uOttawa

Project Deliverable D

GNG 1103 A05, Group 19

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Section 1: Introduction

The purpose of this deliverable will be to lay the foundational design of the facility by detailing how three of the main subsystems of the building will be designed and constructed.

Section 2: Workshop/Garage subsystem

Section 2.1: Jacob's Proposal

The workshop/garage will be a dual purpose space, being able to act as both a workshop for minor vehicle repair and small projects, as well as a garage to store approx. 4 pick up trucks.

To accommodate for its use as a garage it should be approx. 35 feet wide, 15 feet deep, and 9 feet tall, as well as being equipped with 2 large garage doors.

To accommodate for its use as a workshop there should be a standing tool cabinet at the back of the room, multiple wall mounts for any power tools that are too large for the tool cabinet and a wall mounted folding table to provide a work environment. All of these features ensure that the space can be quickly adjusted to accommodate either of its needs,

Section 2.2: James' proposal

This space is essentially an extension of the building that lacks any of the insulation, flooring and accommodations that the rest of the building has. It is meant to keep out the elements and not much else. This space would be about 600 square feet(20ftx30ft). Under the current budget the more stripped down the garage is, the larger we can make it. Think of an aeroplane hanger or warehouse but on a smaller scale. The floor is just flat concrete, the walls can be made of thick steel sheet metal, and the roof can just be a standard open gable.

The most important part of this proposal is the loading bay. This is an extension of the building at the back, it is not meant to be seen by anyone but the people that are using it. In this location a loading bay to the lab can be implemented to have easy access to material brought in by the trucks. Raised doors at the same level as the truck bed can allow items to be rolled in instead of lifted by employees which will be helpful.

There are a few options for the style of doors in the garage. The entrance can have sliding doors which can increase the size of the opening. Regular garage doors might be too expensive to fix the dimensions required. Swinging barn doors is the easiest and least expensive option. The doors from the loading bay to the lab can be large double doors that swing open and can be held open with a chain.

For tool storage the walls can be used by putting up pegboard and gridwall. Tools can be hung up and organised there.

Section 2.3: Esther's proposal

Our research centre can allow activities by establishing a workshop/ garage subsystem. To begin, the space is an adjunct to the building. The dimension is about 750 square feet. The workshop area would be equipped with a movable workspace; the body of which is made of wood and stainless surface. The dimension is approximately 30-60 inches. Also, it would consist of a canopy to serve as a shed alongside tables and chairs.

Next is the garage space/loading bay, this space is located right behind the lab. The dimensions should be approximately 40ft wide, and 14ft high. Especially the loading bay because of trucks that bring in supplies and send out supplies. It has electronically controlled doors so it's easier for employees to use. It will be built with concrete. The garage door style will be that of a sliding door.

Also, the tool storage will be in a small room of about 5ft by 5ft with a long peg board to store equipped. Thus, there will be enough space for other machinery to be stored.

Section 2.4: Nick's Proposal

The workshop/garage area will consist of a garage space (40x20) which should fit approximately 4 vehicles at once. With an additional outdoor parking with another ~10 spaces for employees and other visitors.

Additionally a workshop space will be built adjacent to the garage. This space should include most of the tools needed for the facility as a whole. There will be a cabinet and a large working space/table to have for any repairing/projects of all sorts of sizes. The workspace should probably just be around 15 x 15 in size.

The garage space doesn't need any form of heating or ac really and will half a large garage door for vehicles to enter. Additionally the workshop should be heated and more apart of the actual building itself.

Section 3: Lab Subsystem

Section 3.1: Esther's Proposal

The design layout for our Indigenous Animal and Plant Research Lab incorporates a compatible blend of functionality and sustainability. The lab comprises segregated sections for animal and plant research, each equipped with necessary infrastructure like analytical equipment and 2-4 microscopes among others. This should be able to accommodate 4-5 people.

Furthermore, the animal research wing features spacious, climate-controlled vivariums with environmental controls and comfortable holding areas that can accommodate 5 people at a time. The plant research section boasts controlled growth chambers with customizable light and temperature

settings, hydroponic and soil-based cultivation areas, and dedicated spaces for specimen storage and analysis. For example, storage places like the freezer, and the medium size freezer would be acquired. Shared spaces include cutting-edge equipment and a sterile preparation area. The entire lab is infused with ample natural light, energy-efficient LED lighting, and a sophisticated HVAC system, all contributing to an eco-friendly design.

