

**Science & Technology Center  
Chestnut Hill Academy  
Philadelphia, PA**



**Michael R. Pothering**

**Construction Management**



**Technical Assignment #2  
Advisor Dr. Messner**



## Executive Summary

Compiled in this technical assignment are detailed reports in which were intended to better understand the building system, schedule attributes, and project site logistics of the New Science & Technology Building.

The first area that was reviewed is the detailed project schedule. This schedule shows the detailed breakdown of activities in which the project was constructed. The allotted time and sequencing of the activities are shown via the Gantt chart graphical summary.

The project site logistics were taken into consideration in this report by the development of two site plans. Site plans showing the excavation phase of the project as well as another plan showing the building construction phase of the project are included in the report.

A cost estimate for the structural system was prepared to better understand the overall structural components of the building. The system is primarily steel frame with concrete foundations and floors. The compiled estimate amounted to \$657,898. A general conditions estimate was done assembling the project's overhead costs. Included were the project staffing, equipment, and other expenses. The total amount for the general conditions was \$1,068,264.





## A. Detailed Project Schedule Summary

The schedule for the Science & Technology Center starts in the design phase on 3/7/07 and last until 11/28/08 for an overall project time of 93 weeks.

Project Milestones:	Begin	End
• Proposal/Award Phase	<b>3/7/07</b>	<b>3/20/07</b>
• Preconstruction Period	<b>3/7/07</b>	<b>11/26/07</b>
• Procurement	<b>6/11/07</b>	<b>12/11/07</b>
• Construction Begins	<b>11/23/07</b>	<b>11/23/07</b>
○ Site work	<b>11/23/07</b>	<b>1/25/08</b>
○ Structure	<b>12/19/07</b>	<b>4/25/08</b>
○ Building Envelope	<b>3/31/08</b>	<b>9/12/08</b>
○ MEP Systems	<b>1/7/08</b>	<b>11/28/08</b>
○ Interiors	<b>5/26/08</b>	<b>11/7/08</b>
• Substantial Completion	<b>11/28/08</b>	<b>11/28/08</b>



## B. Site Layout Planning

The Science & Technology Center is being built on the campus of the Chestnut Hill Academy. It is being constructed on an existing parking lot and grass lawn. The location of an existing building approximately 75' to the Southwest of the site adds a small amount of congestion. The opposing side of the site has an open field next to an athletic track, which will provide ample lay down and storage room for the site. Since all the deliveries to site will be timed according to demand there will only be primary storage of essential items on site providing sufficient room for maneuvering. Offsite parking will be available for workers on the surrounding streets. Deliveries will be taken from the South entrance of the site in the existing road loop allowing for one way traffic. Trucks will enter then unload and continue around the loop keeping efficient flow of deliveries.

The excavation phase of the project will last three weeks. The bottom of foundation will be a minimum of 3' below grade therefore there will be no need for excavation support. A temporary soil stock pile will be located to the North of the site during excavation. Once the foundation is place, the soil will return as suitable backfill. The remaining soil will be shipped off site and sold. After the backfill is completed the excavation phase will be complete and move to the construction/superstructure phase.

*\*See appendix B.1 for the Excavation Site Plan*

The construction phase will begin with the placement of the slab on grade. The commencement of the steel erection will begin after the concrete cured adequately. The steel will be erected by a 60 Ton hydraulic mobile crane. The crane will place the steel frame from the Northeast and Southwest side of the site. Shakeout for steel members will be separated into corresponding picks for crane locations. Deliveries will be made on the south end of the site. Dumpers will be located around site for access by all workers.

*\*See appendix B.2 for Construction Site Plan*



### C. Detailed Structural System Estimate

The structural system for the New Science & Technology Center consist of primarily of structural steel frame with steel braces frames for lateral support. See *Figure1*. The braces frames utilize hollow structural steel (HSS) extending from the corners of the columns to the over head beam in a truss like manor. The HSS will be field welded to plates connecting the HSS to the structural wide flange sections creating a resistance to lateral forces. The structural steel system will be comprised of columns ranging from W8x24 to W8x48 and beams/girders ranging from W8x10 to W24x84. The foundation consists of cast-in-place concrete strip footings around the perimeter with approximately 18” of foundation wall above the footing. The columns have added spread footing foundations which will help distribute the acquired load to the soil. The first floor has a 5” 4,000 PSI concrete slab on grade, which is reinforced with 6x6 welded wire fabric (WWF). The second floor utilizes a 4 ¼” 3,000 PSI slab reinforced with 6x6 WWF on 2” deep, 20 gauge metal decking. The use of shear studs which will protrude through the metal deck and will be welded to the steel beams create a composite reaction with the steel members and the concrete slab. The roof will be covered with a 3” deep 20 gauge roof deck.

The structural estimate results were done by doing a detailed steel member takeoff, as well as measuring the amount of floor and roof area of the metal decking. The concrete was done in a similar manor by finding the total amount of cubic yards of concrete in each area. The following table shows the breakdown of the different components of the overall structural system costs divided into material cost, labor cost, equipment cost, and finally the overall cost. These numbers were taken from the 2008 R.S. Means cost reference.

