3.

Project Recommendations.

Looking holistically at the project provide a formal

summary of any recommendations you would make based on information collected thus far. These recommendations may focus on the system design, prototype design, additional research that needs to be conducted, steps for validation, testing, etc.

A recommendation is buying in bulk to reduce overall price and reduce manufacturing costs by moving it to an international distributor. In the future with more research and development our users could expand out to the military and toy market. We could also create a homeless community where people can come set up their shelters together at a local area. Since our current design might start leaking due to the flat top surface and rain accumulating on the roof, a recommendation for our product design, as Leah's dad mentioned to us, is to add a curved surface over the top of the tent.

Create/ Model Prototypes.

Describe your research and development, including the

following:

a.Describe the methodology of your research and development.

b.What conclusions were reached ( include appropriate figures)? What conclusions and recommendations will you follow from your research? After conferring with other teams, what recommendations would you make from their research?

C. Include major takeaways for moving the project forward.

Our main method of research and development consisted of creating a SolidWorks model of our product design. By creating a realistic CAD prototype we were able to evaluate various design requirements such as weight, volume, cost, stability and originally it was our goal to also evaluate the force needed to compress on SolidWorks. The force simulation we were planning on running did not work in the end, but the evaluated mass properties feature on Solidworks helped us estimate how much material is needed to produce our product, and how large and heavy it is. The stability of our product in different wind speeds was determined from a SolidWorks flow simulation. From this flow simulation we concluded that our product can withstand 20 mph winds without tipping over, which was our ideal design goal. Creating a prototype of our design also allowed us to get valuable feedback from other groups regarding design improvements. For instance, making the pockets bigger to store more belongings, creating a waist/shoulder strap for easy transportation, and curving the roof to allow rain runoff. These recommendations are extremely helpful for improving our design in the future and elevating it to the next level so it is as effective and long lasting as possible.

ASHWIIN INSERT FLOW SIMLUATION RESULT FIGURE AND MASS PROPERTIES PICTURE FOR THIS

Final Prototype Design.

Explain how your Final Prototype design matches your research findings. Describe any non-standard parts that your team created. Then, in your report appendix, include a full working drawings packet of your team's Final Prototype design in Solidworks

Our final prototype design matches our research finding by achieving nearly all of our design requirements. During our research and development, we had to adjust certain aspects of our design such as the material, dimensions of the spring, and dimensions of the closed backpack to best fit our design goals. For instance, we changed our spring material from stainless steel to aluminum to achieve the optimal weight, force needed to close, and cost of our product. In addition, the dimensions of the spring were adjusted to create the best mixture of stability and ease of use. The specifics of the spring such as the wire pitch, thickness, wire material correlate highly to the cost of our product as the metal for the spring is the most expensive aspect of the design. Our final prototype is reflective of the combination of materials and dimensions that best fit our research and development goals. All of the parts of our product are non-standard such as the cover, spring, and two halves of the backpack. We had to make these parts specific to our product needs and dimensions, the drawings of each part as well as the full assembly is available in the appendix.

PUT PART AND ASSEMBLY DRAWINGS IN APPENDIX