Importantly, a lab should be built with safety measures in mind, therefore, the lab will consist of a fume hood for handling potentially hazardous materials. Also, there is a site for emergency eyewash and shower stations. Also, there is a placement for a cabinet to store specimens and/or chemicals. Also waste management system will be put in place to reduce carbon footprint or release of harmful substances to the environment.

A centralized data hub allows for real-time data sharing between both research areas, promoting collaboration and fostering interdisciplinary research. For instance, the computer's workspace is created for an AIO computer which should be approximately 5 computers. Additionally, the facility adheres to the highest safety and biosecurity standards, ensuring researchers' welfare and the studies' integrity. This versatile and sustainable research lab is a hub for innovative, biological research and environmental conservation.

Section 3.2: Jacobs Proposal

The Lab subsystem should be split into 3 main sections: analysis, storage, and experimentation. The analysis section will consist of 6-8 stations, each station being made up of a table, chair, and desktop computer; this section of the room should be about 15 ft wide and 30 ft long. The storage section will consist of storage cabinets for equipment and room-temp safe materials, and a walk-in freezer; the walk-in freezer will be 6 ft by 8 ft and the rest of the section will be 15 ft by 15 ft. The experimentation section will be 30 ft by 30 ft and consist of 6-8 lab benches, as well as 2-4 sinks. The room will be laid out with the analysis section first, then the experimentation section, then the storage section.

Section 3.3: James' Proposal

There are two sections of the lab. The main laboratory and the computer laboratory. These are two rooms that are about 30 ft by 20 ft separated by a wall with a very large clear window and a door. In the computer laboratory this is where all of the high speed desktop computers with ethernet cables will be. All of the data collected in the lab will be processed, and stored

here. There will be two long desks with 3 spaced out monitors each to give the scientists space.

In the main laboratory there will be three lab benches arranged perpendicular to the large window. These lab benches are long enough so that two people can work on each. Underneath each of these lab benches the glassware, hotplates, thermometers and other equipment is stored. On the other side of the room there are lockers and drawers that are used to store chemicals, waste containers and the scientist's belongings.

Section 3.4: Nick's Proposal

The lab subsystem should consist of a space for computers and research type activities, and a second space for hands-on activity and experiments with more proper tools and such.

The computer laboratory/research space should be a simple room (15 x 15) with 5 computers and additional desk space for papers + written research. Additionally there will be some cabinets.

The other section will be slightly larger (20 x 20) and consist of the standard laboratory materials such as glassware, chemicals, hotplates, and other laboratory equipment.

Section 4: Cultural Space Subsystem

Section 4.2: Jacobs proposal

The cultural space will be a place for people to enjoy, and connect to indigenous culture. As such it should be dedicated to the display of indigenous art and culture as well as conversation between people.

To facilitate this the space will be an open concept room, approx. 30 ft wide, 45 ft deep, and 15 ft tall, with plenty, with room on the walls for indigenous art, a sound system for playing indigenous music, and a a set of bookshelves on the far side of the room to hold indigenous literature. The bulk of the space of the room will be filled with a large common area with lots of seating to facilitate group gatherings.

The space can also be converted to a presentation space. To facilitate this a small (10 ft by 10ft) storage room will be included to store spare chairs and presentation materials.

Section 4.3: Nicks Proposal

The general layout of the cultural space system should be very large as large portions of this area will be outside. The outdoor space should be ~0.5 acre as that leaves plenty of

recreational space to allow for a safe feeling space for connection between people and room to plant a garden to lessen the environmental impact of the building.

The indoor section of the cultural space subsystem should generally consist of a room to help show off indigenous culture. The room should be decently big (30ft x 20ft) so we can fit the many important aspects to show off indigenous culture. It will be set up to look like almost a miniature museum, with artwork, interesting tools and tradition all being shown off with small plaques to give a brief description in case anyone is interested.

Additionally this space should also have plenty of seating and generally open space to talk to people. The room should be located around the center of the building to make it the easiest section to access. The outdoor and indoor sections should also be connected via a clear glass patio door to give a better "connection" to nature while in the area.

Section 4.4: James' Proposal

The cultural space can mostly be outside with a smaller section of the inside of the building. The outside cultural space consists of a patio (40x30ft) and an extension of the roof over the patio supported by beams. The outdoor cultural space might be used for skinning deer, the roof must be 15-20 ft high. The rest of the outdoor space about 1 acre can have a grass clearing (0.25acre) for people to hang out and a natural zone where the forest can grow naturally. The idea behind this is that herbs, mushrooms and other ingredients can be harvested and used in cultural practices. In the grass part there is a fire pit made with cinder blocks.

