Deliverable E: Project Progress

Overview

Breakdown

1. Deliverable B: Benchmarking, Client Statements, Interpreted Needs and Target Specifications
2. Deliverable C: Functional Decomposition, Concepts, and Finalized Design
3. Client Feedback
4. Prototype I
5. Bill of Materials
6. Project Plan: What Comes Next?
7. Lessons Learned

Breakdown

01 Portable Change Table

02 For use anywhere

03 Providing privacy

Project objective

"People with physical disabilities that prevent mobility can often have issues with changing themselves. Design a portable change table that is compact, lightweight, ergonomic and provides privacy that can be used by a caregiver to assist a person with mobility issues in changing themselves. The design can be used both indoors and outdoors."

Initial Project Plan

#	Task	Time															Owner
		September				October				November				December			
1	Team Contract & Plan skeleton	x	x														Group
2	Client needs & problem statement		x														Group
3	Benchmarking		x														Ersan
4	Design Criteria		x														Frank
5	Concetpual Design, Feasibility Study			x													Devin
6	Prototype I Testing and results				x	x	x										Devin & Frank
7	Prototype II Testing and results							x	x	x							Devin & Frank
8	Protype III Testing and results										x	x	x	x			Devin & Frank
9	Design Day											x	x	x			Group
10	User Manual & Project closeout												x	x	x	x	Group
Project Risks: Delivery delay + Team Conflict																	
	x Means one week					Mllestone such as client meet or design day											

Client Statements/ Interpreted Needs

Client Statements	Interpreted Need
"Easy to carry and not too bulky. I kinda envisioned- you know how camping chairs fold out- maybe some kind of feature like that or something like patio lounge chairs that fold up into like a tri-fold. So do it like that or fold the way a camping chair folds"	Looking for a foldable and easy to carry table with similar features to a camp cot or patio lounge chair.
"About two feet by… five feet long"	Dimensions of device approximately 2' by 5'
"It does not need to be [cushioned] as long as it's not poking him"	Comfort is a priority
"It might need to be a little bit height adjustable but I don't know if that's feasible	Height adjustability desired

Customer Needs

- Interpreted needs then taken and put into ranked statements
- Rank is decided based on either how much the client emphasised the interpreted needs importance
- Or based on amount of times client mentioned the need: eg if need is mentioned more than once the rating will be higher

#	Customer Needs	Importance
1	The change table is compact	5
2	The change table is portable	5
3	The change table is ergonomic for user	3
4	The change table is made of a comfortable material	3