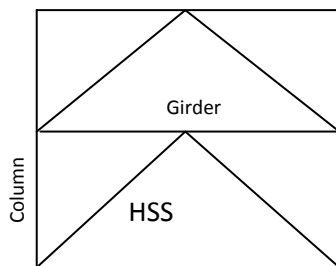


Figure 1. Example of Braced Frame



Structural Steel Takeoff							
	Quantity	Unit	Material	Labor	Equipment	Total	Cost
Structural Steel	106.42	TON	\$3,200	\$410	\$205	\$3,815	\$ 405,992
Floor Decking	7105	SF	\$2.58	\$0.41	\$0.04	\$3.03	\$ 21,528
Roof Decking	11736.7	SF	\$1.89	\$0.36	\$0.03	\$2.28	\$ 26,760.
Weld Wire Fabric	180.72	CSF	\$20	\$22		\$42	\$ 7,590
Rebar	2.2	TON	\$965	\$765		\$1730	\$ 3,806
<b>Total</b>							<b>\$ 465,676</b>
<b>Location Factor (LF) of 1.15</b>							
<b>Adjusted Total</b>							<b>\$ 535,527</b>

CONCRETE TAKEOFF							
	Quantity	Unit	Material	Labor	Equipment	Unit Cost	Total
Concrete Strip Footing	52	CY	\$133	\$85.5	\$0.51	\$219.01	\$ 11,389
Concrete Spread Footing	62.5	CY	\$192	\$5.5	\$0.57	\$288.07	\$ 18,004
Concrete Grade Wall	55	CY	\$177	\$166	\$16.45	\$359.45	\$ 19,770
Slab on Grade 5" Thick	10186	SF	\$1.65	\$0.74	\$0.01	\$2.40	\$ 24,447
Slab on Grade 15" Thick	41	SF	\$5.01	\$1.00	\$0.01	\$6.02	\$ 248
Elevated Slab	7105	SF	\$1.44	\$0.73	\$0.28	\$2.45	\$ 17,407
Slab on Grade Formwork	421	L.F	\$0.32	\$1.93		\$2.25	\$ 947
Foundation Wall Formwork	2131.8	SFCA	\$2.7	\$4.82		\$6.66	\$ 14,198
<b>Total</b>							<b>\$ 106,410</b>
<b>Adjusted Total with (LF)</b>							<b>\$ 122,371</b>



## D. General Conditions Estimate

The general conditions estimate for the project includes project staffing, general job expenses, temporary utilities and insurance/bonding. These items are all done for the CM/GC Turner Construction. The durations for these items began at site mobilization on 11/23/07 and ended at substantial complete on 11/28/08. This sums the overall construction of the project to 53 weeks. The duration of the project staff was taken from an owner's representative contact. A summary of the costs is provided in Table E.1.

Table E.1

General Conditions Summary	
Project Staffing	\$487,450
General Expenses	\$190,610
Temporary Utilities	\$35,756
Insurance	\$82,758
Bonds	\$240,576
<b>Total</b>	<b>\$1,037,150</b>





## E. Critical Industry Issues

The economy for today’s construction industry has changed dramatically in the past five to ten years. Rising costs of materials, energy, and fuel has directed the industry to escalate bidding prices to allow for economic inflation and uncertainty. It has become important for quick adaptation by companies to plan for the future. It will be important to change design methods to incorporate sustainability and environmental considerations.

Several areas to incorporate savings on projects: design, construction, and building life cycles.

### Design

Designing the project to be sustainable in today’s market can be done in many ways. Using new technologies can be a major energy savings tactic. The new controls made for MEP systems increase the efficiency by managing the equipment during downtimes allowing for less consumption. Since the Science & Technology Center is seeking LEED Silver rating it has taken many steps in sustainable design. An example of this technology is the buildings lighting system. It will be primarily florescent and have Lutron’s EcoSystem digital electronic dimming ballasts. The EcoSystem utilizes sensors to detect additional outside light levels then automatically dims the interior lights to save energy. It also has occupancy sensors to turn the lights off when the rooms are unoccupied. The system has controls to allow an individual to control their light increasing or decreasing output to improve productivity and increase energy savings. This system could potentially save 50% of lighting electricity in return saving energy. There are countless other methods to design sustainability into buildings, with the rising LEED market and upcoming technologies for renewable energy in building systems, the consumption throughout new buildings will be significantly decrease.

