Donna Kent
Structural Option
Building: Vickroy Hall
Location: Duquesne University
Pittsburgh, PA 15282
Date: December 15, 2006
Title of Report: Thesis Proposal
Faculty Consultant: Dr. Boothby

Executive Summary

After exploring multiple structural systems in previous technical assignments, it was decided that a pre-cast hollow core planking system on concrete supports with steel columns will be further analyzed for comparison to the original system.

The redesign of the system will include a modification to two column lines, the removal of all moment connections, the addition of shear walls around stair wells and elevator shafts, and finally, a floor system consisting of pre-cast hollow core planks. The support for the floor system will also change from a steel frame to pre-cast concrete beams. The preliminary beam sizes were determined in Technical Assignment 2. However, lateral loads were not superimposed on the system and it must be re-evaluated for the additional loads.

The new structural system will be analyzed first using RAM to determine preliminary column sizes. The system will then 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.

Two breadth topics will be investigated. The first is an in depth cost efficiency comparison with take-offs from the new system which will then be compared to the cost of the original system. The second breadth topic will be to investigate whether the mechanical system is impacted greatly and if the system could be improved by new means of routing ducts, etc.

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.