Technical Assignment 2

Voorhees Replacement Facility | Voorhees, NJ

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10/28/2009

Chris Magent

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Executive Summary

Technical assignment 2 provides a more detailed insight into the construction schedule then technical assignment 1. It explores the site utilization plan for the finish phase of the project that is the critical path for the longest duration of the project and finally it includes detailed estimates of the structural system for the hospital bed tower and an estimate of the general conditions over the duration of the project. After completing the detailed project schedule it can be seen very clearly that the project is broken down into two main components, the bed tower and ancillary spaces. It can also be seen that the MEP rough in and finishes for the bed tower component are on the critical path and are essential to completing the project on time.

From developing the site utilization plan for the finish phase of the project it was found that the site is extremely open and does not present many spatial challenges. It was also found that even though a site may not have spatial challenges it is extremely important to use the space effectively. Examples of this include the subcontractor parking and subcontractor trailer areas as well as the differing access roads for deliveries and personnel.

The detailed structural systems estimate was calculated using RS Means 2009 cost data and focuses on the bed tower portion of the building, Areas 1, 2 & 3. These areas were focused on due to the immense size of the entire building. Using both RS Means 2009 cost data as well as current industry costs provided by Turner Construction Company formed the general conditions estimate.

Lastly, critical industry issues discussed at the PACE Roundtable Meeting were summarized. In the first session the current state of the economy and its affect on the construction industry was discussed. One of the main conclusions that came of the discussion was that during a time such as now it is extremely important as a company to maintain relationships with clients while building new relationships and re-evaluate your company. In the second session the problems with energy in construction were discussed. From this discussion I was presented with a very good idea that could possibly be studied further for my thesis. The idea would be to replace the fluorescent fixtures in the patient rooms to LED and explore any lifetime cost savings, possibly HVAC load reduction and savings as well as if the LED lighting creates a better healing environment for the patient.

Detailed Project Schedule

Please see Appendix A for a copy of the detailed project schedule created by Microsoft Project.

The construction schedule for the Voorhees Replacement Facility is a three-year construction period breaking ground in March of 2008 and obtaining the certificate of occupancy in March of 2011. By looking at the detailed project schedule in Appendix A, one can see that the schedule is broken down into two different sections; the construction of the bed tower and the construction of the ancillary spaces. Under each building the schedule is furthermore broken down into different pieces of construction such as foundations, structural steel, slab on deck, building enclosure, MEP rough-in and finishes. The last way each piece of construction is broken down is by the area of the building designated by Figure 1 below.

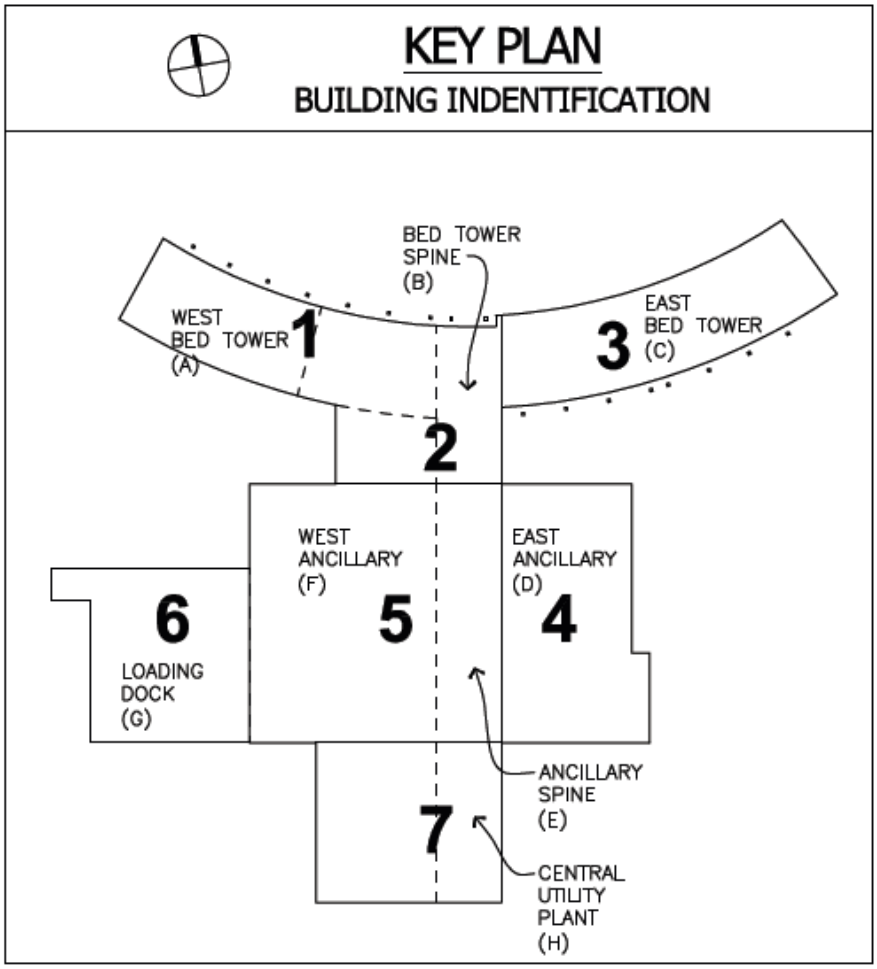


Figure 1

Finish Phase Site Layout

Please see Appendix B for a copy of the Finish Phase Site Utilization Plan.

By looking at the site utilization plan in Appendix B one can see that the site for the Voorhees Replacement Hospital is wide open and does not contain many hazards that might affect construction. However just because the site does not present spatial challenges it is still important to make the site as efficient as possible so that trades do not interfere with each other and the schedule can stay on track.

The first examples of utilizing the space appropriately are the site access roads as well as the subcontractor parking and trailer lots. The space for the subcontractor parking and trailers as seen on the utilization plan is the location of the hospital parking lot to be. In order to use this space effectively, just before the major subcontractors mobilize to the site the base layer of the parking lot is placed so that not only will the base layer already be in place later on down the road but it also allows for a hardtop surface for trailers and parking. This is true for the majority of the access roads seen on the plan as well.

Next, one can see that there are 2 construction gates located off of dutchtown road and route 73, which allows for separate delivery and car entrances. The entrance off of dutchtown road is used primarily for personnel and small deliveries such as FedEx. The entrance off of route 73 is a doublewide gate that allows for 2-way access to the site. The loop around the courtyard outside of the bed tower allows for larger delivery trucks to not have to reverse once on the site creating a safety hazard. It is also important to note that the location of certain spaces such as material storage, dumpster and porta potty's are placed alongside the access roads to provide easy access for waste removal and deliveries.

Each of the two locations of the material and personnel hoists shown on the site utilization plan contains both a material and personnel hoists totaling 4 mechanical hoists. These are located only at the bed tower because the bed tower is 8 stories above ground as opposed to the ancillary spaces that are only 4 stories above ground and have a loading dock with stairs.

Lastly the orange directional lines shown on the footprint of the building show the direction of workflow on each floor for the finish phase of the project. The vertical workflow of the building is from the garden level to the top floor of each space.

Detailed Structural Systems Estimate

Please see appendix C for the Detailed Structural System Estimate Spreadsheets

Table 1: Structural Systems Estimate Summary (Areas 1,2 & 3)	
Description	**Estimate**
Structural Steel Columns	$1,915,336.05
Structural Steel Beams	$3,113,819.04
Metal Decking	$1,074,392.00
Roofing Decking	$89,320.00
Shear Studs	$81,073.44
Concrete – Spread Footings	$208,873.46
Concrete - Piers	$10,159.06
Concrete – Strip Footings	$46,821.77
Concrete – Slab on Grade	$52,182.10
Concrete – Slab on Deck	$385,950.62
Concrete Placing	$129,966.58
Formwork – Spread Footings	$47,993.63
Formwork – Piers	$12,907.28
Formwork – Strip Footings	$16,215.53
Formwork – Slab on Grade	$3,091.40
Reinforcing - Footings	$56,671.07
Reinforcing – Piers	$1,687.53
Reinforcing – Strip Footings	$33,111.76
Reinforcing – WWF (SOG, SOD)	$163,647.00
Structural Systems Estimate Total (Areas 1,2 & 3)	**$7,443,219.32**

The detailed structural systems estimate was calculated using RS Means 2009 cost data. The estimate includes the major structural components of the Voorhees Replacement Facility for areas 1, 2 and 3. These areas were focused on due to the immense size of the overall project. The definition of areas 1, 2 and 3 can be seen in figure 1 included in the detailed project schedule section. Please refer to Appendix C for a breakdown of the structural system estimate.

