



Towers Crescent Building B
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Final Presentation

Breadth Study 2 – Cost Analysis

Cost Analysis

As a second breadth analysis, I performed a cost comparison between the existing composite steel structure and the two other proposed structures. RSMean 2006 was used to compute the total costs of the structures. You can find all calculations for the costs in Appendix B.

Through looking at total costs for materials, labor, and equipment, none of the structures really stood out above the rest in cost to the owner. The least expensive layout is the existing structure, though the difference in cost between it and the 40'x30' Bay Structure is only \$58,000. For a \$48 million structure, this difference is not a factor. The largest difference in cost is between the existing layout structure and the 30'x27.5' Bay structure. The \$290,000 difference is quite large; yet still not large enough to be a deciding factor in selecting the system. Below is a table showing the broken down as well as total cost of each structural system.

Layout	Columns (\$)	Slab (\$)	Beams/ Girders (\$)	Decking (\$)	Braced Frames (\$)	PT (\$)	Reinf. (\$)	Shear Walls (\$)	Formwork (\$)	Total Cost(\$)
Existing	448,816.23	433,965.74	1,589,730.00	519,126.30	131,489.67	-----	-----	-----	-----	3,123,127.94
40' x 30' Bay	498,122.53	676,310.25	-----	-----	-----	267,249.60	400,817.39	432,047.86	906,444.00	3,180,991.63
30' x 27.5' Bay	540,166.11	595,139.75	-----	-----	-----	-----	939,950.74	432,047.86	906,444.00	3,413,748.46



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Along with a cost analysis, I compared the time of construction between the existing structure and the two proposed structures. This turned out to be the real deciding factor for choosing one layout over the other.

Through the use of Primavera scheduling software, the amount of time to construct the existing steel structure, 52 days, was much less than the two alternate concrete structures, 135 days and 126 days. (The 40'x30' Bay structure taking 135 days and the 30'x27.5' Bay structure 126 days.)

This large difference in construction time is mostly due to the float available in steel construction, where as the slab is being poured and curing, the next level of steel columns/beams is placed on the structure.

Normally, a nine story concrete structure would take longer than 126 or 135 days to erect, but through discussion with a professional, I was informed that since Washington DC is a concrete city, contractors have become extremely efficient in the construction of concrete structures, even with post tensioning. This was taken into consideration when setting the construction schedule. A detailed schedule from Primavera is located in Appendix C.

When considering both structural cost and time of construction, the steel building is the most economic to build, with it having such a short time of construction. This also will save the owner a lot of money due to a lower cost for general construction costs, such as engineers, project managers, trailers, etc. There is no real difference economically between the two concrete alternatives as both cost nearly the same, with the 40'x30' Bay costing less than the 30'x27.5' Bay, and their construction schedules differ by about one week.