

Executive Summary

The Hotel in this report is located in the Northeast United States (referred to as the Hotel N.E.U.S.) along a river. Standing 60'-8" tall at its highest, the hotel contains 113 rooms and 75,209 square feet. Construction began in October of 2011 and was completed in November 2012. The project cost around \$10 million.

This thesis focuses on redesigning the framing using steel construction. The existing framing consists of masonry bearing/shear walls with precast planks making up the floor system. Composite steel and concrete on metal deck will be used to replace the planks and steel beams and columns will be used in place of the masonry walls. Efficient column placement will not interrupt any room spaces and keep the floor plan identical to the existing design, minimizing conflicts in architecture.

The existing shear walls can be redesigned using braced frames in the short direction and moment frames in the long direction. Utilizing braced frames in the short direction will keep them concealed in partition walls (where the shear walls currently exist). Moment frames in the long direction can allow window and door placement to remain unaltered.

By changing the material to steel, the overall building weight will significantly decrease which lowers seismic loads. The construction timeline could also be decreased. A large benefit to steel construction is that the lateral system can achieve a balanced layout. Masonry suffers with placement because it must run continuous from foundation to roof. The ability to resist lateral loads and limit drift is well met with shear walls. This report will serve as a learning tool to decipher the difference between masonry and steel construction in low rise buildings.

To break away from the characteristic hotel style in today's construction industry, the architecture of the Hotel N.E.U.S. will be reevaluated. A study of old and new buildings will forge a new design for the hotel. A computer model will be created to convey the fresh architectural style. Along with this, the enclosure of the building will be investigated. After an analysis of the existing enclosure, the new façade selected for the architecture will be inspected and compared to the old system based on certain criteria. These breadths work in conjunction with each other to look at the building's shell for performance and for aesthetics.