This paper addresses the team’s initial understanding of the design project, prospects for design implementation and constraints from technical issues.

The Genesee division of SI Corp. is responsible for manufacturing various types of erosion control blankets. The facility houses two separate machines capable of producing approximately 15,000 blankets per month. Currently the main quality control feedback comes from weighing each blanket as they are produced to determine the amount of raw material used. SI Corp. has expressed interest in adding a second level of quality control to the manufacturing process. The company’s proposal is to develop testing equipment that will examine the distribution of the raw materials as they are woven into the blanket. This would alleviate any need for human inspection of the blankets and create greater consistency in the manufacturing process.

The goal of the design team is to design and build testing equipment that will fulfill the needs and specifications submitted by SI Corp. The initial design requirements are that testing equipment must electronically detect individual and patterned flaws in the blankets as they travel along the conveyor belt at a speed of 1 foot per second. All data gathered from the testing equipment will be organized and stored for ease of retrieval and use by SI Corp. An alarm or notification must be activated when the testing equipment detects an unacceptable situation. Lastly, the testing equipment must be designed such that it can be installed in the machine without disrupting the manufacturing process.
Our group has produced a list of several initial design possibilities, which includes: digital photography with a backlighting source, blowing compressed air through the blanket, measuring light penetration using photo-optic sensors, and detecting blanket thickness using a system of rollers. The final design choice will face several major technical constraints. The first constraint is that the system must minimize the amount of heat generated, and not produce sparks. The amount of airborne materials will require the design to be immune to the settling of dust and larger particles. Another considerable constraint will be the production of the design within a reasonable budget. Finally, because the analysis is to be done while the system is running, the analysis and detection of flaws will need to be accomplished rapidly. This means either a real-time or near real-time response to minimize wasted materials.

Until more details on the project are researched, a preliminary budget cannot be created. Also, a time schedule has yet to be established. However, after considering both the academic schedule of the design team as well as scheduling needs determined by SI Corp. we will create the time schedule for the project.