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Structural Technical Report #1: Structural Concepts/Structural Existing Conditions

Executive Summary

The following report is a detailed summary of the structural system of the River Tower at Christina Landing. The River Tower is part of the latest phase of redevelopment along the banks of the Christina River in Wilmington, DE. The redevelopment site consists of luxury townhouses, a 22-story apartment building, and will now add the River Tower, a 25-story condominium tower. This tower has since been redesigned for value engineering, and has added two stories to create a 27-story condominium tower. The drawings that I have procured, however, reference the original 25-story design, and this design will be the focus of my analysis and research.

This initial report will provide an introduction to the overall existing design of the structural system of River Tower at Christina Landing. The applicable codes and standards used in the design of this system are listed, along with some typical framing plans and elevations to illustrate the overall framing layout of the building. Loading diagrams showing the required seismic and wind loads, determined through code research and calculation, are given as well. Finally, a spot check for gravity loads in a typical floor slab, as well as a simplified check for one of the shear walls as an example, is provided in this report.

In my preliminary analysis of the River Tower, I have found that most of the design criteria do not deviate from BOCA 1996, as my research has produced the same values as those provided on the construction documents and drawings. The structural system for this building presents an especially challenging analysis due to my lack of experience with post-tensioned concrete flat plate slab design. I attempted to analyze a 12 inch section of the slab as a post-tensioned beam, as I was fairly aware of that procedure. However, my over-simplification appears to have rendered this analysis inclusive. While I hope to learn more about this system as my research work progresses, the following analyses are mere first attempts and will be improved upon and added to with time. With a better understanding of the analysis of the post-tensioning slab system, I will be able to provide a more accurate check in upcoming reports.