

CONSTRUCTION MANAGEMENT BREADTH

In every project, the initial design and the end result are usually very different. One main reason for this drastic change in a project is the budget. Unfortunately, each and every project has a budget which affects the many different disciplines involved. Sometimes, a very tight spending budget can run the entire project. This is the reason I have chosen to perform a cost analysis based on my redesign.

My study involves the contractor costs for the existing luminaires compared to the contractor costs for the lighting redesign. I controlled the study to involve only the interior fixtures involved with the main lobby, black-box theater, and the 3100 research cluster. I received these estimates by contacting various vendors and reps for contractor cost pricing on these various fixtures. These costs will be about 30% more for the owner because of mark-ups by the architect, designer, and distributor. I have also done a labor and installation cost analysis based on R.S. Means for 2005 for all the spaces I mentioned as well as the entire courtyard redesign. This will give an idea for the total costs involved with purchasing and installing these fixtures.

Existing Conditions

Cost Analysis					
Existing Conditions					
Fixture	Location	Cost Unit	Unit	Total Cost	Total Cost per Room
F1	3100 Research Cluster	\$75/ft	248 ft	\$18,600.00	
F1A	3100 Research Cluster	\$75/ft	32 ft	\$2,400.00	
F2	3100 Research Cluster	\$30/ft	64 ft	\$1,920.00	
F5	3100 Research Cluster	\$195/fx	14	\$2,730.00	
F7	3100 Research Cluster	\$483/fx	9	\$4,347.00	
F20	3100 Research Cluster	\$220/fx	12	\$2,640.00	
					\$32,637.00
F12	Main Lobby	382/fx	11	\$4,202.00	
F13A	Main Lobby	\$290/fx	20	\$5,800.00	
F21C	Main Lobby	\$500/fx	4	\$2,000.00	
F23	Main Lobby	\$220/fx	15	\$3,300.00	
F38A	Main Lobby	\$320/fx	20	\$6,400.00	
F39	Main Lobby	\$450/fx	22	\$9,900.00	
F49	Main Lobby	\$225/fx	4	\$900.00	
					\$32,502.00
F42	Black-Box Theater	\$384/fx	11	\$4,224.00	
F43	Black-Box Theater	\$165/fx	4	\$660.00	
F44	Black-Box Theater	\$250/fx	16	\$4,000.00	
F51	Black-Box Theater	\$540/fx	6	\$3,240.00	
F53	Black-Box Theater	\$85/fx	22	\$1,870.00	
					\$13,994.00
				TOTAL	\$79,133.00

This shows the existing fixtures currently installed in the three interior spaces I redesigned. The total contractor cost for these spaces is about \$79,133.00. These do not include the ballasts or lamps for the fixtures.

Redesign Conditions

Cost Analysis					
Redesign Conditions					
Fixture	Location	Cost Unit	Unit	Total Cost	Total Cost per Room
B1	3100 Research Cluster	\$35/ft	64 ft	\$2,240.00	
B2	3100 Research Cluster	\$55/ft	308 ft	\$16,940.00	
B3	3100 Research Cluster	\$200/fx	14	\$2,800.00	
B5	3100 Research Cluster	\$255/fx	12	\$3,060.00	
B6	3100 Research Cluster	\$504/fx	9	\$4,536.00	
					\$29,576.00
B7	Black-Box Theater	\$384/fx	11	\$4,224.00	
B8	Black-Box Theater	\$1250/fx	14	\$17,500.00	
B9	Black-Box Theater	\$504/fx	19	\$13,281.00	
B10	Black-Box Theater	\$225/fx	6	\$1,350.00	
B11	Black-Box Theater	\$165/fx	4	\$660.00	
B12	Black-Box Theater	\$289/fx	12	\$3,468.00	
B13	Black-Box Theater	\$220/fx	12	\$2,640.00	
					\$43,123.00
					\$25,623.00
B14	Main Lobby	\$315/fx	16	\$5,040.00	
B15	Main Lobby	\$315/fx	36	\$11,340.00	
B16	Main Lobby	\$236/fx	9	\$2,124.00	
B17	Main Lobby	\$430/fx	7	\$3,010.00	
B18	Main Lobby	\$65/ft	104 ft	\$6,760.00	
B19	Main Lobby	\$1550/fx	4	\$6,200	
					\$34,474.00
					\$28,274.00
		With Custom Fixtures		TOTAL	\$107,173.00
		Without Custom Fixture		TOTAL	\$83,473.00

This table shows my redesigned budget. The fixtures highlighted in light blue are the custom fixtures I added to the spaces. Since these are custom designs, I estimated the prices of these fixtures by talking to professionals and manufacturers about rough costs for parts. Much of this was very broad and not precise which is why I also calculated a cost for the redesign not including the custom fixtures.

