



Executive Summary

This thesis proposal is an elaboration on Technical Assignment 3. After brainstorming some initial ideas, I have refined my research to a few key concepts. Some initial research was performed to determine the feasibility of my proposed solutions. The Analysis Descriptions will highlight 3 main topics for my thesis project.

Analysis 1 will look at slab coordination for the Wisconsin Place apartment tower. Since this is a post tensioned structure, much planning has gone into the placement of tendons, conduit, and mechanical box-outs in the 8 inch slab. There have already been a few instances where penetrations were placed at incorrect locations, and the remedy for this is costly and time consuming. One breadth stems from this issue and that is using building information modeling (BIM) to detect clashes in the field before it is actually constructed.

Analysis 2 will look at the building envelope and try to find ways to reduce cost by limiting the faced to one or two standard materials. A breadth will be embedded in this analysis to look at the acoustics of a typical apartment unit and determine ways to further reduce noise and vibration in this city location.

Analysis 3 will look at the punch list process and determine ways to expedite and simplify the tedious job of turning over units. Turner currently uses an Excel spreadsheet to track progress. I will research some computer programs that could be used to monitor the punch list process more effectively as well as speak to companies that are currently using such programs. BIM will also be used here as an easy way to tag incomplete or incorrect items within an apartment unit, making the jobs of the finishes trades a lot easier.

These three topics are supported by background research, potential solutions, steps to achieve my technical analysis, and my expected outcome. In addition, one critical issue research topic will also be explored, and that is prefabrication and the potential schedule and cost savings impacts it can have on a project. The goal of my research is to standardize common building elements to facilitate a faster construction schedule.

The weight matrix shows how much emphasis will be placed on the core areas of research, alternative methods, value engineering, and schedule compression. A detailed explanation of my breadth studies can be found in Appendix A. The purpose of the breadth is to show my proficiency in at least two option areas outside of construction.

Through executing my technical assignments this semester, receiving feedback from professors, attending conferences, and speaking with the Turner team on Wisconsin Place, I feel I have chosen topics that both interest me and could provide some positive solutions for the WPR project. I look forward to what the next semester brings.



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Breadth Studies

Breadth 1: BIM for Slab Coordination

The benefits to using a post-tensioned concrete structure are many. Fewer interior columns allow for a more open floor plan, and the unbonded tendons can be de-stressed before attempting repair work on the slab. But guaranteeing the location of every penetration in the slab before it is poured is a difficult task. I will use Revit Systems and Revit Structures to draft plans that can then be used to detect any interference between the MEP and structural work.

Breadth 2: BIM for Punch List Coordination

One problem with performing a quality control walk-through in a building is being able to pinpoint the exact areas that need to be fixed. Finish trades sometimes search for hours trying to find a knick in the drywall or the missing piece of trim in an apartment unit. By creating a building information model of a typical apartment unit the CM can easily tag the exact location of mistakes that need to be fixed. The subcontractor can carry around a palm pilot or pocket PC that displays this model so that he can quickly find the mistakes and correct them. This model is also a good tool for tracking punch list progress. A master file will be used so that the project team can see how many units are being turned over a day. This can also be a way to track where the most inconsistencies are located.

Breadth 3: Acoustical Analysis

Since it is located in city environment, noise will definitely be an issue for Wisconsin Place. The fact that this tower is being constructed amidst an office, major retailers and restaurants will be another reason to focus on traffic and sound attenuation. I will research some acoustical ceiling tiles or decorative baffles that will reduce the amount of noise and vibration for tenants without detracting from the overall look of the interior space. Additionally, I will provide the cost and schedule impact associated with installing sound-reducing accessories.