



Tech Report 2

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Structural Option
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Upper Campus Housing Project

The following report is a study of optional structural systems that could be used on the Upper Campus Housing Project that is located in Pittsburgh, PA. The building will be used as a dormitory facility for The University of Pittsburgh students. The existing structure of the building is precast concrete hollow-core planks with concrete masonry bearing and shear walls. A typical floor plan is located in the section of this report containing a study of the existing structure (pg.3).

Included in this report are an analysis of the existing floor system and an analysis of four alternate systems for Upper Campus Housing Project. These systems include: flat slab with drop panels, flat plate, waffle slab, and a composite steel system. Design aids were used in the analysis of the structure. Such aids included RAM and CRSI Design Handbook. Hand calculations were also done for three of these four systems. All charts from CRSI and all hand calculations are located in the Appendix. For the purposes of this assignment a typical bay was used to analyze each system. From examination of the architectural floor plans a typical bay consists of dormitory and corridor loads and an equivalent live load is shown on page 2.

From the analysis and comparison of systems, the waffle slab and the flat plate systems will still be considered as options for the floor structure of the Upper Campus Housing Project. Other factors will still need to be considered to come to a definite alternative floor system. Such factors include: implications on the foundations, column design and shear at columns, and lateral system.

