

River Tower at Christina Landing

Wilmington, DE



Joseph Bednarz
Structural Option
Faculty Advisor: Dr. Boothby

April 3, 2006

Senior Thesis Report: Feasibility and Consequences of Staggered Truss Construction

EXECUTIVE SUMMARY

Perhaps more than in any other type of structure, high-rise buildings always have a premium need for space: maintaining rentable floor space and sufficient floor thickness while meeting overall height requirements of local building codes. The River Tower at Christina Landing is no different. In the initial design, a flat plate, post-tensioned flooring system was able to minimize floor thickness, thereby controlling the overall building height. This maximizes useable floor area while satisfying code requirements at a critical benefit to the realtor. However, this flooring system results in sizeable columns, and a clustered column layout that hinders future renovation or versatility in the architectural layout.

In this report, the feasibility of a steel staggered truss system is considered, while detailing the existing conditions for the River Tower. Through structural analysis, cost estimates, and research into the existing and coordinating fire protection system of the building, it has been determined that the staggered truss system is not a cost effective solution for the River Tower at Christina Landing. This situation is not without its benefits, as building weight has been reduced, and the floor plan under the new system has the ability to be more flexible in the planning of architectural spaces. However, the River Tower's towering height and location in Wilmington, DE, where steel is at a high premium, negate the potential benefits of staggered truss construction. The existing post-tensioned flat plate construction remains the most efficient design for the River Tower at Christina Landing.