

Executive Summary

The Gateway Commons building in Ithaca, New York is a mixed-use development building being used for retail and residential apartments. It has a basement floor below grade and six floors above grade at a height of 62 feet. CMU walls supporting precast concrete hollow core planks make up the building structure. The building façade uses a combination of brick, an Exterior Insulation Finish System (EIFS), and metal panels.

The objective of this report is to explore alternative floor framing systems for the Gateway Commons building and analyze their feasibility. The feasibility of each system was based on cost, constructability, floor depth, fire resistance, and the impact on the lateral system and foundation. A framing plan for each alternative was developed and representative bays were designed and compared against the other alternatives. The four alternatives that were analyzed are:

- Hollow Core Planks on Steel Beams
- Two Way Slab with Edge Beams
- Composite Steel
- Non-Composite Steel

Based on the findings of this report the hollow core planks on steel beams system and the non-composite system were discarded as possibilities. The two way slab with edge beams and the composite design were both considered as possible alternatives to the existing hollow core planks on CMU walls system. Due a lower cost and a shallower floor depth than the composite steel design, the two way slab with edge beams was chosen as the best alternative to the existing system.