Deliverable D - Conceptual Design

Eco Engineers:

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Introduction

Conceptual designing plays a key part when working towards a final product, it allows for different ideas to be considered and criticized. In this deliverable, we developed conceptual designs for our project based on technical benchmarking and design criteria. Each team member generated concepts for the subsystems, and we've collaborated to refine them. We've selected the best out of three fully functional solutions based on the design criteria while documenting our process for future modifications.

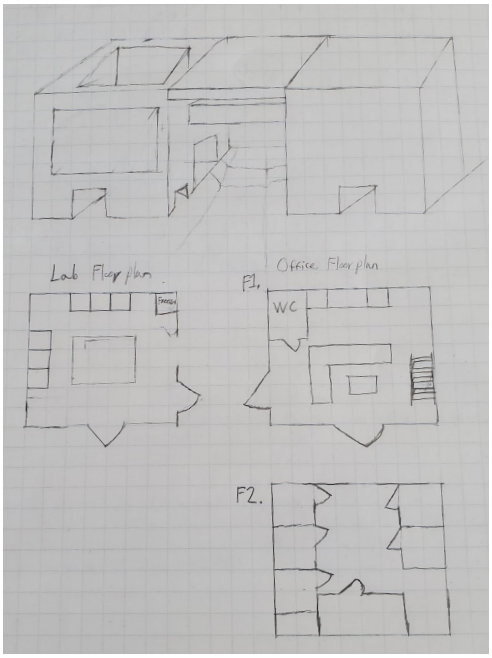
Definition of Subsystems

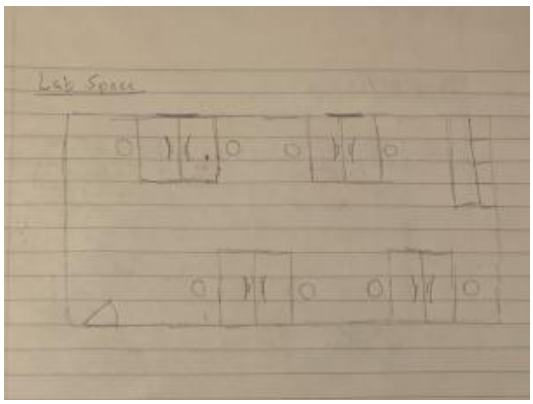
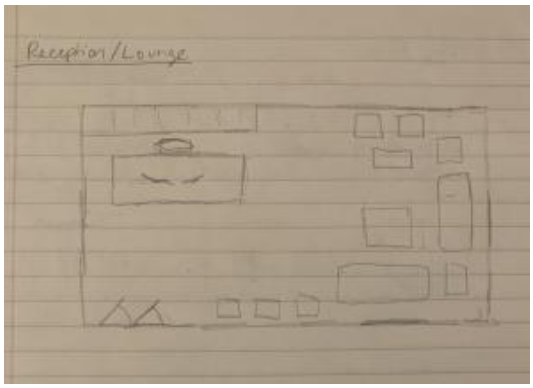
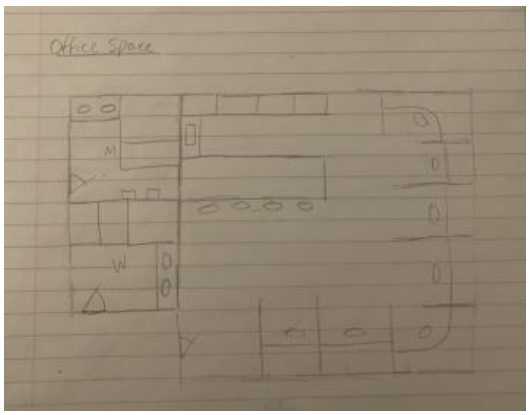
The three subsystems defined presently before the second client meeting are the office space, the lab space, and the reception/community lounge area. Based on the previously determined design criteria, most of the required needs fit into these three categories.