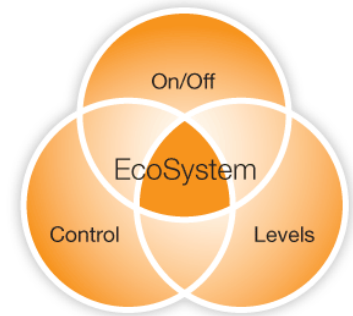


Image by Lutron

### Construction

Utilizing sustainability can be a relatively easy process for many companies to take part in by changing their waste management techniques, utilizing alternative materials, and constructability methods. Separating recyclable waste from the unsalvageable material will not only reutilize what is left over but could also be a source of revenue by selling things like scrap metals. Using alternative materials that contain recycled material, made of plentiful renewable material such as wood and bamboo. Using locally available materials could save money as well as energy by cutting on shipping costs. Reusing salvaged materials such as brick can also be beneficial. Taking advantage of certain construction methods such as low-VOC assemblies can cut on schedule time by dismissing allotted time for off gassing.



### **Building Life Cycles**

Constructing buildings to live out their use effectively and efficiently is always a major initiative in the industry. This can be done by utilizing state-of-the-art mechanical equipment with built in economizers an energy recovery wheels, much like in the Science & Technology Center. This will ensure the system can efficiently use the energy it consumes. Designing the equipment to meet the needs of the building while not over designing will successfully exploit the equipment's intent, while not consuming unneeded energy. As the economy's demand for buildings change a perspective method of construction would be designing buildings with the intent of possible retrofitting for alternative uses such as an small office building that could be turned into a retail market building. Keeping the future in mind will always be a pressing issue within the industry, keeping sustainable and reusable designs may help ease this economic concern.



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Chestnut Hill Academy  
Philadelphia, PA  
Michael Pothering  
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Cost & Schedule Analysis

