

Executive Summary

The Christiana Hospital project is a 299,000 square foot addition to the Christiana Medical Campus. This expansion, designed by architects at Wilmot/Sanz, will expand the hospital's clinical capabilities along with adding a new medical education center capable of providing this teaching hospital with the latest techniques and learning tools. Structurally the building has been designed essentially into two separate buildings. These two buildings consist of a three story education wing using steel construction and an eight story clinical tower that takes advantage of reinforced concrete construction.



This paper is designed to propose an alternative design for the Christiana Hospital. The design will consist of dividing the main clinical tower into separate structures coming together at an expansion joint to decrease the torsional effects on the lateral force resisting system while still maintaining the building's functionality and architectural appeal. Secondly the current 9½" thick two-way concrete floor system will be redesigned using post-tensioning in an attempt to decrease the slab depth. Designing the building in this manner will require a redesign of the shear walls along with the complete redesign of the floor system. This new structure will be compared to the original design regarding efficiency and constructability.

Along with the redesign of the Christiana Hospital's structural system two breadth topics will be discussed focusing in fields of construction management and mechanical engineering. Regarding construction management, the impact of the redesign on overall project cost and the construction schedule will be addressed. Concerning the mechanical breadth, air in the Christiana Hospital is currently cooled using chilled water provided by an outside source. I propose to research and design a chiller that will be capable of creating this chilled water on site and compare its cost and functionality to the current system.