The Arts & Humanities Instructional Building
Howard Community College
Columbia, MD

TECHNICAL ASSIGNMENT #2

Noah J. Ashbaugh
Construction Management 2006
Advisor: Dr. Messner
October 31, 2006

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CM Option
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EXECUTIVE SUMMARY

The second technical assignment expands on a few important areas of study from the first assignment. A more detailed project schedule is assembled for the construction of the Arts and Humanities Instructional Building. This schedule has more detailed activities and a few important milestones. An analysis of the site is also included in the following document. A closer look is taken at the site plan with emphasis on the sequence of work.

Investigation of the costs associated with the AHIB is a large portion of this report. An assemblies estimate is performed on the building envelope. RS Means 2005 is the resource used to perform the estimate. The estimated value of the exterior wall systems and roof assembly is $ 862,664. A detailed estimate is also calculated and included. The detailed estimate is performed on the structural system of the building. The cast in place strip footings, structural steel columns, beams, girders and floor construction cost approximately $ 1,908,980.

Finally, a general conditions estimate is calculated for the AHIB. The estimate is a valuable part to understanding the construction of the project. The general conditions estimate summary and full items list is included. For the entire 22 month schedule the general conditions is estimated to be $ 1,056,493.

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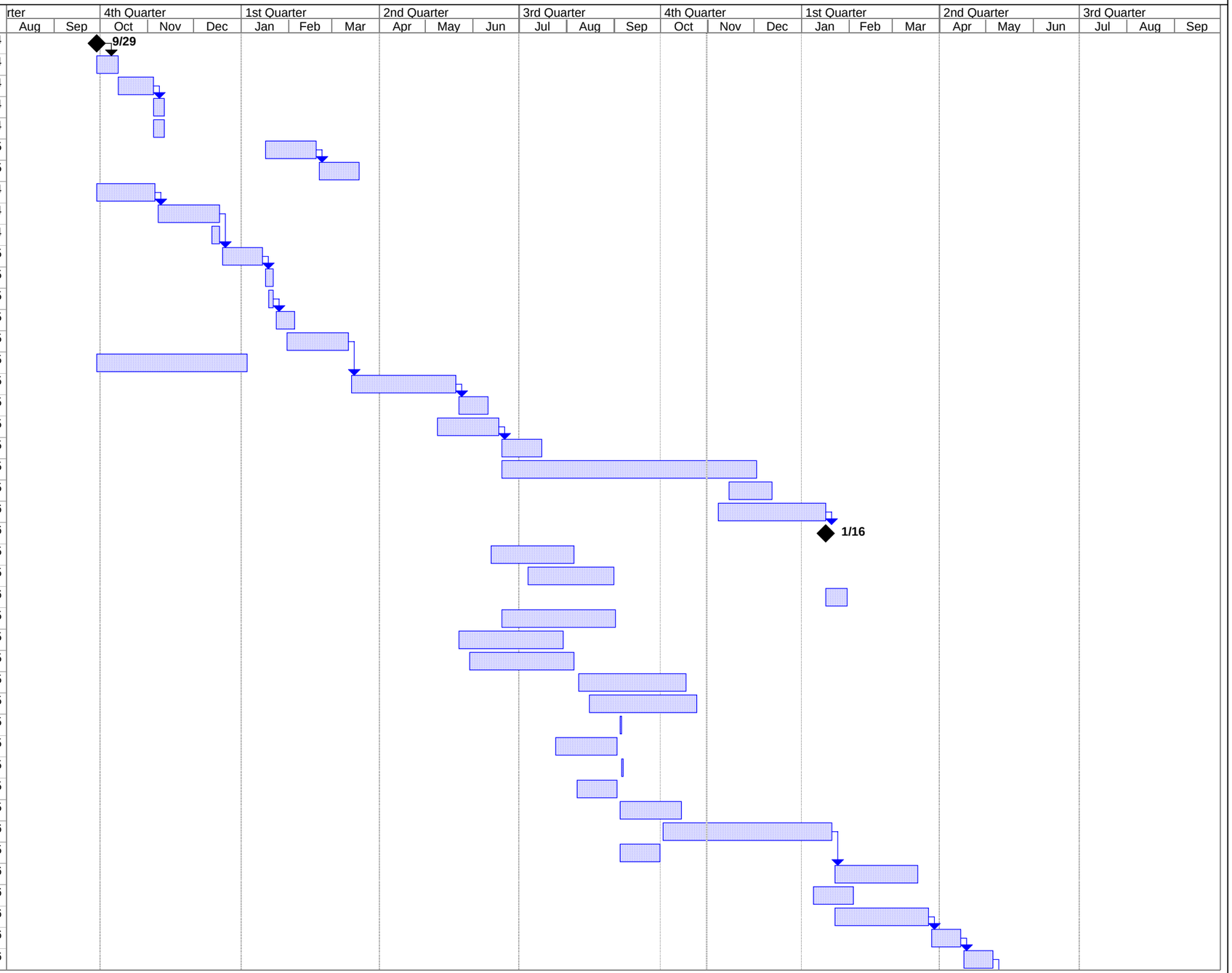
DETAILED PROJECT SCHEDULE

The total timeframe for construction of the Arts and Humanities Instructional Building is about 21 months. The design phase took approximately 2 years; site work on the project lasted approximately 3 weeks. The spread footing foundations have been scheduled to be completed in a month. The structural steel frame will be erected with final connections taking place in just over 2 months. The building will be completely enclosed within 12 months of beginning the site work, and will take 5 months from start to completion. Finishes will last about 4 months, with final occupancy taking place the end of June.