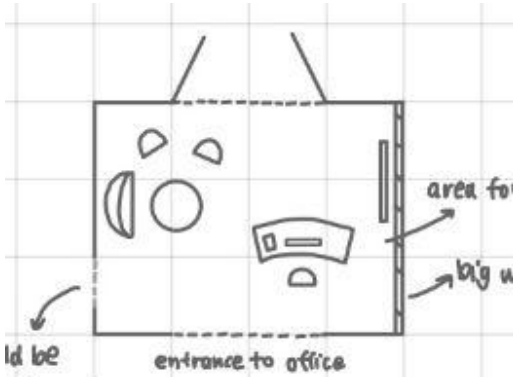
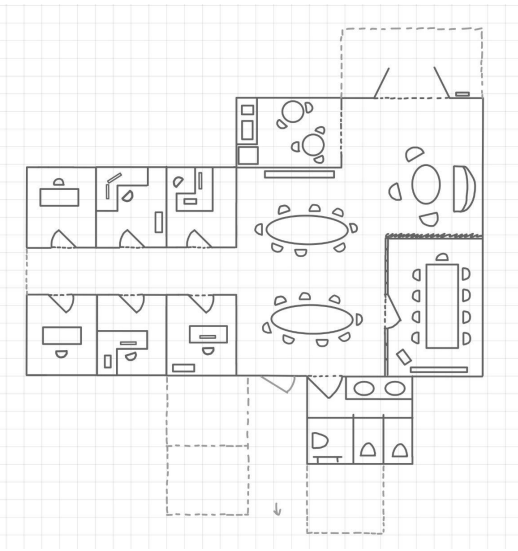
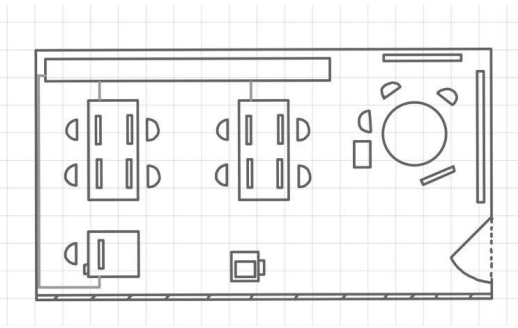
In general, it was defined that the office space would consist of both individual and communal work spaces, resting areas such as kitchenette and washrooms, and a private board room. The reception would include open space for community involvement and the lab space would have an industrial sink, freezer, and lab benches for cultural tasks.

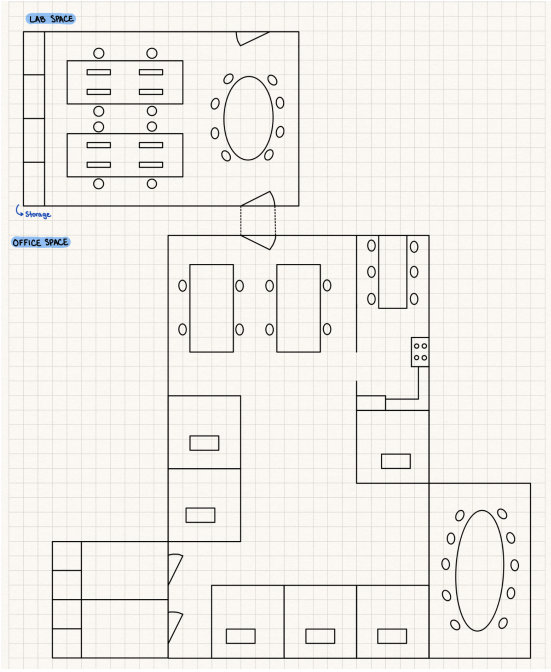
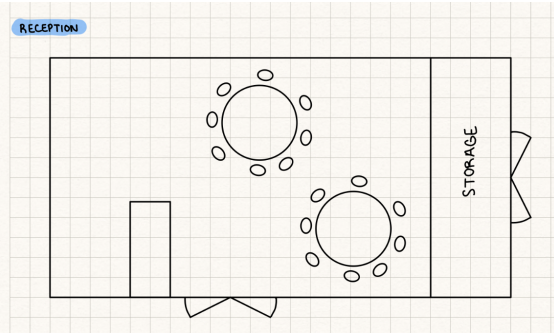
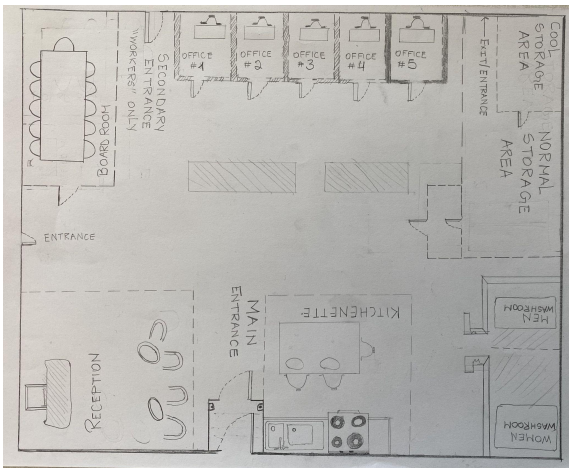
Subsystem Concepts