Technical Assignment # 2  
10/24/08

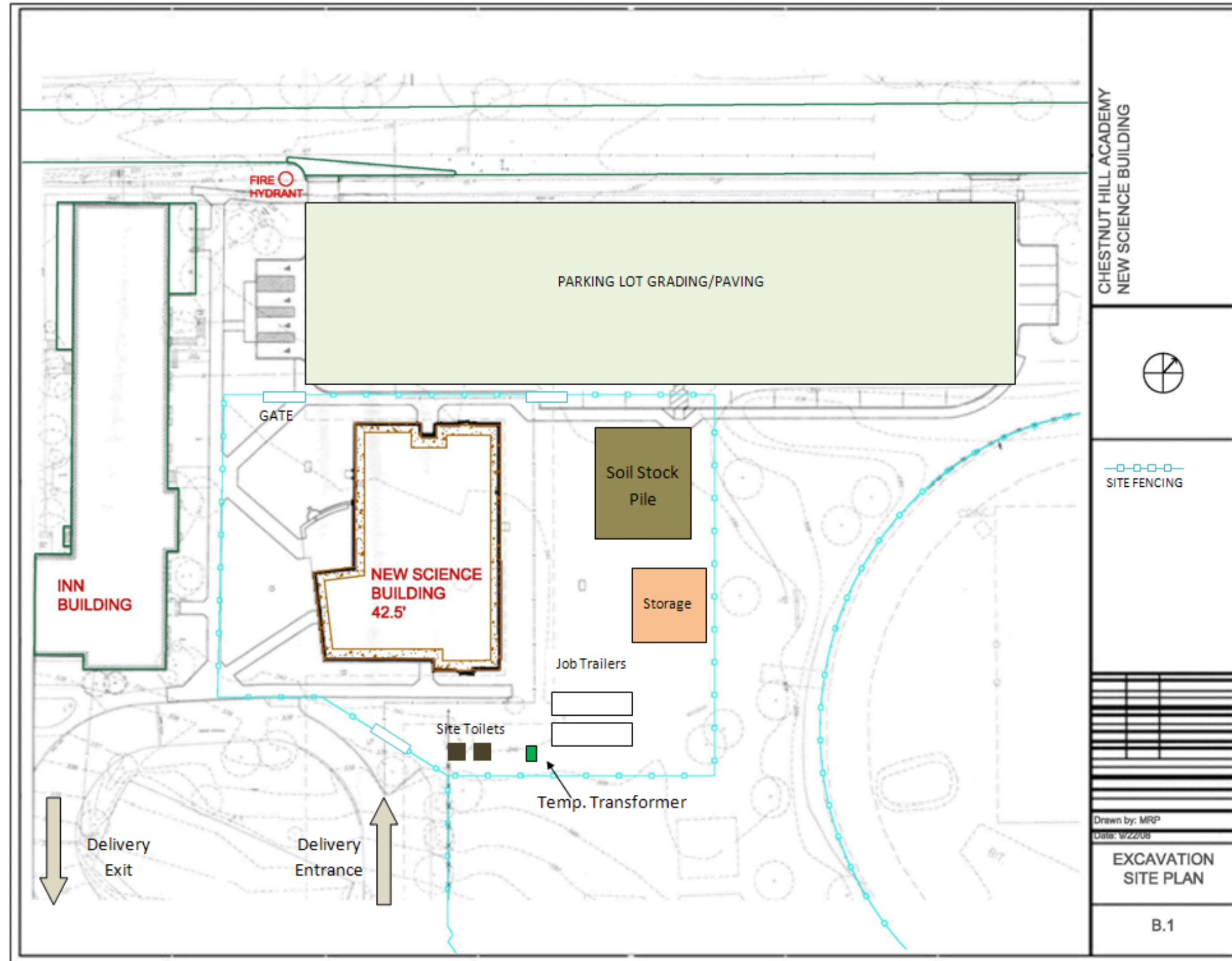
Advisor Dr. Messner

## Appendix A

***\*\*\* Detailed Project Schedule will be attached at end of report due to difficulties with Adobe Acrobat***

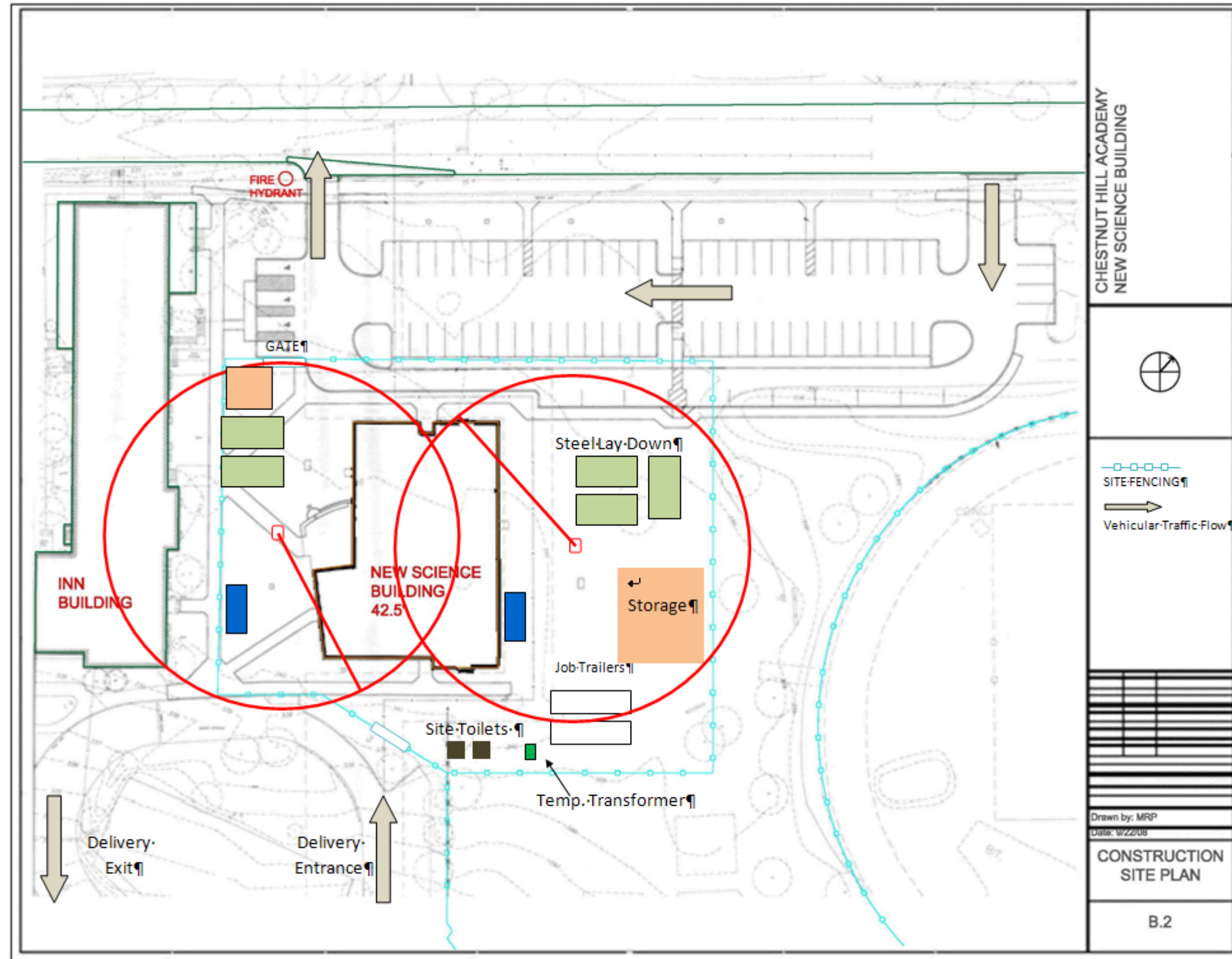


**Appendix B.1**  
Excavation Site Plan





Appendix B.2  
Construction Site Plan





## Appendix C

### Detailed Structural System Takeoff

Detailed Structural Estimate			
Structural Steel			
Size	Length	Quantity	Lbs
Columns			
8 x 24			
	14.25	10	3420
8 x 31			
	11	30	10230
8 x 35			
	11	16	6160
8 x 40			
	11	4	1760
	14.25	1	570
8 x 48			
	11	4	2112
	14.5	4	2784
W- Flange Beams			
6 x 10			
	2.5	2	50
	3	2	60
	3.5	7	245
	4.5	2	90
	5	2	100
	9	2	180
8 x 10			
	1	2	20
	3.33	2	66.6