There are a few important activities to consider when detailing a construction schedule. An important piece to the schedule is the procurement of steel. The reinforcing bar needs to be procured before the foundation system can be assembled. Another important activity includes the procurement and shake out of structural steel. Just as important are major milestones. One milestone includes toping out of steel. Another milestone is after the building is enclosed and interior work can begin. A detailed project schedule can be found following this section.

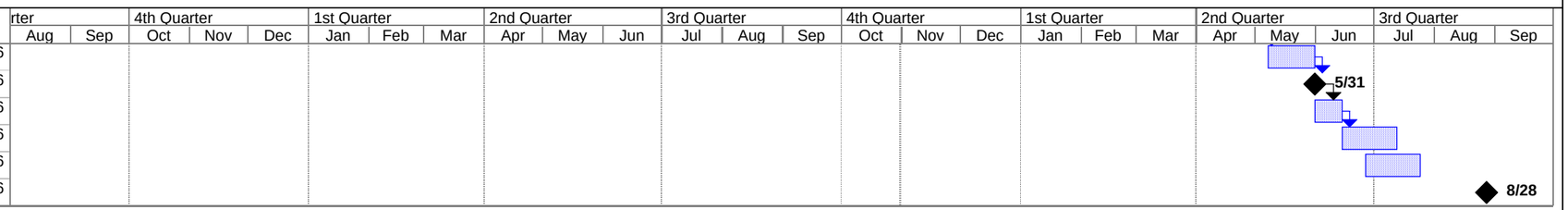
ID	Task Name	Duration	Start	Finish
1	Start Construction	0 days	Wed 9/29/04	Wed 9/29/04
2	Temporary Lots/Site prep	2 wks	Wed 9/29/04	Tue 10/12/04
3	Basement Excavation	17 days	Wed 10/13/04	Thu 11/4/04
4	Relocate Sewer Line	1 wk	Fri 11/5/04	Thu 11/11/04
5	Upper Level Grading	1 wk	Fri 11/5/04	Thu 11/11/04
6	Paving, curbs, & walks	5 wks	Mon 1/17/05	Fri 2/18/05
7	Landscaping	4 wks	Mon 2/21/05	Fri 3/18/05
8	Foundation Rebar - Lead	28 days	Wed 9/29/04	Fri 11/5/04
9	Concrete Foundations/Basemer	6 wks	Mon 11/8/04	Fri 12/17/04
10	elevator jack hole drilling	1 wk	Mon 12/13/04	Fri 12/17/04
11	Waterproofing/underslab plumb	4 wks	Mon 12/20/04	Fri 1/14/05
12	Concrete Basement SOG	1 wk	Mon 1/17/05	Fri 1/21/05
13	Brace Basement walls	3 days	Wed 1/19/05	Fri 1/21/05
14	Backfilling basement walls	2 wks	Mon 1/24/05	Fri 2/4/05
15	Concrete ftgs & sog (1st floor)	6 wks	Mon 1/31/05	Fri 3/11/05
16	Steel - lead time, shop drawings	14 wks	Wed 9/29/04	Tue 1/4/05
17	Erect Structural Steel	10 wks	Mon 3/14/05	Fri 5/20/05
18	Steel Detailing	3 wks	Mon 5/23/05	Fri 6/10/05
19	Concrete elevated decks	6 wks	Mon 5/9/05	Fri 6/17/05
20	Stairs set & pour	4 wks	Mon 6/20/05	Fri 7/15/05
21	Masonry - shell, backup & vene	24 wks	Mon 6/20/05	Fri 12/2/05
22	Punch windows	4 wks	Tue 11/15/05	Mon 12/12/05
23	Curtainwall & metal panels	10 wks	Tue 11/8/05	Mon 1/16/06
24	Building Inclosed	0 days	Mon 1/16/06	Mon 1/16/06
25	Roofing Field	8 wks	Mon 6/13/05	Fri 8/5/05
26	Roof top epuipment	8 wks	Thu 7/7/05	Wed 8/31/05
27	Roof perimeter after exterior wa	2 wks	Tue 1/17/06	Mon 1/30/06
28	Interwalls/shafts MEP Rough-In	54 days	Mon 6/20/05	Thu 9/1/05
29	Ductwork ceiling	10 wks	Mon 5/23/05	Fri 7/29/05
30	Plumbing	10 wks	Mon 5/30/05	Fri 8/5/05
31	Electrical Ceiling Cabletrays	10 wks	Tue 8/9/05	Mon 10/17/05
32	Sprinkler system	10 wks	Tue 8/16/05	Mon 10/24/05
33	Switchgear Active/Power for Ele	1 day	Mon 9/5/05	Mon 9/5/05
34	Elevators Installed	6 wks	Mon 7/25/05	Fri 9/2/05
35	HVAC dehumidification	1 day	Tue 9/6/05	Tue 9/6/05
36	Frame walls/bulkheads	4 wks	Mon 8/8/05	Fri 9/2/05
37	Drywall walls MEP rough-in	6 wks	Mon 9/5/05	Fri 10/14/05
38	Drywalls/ finishing	16 wks	Mon 10/3/05	Fri 1/20/06
39	Wenger Equipment	4 wks	Mon 9/5/05	Fri 9/30/05
40	Specialty systems installation	8 wks	Mon 1/23/06	Fri 3/17/06
41	Ceiling grid	4 wks	Mon 1/9/06	Fri 2/3/06
42	Painting / Flooring	9 wks	Mon 1/23/06	Fri 3/24/06
43	Ceiling Tile	3 wks	Mon 3/27/06	Fri 4/14/06
44	MEP Trim work	3 wks	Mon 4/17/06	Fri 5/5/06