The interior of the cultural space is a room about 400 square feet, where all of the native practices can be displayed. The wall is panelled with wood from the local tree species, there are aligned in rows parallel to each wall. In the

Section 5: Synthesis of Subsystems

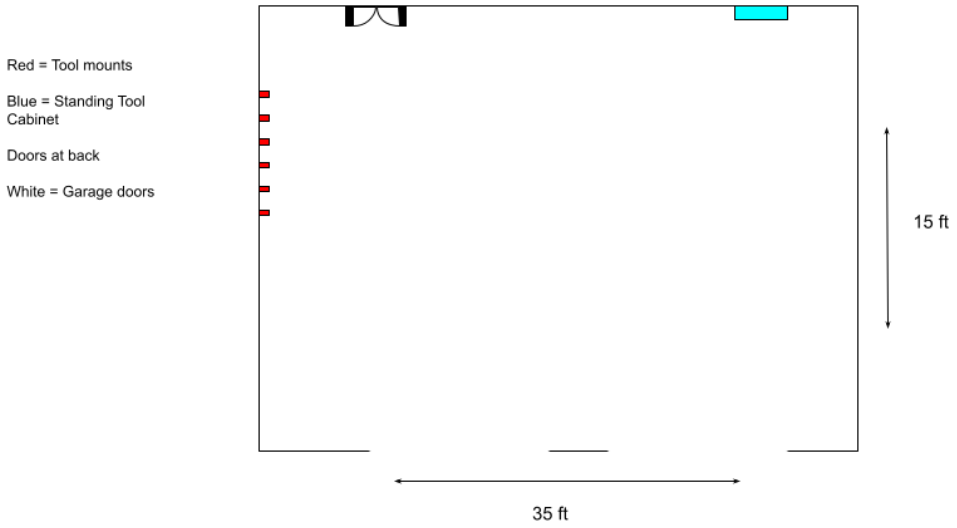
Section 5.1: Workshop Subsystem Solution 1 (Jacob)

The workshop/garage will be a dual purpose space, functioning both as a workshop for completing minor repairs as well as a space to store vehicles while not in use.

The room will lack insulation and fine detail to save on cost, with poured concrete flooring and basic walls. Dimensions wise the room will be 35 ft wide, 15 ft deep, and 9 ft tall.

To facilitate its use as a garage it will contain 2 garage doors for allowing vehicle entry, as well as ample space to store approx. 4 trucks.

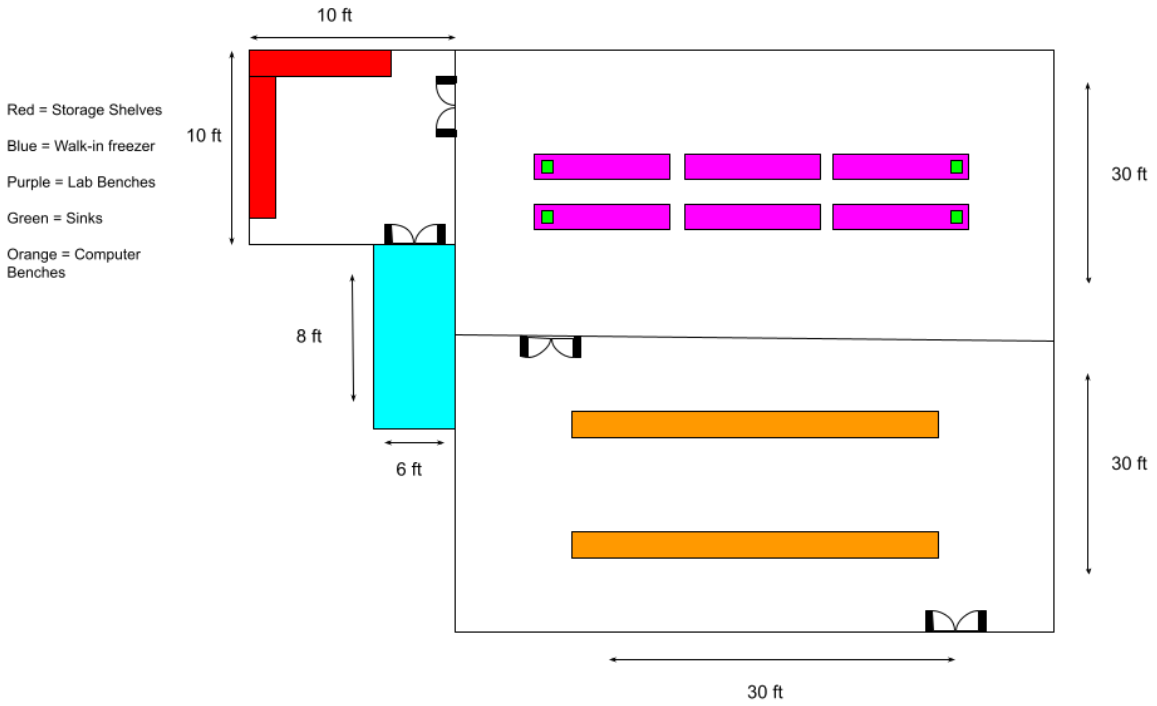
To facilitate its use as a workshop there will be a standing tool cabinet at the back of the room, multiple wall mounts for any power tools that are too large for the tool cabinet and a wall mounted folding table to provide a work environment. All of these features ensure that the space can be quickly adjusted to accommodate either of its purposes.



