

Executive Summary

The Senior Thesis Final Report is intended to describe the results and recommendations for the four analysis topics executed on the Kaiser Permanente Medical Office Building. The project includes the renovation of an existing 250,000 SF building and construction of a new mechanical tower. The analyses were developed to address challenging issues the project faced. Although, the main focus of these analyses is to add value to the building through value engineering, sustainability, and aesthetics.

Analysis 1: Integrated Project Delivery Method on Coffe Re-design Issue

In order to address the cost and time challenges associated with the coffe re-design of the existing waffle slab, the project delivery method for this project needed to be reconsidered. For the analysis, the project delivery method was changed from design-bid-build to Integrated Project Delivery in order to research the impact it would have on the coffe design issue. A successful IPD case study for a similar renovation project was explored in order to compare the process, risk, and cost of IPD versus design-bid-build. The results of the analysis indicated that IPD would be a viable option for Kaiser Tysons because if done correctly, it could lead to cost savings and better use of time. Although it was found IPD can present issues of risk and owner's trust, through early collaboration and positive benefits it is highly recommended.

Analysis 2: Façade Re-design

Due to the water infiltration issues associated with the existing, cracked precast panels and glazing, a new façade design was explored. The analysis replaced the existing exterior façade with a Kawneer 1600 Curtain Wall system to encompass both the cladding and glazing in one unit. The impact on the schedule, cost, and value added was found to see the feasibility of this change. Also, an architectural breadth aided in this analysis to further explore aesthetical value added. Results concluded that the Curtain Wall system would cost \$2, 440,980 which is an increase of \$402,120 from the cost of the required precast panel epoxy injections and new glazing. This change also showed no impact on the schedule duration because the activity was able to be incorporated before building construction began. The architectural breadth also showed added value from overall exterior aesthetic enhancement and increase in natural interior lighting.

Analysis 3: LED Temporary Lights

With the extensive amount of medical equipment and high demand for energy, the maintenance costs and energy consumption of this building can result in staggering numbers. The lifecycle costs and carbon footprint of the building could potentially be a problem in the future if not addressed during design. To address this issue, an analysis was conducted to compare the energy and cost of the LED FLEX SLS temporary lighting system versus the standard fluorescent temporary lighting system used. The amount of energy that was saved during the construction timeframe by converting from fluorescent to LED was researched and found to save 88, 036 Watts over the duration of the 13 month project. Cost analysis for this product and other temporary lighting systems was also explored by finding energy cost, initial upfront cost versus the money saved from energy savings, and second project use cost. It was found that the FLEX SLS system had the lowest costs and could be reused from project to project. Additionally, an electrical/lighting breadth was performed in order to see differences in the lighting layout and power plan between the systems. The results of the breadth concluded further cost and material savings for the FLEX SLS system due to the modules and kit configuration.

Analysis 4: Addition of Green Roof Exterior Terraces

Due to the fact that Kaiser Permanente MOB is the renovation of an existing structure, the lack of sustainable features is something to be addressed. Sustainable design is a critical industry issue that is becoming a standard for most commercial buildings to utilize. The analysis conducted involved incorporating green roofs on the existing exterior terraces to provide patient access. Since Kaiser

Permanente believes that light and nature aids in the healing process, a green roof terrace supports this vision. Factors explored were green roof types based on structural limitations, initial and maintenance costs, value added, and contribution to patient healing. After choosing a modularized extensive system, designing the layout, and finding associated cost, it was concluded that this would be an inexpensive, quick, and valuable addition to reach sustainable goals and improve patient comfort.