

T.C. WILLIAMS HIGH SCHOOL

ALEXANDRIA, VA



CHRISTOPHER B. DEKER

STRUCTURAL OPTION

APPENDIX A – CONSTRUCTION MANAGEMENT

09 APRIL 2008

FACULTY CONSULTANT: PROF PARFITT

APPENDIX A – CONSTRUCTION MANAGEMENT

Existing Cost Spreadsheet.....Page 53-54

New Cost Spreadsheet.....Page 55-56

Existing Project Schedule.....Page 57-58

New Project Schedule.....Page 59-61

EXISTING COSTS SPREADSHEET

System	Component	Crew	Daily Output	Labor Hours	Units	No. Units	Material	Labor	Equip	Cost / Unit	Cost + O&P/Unit	Total Cost
Roof	Joist - 10K1	E-7	1200	0.067	LF	440	\$3.78	\$2.83	\$1.53	\$8.14	\$10.80	\$4,752
	Joist - 24K6	E-7	2200.00	0.036	LF	4,225	\$7.20	\$1.54	\$0.83	\$9.57	\$11.50	\$48,588
	Joist - 24KCS5	E-7	1800.00	0.045	LF	1,122	\$15.80	\$1.54	\$0.83	\$18.17	\$21.80	\$24,460
	Deck - 1.5" 22 GA	E-4	4900.00	0.007	SF	29,580	\$1.25	\$0.28	\$0.03	\$1.56	\$1.92	\$56,794
	Deck - 3" 18-GA	E-4	2850.00	0.011	SF	6,380	\$2.29	\$0.49	\$0.05	\$2.83	\$3.45	\$22,011
	Truss	-	-	-	Truss	20	-	-	-	-	\$1,925	\$38,500
	Beam - W16x26	E-2	1000.00	0.056	LF	1,715	\$31.50	\$2.34	\$1.57	\$35.41	\$40.50	\$69,458
	Girder - W21x44	E-5	1064.00	0.075	LF	1,334	\$53.00	\$3.19	\$1.60	\$57.79	\$66.00	\$88,044
	Fireproofing Joist	G-2	1200.00	0.019	SF	22,121	\$0.47	\$0.65	\$0.08	\$1.20	\$1.54	\$34,066
	Fireproofing Girder	G-2	1500.00	0.016	SF	9,242	\$0.47	\$0.51	\$0.08	\$1.06	\$1.39	\$12,846
Fireproofing Deck	G-2	1250.00	0.019	SF	35,000	\$0.71	\$0.62	\$0.10	\$1.43	\$1.83	\$64,050	
Floor	C-Beam - W18x35	E-5	960.00	0.083	LF	4,250	\$42.50	\$3.53	\$1.77	\$47.80	\$54.50	\$231,625
	C-Deck 1.5" 18-GA	E-4	3400.00	0.009	SF	35,000	\$2.66	\$0.41	\$0.04	\$3.11	\$3.70	\$129,500
	Beam - W12x14	E-2	880.00	0.064	LF	902	\$16.95	\$2.66	\$1.78	\$21.39	\$25.00	\$22,550
	Shear Studs	-	-	-	Stud	5,906	-	-	-	-	\$15.00	\$88,590
	NWC Slab	C-20	140.00	0.457	CY	416	\$106.00	\$14.90	\$5.55	\$126.45	\$146.00	\$60,765
	Girders - W21x50	E-5	1064.00	0.075	LF	1,656	\$60.50	\$3.19	\$1.60	\$65.29	\$74.00	\$122,544
	Fireproofing Beam	G-2	1500.00	0.016	SF	14,554	\$0.47	\$0.51	\$0.08	\$1.06	\$1.39	\$20,230
	Fireproofing Deck	G-2	1250.00	0.019	SF	35,000	\$0.71	\$0.62	\$0.10	\$1.43	\$1.83	\$64,050
	Fireproofing Girder	G-2	1500.00	0.016	SF	5,796	\$0.47	\$0.51	\$0.08	\$1.06	\$1.39	\$8,056
	Exterior Wall	6 Inch CMU	D-8	430.00	0.093	SF	2,430	\$2.10	\$3.32	\$0.00	\$5.42	\$7.35
8 Inch CMU		D-8	395.00	0.101	SF	13,524	\$2.27	\$3.62	\$0.00	\$5.89	\$8.00	\$108,192
10 Inch CMU		D-8	320.00	0.125	SF	6,930	\$3.06	\$4.47	\$0.00	\$7.53	\$10.15	\$70,340
14 Inch CMU		D-9	300.00	0.160	SF	5,040	\$3.30	\$5.60	\$0.00	\$8.90	\$12.10	\$60,984
4 Inch Face Brick		D-8	310.00	0.129	SF	18,189	\$4.12	\$4.61	\$0.00	\$8.73	\$11.55	\$210,083
8 Inch CMU Grout		D-4	680.00	0.047	SF	3,381	\$1.13	\$1.63	\$0.19	\$2.95	\$3.91	\$13,220
Windows	H-1	195.00	0.164	SF	12,320	\$31.50	\$6.60	\$0.00	\$38.10	\$45.50	\$560,560	