Section 5.2: Workshop Subsystem Solution 2 (Esther)

Section 5.3: Lab Subsystem Solution 1 (Jacob):

The Lab subsystem will be split into 3 main sections: analysis, storage, and experimentation. The analysis section will be 15ft x 30ft is where all of the high speed desktop computers with ethernet cables will be. All of the data collected in the experimentation section will be processed, and stored here. There will be two long desks with 3 spaced out monitors each to give the scientists space. The experimentation section will be 30 ft by 30 ft and consist of 6 lab benches, as well as 4 sinks. The room will be laid out with the analysis section first, then the experimentation section, then the storage section.
The storage section will consist of storage cabinets for equipment and room-temp safe materials, and a walk-in freezer; the walk-in freezer will be 6 ft by 8 ft and the rest of the section will be 10 ft by 10 ft.



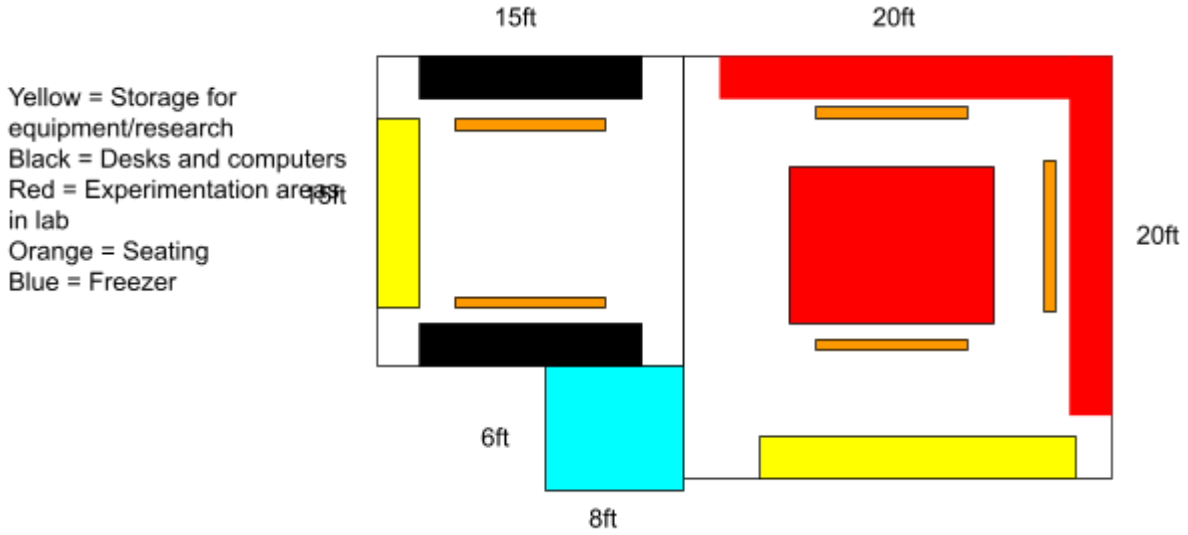
Section 5.4: Lab Subsystem Solution 2 (Nick)

All measurements in feet

The lab subsystem will consist of 3 rooms. The first room will be a research/computer lab space (15 x 15). This room will be designed with 5 desks each with its own computer. An additional table will be there for written documents and there will be storage cabinets for data and other printed resources.

