



Executive Summary

The Koshland Integrated Natural Science Center, located in Haverford, Pennsylvania, is a four-story laboratory building and is a new addition to the Haverford College campus. The building is comprised of laboratory, classroom, and office spaces as well as numerous communal areas. The KINSC is directly connected to the two existing structures, Sharpless and Hilles Halls, but is very distinctive in its architecture and engineering. The existing structural system is primarily precast concrete, including the floor system, the framing, and the lateral system.

This report provides an in-depth study on the comparison between the existing precast concrete system and a proposed structural system of steel framing with composite concrete slab on metal deck as the proposed floor system. The proposed lateral system consists of steel braced frames. The design of the structural system was performed with the use of the RAM Structural System program. The lateral system was designed with the aid of STAAD Pro. The purpose of this study is to examine any possible benefits that could come from using the proposed system over the existing system.

Also included in this report are two breadth studies, in the areas of Construction Management and Mechanical emphasis. The C.M. breadth directly correlates to the structural depth study in that it compares the existing and proposed systems in a cost analysis and project schedule. The Mechanical breadth study involves the investigation of the thermal resistance between floors of both the existing and proposed systems due to the strict temperature controls necessary for the laboratory areas in the building.

Ultimately, the purpose of this report is to decisively indicate which structural system proves to be more efficient. The results are based solely on the investigations performed within this thesis study. The conclusions of this thesis study project that the proposed steel system is more efficient than the existing system in terms of cost and schedule. In no way was the purpose of this report to undermine the decisions made by the engineers of the existing design.