General Conditions Estimate

Please see Appendix D for the breakdown of the General Conditions Estimate

Table 2: General Conditions Estimate Summary	
Description	**Estimate**
Personnel	$3,076,280.00
Temporary Facilities	$1,235322.00
General Expenses	$988,524.00
Hoisting	$1,330,360.00
Temporary Utilities	$204,750.00
Cleaning	$2,857,990.00
Protection & Safety	$1,177,000.00
GC Total	**$10,870,226.00**

The general conditions estimate above and in Appendix D was prepared through the use of both 2009 RS Means cost data and current industry costs provided by Turner Construction Company. The personnel make up a large portion of the estimate and were calculated using RS Means cost data and includes both the preconstruction and construction phase of the project. The project-staffing plan was utilized to determine the proper staffing for the project.

Critical Industry Issues

After attending the PACE Roundtable Meeting I am now able to understand more closely the direction the construction industry is moving due to the economy as well as issues in energy and how they may be applied to my thesis project.

During the first session of the meeting some members from the industry spoke to the group about the effects of the economy on the construction industry and the different ways it is affecting companies. One conclusion that the panel came to was that diversification within a company is key to staying successful even in a bad economy such as the one we are experiencing now. Companies should use the cliché "back to basics" to evaluate their company to make sure they stay on course with what works for them while still heading in new directions if it is in the best interests of the company. It is extremely important in a bad economy to maintain current relationships while gaining new ones. Along with evaluating the overall structure of the company it is also important to evaluate the fee structure of the company. See where the company can cut costs and not people such as going to a "paperless" or "paper-light" projects.

In the next sessions after the industry panel I broke off and attended the energy group discussion. For the first part of the energy discussion we brainstormed ideas concerned what problems we have seen or foresee with energy in general and in the construction industry. Some of the main ideas that we brainstormed included the following.

- Carbon footprints and their effects on the environment.
- Rising energy costs and supply and demand.
- Self preservation of buildings and companies in general through using renewable resources such as wind, solar, geothermal, wave currents and bio fuel.
- Life cycle costs of buildings.
- Operation of buildings including the behavior of occupants, building automation and actual use. It was said that buildings are programmed to a predicted occupancy and use. It is important to develop systems that adjust based on the behavior of occupants and the actual use of the building.
- Integration of all building systems which in turn will reduce energy usage.
- Lastly we talked about different organizations affecting the way we design and build energy efficient buildings. These organizations include ASHRAE,

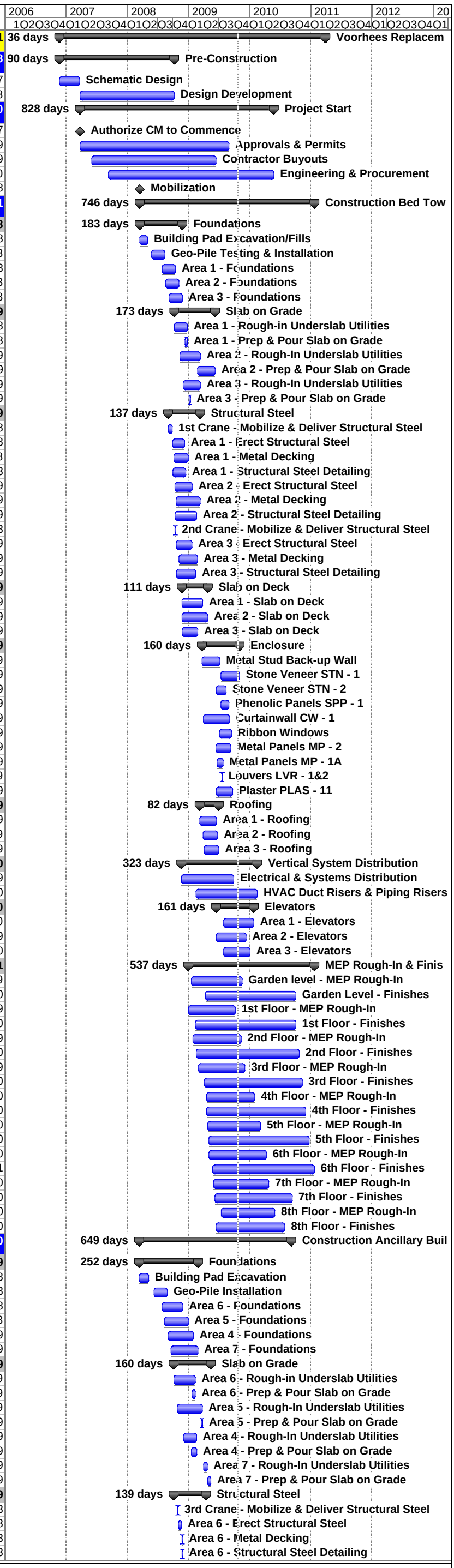
EPA, US D.O.E, and Universities setting examples and finally energy auditing to make sure buildings are performing the way they were designed.

In the second portion of the energy discussion the industry professionals opened up to any questions or ideas that students might have regarding their thesis project. From this I was able to get some really good ideas and a direction to take when exploring thesis ideas for my building. These include the replacement of the existing fluorescent lights in the patient rooms and replace them with LED lighting. From this I could also explore the reduced HVAC loads on each patient room and possibly cost savings from reducing the size of the AHU's as well as the life cycle of the building due to the long life and low energy costs of LED lighting. It might also be interesting to explore the difference between fluorescent lights and LED lighting in regards to a patient's health and healing environment.