The second room will be a proper lab area (20 x 20). There will be plant and animal research done in this space. The animal research wing features spacious, climate-controlled vivariums with environmental controls and comfortable holding areas that can accommodate 5 people at a time. The plant research section boasts controlled growth chambers with customizable light and temperature settings, hydroponic and soil-based cultivation areas, and dedicated spaces for specimen storage and analysis. The lab will also include basic lab benches and include storage for basic lab equipment such as glassware.

The third room will be a walk-in freezer area (6 x 10) to store anything that is needed to be kept in colder temperatures.

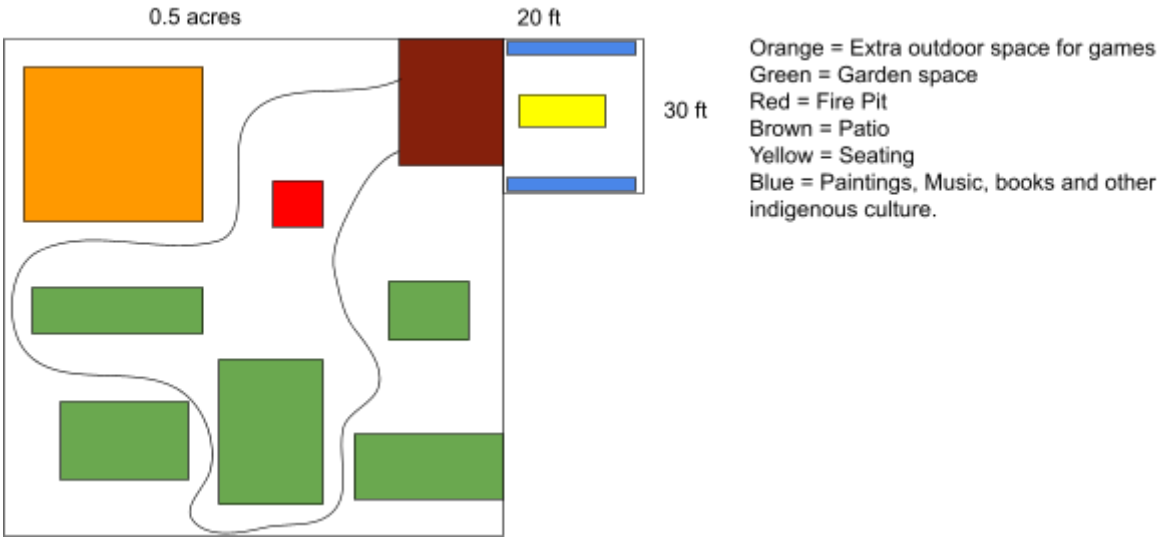


Section 5.5: Cultural Space Subsystem Solution 1 (Nick)

The Cultural Space subsystem will consist of 2 main areas. The first area will be the outdoor section. This area will have plenty of large space to make it feel naturally incorporated with nature. It is going to be very large (~0.5 acres) and have a path going through it and a small area to show off some of the natural parts of indigenous culture in canada. Other than the garden there will also be a nice patio with a sitting space around it, a campfire pit can be found here and general outdoor activities can be done.

The other room will be a large open room (30 ft x 20 ft) that will be filled with artwork, statues, music, books and everything you could think of involving indigenous culture, some sections will have plaques and be like a miniature museum of sorts. The space will include lots of chairs and tables to sit and communicate/connect with anyone else in the space. This area will be a nice place to relax and appreciate culture.

The two rooms will be connected via a glass door to the patio in the outdoor space, increasing the connectivity of the area.



Section 5.6: Cultural Space Subsystem Solution 2 (James)

The cultural space can mostly be outside with a smaller section in the inside of the building. The space can also be converted to a presentation space. To facilitate this a small (10 ft by 10ft) storage room will be included to store spare chairs and presentation materials. The outdoor space should be ~0.5 acre as that leaves plenty of recreational space to allow for a safe feeling space for connection between people and room to plant a garden to lessen the environmental impact of the building. The outside cultural space consists of a patio (40x30ft) and an extension of the roof over the patio supported by beams. The outdoor cultural space might be used for skinning deer, the roof must be 15-20 ft high. The rest of the outdoor space about 1 acre can have a grass clearing (0.25acre) for people to hang out and a natural zone where the forest can grow naturally. The idea behind this is that herbs, mushrooms and other ingredients can be harvested and used in cultural practices. In the grass part there is a fire pit made with cinder blocks. The indoor section of the cultural space subsystem should generally consist of a room to help show off indigenous culture. The room should be decently big (30ft x 20ft) so we can fit the many important aspects to show off indigenous culture. Additionally this space should also have plenty of seating and generally open space to talk to people. The room should be located around the centre of the building to make it the easiest section to access.

