

Executive Summary

The Christina Landing Apartment Tower is a 22 story apartment building located just outside center city Wilmington, DE. The tower provides 250,000 square feet of floor space. The structure is a predominately cast-in-place concrete building. Its floors are supported by a two way flat slab system. The typical floor system also incorporates small areas of reinforced concrete and post-tensioned beams to aid the lateral force resisting system. The floors are supported by square and round concrete columns. Lateral forces induced on the building are resisted by a box of four shear walls. All columns and shear walls rest on a foundation system of H-piles and pile caps. Typical floor loads are 130psf dead load and 40psf live load.

The proposed thesis will include an investigation of two alternate structural systems as well as two breadth studies for the apartment building. The first structural redesign will be changing an 8" reinforced concrete slab framing system to a 7" post-tensioned slab. The goal of this redesign will be to decrease material cost. The second redesign proposed will involve eliminating the structure's concrete moment frames and replacing them with shear walls on the east face of the building. The goal of this redesign will be to reduce material and labor costs, as well as decrease the total building deflection. The two breadth studies that will be undertaken will be a cost comparison between systems, and an acoustical redesign.