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# Senior Thesis Final Report

Project 2012



*Susquehanna Patient Tower Expansion*  
*Williamsport, PA*



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## **1.0 EXECUTIVE SUMMARY**

This report will discuss and evaluate all findings from three analyses performed on the Susquehanna Health Patient Tower Expansion project in Williamsport, PA. This report will explore different possible design and construction changes as to produce a better quality project.

### ***Analysis-1 Mobile Crane to Tower Crane Analysis***

During this analysis two L.F. Driscoll projects similar in nature were compared to see which one erected the steel faster with either a tower crane or a mobile crane. After considering the possibility of utilizing a tower crane over a mobile crane, the better choice is by far the mobile crane. In terms of schedule, a total of only seven calendar days was saved from the total schedule. This schedule reduction wasn't even close to getting Susquehanna Health interested in swapping cranes. The total cost impact force Susquehanna Health to spend an additional \$464,000 for a man hoist and tower crane. The man hoist was the really big factor in this analysis but even without it an additional \$55,000 would have to be spent. Because Susquehanna Health is a non-profit organization and can't give proper justification for this change it is the recommendation of this analysis to keep the mobile cranes.

### ***Analysis-2 Use of Prefabrication in Patient Rooms***

In this analysis headwalls, footwalls, patient bathrooms will be prefabricated and then shipped to the site to reduce schedule and costs for the whole project. After reviewing all of the data in this pre fabrication analysis, it is clear to see that prefabrication could be utilized with great success. When first starting this analysis it was believed that the schedule savings would be the greatest advantage associated with this type of construction. However, the cost benefits proved to be just as substantial. After implementing prefabrication, the schedule was reduced by a total of 40 calendar days. In addition to the schedule savings, \$432,161 was saved in general conditions and labor. As long all elements of the project team collaborate and coordinate effectively everyone can see the benefits of prefabrication. Prefabrication must start from day one and the project team must buy into it completely. As long as the assumptions can be met then prefabricating these elements is without a doubt a good investment.

### ***Analysis-3 Value Engineering Roofing Systems and Providing alternatives***

Because very little value engineering was done on this project, this analysis will focused on value engineering the expensive green roof and providing more cost effective alternatives. After value engineering the roofing systems and providing alternative systems it has been determined that the best option for Susquehanna Health is to eliminate the green roofs at roof level leaving only the one over the entrance. However, steel member should not be value engineering the steel should not be done. Choosing this option will also allow Susquehanna Health to determine if a photovoltaic array is still in the budget. Taking into consideration that the green roofs cost so much, Susquehanna Health would only need to come up with an additional \$60,000 which seems pretty reasonable for such a large organization.