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Structural Option
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110 Third Avenue
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Thesis Proposal

Investigation and Summary of Future Research and Activity

1.1 Executive Summary

110 Third Avenue is a residential mid-rise tower that sits in the heart of Manhattan between Gramercy and East Village. Standing at 210' to the bulkhead slab, it offers 21 stories of mid-sized apartments totaling approximately 107,000 square feet of inhabitable space. The structural system of 110 Third Avenue is predominantly cast-in-place concrete. Most floors have 8" CIP slab, but beginning with floor 15 the slab increases to as much as 24" to support cantilevered portions of the building and mechanical equipment on the roof.

The proposed thesis analysis is two-fold. First, the advantages and disadvantages of the existing floor system will be compared to a Post Tensioned alternate system. Manhattan is a unique environment for concrete buildings due to height restrictions and high occupancy level per volume of space. Owners desire the thinnest, easiest-to-construct floor system possible. A post tensioned two-way slab will likely allow an increase in spans without increasing the depth of the floor, but columns and the lateral system will subsequently need to be adjusted. Construction in Manhattan has almost always used a flat plate system for a mid-rise residential structure such as 110 Third Avenue. Knowing the bounds of this system, however, will allow designers to properly evaluate which system is best and economical for a given set of conditions.

Second, lateral analysis in Tech 3 demonstrated that designers used a combination system, not just shear walls, in the design of the lateral force resisting system. This system was previously only analyzed by taking into account shear walls. In future research, the combination system will be analyzed and compared to the shear wall system. Finally, the redone analysis of the lateral system will be compared to the modified lateral system created by using a two-way post tensioned floor system.