Project Deliverable F

Introduction

This deliverable emphasizes the role of the client feedback and the changes that came after the meeting. Using our client's feedback, we developed the first prototype, and we analyzed the critical components that make up our design. Additionally, feedback from peers/potential clients is collected and used to start the development of the second prototype.

Feedback from the client

During the client meeting, the client requested some minor adjustments to our design. The first request was to increase the freezer space in the lab. Our initial design possessed four standard freezers, but the client preferred a larger, unified walk-in freezer that could accommodate a deer carcass. This was implemented into our next iteration of the prototype.

After presenting our parking lot design, the client mentioned that our parking lot was bigger than necessary; they only needed around 5-6 parking spaces. Additionally, we were asked to factor in harsh weather conditions, and a covered loading space for ATVs and trucks was requested.

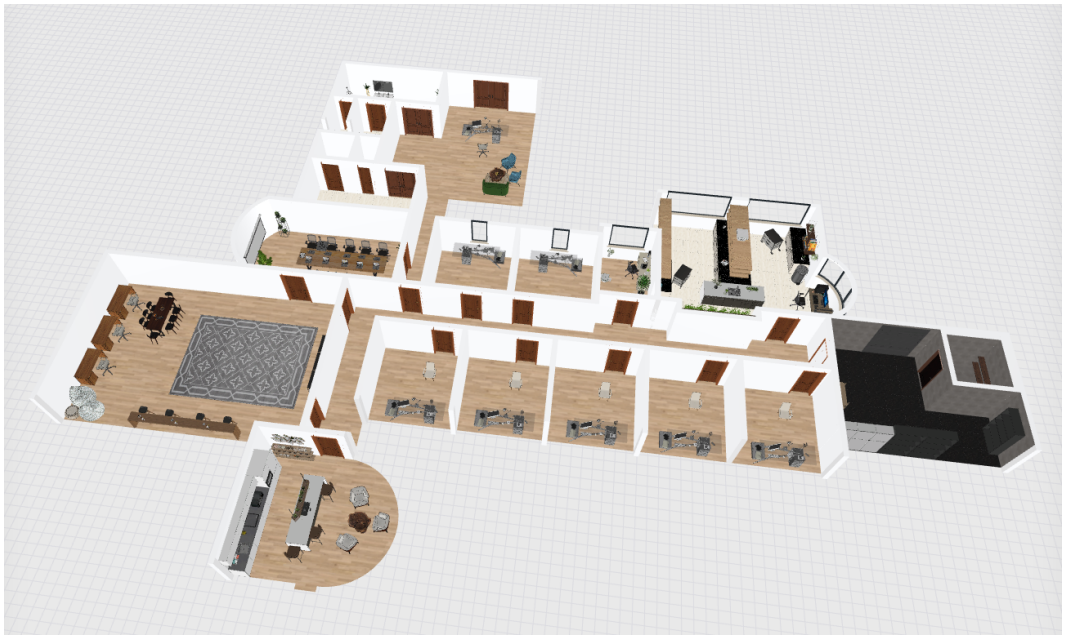
The last adjustments were minor changes to the board room and kitchenette. For our initial design, we planned for a more immersive experience with multiple projectors at each side of the room. Our client preferred a more standard approach with a single projector. They also mentioned that they would prefer a simpler kitchen, which meant omitting the stove from the final design and including a simple microwave.

