

## Deliverable C: Design Criteria

### Introduction

The purpose of this document is to identify the design criteria for the Guardian Program building based on its function and constraints. Research will be conducted to identify similar, existing products (benchmarking) to compare and contrast with the needs of this project.

Function Description	A building equipped to facilitate research through sampling and harvesting from the nearby environment. The building provides common spaces for team collaboration as well as individual work.
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Need Statements	Design Criteria
The building has a loading dock for large content transfer.	<ul style="list-style-type: none"> <li>- Minimum dimensions of loading dock (m)</li> <li>- Minimum height of loading platform (m)</li> </ul>
There is a public parking lot for the employees and the community.	<ul style="list-style-type: none"> <li>- Number of parking spots</li> <li>- Dimensions of parking spot(m)</li> </ul>
There is an outdoor lot for the company's vehicle storage.	<ul style="list-style-type: none"> <li>- Number of company vehicles/parking spots</li> </ul>
There is a multipurpose outdoor space.	<ul style="list-style-type: none"> <li>- Size of space (m)</li> <li>- Workspace</li> <li>- Recreational space</li> </ul>
The building is accessible to all.	Forms of accessibility: <ul style="list-style-type: none"> <li>- Ramps</li> <li>- Button activated doors</li> <li>- Elevator/lift</li> <li>- Wide doors</li> </ul>
The building has two washrooms.	<ul style="list-style-type: none"> <li>- Dimensions of washrooms (m)</li> <li>- # of stalls</li> <li>- # of urinals</li> <li>- Accessible toilets</li> </ul>
The building has a kitchenette for the employees.	Size of kitchenette (m) <ul style="list-style-type: none"> <li>- Sink</li> <li>- Stove/oven</li> <li>- Fridge/freezer</li> <li>- Cupboards</li> <li>- Ample counter space</li> </ul>
The building has 4-5 offices.	Dimensions of offices (m)
The building has an area to host meetings/large gatherings.	<ul style="list-style-type: none"> <li>- Minimum capacity of room/space               <ul style="list-style-type: none"> <li>- Meeting table</li> <li>- Seating area</li> </ul> </li> <li>- Size of space (m)</li> </ul>
A building that reflects the community's values.	Aesthetic

The building has a multipurpose workspace with outdoor access.	<ul style="list-style-type: none"> <li>- Size of workspace (m)</li> <li>- Tables for collaborative work with ample seating</li> <li>- Individual workspaces</li> <li>- Outdoor access</li> </ul>
The building has a space for harvesting samples.	Dimensions & capacity of harvesting space (m)
The building has a space for drying samples.	Dimensions & capacity of drying space (m)
The building has a storage space for handheld lab equipment.	Dimensions & capacity of equipment storage (m)

### Technical Benchmarking: NRC Plant growth research facility

<https://nrc.canada.ca/en/research-development/nrc-facilities/plant-growth-research-facilities>

Equipment and Rooms	Description
Phytotron	Their phytotron chamber consists of controlled environment spaces that can be lit both naturally as well as artificially. It also contains 3000 square feet of plant chambers with humidity control as well as dedicated tissue culture space and seed storage.
HVAC crop greenhouse	isolation greenhouse allowing precise temperature control while still utilizing supplemental and natural light spectrums.
Transgenic plant center greenhouse	Fully automated facility allows for multiple-line experiments and seed increases
Sunrooms	A unique hybrid of combined lab and growth space providing natural sunlight with supplemental light for overcast days and shorter winter daylight hours.
Hydroclave	Large capacity disposal for transgenic and biohazardous waste

The reason why the NRC Plant growth research facility was chosen as our benchmark was because the criteria that the facility fit proved to be the best out of the options we could find, for a research facility centered around monitoring the surrounding environment. As such, when we design the building we plan to improve and redesign so it matches the needs of our client.

Design Specifications	Relation (=, <, >)	Value	Units	Justification (Verification)
<b><u>Functional Requirements</u></b>				
Minimum height of loading platform	>	0.5	meters(m)	0.5 meters is the minimum height of the bed of a 1500 Chevrolet pickup.
# of parking spots (public lot)	>	15	each	This is the minimum amount of parking spots required. Depending on

