Thesis Proposal

Executive Summary

The 8th Street Office Building project is a government office building designed for the state of Virginia. Unfortunately, construction of the building has not come to fruition as a result of a budget deficit. Therefore, design of the building has been on hold since 2008 at approximately 85-90% completion until funds are allocated for the remainder of the project.

It was discovered in Technical Report #3 and through discussions with the structural design engineers that the current lateral system for the 8th Street Office Building can be optimized through further analyses. Therefore, the main intent of the proposed thesis will be to investigate the 12" thick reinforced concrete shear walls that are specified to surround the four transportation cores of the building. Boundary elements and coupling beams will be included in the analysis as well as alternative locations for the shear walls in order to reduce torsion effects. Furthermore, braced frames will be considered as another potential lateral system, which will be compared to the fully designed shear walls. The comparison will be based on effectiveness against torsion, weight, cost, and location. The computer program ETABS will be utilized in the design of the lateral systems.

The relocation of the transportation cores has the potential to greatly affect the architecture of the 8th Street Office Building. Therefore, movement and flow of the occupants through the building as well as the required means of egress must be considered. In addition, the functions that are displaced by the relocated cores will need to be rearranged within the floor plan.

Finally, the 8th Street Office Building is intended to achieve a Silver Certification under the U.S. Green Building Council's LEED for New Construction Version 2.2 Rating System. Many sustainable strategies have already been incorporated, but many more points may be gained through the addition of a green roof that retains and distributes water for use throughout the building. Therefore, a green roof will be considered on the main roof level as well as in place of the existing planters on the terraces. The loads from the green roof will be included in the lateral analysis, and every attempt will be made to provide the occupants with access to the green roof.