Project: longer_schedule
Date: Mon 10/31/05

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

ID	Task Name	Duration	Start	Finish
45	Commisioning of Systems	18 days	Mon 5/8/06	Wed 5/31/06
46	Substantial Completion	0 days	Wed 5/31/06	Wed 5/31/06
47	Final Clean	2 wks	Thu 6/1/06	Wed 6/14/06
48	Final Punchlist	4 wks	Thu 6/15/06	Wed 7/12/06
49	Use & Occupancy Inspections	4 wks	Tue 6/27/06	Mon 7/24/06
50	Start of School	0 days	Mon 8/28/06	Mon 8/28/06



Project: longer_schedule
Date: Mon 10/31/05

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

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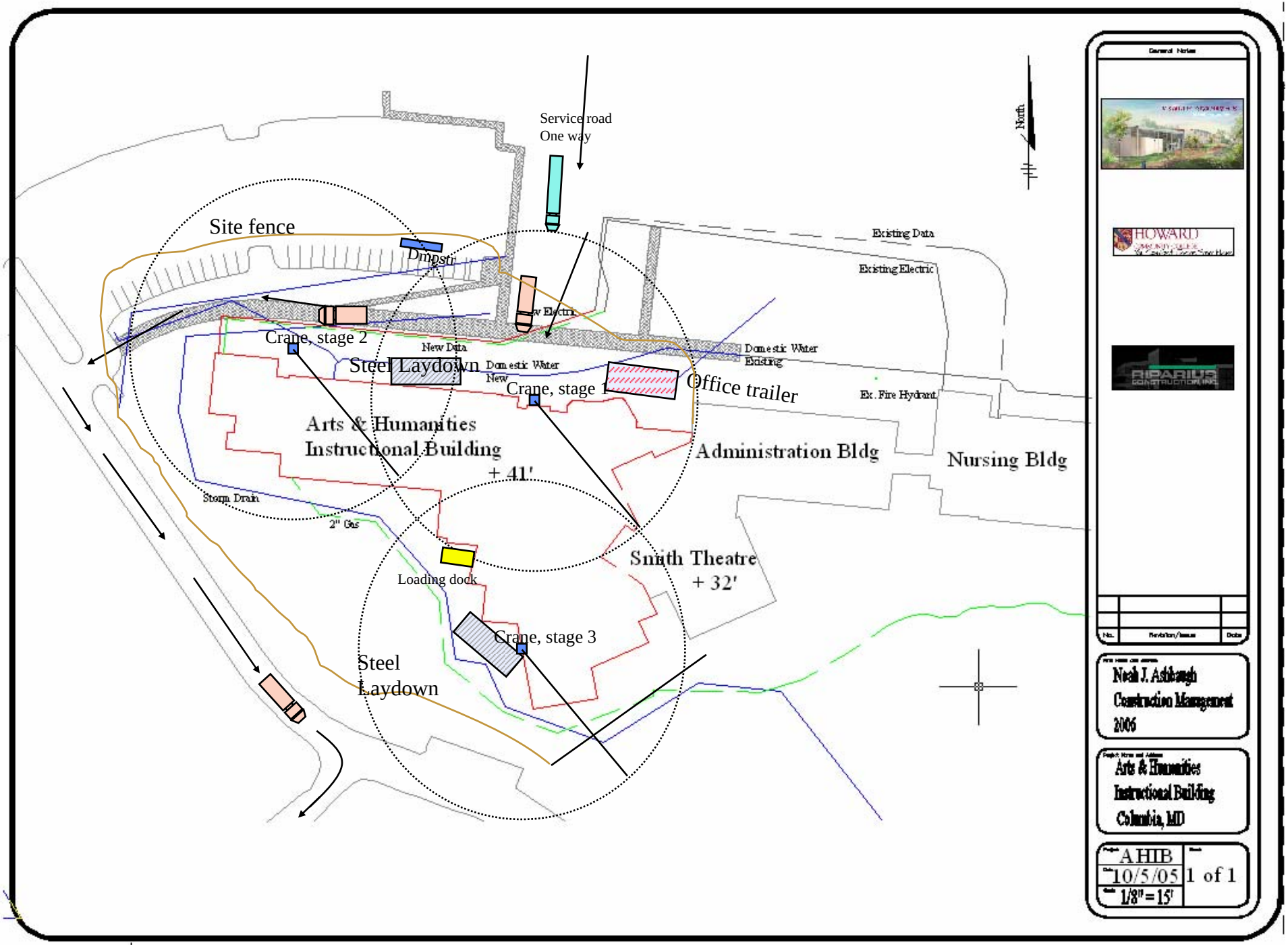
Oct 31, 2005

SITE PLANNING

The site of the new AHIB can cause a few problems for the construction manager if a good site plan is not implemented. The new AHIB attaches to the existing Smith Theatre which could cause coordination and site issues during construction if not well planned out. The west side of the site is open and will be beneficial to use for construction lay down and traffic. All traffic for construction will come from the north end of the site down the access road. The traffic will navigate around the west end of the site and exit from the south. The construction fence will surround the entire sire and will have one entrance and one exit.