Design Specifications

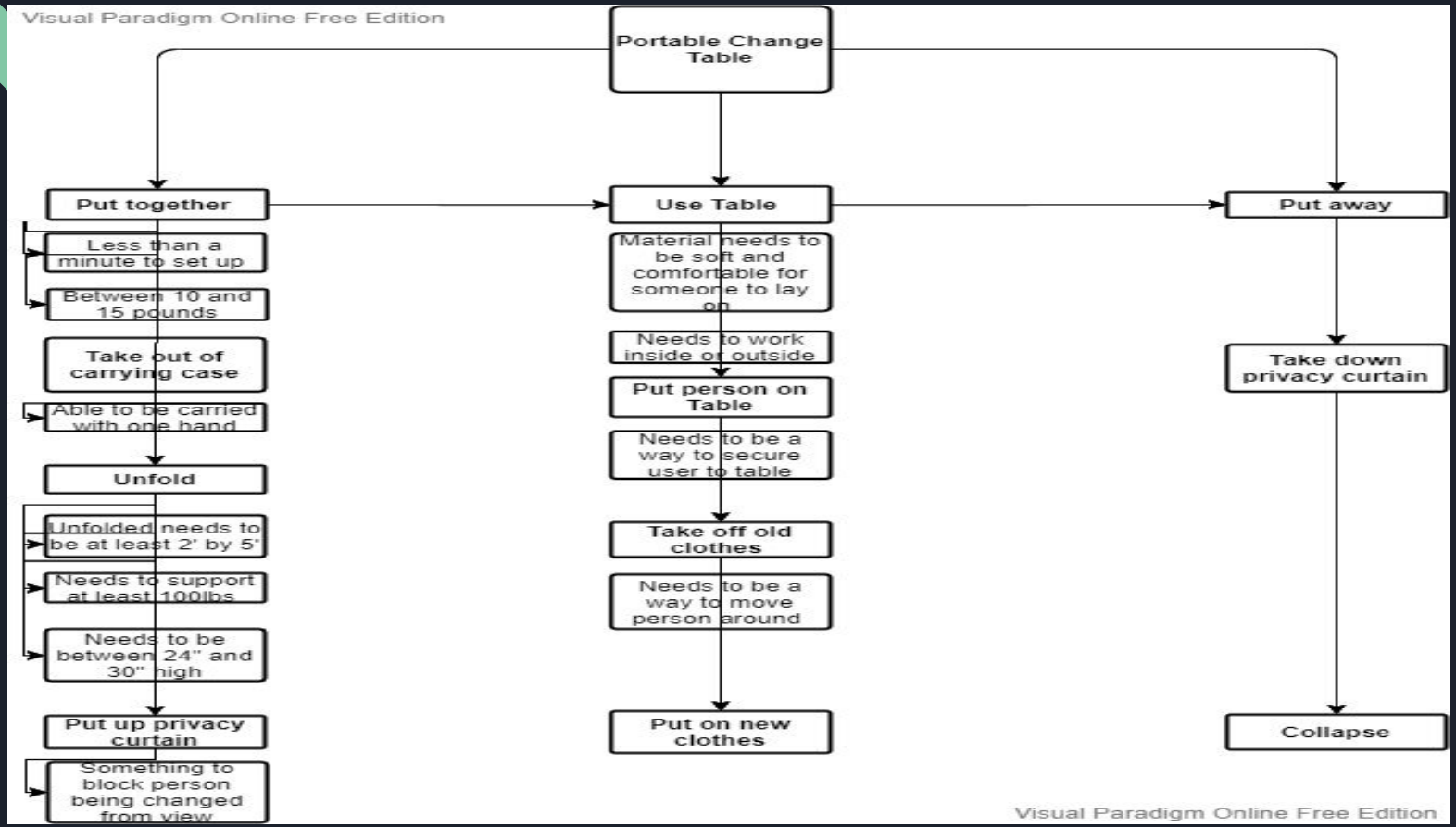
Metric	Unit	Functionality/ Constraint
Weight	Pounds (lb), Kilogram (kg)	Constraint
Height	Feet (ft), Metric (m)	Functional
Size of Table Top Width	Feet (ft), Metric (m)	Functional
Size of Table Top Length	Feet (ft), Metric (m)	Functional
Collapsible	Percentage (%)	Functional
Set up Time	Minutes (mins), Seconds (s)	Non-Functional
Cushioned	Binary	Non-Functional
Water Resistance/Proof	Binary	Non-Functional
Weight Supportive	Pounds (lb)	Functional
Cost	Dollars ($)	Constraint

Benchmarking

- Results of benchmarking similar products
- Learned that not a lot of similar products exist on the market
- Learned that the weight may be more than expected
- Learned about best practices. Eg. security/support straps on these devices

Product	Cost	Material	Weight	Portable?
Armedica Hi-Lo Changing Table	$2330	Metal, with cushioned padding and rails	450lbs	No
Rifton Hygiene Support Station	$3270	Metal with cushioned padding	250lbs	No
Extra Large Portable Folding Comfort (Camp Cot)	109.99	Metal and polyester	23.37lbs	Yes

