3. Executive Summary

This senior thesis final report provides background information on Turnberry Tower Arlington, as well as examines the construction and technical aspects of the project. The different studies will discuss what was done during construction and what could be changed to help reduce the schedule or decrease the overall cost. The analysis will end with a recommendation of the success or failure of the proposed change.

The first analysis that will be investigated is the window wall attachment using reinforced concrete instead of the engineered post tension concrete decks. The post tension concrete decks failed during the installation of the window wall when banded tendons were hit. If reinforced concrete decks were used, it would eliminate the problem of striking post tension tendons. After designing the decks using reinforced concrete, it was determined that the decks needed to be 11 inches thick. When comparing the schedules, the analysis showed that the reinforced concrete construction would have no impact. The cost of the post tension decks was $20.6 million and the analysis showed that the reinforced concrete would cost $22.6 million. Because the two reinforced systems analyzed will cost more money than the cost of repairing the damage from the post tension failures, it is recommended that the existing post tension concrete be used over the proposed reinforced concrete decks.

The second analysis investigated was the supply water system that feeds each residential unit. The current system utilizes CPVC piping that connects to the copper pipe risers through the building. I wanted to introduce a new system in the building and see if it would improve the schedule or the cost of the project. The Propress system uses copper piping and an easily connected fitting that makes installation of the supply water system much faster than the typical soldering of copper pipe. Unlike the installation of CPVC, there is no glue necessary to connect the piping because the fittings are mechanically installed with a special tool, which would be a plus for LEED and sustainable construction. When the cost and schedule was analyzed, it was predicted the Propress system would cost $160,000 more. This was due to the fact that the cost of copper in 2006 was very high when the project was designed. The installation of the system would save 17 man hours per unit, but that cost is not offset by the cost increase of the system. It is recommended that since the project was designed in 2006 and the price of copper was high, the CPVC system be used for the supply water to each unit.

The third analysis looks at the current site logistics plan and the overtime cost that needed to be paid to load drywall into the building. There was a large area on the east side of the site that was not used. If the logistics plan used that side of the site during concrete construction to load drywall into the building, it was determined that there could be a cost savings on labor of $750 to $2000 per 1000 boards loaded. This project has 91,000 sheets of drywall to load into the building. The new logistics plan would not affect the SIP schedule and would only require one window wall not to be installed during concrete construction. After looking at the plan and seeing that it is possible to use this site logistics plan, it is recommended that this site logistics plan be used to help reduce the overtime cost needed to load drywall into the building during construction.