Deliverable C - Design Criteria

Eco Engineers:

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Introduction

There are a number of primary concerns when designing a building. It must, of course, be connected to electricity, have a working plumbing system and have sufficient space for workers to do their work. With that said, there are a near infinite number of ways to design a space and a well designed space is tailored to the needs of the client and users. In pursuit of making the best design for our client we have translated the needs of the client into Design Requirements, Design Criteria, and finally drawn specific specifications for the way this space needs to be designed.

Design Criteria and Requirements

#	Need	Design Criteria
1	Building must-haves	Air conditioning Plumbing Electricity Heating Height Area (m^2) Washroom Kitchenette
2	Office space with 5-10 spaces for labs	Area (m^2) Air conditioning Height
3	Open space for community involvement	Area (m^2)
4	Central common area for staff members involvement with a large table	Area (m^2)
5	Disability accessibility	Ramp Elevator
6	Loading dock for equipment into and from vehicles	Area (m^2) Loading dock garage doors
7	Animal processing space for traditional hyde tanning, minimum 16-20 feet tall (ex. Deer, moose)	Area (m^2)
8	Garage type space for snowmobile and atv parking	Area (m^2)
9	Contains space for a minimum of 5 computer Workstations, with space available for a maximum of 10	Area (m^2)
10	Open work space for plant processing/Lab space for plants, including a mobile plant	Area (m^2)

	processing station (lab bench/table not wooden)	
11	Freezer space for storage of organic samples: deep freezer	Area (m^2) Generator
12	Versatile storage facilities and space for handheld equipment	Area (m^2)
13	Security system	Cost ($) Cameras (Field of view)
14	Has to reflect who they are, sustainability and promote a sustainable way of life, architectural design of the building should reflect them as well	Aesthetics Sustainable

Functional Requirements	Area Heating Plumbing system Electricity Height Building Lifespan
Non-Functional Requirements	Elevator Generator Aesthetics Air conditioning Fire escapes Cameras
Constraints	Building footprint Environmentally ethical Lot size

Benchmarking

The example below gave us some ideas about how the outdoor space can be incorporated into the building itself, allowing for easy loading and unloading of equipment/product and providing shelter for work in the winter.

Figure 1: Example of community center building design (from https://architizer.com/blog/inspiration/collections/come-together

We are continuing to explore more existing designs, with some other good ideas taken from: https://www.dezeen.com/tag/community-centres/

Design Specifications

	Design Specifications	**Relation (>, <, =)**	**Value**	**Units**	**Verification Method**
Functional Requirements					
1.	Area	<	1000	m^2	Prof. will supply max.
2.	Heating	=	Yes	NA	Test
3.	Plumbing	=	Yes	NA	Test
4.	Electricity	=	Yes	NA	Test
5.	Height (Two Stories)	<	4-5	m/story	Analysis
6.	Building Lifespan	>	70	Years	Test
Non-Functional Requirements					
7.	Elevator	=	Yes	NA	Analysis
8.	Generator	=	Yes	NA	Analysis
9.	Aesthetics	=	Yes	NA	Client satisfaction
10.	Air conditioning	=	Yes	NA	Test

11.	Fire escapes	=	Yes	NA	Test
12.	Cameras	=	Yes	NA	Test
Constraints					
13.	Building footprint	=	TBD	m^2	Analysis
14.	Environmentally ethical	=	Yes	NA	Test
15.	Lot size	=	TBD	m^2	Prof. will supply

Reflection

Before the client meeting, each member of the team brainstormed their own ideas of what the client might want or need in the building with not much direction. In the client meeting, all specific requirements were established for the building. The client was able to give us some better direction on the features that are important for her, and we began to modify the ideas we have to suit her requirements for the project. These requirements helped our team develop a list of specific needs, that we ranked in terms of importance, which led to the design criteria being established. From deliverable B, the need of “no budget” was removed because we were given information that there will be a budget specified by the professor. The need of “building must-haves” was added, and the former needs such as “washroom” and “kitchenette” were added as design criteria. This is due to the fact that they fall under this category and we believe this more accurately reflects how the space will be broken down. “Height” was added as a functional requirement since it is something that is extremely important to consider in our next deliverable, specifically space for plumbing, electricity and AC to be supplied throughout the facility since those will pass through space between floors.

Conclusion

A solid breakdown of the systems involved in this project has been made, and plans for addressing each specification has begun. We are each tasked with producing some prototype designs for the next meeting as a way to begin the ideation process. Specific solutions for the plumbing, electrical, AC systems and most importantly, the functional design of the interior spaces that are tailored to the needs of the client are being developed. Taking these steps will allow for the creation of a more personalized product for the client, one that fits their specific requirements.