Functional Decomposition



Finalized Design

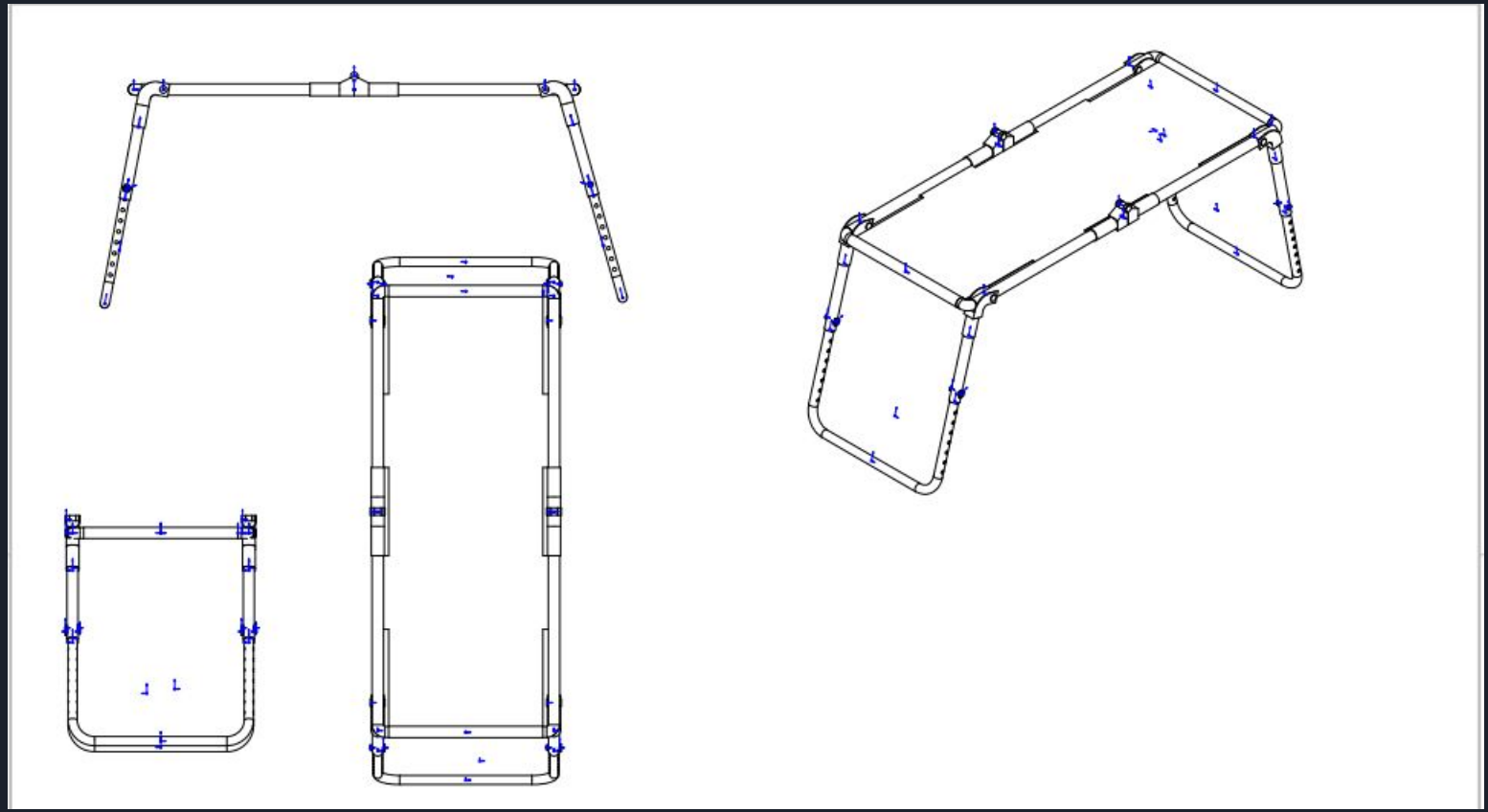
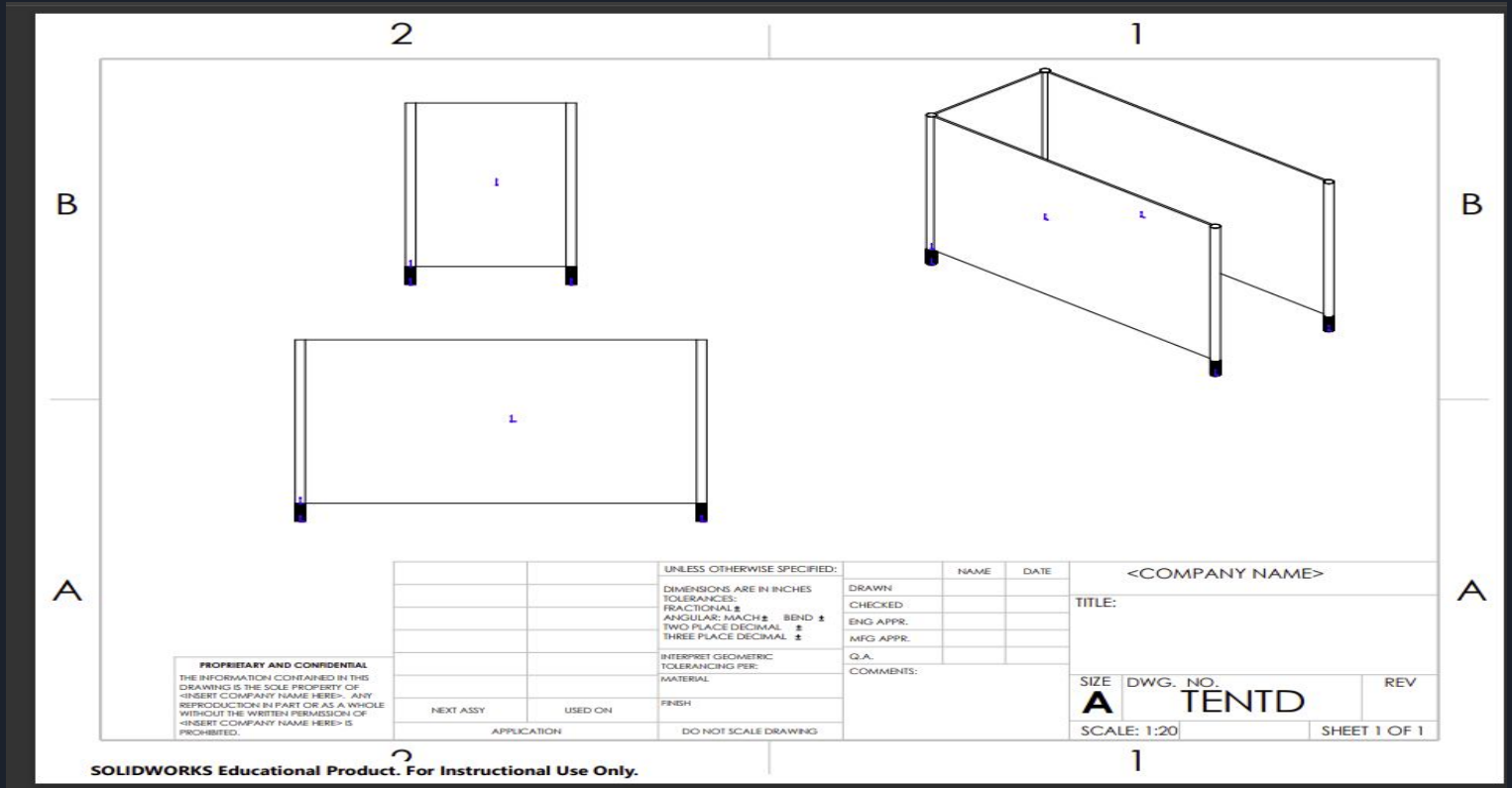