Appendix A

Detailed Project Schedule

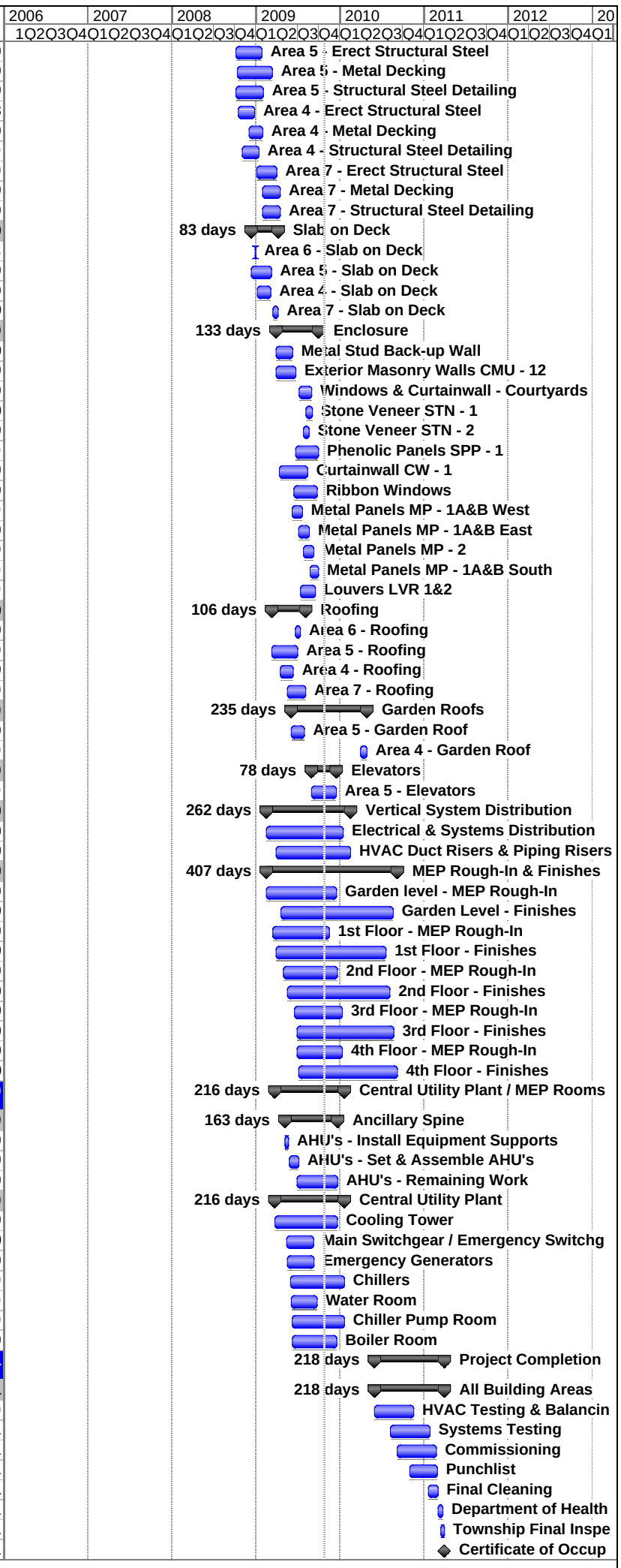
ID	Task Name	Duration	Start	Finish
1	**Voorhees Replacement Facility**	**1136 days**	**Thu 11/23/06**	**Thu 3/31/11**
2	**Pre-Construction**	**490 days**	**Thu 11/23/06**	**Wed 10/8/08**
3	Schematic Design	87 days	Thu 11/23/06	Fri 3/23/07
4	Design Development	403 days	Mon 3/26/07	Wed 10/8/08
5	**Project Start**	**828 days**	**Mon 3/26/07**	**Wed 5/26/10**
6	Authorize CM to Commence	0 days	Mon 3/26/07	Mon 3/26/07
7	Approvals & Permits	636 days	Mon 3/26/07	Mon 8/31/09
8	Contractor Buyouts	531 days	Mon 6/4/07	Mon 6/15/09
9	Engineering & Procurement	706 days	Wed 9/12/07	Wed 5/26/10
10	Mobilization	0 days	Mon 3/17/08	Mon 3/17/08
11	**Construction Bed Tower**	**746 days**	**Mon 3/17/08**	**Mon 1/24/11**
12	**Foundations**	**183 days**	**Mon 3/17/08**	**Wed 11/26/08**
13	Building Pad Excavation/Fills	35 days	Mon 3/17/08	Fri 5/2/08
14	Geo-Pile Testing & Installation	57 days	Tue 5/27/08	Wed 8/13/08
15	Area 1 - Foundations	58 days	Tue 7/29/08	Thu 10/16/08
16	Area 2 - Foundations	58 days	Mon 8/18/08	Wed 11/5/08
17	Area 3 - Foundations	58 days	Mon 9/8/08	Wed 11/26/08
18	**Slab on Grade**	**173 days**	**Fri 10/10/08**	**Tue 6/9/09**
19	Area 1 - Rough-in Underslab Utilities	56 days	Fri 10/10/08	Fri 12/26/08
20	Area 1 - Prep & Pour Slab on Grade	11 days	Fri 12/12/08	Fri 12/26/08
21	Area 2 - Rough-In Underslab Utilities	89 days	Tue 11/11/08	Fri 3/13/09
22	Area 2 - Prep & Pour Slab on Grade	75 days	Wed 2/25/09	Tue 6/9/09
23	Area 3 - Rough-In Underslab Utilities	75 days	Mon 12/1/08	Fri 3/13/09
24	Area 3 - Prep & Pour Slab on Grade	7 days	Mon 1/5/09	Tue 1/13/09
25	**Structural Steel**	**137 days**	**Wed 9/3/08**	**Thu 3/12/09**
26	1st Crane - Mobilize & Deliver Structural Steel	18 days	Wed 9/3/08	Fri 9/26/08
27	Area 1 - Erect Structural Steel	52 days	Mon 9/29/08	Tue 12/9/08
28	Area 1 - Metal Decking	63 days	Mon 10/6/08	Wed 12/31/08
29	Area 1 - Structural Steel Detailing	55 days	Wed 10/1/08	Tue 12/16/08
30	Area 2 - Erect Structural Steel	75 days	Mon 10/13/08	Fri 1/23/09
31	Area 2 - Metal Decking	104 days	Mon 10/20/08	Thu 3/12/09
32	Area 2 - Structural Steel Detailing	93 days	Tue 10/14/08	Thu 2/19/09
33	2nd Crane - Mobilize & Deliver Structural Steel	5 days	Mon 10/13/08	Fri 10/17/08
34	Area 3 - Erect Structural Steel	68 days	Tue 10/21/08	Thu 1/22/09
35	Area 3 - Metal Decking	79 days	Thu 11/6/08	Tue 2/24/09
36	Area 3 - Structural Steel Detailing	83 days	Wed 10/22/08	Fri 2/13/09
37	**Slab on Deck**	**111 days**	**Mon 11/24/08**	**Mon 4/27/09**
38	Area 1 - Slab on Deck	90 days	Mon 11/24/08	Fri 3/27/09
39	Area 2 - Slab on Deck	111 days	Mon 11/24/08	Mon 4/27/09
40	Area 3 - Slab on Deck	68 days	Tue 11/25/08	Thu 2/26/09
41	**Enclosure**	**160 days**	**Tue 3/24/09**	**Mon 11/2/09**
42	Metal Stud Back-up Wall	77 days	Tue 3/24/09	Wed 7/8/09
43	Stone Veneer STN - 1	79 days	Wed 7/15/09	Mon 11/2/09
44	Stone Veneer STN - 2	43 days	Wed 6/17/09	Fri 8/14/09
45	Phenolic Panels SPP - 1	34 days	Wed 7/15/09	Mon 8/31/09
46	Curtainwall CW - 1	113 days	Wed 4/1/09	Fri 9/4/09
47	Ribbon Windows	52 days	Mon 7/6/09	Tue 9/15/09
48	Metal Panels MP - 2	65 days	Mon 6/15/09	Fri 9/11/09
49	Metal Panels MP - 1A	26 days	Mon 6/22/09	Mon 7/27/09
50	Louvers LVR - 1&2	2 days	Tue 7/21/09	Wed 7/22/09
51	Plaster PLAS - 11	70 days	Wed 6/17/09	Tue 9/22/09
52	**Roofing**	**82 days**	**Tue 3/10/09**	**Wed 7/1/09**
53	Area 1 - Roofing	73 days	Tue 3/10/09	Thu 6/18/09
54	Area 2 - Roofing	63 days	Mon 3/30/09	Wed 6/24/09
55	Area 3 - Roofing	63 days	Mon 4/6/09	Wed 7/1/09
56	**Vertical System Distribution**	**323 days**	**Fri 11/21/08**	**Tue 2/16/10**
57	Electrical & Systems Distribution	223 days	Fri 11/21/08	Tue 9/29/09
58	HVAC Duct Risers & Piping Risers	262 days	Mon 2/16/09	Tue 2/16/10
59	**Elevators**	**161 days**	**Wed 6/17/09**	**Wed 1/27/10**
60	Area 1 - Elevators	129 days	Fri 7/31/09	Wed 1/27/10
61	Area 2 - Elevators	128 days	Wed 6/17/09	Fri 12/11/09
62	Area 3 - Elevators	112 days	Fri 7/31/09	Mon 1/4/10
63	**MEP Rough-In & Finishes**	**537 days**	**Fri 1/2/09**	**Mon 1/24/11**
64	Garden level - MEP Rough-In	218 days	Mon 1/19/09	Wed 11/18/09
65	Garden Level - Finishes	387 days	Mon 4/13/09	Tue 10/5/10
66	1st Floor - MEP Rough-In	200 days	Fri 1/2/09	Thu 10/8/09
67	1st Floor - Finishes	429 days	Thu 2/12/09	Tue 10/5/10
68	2nd Floor - MEP Rough-In	207 days	Wed 1/28/09	Thu 11/12/09
69	2nd Floor - Finishes	440 days	Tue 2/17/09	Mon 10/25/10
70	3rd Floor - MEP Rough-In	199 days	Tue 3/3/09	Fri 12/4/09
71	3rd Floor - Finishes	420 days	Mon 4/6/09	Fri 11/12/10
72	4th Floor - MEP Rough-In	206 days	Mon 4/20/09	Mon 2/1/10
73	4th Floor - Finishes	425 days	Mon 4/20/09	Fri 12/3/10
74	5th Floor - MEP Rough-In	226 days	Mon 4/27/09	Mon 3/8/10
75	5th Floor - Finishes	429 days	Mon 5/4/09	Thu 12/23/10
76	6th Floor - MEP Rough-In	246 days	Mon 5/4/09	Mon 4/12/10
77	6th Floor - Finishes	435 days	Tue 5/26/09	Mon 1/24/11
78	7th Floor - MEP Rough-In	236 days	Mon 6/1/09	Mon 4/26/10
79	7th Floor - Finishes	330 days	Tue 6/9/09	Mon 9/13/10
80	8th Floor - MEP Rough-In	228 days	Fri 7/17/09	Tue 6/1/10
81	8th Floor - Finishes	294 days	Tue 6/16/09	Fri 7/30/10
82	**Construction Ancillary Building**	**649 days**	**Thu 3/13/08**	**Tue 9/7/10**
83	**Foundations**	**252 days**	**Thu 3/13/08**	**Fri 2/27/09**
84	Building Pad Excavation	42 days	Thu 3/13/08	Fri 5/9/08
85	Geo-Pile Installation	58 days	Tue 6/10/08	Thu 8/28/08
86	Area 6 - Foundations	90 days	Mon 7/28/08	Fri 11/28/08
87	Area 5 - Foundations	103 days	Mon 8/11/08	Wed 12/31/08
88	Area 4 - Foundations	109 days	Tue 9/2/08	Fri 1/30/09
89	Area 7 - Foundations	116 days	Fri 9/19/08	Fri 2/27/09
90	**Slab on Grade**	**160 days**	**Mon 10/6/08**	**Fri 5/15/09**
91	Area 6 - Rough-in Underslab Utilities	93 days	Mon 10/6/08	Wed 2/11/09
92	Area 6 - Prep & Pour Slab on Grade	14 days	Fri 1/23/09	Wed 2/11/09
93	Area 5 - Rough-In Underslab Utilities	108 days	Mon 10/27/08	Wed 3/25/09
94	Area 5 - Prep & Pour Slab on Grade	6 days	Fri 3/20/09	Fri 3/27/09
95	Area 4 - Rough-In Underslab Utilities	57 days	Wed 12/3/08	Thu 2/19/09
96	Area 4 - Prep & Pour Slab on Grade	25 days	Mon 1/19/09	Fri 2/20/09
97	Area 7 - Rough-In Underslab Utilities	17 days	Thu 4/2/09	Fri 4/24/09
98	Area 7 - Prep & Pour Slab on Grade	15 days	Mon 4/27/09	Fri 5/15/09
99	**Structural Steel**	**139 days**	**Mon 10/6/08**	**Thu 4/16/09**
100	3rd Crane - Mobilize & Deliver Structural Steel	3 days	Wed 10/29/08	Fri 10/31/08
101	Area 6 - Erect Structural Steel	15 days	Mon 11/3/08	Fri 11/21/08
102	Area 6 - Metal Decking	5 days	Mon 11/24/08	Fri 11/28/08
103	Area 6 - Structural Steel Detailing	5 days	Mon 10/13/08	Fri 11/28/08