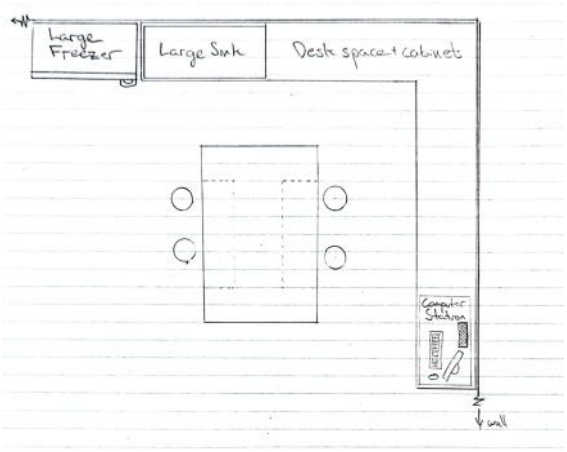
Concepts	Pros	Cons

 **Francis**	● Big window in ceiling ● Space efficient, in terms of office spaces ● Overhang ● Easy access for loading/unloading equipment ● Open lab space	● Expensive and difficult to ● Does not have a large communal space ● Small office space ● Not enough room for storage space

   **Jack**	• Washroom layouts are well thought out • Big doors at reception	• Lab space was not what the client desired, one large lab bench in the center of the room • Reception area takes up a lot of space that could be used for something else • Lots of computers ($$)

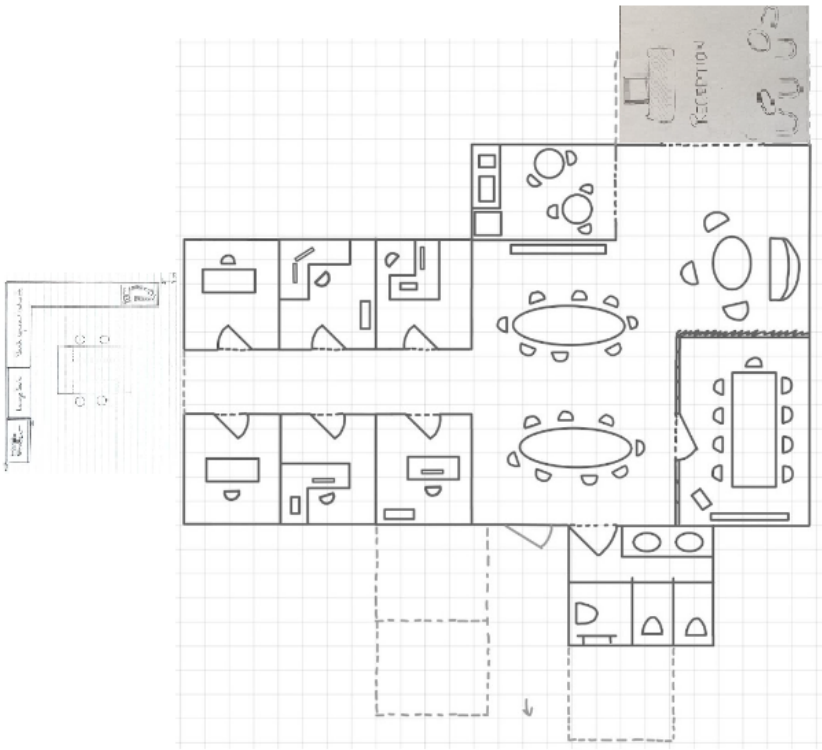
   **Liana**	● Large open spaces ● Neat and well organised ● Lots of windows for natural light ● Great office layout, individual office spaces are a good size	● Has too much lab space (the client mentioned that the lab space does not need to be separate) ● More space needed in the reception/lounge area ● Conference room beside communal work space may be disruptive