Cost & Schedule Analysis

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	3.54	4	141.6
	4.24	4	169.6

	4.5	4	180
	5	1	50
	5.5	4	220
	5.75	1	57.5
	6.165	2	123.3
	6.67	1	66.7
	7	6	420
	7.5	2	150
	8	24	1920
	8.165	3	244.95
	8.33	1	83.3
	8.67	2	173.4
	8.83	4	353.2
	9	8	720
	9.33	6	559.8
	9.83	5	491.5
	10	4	400
	10.165	2	203.3
	10.67	7	746.9
	10.83	6	649.8
	11.67	6	700.2
	12.67	1	126.7
	14.85	2	297
	16	12	1920
	21.2	3	636
	26.87	2	537.4
8 x 18			
	6.33	2	227.88
	8.165	1	146.97
	8.83	7	1112.58
	10.5	1	189
	10.83	2	389.88
	11.33	2	407.88



8 x 35			
	30	1	1050

10 x 12			
	3	2	72
	7	2	168
	8	1	96
	9	1	108
	10.67	1	128.04
	14	1	168
	15	1	180
	17.67	2	424.08
	21.2	2	508.8
	26.87	17	5481.48
10 x 15			
	15	1	225
	18.5	1	277.5
10 X 17			
	14	1	238
	15.5	1	263.5
	20	1	340
10 X 19			
	21	1	399
10 x 22			
	8.165	1	179.63
	21.2	1	466.4
	21.83	1	480.26
	26.87	1	591.14
10 x 60			
	14	1	840
12 x 14			
	2.67	1	37.38
	4.5	1	63
	5.25	1	73.5





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	5.33	1	74.62
	7	1	98
	7.5	1	105
	9.5	1	133
	10.67	1	149.38
	10.83	1	151.62
	11	1	154
	13.33	2	373.24
	14	1	196
	16.165	2	452.62
	19	4	1064
	29.69	2	831.32
12 x 16			
	19	3	912
	24	1	384
	29.69	1	475.04
12 x 19			
	4.5	1	85.5
	10.5	1	199.5
12 x 26			
	8.83	3	688.74
	9	2	468
	19.67	1	511.42
	25	1	650
	25.33	1	658.58
13 x 35			
	32.67	1	1143.45
12 x 45			
	26.5	1	1192.5
14 x 22			
	9	4	792
	10.5	3	693
	10.67	4	938.96
	11	4	968
	13	2	572



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	14	2	616
	17.5	4	1540
	29	2	1276
	29.83	2	1312.52
	31.33	2	1378.52
14 x 26			
	29	4	3016
	31.33	1	814.58
14 x 34			
	34	1	1156
16 x 26			
	29.83	1	775.58
	31.33	18	14662.44
16 x 45			
	26.5	1	1192.5
18 x 35			
	15	1	525
	16.165	5	2828.875
	17.5	4	2450
	26.5	6	5565
	29	2	2030
	29.83	1	1044.05
	30	1	1050
	31.33	1	1096.55
	34.33	2	2403.1
18 x 40			
	21.2	2	1696
	26.5	2	2120
	26.87	2	2149.6
	31.33	1	1253.2
	34.33	2	2746.4
18 x 46			
	10.6	1	487.6
	17.66	1	812.36
	21.2	2	1950.4
	26.67	2	2453.64



Cost & Schedule Analysis

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	31.33	7	10088.26
18 x 50			

	26.5	4	5300
	31.33	5	7832.5
18 x 55			
	26.5	2	2915
	31.33	1	1723.15
18 x 60			
	26.5	1	1590
18 x 71			
	26.5	2	3763
	31.33	5	11122.15
24 x 55			
	55	2	6050
24 x 84			
	26.5	4	8904
WT Shape Beams			
6 x 9.5			
	6	38	2166
	6	38	2166

<b>Total LBS</b>			<b>196660.115</b>
<b>Tota Tons</b>			<b>98</b>



Hollow Structural Steel (Nominal Size)				
Inch	L	#	lbs/ft	LBS
5 x 1/4	11	7	12.69	977.13
6 x 6 x 3/8	19.14	8	27.48	4207.7376
	17.2	2	27.48	945.312
8 x 8 x 1/2	28.7	4	48.85	5607.98
5 x 5 x 5/16	12.8	4	21.21	1085.952
	3	4	21.21	254.52
5 x 10 x 1/4	9.33	4	24.12	900.1584
	4.83	4	24.12	465.9984
4 x 4 x 1/4	4.25	8	12.21	415.14
6 x 12 x 1/4	9.5	1	29.23	277.685
	11	1	29.23	321.53
4 x 6 x 1/4	2.5	4	15.62	156.2
	9	4	15.62	562.32
			<b>Total # of Pieces</b>	<b>569</b>
			<b>Total Lbs</b>	<b>16177.6634</b>
			<b>Total Tons</b>	<b>8.09</b>