Project: Detailed_Schedule
Date: Thu 10/22/09

Task		Rolled Up Task		External Tasks	
Progress		Rolled Up Milestone	◇	Project Summary	
Milestone	◆	Rolled Up Progress		Group By Summary	
Summary		Split		Deadline	⇩

ID	Task Name	Duration	Start	Finish
104	Area 5 - Erect Structural Steel	82 days	Mon 10/6/08	Tue 1/27/09
105	Area 5 - Metal Decking	110 days	Mon 10/13/08	Fri 3/13/09
106	Area 5 - Structural Steel Detailing	85 days	Tue 10/7/08	Mon 2/2/09
107	Area 4 - Erect Structural Steel	51 days	Fri 10/17/08	Fri 12/26/08
108	Area 4 - Metal Decking	43 days	Wed 12/3/08	Fri 1/30/09
109	Area 4 - Structural Steel Detailing	53 days	Mon 11/3/08	Wed 1/14/09
110	Area 7 - Erect Structural Steel	63 days	Mon 1/5/09	Wed 4/1/09
111	Area 7 - Metal Decking	55 days	Fri 1/30/09	Thu 4/16/09
112	Area 7 - Structural Steel Detailing	55 days	Fri 1/30/09	Thu 4/16/09
113	**Slab on Deck**	**83 days**	**Fri 12/12/08**	**Tue 4/7/09**
114	Area 6 - Slab on Deck	3 days	Mon 12/29/08	Wed 12/31/08
115	Area 5 - Slab on Deck	62 days	Fri 12/12/08	Mon 3/9/09
116	Area 4 - Slab on Deck	42 days	Thu 1/8/09	Fri 3/6/09
117	Area 7 - Slab on Deck	16 days	Tue 3/17/09	Tue 4/7/09
118	**Enclosure**	**133 days**	**Mon 3/30/09**	**Wed 9/30/09**
119	Metal Stud Back-up Wall	52 days	Mon 3/30/09	Tue 6/9/09
120	Exterior Masonry Walls CMU - 12	62 days	Mon 3/30/09	Tue 6/23/09
121	Windows & Curtainwall - Courtyards	39 days	Wed 7/8/09	Mon 8/31/09
122	Stone Veneer STN - 1	20 days	Fri 8/7/09	Thu 9/3/09
123	Stone Veneer STN - 2	19 days	Mon 7/27/09	Thu 8/20/09
124	Phenolic Panels SPP - 1	72 days	Tue 6/23/09	Wed 9/30/09
125	Curtainwall CW - 1	89 days	Mon 4/13/09	Thu 8/13/09
126	Ribbon Windows	73 days	Tue 6/16/09	Thu 9/24/09
127	Metal Panels MP - 1A&B West	33 days	Mon 6/8/09	Wed 7/22/09
128	Metal Panels MP - 1A&B East	35 days	Mon 7/6/09	Fri 8/21/09
129	Metal Panels MP - 2	33 days	Mon 7/27/09	Wed 9/9/09
130	Metal Panels MP - 1A&B South	27 days	Tue 8/25/09	Wed 9/30/09
131	Louvers LVR 1&2	47 days	Tue 7/14/09	Wed 9/16/09
132	**Roofing**	**106 days**	**Wed 3/11/09**	**Wed 8/5/09**
133	Area 6 - Roofing	16 days	Mon 6/22/09	Mon 7/13/09
134	Area 5 - Roofing	81 days	Wed 3/11/09	Wed 7/1/09
135	Area 4 - Roofing	41 days	Fri 4/17/09	Fri 6/12/09
136	Area 7 - Roofing	58 days	Mon 5/18/09	Wed 8/5/09
137	**Garden Roofs**	**235 days**	**Thu 6/4/09**	**Wed 4/28/10**
138	Area 5 - Garden Roof	41 days	Thu 6/4/09	Thu 7/30/09
139	Area 4 - Garden Roof	20 days	Thu 4/1/10	Wed 4/28/10
140	**Elevators**	**78 days**	**Mon 8/31/09**	**Wed 12/16/09**
141	Area 5 - Elevators	78 days	Mon 8/31/09	Wed 12/16/09
142	**Vertical System Distribution**	**262 days**	**Mon 2/16/09**	**Tue 2/16/10**
143	Electrical & Systems Distribution	240 days	Mon 2/16/09	Fri 1/15/10
144	HVAC Duct Risers & Piping Risers	232 days	Mon 3/30/09	Tue 2/16/10
145	**MEP Rough-In & Finishes**	**407 days**	**Mon 2/16/09**	**Tue 9/7/10**
146	Garden level - MEP Rough-In	219 days	Mon 2/16/09	Thu 12/17/09
147	Garden Level - Finishes	350 days	Mon 4/20/09	Fri 8/20/10
148	1st Floor - MEP Rough-In	176 days	Mon 3/16/09	Mon 11/16/09
149	1st Floor - Finishes	342 days	Mon 3/30/09	Tue 7/20/10
150	2nd Floor - MEP Rough-In	167 days	Fri 5/1/09	Mon 12/21/09
151	2nd Floor - Finishes	320 days	Mon 5/18/09	Fri 8/6/10
152	3rd Floor - MEP Rough-In	148 days	Thu 6/18/09	Mon 1/11/10
153	3rd Floor - Finishes	301 days	Mon 6/29/09	Mon 8/23/10
154	4th Floor - MEP Rough-In	141 days	Mon 6/29/09	Mon 1/11/10
155	4th Floor - Finishes	307 days	Mon 7/6/09	Tue 9/7/10
156	**Central Utility Plant / MEP Rooms**	**216 days**	**Wed 3/25/09**	**Wed 1/20/10**
157	**Ancillary Spine**	**163 days**	**Fri 5/8/09**	**Tue 12/22/09**
158	AHU's - Install Equipment Supports	11 days	Fri 5/8/09	Fri 5/22/09
159	AHU's - Set & Assemble AHU's	29 days	Wed 5/27/09	Mon 7/6/09
160	AHU's - Remaining Work	127 days	Mon 6/29/09	Tue 12/22/09
161	**Central Utility Plant**	**216 days**	**Wed 3/25/09**	**Wed 1/20/10**
162	Cooling Tower	194 days	Wed 3/25/09	Mon 12/21/09
163	Main Switchgear / Emergency Switchgear	83 days	Fri 5/15/09	Tue 9/8/09
164	Emergency Generators	84 days	Mon 5/18/09	Thu 9/10/09
165	Chillers	168 days	Mon 6/1/09	Wed 1/20/10
166	Water Room	80 days	Thu 6/4/09	Wed 9/23/09
167	Chiller Pump Room	163 days	Mon 6/8/09	Wed 1/20/10
168	Boiler Room	139 days	Tue 6/9/09	Fri 12/18/09
169	**Project Completion**	**218 days**	**Tue 6/1/10**	**Thu 3/31/11**
170	**All Building Areas**	**218 days**	**Tue 6/1/10**	**Thu 3/31/11**
171	HVAC Testing & Balancing	122 days	Tue 6/1/10	Wed 11/17/10
172	Systems Testing	124 days	Mon 8/9/10	Thu 1/27/11
173	Commissioning	123 days	Tue 9/7/10	Thu 2/24/11
174	Punchlist	86 days	Mon 11/1/10	Mon 2/28/11
175	Final Cleaning	30 days	Fri 1/21/11	Thu 3/3/11
176	Department of Health Inspection	15 days	Fri 3/4/11	Thu 3/24/11
177	Township Final Inspections	12 days	Wed 3/16/11	Thu 3/31/11
178	Certificate of Occupancy	0 days	Thu 3/31/11	Thu 3/31/11