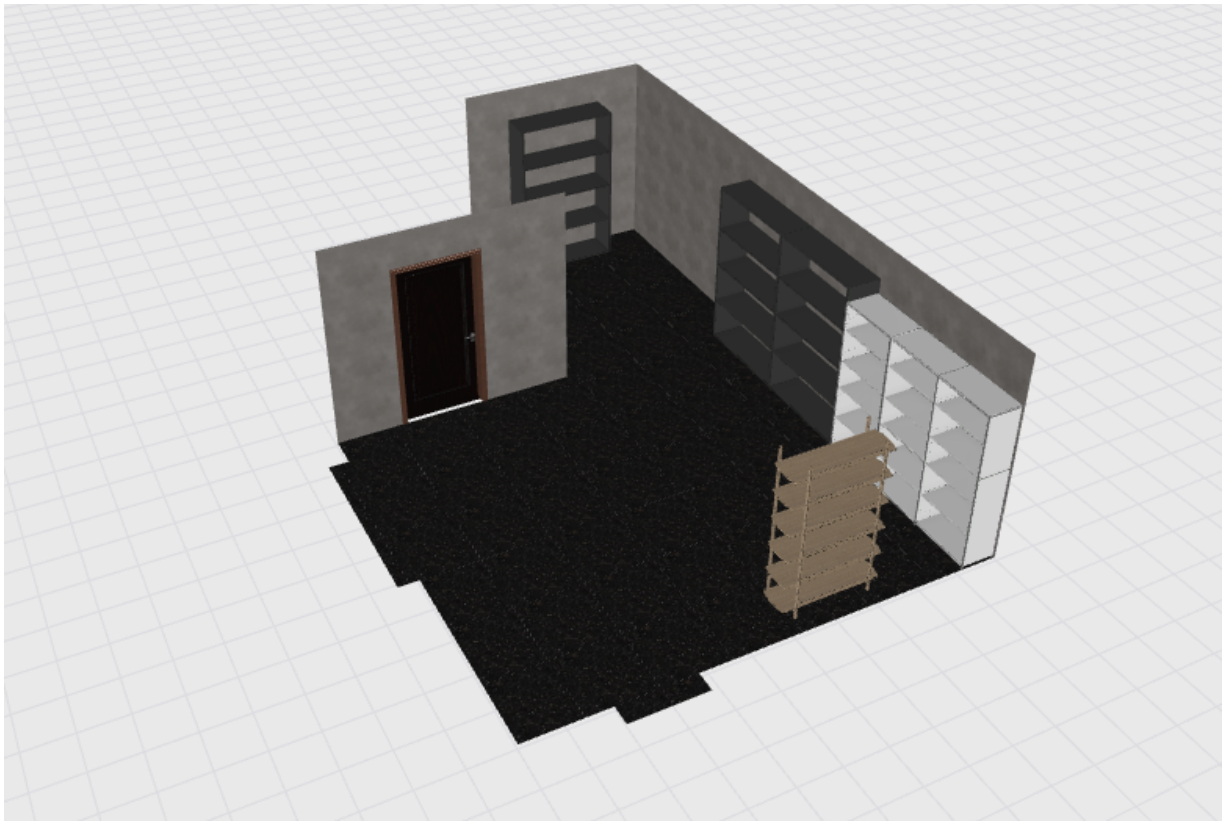
This client meeting was essential in understanding the client's vision for the building and where their priorities lie. Moving forward, we plan on sticking to the client's vision to ensure that the client's needs are satisfied, leading to a successful design. By aligning our design approach with the client's vision, we can reach the shared goal of creating a space that reflects the client's goals.

