Executive Summary

The purpose of this report is to present the proposed change in location of the Hyatt Place North Shore from Pittsburgh, PA to San Diego California. After analyzing the existing structural system of the 7-story Hyatt Place North Shore it is determined that it is sufficient to carry the load and meet code standards. The 70 feet tall, 108,000 square foot structure has intermediate reinforced concrete masonry bearing walls working in combination with an 8" un-topped precast concrete plank floor structure to handle both gravity and lateral loads down into the soft soils along the Allegheny River and to bedrock approximately 70 feet below with numerous 18" diameter auger piles.

The Hyatt Place North Shore is an "L" shape that has an abundance of shear walls around its perimeter and along the double loaded corridor that runs down the middle of each leg, thus the center of rigidity is expected to be near the center of mass. But in general the "L" shape leads to the legs acting individually and creating large amounts of stress where the ends of the wings meet and at the reentrant corner. There would have to be special considerations for this building shape if the building was purposed for a location in the Western United States where seismic load is much greater. Ideally a large "L" shaped building would have a separation joint large enough to allow the two legs of the building to act independently from each other limiting the twisting action due to the orientation of shear walls. Thus the building shape leads to the thesis study for the Hyatt Place North Shore.

The proposed thesis study is to have the building relocated to California and redesigned to best meet to the seismic loads given the building layout. This will require a complete redesign of the gravity and lateral force resisting systems. The gravity structure will be steel with topped precast concrete plank floor system and the lateral system will be steel braced frames along with concrete shear walls around stairwells. These systems will be designed in RAM and ETABS and checked for validity by hand. Two lateral force resisting frames will be designed by hand in order to incorporate my MAE courses. Throughout the study there will be a focus on torsional effects and how the building reacts under seismic loads.

With the redesign of the superstructure, the cost and schedule of the building will be affected, along with the architecture. Both topics will be analyzed and used to compare the effect of location on the building as a whole. The use of the separation joint between wings of the building will also be compared. All of this information will be complied to compare the Pennsylvania location with the California location.