

Project: Cardboard Bed**Andrew Nudga - 300081308****Date: Feb 3rd, 2019****Brytan Lord - 300064595****Oliver Lafleche - 300056232****Eric Nisioiu - 300077365****Liam Whittaker - 300079186****Title: Design Criteria and Target Specifications****Introduction**

When creating a product, designers must work with priorities in mind. Our foldable, portable cardboard bed is no different. By analyzing the questions we asked the client, we were able to determine their needs for the cardboard bed and rank the needs in terms of importance on a scale of 1 to 5.

Interpreted Needs and Importance

Question	Customer Statement	Interpreted Needs
Bed dimensions?	Preferably a Twin but a double or even a queen would be acceptable	Bed needs to be able to switch between mattress sizes
Recyclable?	Doesn't matter but recycled is preferred.	Cardboard should be recycled
Installation?	Preferably one piece but if you are unable multiple piece is okay	Bed needs to be a one piece installation
How does the bed rest on the ground?	The bed needs to be a foot off the ground resting on a frame	Bed Needs to be one foot off the ground
Does the bed need to be fully cardboard?	No, you can use metal as long as its not too heavy	Metal can be interpreted into the bed.
What weight does the bed need to support	The bed needs to support at least 250 pounds.	Bed needs to support at least 250 lbs. (113.4 kg)
What is the desired weight of the bed itself?	The bed needs to be lightweight and portable	Build a lightweight and portable bed
Does there need to be a headboard?	We'll say no but if we can implement it into the design then it would be good.	The bed needs a headboard
Need #	Needs	Importance
1	Changable frame size	2
2	Recyclable	3
3	One piece installation	4
4	One foot off the ground	4
5	Needs to support 250 lbs. (113.4 kg)	5
6	lightweight and portable	5
7	Headboard	2
8	Metal interpretation	1

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As shown above, our most important interpreted needs are the need to support heavyweight and the need to be lightweight and portable and the least important is the interpretation of metal in the design (in fact this is undesirable). Therefore, our design criteria must prioritize these needs first, and then the others. Through our interpreted needs we are able to create a list of our prioritized design criteria for our bed as well as their requirement for the overall function as a lightweight, portable, foldable cardboard bed.

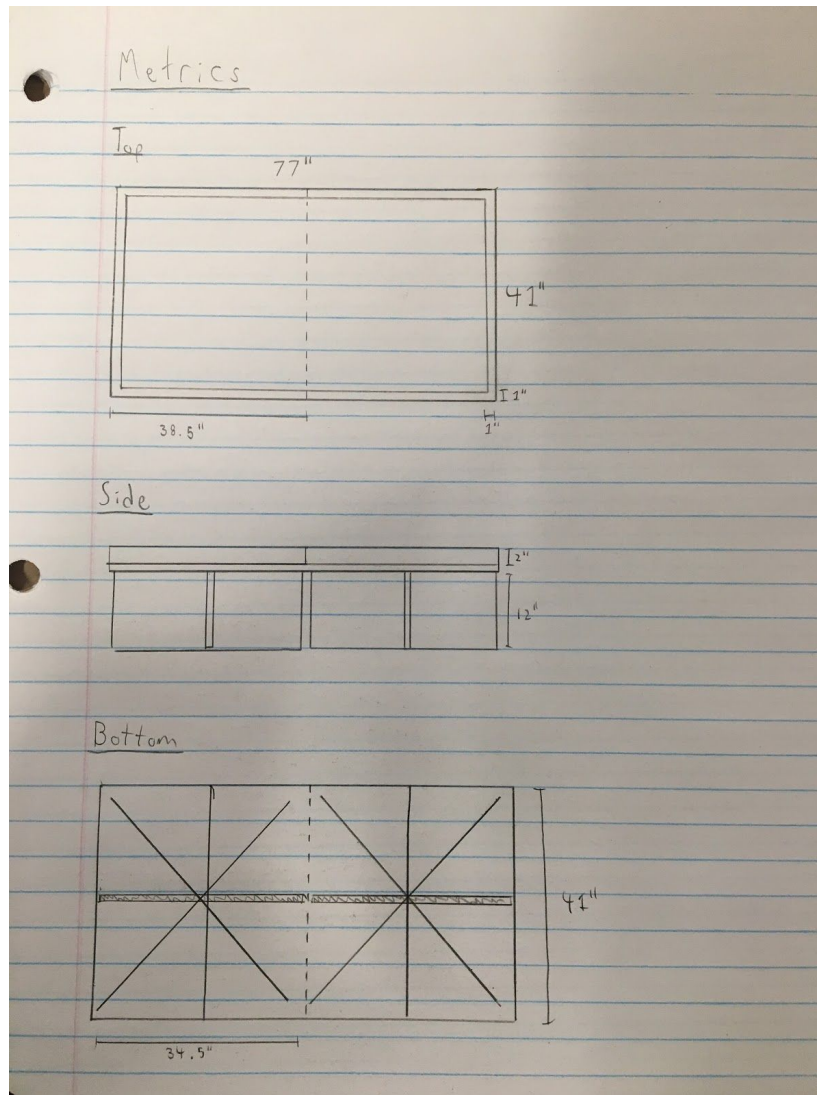
Prioritized Design Criteria

	Design Specifications	Relation (=, <, >)	Value	Units	Verification Method
	Functional Requirements				
1	Made of cardboard	=	yes	N/A	N/A
2	Height above the ground	>	12	inch	Analysis
3	Ability to fold	=	yes	N/A	Test
4	Portable	=	yes	N/A	Test
5	Weight supported	>	250	lbs	Test
	Constraints				
1	Weight	<	30	lbs	Analysis
2	Cost	<	100	\$	Estimate, check
	Non-Functional Requirements				
1	Lifespan	>	2	years	Test
2	One-piece setup	=	yes	N/A	Test
3	Foldable legs	=	yes	N/A	Test

These are the criteria that our team followed when thinking of design ideas. Our current design consists of a full twin size bed frame, foldable at the middle, with a crossing/star leg design on the bottom, 12" above the ground.

Project: Cardboard Bed**Metrics**

- Twin Bed - 39" x 75" (Mattress Dimensions)
- adding an inch on every side for a frame, making 41" x 77"
- Supports are double thick cardboard
- Supports are foldable at main support
- Main Cardboard support: 12" x 34.5"
- Diagonal Cardboard supports: 12" x 52.2"
- Side cardboard support: 12" x 41"
- Frame: 1" around entire frame, 2" high
- Bed face: 41" x 77" triple thick cardboard
- Foldable at the halfway point (38.5")
- Cut out handles. 1" from edge, 2" x 4". Centered from sides.



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This figure is a rough visual representation of our current design. Created with the help of our prioritized design criteria, the design meets all of the client needs discovered from the client meeting. In the bottom drawing, the thicker, shaded, horizontal lines are the main cardboard supports, the crossed lines are the diagonal cardboard supports, and the vertical lines between the diagonal supports are the side cardboard supports. To meet the need of a headboard, one would just need to extend the frame on one end of the bed.

Reflection

The client meeting allowed us to ask the questions which in turn allowed us to figure out the needs of our bed. After learning the wants and needs of the client we had to change some things about our conceptual design, including the idea of a bed that would be assembled in many parts. However, analyzing the client's questions did help us to decide about which features were most important to our design and which features the client wanted most. These together from the client meeting allowed us to create our list of prioritized design criteria.