Three crane placements will be used to erect the structural steel. There will be two different areas for steel lay down on the site. A concrete pump station will be set up to deliver concrete to the rear of the site where a concrete truck will not reach. For the later stages of construction a loading dock will be accessible on the south side of the building. Dumpsters will be located north of the building next to the access road. Office trailers will be set up next to the north entrance of the site.

The construction of the overall project will begin on the west end where the basement is and work east toward the Smith Theatre. This sequence of work is chosen to start the construction of the basement first. However, starting closest to the existing Smith Theatre and working west may be a possibility that should be investigated. This sequence of work may allow for fewer compounding errors when connected the new entrance to the existing entrance of Smith Theatre.


Service road
One way
North
Site fence
Dmpstr
Existing Data
Existing Electric
Crane, stage 2
New Data
Steel Laydown
Domestic Water
New
Domestic Water
Existing
Crane, stage 1
Office trailer
Ex. Fire Hydrant
Arts & Humanities
Instructional Building
+ 41'
Administration Bldg
Nursing Bldg
Storm Drain
2" Gas
Smith Theatre
+ 32'
Loading dock
Crane, stage 3
Steel
Laydown
General Notes
HOWARD
RIPARIUS
No.
Revision/Issue
Date
Noah J. Ashbaugh
Construction Management
2006
Arts & Humanities
Instructional Building
Columbia, MD
AHIB
10/5/05
1/8" = 15'
1 of 1

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DETAILED STRUCTURAL SYSTEM ESTIMATE

A detailed estimated is performed on a single bay of the AHIB. The square bay is approximately 27'6" x 27'6". The primary structure of the building is structural steel on spread footings. RS Means 2005 cost data information is used to develop the detailed estimate. A location factor of 0.92 is applied to all the cost information for the Baltimore, MD area. The following is a brief summary of the detailed estimate results. An expanded table can be found on the next page. The structural cost per square foot of both the bay and total building is $27.27.

	COST PER BAY	TOTAL BUILDING
Material	$24,110	$1,115,835
Labor	$ 8,087	$ 374,319
Equipment	$ 1,649	$ 76,359
Total	$33,847	$1,566,512
Total w/ O&P	**$41,247**	**$1,908,980**

Steel Costs: $ 2,408 / ton

Concrete: $ 268 / cy

Howard Community College
Arts & Humanities Instructional Building
Detailed Structural Estimate
October 31, 2005

Noah J. Ashbaugh
Construction Management

Location Factor	0.92	Area Multiplier	46.28
Unit observed	27.5' x 27.5' bay	(Total building area divided by area oberved	
Area observed	756.25 square feet per floor	per unit)	
	1512.5 square feet for 2 floors		
Total Building	70,000 square feet		

Summary Table

	No. of Units		Costs Mat.	Lab	Equip	Total	Tot w/ O&P
Strip Footings	5.70 cy	Total	$ 582.1	$ 366.1	$ 2.4	$ 950.5	$ 1,214.9
Column Footings	12.61 cy	Total	$ 1,903.2	$ 1,096.7	$ 7.1	$ 3,007.0	$ 3,829.7
Baseplates	2.04 cwt	Total	$ 76.9	$ -	$ -	$ 76.9	$ 84.5
Columns	3.74 tons	Total	$ 6,049.9	$ 1,168.7	$ 756.2	$ 7,974.9	$ 9,487.4
Girders	2.37 tons	Total	$ 4,288.4	$ 340.8	$ 178.4	$ 4,807.5	$ 5,502.8
Beams	3.26 tons	Total	$ 5,622.1	$ 574.3	$ 342.0	$ 6,538.4	$ 7,543.3
Steal Connctions	@ 10% of total steel	Total	$ 1,603.7	$ 208.4	$ 127.7	$ 1,939.8	$ 2,261.8
CMU walls	1085 sf	Total	$ 1,976.4	$ 3,493.0	$ -	$ 5,469.4	$ 7,499.6
3" Concrete Deck	7.00 cy	Total	$ 626.2	$ 536.6	$ 222.3	$ 1,385.1	$ 1,746.8
WWF 6.0x6.0 W2.1xW2.1	7.56 csf	Total	$ 177.4	$ 136.4	$ -	$ 313.8	$ 420.9
2" Metal Deck	756.25 sf	Total	$ 1,203.6	$ 167.0	$ 13.9	$ 1,384.5	$ 1,655.9
	Total Cost per Bay		$ 24,110.0	$ 8,088.0	$ 1,649.9	$ 33,847.9	$ 41,247.6
cost/bay x area multiplier =	Total Building Cost		$ 1,115,834.9	$ 374,318.5	$ 76,358.7	$ 1,566,512.2	$ 1,908,979.8

Howard Community College
Arts & Humanities Instructional Building
Detailed Structural Estimate
October 31, 2005

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DETAILED COST BREAKDOWN

Strip Footings

Dimensions (in) l	w	h	Cubic Yards	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
192	48	12	2.37	C.Y.	108.00	61	0.39	169.39	214.00	$ 256.00	$ 144.59	$ 0.92	$ 401.52	$ 507.26
240	24	12	1.48	C.Y.	113	76	0.49	189.49	244.00	$ 167.41	$ 112.59	$ 0.73	$ 280.73	$ 361.48
300	24	12	1.85	C.Y.	113	76	0.49	189.49	244.00	$ 209.26	$ 140.74	$ 0.91	$ 350.91	$ 451.85
								Total		$ 632.67	$ 397.93	$ 2.56	$ 1,033.15	$ 1,320.59

