2.0 Executive Summary

The theme of the research conducted in this thesis is to explore alternatives and procedures that could have been implemented to avoid or reduce the impact of the changes and constructability challenges on the New Clinical Building.

Three technical issues relevant to the construction management aspects of this project are researched to determine if they can add value to the project by reducing the schedule and cost, while improving the constructability. The following three analyses were conducted.

Analysis 1: Alternative Project Delivery Method (MAE Requirement)

The current design-bid-build with early procurement project delivery method has resulted in 60 Construction Change Directives, 2,700 Request for Information, and 700 change orders to date. This has resulted in a cost escalation of approximately [redacted] and an extension of [redacted] to the original schedule. An alternative delivery method is researched to find a method that can more efficiently manage the changes while meeting the Owner's project goals. The recommended delivery system is a traditional delivery method with early procurement, a project manager, integrated project delivery principles, and design-build MEP contractors. This method would have reduced the risk of changes and managed the rest more efficiently.

Analysis 2: Chilled Beams Cost & Schedule Impact (Mechanical Breadth)

The mechanical system has suffered the most from the design changes. The result is a 7 month delay that will cost the Owner several million dollars. A new HVAC technology - chilled beams is analyzed to determine the impact on cost and time. The findings are that it would have saved $3,207,684 initially and an additional $13.4 M - $31.3 M over a 30 year life-cycle. It would also allow JHH to generate an additional income of $18,125,537 per year. The system would also save an average of 31 working days on a typical floor. This would take the mechanical overhead off the critical path of the project schedule. This system would be able to absorb many of the changes and delays encountered thus far on the NCB project.

Analysis 3: Case Study - Concrete Over-pour on Decks Due to Steel Deflection (Structural Breadth)

One of the major constructability challenges on this project was the concrete over-pour on metal decks from the steel deflection. This is a common problem on many projects. This analysis looks at what happened on the NCB and suggest ways to avoid the problem on future projects in each phase of the project delivery. The analysis found there was 1,200 CY of extra concrete poured that amounted to $100,000 of exposure to the concrete contractor. Further projects can avoid this problem by working with the structural engineer to determine the expected deflections. An allowance should be carried by the contractor to avoid the financial risk associated with this problem.