Section 6: Final solutions

Section 6.1: Full Solution 1 (Jacob)

The full global solution will be a combination of 5.1, 5.3, and 5.6. Starting from the lobby, turning left will bring you to the science wing of the building, where you'll find both the lab and the garage/workshop.

The lab is on the left; it is split into 3 main sections: analysis, storage, and experimentation. The analysis section is 5ft x 30ft and is where all of the high speed desktop computers with ethernet cables are. All of the data collected in the experimentation section is processed, and stored here. There are two long desks with 3 spaced out monitors each to give the scientists space. The experimentation section is 30 ft by 30 ft and consists of 6 lab benches, as well as 4 sinks. The room is laid out with the analysis section first, then the experimentation section, then the storage section.
The storage section consists of storage cabinets for equipment and room-temp safe materials, and a walk-in freezer; the walk-in freezer is 6 ft by 8 ft and the rest of the section is 10 ft by 10 ft.

If you instead turn right, you will enter the workshop/garage, which is a dual purpose space, functioning both as a workshop for completing minor repairs as well as a space to store vehicles while not in use.

The room lacks insulation and fine detail to save on cost, with poured concrete flooring and basic walls. Dimensions wise the room is 35 ft wide, 15 ft deep, and 9 ft tall.

To facilitate its use as a garage it will contain 2 garage doors for allowing vehicle entry, as well as ample space to store approx. 4 trucks.

To facilitate its use as a workshop there is a standing tool cabinet at the back of the room, multiple wall mounts for any power tools that are too large for the tool cabinet and a wall mounted folding table to provide a work environment. All of these features ensure that the space can be quickly adjusted to accommodate either of its purposes.

If you were to take a right from the lobby you would instead enter cultural space; the cultural space is mostly outside, with a smaller section in the inside of the building. The space could also be converted to a presentation space. To facilitate this a small (10 ft by 10ft) storage room is included to store spare chairs and presentation materials. The outdoor space will be ~0.5 acre, meaning that there will be plenty of recreational space to allow for a safe feeling space for connection between people and room to plant a garden to lessen the environmental impact of the building. The outside cultural space consists of a patio (40x30ft) and an extension of the roof over the patio supported by beams. The outdoor cultural space might be used for skinning deer, the roof must be 15-20 ft high. The rest of the outdoor space about 1 acre can have a grass clearing (0.25acre) for people to hang out and a natural zone where the forest can grow naturally. The idea behind this is that herbs, mushrooms and other ingredients can be harvested and used in cultural practices. In the grass part there is a fire pit made with cinder blocks. The indoor section of the cultural space subsystem consists of a room to help show off indigenous culture. The room is 30ft x 20ft. Additionally this space also has plenty of seating and generally open space to talk to people. The room is located around the centre of the building to make it the easiest section to access.

Section 6.2: Full Solution 2 (James)