Column Footings

Designation	Dimensions (in) l	w	h	Cubic Yards	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
F-6	72	72	16	1.78	C.Y.	164.00	94.5	0.61	259.11	330.00	$ 291.56	$ 168.00	$ 1.08	$ 460.64	$ 586.67
F-6	72	72	16	1.78	C.Y.	164.00	94.5	0.61	259.11	330.00	$ 291.56	$ 168.00	$ 1.08	$ 460.64	$ 586.67
F-8	96	96	20	3.95	C.Y.	164.00	94.5	0.61	259.11	330.00	$ 647.90	$ 373.33	$ 2.41	$ 1,023.64	$ 1,303.70
F-8	96	96	20	3.95	C.Y.	164.00	94.5	0.61	259.11	330.00	$ 647.90	$ 373.33	$ 2.41	$ 1,023.64	$ 1,303.70
F-5	60	60	15	1.16	C.Y.	164.00	94.5	0.61	259.11	330.00	$ 189.81	$ 109.38	$ 0.71	$ 299.90	$ 381.94
									Total		$ 2,068.73	$ 1,192.04	$ 7.69	$ 3,268.46	$ 4,162.69

Baseplates

Designation	Dimensions (in) l	w	th	unit wght	CWT	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
BP2	12	12	1.00	40.8	0.41	cwt	41.00	0.00	0.00	41.00	45.00	$ 16.73	$ -	$ -	$ 16.73	$ 18.36
BP2	12	12	1.00	40.8	0.41	cwt	41.00	0.00	0.00	41.00	45.00	$ 16.73	$ -	$ -	$ 16.73	$ 18.36
BP5	14	14	1.25	40.8	0.41	cwt	41.00	0.00	0.00	41.00	45.00	$ 16.73	$ -	$ -	$ 16.73	$ 18.36
BP4	14	14	1.00	40.8	0.41	cwt	41.00	0.00	0.00	41.00	45.00	$ 16.73	$ -	$ -	$ 16.73	$ 18.36
BP1	12	12	0.75	40.8	0.41	cwt	41.00	0.00	0.00	41.00	45.00	$ 16.73	$ -	$ -	$ 16.73	$ 18.36
					2.04											
										Total		$ 83.64	$ -	$ -	$ 83.64	$ 91.80

Howard Community College
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DETAILED COST BREAKDOWN

CMU walls

	L (ft)	H (ft)	SF	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
16" cmu wall	27.5	10	275	SF	2.51	4.97	0	7.48	10.35	$ 690.25	$ 1,366.75	$ -	$ 2,057.00	$ 2,846.25
8" cmu wall	45	18	810	SF	1.80	3.00	0.00	4.80	6.55	$ 1,458.00	$ 2,430.00	$ -	$ 3,888.00	$ 5,305.50
									Total	$ 2,148.25	$ 3,796.75	$ -	$ 5,945.00	$ 8,151.75

Lightweight Concrete Deck

	W	L	SF	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
3" Concrete Deck	27.5	27.5	756.25	SF	0.9	0.65	0.27	1.82	2.27	$ 680.63	$ 491.56	$ 204.19	$ 1,376.38	$ 1,716.69
	W	L	CY											
Placing	27.5	27.5	7.0	CY	0	13.1	5.35	18.45	26.00	$ -	$ 91.73	$ 37.46	$ 129.19	$ 182.06
									Total	$ 680.63	$ 583.29	$ 241.65	$ 1,505.57	$ 1,898.75

Welded Wire Fabric

	W	L	SF	CSF	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
6x6 - W2.1xW2.1	27.5	27.5	756.25	7.56	SF	25.5	19.6	0	45.10	60.50	$ 192.84	$ 148.23	$ -	$ 341.07	$ 457.53
										Total	$ 192.84	$ 148.23	$ -	$ 341.07	$ 457.53

2" Metal Deck (20 Guage)

	W	L	SF	Unit	Unit Costs Mat.	Lab	Equip	Total	Tot w/ O&P	Bay Costs Mat.	Lab	Equip	Total	Tot w/ O&P
2" Deck	27.5	27.5	756.25	SF	1.73	0.24	0.02	1.99	2.38	$ 1,308.31	$ 181.50	$ 15.13	$ 1,504.94	$ 1,799.88
									Total	$ 1,308.31	$ 181.50	$ 15.13	$ 1,504.94	$ 1,799.88

Howard Community College
Arts & Humanities Instructional Building
Detailed Structural Estimate
October 31, 2005

