Executive Summary

The project center for this entire thesis was the Plaza East, an office building located in Chantilly, VA. This was a 5 story cast-in-place office building with no subfloors. Several building components were researched and analyzed to reach the **goals** of better means to save money, time, and building costs. Accompanying the building analyses is research on software implementation for steel buildings, and the benefits that can be used now and in the future.

The first section is research that focused on implementing CIMSteel Integration Standards/Version 2 (CIS/2) protocols for Electronic Data Interchange (EDI). This is to be used to a single 3D model and can be carried through the entire project. This research was basically for steel structures and allows a project to be completely paperless. Even though the type of superstructure does not match that of Plaza East, the software and tools prove that they can be helpful on any project, especially through communication.

The first analysis is focused on the architectural precast building envelope. Researching two separate types of metal panel systems are compared to the existing building envelope. Savings on price and energy costs are shown to prove the different systems could be worth the different look the building would have had.

The next study focuses on green roofs and their advantages to buildings such as Plaza East. The money saved on the building envelope in analysis one is to be used to implement a green roof and prove the aspects of why the industry should be focusing more on sustainability. This analysis contains my mechanical breadth by using Energy 10 software to show energy saving possibilities. Not only will it be used to show savings through the roof, but also through the new wall panels being used.

The last analysis contains my structural breadth. Calculations had to be made to ensure the 5 ½" roof slab could sustain the new load created by the green roof. Post tensioned beams are integrated and poured together with the slab. Most calculations focused on the slab and how much of a reinforcement upgrade should be used for the building's new roof load.