

### Executive Summary

The Mercy medical Center has been analyzed to establish means for potential value engineering, schedule reduction and alternative building options. In this proposal four areas of research will be discussed, along with their relation with the analysis topics.

The critical research topic being analyzed is the role of women in the construction industry. The research pertains to determining why there are so few women in the construction industry, and ways to create interest in the construction industry. Through the use of a survey, given to both women in the construction field and those hiring in the construction field, a better perspective on the industry can be established, which will allow for a solution to be reached when recruiting women engineers.

My technical research problems focus on the site of the building with respect to the overall congestion of the site as well as the onsite ventilation. The level of congestion of the site can have a drastic effect on the delivery of site materials as well as the ease of the construction process. Because the hospital is being built on a site where there are adjacent buildings, the analysis will include the projects effect on adjacent buildings. The end result will be a chart which establishes various levels of site congestion based on prior sites, with each level corresponding to possible solutions to the site congestion.

Onsite ventilation is also a very important topic for medical facilities, especially since there are established hospital buildings around the new site. This poses the problem of cross-contamination from construction. Identifying the main causes of potential contamination is a major aspect of my analysis. These causes will then be used to make an effective list of ways to minimize contamination. All research tools will be obtained from ICRA. The last topic refers to the use of a drilled shaft foundation system, versus a mat foundation system. The analysis will involve researching the positive and negatives of each system, looking at both schedule and cost.

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## Breadth 1: Mechanical System

Due to the fact that hospital already has operating facilities surrounding the proposed site, it is very important to maintain a level of active circulation in and around the site area for patients and pedestrians. Cross contamination from outside air and debris can cause the mechanical systems of the existing buildings to be less effective in filtering. The research will explore possible ways to reduce cross-contamination, and increase the amount of ventilation onsite. Possible solutions include the installation of temporary on-site ventilation systems as well as more evasive ways of reducing contamination.

## Breadth 2: Foundation Analysis

The use of a drilled shaft foundation is primarily used for buildings where a deep foundation is required, due to high axial loads being applied. The idea of using a mat foundation instead of a drilled shaft foundation could provide savings in cost as well as reduce the schedule. The research will focus on the various positives and negatives of using a mat foundation instead of a drill shaft foundation