Project: Detailed_Schedule
Date: Thu 10/22/09

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

Appendix B

Finish Phase Site Layout

Site Utilization Plan for Finish Phase

LEGEND

- Property Line
- Site Access
- Construction Fence/Gates
- Work Flow
- CM Offices
- Subcontractor Trailers
- Subcontractor Parking
- Material Storage
- Loading Areas
- Dumpsters
- Porta-Pottys
- Material/Personnel Hoists
- Loading Dock w/ Stairs
- Route 73

Steven Farrah

Technical Assignment #2

Voorhees Replacement Hospital

Voorhees, NJ

Appendix C

Structural Systems Estimate Spreadsheets

Steel						
Structural Steel Columns (All Floors, Areas 1,2 & 3)						
Structural Steel Member	Length (ft)	Quantity	Total Length (ft)	Pricing Unit	Cost/ Pricing Unit	Total Cost
W14x90	32	24	768	L.F.	$ 152.65	$ 117,235.20
W14x74	32	15	480	L.F.	$ 126.25	$ 60,600.00
W14x74	29	48	1392	L.F.	$ 126.25	$ 175,740.00
W14x74	26	20	520	L.F.	$ 126.25	$ 65,650.00
W14x74	13	10	130	L.F.	$ 126.25	$ 16,412.50
W14x109	32	36	1152	L.F.	$ 184.00	$ 211,968.00
W14x109	29	8	232	L.F.	$ 184.00	$ 42,688.00
W14x68	32	3	96	L.F.	$ 116.35	$ 11,169.60
W14x61	32	11	352	L.F.	$ 104.80	$ 36,889.60
W14x61	29	19	551	L.F.	$ 104.80	$ 57,744.80
W14x61	26	2	52	L.F.	$ 104.80	$ 5,449.60
W14x61	13	15	195	L.F.	$ 104.80	$ 20,436.00
W14x48	29	4	116	L.F.	$ 83.35	$ 9,668.60
W14x48	26	2	52	L.F.	$ 83.35	$ 4,334.20
W14x48	13	2	26	L.F.	$ 83.35	$ 2,167.10
W14x43	29	11	319	L.F.	$ 75.10	$ 23,956.90
W14x43	26	11	286	L.F.	$ 75.10	$ 21,478.60
W14x43	15	2	30	L.F.	$ 75.10	$ 2,253.00
W14x43	13	13	169	L.F.	$ 75.10	$ 12,691.90
W14x193	32	6	192	L.F.	$ 322.60	$ 61,939.20
W14x132	32	31	992	L.F.	$ 221.95	$ 220,174.40
W14x257	32	20	640	L.F.	$ 428.20	$ 274,048.00
W14x257	29	8	232	L.F.	$ 428.20	$ 99,342.40
W14x159	32	20	640	L.F.	$ 266.50	$ 170,560.00
W14x159	26	4	104	L.F.	$ 266.50	$ 27,716.00
W14x159	13	3	39	L.F.	$ 266.50	$ 10,393.50
W14x145	17	6	102	L.F.	$ 243.40	$ 24,826.80
W14x120	32	5	160	L.F.	$ 202.35	$ 32,376.00
W14x120	29	5	145	L.F.	$ 202.35	$ 29,340.75
W14x120	26	5	130	L.F.	$ 202.35	$ 26,305.50
W14x211	29	3	87	L.F.	$ 352.30	$ 30,650.10
W14x211	26	1	26	L.F.	$ 352.30	$ 9,159.80
All Floors, Areas 1,2 & 3 Column Subtotal						$ 1,915,366.05