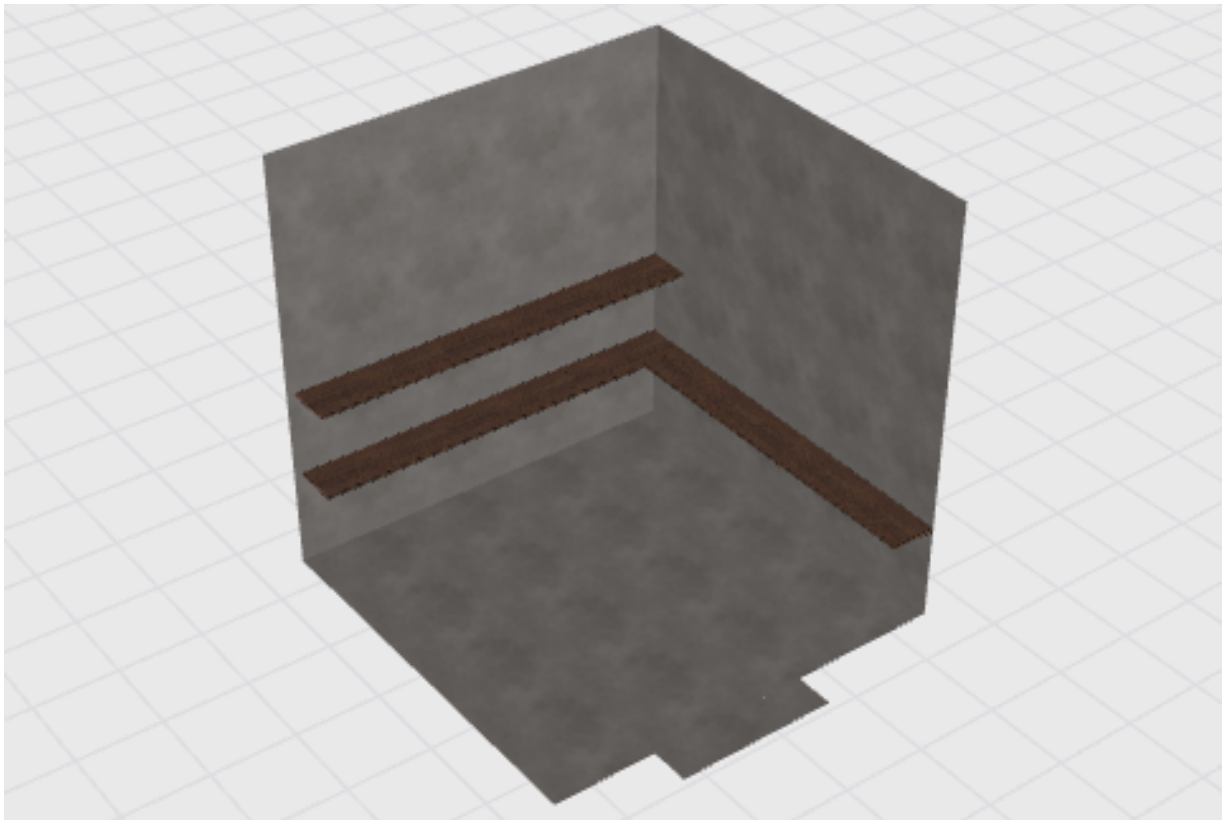
Prototype #1

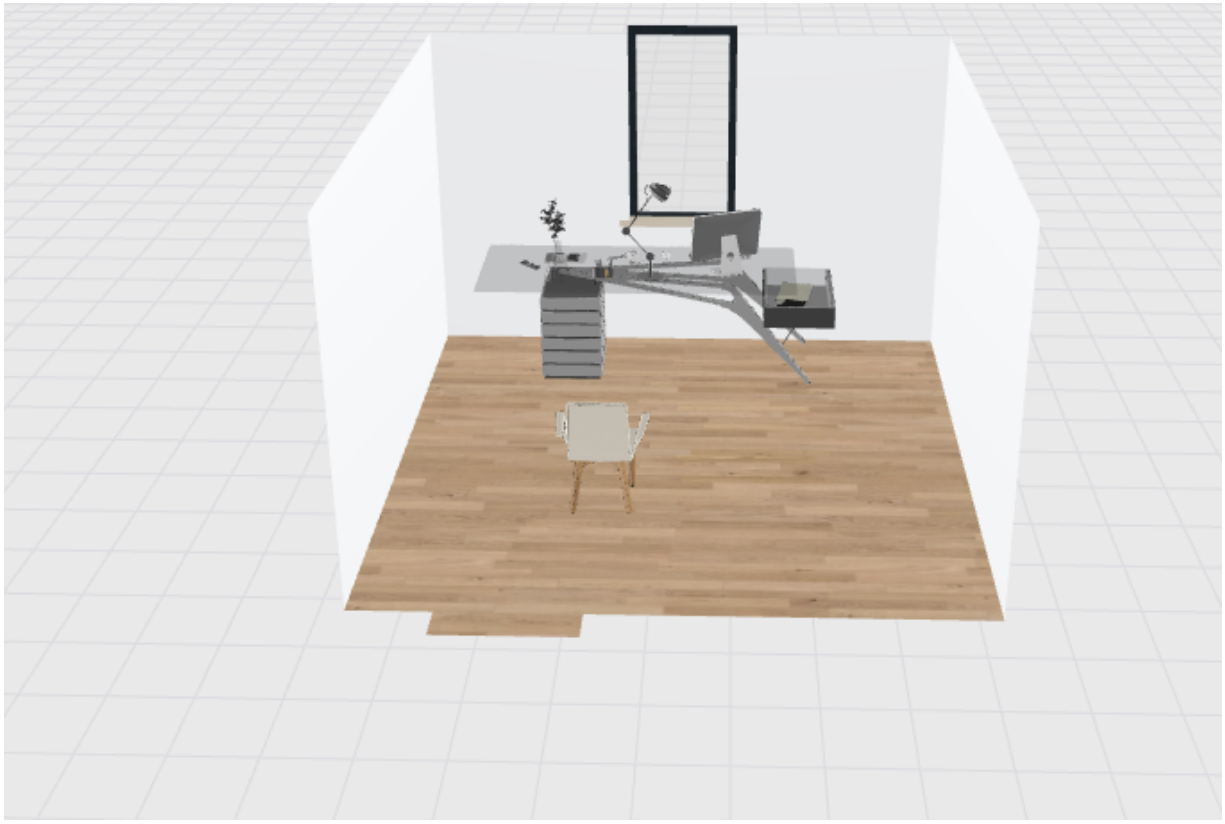
For our first prototype, we created a 2D and 3D floor plan of our building. This floor plan includes every important subsystem, including the lab, loading dock, offices, board room, bathroom, workspace/activity room and kitchenette. All the rooms are dimensioned accordingly, and the measurable goals of this prototype are the amount of sunlight that enters the building, the accessibility of the building, the safety features of the building, the cultural elements of the building and how much the loading dock can accommodate vehicles. The prototype also serves to show the building shape and room locations, along with their dimensions. This is an early stage of our prototype, so we do not have the specifics of the outside. However, we are planning to expand this prototype further by adding the parking lot, backyard space and additional Algonquin-related structures in the open space outdoors for recreational and educational uses. This prototype was finished on November 9th and will be expanded on to prepare for design day in late November.


Outside
29588.92 ft²
Unnamed
683.99 ft²
Main Lab
636.96 ft²
Board Room
374.90 ft²
Office
172.22 ft²
Office
172.22 ft²
Office
172.22 ft²
Office
172.22 ft²
Office
171.71 ft²
Workspace/Activity Room
1038.07 ft²
358.90 ft²

