

# Executive Tower

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Structural

## Technical Assignment 2 Pro-Con Study of Alternative Floor Systems



### Executive Summary

This report investigates the effectiveness of using an alternative floor framing system than the existing. The existing framing system was designed and compared to four additional framing systems for cost, total thickness and constructability. The existing floor system consists of an 8" flat slab with 8" drop panels at column locations. The four alternative systems are two variations of concrete and two of steel and are noted in the report respectively, concrete flat plate, post tensioning, composite steel beam, and open web steel joists.

The two steel systems were analyzed using RAM structural analysis program and the steel composite was also checked by hand calculations displayed in Appendix D. The deck and load calculations of the steel joists are called out in Appendix E. As for the two concrete systems, the flat plate system examines the constructability compared to the how much more concrete this system will require over the flat slab with drop panels. The post tension is an alternative attempting to achieve a system considerably less thick than the existing. The hand calculations for the flat plate and post tension are in Appendix B and C respectively.

The findings through this intense analysis show two systems to be more dominate over the others. The concrete post tensioning and steel composite beams both achieve two goals, thinner slab and constructability, and warrant the continued research to see which system will be most rewarding in the end. The post tensioning was designed to be a 7 ½" slab but through more research and a better understanding of the system, a thinner slab can be achieved. The composite beam is less labor intensive and lowers the dead load self weight approximately 40 psf less than the post tensioning.