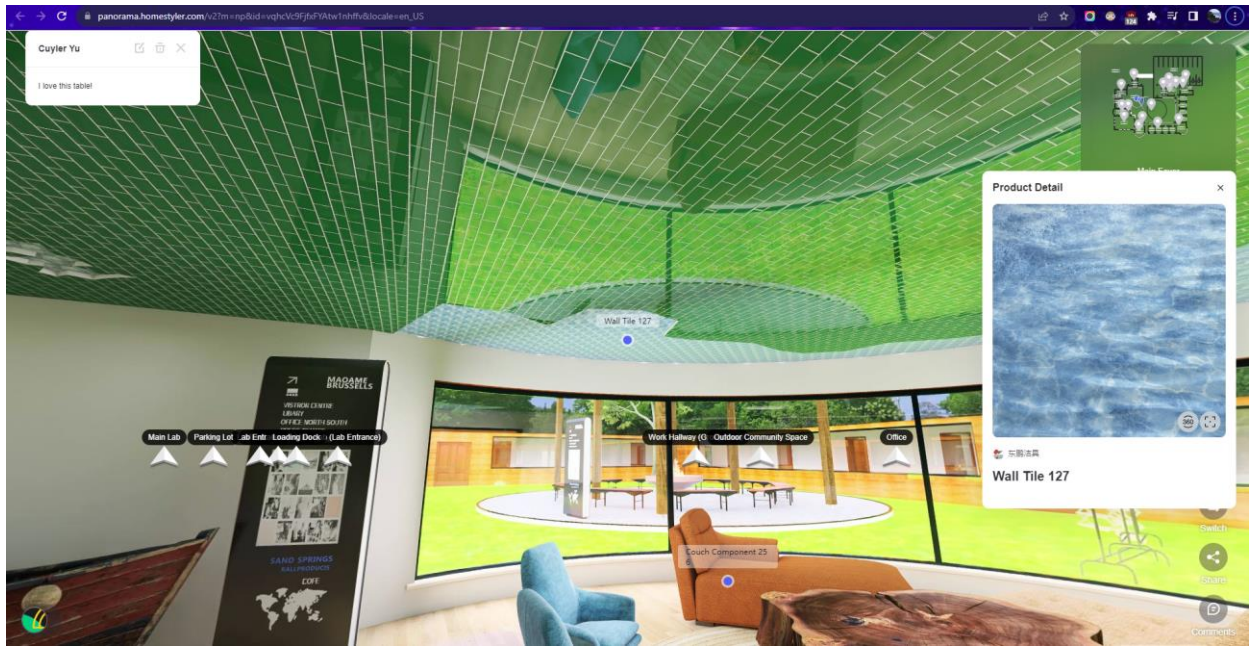
Figure 13: Tags option displays all furniture and materials used

Clicking the blue dots will display product details.
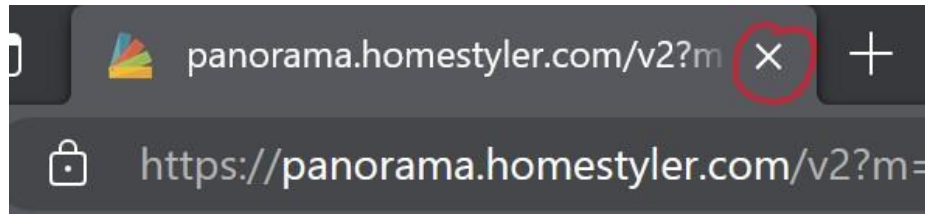
Figure 14: Exiting the program

For exiting the program, it is safe to click on the X located on the tab name.

This should be all you need to explore our virtual prototype! There are additional features in the mobile version we didn't cover, but they are not necessary to experience our virtual tour. Have fun exploring!

