

Executive Summary

The St. Elizabeth Boardman Inpatient Facility is a 65 million dollar renovation to the already existing hospital located in Boardman, Ohio. The hospital, owned by the Humility of Mary Health Partners, began the renovation project in October of 2005 and has recently finished construction of the new addition in August of 2007, which consists primarily of a seven story, 25,000 square foot tower addition. Structurally, the building has been designed as three distinct sections; the patient tower, the surgical wing, and the diagnostic wing. The patient tower is the majority of the renovation, though the diagnostic wing has also received an addition. The structural system for the patient tower addition consists of structural steel framing with a brick façade and an aluminum panel curtain wall system that exists on the north facing elevation of the tower, while the rest of the building is primarily two stories of masonry construction.

The proposed thesis is to investigate the validity of a redesign of the patient tower with a structural concrete system, as apposed to the original steel frame design. From calculations performed throughout the second technical assignment, it was determined that the steel system used would have been the most efficient design for the building. Though, a structural alteration may provide additional improvements throughout other applications of the building's functions and processes, including; construction, operation, overall design efficiency, or any other number of areas of practical usage.

Along with the redesign of the patient tower's main structural system, a few breadth studies will also be conducted. First off, the architectural aluminum panel curtain wall will be evaluated for the validity of its use with a concrete structural system, as well as its ability to withstand weather elements without leakage and resist excessive amounts of heat loss from within the building. Secondly, as the design of the building undergoes a variety of modifications, the overall cost and scheduling for the building are likely to change as well. Thus, to make an adequate comparison of the differing structural systems, an updated estimate and schedule will be prepared for the concrete system and the construction processes that are involved.

Once all of the final components of the hospital are considered, the effect the building places on the environment and the degree of sustainable practices used throughout the construction phase and its life cycle will also be evaluated. With this information, it can then be determined how close the hospital would be to obtaining a LEED ranking and becoming acknowledged as a certified "green" building. Also, with an evaluation of the amount of earnable LEED points, the necessary steps to improve efficiency can be established and the goal to achieve this recognition, or possibly raise it to a higher level, can begin.