EXISTING COSTS SPREADSHEET

System	Component	Crew	Daily Output	Labor Hours	Units	No. Units	Material	Labor	Equip	Cost / Unit	Cost + O&P/Unit	Total Cost
Lateral Resisting	Beam - W18x50	E-5	912.00	0.088	LF	228	\$60.50	\$3.72	\$1.86	\$66.08	\$75.00	\$117,100
	Beam - W24x68	E-5	1110.00	0.072	LF	456	\$82.50	\$3.06	\$1.53	\$87.09	\$97.50	\$44,460
	Brace - HSS 14x16x.5	E-2	46.00	1.189	EA	16	\$1,848	\$75.50	\$50.00	\$1,973	\$2,210	\$35,360
	Brace - HSS 12x6x.5	E-2	48.00	1.167	EA	16	\$1,680	\$68.50	\$45.50	\$1,794	\$2,010	\$32,160
	Brace - HSS 7x5x3/8	E-2	50.00	1.120	EA	16	\$1,209	\$88.00	\$59.00	\$1,356	\$1,520	\$24,320
	Column - W10x68	E-2	984.00	0.057	LF	720	\$82.50	\$2.38	\$1.59	\$86.47	\$96.50	\$69,480
Connection		-	-	-	20% Mat	8	-	-	-	-	\$5,572	\$44,576
Columns	Steel Col. - W10x54	E-2	550.00	0.102	LF	3,780	\$59.50	\$4.26	\$2.85	\$66.61	\$75.50	\$285,390
	Fireproofing - 1-1/8"	G-2	1100.00	0.022	SF	12,600	\$0.53	\$0.70	\$0.12	\$1.35	\$1.78	\$22,428
	Column Splice	-	-	-	Splice	0	-	-	-	-	\$750.00	\$0
Foundations	Spread Footings	C-14C	75.00	1.493	CY	203	\$176.00	\$54.50	\$0.33	\$230.83	\$280.00	\$56,913
	Strip Footings	C-14C	60.00	1.867	CY	202	\$128.00	\$68.50	\$0.41	\$196.91	\$248.00	\$50,213
	6" Slab On Grade	C-14E	92.00	0.957	CY	722	\$117.00	\$36.00	\$0.27	\$153.27	\$187.00	\$135,014
	6x6 - W2.9xW2.9 WWF	2 Rodm	29.00	0.552	CSF	390	\$20.00	\$23.50	\$0.00	\$43.50	\$61.00	\$23,790
	Geopier Soil Reinf	-	120.00	-	LF	5,100	-	-	-	-	\$40.00	\$204,000
	Shear Wall Footings	C-14C	75.00	1.493	CY	51	\$176.00	\$54.50	\$0.33	\$230.83	\$280.00	\$14,186
	Truss	Beam - W4x13	E-2	600.00	0.093	LF	37	\$15.13	\$3.91	\$2.61	\$21.64	\$26.00
Beam - W6x15	E-2	600.00	0.093	LF	11	\$19.35	\$3.91	\$2.61	\$25.87	\$31.00	\$341	
Beam - W8x31	E-2	550.00	0.102	LF	11	\$37.50	\$4.26	\$2.85	\$44.61	\$52.00	\$572	
Connections	F-6	48.00	0.833	EA	1	-	\$29.50	\$15.95	\$45.45	\$63.00	\$63	
Cost/Truss	-	-	-	-	EA	1	-	-	-	-	-	\$1,925
Partitions	CMU Partitions	D-8	375.00	0.107	SF	22,869	\$2.07	\$3.81	\$0.00	\$5.88	\$8.10	\$185,239
TOTAL BUILDING COST												\$4,615,735