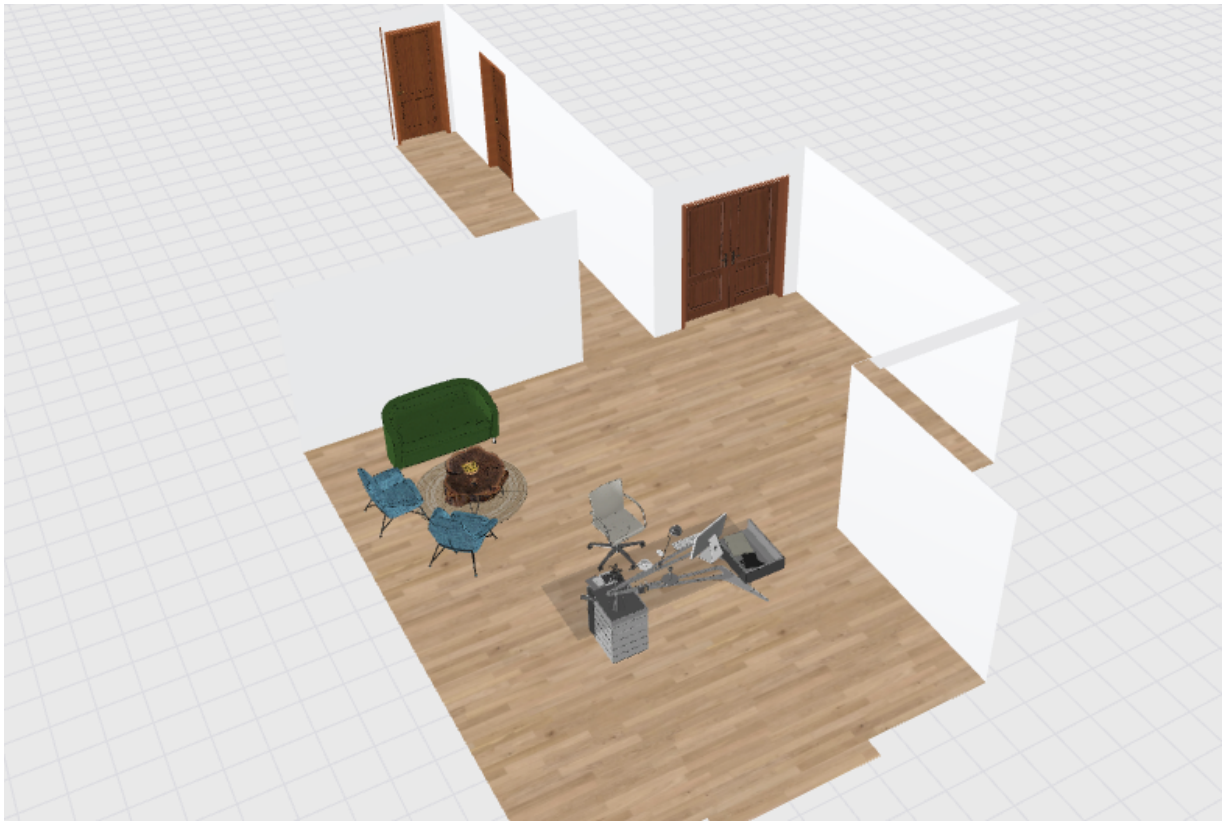









Free Trial: 3



Analysis of critical components:

- Accessibility in Ontario's Building code:
    - Designated wheelchair spaces and adaptable seating. Our floor plan was specifically designed to accommodate wheelchair users.
    - Bathroom stalls are big enough to accommodate wheelchairs.
    - Adaptable seating is also implemented.
- Freezer:
    - The latest iteration of the freezer is in accordance with the clients needs.
    - The freezer will be constructed of foam insulation bonded between two pieces of sheet metal. This will drastically decrease the amount of heat dissipated.
    - The walk-in freezer also minimizes cost since it requires less power than standard individual freezers.
- Offices
    - The building houses individual and identical offices. Although the choice to make the offices individual instead of going for a cubicle approach increases costs. We decided to stick to it, with the agreement of the client, to ensure privacy and confidentiality.

Documentation of Prototype Test Plan (Results and Stoppers) #1

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 1-2 black trucks	The prototype is to scale so we will scale down the measurement of trucks and see if the parking lot and loading dock can accommodate	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 therefore does accommodate trucks	Satisfied when we know a large truck can fit in the parking lot and loading zone

Documented Feedback

Dan’s PM feedback:

Your design is innovative and creative. I like how you incorporated nature into the building, especially with the plant wall in the lab and other plants throughout the space. The idea of having large windows in the kitchen is great; it gives the impression that it’s a spacious room and adds a welcoming and charming touch.

However, I feel that the building lacks some lighting, apart from the natural light from the windows. I don’t see many light sources, such as ceiling lights, which are essential for proper lighting. Additionally, I suggest working on the overall look of the design to avoid making it appear overly industrial. On top of that, you might want to work more on the outside of the building. Adding a cultural space area or some decorative elements, for example, will make your design stand out from the crowd.

A First Nation member's feedback (Micheal’s friend):

I appreciate the effort you put into making the office accessible, following Ontario's Building Code. The wheelchair spaces and roomy bathroom stalls show you're thinking about everyone's needs. The energy-efficient freezer design is cool too. But here's a thought: why not chat more with the local First Nations folks? They could give you awesome insights into their needs and culture because we do not all have the same cultural elements. Maybe add some of their Indigenous artwork or materials? Also, while private offices are nice, think about creating cozy communal spaces. Indigenous gatherings are all about community, you know? Getting advice from local experts could help blend functionality with cultural richness. That’s my friendly suggestion to make the space even more inclusive and welcoming for everyone!