4.2 Using Our 3D Printed Prototype

It is quite simple to use our 3D printed prototypes. Once printed, they are readily available for viewing. You can rotate them around and look at the interior details to get a new perspective on the rooms and proportionally see how large they are with each other. Once removed from the printer, there are support ligaments that you may want to remove to have an accurate looking model. These ligaments are typically for supporting structures that have space beneath them such as a table or window.
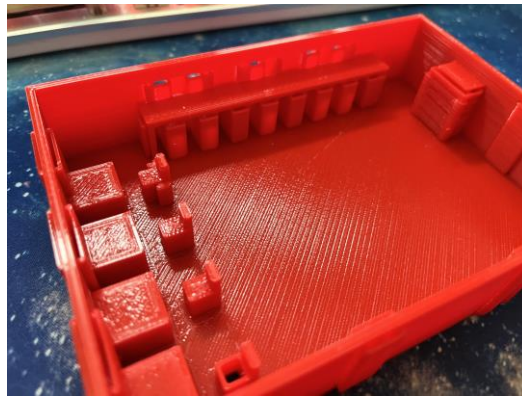
Figure 15: Support structures visible under long table and window

If you want to attach a ceiling, you can attach acrylic hinges to your rooms with super glue. You can then open and close your roofs for a unique look on your 3D model.
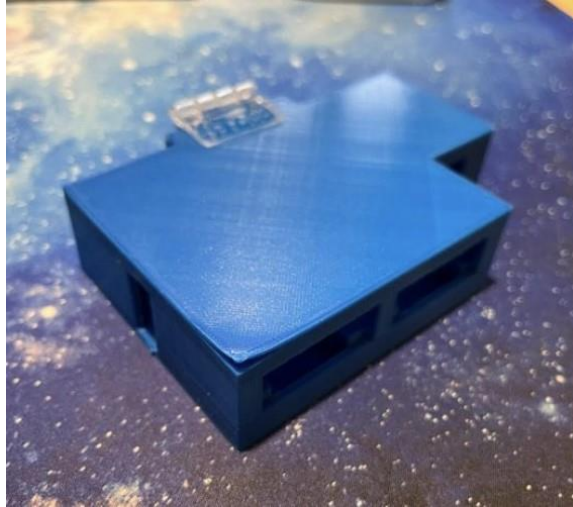
Figure 16: Closed model of the lab subsystem

Figure 17: Open model of the lab subsystem

5   Troubleshooting & Support

This subsection describes common errors for the creation of the 3D printed models, as well as their recovery and maintenance.

5.1   Error Messages or Behaviors

It is common to have a 3D printed part that does not print the way it was intended to. In that case, see "Print Quality Troubleshooting Guide" in Appendix I.

5.2   Special Considerations

When handling situations of failed 3D prints, exercise caution when placing one's hands near the printer's nozzle as it is a hot surface.

5.3   Maintenance

Store the 3D models at room temperature in a dry area, avoiding any direct sunlight. Wipe the models every other week or when dust accumulates. Do not stack models on top of each other for storage.

5.4   Support

For technical help or questions with any of the prototypes or support, you can contact any of us:

- Cuyler Yu: cyu082@uottawa.ca

- Dylan Konguende: dkong016@uottawa.ca

- Ghalia Mohammed: gmoha076@uottawa.ca

- Michael Mo: mmo089@uottawa.ca

- Jeremy Poole: jpool012@uottawa.ca

- Tony Huang: ghuan024@uottawa.ca

For uOttawa students and staff on-campus:

For emergencies, call Protection Services at 613-562-5499.

MakerSpace (STEM building):

Tel.: 613-562-5800 ext. 1559

General inquiries: makerspace@uOttawa.ca

Volunteering: volunteer@makerepo.com

Expert help: experts.makerspace@uOttawa.ca

If you wish to report a problem for anything in the MakerSpace, simply call or send an e-mail to the appropriate address including relevant information about the malfunctioning equipment. Ex: "Printer E08 seems to be jammed".

For individuals off-campus:

For emergencies, call local emergency services.

Refer to the printer's manual or manufacturer's website to obtain additional relevant information.