*note: cost/pricing unit includes all materials, labor and equipment costs

Steel						
Structural Steel Beams (Typical Floor, Areas 1,2 & 3)						
Structural Steel Member	Length (ft)	Quantity	Total Length (ft)	Pricing Unit	Cost/ Pricing Unit	Total Cost
W14x22	30	98	2940	L.F.	$ 47.22	$ 138,826.80
W14x22	10	4	40	L.F.	$ 47.22	$ 1,888.80
W14x22	22	18	396	L.F.	$ 47.22	$ 18,699.12
W14x22	20	6	120	L.F.	$ 47.22	$ 5,666.40
W14x22	18	4	72	L.F.	$ 47.22	$ 3,399.84
W14x22	28	8	224	L.F.	$ 47.22	$ 10,577.28
W21x44	30	4	120	L.F.	$ 77.58	$ 9,309.60
W21x44	20	2	40	L.F.	$ 77.58	$ 3,103.20
W21x44	32	6	192	L.F.	$ 77.58	$ 14,895.36
W12x14	12	48	576	L.F.	$ 31.25	$ 18,000.00
W12x14	7	6	42	L.F.	$ 31.25	$ 1,312.50
W12x14	10	8	80	L.F.	$ 31.25	$ 2,500.00
W12x57	26	2	52	L.F.	$ 101.07	$ 5,255.64
W12x50	32	2	64	L.F.	$ 88.07	$ 5,636.48
W21x57	12	4	48	L.F.	$ 100.00	$ 4,800.00
W21x57	20	2	40	L.F.	$ 100.00	$ 4,000.00
W24x55	30	2	60	L.F.	$ 95.87	$ 5,752.20
W21x50	30	2	60	L.F.	$ 87.58	$ 5,254.80
W21x50	32	6	192	L.F.	$ 87.58	$ 16,815.36
W18x35	28	4	112	L.F.	$ 63.62	$ 7,125.44
W16x26	20	4	80	L.F.	$ 47.18	$ 3,774.40
W27x84	12	2	24	L.F.	$ 143.54	$ 3,444.96
W27x84	20	2	40	L.F.	$ 143.54	$ 5,741.60
W24x94	12	2	24	L.F.	$ 160.01	$ 3,840.24
W24x94	20	2	40	L.F.	$ 160.01	$ 6,400.40
W24x94	30	1	30	L.F.	$ 160.01	$ 4,800.30
W18x40	32	2	64	L.F.	$ 71.62	$ 4,583.68
W12x16	10	6	60	L.F.	$ 31.25	$ 1,875.00
W24x76	32	10	320	L.F.	$ 129.87	$ 41,558.40
W24x76	30	7	210	L.F.	$ 129.87	$ 27,272.70
W24x76	12	2	24	L.F.	$ 129.87	$ 3,116.88
Typical Floor, Areas 1,2 & 3 Beam Subtotal						$ 389,227.38
Total Cost for All Floors, Areas 1,2 & 3						$ 3,113,819.04

*note: cost/pricing unit includes all materials, labor and equipment costs

Steel				
Metal Decking Typical Floor, Areas 1,2 & 3				
Decking Type	Square Footage (S.F.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
3" x 18 Gauge Composite Metal Deck	31900	S.F.	$ 4.21	$ 134,299.00
Typical Floor, Areas 1,2 & 3 Floor Decking Subtotal				$ 134,299.00
Total Cost for All Floors, Areas 1,2 & 3				$ 1,074,392.00

Roof Decking for Areas 1,2 & 3				
Decking Type	Square Footage (S.F.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
3" x 20 Gauge Steel Roof Deck	31900	S.F.	$ 2.80	$ 89,320.00
Total Cost for Roof Decking Areas 1,2 & 3				$ 89,320.00

Shear Studs Typical Floor, Areas 1,2 & 3				
Shear Stud Type	Quantity	Pricing Unit	Cost/ Pricing Unit	Total Cost
3/4", 5" Long Headed Studs	5362	Each	$ 1.89	$ 10,134.18
Typical Floor, Areas 1,2 & 3 Shear Studs Subtotal				$ 10,134.18
Total Cost for All Floors, Areas 1,2 & 3				$ 81,073.44

*note: cost/pricing unit includes all materials, labor and equipment costs

Concrete										
Footings Areas 1,2 & 3										
Footing Mark	Quantity	Length (ft)	Width (ft)	Depth (ft)	Volume/ Footing (ft^3)	Total Volume (ft^3)	Total Volume (C.Y.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
F8	3	8	8	2	128.0	384.0	14.2	C.Y.	$ 106.00	$ 1,507.56
F9	9	9	9	2.333	189.0	1701.0	63.0	C.Y.	$ 106.00	$ 6,678.00
F10	26	10	10	2.667	266.7	6933.3	256.8	C.Y.	$ 106.00	$ 27,219.75
F11	22	11	11	2.67	323.1	7107.5	263.2	C.Y.	$ 106.00	$ 27,903.68
F12	1	12	12	3	432.0	432.0	16.0	C.Y.	$ 106.00	$ 1,696.00
F30	2	36	15	5	2700.0	5400.0	200.0	C.Y.	$ 106.00	$ 21,200.00
F31	1	35	32.08	5	5614.6	5614.6	207.9	C.Y.	$ 106.00	$ 22,042.44
F32	2	22	16	3	1056.0	2112.0	78.2	C.Y.	$ 106.00	$ 8,291.56
F33	2	18	11	2.67	528.7	1057.3	39.2	C.Y.	$ 106.00	$ 4,150.96
F34	1	22	11	3	726.0	726.0	26.9	C.Y.	$ 106.00	$ 2,850.22
F35	1	51.1	15	6	4599.0	4599.0	170.3	C.Y.	$ 106.00	$ 18,055.33
F36	1	33.67	25	5	4208.8	4208.8	155.9	C.Y.	$ 106.00	$ 16,523.24
F37	3	34	14	5	2380.0	7140.0	264.4	C.Y.	$ 106.00	$ 28,031.11
F38	1	49	13.5	6.5	4299.8	4299.8	159.3	C.Y.	$ 106.00	$ 16,880.50
F39	1	11	7	2.33	179.4	179.4	6.6	C.Y.	$ 106.00	$ 704.35
F40	1	18.33	15	3	824.9	824.9	30.6	C.Y.	$ 106.00	$ 3,238.30
F41	1	12	7	2.33	195.7	195.7	7.2	C.Y.	$ 106.00	$ 768.38
F42	1	12	9	2.67	288.4	288.4	10.7	C.Y.	$ 106.00	$ 1,132.08
Concrete for Footings in Areas 1,2 & 3 Subtotal										$ 208,873.46

Concrete Piers in Areas 1,2 & 3										
Pier Mark	Quantity	Length (ft)	Width (ft)	Depth (ft)	Volume/ Pier (ft^3)	Total Volume (ft^3)	Total Volume (C.Y.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
P1	10	2.33	2.33	5	27.1	271.4	10.1	C.Y.	$ 106.00	$ 1,065.67
P2	9	2.67	2.67	4	28.5	256.6	9.5	C.Y.	$ 106.00	$ 1,007.55
P3	6	3	3	4	36.0	216.0	8.0	C.Y.	$ 106.00	$ 848.00
P4	1	2	3	4	24.0	24.0	0.9	C.Y.	$ 106.00	$ 94.22
P5	12	3	4.67	5	70.1	840.6	31.1	C.Y.	$ 106.00	$ 3,300.13
P6	16	2.67	4.583	5	61.2	979.0	36.3	C.Y.	$ 106.00	$ 3,843.48
Concrete for Piers in Areas 1,2 & 3 Subtotal										$ 10,159.06

Concrete										
Strip Footings										
Detail	Quantity	Length (ft)	Width (ft)	Depth (ft)	Volume/ Footing (ft^3)	Total Volume (ft^3)	Total Volume (C.Y.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
12-S501	1	288	14.5	2.5	10440	10440	386.7	C.Y.	$ 106.00	$ 40,986.67
4-S502	1	890	1.67	1	1486.3	1486.3	55.0	C.Y.	$ 106.00	$ 5,835.10
Concrete for Strip Footings in Areas 1,2 & 3 Subtotal										$ 46,821.77

Slab on Grade, Areas 1,2 & 3									
SOG	Quantity	Square Footage (S.F.)	Depth of SOG (ft)	Volume/ Slab (ft^3)	Total Volume (ft^3)	Total Volume (C.Y.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
5" 4000psi SOG	1	31900	0.417	13291.7	13291.7	492.3	C.Y.	$ 106.00	$ 52,182.10
Concrete for Slab on Grade in Areas 1,2 & 3 Subtotal									$ 52,182.10

Slab on Deck, Areas 1,2 & 3									
SOD	Quantity	Square Footage (S.F.)	Depth of SOD (ft)	Volume/ Slab (ft^3)	Total Volume (ft^3)	Total Volume (C.Y.)	Pricing Unit	Cost/ Pricing Unit	Total Cost
3.5" 3500psi Lightweight Concrete	1	31900	0.292	9304.2	9304.2	344.6	C.Y.	$ 140.00	$ 48,243.83
Concrete for Slab on Deck in Areas 1,2 & 3 Subtotal									$ 48,243.83
Total Cost All Floors Slab on Deck in Areas 1,2 & 3									$ 385,950.62

