

V. Thesis Conclusion & Recommendations

After conducting these analyses, it is important to indicate the next course of action. The first analysis provides a better alternative of construction methods for the curtain wall. The second analysis establishes a more efficient design for the curtain wall, which will put more money in the owner's pockets. Both of these analyses provide better methods than what is currently being implemented.

Curtain Wall Prefabrication Analysis

The current method of curtain wall construction for Main & Gervais is the stick-built method. It is clear that the advantages of prefabrication outweigh the disadvantages for prefabrication. After identifying these specific advantages and disadvantages, it is important to consider two issues that are very important in construction. These two issues are time and money. The schedule for prefabrication is a third of the time it takes for the stick-built method. This extra time allows the interior trades to begin their work since the building is enclosed faster. The cost evaluation shows that the material costs for prefabrication construction are higher than the stick-built method. This fact would lead to an increase in overall cost by 29% for non-union labor. It is important to mention the cost savings from turning over the building to the owner quicker. Finishing the building possibly 81 days earlier will allow the owner to bring in \$945,000.00 for leasing the space. This brings down the overall cost of prefabrication to only be 8% more than stick-built. This provides a stronger case to the owner to choose prefabrication.

Curtain Wall Design Analysis

Eliminating the slope of the curtain wall provides additional area to each floor of the office tower. This extra area amounts to an additional 2756 ft² in area. The owner can charge an additional \$57,876.00 a year for this space. Adding this area does come at a cost to the owner. This cost is in the form of structural support, construction costs, and energy bills. It is concluded that extra columns and joists, and a resizing of the beams are necessary to support the additional slab area. Also, changing the slope of the curtain wall alters the amount of window heat gain the façade allows. The structural addition amounts to an upfront cost of around \$30,828.07. And the new energy load increases the energy bill by approximately \$7,461.94 for the year. After the first year, the owner annually brings in an extra \$50,414.06 in rent money. In conclusion, putting this change into action is a profitable business plan.

Combining Both Analyses

After completing both analyses, there is an important conclusion that is revealed. The surplus revenue from extending the floor plan can compensate for the additional cost to choose prefabrication over stick-built construction. The additional floor plan will provide the owner an additional \$372,484.41 after eight years. This surplus can contribute to the additional cost of prefabrication, which is \$351,842.40. The owner will break even if prefabricated curtain wall panels were chosen and curtain wall slope was eliminated on the west elevation of the façade. Therefore, it is suggested that the curtain wall panels be prefabricated and the slope of the curtain wall on the west elevation be eliminated.