6 Product Documentation

6.1 Virtual Prototype

The online 3D floor planner, Homestyler, was used to create the final virtual prototype. The represented the design realistically and allowed for accurate furniture placement and measurements. The reason a virtual prototype was made was because virtual prototypes cut down material costs and allow remote collaboration. Additionally, we were able to meet with the client virtually and present the prototype virtually.

Before constructing the prototype, various design considerations were considered:

- Buildings general layout:
  - The buildings layout was important to ensure optimal space utilization. Additionally, the buildings layout should allow further expansion.
- Feasibility:
  - The design must comply with federal and provincial mandates. The design must also be realistic and within budget.
- Budget:
  - The design must be in line with the client's budget.
- Cultural Aesthetic:
  - The building is a cultural building for the Algonquin of Pikwakanagan. It must include adequate cultural amenities.

6.2 Physical Prototype

Physical Prototypes were made to ensure that the client can physically conceptualize the design. The physical prototype consisted of scaled down versions of the main critical subsystems: the office, workspace, boardroom, kitchenette, lab, loading dock, washrooms, and mobile workbench. The prototype was 3D printed using recycled 3D filament. The physical 3D printed models can be seen in Fig.9.
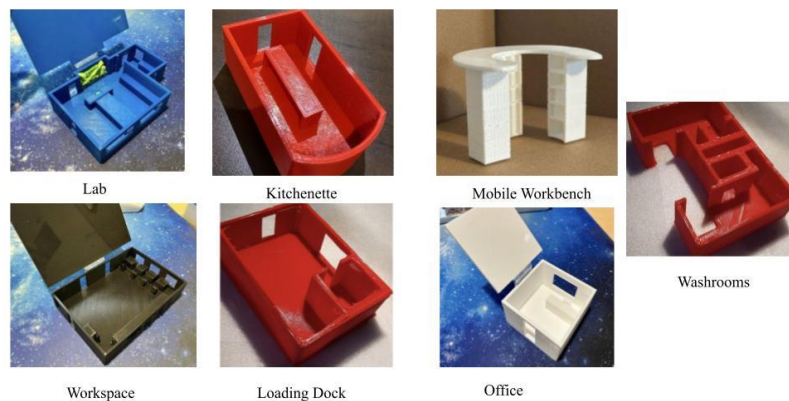
Figure 18: 3D printed models of critical subsystems

6.3 BOM for all critical Subsystems

All subsystems went through the same prototyping process; hence they have similar BOM. See Appendix II *Table 4* for the BOM for the final prototype.

6.4 Lab

6.4.1 Description

The lab consists of two rooms, which is the lab entrance and the main lab. Starting with the lab entrance, it serves as a small workspace/foyer where workers can hang their coats and personal items on the hooks and counters behind, while also offering a small workspace for anyone visiting

shortly or needing to get some quick research done. The room is 2.70 m x 4.00 m with 10.800 m^2 of area to walk around on the wooden floor. There will be a window opposite the door too to allow natural light to shine in when it gets dark. The main advantage of this room is to declutter the lab by allowing users to store their personal items here to keep a clean lab space, while also offering a small workspace to get some quick work done. Fig 10 depicts a picture of the lab.

Figure 19: Preview of the lab

6.4.2   List of Equipment

See Appendix II *Table 5* for Lab equipment list.

6.5 Offices and Workspace

6.5.1 Description

The office includes seven individual 4 m x 4 m (16 m²) offices, a large entrance area that can accommodate a waiting area, and an additional 96 m² workspace as requested. The main advantage of this design is that each office is disconnected from the other offices, giving the users of the space their privacy and allowing them to personalize their working environment to their liking while also minimizing any possible distractions. We also decided to add as many windows as possible, each office and the workspace has a window. The building contains 8 offices.