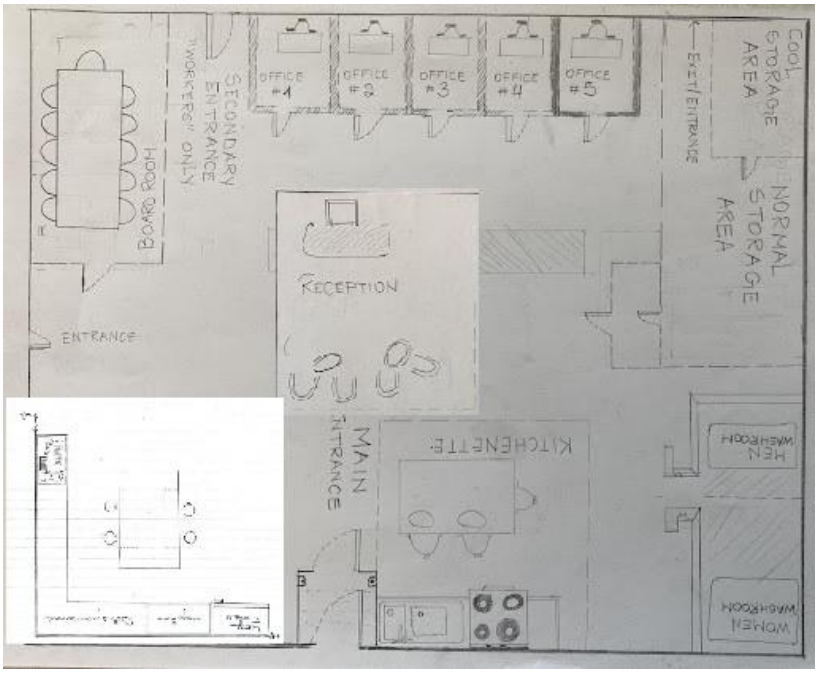
  **Emiline**	• Open and comfortable space • Plenty of office space • A lot of room for visitors to come in a work • Space is well thought out and doesn't waste space. • Nicely spaced out. Reasonable amount of offices.	• Conference room could be more central • Lab space does not appeal to the needs of the client • Exceedingly large reception may be redundant • Lack of lab space and the sink.
 **Eliel**	• Open concept • Very complete (contains all relevant components)	• Quite a bit of wasted space in the center • Lack of lab space • Too few office spaces (probably fixable) • Central space could be used more effectively

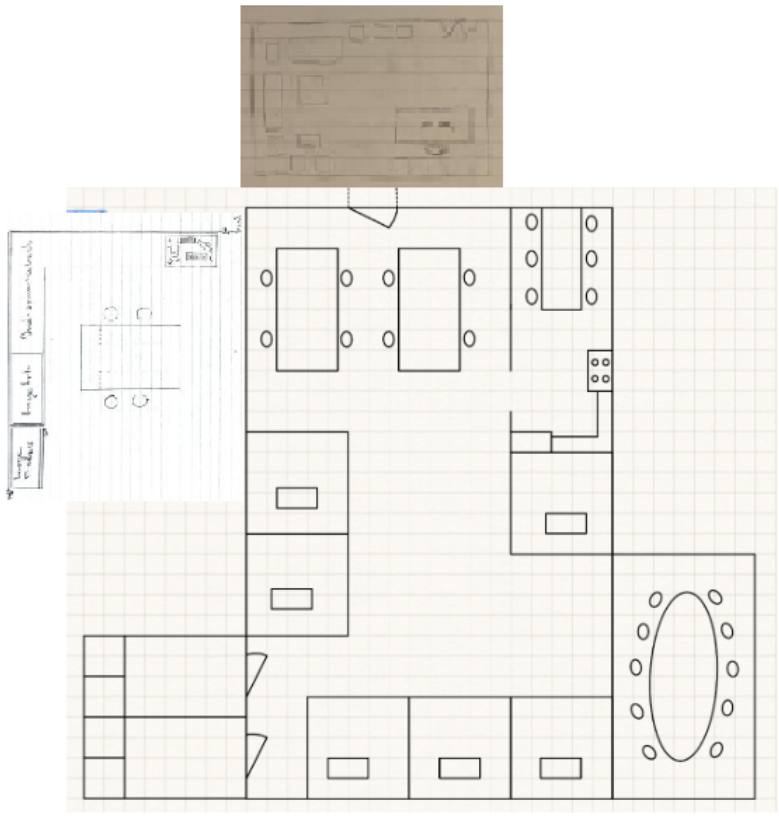
 **Adam**	• Open lab space • Appeals to client's needs • Plenty of room for multiple people to be working at a time	• Somewhat lack of storage space

Potential Solutions

There are benefits and drawbacks to each subsystem, therefore the three modified concepts for each subsystem are reconsidered and combined with the design criteria and client's best interest in mind.

