

## **THESIS PROPOSAL**

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### **EXECUTIVE SUMMARY**

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The Swedish American Hospital's new Heart and Vascular Center is a 4 story steel structure located in Rockford, IL, west of Chicago. The original design was a 7 story patient facility that was to be constructed in two phases. The first phase was the construction of the existing 4 story structure with mechanical units located on the roof. The second phase includes enclosing the roof and mechanical units into a 5<sup>th</sup> story and the addition of two more stories above. Each floor is approximately 25,000SF of composite steel and metal deck.

The original 7 story design is based on a "Certificate of Need" requiring the space to be designed to accommodate a specified number of patients based on the future population of the Rockford area. Although the idea of studying the cost savings from the design and construction of only the existing 4 story structure was expressed, it would not satisfy the requirements of the "certificate of need". Therefore, it is proposed to study an economic alternative to the existing floor framing layout and lateral resisting system for the full 7 story structure. A cost/benefit analysis will be completed comparing the construction of the building in one and two phases.

To determine the validity of this thesis, an analysis of alternative framing plans and lateral systems will be completed. The use of computer modeling software, ETABS, will assist in the detailed analysis of various structural systems. A specific study of the column base plate connections at the foundation will be completed to determine the rigidity of the connection in an attempt to help control the overall drift of the structure.

In conjunction with this thesis, two breadth studies will be completed focusing on the façade of the building and construction of the project. The façade study will focus on the architectural panels and precast lintel areas surrounding the windows in the patient rooms. Swedish American provided information of an existing thermal and moisture problem typically observed around the base of the window sills. At the conclusion of this study, a repair will be designed and repair documents will be submitted. The construction management study will research the constructability, construction schedule and cost savings of the final alternative framing plan and lateral system chosen for the Heart Hospital. From the construction schedule, a critical path will be followed to determine what affect the structural framing has on the overall construction time of the project.

## **BREADTH OPTIONS**

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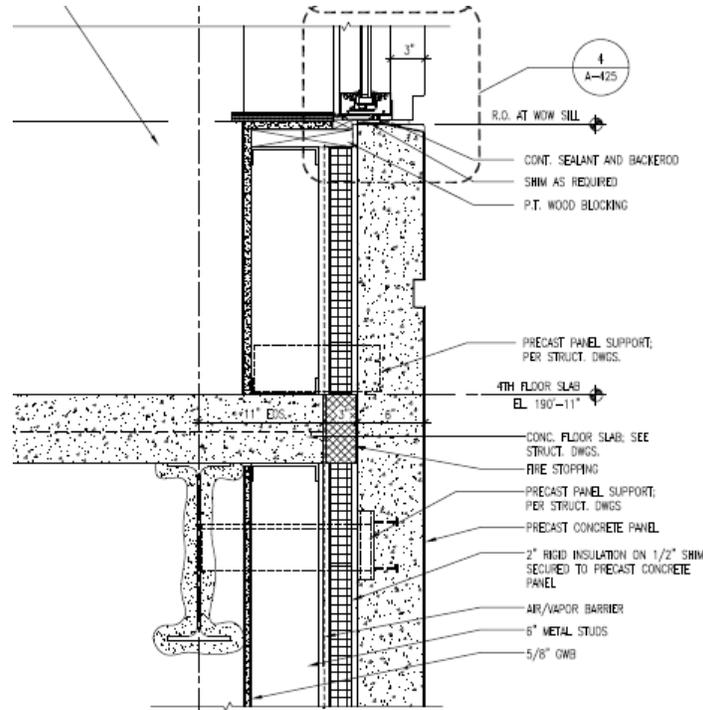
Along with the main study of alternative economic framing plans and lateral systems, two breadth studies will also be completed. They include a study of the Heart Hospital's façade and a construction management study focusing on the cost savings and scheduling impact of the alternative framing plan/lateral system deemed acceptable.

The façade study will focus on the architectural wall panels and precast lintels surrounding the windows at the patient rooms. It was expressed to me, in a conversation with Glenn Evans, that Swedish American was experiencing thermal and moisture issues around and below the sill area of the window units. (See Appendix A for details) I will study the details provided in the plans and seek the help of industry professions with this specialty to develop a reasonable solution and repair for this problem. If able, time permitting, I will develop a set of drawings or sketches to repair the problem.

The façade study will also tie into the construction management study. I will complete a cost analysis of the repair and develop a rough construction schedule for the repair work to be done. This study will also research the constructability, construction schedule and cost savings of the final alternative framing plan and lateral system chosen for the Heart Hospital. A cost/benefit analysis will be completed comparing the construction of the building in one phase and two phases. From the construction schedule, a critical path will be followed to determine what affect the structural framing has on the overall construction time of the project.

**APPENDIX A**

Detailed Sections of Window Sill at Architectural Precast Wall Panel



**SECTION DETAIL AT WINDOW / WDW SEAT**

1 1/2" = 1'-0"