The workspace serves as a multifunctional work area. It has 8m x 9m. Includes multifunctional workstations and a mural of the traditional medicine wheel at the ceiling. The workspace serves the purpose of communal gathering and similar meet and greets.
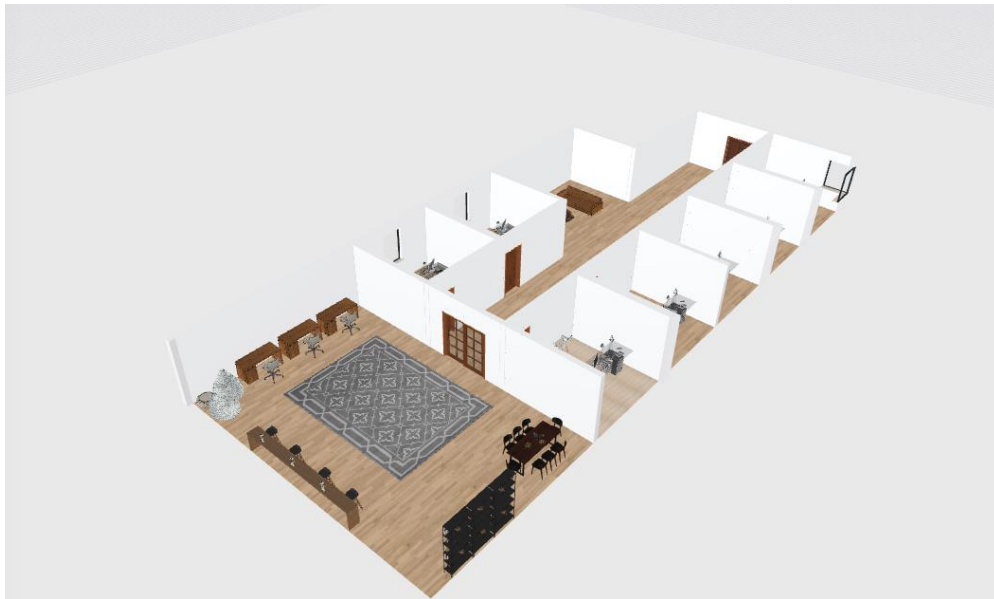
Figure 20: Workspace and offices

6.5.2   List of Equipment

See Appendix II Table 5 for list of Workspace and Office Equipment

6.6   Boardroom

6.6.1   Description

The Boardroom is a 376.03 ft² room, with a rectangular area of 24'3'' by 14'1'' and with a
rounded end of 14'1'' in width and a radius of 3'7''. The rounded end allows for people to feel as
if they are not trapped in a rectangular boxed area, but rather a cozy and unique looking room. The
main advantage of this area is that it can comfortably accommodate 12 people to discuss information
about the ongoing projects. The room consists of a projector screen, allowing for a clear presentation
of ongoing discussion.

Figure 21: Boardroom

6.6.2 List of Equipment

See Appendix II *Table 6* for list of Board Room equipment.

6.7 Kitchenette

6.7.1 Description

The Kitchenette serves as a breakroom area for the employees of the building. It contains storage cabinets and a microwave, as per our client's request. We added enough sunlight and greenery, to make the room appear livelier.

