

Executive Summary

The Bed Tower Addition at Appleton Medical Center is facility located at 1818 North Meade Street in Appleton, Wisconsin. It is an eight story building with a mechanical penthouse on top which houses 139 extra beds for patients. The existing structure uses a mat slab foundation, composite beam gravity system with slab on deck, and concentrically braced frames.

This report was to focus on two aspects of seismic design. The first phase was to move the rebuild the existing structure's footprint in San Francisco and modify the braced frames to withstand new loads. The second phase was to analyze a base isolation system combined with the existing structure and modified structure. Once the results were obtained, the last phase was to compare the differences between use of the existing structure and modified structure, but to focus on whether base isolation would be feasible alternative system for the new location.

Using ASCE7-10, seismic design parameters were calculated to determine the vertical distribution of forces on the building with and without base isolation. It was then determined that the design base shear for the structure decreased by more than 211% with the use of base isolation. This resulted in a decrease in story forces and shears. Comparison of base isolation with both structures did warrant any conclusive results. The displacements and drifts were very similar to each other with minor differences. A better analysis comparing the various configurations of the base isolation system would have resulted in better comparison. However, the results showed that implementing the base isolation system reduced the drifts to a minimum and all calculations were less than the allowable drift limit.

From the report, it is plausible to say that the existing structure could be moved to a different location if base isolation is implemented. The ramifications of implementing a base isolation system would be costly though. The total project cost grew to \$61,300,340 with the increase coming from installation costs and schedule changes. Use of base isolation would extend the schedule just 7 days and increased the total project cost by \$2,200,340.

Architecture was also taken into consideration. A base isolation system needs a moat to allow for the entire building to displace without disruption. To cover up a moat, breakable lightweight greets were placed on top. The moat was also covered up by using a seismic retaining wall which extends three above the ground level for safety and is also disguised by hedges. Another difference in architecture during the move occurred in the façade. A new façade was designed to match the surroundings of San Francisco State University. Several buildings were used as inspiration and the new look should fit into SFSU.