



Executive Summary

This document contains a study of the lighting and electrical systems in Duques Hall, the new George Washington School for Business and Public Management. Primary focus of the study involves the work in my primary depth of study, lighting and electrical, and compliments that work with a breadth analysis of two other building systems. The primary goal of the study was to create a more efficient building while maintaining it's individuality as a new and interesting building. To achieve this goal, a lighting system was designed to not only enhance the space, but to do so in the most cost efficient way. All design was created with the ASHRAE 90.1 and IESNA standards in mind.

The electrical depth took a look at a more efficient way to approach the design of the 208/120 volt distribution system. Distribution provided by the existing system was more than sufficient for the loads on the building and provides room for adequate growth of the system as well. However, two alternate systems were designed to examine the possibilities of cost savings, particularly by designing a system that would eliminate a switchgear. After the design of the two systems was finalized, this portion of the thesis work would be tied in to the construction management depth of my project. A cost analysis would be performed to determine if cost savings could be made with the creation of the system.

Following the desire for a more efficient building, possibilities of cost savings and equipment savings were examined in the mechanical breadth portion of the paper. Using one of the spaces that was designated for lighting design, the mechanical system in the room was examined to determine how the architectural changes to the façade would affect the mechanical system. By using a program called the hourly analysis program, energy and systems costs for the mechanical supply to the capital market classroom was examined.

The construction management depth topic was tied in with the other portions of my thesis. The primary portion of this depth topic was examining the savings between the electrical systems, and the implications to the construction process created when moving a switchgear onto the roof of a building. Cost data was also interpreted for the mechanical systems, and with the day light integration to the capital market classroom.

The design for the four lighting spaces and the other various building systems provided an excellent opportunity to explore a variety of building systems and their interaction with one another. Examining the different systems and implementing my design gave me an excellent opportunity to enhance the design of an existing building and then learn from any mistakes I might make in the process.