Figure 22: Kitchenette

6.7.2   List of Equipment

See Appendix II Table 7 for list of Kitchenette Equipment

6.8   Washroom

6.8.1   Description

There are separate restrooms for men and women in this section of the structure. The bathrooms are built of two "L" shaped pieces, or four rectangles. Each bathroom measures 24.11 m², which is the same for both of them. To offer further privacy, it is vital to note that there is a 1 m wall divider between the bathrooms. The bathroom entrance has two double doors that are thick and spacious. There is one hand dryer, one paper towel dispenser, two sinks, three mirrors, and three examples of plants in the women's restroom. Additionally, it features two stalls, one of which is marginally larger than the other to accommodate those with impairments. The bigger one measures 3.52 m², while the smaller one is 2.11 m². A toilet and toilet paper are provided in these stalls. The men's bathroom has one smaller stall, two mirrors, and two instances of plants, but it has the same amount of sinks, paper towel dispensers, and hand dryers as the women's bathroom. The smaller number of stalls is used to make room for two urinals. The men's restroom measures 2.11 m², whereas the urinal area is 4 m².
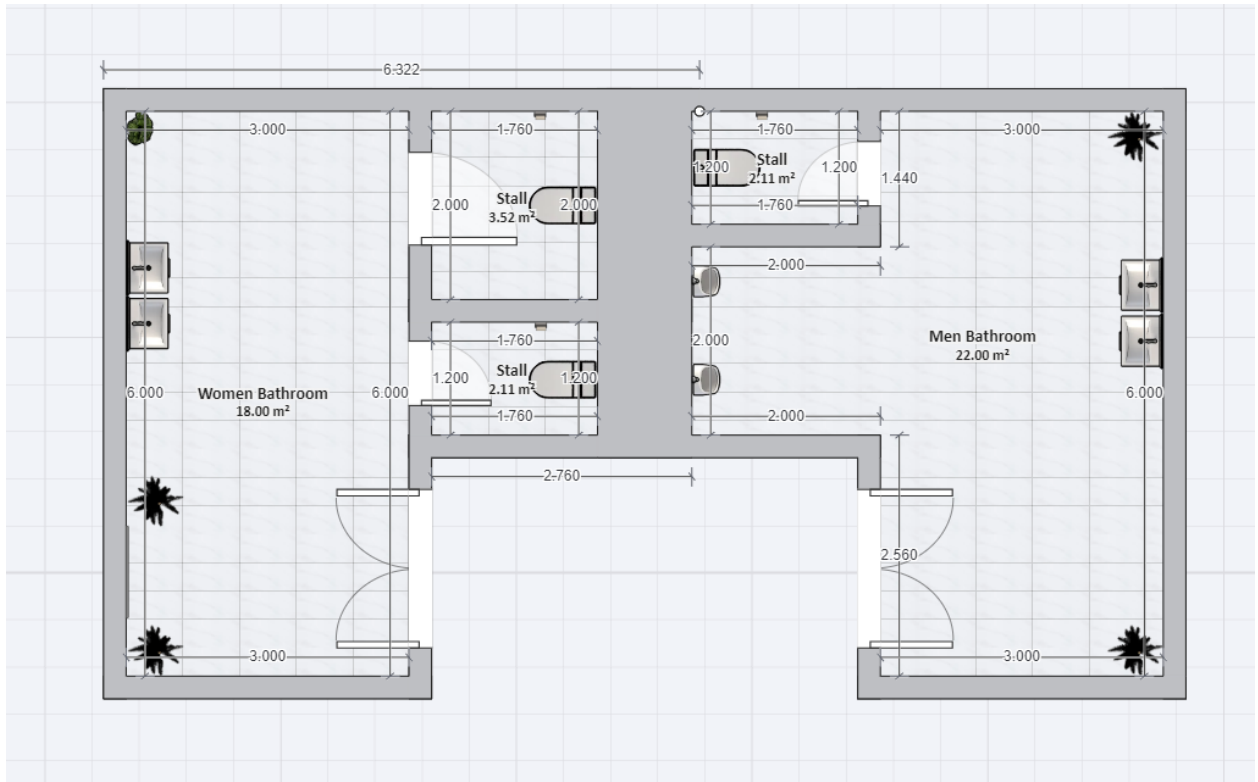
Figure 23: Floor plan of Washrooms

6.8.2 List of Equipment

See Appendix II Table 8 for List of Washroom Equipment

6.9 Testing & Validation

To validate the final prototype, several tests were done. They are all listed and explained in the table below.

