

Assemblies Estimate

The assemblies estimate looks at the structural systems in the Courtyard of the Patent Office building. The courtyard's structural elements were chosen because the courtyard has two different structural systems being used. The west half of the courtyard is structural steel with a one way slab. The east half is a structural two way slab with concrete cast in place columns. Around the perimeter of the courtyard is a structural concrete wall with varying height (the auditorium section in the west half slopes downward and has higher floor to ceiling height. The courtyard will also be looked at in detail in the third technical assignment with a detailed estimate.

Material Takeoff Data

Item	Dimension	Quantity
CIP Columns	14' Tall, 15" square	35
Steel Columns	18' Tall, 48 plf	24
Steel Columns	18' Tall, 58 plf	5
One Way Slab	30' x 6'	1
	200' x 7'	1
	20' x 40'	1
	53' x 16'	1
Total		3250 SF
Two Way Slab	80' x 43'	1
	53' x 3'	1
	33' x 6'	1
Total		3800 SF
Slab on Grade		7050 SF
W shape Beams & Girders	3250 SF	1
CIP Walls	18' x 53'	2
	18' x 16'	1
	14' x 75'	2
	14' x 53'	1
Total		5000 SF

Source	Line Number	Description	Quantity	Unit	Ext. Material Incl O&P	Ext. Installation Incl O&P	Ext. Total Incl O&P	Zip Code Prefix	Type	Release
Assembly	A10301202280*	Slab on grade, 4" thick, light industrial, reinforced	7,050.00	S.F.	\$13,481.43	\$16,020.35	\$29,501.78	20004	Union	2003
Assembly	B10102030900*	CIP col, sq tied, 200 K, 14' sty ht, 14" col, 196 PLF wt, 4000 PSI conc	35.00	V.L.F.	\$407.73	\$1,679.63	\$2,087.36	20004	Union	2003
Assembly	B10102083800*	Steel columns, 125 KIPS, 20' unsupported height, 48 PLF weight, 8" wf	24.00	V.L.F.	\$851.76	\$149.93	\$1,001.69	20004	Union	2003
Assembly	B10102085000*	Steel col, 200 KIPS, 20' unsupported height, 58 PLF weight, 12" wf	5.00	V.L.F.	\$215.08	\$31.23	\$246.31	20004	Union	2003
Assembly	B10102173800*	CIP slbs, 1 way, sgl 15' span, 200 PSF supimp, 8.5" thk, 306 PSF tot	3,250.00	S.F.	\$13,394.06	\$23,719.41	\$37,113.47	20004	Union	2003
Assembly	B10102206600*	CIP bm&slb, 2 way, 25x30', 200PSF supimp, 20" col min, 8.5" slb, 341PSF tot	3,800.00	S.F.	\$22,801.90	\$40,275.82	\$63,077.72	20004	Union	2003
Assembly	B10102418980*	Wf b&g, 35x30' (BXg), 200 PSF supimp, 36" d., 874 SF/SF for, 281 PSF tot	3,250.00	S.F.	\$39,502.13	\$16,420.98	\$55,923.11	20004	Union	2003
Assembly	B20101017400*	Conc wall reinforced, 8' high, 12" thick, plain finish, 3000 PSI	5,000.00	S.F.	\$25,254.00	\$71,765.85	\$97,019.85	20004	Union	2003
					\$115,908.09	\$170,063.20	\$285,971.29			

*Note: The table above was put together using RS Means Costwork 2004 Program which allows the input of the zip code of the project for location cost calculations as well as the year of the project start to convert for time value of money.

When reviewing the data it is interesting to not the steel system employed on the west half and the concrete system on the east half show a significant difference in price. The column systems are comparable, but when looking at the slabs employed on both, the one way slab used on the west half cost about half again as much as the two way slab on the east half when the cost of the steel beams and girders are taken into account. There seems to be a prime opportunity here to find an alternative system that would make the courtyard one consistent structural system (making construction simpler) and at the same time making the system itself less expensive from a materials standpoint.