



CONSTRUCTION MANAGEMENT BREADTH STUDY



Construction Management Breadth Study

Cost Analysis:

By changing the structural material of Sherman Plaza, the building cost will also be affected. This change will impact the costs of materials, equipment and labor. R.S. Means was used to estimate the costs of both the reinforced concrete system and the structural steel system for a comparison between the two. In this estimate, only the structural materials and the exterior cladding material were considered. Therefore, in the steel system, the materials that were considered are the beams, columns, lateral bracing, shear studs, metal deck, foundations, and concrete slab. The amount of structural materials was either estimated or taken from the takeoff from RAM Steel. For the concrete system, the beams, columns, slabs, foundations, and shear walls were considered. The exterior cladding cost was estimated for each system, because the steel structural system results in a building with a greater height and therefore greater cladding cost. Table 6 shows the summary of the cost estimate for the steel system. Table 7 shows the cost estimate for the reinforced concrete system. The full calculations and takeoff can be found in the appendix.

Table 6: Steel System Cost Summary		
	Total Length (ft.)	Total Cost
Steel Beams	99845.69	3113651.455
	Total Length (ft.)	Total Cost
Steel Columns	23015.2	3750311.381
	Total Length (ft.)	Total Cost
Lateral Bracing	25884.8	694489.184
	Total No. Studs	Total Cost
Shear Studs	67681	92722.97
	Total Sq. Feet	Total Cost
Metal Deck	593800	1146034
	Total Sq. Feet	Total Cost
Concrete Slab	5500	569525
	Total Cu. Yards	Total Cost
Foundations	3837.03	3473184.2
	Total Sq. Feet	Total Cost
Ext. Cladding	220668.07	4614169.3
Total Cost Steel System:		17454087.5

Table 7: Concrete System Cost Summary		
	Total Cu. Yards	Total Cost
Concrete Columns	3316.452	3028635.148
	Total Cu. Yards	Total Cost
Concrete Slab	14662	7169718
	Total Cu. Yards	Total Cost
Shear Walls	2265.222	377100.3204
	Total Cu. Yards	Total Cost
Foundations	3509.74	10790575.1
	Total Sq. Feet	Total Cost
Ext. Cladding	203964.58	4264899.4
Total Cost Concrete System:		25630928.0

Schedule Estimate:

The schedule estimate was also performed using data from R.S. Means. For each of the structural materials considered in the cost analysis above, the daily output was found and used to find the total number of days to perform each task. The days for each task were then added to provide an estimate of total days to erect each structural system. Table 8 and Table 9 provide the schedule estimates for the steel and concrete systems, respectively. The full calculations and takeoff can be found in the appendix.

Table 8: Steel System Schedule Summary		
	Total Length (ft.)	Total Days
Steel Beams	99845.69	143.8260964
	Total Length (ft.)	Total Days
Steel Columns	23015.2	24.06033438
	Total Length (ft.)	Total Days
Lateral Bracing	25884.8	115.0435556
	Total No. Studs	Total Days
Shear Studs	67681	70.50104167
	Total Sq. Feet	Total Days
Metal Deck	593800	138.0930233
	Total Sq. Feet	Total Days
Concrete Slab	5500	34.375
	Total Cu. Yards	Total Days
Foundations	3837.04	619.3
Total Days Steel System:		1145.2

Table 9: Concrete System Schedule Summary		
	Total Cu. Yards	Total Days
Concrete Columns	3316.452	222.60
	Total Cu. Yards	Total Days
Concrete Slab	14662	484.85
	Total Cu. Yards	Total Days
Shear Walls	2265.222	29.810
	Total Cu. Yards	Total Days
Foundations	3509.74	1922.3
Total Days Concrete System:		2659.6

Summary:

An estimate was performed of the costs of the exterior cladding and structural materials for each system from R.S. Means. The steel system resulted in a total cost of \$17.45 million, and the reinforced concrete system had a total cost of \$25.63 million. The steel system, therefore, was \$8.18 million less expensive than the concrete system.

R.S. Means was also used to perform a schedule estimate. The steel system took a total of 1146 days to complete, while the concrete system took 2660 days. Therefore, the steel system could be erected 1514 days faster than the concrete system. These values, however, are based on the crew type that is used to perform each task. If the same crew does not perform the tasks for each of the buildings, then these results may not be completely accurate.