Test ID	Test Objective	Description of Prototype used and of Basic Test Method	Description of Results to be Recorded and how these results will be used	Estimated Test duration and planned start date	Results	Stopper
1	Measure the WWR to make sure a good amount of sunlight enters the building.	Measure the window/wall ratio. A 3D rendering of the floor plan (prototype 1).	The window/wall ratio (WWR) should be at least 0.03. What we are going to do is measure the area of each window divided by the area of each wall, using Excel. WWR=window area/area of each wall	The test should take around 30 mins. We are planning to start this on Nov 8.	Offices: 0.04 Lab: 0.21 Kitchen: 0.17 Workspace: 0.22	As long as WWR is above 0.03, we are satisfied
2	Is the building accessible to handicapped people.	Analysis of features of the building and conducting a survey that asks random people for their opinion on the accessibility of the building to mitigate any bias that can come from designers. We are looking for at least 80% approval. A 3D rendering of the floor plan (prototype 1)	The building should pass the Accessibility in Ontario's Building Code and get 80% approval from survey.	The test should take around a day for everyone to submit their response to the survey. We will start on Nov 7	We have obtained a 90% approval rate from 20 different people	Satisfaction when communicated with 20 at least individuals, to ensure confident results from large sample size
3	Safety Features. The building must pass certain Ontario building codes	Analysis of features of the building and seeing if it meets the criteria A 3D rendering of the floor plan (prototupe 1)	The building should pass the Ontario's Building Code	The analysis should take two days and will start on Nov 6	The building did indeed pass the Ontario's Building Code	Satisfied when we know the building is up to code
4	The building must have cultural elements that relate to the algonquin culture	Conduct a survey that asks an unbiased group of people whether the building incorporates the culture adequately. We can also interview algonquin people A 3D rendering of the	The building must get an 80% approval rating.	The test should take around a day for everyone to submit their response to the survey. Nov 7	We have obtained an 85% approval from 20 different people	Satisfaction when communicated with 20 at least individuals, to ensure confident results from large sample size
5	The loading dock and parking lot should be capable accommodate	The prototype is to scale so we will scale down the measurement of trucks and see if the parking lot and loading dock can	The parking lot and loading dock must accommodate the trucks with an error of 0.5m	This analysis will take 30 mins and it will take place on Nox 9	Our garage entrance is larger than the area of a truck (36 square inches), and	Satisfied when we know a large truck can fit in the parking lot and

Figure 24: Test plan

7 Conclusions and Recommendations for Future Work

Because the goal of the final prototype is to sell your idea to the client, try to make it as "flashy" as possible. Find the optimal point for the effort-to-results ratio. The prototype is only as good as the presentation you give to the client, so try to coordinate aspects of the prototype to a captivating presentation. In other words, plan your prototype around your pitch to the client.

If we had a few more months to work on the project, we would have developed a more intricate roof design. Due to a lack of time, we went with a basic roof shape. Because of the architectural nature of the project, it is important to have a good roof design because it contributes immensely to the building's look on top of offering useful functionalities, such as climate regulation inside the building and ease of snow removal.

8 Bibliography

"Print Quality Guide." *Simplify3D Software*, 21 June 2019, www.simplify3d.com/resources/print-quality-troubleshooting/. Accessed 08 Dec. 2023.

APPENDICES

9   APPENDIX I: Design Files

From section 5.1 Error Messages or Behaviors:

Print Quality Troubleshooting Guide: https://www.simplify3d.com/resources/print-quality-troubleshooting/

This document addresses several 3D printing errors types and the common fixes to the problems.

Disclaimer: We do not claim ownership of the information produced in the links above. All works belong to their respective authors.

Link to OnShape 3D Models:

https://cad.onshape.com/documents/b69e1bf890258f79fbb9aaba/w/82c9fd62b94edc0a8c74187a/e/79f882db9987c6762ab20f1b?renderMode=0&uiState=65739295777e7966722caf49

Link to Homestyler 3D Models:

First Prototype: https://www.homestyler.com/openShared?assetId=b1665cfb-e17b-4ef1-b883-53d1ed9e4d7a

Second Prototype: https://www.homestyler.com/openShared?assetId=f3d887f5-b513-40f2-8b8a-740128e05f93

