Tech Report #3
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Upper Campus Housing Project

Executive Summary

The University of Pittsburgh is currently constructing a dormitory facility on its upper campus. The Upper Campus Housing Project is a 161,600ft^2, 9-story building. This building will hold approximately 500 students. Located in the city of Pittsburgh, this 102ft structure will be located near the Peterson Events Center. The building construction began in May of this year and is expected to be completed in July of 2006. The floor system is composed of 8" precast hollow-core concrete planks with a 2 ½" topping. The lateral system consists of concrete masonry bearing and shear walls of varying thicknesses.

The following report examines the lateral system for the Upper Campus Housing Project. By examination of the load cases, it is clear the seismic loading will control the design of the shear walls. The load case 1.2D+1.0E+0.5L+0.2S was used. A full distribution of lateral loads was completed based on stiffness. Due to the location of an expansion joint (along line 3) the building can be broken into two halves and analyzed separately. After analysis of the shear on each wall a spot check was performed to compare the design provided by the structural engineer (Atlantic Engineering Services). Drift and overturning were also considered and analyzed. The drift for the right side of the building was computed to be less than 0.36", which is the allowable value of drift (H/400). Overturning proved not to be an issue because the weight of the building causes a resisting moment that is larger than that caused by overturning.