Concrete Placing					
All Concrete Placed Using a Pump (Areas 1,2 & 3)					
	C.Y. of Concrete to Place	Pricing Unit	Cost/ Pricing Unit	Total Cost	
Spread Footings	1970.5	C.Y.	$ 19.70	$ 38,818.85	
Strip Footings	441.7	C.Y.	$ 18.49	$ 8,167.03	
Concrete Piers	95.8	C.Y.	$ 12.34	$ 1,182.17	
Slab on Grade	492.3	C.Y.	$ 22.80	$ 11,224.44	
Slab on Deck	2756.8	C.Y.	$ 25.60	$ 70,574.08	
Concrete Placing Areas 1,2 & 3 All Floors Subtotal				$ 129,966.58	

Formwork									
Spread Footings (Areas 1,2 & 3)									
Footing Mark	Quantity	Length (ft)	Width (ft)	Depth (ft)	SFCA/ Footing (ft^2)	Total SFCA (ft^2)	Pricing Unit	Cost/ Pricing Unit	Total Cost
F8	3	8	8	2	64	192	SFCA	$ 3.63	$ 696.96
F9	9	9	9	2.3333	84	756	SFCA	$ 3.63	$ 2,744.28
F10	26	10	10	2.6667	107	2773	SFCA	$ 3.63	$ 10,067.20
F11	22	11	11	2.67	117	2585	SFCA	$ 3.63	$ 9,381.95
F12	1	12	12	3	144	144	SFCA	$ 3.63	$ 522.72
F30	2	36	15	5	510	1020	SFCA	$ 3.63	$ 3,702.60
F31	1	35	32.08	5	671	671	SFCA	$ 3.63	$ 2,435.13
F32	2	22	16	3	228	456	SFCA	$ 3.63	$ 1,655.28
F33	2	18	11	2.67	155	310	SFCA	$ 3.63	$ 1,124.28
F34	1	22	11	3	198	198	SFCA	$ 3.63	$ 718.74
F35	1	51.1	15	6	793	793	SFCA	$ 3.63	$ 2,879.32
F36	1	33.67	25	5	587	587	SFCA	$ 3.63	$ 2,129.72
F37	3	34	14	5	480	1440	SFCA	$ 3.63	$ 5,227.20
F38	1	49	13.5	6.5	813	813	SFCA	$ 3.63	$ 2,949.38
F39	1	11	7	2.33	84	84	SFCA	$ 3.63	$ 304.48
F40	1	18.33	15	3	200	200	SFCA	$ 3.63	$ 725.93
F41	1	12	7	2.33	89	89	SFCA	$ 3.63	$ 321.40
F42	1	12	9	2.67	112	112	SFCA	$ 3.63	$ 407.07
								Spread Footings Areas 1,2 & 3 Subtotal	$ 47,993.63

Concrete Piers in Areas 1,2 & 3									
Pier Mark	Quantity	Length (ft)	Width (ft)	Depth (ft)	SFCA/ Pier (ft^2)	Total SFCA (ft^2)	Pricing Unit	Cost/ Pricing Unit	Total Cost
P1	10	2.33	2.33	5	47	466	SFCA	$ 3.96	$ 1,845.36
P2	9	2.67	2.67	4	43	384	SFCA	$ 3.96	$ 1,522.54
P3	6	3	3	4	48	288	SFCA	$ 3.96	$ 1,140.48
P4	1	2	3	4	40	40	SFCA	$ 3.96	$ 158.40
P5	12	3	4.67	5	77	920	SFCA	$ 3.96	$ 3,644.78
P6	16	2.67	4.583	5	73	1161	SFCA	$ 3.96	$ 4,595.71
								Concrete Piers Areas 1,2 & 3 Subtotal	$ 12,907.28

Formwork

Strip Footings (Areas 1,2 & 3)

Footing Mark	Quantity	Length (ft)	Width (ft)	Depth (ft)	SFCA/ Footing (ft^2)	Total SFCA (ft^2)	Pricing Unit	Cost/ Pricing Unit	Total Cost
12-S501	1	288	14.5	2.5	1513	1513	SFCA	$ 4.92	$ 7,441.50
4-S502	1	890	1.67	1	1783	1783	SFCA	$ 4.92	$ 8,774.03
								Strip Footings Areas 1,2 & 3 Subtotal	$ 16,215.53

Slab on Grade (Areas 1,2 & 3)

Footing Mark	Quantity	Perimeter	Depth (ft)	Total SFCA (ft^2)	Pricing Unit	Cost/ Pricing Unit	Total Cost
S.O.G.	1	1392	0.4167	580	SFCA	$ 5.33	$ 3,091.40
						Slab on Grade Formwork Subtotal	$ 3,091.40

*note: cost/pricing unit includes all materials and labor costs

Reinforcing												
Footings, Areas 1,2 & 3												
	Quantity	Length (ft)	Width (ft)	Long Way Rebar	Long Way Rebar Quantity	Short Way Rebar	Short Way Rebar Quantity	Total Length of Rebar (ft)	Weight of Rebar (PLF)	Total Weight of Rebar (tons)	Rebar Cost per ton	Total Rebar Cost
F8	3	8	8	#7	7	#7	7	112	2.044	0.114	$ 1,795.00	$ 205.46
F9	9	9	9	#8	7	#8	7	126	2.67	0.168	$ 1,795.00	$ 301.94
F10	26	10	10	#8	9	#8	9	180	2.67	0.240	$ 1,795.00	$ 431.34
F11	22	11	11	#8	11	#8	11	242	2.67	0.323	$ 1,795.00	$ 579.91
F12	1	12	12	#9	10	#9	10	240	3.4	0.408	$ 1,795.00	$ 732.36
F30	2	36	15	#10	19	#10	44	1344	4.303	2.892	$ 1,795.00	$ 5,190.45
F31	1	35	32.08	#10	39	#10	43	2745	4.303	5.905	$ 1,795.00	$ 10,599.42
F32	2	22	16	#10	17	#10	23	742	4.303	1.596	$ 1,795.00	$ 2,865.56
F33	2	18	11	#8	12	#8	19	425	2.67	0.567	$ 1,795.00	$ 1,018.44
F34	1	22	11	#8	12	#8	23	517	2.67	0.690	$ 1,795.00	$ 1,238.90
F35	1	51.1	15	#10	23	#10	77	2330	4.303	5.014	$ 1,795.00	$ 8,999.48
F36	1	33.67	25	#10	31	#10	41	2069	4.303	4.451	$ 1,795.00	$ 7,989.47
F37	3	34	14	#10	18	#10	42	1200	4.303	2.582	$ 1,795.00	$ 4,634.33
F38	1	49	13.5	#10	21	#10	74	2028	4.303	4.363	$ 1,795.00	$ 7,832.02
F39	1	11	7	#9	8	#9	12	172	3.4	0.292	$ 1,795.00	$ 524.86
F40	1	18.33	15	#10	16	#10	19	578	4.303	1.244	$ 1,795.00	$ 2,233.28
F41	1	12	7	#9	8	#9	13	187	3.4	0.318	$ 1,795.00	$ 570.63
F42	1	12	9	#9	10	#9	13	237	3.4	0.403	$ 1,795.00	$ 723.21
Footing in Areas 1,2 & 3 Rebar Subtotal												$ 56,671.07

*note: cost/pricing unit includes all materials and labor costs

Reinforcing											
Concrete Piers, Areas 1,2 & 3											
	Quantity	Length (ft)	Width (ft)	Depth (ft)	Vertical Reinforc.	Vertical Reinforc. Quantity	Total Length of Rebar	Weight of Rebar (PLF)	Total Weight of Rebar (tons)	Rebar Cost per ton	Total Rebar Cost
P1	10	2.33	2.33	5	#9	8	56	3.4	0.095	$ 1,795.00	$ 170.88
P2	9	2.67	2.67	4	#9	12	72	3.4	0.122	$ 1,795.00	$ 219.71
P3	6	3	3	4	#10	12	72	4.303	0.155	$ 1,795.00	$ 278.06
P4	1	2	3	4	#9	10	60	3.4	0.102	$ 1,795.00	$ 183.09
P5	12	3	4.67	5	#11	18	126	5.313	0.335	$ 1,795.00	$ 600.82
P6	16	2.67	4.583	5	#9	11	77	3.4	0.131	$ 1,795.00	$ 234.97
Rebar for Concrete Piers in Areas 1,2 & 3 Subtotal											$ 1,687.53