Link to MakerRepo page:

https://makerepo.com/Cuyler/1725.the-tdm-lab

Table **3**. Referenced Documents

Document Name	Document Location and/or URL	Issuance Date
Print Quality Troubleshooting Guide	https://www.simplify3d.com/resources/print-quality-troubleshooting/	Not applicable

10 APPENDIX II: Other Appendices

Table 4. BOM for all subsystem

List of Equipment	Cost (CAD)	Link
Air Dry Modelling Clay 27 Colors	18.07	Modelling Clay
CAD Designer	0.00	N/A
3D Printer	0.00	N/A
3D Printing Threads (ALL PROTOTYPES)	20.20	N/A
20 Pieces Acrylic Hinges	18.20	Acrylic Hinges
Homestyler (Pro plan)	4.90	Homestyler Link
Homestyler (Styler plan)	3.90	Homestyler Link

Table 5. Lab Equipment List

Item Name	Description	Quantity	Total Cost	Link
Masonite Door	4-inch x 80-inch x 4 9/16-inch	3	CAD 1,305.15	Masonite Door
Brown Computer Desk	Desk	1	CAD 377.47	Office Desks
Ergonomic Office Chair	Black Mesh office chair	3	CAD 494.83	Ergonomic Office Chair

Epoxy Resin Countertops	Lab grade countertops (per sqft)	64	CAD 10,914.67	Epoxy Resin Countertops
Lab Grade Chemical Resistant Sinks	A stainless steel utility sink	2	CAD 2,597.66	Uline-Stainless Steel Utility Sink
Inspiron Dell Desktop Computer 13 Gen I7 Intel CPU	Dell desktop computer for computing data	1	CAD 1,628.68	Inspiron Dell Desktop
Seagate Portable 5TB Hard drive	HDD used for storing data	1	CAD 214.69	External Harddrive
Fisher Brand Phenolic Shelving	Chemical resistant black phenolic resin shelving	30	CAD 3,887.20	Fisher Phenolic Shelving
Norbeck 8ft x 8ft Walk-In Freezer	Walk in freezer with door and remote refrigeration	1	CAD 20,685.78	Norbec Walk-In Freezer
Epson Expression Home XP-5200 Desk Printer	Wireless Epson Desk Printer	1	CAD 258.56	Epson Desk Printer

Uline Utility Cart	Hard plastic mobile workstation cart	3	CAD 586.47	Utility Cart
Environmental Lab Study Kit	Lab tools for studying environmental sciences	2	CAD 601.21	Enviornmental Science Kit
Celestron CB2000C Compound Microscope	Professional-grade binocular microscope with 2000x power.	1	CAD 857.33	Celestron Compound Microscope
Logitech NJ129 Wired Keyboard & Mouse	Keyboard and mouse for computer use	1	CAD 28.22	Logitech Keyboard and Mouse
Earth Studio 80 Pot Vertical Garden Kit (Living Wall)	A vertical wall for growing plants	1	CAD 1,683.64	Earth Studio Modular Garden
Uline Industrial Steel L Desk	A steel desk 66 x 78 " in dimensions	1	CAD 1,949.25	Uline Industrial Steel L Desk

Table 6 List of Workspace and Office Equipment

Item Name	Description	Quantity	Total Cost	Link
Masonite Door	4-inch x 80-inch x 4 9/16-inch	8	CAD 3,480.40	Masonite Door

LAGKAPTEN TILLSLAG	Desk	7	CAD 1,362.72	Office Desks
Ergonomic Office Chair	Black Mesh office chair	7	CAD 838.30	Ergonomic Office Chair
Guest Chair	Grey chair	14	CAD 2,107.45	LÄKTARE-IKEA
Conference table	96"x48"	2	CAD 2,902.76	Uline-Conference Table
Vertical File Cabinet	Filing Cabinets	7	CAD 4,037.84	Filing Cabinters
Shelf Unit	36"x14"x54". 1000lb Weight limit	2	CAD 155.91	Storage Shelf
LINNMON / ADILS	Standard desk for Workspace	3	CAD 310.75	LINNMON / ADILS
ELDBERGET / MALSKÄR	Desk chairs to go with "linnmon" desks	3	CAD 273.46	ELDBERGET / MALSKÄR
Plastic Stackable Chair	Black chair. 18 x 17"	12	CAD 1,426.98	Stackable chairs-Uline
Bean bags	Bean bags for workspace	5	CAD 316.29	Home Depot Link
Light	Hampton Bay 15 inch light	10	CAD 1,043.33	Overhead Light