NEW COSTS SPREADSHEET

System	Component	Crew	Daily Output	Labor Hours	Units	No. Units	Material	Labor	Equip	Cost / Unit	Cost + O&P/Unit	Total Cost
Roof	Joist - 18K3	E-7	2000.00	0.040	LF	2,083	\$5.28	\$1.79	\$0.97	\$8.04	\$10.00	\$20,830
	Joist - 10K1	E-7	1200.00	0.067	LF	1,219	\$3.78	\$2.83	\$1.53	\$8.14	\$10.80	\$13,165
	Joist - 24KCS3	E-7	2200.00	0.036	LF	809	\$12.80	\$1.54	\$0.83	\$15.17	\$17.65	\$14,279
	Deck - 1.5" B 18 GA	E-4	4100.00	0.008	SF	13,230	\$1.96	\$0.34	\$0.03	\$2.33	\$2.80	\$37,044
	Deck - 1.5" B 22 GA	E-4	4900.00	0.007	SF	7,425	\$1.25	\$0.28	\$0.03	\$1.56	\$1.92	\$14,256
	Deck - 3" 18 GA	E-4	2850.00	0.011	SF	2,970	\$2.29	\$0.49	\$0.05	\$2.83	\$3.45	\$10,247
	Girder - W18x35	E-5	960.00	0.083	LF	2,160	\$42.50	\$3.53	\$1.77	\$47.80	\$54.50	\$117,720
	Truss	-	-	-	Truss	10	-	-	-	-	\$1.925	\$19,250
	Fireproofing Joist	G-2	1200.00	0.019	SF	11,517	\$0.47	\$0.65	\$0.08	\$1.20	\$1.54	\$17,736
	Fireproofing Girder	G-2	1500.00	0.016	SF	6,480	\$0.47	\$0.51	\$0.08	\$1.06	\$1.39	\$9,007
Fireproofing Deck	G-2	1250.00	0.019	SF	21,600	\$0.71	\$0.62	\$0.10	\$1.43	\$1.83	\$39,528	
Floor	C Joist - 22VC1600	E-7	1800.00	0.044	LF	2,380	\$19.25	\$2.42	\$1.31	\$22.98	\$27.00	\$64,260
	Joist - 10K1	E-7	1200.00	0.067	LF	594	\$3.78	\$2.83	\$1.53	\$8.14	\$10.80	\$6,415
	C Deck - 2" 18 GA	E-4	3400.00	0.009	SF	21,600	\$2.66	\$0.41	\$0.04	\$3.11	\$3.70	\$79,920
	Shear Studs	-	-	-	Stud	2,440	-	-	-	-	\$15.00	\$36,600
	NWC Slab	C-20	140.00	0.457	CY	233	\$106.00	\$14.90	\$5.55	\$126.45	\$146.00	\$34,062
	Girders - W21x50	E-5	1064.00	0.075	LF	1,180	\$60.50	\$3.19	\$1.60	\$65.29	\$74.00	\$87,320
	Fireproofing Joist	G-2	1200.00	0.019	SF	9,717	\$0.47	\$0.65	\$0.08	\$1.20	\$1.54	\$14,964
	Fireproofing Deck	G-2	1500.00	0.016	SF	21,600	\$0.47	\$0.51	\$0.08	\$1.06	\$1.39	\$30,024
	Fireproofing Girder	G-2	1250.00	0.019	SF	4,130	\$0.71	\$0.62	\$0.10	\$1.43	\$1.83	\$7,558
	Exterior Wall	6 Inch CMU	D-8	430.00	0.093	SF	3,105	\$2.10	\$3.32	\$0.00	\$5.42	\$7.35
8 Inch CMU		D-8	395.00	0.101	SF	15,300	\$2.27	\$3.62	\$0.00	\$5.89	\$8.00	\$122,400
10 Inch CMU		D-8	320.00	0.125	SF	10,818	\$3.06	\$4.47	\$0.00	\$7.53	\$10.15	\$109,803
14 Inch CMU		D-9	300.00	0.160	SF	7,860	\$3.30	\$5.60	\$0.00	\$8.90	\$12.10	\$95,106
4 Inch Face Brick		D-8	310.00	0.129	SF	21,803	\$4.12	\$4.61	\$0.00	\$8.73	\$11.55	\$251,825
Grout - 8" CMU		D-4	680.00	0.047	SF	15,300	\$1.13	\$1.63	\$0.19	\$2.95	\$3.91	\$59,823
Windows	H-1	195.00	0.164	SF	19,264	\$31.50	\$6.60	\$0.00	\$38.10	\$45.50	\$876,512	

