North Shore at Canton

Baltimore, MD

Final Report

Construction Management Breadth

Beau Menard
Structural
Parfitt
4/05/06

Cost Analysis:

A cost analysis based on the total cost values, including operation and production, given in the RS Means manual was done, to compare the cost of the steel frame and the pre-cast concrete frame against the original cost of the town homes. Cost analysis includes structural elements of each frame system, as well as each respective floor system. It should be noted that the cost estimates did not include the cost of connections required for each system, and the total cost of the structure is subject to change based on the connections used.

The cost of the original systems was based on an estimate given to me from the engineers at WCMB, on the town home structural elements, the steel stud walls sheathed in gypsum, as well as the floor and roof systems. However the cost estimate given did not include the cost of the steel columns or the cost of the hollow core planks, which support the first floor of the town homes. An estimate was done on the columns and planks and concrete topping, and was then added to the cost of the town homes. It was found that the cost of the original structure was about $ 448,600.00.

The cost of the steel structure was based on the columns, girders and bracing elements used. Also the cost of the floor joists, metal decking, and concrete topping were taken into consideration. The estimated cost of the steel frame came out to roughly $ 650,000.00.

The cost of the pre-cast frame was based on the columns, girders, shear walls, and the floor system used. The cost does not include the cost required to alter the pier foundation of the building. The total cost of the pre-cast concrete frame came out to be roughly $ 766,000.00.

Overall the original system was the cheapest system to implement, which is fairly reasonable considering the structural members consisted of gypsum board and steel studs.

The steel frame only increased the cost from the original by roughly $ 200,000, while the pre-cast frame increased the rough estimate by $ 310,000. Though these estimates did not consider the specific cost of the connections between members, I do believe they fairly represent the general cost of the structure. Member quantities and cost take offs are located in appendix A.

Construction Durations:

The construction durations estimated for this analysis were done using information given by the RS Means manuals. A duration estimate was done for a typical bay of each redesign option, and then was extrapolated to determine the construction duration of the entire structure.

The original construction of the town homes lasted approximately 5 months. The project started in late January of 2002, and was completed near the middle of July of 2002.

The duration estimates used for the steel frame were based on a typical bay, which consisted of 8 typical columns, 4 exterior girders, 2 interior girders, and 2 bracing members. It was found that construction duration for a typical frame was about 3.5 days per bay. Since there are approximately 40 typical bays in the structure, it was determine that the construction of the steel frame would take approximately 4 months to complete.

The duration estimates used for the pre-cast concrete frame were based on a typical bay, which consisted of a 8 columns, 2 interior girders, 2 perimeter beams and a full length shear wall. It was found that construction duration for a typical pre-cast frame was about 15 days. Since there are approximately 12 typical bays in the structure, it was determined that the construction of the pre-cast concrete frame would take about 6 months to complete.

The durations for each system were roughly the same. Construction time estimates are highly subject-able and are easily altered. There are a lot of factors that affect construction durations, including material procurement, types of connections, crew sizes and equipment used. The values estimated for this report were based on construction time only, with a single crew. Adding multiple crews, which would be a more realistic situation, would decrease construction time for either frame.