	Mouse and Key			
Office Computer	board incliuded	7	CAD 8,405.99	Office computer
Monitor	Dell 27 FHD	7	CAD 1,445.19	DEll lapotop

Table 7. Boardroom List of Equipment

Item Name	Quantity	Total cost (CAD)	Link
Epson EX3280 3LCD XGA Projector	1	689.99	Projector
Tropi co. Home Office Indoor Plant Collection 4-Pack	1	74.75	Plants
Rectangular 6 ft Conference Table	1	419.58	Boardroom Table
Home Office Chair	12	1090.06	Storage unit
LED Flush Mount Ceiling Light	2	206.98	Office Lights
Abstract Canvas Art	1	254.74	Painting
Owl Labs Meeting Owl 3	1	1723.85	Meeting Device
MacBook Pro 3 14"	1	3103.85	MacBook

Table 8. Kitchenette List of Equipment

Item Name	Quantity	Total Cost	Link
Long chairs	4	781.95	Chair
Kitchen cabinets	1	3794.99	Cabinet
Kitchen counter	2	492.18	Counter
Shelves and storage unit	2	1025.78	Storage unit
Refrigerator	1	1608.85	Refrigerator
Coffee mugs	6	34.50	Mugs
Coffee maker	1	31.27	Coffee maker
Soap dish	1	13.21	Soap
Microwave oven	1	198.94	Microwave
Kitchen sink and faucet	1	374.39	Sink
Toaster	1	31.03	Toaster
Cutery set	1	6.89	Cutlery
Glasses set	1	35.59	Glasses
Curtains or blinds	6	482.66	Blinds
Rugs or carpets	1	339.24	Area rug
Trash can and recycle bins	1	114.99	Trash can
Arm chair	3	1345.47	Chairs
Coffee table	1	160.99	Coffee table

Table 9. List of Equipment for Washroom

Item Name	Description	Quantity	Total Cost	Links
Toilet	Overall: 14.125" H X 15" W X 30.25" D Weight: 64 lb	3	$1,090.63	Toilet
Urinal	Overall: 12-In x 18-In	2	$1,036.35	Urinal
Bathroom Sink	Overall: 13.78" Standard White Ceramic Rectangular Wall Mount Bathroom Sink with Overflow	4	$1,898.40	Bathroom Sink
Sensor Faucet	Overall: Made of premium stainless steel, multi-layer chrome finish, smooth feeling, stunning	4	$776.49	Sensor Faucet

	looking, rust-proof and durable, drip-free, smooth-feel, resists scratches, corrosion and tarnishing and suitable for bathroom			
Toilet Paper Dispenser	Overall: 8 x 11 x 7"	3	$61.02	Toilet Paper Dispenser
Framless Mirror	Overall: 40-In x 30-In	4	$1,007.91	Framless Mirror
Wall Mirror	Overall: 48-In x 30-In	1	$187.57	Wall Mirror
Plants	Overall: Artificial Fake Bamboo Plant with Plastic	5	$377.02	Plants

	Planter Pot - 39.4-Inch			
Bathroom Stalls	Overall: Polymer Complete In-Corner ADA Approved Compartment-Left Side 60"W X 61 ¼"D-Gray	3	$9,264.87	Bathroom Stalls
Entrance Door	Overall: Steel Outward Swing Partition Door - 23-5/8"W x 58"H	2	$892.59	Entrance Door