Reinforcement Takeoff			
	Lbs/Ft	Ft	LBS
<b>Footing Rebar (2) # 5 Cont.</b>	1.043	1332.50	1389.7975
<b>Foundation Wall (6)#4 Cont.</b>	0.668	4060.6	2712.4808
<b>Horizontal (3)#4</b>	0.668	96	64.128
<b>Vertical #4 12"o.c.</b>	0.668	338.4	226.0512
		<b>Total Lbs</b>	<b>4392.4575</b>
		<b>Total TONS</b>	<b>2.20</b>



Concrete footing					
Rectangular Shaped					
<b>l</b>	<b>w</b>	<b>d</b>	<b>CF</b>	<b>CY</b>	
6405.20	24	12	1067.5	39.5	
384	36	12	96	3.6	
630	18	25	164	6.1	
576	7	12	28	1.0	
Additional					
<b>b</b>	<b>h</b>	<b>l</b>	<b>CF</b>	<b>CY</b>	
5	7	1152	11.66666667	0.4	
7	7	1260	17.86458333	0.7	
				<b>Total CF</b>	<b>1385.1</b>
				<b>Total CY</b>	<b>51.3</b>

Spread Footing						
<b>Drawing Type</b>	<b>#</b>	<b>l</b>	<b>w</b>	<b>d</b>	<b>CF</b>	<b>CY</b>
F1	18	48	48	12	288.0	10.7
F2	0	60	60	15	0.0	0.0
F3	1	66	66	15	37.8	1.4
F4	2	72	72	16	96.0	3.6
F5	2	78	78	18	126.8	4.7
F6	4	84	84	20	326.7	12.1
F7	1	90	90	20	93.8	3.5
F8	1	72	72	24	72.0	2.7
F9	2	84	84	24	196.0	7.3
F10	4	90	90	24	450.0	16.7
					<b>Total CF</b>	<b>1687</b>
					<b>Total CY</b>	<b>62.5</b>



Concrete Foundation Wall					
	<b>l</b>	<b>w</b>	<b>h</b>	<b>CF</b>	<b>CY</b>
	8121.2	18	16	1353.5	50.1
	384	8	16	28.4	1.1
	240	12	60	100	3.7
				<b>Total CF</b>	<b>1482</b>
				<b>Total CY</b>	<b>55</b>

Concrete Slabs				
	<b>SF</b>	<b>Thickness(inches)</b>	<b>CF</b>	<b>CY</b>
<b>First Floor SOG (4000PSI)</b>	10186.15	5	4244	157.2
Elevator	41.25	15	52	1.9
2' Slab depression	739.5	3	185	6.8
<b>2nd Floor slab on deck(3000 PSI)</b>				
	7105	4.25	2516	93.2
			<b>Total CY 4000 psi</b>	<b>166.0</b>
			<b>Total CY3000 psi</b>	<b>94.0</b>



