

Thesis Final Report

Executive Summary

Fraser Centre is a mixed-use, high-rise development located in State College, Pa. The 11 story structure has been designed using a two-way concrete slab with concrete shear walls.

In Technical Report 3, lateral loads were found to be resisted by two shear walls on the east end of the building. In an effort to reduce the torsion created by this configuration, shear walls on the theater level were extended throughout the building. The new shear walls were then redesigned for the new load distribution. With the new layout of shear walls an alternate floor system, composite deck, was also studied.

Two non-structural breadth analyses were also undertaken. An analysis and slight redesign of the architectural layout of the residential floors was conducted. This analysis determined that the shear wall layout had a minimal impact on the architectural floor plan. In addition to the architectural redesign a cost and schedule analysis was completed for the existing design and the new design. This analysis helped determine if the proposed changes were economical.

With these analyses it was determined that the proposed changes were not economical or recommended. The floor system did reduce the building weight, but it also increased the building height. The cost and schedule analysis showed that the new floor system reduced the construction time but also significantly increased the cost of the project. The new shear wall layout had very little impact on the architecture of the residential floors but is not a recommended change if the proposed floor system is not going to be used.