Project Deliverable C: **Design Criteria and Target Specifications**

GNG 1103 – Engineering Design

Faculty of Engineering – University of Ottawa

Present to :

Muslim Majeed

For the course :

Engineering Design

GNG 1103

By :

Valerie Grant (#300123284)

Caleb Cronin (#300128147)

Zehan Li (#300130533)

Luke Lemieux (#300123410)

Gwladys Nkazeu (#7909631)

University of Ottawa

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Introduction

This deliverable is about the design criteria and the target specifications, which is based upon a list of prioritized design criteria set in place by the clients and interpreted by our group. The next included material is a benchmarking table based on greenhouses found by our members. Lastly, the target specifications for the greenhouse that we will be creating.

Design Criteria

Based on the criteria provided below, we can conclude that the greenhouse that we are designing and building has restrictions a

Number	Need	Design Criteria
1	To run through at least 3 of the seasons	Cold Endurance
2	The customer/user does not want to put much effort into this greenhouse	Self-sustainability
3	Protect from wild animals	Animal proof/safe
4	Low cost	Cost($)
5	Easy to maintain, and use	Operability
6	Modular(Max 4x8, high enough to stand in)	Volume (in^3) Height (in)
7	Do not need to take care of the plants regularly	rainwater harvesting system
8	Can suffer from the bad environment	Environmental suitability
9	The customers would like to have it be kid friendly and possibility a learning opportunity	Kid-friendly material Visual and safe structure

Benchmarking

By ranking the importance of each category in this chart, the group can decide which key features from each example and try and incorporate these factors into our greenhouse. The colours represent the importance of each feature: Red=1, yellow=2, green =3. From this table we can conclude that the Palram Hybrid greenhouse includes better features than the other greenhouses found by our team. It includes the largest volume, and includes some of the materials that are more weather resistant, which is very important to the environment that our greenhouse will be operating in.

Greenhouse Specifications	**Importance (weight)**	Hybrid 8 Ft. W x 4 ft. D Greenhouse	GrowIt Backyard 6 Ft. W x 4 Ft. D Greenhouse	Monticello 8 Ft. W x 4 Ft. D Greenhouse
Company		Palram	ShelterLogic	Riverstone Industries
Cost ($)	**3**	969.99	249.99	4099.99
Size (L*W*H ft^3)	**4**	4*8*8	4*6*6	4*8*7
Weather Resistant	**5**	Yes	No	Yes
Frame Material	**4**	Aluminum	Steel	Aluminum
Panel Material	**4**	Polycarbonate	Luminate Diffusion Fabric	Polycarbonate
Year-Round Use	**5**	Yes	No	Yes
Score		54	39	47
Link		https://www.wayfair.ca/outdoor/pdp/palram-hybrid-8-ft-w-x-4-ft-d-greenhouse-palr1166.html	https://www.wayfair.ca/outdoor/pdp/shelterlogic-growit-backyard-6-ft-w-x-4-ft-d-greenhouse-tcgt1022.html	https://www.wayfair.ca/outdoor/pdp/riverstone-industries-monticello-8-ft-w-x-4-ft-d-greenhouse-qbja1004.html

Engineering Design Specification: Target Specifications

This engineering design specifications chart shows and explains all the important functions, constraints, and non-functional requirements specifications for our greenhouse. Testing these functions and constraints, will help us finalize our ideal and innovative design.

	Design specifications	Relation (=,<, or >)	Value	Units	Verification Method
	Function Requirement				
1	Operate through most of the year	<=	3	seasons	test
2	Self sufficient	=	yes	N/A	Test
3	Simple and easy maintenance	=	yes	N/A	Test
4	Simple and easy to use	=	yes	N/A	Test/ Analysis
	Constraints				
1	Cost	<	500	$	Estimate, BOM
2	Size before assembled (Modular)	<	6x8	ft	analysis
3	Operating condition temperature	=	-20 to 25	°C	Test
4	Operating conditions: snow, ice, slush	=	yes	N/A	Test
	Non-Functional Requirements				
1	aesthetics	=	yes	N/A	Test
2	Product life	>	1	year	test
3	Animal Proof/ safe	=	Yes	N/A	test
4	Kid friendly	=	yes	N/A	test

Conclusion

After the meeting with our Client, we were able to list and understand her needs and requirements. That helps us to establish the Design Criteria, functional and nonfunctional requirements. The second step was to do research on the internet to determine what material will suit the Client Criteria and then evaluate on the market place, the cost of different material that we need for the Project. This allowed us to calibrate three different models of construction and thus identify their specifications in order of importance. After analysis, we finally found out that the best model for our project is the Hybrid 8 Ft. W x 4 ft. D Greenhouse because this model as a whole meets the Client requirements.