The Sure Tarp – Project Recap

Overview
Cheaply built and inexpensive tarps are available on the market today but offer underwhelming results in exchange for, at times, significant effort. The Sure Tarp is a quality product that must hold up in inclement weather for extended periods while offering a convenience that no other tarp on the market can. It must require no external tying or weighting down to work; an edge-weighted ballast system will accomplish this if executed correctly.

Objectives
The Capozzo Family tasked the team with an open-ended project whose objective was to improve upon their ballast system design. With this goal in mind, the team strived to develop a design of high quality materials that could, if mass produced, be usable right out of the box and survive in precipitous conditions for many years. This design process was to culminate with a full-scale, ready-to-use prototype.

Approach
- A list of customer needs was gathered through conversations with the Capozzo Family, peers and classmates.
- Design metrics were specified that drove the customer needs. These metrics set weight and size limits and specified certain conditions that the tarp must withstand.
- A group of four concepts that could satisfy these needs and metrics were developed. The final design was chosen through a quantitative-ranking Pugh chart.
- Quality materials were chosen to make the product more durable than a standard tarp, with the environmental fallout of a product failure taken into account. Polyester and dry sand were the two main materials chosen.
- A weight analysis was performed to ensure that specifications would be met and pre-alpha prototypes were developed to test certain design concepts such as foldability.
- A manufacturing process plan was developed and translated into an actual construction process to build the final prototype.
- The prototype was rigorously tested to confirm waterproofness and left outside for an extended period to observe how it holds up to high winds. Test results showed that the tarp held up to heavy rain and wind gusts reaching 44 mph.

Outcomes
- This project resulted in the design of a product that meets all defined customer needs and whose manufacture is easily automated with minimal manual labour.
- The final design is versatile in that materials and size can easily be changed without affecting the design. This allows for consumer customization in the product’s market.
- Overall, the product is a vast improvement on current tarps as it is easy to maneuver, store and place without any external efforts.