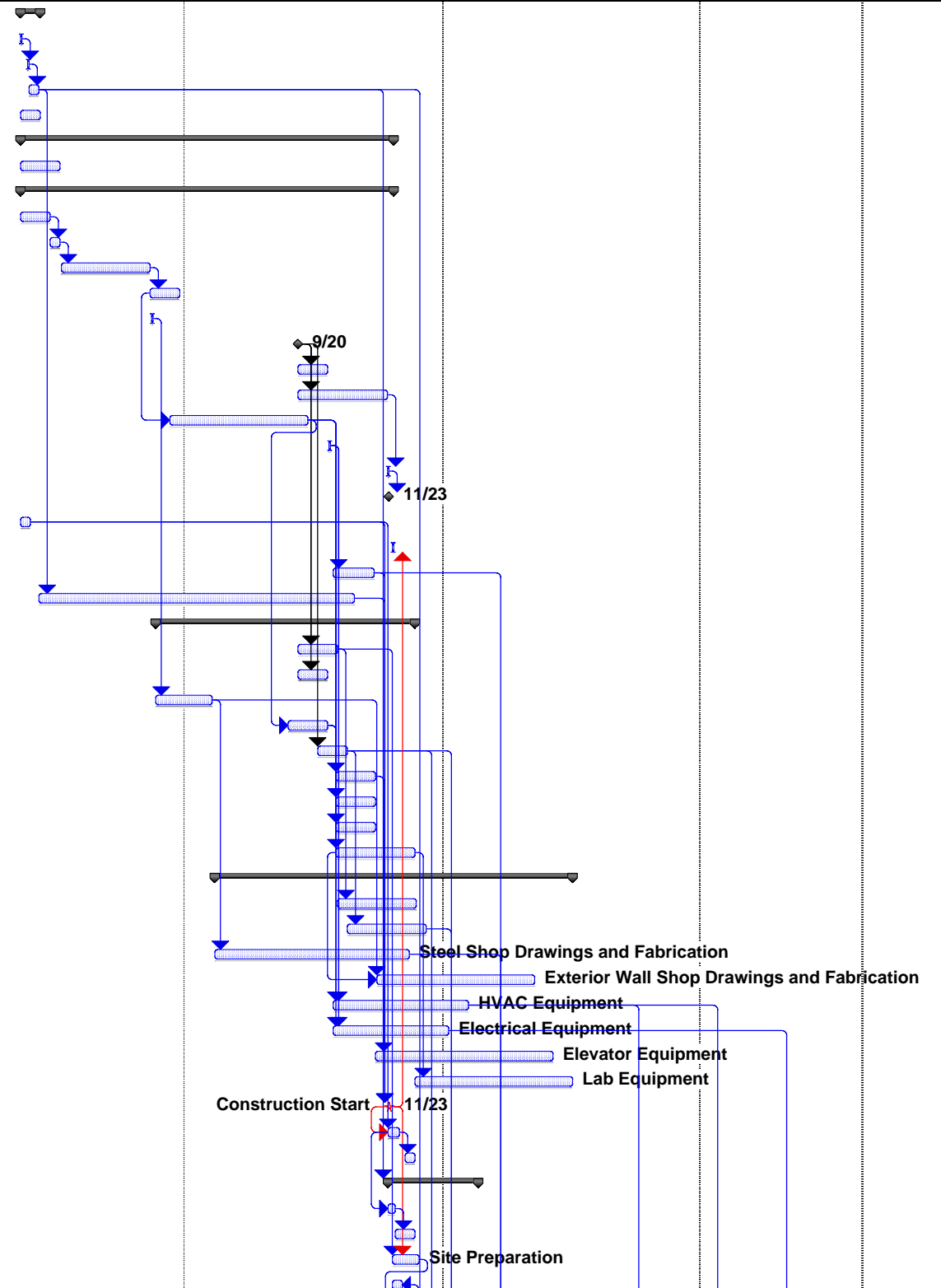
## Appendix D

### General Conditions

General Conditions Estimate				
Item Description	Quantity	Unit	Cost/Unit	Total
<b>Project Staff</b>				
Senior Project Manager	40	Weeks	\$3,375	\$135,000
PM/Superintendent	53	Weeks	\$2,750	\$145,750
Project Engineer	53	Weeks	\$2,100	\$111,300
Assistant Project Engineer	53	Weeks	\$1,800	\$95,400
<b>General Expense</b>				
Job Trailer	12	Month	355	\$4,260
Telephone/Fax	12	Month	88	\$1,056
Daily Cleanup	370	Day	40.5	\$14,985
Final Cleanup	1	% of Job	1%	\$96,230
Office Supplies	12	Month	93.5	\$1,122
Office Equipment	12	Month	171	\$2,052
Dumpsters(2)	53	Week	550	\$58,300
Portable Toilets (2)	53	Week	171	\$9,063
Temporary Fencing	720	LF	4.92	\$3,542
<b>Temporary Utilities</b>				
Lights & HVAC	12	Month	165	\$1,980
Temp. Heat	268.7	CSF Flr	34.5	\$9,270
Temp. Electric	268.7	CSF Flr	39.5	\$10,614
Temp. Power	268.7	CSF Flr	51.7	\$13,892
<b>Insurance</b>				
All Risk Insurance	1	% of Job	0.62	\$59,662.85
Builders Risk Insurance	1	% of Job	0.24%	\$23,095
<b>Bonds</b>				
Performance Bond	1	% of Job	2.50%	\$240,576
			<b>SUBTOTAL</b>	<b>\$1,037,150</b>
			<b>Fee</b>	<b>\$31,114</b>
			<b>Total</b>	<b>\$1,068,264</b>