				the expected number of employees (analysis)
# of company vehicles/parking spots (company vehicle storage)	>	5	each	This is how many company vehicles there will be (analysis)
Seating area (meeting/gathering area)	=	yes	N/A	There must be an area for information presentation and communication (analysis)
Tables for collaborative work with ample seating (multipurpose workspace)	=	yes	N/A	There must be an area for collaborative team work (analysis)
Outdoor access (multipurpose workspace)	=	yes	N/A	There must be an outside workspace that is accessible from the building (analysis)
Dimensions of harvesting space	>	20x20	feet (ft)	There must be enough space for harvesting. Size depending on types of substances the client plans to harvest. (analysis)
Dimensions of drying space	>	10x10	feet (ft)	There must be enough space for samples to dry. Size depending on types of samples the client plans to dry. (estimate, test, analyze)
Dimensions of equipment storage	>	8x10	feet(ft)	There must be enough space for equipment not in use. Equipment is handheld and can be stored on shelves. (estimate, test, analyze)
Size of multipurpose outdoor space	>	0.5	acres	The outdoor space must be at least this big. Depending on the types of activities that will be conducted. (analysis)
Size of kitchenette	>	350	Square feet (ft <sup>2</sup> )	The kitchenette must be at least this big. Depending on the expected number of employees. (analysis)
Dimensions of offices	>	60-72 x 90-126	Inches(in)	Each office must be at least this big according to the CCOHS (analysis)
Size of multipurpose workspace	>	15x20	feet(ft)	The multipurpose workspace must be at least this big (analysis)
<b><u>Constraints</u></b>				
Accessible for all	=	yes	N/A	The space must be accessible for all (test)

Ramps (accessibility)	=	yes	N/A	Ramps must be an alternative for inclines for those unable to climb (test)
Button activated doors (accessibility)	=	yes	N/A	Buttons must be located in a convenient spot on all doors to ensure everyone can enter and exit (test)
Wide doors (accessibility)	=	32	Inches(in)	The doors must be at least this wide according to ADA standards (analysis)
Accessible toilets (washrooms/accessibility)	=	yes	N/A	There must be an accessible toilet (test)
# of washrooms	=	2	each	There has to be two washrooms in the building (analysis)
# of stalls (washrooms)	>	1	each	There must be at least one stall in each washroom according to ADA standards (analysis)

**Non-Functional Requirements**

Building Aesthetics	=	yes	N/A	The building must reflect its purpose and community (test)
Easily navigable	=	yes	N/A	The building must be easy to navigate inside (test)
Sink (kitchenette)	=	yes	N/A	The kitchenette must have a functioning sink (test)
Stove/oven (kitchenette)	=	yes	N/A	The kitchenette must have a functioning stove/oven (test)
Fridge/freezer (kitchenette)	=	yes	N/A	The kitchenette must have a functioning fridge and freezer (test)
Cupboards (kitchenette)	=	yes	N/A	The kitchenette must have a functioning and accessible cupboards (test)
Ample counter space (kitchenette)	=	yes	N/A	The kitchenette must have ample counter space (test)

Gaps in Design Criteria  
(To be addressed at the next client meeting)

- Types of samples that will be harvested.
  - Aids in determining size of harvest space as well as the multipurpose workspace
- Types of samples that will be dried.
  - Aids in determining the size of drying space as well as the multipurpose workspace
- The expected number of employees

	<ul style="list-style-type: none"> <li>○ Aids in determining the number of required parking spots as well as the size of gathering/common areas (ie meeting rooms, kitchenette, washrooms multipurpose workspace)</li> <li>● Types of outdoor activities that will be conducted <ul style="list-style-type: none"> <li>○ Aids in determining the size of the outdoor multipurpose workspace</li> </ul> </li> </ul>
References	<p>ADA disability standards → <a href="http://access-board.gov">ADA Accessibility Standards (access-board.gov)</a></p> <p>ADA bathroom requirements → <a href="#">Restroom Stall Dimensions: Standard and ADA Handicap Stalls - Restroom Stalls and All</a></p> <p>CCOHS Office space requirements → <a href="#">CCOHS: Office Ergonomics - Space Requirements for Office Work</a></p> <p>Standard dimensions of a dry room → <a href="#">Dry Room — Knowledge — Excel Air Systems</a></p>

**Conclusion**

In conclusion, all the design criteria stated above will play a significant role in the design process of the Guardian Program building. At the next client meeting, gaps in the design criteria will be addressed in order to finalize and perfect certain aspects of the project.

**Task Management Update:**

Due to the issues with the Wrike license, we were not able to access the site to update the tasks even after the invitation was sent by the TA. An email was sent to the TA on Friday, October 6th, but we were not able to fix the problem in time. As a result we used a different website (Trello). However, its capabilities were limited without the premium account. We will be addressing this issue with our TA (Sumit Kumar Paul) and hopefully we can come to a better solution for the next deliverable. Below is the link to our board:

<https://trello.com/invite/b/mmSbSdlk/ATTIb958f8388aeb4aa90442405fd17977cfC1982CC4/design-project>