Updated Target Specifications

- **Bathroom BOM:**
  - Number of stalls changed from 3 to 4

Name	Description	Quantity	Cost	Extended Cost	Tax	Total Cost	Links
Toilet	Overall: 14.125" H X 15" W X 30.25" D Weight: 64 lb	3	$321.72	$147.23	$41.82	$1,090.63	Toilet
Urinal	Overall: 12-In x 18-In	2	$486.55	$85.86	$63.25	$1,036.35	Urinal
Bathroom Sink	Overall: 13.78" Standard White Ceramic Rectangular Wall Mount Bathroom Sink with Overflow	4	$420.00	-	$54.60	$1,898.40	Bathroom Sink
Sensor Faucet	Overall: Made of premium stainless steel, multi-layer chrome finish, smooth feeling, stunning looking, rust-proof and durable, drip-free, smooth-feel, resists scratches, corrosion and tarnishing and suitable for bathroom	4	$171.79	$10.91	$22.33	$776.49	Sensor Faucet
Toilet Paper Dispenser	Overall: 8 x 11 x 7"	3	$20.00	-$2.00	$2.34	$61.02	Toilet Paper Dispenser
Framless Mirror	Overall: 40-In x 30-In	4	$222.99	-	$28.99	$1,007.91	Framless Mirror
Wall Mirror	Overall: 48-In x 30-In	1	$165.99	$69.99	$21.58	$187.57	Wall Mirror
Plants	Overall: Artificial Fake Bamboo Plant with Plastic Planter Pot - 39.4-Inch	5	$66.73	-	$8.67	$377.02	Plants
Bathroom Stalls	Overall: Polymer Complete In-Corner ADA Approved Compartment-Left Side 60"W X 61 ¼"D-Gray	4	$2,733	-	$355.29	$12,353.16	Bathroom Stalls
Entrance Door	Overall: Steel Outward Swing Partition Door - 23-5/8"W x 58"H	2	$394.95	-	$51.34	$892.59	Entrance Door
Total						$19,681.14	

- **Lab BOM**
  - Removed fridges, replaced with green wall

Item Name	Description	Cost (CAD)	Quantity	Extended Cost	Tax	Total Cost (CAD)	Links
Masonite Door	4-inch x 80-inch x 4 9/16-inch	CAD 385.00	3	CAD -	CAD 150.15	CAD 1,305.15	Masonite Door
Brown Computer Desk	Desk	CAD 143.09	1	CAD 190.95	CAD 43.43	CAD 377.47	Office Desks
Ergonomic Office Chair	Black Mesh office chair	CAD 75.99	3	CAD 209.93	CAD 56.93	CAD 494.83	Ergonomic Office Chair
Epoxy Resin Countertops	Lab grade countertops (per sqft)	CAD 150.00	64	CAD 59.00	CAD 1,255.67	CAD 10,914.67	Epoxy Resin Countertops
Lab Grade Chemical Resistant Sinks	A stainless steel utility sink	CAD 1,100.00	2	CAD 98.81	CAD 298.85	CAD 2,597.66	Uline-Stainless Steel Utility Sink
Inspiron Dell Desktop Computer 13 Gen I7 Intel CPU	Dell desktop computer for computing data	CAD 1,200.00	1	CAD 241.31	CAD 187.37	CAD 1,628.68	Inspiron Dell Desktop
Seagate Portable 5TB Harddrive	HDD used for storing data	CAD 180.00	1	CAD 9.99	CAD 24.70	CAD 214.69	External Harddrive
Fisher Brand Phenolic Shelving	Chemical resistant black phenolic resin shelving	CAD 114.50	30	CAD 5.00	CAD 447.20	CAD 3,887.20	Fisher Phenolic Shelving
Norbec 8ft x 8ft Walk-In Freezer	Walk in freezer with door and remote refridgeration	CAD 18,301.00	1	CAD 5.00	CAD 2,379.78	CAD 20,685.78	Norbec Walk-In Freezer
Epson Expression Home XP-5200 Desk Printer	Wireless Epson Desk Printer	CAD 130.00	1	CAD 98.81	CAD 29.75	CAD 258.56	Epson Desk Printer
Uline Utility Cart	Hard plastic mobile workstation cart	CAD 173.00	3	CAD -	CAD 67.47	CAD 586.47	Utility Cart
Environmental Lab Study Kit	Lab tools for studying environmental sciences	CAD 266.02	2	CAD -	CAD 69.17	CAD 601.21	Enviornmental Science Kit
Celestron CB2000C Compound Microscope	Professional-grade binocular microscope with 2000x power.	CAD 758.70	1	CAD -	CAD 98.63	CAD 857.33	Celestron Compound Microscope
Logitech NJ129 Wired Keyboard & Mouse	Keyboard and mouse for computer use	CAD 24.97	1	CAD -	CAD 3.25	CAD 28.22	Logitech Keyboard and Mouse
Earth Studio 80 Pot Vertical Garden Kit (Living Wall)	A vertical wall for growing plants	CAD 1,489.95	1	CAD -	CAD 193.69	CAD 1,683.64	Earth Studio Modular Garden
Uline Industrial Steel L Desk	A steel desk 66 x 78 " in dimensions	CAD 1,725.00	1	CAD -	CAD 224.25	CAD 1,949.25	Uline Industrial Steel L Desk
					Total Cost:	CAD 48,070.79	

