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Structural Option
Metropolis at Dadeland
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Tech 1 Exec Summary
10/5/05

Technical Report 1 – Executive Summary
Structural Concepts and Existing Conditions

This report contains an analysis of the overall structure of the Metropolis at Dadeland, phase 1 tower. Metropolis is a 28 story building that is 313 feet tall, meaning that there is no taller tower south of it in Florida. It is the tallest of a rebuilding effort around the east end of Kendall to create a "downtown" atmosphere in that area. The bottom level is entirely commercial and public space. Up to the seventh level there is a parking garage on the interior with loft spaces around the perimeter. The eighth floor is a communal space for the buildings residents with spaces like a gym and pool. Above that there are just condominiums and penthouses. The top two floors and roof are dedicated to mechanical equipment.

The structure of Metropolis is entirely concrete. The foundation consists of piles, most of which lie under a 5 foot thick mat. The columns are reinforced concrete and the slabs are all post-tensioned aside from the roof. The strengths of concrete used range from 4,000 psi to 10,000 psi.

The focus of this report was on the loading of this structure. Analysis of wind, seismic, and gravity loads were performed. As expected, the wind loading was far more critical than the seismic loading. Loading diagrams and plans of the structure are included throughout the report to clarify the loads calculated. Spot checks were also performed in order to ensure that my analysis matches the design of the original engineer. Wind calculations can be found in appendix A, seismic in appendix B, shear wall analysis in appendix C, and the spot check in appendix D.

In the column and shear wall check my calculations resulted in the need for less reinforcement than what was originally designed into the building. This is most likely caused by my simplified assumptions to be able to design everything by hand in a reasonable time frame. My calculation of the slab, however, required more reinforcing than the real design. I attribute this to the challenges I had trying to follow the procedure layed out in *Design of Post-Tensioned Slabs*, Post-Tensioning Institute, 2nd edition.