

River Tower at Christina Landing

Wilmington, DE

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Structural Option
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Structural Thesis Proposal: **Breadth Analysis**

Executive Summary

The River Tower at Christina Landing is a proposed 25-story condominium tower with a wide parking garage base in the first eight levels of the structure. The existing structural system consists of a post-tensioned concrete flat slab system with reinforced concrete columns. Reinforced concrete shear walls, located primarily around the elevator and stairwell core, provide the primary lateral resistance along with the concrete columns.

The main structural redesign will analyze a composite steel framing system with either moment or braced frames. Both of these steel framing systems will be considered initially, and based on preliminary analysis results and research, the steel system will be appropriately detailed. This steel system offers an opportunity to significantly open the column and architectural layouts, which would in turn affect the requirements of the non-structural building systems.

With a new material and construction method to consider with the proposed structural redesign, constructability must be accounted in a comprehensive building analysis. R.S. Means data was used in Technical Report 2 to assess the potential assembly cost for choosing a composite steel framing system. This research will be expanded upon, with a consideration for the new scheduling and equipment requirements based on a now mostly steel structure. The feasibility for construction of this new system will play a major role in determining the efficiency and suitability of the proposed concrete system.

Likewise, the change from two-way concrete slabs to a composite floor system will significantly alter the mechanical system. The finished ceiling that will hide the new steel floor framing system could be employed to house ductwork and other mechanical equipment. As the floor-to-floor heights and condominium unit layouts are adjusted to the new framing system, the service requirements for the mechanical system may necessitate a resizing or redesign. The fire resistance system will need to be reexamined as well, since there will be no inherent fireproofing in this proposed steel structure.