Table Subsystem



Tent Subsystem

Bill of Materials

Material	Cost($)
Steel Wire	$10 CAD
Polyester Fabric	$40 CAD
Aluminum Piping 1'	$20 CAD
Camp Chair	$30 CAD

Client Feedback

- Overall happy with our design choices
- Preferred the design to be a scrunched up collapsible design
- Wanted us to include a strap to secure the user to table
- Expressed concern about the pop-up tent being easy to blow over

- Feedback was taken into consideration; however, other important aspects would have to be sacrificed to meet it.
- The Tent will be made of a thicker material.
- The strap will be added to the design

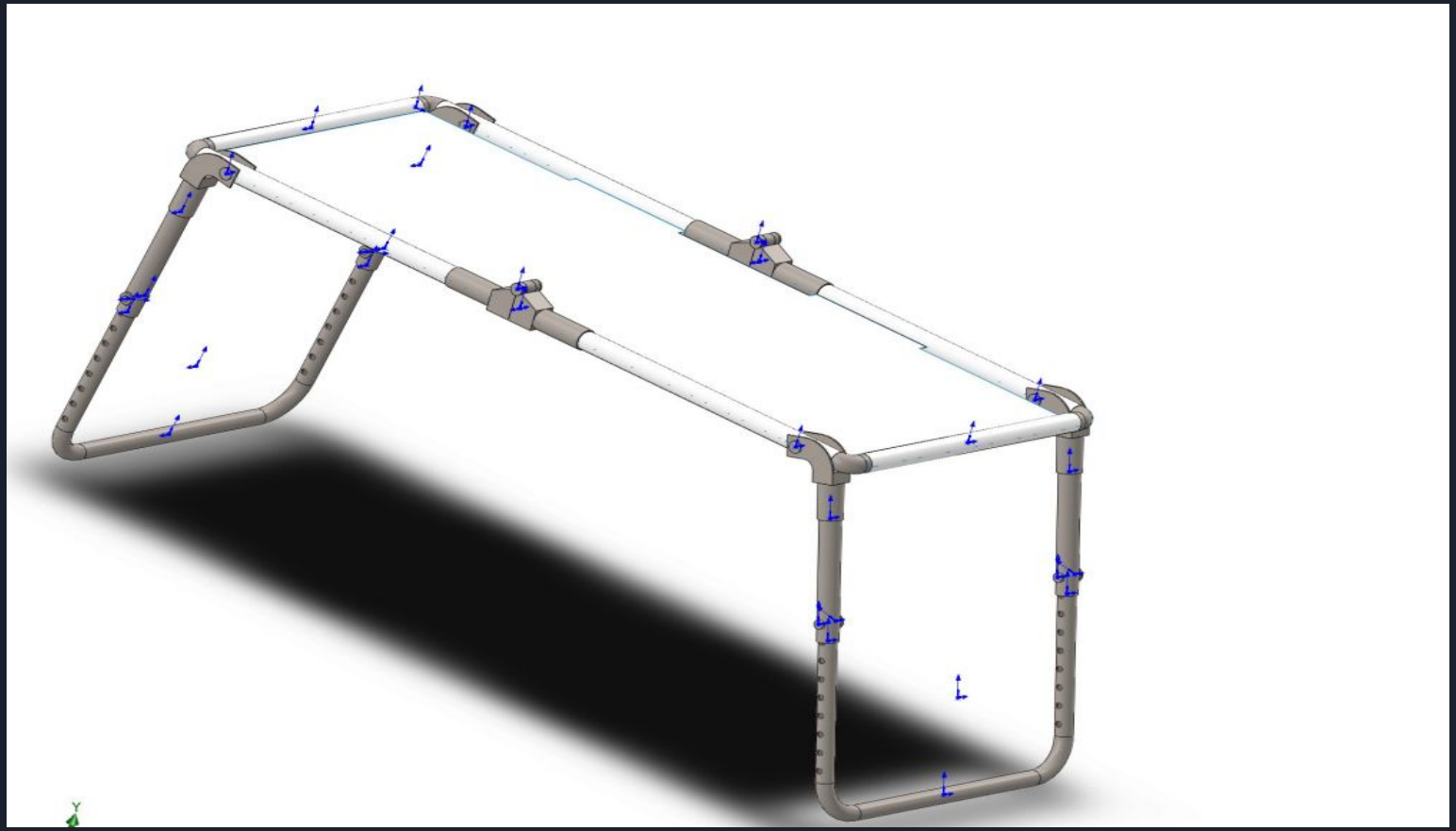
Prototype I

Prototype I

- Didn't want to build anything physical yet as if she doesn't like design, easy to change
- Therefore a solidworks drawing was made
- The prototype is low-fidelity analytical prototype. This prototype was focused on the table itself rather than the other subsystems.