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Construction Management

DETAILED COST BREAKDOWN

Columns

						Unit Costs					Bay Costs				
	Desgination	Type	L (ft)	Weight (lbs/ft)	Unit	Mat.	Lab	Equip	Total	Tot w/ O&P	Mat.	Lab	Equip	Total	Tot w/ O&P
	C8	HSS6x6x5/8	35.5	42.1	lbs	0.88	0.17	0.11	1.16	1.38	$ 1,315.20	$ 254.07	$ 164.40	$ 1,733.68	$ 2,062.48
	C8	HSS6x6x5/8	35.5	42.1	lbs	0.88	0.17	0.11	1.16	1.38	$ 1,315.20	$ 254.07	$ 164.40	$ 1,733.68	$ 2,062.48
	C10	HSS6x6x5/8	35.5	42.1	lbs	0.88	0.17	0.11	1.16	1.38	$ 1,315.20	$ 254.07	$ 164.40	$ 1,733.68	$ 2,062.48
	C10	HSS6x6x5/8	35.5	42.1	lbs	0.88	0.17	0.11	1.16	1.38	$ 1,315.20	$ 254.07	$ 164.40	$ 1,733.68	$ 2,062.48
	C8	HSS6x6x5/8	35.5	42.1	lbs	0.88	0.17	0.11	1.16	1.38	$ 1,315.20	$ 254.07	$ 164.40	$ 1,733.68	$ 2,062.48
			177.5												
										Total	$ 6,576.02	$ 1,270.37	$ 822.00	$ 8,668.39	$ 10,312.40

Girders

						Unit Costs					Bay Costs				
lbs		unit (ea)	unit length (ft)	Tot Length (ft)	Unit	Mat.	Lab	Equip	Total	Tot w/ O&P	Mat.	Lab	Equip	Total	Tot w/ O&P
605	W14x22	2	13.75	27.5	lf	25	2.09	1.34	28.43	32.50	$ 687.50	$ 57.48	$ 36.85	$ 781.83	$ 893.75
852.5	W16x31	1	27.5	27.5	lf	30.00	2.30	1.47	33.77	38.50	$ 825.00	$ 63.25	$ 40.43	$ 928.68	$ 1,058.75
962.5	W18x35	1	27.5	27.5	lf	33.50	3.13	1.46	38.09	44.00	$ 921.25	$ 86.08	$ 40.15	$ 1,047.48	$ 1,210.00
1100	W18x40	1	27.5	27.5	lf	38.50	3.13	1.46	43.09	49.50	$ 1,058.75	$ 86.08	$ 40.15	$ 1,184.98	$ 1,361.25
1210	W21x44	1	27.5	27.5	lf	42.50	2.82	1.32	46.64	53.00	$ 1,168.75	$ 77.55	$ 36.30	$ 1,282.60	$ 1,457.50
4730															
										Total	$ 4,661.25	$ 370.43	$ 193.88	$ 5,225.55	$ 5,981.25

Beams

						Unit Costs					Bay Costs				
lbs		unit (ea)	unit length (ft)	Tot Length (ft)	Unit	Mat.	Lab	Equip	Total	Tot w/ O&P	Mat.	Lab	Equip	Total	Tot w/ O&P
400	W8x10	4	10	40	lf	9.65	3.45	2.21	15.31	18.95	$ 386.00	$ 138.00	$ 88.40	$ 612.40	$ 758.00
665	W12x19	2	17.5	35	lf	13.50	2.35	1.51	17.36	20.50	$ 472.50	$ 82.25	$ 52.85	$ 607.60	$ 717.50
1430	W16x26	2	27.5	55	lf	25.00	2.07	1.33	28.40	32.50	$ 1,375.00	$ 113.85	$ 73.15	$ 1,562.00	$ 1,787.50
1705	W16x31	2	27.5	55	lf	30.00	2.30	1.47	33.77	38.50	$ 1,650.00	$ 126.50	$ 80.85	$ 1,857.35	$ 2,117.50
1100	W18x40	1	27.5	27.5	lf	38.50	3.13	1.46	43.09	49.50	$ 1,058.75	$ 86.08	$ 40.15	$ 1,184.98	$ 1,361.25
1210	W21x44	1	27.5	27.5	lf	42.5	2.82	1.32	46.64	53.00	$ 1,168.75	$ 77.55	$ 36.30	$ 1,282.60	$ 1,457.50
6510															
										Total	$ 6,111.00	$ 624.23	$ 371.70	$ 7,106.93	$ 8,199.25

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Oct 31, 2005

ASSEMBLIES ESTIMATE

The assemblies estimate is performed on the shell of the building. This includes all the exterior wall types, curtain wall, masonry wall and pre-finished aluminum panels. Also included in the estimate is the finished roof system, both a standing seam metal roof and a 4 ply built-up roof system. The last part of the estimate is the roof superstructure. The assemblies estimate is performed using the RS Means Assemblies Estimate 2005 manual. A time factor does not need to be applied because the manual is current construction costs. A location factor of 0.92 is applied to all the prices obtained from the manual. Below is a brief summary of the assemblies estimate. More detailed information can be found on the next page. Included in the appendix is the cost for taxes, overhead and profit.

Description		Total Costs
Curtain Wall	6,492 sf	$ 144,966
Masonry Wall	20,492 sf	$ 477,463
Aluminum Panels	6,044 sf	$ 46,720
Corrugated Alum Panels	1,792 sf	$ 9,784
4ply built-up Roof	29,522 sf	$ 67,014
Standing Seam Roof	400 sf	$ 4,508
Roof Superstructure	29,922 sf	$ 112,207
Total Cost for Shell of the building		**$ 862,664**

