

151 First Side

Executive Summary and Breadth Topics
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Structural Option

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Executive Summary

Report Summary:

151 First Side is an 18 story condominium project located on 151 Fort Pitt Boulevard in Pittsburgh, PA. The first three floors are a parking garage with the above floors housing residential space. The primary floor system is a proprietary Hambro MD2000 composite floor joist system. Lateral stability is achieved using a combination of braced frames and moment connections.

For my thesis I will be proposing a conventional composite steel floor system. I will also research whether a lateral system of all moment connections or all braced frames would be more economical and easier to construct. The final design will provide equal or better strength and serviceability while lowering the final cost.



In addition to redesigning the structural system I will also be looking at two areas of breadth studies. The first breadth study is an acoustical analysis of both the typical residential level as well as the rooftop mechanical unit. The second breadth study will be a detailed cost analysis and schedule impact of my proposed floor system and framing as compared to the current system.

The acoustical analysis is being performed due to an expressed interest in sound transmission by the owner. The current system will be compared to the proposed system and, if necessary, further sound protection will be designed.

Since 151 First Side was designed with speed and cost as two major criteria, I will be analyzing the schedule and cost information. With the proposed structural changes I hope to lower the material cost, labor cost, and overall length of the project. I will also be looking at what impact, if any, the proposed acoustic solutions may have on each of these.

Breadth Topics

In addition to my proposed structural redesign I will consider its affect on other systems in the building. I will also be exploring some of the primary concerns of the owner and engineer in regards to serviceability. From these two topics, I have decided on two topics for my breadth studies.

My first breadth study will be an acoustical analysis. The current floor system design had an extra ½" of concrete added to help in both sound transmission and vibration. I will be looking at the effects of my proposed floor system on the acoustical properties of the residential areas. I will also look at possible ways to reduce the noise from the rooftop mechanical unit as the most common complaint from people touring the building is that sound carries from the unit to the 3,000 SF outdoor terrace of the Penthouse.

The second area I will investigate is within the construction management field. Since this project was designed with cost and schedule as major components of the design process, I will be analyzing the effect of my proposals on both of these criteria. Using RS Means, Primavera, and information obtained by the contractor and owner, I will perform a cost analysis and schedule impact between the current system and the proposed floor system, including acoustical additions.