Executive Summary

The Franklin Square Hospital Center Patient Tower is a 7 story 356,000 square foot hospital addition that serves the existing Franklin Square Hospital campus while adding 291 private inpatient rooms, an expanded emergency department, a dedicated pediatric emergency department and inpatient suites, four new medical and surgical units, and an expanded 50 bed critical care unit.

The current structural system consists a of two-way mildly reinforced concrete flat plate floor system and reinforced concrete moment frames. The proposed thesis focuses on lateral design and optimization by relocating the building to San Francisco, California which requires changes to both the gravity and lateral systems. A redesign of the entire floor system with a post-tensioned flat plate will be utilized to lower building self weight and the existing moment frame lateral system will be analyzed in comparison with a shear wall system in resisting lateral loads.

San Francisco, California was chosen as the new building site for its seismic history. For the purpose of this thesis, an intense lateral redesign was chosen which requires intense lateral loading. Located close to the San Andreas Fault and the Hayward Fault, San Francisco, Ca was a logical choice. The Hayward Fault is considered by some to be the most dangerous fault in America at this time with a 63% chance of a magnitude 6.7 or greater earthquake within the next 30 years. The past five large earthquakes of this fault have occurred on average about 140 years apart and the last occurred 142 years ago, October 21, 1868.

Additional breadth topics proposed in this report focus on other architectural engineering disciplines such as construction management and architecture. One of these studies will focus on a cost and scheduling comparison to determine adjustment to the construction schedule necessitated by the change from a mildly reinforced two way flat plate to a post-tensioned two way flat plate. The associated costs with a changed schedule will also be investigated. The second study involves an architectural redesign of support spaces, nurse's stations and hallways to function around the addition of structural shear walls.

The MAE requirements for the project will be fulfilled through the construction and implementation of an improved and comprehensive ETABS building model. Methods taught in AE 597A: Computer Modeling including modified section properties, rigid end offsets, insertion points, panel zones and rigid and semi-rigid diaphragms will be included in the model. This model will be extremely useful for quickly and accurately comparing proposed lateral system design and implementation.