*note: cost/pricing unit includes all materials and labor costs

Reinforcing											
Strip Footings, Areas 1,2 & 3											
	Length (ft)	Width (ft)	Long Way Rebar	Long Way Rebar Quantity	Short Way Rebar	Short Way Rebar Quantity	Total Length of Rebar (ft)	Weight of Rebar (PLF)	Total Weight of Rebar (tons)	Rebar Cost per ton	Total Rebar Cost
12-S501	288	14.5	#7	cont	-	-	8064	2.044	8.241	$ 1,795.00	$ 14,793.33
12-S501	288	14.5	-	-	#5	288	4176	1.043	2.178	$ 1,795.00	$ 3,909.12
12-S501	288	14.5	-	-	#9	288	4176	3.4	7.099	$ 1,795.00	$ 12,743.06
4-S502	890	1.67	#5	cont	-	-	1780	1.043	0.928	$ 1,795.00	$ 1,666.24
Strip Footing in Areas 1,2 & 3 Rebar Subtotal											$ 33,111.76

*note: cost/pricing unit includes all materials and labor costs

Reinforcing				
6x6 - W2.9xW2.9 Welded Wire Fabric				
Location	Square Footage	Pricing Unit	Cost/ Pricing Unit	Total Cost
Slab on Grade (Areas 1,2 & 3)	31900	100 S.F.	$ 57.00	$ 18,183.00
Slab on Deck - (All Floors Areas 1,2 & 3)	31900	100 S.F.	$ 57.00	$ 145,464.00
Welded Wire Fabric for All floors in Areas 1,2 & 3 Including SOG Subtotal				$ 163,647.00

*note: cost/pricing unit includes all materials and labor costs

Appendix D

General Conditions Spreadsheets

General Conditions & Requirements					
Voorhees Replacement Hospital Voorhees, NJ					
Construction Dates : March 2008 - March 2011 (36 months) Preconstruction : (8 months)					
PERSONNEL		QTY	Unit	Price/Unit	Total
	Sr. Project Executive	6	month	$ 10,000.00	$ 60,000.00
	Sr. Project Manager	44	month	$ 8,400.00	$ 369,600.00
	Safety Engineer	31	month	$ 3,000.00	$ 93,000.00
	Administrative Assistant	37	month	$ 1,520.00	$ 56,240.00
	Documents Clerk	37	month	$ 1,520.00	$ 56,240.00
	Project Engineer	42	month	$ 4,800.00	$ 201,600.00
	Assistant Engineer	13	month	$ 3,600.00	$ 46,800.00
	Assistant Engineer (MEP)	30	month	$ 4,000.00	$ 120,000.00
	Engineer (Arch./Int)	30	month	$ 4,000.00	$ 120,000.00
	Assistant Engineer (Elevators /Equip. /Specialities)	33	month	$ 3,600.00	$ 118,800.00
	Engineer's Assistant (Interior Glass/ Millwork/Doors, Frames & Hardware	24	month	$ 3,400.00	$ 81,600.00
	Assistant Engineer/Superintendent	16	month	$ 3,400.00	$ 54,400.00
	Project Superintendent (Ancillary)	38	month	$ 8,000.00	$ 304,000.00
	Assistant Superintendent (Ancillary)	27	month	$ 5,000.00	$ 135,000.00
	Assistant Superintendent (Site/ Structure)	22	month	$ 5,000.00	$ 110,000.00
	Field Engineer	24	month	$ 4,000.00	$ 96,000.00
	Project Superintendent (Bed Tower)	30	month	$ 8,000.00	$ 240,000.00
	Assistant Superintendent (Bed Tower)	26	month	$ 5,000.00	$ 130,000.00
	Field Engineer	24	month	$ 4,000.00	$ 96,000.00
	Superintendent (MEP)	35	month	$ 8,000.00	$ 280,000.00
	Assistant Super. (Electrical/Telecom)	29	month	$ 5,000.00	$ 145,000.00
	Assistant Superintendent (MEP)	27	month	$ 6,000.00	$ 162,000.00
Subtotal Personnel					$ 3,076,280.00

TEMPORARY FACILITIES		QTY	Unit	Price/ Unit	Total
	Job Office	36	month	$ 8,413	$ 302,868
	Vehicle Rental	36	month	$ 139	$ 5,004
	Tools & Supplies	1	LS	$ 134,250	$ 134,250
	Temporary Roads	1	LS	$ 336,500	$ 336,500
	Winter Weather/Temporary Protection	1	LS	$ 65,000	$ 65,000
	Temporary Building/Installations	1	LS	$ 391,700	$ 391,700
Subtotal Temporary Facilities					$ 1,235,322

General Conditions & Requirements

Voorhees Replacement Hospital
Voorhees, NJ

Construction Dates : March 2008 - March 2011 (36 months)
Preconstruction : (8 months)

GENERAL EXPENSES		QTY	Unit	Price/ Unit	Total
	Office Equipment & Supplies	36	month	$ 3,472	$ 124,992
	Telephone & Shipping	36	month	$ 4,228	$ 152,208
	Construction Documents & Printer	36	month	$ 4,111	$ 147,996
	Computer Expenses	36	month	$ 5,738	$ 206,568
	Accounting Expense	36	month	$ 5,306	$ 191,016
	Living/Travel Expenses	36	month	$ 1,383	$ 49,788
	Photographs	36	month	$ 827	$ 29,772
	Miscellaneous Expenses	36	month	$ 2,394	$ 86,184
Subtotal General Expenses					$ 988,524

HOISTING		QTY	Unit	Price/Unit	Total
	Material Hoists	1	LS	$ 189,600.00	$ 189,600.00
	Operation of Material Hoists	1	ALLOW	$ 442,880.00	$ 442,880.00
	Personnel Hoists	1	LS	$ 188,000.00	$ 188,000.00
	Operation of Personnel Hoists	1	ALLOW	$ 442,880.00	$ 442,880.00
	Temporary Elevators	1	LS	$ 67,000.00	$ 67,000.00
Subtotal Hoisting					$ 1,330,360.00

TEMPORARY UTILITIES		QTY	Unit	Price/Unit	Total
	Temporary Light & Power	36	month	$ 2,000.00	$ 72,000.00
	Temporary Plumbing	36	month	$ 1,250.00	$ 45,000.00
	Porta-Pottys	36	month	$ 2,437.50	$ 87,750.00
	Temporary Heat (owner provided)	0	month	$ -	$ -
Subtotal Temporary Utilities					$ 204,750.00

General Conditions & Requirements					
Voorhees Replacement Hospital					
Voorhees, NJ					
Construction Dates : March 2008 - March 2011 (36 months)					
Preconstruction : (8 months)					
CLEANING		QTY	Unit	Price/Unit	Total
	General Cleaning	1	ALLOW	$ 1,380,190.00	$ 1,380,190.00
	Chutes	1	LS	$ 36,000.00	$ 36,000.00
	Rubbish Removal	1	ALLOW	$ 316,800.00	$ 316,800.00
	Site/Street Cleaning	1	ALLOW	$ 72,000.00	$ 72,000.00
	Glass Cleaning	1	LS	$ 3,000.00	$ 3,000.00
	Final Cleaning	1	LS	$ 1,050,000.00	$ 1,050,000.00
Subtotal Cleaning					$ 2,857,990.00

PROTECTION & SAFETY		QTY	Unit	Price/Unit	Total
	General Protection & Safety	1	ALLOW	$ 462,000.00	$ 462,000.00
	Protection of Finish Work	1	ALLOW	$ 490,000.00	$ 490,000.00
	Fencing/Gates	1	LS	$ 152,000.00	$ 152,000.00
	Watchman	1	LS	$ 25,000.00	$ 25,000.00
	First Aid Facility	1	LS	$ 48,000.00	$ 48,000.00
Subtotal Protection & Safety					$ 1,177,000.00

General Conditions & Requirements Total	**$ 10,870,226.00**