ASSEMBLIES ESTIMATE SUMMARY

Noah J. Ashbaugh
Construction Management
31-Oct-05

Arts & Humanities Instructional Building			78,000	SF
Columbia, MD			$ 12.67	$/SF
ARCH				2 Stories
Howard Community College				
Div	Description	SUBTOTAL	COST/SF	PERCENTAGE
A				
B10	SHELL: SUPERSTRUCTURE	$ 112,208	$ 3.75	11.36%
B20	SHELL: EXTERIOR CLOSURE	$ 678,934	$ 19.50	68.71%
B30	SHELL: ROOFING	$ 71,523	$ 2.39	7.24%
C				
D10				
D20				
D30				
D40				
D50				
E				
F				
G				
	BUILDING SUBTOTAL	$ 862,665		
	Sales Tax _ % x subtotal/2	5%		$ 21,567
	General Conditions_% x subtotal	10%		$ 86,266
			subtotal A	$ 970,498
	Overhead_ % x subtotal "A"	7%		$ 67,158
			subtotal B	$ 1,037,656
	Profit_ % x subtotal "B"	3.5%		$ 36,318
			Subtotal C	$ 1,073,974
	Location Factor_% x subtotal "C"	92%	localized cost	$ 988,056
			Total Project cost	**$ 988,056**
			sf cost	$ 12.67

Howard Community College
Arts & Humanities Instructional Building
Assemblies Estimate Breakdown
October 31, 2005

Noah J. Ashbaugh
Construction Management

Summary Table					
			Costs		
	No. of Units		Mat.	Inst.	Total
Curtain Wall	6,492 sf	Total	$ 101,794.6	$ 43,171.8	$ 144,966.4
Masonry Wall	20,492 sf	Total	$ 135,247.2	$ 342,216.4	$ 477,463.6
Prefinished Aluminum Panels	6,044 sf	Total	$ 20,428.7	$ 26,291.4	$ 46,720.1
Corrugated Aluminum Panel	1,792 sf	Total	$ 4,336.6	$ 5,447.7	$ 9,784.3
Roof, 4ply built up roof	29,522 sf	Total	$ 23,617.6	$ 43,397.3	$ 67,014.9
Standing Seam Metal Roof	400 sf	Total	$ 2,760.0	$ 1,748.0	$ 4,508.0
Roof Superstructure	29,922 sf	Total	$ 80,191.0	$ 32,016.5	$ 112,207.5
Total Cost			$ 368,375.7	$ 494,289.2	$ 862,664.8

Howard Community College
Arts & Humanities Instructional Building
Assemblies Estimate Details
October 31, 2005

Noah J. Ashbaugh
Construction Management

ASSEMBLIES COST DETAILS

Curtain Wall

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
6,492	sf of Curtain Wall	sf	11.65	6.65	18.30	$ 75,631.80	$ 43,171.80	$ 118,803.60
	Galvanized Steel Bracing	ea	4.03	0	4.03	$ 26,162.76		$ 26,162.76
					Total	$ 101,794.56	$ 43,171.80	$ 144,966.36

Masonry Wall

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
20,492	sf of Masonry Wall	sf	6.60	16.7	23.30	$ 135,247.20	$ 342,216.40	$ 477,463.60
					Total	$ 135,247.20	$ 342,216.40	$ 477,463.60

Prefinished Aluminum Panels

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
6,044	sf of Prefinished Aluminum Panels	sf	3.38	4.35	7.73	$ 20,428.72	$ 26,291.40	$ 46,720.12
					Total	$ 20,428.72	$ 26,291.40	$ 46,720.12

Corrugated Aluminum Panel

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
1,792	sf of Corrugated Aluminum Panels	sf	2.42	3.04	5.46	$ 4,336.64	$ 5,447.68	$ 9,784.32
					Total	$ 4,336.64	$ 5,447.68	$ 9,784.32

Roof, 4ply built up roof

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
29522	sf of Roof	sf	0.8	1.47	2.27	$ 23,617.60	$ 43,397.34	$ 67,014.94
					Total	$ 23,617.60	$ 43,397.34	$ 67,014.94

Standing Seam Metal Roof

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
400	sf of Roof	sf	6.9	4.37	11.27	$ 2,760.00	$ 1,748.00	$ 4,508.00
					Total	$ 2,760.00	$ 1,748.00	$ 4,508.00

Roof Superstructure

		Unit	Unit Costs			Total Costs		
			Mat.	Inst	Total	Mat.	Inst	Total
29922	sf of Roof Superstructure	sf	2.68	1.07	3.75	$ 80,190.96	$ 32,016.54	$ 112,207.50
					Total	$ 80,190.96	$ 32,016.54	$ 112,207.50

Noah J. Ashbaugh
CM Option
Advisor: Dr. Messner
Oct 31, 2005

GENERAL CONDITIONS ESTIMATE

General conditions have an important role in the construction process for a construction manager. To calculate general conditions the computer program ICE 2000 estimating software is used. A few general condition items included in the estimate are jobsite trailer, temporary fence, temporary heat and project staffing costs. A time factor as well as location factor is applied to the original estimate calculated from ICE 2000. The total cost for General Conditions is calculated to be $ 1,056,493. It is important, when calculating general conditions, to recognize what items are needed and for how long. General conditions consist of many different items however some items are only needed for part of the construction process. For example, a crane is a large cost but is only needed for part of the construction process. It is important to identify before hand how long a crane is needed. A detailed item list is available on the next pages with a summary of general conditions to follow.