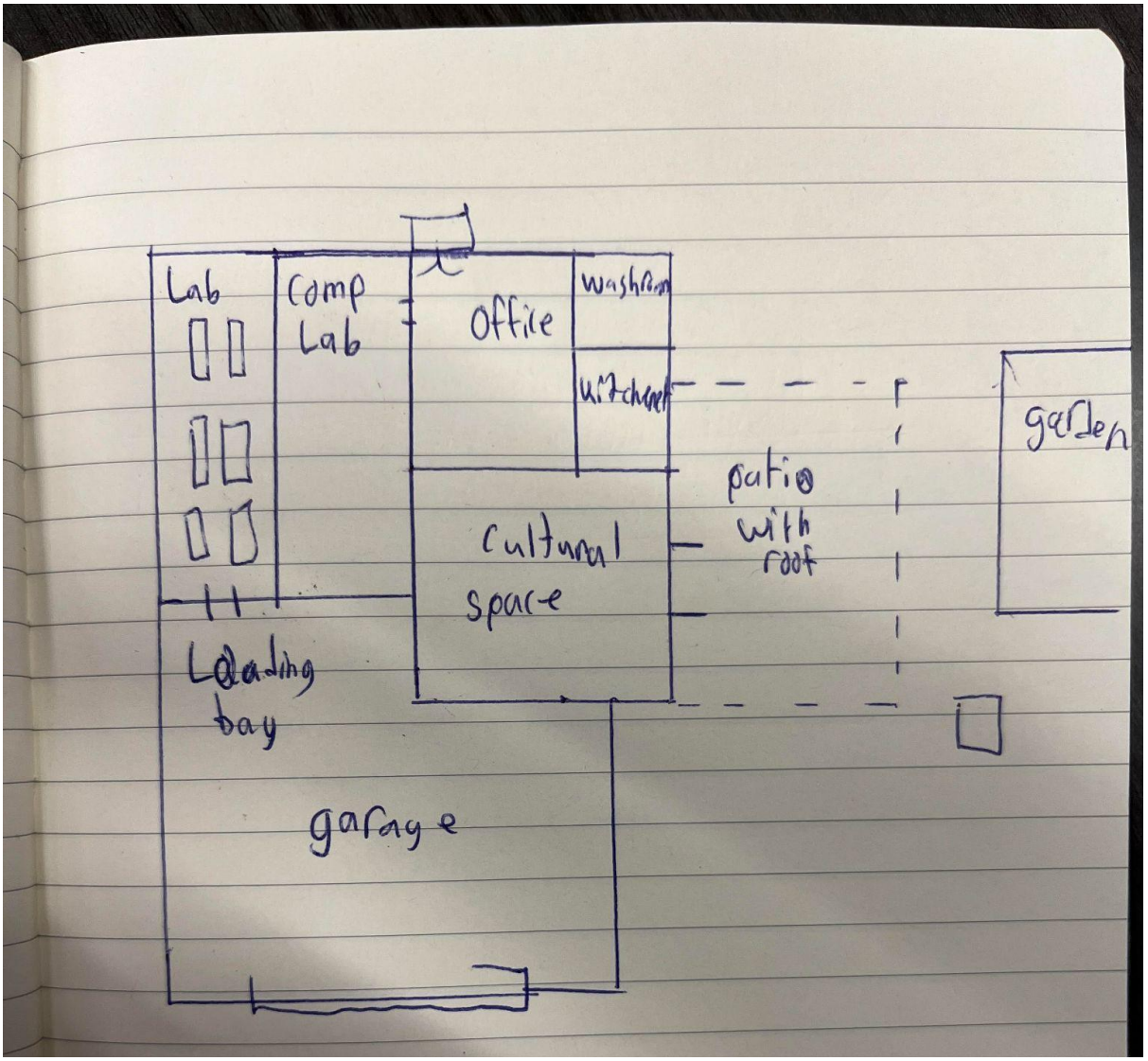
This solution includes elements from 5.1, 5.3, 5.5.

The front entrance of the building leads to the office where there are some office desks and space for a secretary and some phones. Attached to the office there is also a washroom and kitchenette. The washrooms have 2 stalls each and the kitchenette has a countertop with a sink and cupboards.

Moving on, to the right of the entrance is the computer lab. In here there is about (15ft x 30ft) of space where all of the high speed desktop computers with ethernet cables will be. All of the data collected in the experimentation section will be processed, and stored here. There will be two long desks with 3 spaced out monitors each to give the scientists space. Moving forward the lab is adjacent to the computer lab and there is a large glass window between the two rooms. The experimentation section (the main lab) is going to be about (20 x 40) feet with six lab benches, 4 sinks and a standard freezer. At the far end of the room there is a loading bay that leads to the garage. This is essentially a garage door that makes it easy to bring cumbersome items into the lab for examination.

The garage/workshop area is a very barebones section of the building. What it lacks in amenities it makes up for in the amount of space it has. There is no heating or insulation, the floor is poured concrete and the walls are inexpensive. This space is designed to store up to 4 trucks and have space for storing tools. The dimensions will be (30x20x10). There will be 2 large garage doors that lead out to the driveway that loops around the building. At the back of the garage/workshop (opposite the garage doors) there is gridwall for hanging up tools and a locker/toolbox to store equipment.