- **Boardroom BOM**
    - Removed TVs, replaced with large projector

Materials for kitchen/lounge	Price ($)	Quantity	Tax ($)	Total cost ($)	Link
Epson EX3280 3LCD XGA Projector	599.99	1	90.00	689.99	Projector
Tropi co. Home Office Indoor Plant Collection 4-Pack	65	1	9.75	74.75	Plants
Rectangular 6 ft Conference Table	364.85	1	54.73	419.58	Boardroom Table
Home Office Chair	78.99	12	142.18	1090.06	Storage unit
LED Flush Mount Ceiling Light	89.99	2	27.00	206.98	Office Lights
Abstract Canvas Art	221.51	1	33.23	254.74	Painting
Owl Labs Meeting Owl 3	1499	1	224.85	1723.85	Meeting Device
MacBook Pro 3 14''	2699	1	404.85	3103.85	MacBook
Final cost ($)				7563.79	

- **Kitchen BOM**
    - Removed over/stove

Materials for kitchen/lounge	Price ($)	Quantity	Tax ($)	Total cost ($)	Link
Long chairs	169.99	4	101.99	781.95	Chair
Kitchen cabinets	3299.99	1	495.00	3794.99	Cabinet
Kitchen counter	213.99	2	64.20	492.18	Counter
Shelves and storage unit	445.99	2	133.80	1025.78	Storage unit
Refrigerator	1399	1	209.85	1608.85	Refrigerator
Coffee mugs	5	6	4.50	34.50	Mugs
Coffee maker	27.19	1	4.08	31.27	Coffee make
Soap dish	11.49	1	1.72	13.21	Soap
Microwave oven	172.99	1	25.95	198.94	Microwave
Kitchen sink and faucet	325.56	1	48.83	374.39	Sink
Toaster	26.98	1	4.05	31.03	Toaster
Cutery set	5.99	1	0.90	6.89	Cutlery
Glasses set	30.95	1	4.64	35.59	Glasses
Curtains or blinds	69.95	6	62.96	482.66	Blinds
Rugs or carpets	294.99	1	44.25	339.24	Area rug
Trash can and recycle bins	99.99	1	15.00	114.99	Trash can
Arm chair	389.99	3	175.50	1345.47	Chairs
Coffee table	139.99	1	21.00	160.99	Coffee table
Final cost ($)	10872.91				