As you can see, the total contractor cost for these redesigned spaces is about \$107,173.00. Without the custom fixtures, the total contractor cost is about \$83,473.00. I had predicted my redesign would be more expensive based purely on my imaginary budget and the freedom to design custom fixtures and use any manufacturers I pleased. Though expensive, without using any custom fixtures, a difference of only about \$5000 on the job is not a significant amount compared to the total cost.

Labor and Installation Costs

Labor Costs										
Fixture	Location	Number	Labor Cost	Labor Hours	Daily Output	# Electricians	Total Labor Costs	Total Hours	Total Days	
B1	Open Office	16	\$57.00	1.400	5.700	1	\$912.00	22.40	2.8	
B2	Open Office	76	\$74.00	1.818	8.800	2	\$5,624.00	138.17	8.6	
B3	Open Office	14	\$41.00	1.000	8.000	1	\$574.00	14.00	1.8	
B5	Open Office	12	\$41.00	1.000	8.000	1	\$492.00	12.00	1.5	
B6	Open Office	9	\$112.00	2.667	3.000	1	\$1,008.00	24.00	3.0	
B7	Theater	11	\$41.00	1.000	8.000	1	\$451.00	11.00	1.4	
B8	Theater	14	\$40.00	3.500	3.000	1	\$560.00	49.00	4.7	
B9	Theater	19	\$112.00	2.667	3.000	1	\$2,128.00	50.67	6.3	
B10	Theater	6	\$57.00	1.404	5.700	1	\$342.00	8.42	1.1	
B11	Theater	4	\$41.00	1.000	8.000	1	\$164.00	4.00	0.5	
B12	Theater	12	\$46.50	1.143	7.000	1	\$558.00	13.72	1.7	
B13	Theater	12	\$57.00	1.404	5.700	1	\$684.00	16.85	2.1	
B14	Lobby	16	\$38.50	0.941	8.500	1	\$616.00	15.06	1.9	
B15	Lobby	36	\$38.50	0.941	8.500	1	\$1,386.00	33.88	4.2	
B16	Lobby	9	\$41.00	1.000	8.000	1	\$369.00	9.00	1.1	
B17	Lobby	7	\$21.00	0.500	16.000	1	\$147.00	3.50	0.4	
B18	Lobby	26	\$57.00	1.404	5.700	1	\$1,482.00	36.50	4.6	
B19	Lobby	4	\$50.00	3.250	4.000	2	\$200.00	13.00	1.0	
E1	Courtyard	8	\$163.00	4.000	2.000	2	\$1,304.00	32.00	4.0	
E2	Courtyard	29	\$121.00	2.963	2.700	1	\$3,509.00	85.93	10.7	
E3	Courtyard	29	\$41.00	1.000	8.000	1	\$1,189.00	29.00	3.6	
E4	Courtyard	7	\$41.00	1.000	8.000	1	\$287.00	7.00	0.9	
E5	Courtyard	21	\$121.00	2.963	2.700	1	\$2,541.00	62.22	7.8	
E6	Courtyard	4	\$57.00	1.404	5.700	1	\$228.00	5.62	0.7	
E7	Courtyard	8	\$57.00	1.404	5.700	1	\$456.00	11.23	1.4	
E8	Courtyard	5	\$57.00	1.404	5.700	1	\$285.00	7.02	0.9	
E9	Courtyard	7	\$121.00	2.963	2.700	1	\$847.00	20.74	2.6	
E10	Courtyard	11	\$112.00	2.667	3.000	1	\$1,232.00	29.34	3.7	
E11	Tunnel	Custom	\$50.00	1.500	6.000	2	\$750.00	12.00	1.5	
E12	Tunnel	24	\$38.50	0.941	8.500	1	\$924.00	22.58	2.8	
w/ Custom							TOTAL	\$31,249.00	799.85	89.3
w/o Custom							TOTAL	\$29,739.00	725.85	82.10

Using the R.S. Means Cost Estimating Book for 2005, I estimated the cost for labor and installation and a rough amount of hours and days it will take for 1 electrician, or 2 in some cases, to complete the installation of these redesigned fixtures. This gives an estimate for the owner and contractor as to how much money is needed for just installing lighting fixtures in 4 spaces. This gives reason to why MEP construction costs are very high and take up about 25% of the total project cost.

Conclusion

Through this analysis, I learned the true value of fixtures and the savings involved using the different types and different manufacturers for particular sources. I expected the outcome to be high with my custom fixtures, but only spent about \$5000 more without custom fixtures. This, in turn, can show using light in creative ways can really save on cost without using expensive fixtures. Labor and installation costs were a lot higher than I expected, but can add reason to the high cost for any building.