Testing Goals

1. Test the feasibility of the design using the analytical CAD tools.
2. Make sure that the device won't weigh too much
3. Test the look of the design.

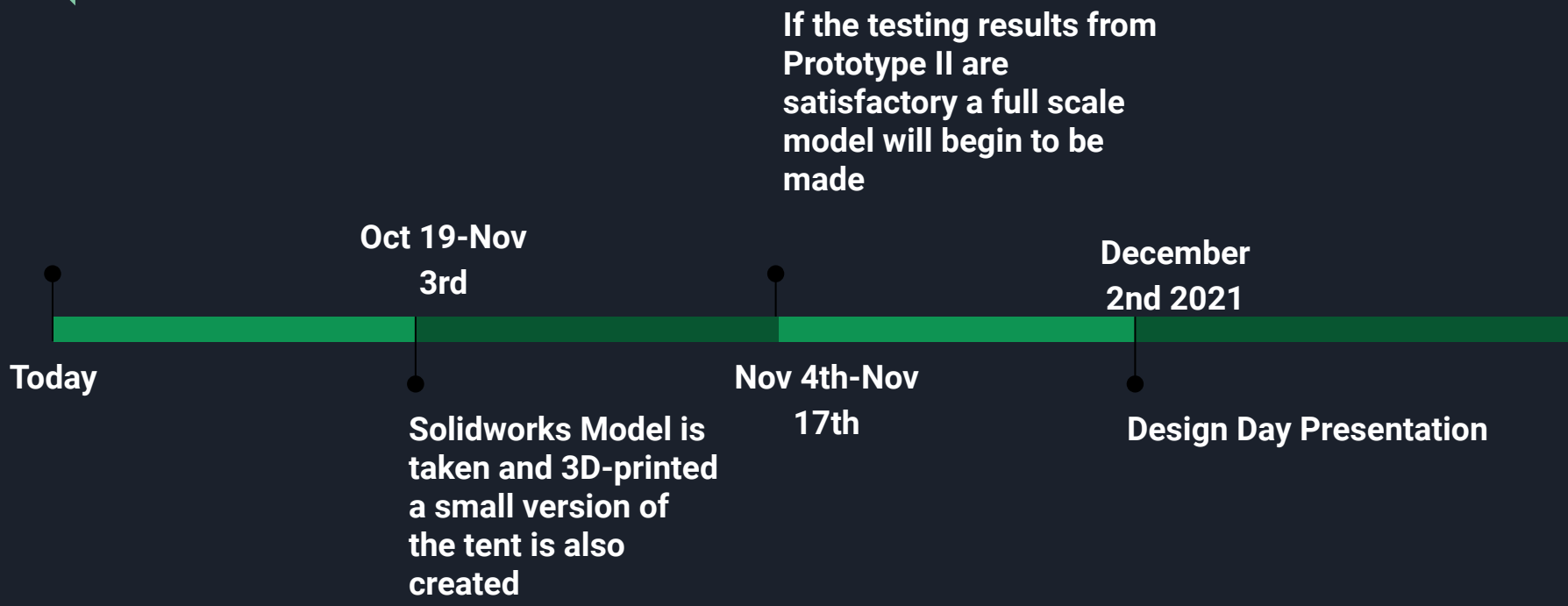


Solidworks drawings of prototype I

Results

Metric	Unit	Ideal Value	Marginally Acceptable Values	Testing
Weight	lb	=<10	<27	Fail, the weight when measured in solidworks is around 66 lbs
Height	in	24 to 30	=24	Pass the measured height is the same
Size of Table Top Width	ft	=2	=2	Pass the measured Width is the same
Size of Table Top Length	ft	5 to 7	=5	Pass the measured Length is the same
Weight Supportive	lb	<100	=100	Passed, able to successfully be assembled in solidworks and support a load of more than 100lbs

Moving Forward



Lessons Learned

Team Management	Preparedness, communication, and planning
Client Feedback	Assumptions, action, and understanding
Prototyping	Flexibility and thinking ahead