



North Shore at Canton

Baltimore, MD

Technical Report 2

Alternative Floor Systems

Beau Menard
Structural
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Executive Summary

In this report the current floor system of North Shore at Canton was compared to four alternative floor systems. A typical bay for North Shore, is approximately 25'x30', these spans line up directly over the concrete bents, spaced 25' apart, which make up the pier structure. The current floor system consists mainly of pre-engineered open web floor trusses, spaced at 16" on center, and span 25'. The floor trusses are topped with 3/4" OSB, and can be considered a rigid diaphragm. Four alternative floor systems were analyzed. The first, which was similar to the existing system, involved pre-engineered composite wood joist, which are spaced at 19.2" and span 25'. The second system analyzed was a 2-way concrete system composed of a flat plate with drop panels, since the bay size is considered large for concrete residential construction, the 30' spans have been reduced to 20'; this does not create any problems since the building is 60' wide and the columns being moved are directly supported by the concrete bents. The third system analyzed is a 30" concrete pan joist system, with 36" beams supporting the joist at the column line, the reduced bay size was also used for this system. The fourth system analyzed was an open web steel joist system supported by steel girders and columns, since steel allows for longer spans the original bay size of 30'x25' was used. The joists are topped with 1.5" metal decking and 2.5" of concrete.

The loading used was in accordance with the IBC 2003, and only gravity loading was considered at this time. Besides loading other factors were used in determining if each system was a viable option for further investigation. Those factors included, but were not limited to; fire rating, availability, economy of the system, and impact on the pier foundation.

Of the four alternative systems analyzed, only one will not need any further investigation. The only system that will not be looked at, is the composite wood joist system. Since the system offers no great advantage over the current system, it will not be regarded. All other systems shall be used for future consideration.