NEW COSTS SPREADSHEET

System	Component	Crew	Daily Output	Labor Hours	Units	No. Units	Material	Labor	Equip	Cost / Unit	Cost + O&P/Unit	Total Cost
Lateral Resisting	8 Inch CMU	D-8	360.00	0.111	SF	1,710	\$3.37	\$3.97	\$0.00	\$7.34	\$9.75	\$16,673
	Grout - 8 Inch CMU	D-4	680.00	0.047	SF	1,710	\$1.13	\$1.63	\$0.19	\$2.95	\$3.91	\$6,686
	#5 Reinf. Steel - Vert	1 Bric	650.00	0.012	LB	2,135	\$0.47	\$0.48	\$0.00	\$0.95	\$1.24	\$2,647
	#4 Reinf. Steel - Horiz	1 Bric	800.00	0.010	LB	1,708	\$0.47	\$0.39	\$0.00	\$0.86	\$1.11	\$1,896
Columns	Steel Col. - W10x54	E-2	550.00	0.102	LF	3,600	\$59.50	\$4.26	\$2.85	\$66.61	\$75.50	\$271,800
	Fireproofing	G-2	1100.00	0.022	SF	12,000	\$0.53	\$0.70	\$0.12	\$1.35	\$1.78	\$21,360
	Column Splice	-	-	-	SPLICE	48	-	-	-	-	\$750.00	\$36,000
Foundations	Spread Footings	C-14C	75.00	1.493	CY	171	\$176.00	\$54.50	\$0.33	\$230.83	\$280.00	\$47,786
	Strip Footings	C-14C	60.00	1.867	CY	130	\$128.00	\$68.50	\$0.41	\$196.91	\$248.00	\$32,148
	6" Slab on Grade	C-14E	92.00	0.957	CY	400	\$117.00	\$36.00	\$0.29	\$153.27	\$187.00	\$74,800
	6x6 - W2.9xW2.9 W/WF	2 Rodm	29.00	0.552	CSF	216	\$20.00	\$23.50	\$0.00	\$43.50	\$61.00	\$13,176
	Geopier Soil Reinf	-	120.00	-	LF	2,808	-	-	-	-	\$40.00	\$112,320
	Shear Wall Footings	C-14C	60.00	1.867	CY	21	\$128.00	\$68.50	\$0.41	\$196.91	\$248.00	\$5,235
Truss	Beam - W4x13	E-2	600.00	0.093	LF	37	\$15.13	\$3.91	\$2.61	\$21.64	\$26.00	\$949
	Beam - W6x15	E-2	600.00	0.093	LF	11	\$19.35	\$3.91	\$2.61	\$25.87	\$31.00	\$341
	Beam - W8x31	E-2	550.00	0.102	LF	11	\$37.50	\$4.26	\$2.85	\$44.61	\$52.00	\$572
	Connections	F-6	48.00	0.833	EA	1	-	\$29.50	\$15.95	\$45.45	\$63.00	\$63
Cost/Truss	-	-	-	-	EA	1	-	-	-	-	-	\$1,925
Partitions	CMU Partitions - 8"	D-8	375.00	0.107	SF	13,739	\$2.07	\$3.81	\$0.00	\$5.88	\$8.10	\$111,286
	TOTAL BUILDING COST											\$4,606,407









