

EXECUTIVE TOWER

NW WASHINGTON, DC



SEAN HOWARD
STRUCTURAL

CONCLUSION

COST ESTIMATION

A cost estimation was calculated to compare reasons for progressing with the construction of a more complex framing system. The values for labor and material were found from MS Means 2005. RAM Concept automatically calculates building materials quantities for concrete, post tension and steel reinforcement. Using these numbers an estimate of \$170,000 was found for the flat slab system per floor and roughly \$160,000 per floor to convert the system to post tension minus the two inches of concrete. However, post tensioning is a slower process and was estimated to cost about \$100,000 from general conditions in addition to the cost per floor. Therefore, the cost for post tension is roughly \$90,000 more per floor than the flat slab system.

The Executive Tower rents per month at \$47 per sqft of office space and \$38 per sqft of retail space. With the addition of the 12th floor, the Executive Tower collects \$552,250 per month minus the \$16,700 lost from the architectural breadth study. The total structural difference can be found by multiplying the \$90,000 per floor by 12 floors to yield \$1,080,000. The number of months to pay off the cost is equivalent to \$1,080,000 total cost divided by the \$535,550 per month equaling 2.02 months.

Flat Slab	Units	Materials	Labor	Equip	Total w/ O&P	Amount	Schedule	Cost
Concrete cost with forms	CY	190	90.5	16.5	380	354.8		134824
Post tension	LB	0.46	0.7	0.03	1.85	0		0
Steel reinforcement	tons	850	305	0	1475	23.17		34175.75
General condition	days						+0	0
								\$168,999.75

Flat Slab w/ Post Tension	Units	Materials	Labor	Equip	Total w/ O&P	Amount	Schedule	Cost
Concrete cost with forms	CY	190	90.5	16.5	380	308.4		117192
Post tension	LB	0.46	0.7	0.03	1.85	12510		23143.5
Steel reinforcement	tons	850	305	0	1475	12.56		18526
General condition	days						+30	100,000
								\$258,861.50
							Difference of	\$89,861.75

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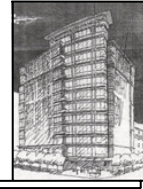
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BUILDING HEIGHT SUMMARY

The original building height for the Executive Tower was 128' - 4", just 1' - 8" short of the height restriction set by the Washington DC Zoning Regulations. Since this 130 foot height is measured from the north side of the building (the shorter side), the Executive Tower had the capability of be lowered up to five and half feet by making it even grade with the south side. After evaluated a few sketches and fully designing one, it was determined that lowing the building only three feet was most suitable for the Executive Tower's overall look, square footage lost and head room regulations. Through the study of the mechanical duct work on each floor, ceiling space depth was able to be reduced by three inches per floor by rerouting and optimizing the duct layout on each floor. In the structural depth study, the task of design the Executive Tower as a fully post tension building was adopted with goals of reducing the slab from eight inches to five inches. However, after the constant failure of the first trial and the troubles met in the second trial, it was decide to abandon this goal and design the slab to be six inches thick. These numbers were plugged into an Excel spreadsheet seen below and found the new building height to be 131' - 10"; 1' - 10" higher than the DC Zoning Regulations will allow.

	Orginal Height	Arch. Breadth	Mech. Breadth	Post Tension	New Floor Heights	New Building Heights	Under 130?
12	-	-	- 3"	- 2"	11' - 1'	131' - 10"	No Good
11	11' - 6"	-	- 3"	- 2"	11' - 1'	120' - 9"	
10	11' - 6"	-	- 3"	- 2"	11' - 1'	109' - 8"	
9	11' - 6"	-	- 3"	- 2"	11' - 1'	98' - 7"	
8	11' - 6"	-	- 3"	- 2"	11' - 1'	87' - 6"	
7	11' - 6"	-	- 3"	- 2"	11' - 1'	76' - 5"	
6	11' - 6"	-	- 3"	- 2"	11' - 1'	65' - 4"	
5	11' - 6"	-	- 3"	- 2"	11' - 1'	54' - 3'	
4	11' - 6"	-	- 3"	- 2"	11' - 1'	43' - 2"	
3	11' - 6"	-	- 3"	- 2"	11' - 1'	32' - 1'	
2	11' - 6"	-	- 3"	- 2"	11' - 1'	21' - 0"	
1	13' - 4"	- 3' - 0"	- 3"	- 2"	9' - 11'	9' - 11'	
	128' - 4"						

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FINAL REMARKS

Though the Executive Tower's proposal to add a 12th floor typical to floors three through nine seemed to fail, the building is still very capable of meeting its 130' height limitation. The building height of the new system is only off by 1' – 10". The story height per floor is now 11' – 1". To reduce the building height less than 130' at this point only requires the floor to ceiling height to be two inches lower per floor. As a result, instead of the tenants have 9' – 0" ceilings, they will have 8' – 10". This would have to be a decision made by the architects and owners of the building to determine if lowering the ceiling heights is what their tenants will want, but if by doing this the owner gains over \$500,000 per month, in my opinion it would be well worth it.

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