Just past the office is the cultural space. This is an open concept area that is meant to display indigenous culture and be used for multiple purposes. The room is about (20x30ft) with 4 rows of bench style seating arranged for presentations. On the walls there is wood panelling from local tree species and space for indigenous art. The cultural space is divided into two areas, indoor and outdoor. On the left side of the indoor section there is a door that leads outside to the patio. This patio is (30x30ft) and the roof of the building extends over to protect from the rain. The height of the roof over the patio is (15-20ft) so that this space can be used for skinning a deer. 4 picnic benches are also in this space. The rest of the (0.5acre) outdoor cultural centre is allocated to gardens and green space. This includes a grass clearing (0.25acre) for people to hang out and a natural zone where the forest can grow naturally. The idea behind this is that herbs, mushrooms and other ingredients can be harvested and used in cultural practices. In the grass part there is a fire pit made with cinder blocks.



Section 6.3: Full Solution 3 (Nick)

This full solution will consist of 5.1, 5.4, and 5.5
First entering the building there will be a small lobby with many different doors leading off of the room and into the subsystems of the building. The first door on the right will lead into the workshop/garage area. The door in the center will lead to the cultural space, and the door on the left will lead to the lab area. Other doors may also lead to small offices and bathrooms and other essential zones as well.

The workshop/garage will be a dual purpose space, functioning both as a workshop for completing minor repairs as well as a space to store vehicles while not in use.

The room will lack insulation and fine detail to save on cost, with poured concrete flooring and basic walls. Dimensions wise the room will be 35 ft wide, 15 ft deep, and 9 ft tall.

To facilitate its use as a garage it will contain 2 garage doors for allowing vehicle entry, as well as ample space to store approx. 4 trucks.

To facilitate its use as a workshop there will be a standing tool cabinet at the back of the room, multiple wall mounts for any power tools that are too large for the tool cabinet and a wall mounted folding table to provide a work environment. All of these features ensure that the space can be quickly adjusted to accommodate either of its purposes.

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The second room will be a proper lab area (20 ft x 20 ft). There will be plant and animal research done in this space. The animal research wing features spacious, climate-controlled vivariums with environmental controls and comfortable holding areas that can accommodate 5 people at a time. The plant research section boasts controlled growth chambers with customizable light and temperature settings, hydroponic and soil-based cultivation areas, and dedicated spaces for specimen storage and analysis. The lab will also include basic lab benches and include storage for basic lab equipment such as glassware.

The third room will be a walk-in freezer area (6 ft x 10 ft) to store anything that is needed to be kept in colder temperatures.

The Cultural Space subsystem will consist of 2 main areas. The first area will be the outdoor section. This area will have plenty of large space to make it feel naturally incorporated with nature. It is going to be very large (~0.5 acres) and have a path going through it and a small area to show off some of the natural parts of indigenous culture in canada. Other than the garden there will also be a nice patio with a sitting space around it, a campfire pit can be found here and general outdoor activities can be done.

The other room will be a large open room (30 ft x 20 ft) that will be filled with artwork, statues, music, books and everything you could think of involving indigenous culture, some sections will have plaques and be like a miniature museum of sorts. The space will include lots of chairs and tables to sit and communicate/connect with anyone else in the space. This area will be a nice place to relax and appreciate culture.

The two rooms will be connected via a glass door to the patio in the outdoor space, increasing the connectivity of the area.

These three major areas of the building will be what make the vast majority of the building. Other than those you may find offices in the main area other small things like bathrooms and eating spaces off of the lobby of the building.

Section 7: Selection of final solution and explanation. (Jacob)

*Designs will be rated on a scale of 1-5, 5 being very well fulfilled, 1 being very poorly fulfilled. Needs that are not applicable have been removed.

Needs	**6.1**	**6.2**	**6.3**
Various handheld equipment	4		4
A common/boardroom area required	5		3
Shed separated from building for trucks	3		3
Freezer space required	5		5
Space to dry hides and clean fish.	3		3
Workspace for experiments to be carried out as well as spaces for computer monitors for data processing (ie. a lab)	5		3
Space to dry and store medicines	3		2
Multi-functional workspace preferred	4		4
Building should reflect First Nation peoples and culture	4		5
Should be a place where First Nation communities can connect	5		4
Loading Bay	4		2
TOTAL	45		38

6.1 has the greatest total and therefore we will be selecting it to move forward with.

Section 8: Wrike snapshot

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=RqywsAqe8wFw9MOv461cI1JMDs27TndC%7CIE2DSNZVHA2DELSTGIYA