# Detailed Project Schedule

ID	Task Name	Duration	Start	Finish	1st Half									1st Half								
					1st Quarter			3rd Quarter			1st Quarter			3rd Quarter			1st Quarter			3rd Quarter		
					Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov
1	<b>PROPOSAL /AWARD PHASE</b>	<b>10 days</b>	<b>Wed 3/7/07</b>	<b>Tue 3/20/07</b>																		
2	Submit Proposal	1 day	Wed 3/7/07	Wed 3/7/07																		
3	Owner Review Period	1 day	Mon 3/12/07	Mon 3/12/07																		
4	Preconstruction Award Notice	1 wk	Tue 3/13/07	Mon 3/19/07																		
5	Contract Review / Execution	10 days	Wed 3/7/07	Tue 3/20/07																		
6	<b>Preconstruction Period</b>	<b>189 days</b>	<b>Wed 3/7/07</b>	<b>Mon 11/26/07</b>																		
7	LEED Design Charette	4 wks	Wed 3/7/07	Tue 4/3/07																		
8	<b>Document Review / GMP Development</b>	<b>189 days</b>	<b>Wed 3/7/07</b>	<b>Mon 11/26/07</b>																		
9	Constructability Review	3 wks	Wed 3/7/07	Tue 3/27/07																		
10	SD Estimate	1 wk	Wed 3/28/07	Tue 4/3/07																		
11	Design Document Development	9 wks	Thu 4/5/07	Wed 6/6/07																		
12	Design Document Estimate	3 wks	Thu 6/7/07	Wed 6/27/07																		
13	Receive Structural Drawings	1 day	Fri 6/8/07	Fri 6/8/07																		
14	80% Construction Documents	0 wks	Thu 9/20/07	Thu 9/20/07																		
15	Subcontractor Bid Phase	3 wks	Thu 9/20/07	Wed 10/10/07																		
16	Prepare GMP	9.1 wks	Thu 9/20/07	Thu 11/22/07																		
17	Construction Documents	14 wks	Thu 6/21/07	Wed 9/26/07																		
18	Receive Permit Docs	1 day	Fri 10/12/07	Fri 10/12/07																		
19	Submit Final GMP for CHA Approval	1 day	Thu 11/22/07	Fri 11/23/07																		
20	Chestnut Hill Academy Notice to Proceed	0 days	Fri 11/23/07	Fri 11/23/07																		
21	Receive Builders Risk Certificate	5 days	Wed 3/7/07	Tue 3/13/07																		
22	Receive Sub Insurance Certs and Bonds	1 day	Mon 11/26/07	Mon 11/26/07																		
23	Building Permit	21 days	Mon 10/15/07	Mon 11/12/07																		
24	Relocation of Gas Main (PGW)	32 wks	Tue 3/20/07	Mon 10/29/07																		
25	<b>Procurement</b>	<b>132 days</b>	<b>Mon 6/11/07</b>	<b>Tue 12/11/07</b>																		
26	Bid and Award Sitework Package on 80% CD's	4 wks	Thu 9/20/07	Wed 10/17/07																		
27	Bid and Award Site Electrical Package on 80% CD's	3 wks	Thu 9/20/07	Wed 10/10/07																		
28	Bid and Award Structural Steel and Metal Deck	6 wks	Mon 6/11/07	Fri 7/20/07																		
29	Bid and Award MEP Equipment	4 wks	Thu 9/13/07	Wed 10/10/07																		
30	Bid and Award Foundations and Concrete	3 wks	Thu 10/4/07	Wed 10/24/07																		
31	Bid and Award Elevators	4 wks	Wed 10/17/07	Tue 11/13/07																		
32	Bid and Award Mechanical	4 wks	Wed 10/17/07	Tue 11/13/07																		
33	Bid and Award Electrical	4 wks	Wed 10/17/07	Tue 11/13/07																		
34	Bid and Award the Remaining Packages	8 wks	Wed 10/17/07	Tue 12/11/07																		
35	<b>Material Lead Times After Procurement and Approvals</b>	<b>182 days</b>	<b>Mon 7/23/07</b>	<b>Tue 4/1/08</b>																		
36	Sanitary/Storm Structures	8 wks	Thu 10/18/07	Wed 12/12/07																		
37	Concrete Rebar Submissions and Fabrication	8 wks	Thu 10/25/07	Wed 12/19/07																		
38	Steel Shop Drawings and Fabrication	20 wks	Mon 7/23/07	Fri 12/7/07																		
39	Exterior Wall Shop Drawings and Fabrication	16 wks	Thu 11/15/07	Wed 3/5/08																		
40	HVAC Equipment	14 wks	Mon 10/15/07	Fri 1/18/08																		
41	Electrical Equipment	12 wks	Mon 10/15/07	Fri 1/4/08																		
42	Elevator Equipment	18 wks	Wed 11/14/07	Tue 3/18/08																		
43	Lab Equipment	16 wks	Wed 12/12/07	Tue 4/1/08																		
44	<b>Construction Start</b>	<b>0 wks</b>	<b>Fri 11/23/07</b>	<b>Fri 11/23/07</b>																		
45	Mobilize/Jobsite Trailers	6 days	Fri 11/23/07	Fri 11/30/07																		
46	Jobsite Trailer Electric & Tele/Data	5 days	Wed 12/5/07	Tue 12/11/07																		
47	<b>Sitework</b>	<b>46 days</b>	<b>Fri 11/23/07</b>	<b>Fri 1/25/08</b>																		
48	Identify, Mark & Protect Specimen Trees/ Site Fence	3 days	Fri 11/23/07	Tue 11/27/07																		
49	Tree Removal	2 wks	Wed 11/28/07	Tue 12/11/07																		
50	Site Preparation	3 wks	Mon 11/26/07	Fri 12/14/07																		
51	Survey & Layout Sitework	5 days	Mon 11/26/07	Mon 12/3/07																		



Task		Milestone		Rolled Up Split		External Tasks		Deadline	
Split		Summary		Rolled Up Milestone		Project Summary			
Progress		Rolled Up Task		Rolled Up Progress		External Milestone			