Sketch	Notes
	This improved conceptual design merges the best aspects from Adam's lab space, Eliel's reception, and Liana's office space. The benefits of this concept is that it fulfills the client needs based on the design criteria including the bathroom, kitchenette, board room, additional work common area, lab benches and separate office spaces. Also, a benefit is the open space. Based on our design criteria, the open space for community involvement was important to the client. There would need to be an additional back access double door in order to fulfill the client's need for equipment transport and some additional storage space for

Concept 1	large equipment. It would also be better to optimize the location of the conference room to lower disruptions.
 **Concept 2**	This updated conceptual design combines the best features from Adam's lab space and from Eliel's office space and reception. The benefits of this concept is that it fulfills the client needs based on the design criteria including the bathroom, kitchenette, board room, storage space, lab benches, and separate office spaces. Also, a benefit is the open space. Based on our design criteria, the open space for community involvement was important to the client. There would need to be an additional office space in order to fulfill the clients need for a minimum of 6 office spaces and double wide access doors at the secondary entrance for equipment transport.



Concept 3

This renewed conceptual design combines the best qualities from Adam's lab space, Emiline's office space, and Jack's reception.

The benefits of this concept is that it fulfills the client needs based on the design criteria including the bathroom, kitchenette, board room, storage space, lab benches, and separate office spaces. Also, a benefit is the large comfortable space. Based on our design criteria, the open space for community involvement was one of the priorities of the client.

There would need to be an optimization of the space used in the reception, a more central conference room, and back access double door in order to fulfill the clients need for equipment transport.

Final Solution

The team decided to use a rating system from 1 to 3 using a selection matrix in reference to the design criteria established in Deliverable C to evaluate each concept.

	Design Concepts		
Design Criteria	**Concept 1**	**Concept 2**	**Concept 3**
Building must-haves	3	3	3
6-15 office spaces with spaces for labs	3	1	3
Open space for community involvement	2	3	1

Central common area for staff members involvement with a large table	3	3	3
Disability accessibility	3	2	3
Loading dock for equipment into and from vehicles	1	1	1
Animal processing space for traditional hyde tanning, minimum 16-20 feet tall (ex. Deer, moose)	1	1	1
Garage type space for snowmobile and atv parking	1	1	1
Contains space for a minimum of 5 computer Workstations, with space available for a maximum of 10	3	3	3
Open work space for plant processing/Lab space for plants, including a mobile plant processing station (lab bench/table not wooden)	3	3	3
Freezer space for storage of organic samples: deep freezer	3	3	3
Versatile storage facilities and space for handheld equipment	1	3	1
Security system	3	2	2
Has to reflect who they are, sustainability and promote a sustainable	3	2	2

way of life, architectural design of the building should reflect them as well			
FINAL VERDICT (SUM)	**33/42**	**31/42**	**30/42**

Therefore, our final global concept is concept #1.

The benefits of this concept is that it fulfills the client needs with some aspects to be optimized and changed. For example, there are a minimum of 6 private office spaces, resting areas such as the bathroom and kitchenette, a private boardroom and space for community involvement. In the lab, there is freezer space, lab benches to work on plant processing, and room for computers for data entry. The reception area is also large enough for community visitors.

Some aspects to be improved on is the addition of a loading dock with double doors for transportation of large equipment, definition of where the animal processing will be held, and a concept for the garage space used for snowmobile and atv parking. There would also need to be additional storage reserved for equipment, such as handhelds.

Conclusion

In conclusion, this deliverable marks a crucial phase in our project's development as it allows for our team to generate conceptual designs, compare and contrast them, and select the best for our client. In this case, concept #1 was selected as it satisfies the clients needs and preferences while leaving room for future modifications as needed. Thorough documentation of our process during this phase has ensured adaptability as the project evolves. The next deliverable will involve our team deciding on specifics for costs and components of the project, by using the conceptual design as our guide to do so.