Executive Summary

Presented in this Architectural Engineering Senior Thesis Final Report are the findings of a semester's worth of analysis and research on the Army National Guard Readiness Center project. The project is a $100,000,000 Federal office facility located in Arlington, VA.

The first analysis topic is a construction management analysis based on a critical industry issue: Building Information Modeling deliverables on a project. A series of interviews were conducted with owners and general contractors dealing with how Building Information Modeling deliverables are used on their projects and in the industry as a whole. A list of questions was sent out to owner and general contractor contacts within the industry and their responses are compiled in the following report, along with conclusions drawn from their responses on what can be done to further Building Information Modeling in the industry.

The second analysis deals with the emergency backup power supply to the facility. There are two diesel powered emergency backup generators located on the roof of the facility that will supply power to the facility during a blackout. This analysis replaces one of those backup generators with an array of photovoltaic solar panels which will supply the building with clean energy and help power the facility and reduce the energy impact on the local power grid. It will provide a large cost savings to the owner and help the project attain the goal of a LEED Silver rating.

The final analysis looks at a unique feature of the Army National Guard Readiness Center project: a permanent structural secant pile wall system. The installation of the secant pile wall system is expensive due to its uniqueness, difficulty of installation, and long schedule. For this analysis, an alternate system is designed to replace the secant pile wall while maintaining structural performance and reducing the cost and schedule of the project.

The results of these three analyses are based upon the research of Arne Kvinnesland and the ideas presented are those solely of Arne Kvinnesland. Sources of information are listed at the end of the report along with special thanks to all of those who aided Arne in his development as a senior student in the Architectural Engineering major.