Item Code	Description	Quantity	Labor Cost	Material Cost	Sub Cost	Equipt Cost	Equipt Rental	Temp Matl	Other Costs
1540.190	Air compressor	15.00 MO				261.000			
1540.200	Welding machine	4.00 MO				208.000			
1540.210	Equipment repair	LS							
1540.220	Gasoline and lubricating oil	GALS				1.850			
1540.230	Generators	8.00 MO				1,216			
1540.240	Pickup truck rental	MO				521.000			
1540.250	Truck rental	MO				874.000			
1540.260	Pumps	4.00 MO				115.000			
1540.270	Conveyors	MO				350.000			
1540.280	Power buggies	DAY				68.750			
1540.290	Forklift	8.00 MO				631.000			
1540.300	Personnel hoist	10.00 MO				847.000			
1540.310	Scaffolding	1.00 LS							
1540.320	Jobsite communications	18.00 MO		87.500					
1550.100	Temporary road	450.00 SQYD	1.185	0.360		0.355			
1560.100	Watchman	12.00 WEEK	518.250						
1560.110	Watchman and command dog	WEEK	610.500						
1560.120	Temporary job fence	1,300.00 LNFT	1.280	11.280					
1560.130	Protect trees	EACH	24.500	16.100					
1560.140	Slab barricades	LNFT	1.750	0.410					
1560.150	Sidewalk barricades	400.00 LNFT	30.000	10.000					
1560.160	Temporary partitions	SQFT	0.550	0.150					
1560.170	Temporary storage	1.00 LS							
1560.180	Weather protection	1.00 LS							
1580.100	Job sign	2.00 EACH	275.000	114.000					
1650.100	Freight demurrage	1.00 LS			1,039				
1720.100	Layout supplies	2.00 WEEK		81.000					
1730.100	Cut and patch	1.00 LS							
1740.100	Job clean up	78,000.00 SQFT	0.380						
1740.110	Clean glass	SQFT	0.510						
1740.120	Trash chutes	FLRS			214.000				
1740.130	Rubbish removal	900.00 CUYD	15.110	1.265					
1830.100	Turn on HVAC early	MO							

General Conditions - *Standard Construction Project*

User Name: user

Item Code	Description	Quantity	Labor Cost	Material Cost	Sub Cost	Equipt Cost	Equipt Rental	Temp Matl	Other Costs	Quantifier
1110.100	Engineering fees	1.00 LS			4,560					
1310.100	Project manager	181.00 WEEK	1,590							
1310.110	Superintendent	181.00 WEEK	1,241							
1310.120	Assistant superintendent	WEEK	898.550							
1310.130	Job engineer	91.00 WEEK	841.250							
1310.140	Clerk	91.00 WEEK	384.000							
1310.150	Timekeeper	WEEK	653.000							
1310.160	Secretary	91.00 WEEK	729.150							
1310.170	General purpose laborer	WEEK	888.850							
1310.180	General pupose carpenter	91.00 WEEK	936.750							
1310.190	Living expenses	WEEK	412.850							
1310.200	Permit	1.00 LS								
1310.210	Purchase drawings	1.00 LS								
1310.220	Travel expenses	LS								
1320.100	Progess photographs	21.00 MO			119.000					
1320.110	CPM schedule	1.00 LS			4,852					
1450.100	Laboratory testing	1.00 LS								
1510.100	Temporary wiring	2.00 MO			258.000					
1510.110	Job telephone	21.00 MO			89.350					
1510.120	Electric light bill	21.00 MO			283.000					
1510.130	Water bill	21.00 MO			89.000					
1510.140	Temporary heat	12.00 MO			1,108					
1510.150	Temporary fire protection	21.00 MO			206.000					
1520.100	Office trailer	20.00 MO			374.000					
1520.110	Job tool house	1.00 EACH			1,210					
1520.120	Portable chemical toilet	1.00 MO			87.250					
1520.130	Water, ice and cups	21.00 MO			138.000					
1520.140	First aid supplies	21.00 MO			50.000					
1520.150	Safety supplies	21.00 MO			150.000					
1520.160	Office supplies	21.00 MO			275.750					
1540.100	Crane rental	8.00 MO				191.000				
1540.110	Climbing crane	MO				6,590				
1540.120	Buck hoist	MO				850.000				
1540.130	Tower hoist	MO				7,450				
1540.140	Crawler crane	DAY				550.000				
1540.150	Backhoe	120.00 HOUR				62.500				
1540.160	Front end loader	120.00 HOUR				68.000				
1540.170	Bulldozer	120.00 HOUR				73.000				
1540.180	Small tools	18.00 MO				167.750				

General Conditions Estimate

10/31/2005

Standard Construction Project

Management Computer Controls, Inc.

Columbia, MD

sqft

21 Mo. Constr. Time

		Labor	Material	Equipment	Subcontract	Temp Matl	Equip Rental	Other	Totals
Direct costs	%								
Base labor		$839,675	$21,930	$57,580	$62,440	$0	$0	$0	$981,625
Labor burden	0.00%	$0							$0
Labor fringes		$0							$0
Labor manhours		0							
Material sales tax	0.00%		$0						$0
Equipment Surcharge	0.00%			$0					$0
Temporary material markup	0.00%					$0			$0
Equipment rental markup	0.00%						$0		$0
Other markup	0.00%							$0	$0
Gross cost		$839,675	$21,930	$57,580	$62,440	$0	$0	$0	$981,625
Gross receipts tax	0.00%								$0
Builder's risk insurance	0.00%								$0
	Overall								
Location Factor	92.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	$903,095	$0	$0	$0	$0	$0	$0	$0	$903,095
Time Adjustment	4.0% / year	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	for 4 years	$0	$0	$0	$0	$0	$0	$0	$1,056,493
									$0
									$0
									$0
									$0
Total									**$1,056,493**
Cut/Add									$0
Project total									**$1,056,493**