- **Loading Dock BOM**
  - New

Name	Description	Quantity	Cost	Tax	Total Cost	Links
Large Garage Door	Each door runs in a 4½" deep extruded aluminum guide track and contains aluminum wind stiffeners for added door protection. Bottom breakaway bar allows the door to release from the tracks when struck preventing damage to the screen. Door easily installs in-jamb.	2	$2,819	$366.47	$6,371	Large Garage Door
Shelves	Husky 77-inch W x 78-inch H x 24-inch D 4-Shelf Heavy Duty Industrial Welded Steel Garage Storage Rack Shelving Unit in Black	2	$287	$37.31	$648.62	Shelves
Ramps	Safely load any four-wheel ATV or lawn tractor into your pick-up truck or trailer Includes safety straps to hold ramp in place 1500 lbs. maximum	2	$259.99	$33.80	$587.58	Ramps
Warehouse Trolleys	This utility cart can accommodate larger sized items, giving you an extra base to hold your cargo. Large steel platform truck, sturdy and durable, strong loading capacity. Bearing: 400kg/ 880lb. Material: metal fold-down handle, Steel platform. Size: 90*60*87cm(35.4*23.6*34.3 inch).	2	$533.64	$69.37	$1,206.03	Warehouse Trolleys
Total					$8,813	

- **Walk-in Freezer BOM**
  - New

Name	Description	Quantity	Cost	Tax	Total Cost	Links
Shelves	90-inch W x 90-inch H x 24-inch D 5-Shelf Heavy Duty Industrial Welded Steel Garage Storage Rack Shelving Unit in Black	4	$448	$58.24	$2,024.96	Shelves
Walk-In Freezer		1	$21,000	$2,730	$23,730	Walk-In Freezer
Total					$2,024.96	

Total cost should equal to $23,754.96. Typo in the screenshot.

Prototype Test Plan #2

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (When)
1	Analyzing critical subsystem (Lab) in Prototype 1 for learning. The test will serve to identify any additions we need to make to Prototype 2.	We will use Prototype 1 to analyze the different aspects of the critical subsystems contained within. It will be an analytical prototype because the results from the test will yield from analysis. Using the first prototype and the associated feedback from the clients, we will look into detail to elaborate on all components for the critical subsystem that we chose, which is the lab. The prototype can be built using the modelling skills we learned in the previous labs.	We would measure the changes that we want to implement in the critical subsystem of Prototype 2 when compared to the one in Prototype 1. The information measured will be relative to the feedback given by the client and on other relevant improvements. The data gathered will take form of a list of furniture, equipment, and other assets that we want to add in Prototype 2. It is consistent with the objectives set for this test.	This is a straightfoward test and should take around 1-2 hours. The test depends on client feedback, which we already have gathered. The time seems reasonable. We may take up less time on this task, but this test will be done.
2	Analysis of system integration of the Lab to ensure compatibility with other subsystems for de-risking.	We will use Prototype 1 to analyze the compatibility between Prototype 2 and the other subsystems. It will be analytical because the results from the test will yield from analysis. After we have come up with a list of changes to the lab, we must evaluate the compatibility of the lab to other adjacent rooms and to the building as a whole. The material required is the floor plan of both prototypes. The prototype can be built using the modelling skills we learned in the previous labs.	The information to be gathered will consist of observations from the floor plans. We will note any potential inconsitency in the lab design either in terms of room dimensions, placement of crucial modules or ease of use. We will compile them in a list. This data is very important because it makes a considerable amount of difference in the quality of life for the clients with the use of our building. It is consistent with the objectives set for this test.	This test may take 1-2 hours. However, it is dependant upon the first test, because we need both prototypes to be existant to compare them. To make things go faster, we can split the task between people. The test is an important one because it will avoid compatibility issues in the future. The results will be available in time to make a difference on the project, because we have other tasks dependant upon this one.
		Stopping criteria: We will run the test results and give all the members a look. If they have things to add, they are free to do so. We will repeat the process until everyone has nothing to add to the tests.		

Wrike Snapshot:
https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=1v6LB89euJQfp1rag4WTNUqMebZYgynX%7CIE2DSNZVHA2DELSTGIYA

Conclusion

We made multiple changes to our initial prototype in response to input from other parties, including peers, colleagues, people of the First Nation, project managers, and clients, to ensure that all significant requirements that were overlooked were met. Our bills of materials and detailed design were altered as a result. Last but not least, a precise stopping criterion has been included in the prototype test plan for the first and second prototypes.