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Structural Option
Building: Vickroy Hall
Location: Duquesne University
Pittsburgh, PA 15282
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Title of Report: Thesis Proposal
Faculty Consultant: Dr. Boothby



Executive Summary

Vickroy Hall is an eight story living/learning center at Duquesne University. It houses up to 280 students and allows them places to study and socialize. The building is constructed of structural steel with moment connections for its main supporting element. These connections guard against lateral loading such as wind and seismic effects and also transfer loads through the building to the ground. The floor system is a composite system of metal decking and lightweight concrete.

After exploring multiple structural systems in previous technical assignments, it was decided that a pre-cast hollow core planking system supported by load bearing masonry walls will be further analyzed for comparison to the original system.

The redesign of the system will include the removal of all moment connections, the addition of shear walls around stair wells, elevator shafts, and between suites. The masonry bearing walls will be placed around the perimeter as well, with the brick façade remaining as a curtain wall. Finally, a floor system consisting of pre-cast hollow core planks will replace the existing composite floor. Lateral loads will be superimposed on the system and it will be evaluated for both gravity and lateral loading.

The masonry walls will be designed using the Empirical Method for Designing Masonry walls. The wall designs will then be adjusted as new methods are learned in classes. Finally, the new structural system will be analyzed using ETABS to determine how the building reacts to the loads superimposed upon it. Drift, story drift, strength, and serviceability will be checked according to code and industry standards.

Within the process of redesigning the system, the appropriateness of whether or not the new system could effectively replace the old will be determined. The final report and presentation will comment on the results of the analysis and comparison of the two systems, including the structural redesign and both breadth topics.