Villanova University: School of Law
Villanova, PA

Fall Thesis Proposal December 18, 2007

Executive Summary

The proposal for the AE senior thesis defines the work that will be completed for the different areas of analysis and redesign for the Villanova University: School of Law in the spring of 2008. Both the depth and breadth analyses will look at the building systems in an integrated fashion. The idea behind this is to not only discover ways to improve one system, but to improve them all collectively.

The depth analysis will focus on the lighting and electrical systems for the law school. The lighting depth will redesign four spaces: the courtyard, the atrium, the moot court and the 135 seat classroom. The overall design goals for all spaces are to enhance the architecture present in the building, provide a workable and comfortable environment for the occupants and limit the building's environmental effects. The building will be redesigned using ASHRAE 90.1 and the recommendations from the 9th Edition of the IESNA Lighting Handbook.

The electrical depth will provide revisions to the circuiting in the four spaces that will be redesigned. A protective device coordination study with short circuit calculations will be performed. The distribution system for one floor will be redesigned and then analyzed and compared to the existing distribution system. Lastly, analysis will be performed on the motor control center. The analysis will focus mainly on the sizing of the main equipment and feeder. If there is room for a redesign, a cost analysis will be performed to see what savings could be had.

The two breadth topics that will be explored are mechanical and acoustical. The mechanical breadth will study the cooling load reduction in the atrium due to the solar controls that will be included on the atrium's lighting redesign. The acoustical analysis will study the acoustical requirements for a courtroom and classroom. The moot courtroom will then be analyzed to see if one or both of the requirements can be met. After this analysis is done, a cost analysis will be performed to determine if the implementation of the chosen acoustical system is feasible.