City Hospital
Pennsylvania
Phase I

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TABLE OF CONTENTS

Executive Summary

This report is intended to familiarize you with the cost and methods analysis under which the City Hospital Phase I building is constructed and give you a general overview of the systems incorporated into the building. Phase I is an "L" shaped four-story composite building structure which will provide a research facility, an administrative space, a conference space, and a Central Utility Plant (C.U.P.) located across from the existing main hospital. The structure of the Phase I facility is designed to support twenty two stories of additional research space in the future phases.

The methods in which the project will be completed are outlined in the detailed schedule and the site plan. The detailed schedule reflects how the project will be built, including the phasing and structural sequence of the project. It also shows that construction began in March of 2005 with an intended completion date of December 2007. Some of the key milestones on the schedule are the MEP rough-in, finishes, building enclosure, etc. The site plan provides a description of the key construction phases on the 6.5 acre site. The top level of Phase I is at an elevation of 26 ft. and is about 16ft. below street level. The plans include critical phases such as steel erection and material handling. Temporary equipment, ramps, fences, a crane, hoist, etc., can also be located on the site plan.

Turner Construction provides preconstruction and construction services for the $156 million phased project under a guaranteed maximum price contract. For cost analysis, a detailed estimate was prepared for the structural system, telecommunications system, and the general conditions. The square foot estimate for the four-story composite structure provides cost of labor, equipment, and materials for the entire structural system. The scope of work includes the cost of concrete, masonry, and steel. An assemblies estimate was completed on the telecommunications system. The general conditions estimate provides a cost breakdown of the general requirements on site that will aid the construction process such as temporary utilities, project and staff cost, etc.

The following document contains information about the detailed project schedule, site plan layout, assemblies estimate, detailed structural systems estimate, and general conditions estimate. The information used in this report was provided by Turner Construction and RS Means Costworks.

I. Site Plan Layout

The figures on the following pages illustrate the site plan layout for two critical phases of the project; material handling (Figure 2.1) and steel erection (Figure 2.2).

The main entrance to the project site is to the south of the building. Material deliveries are made to the project site from the west and delivered to the site through the South Road. Usually the road is open to all traffic unless there is a large material delivery or activities like steel erection and concrete pouring taking place. In these cases a traffic monitor, supplied by the subcontractor, regulates passage to ensure safety. Materials such as drywall and masonry units can be stored on the A level loading dock above C.U.P., in the area between the ramp and the building, or in the building. A ramp was constructed for ease of access and deliveries along the east side of the building as shown. The ramp is sloped downward leading to D level. A hoist can be used to lift material into the building through wall openings on levels A through C as shown in the material delivery site plan. Scaffolding and hoists were also used to erect the exterior masonry walls. Forklifts were used to transport material around the site. Fencing is provided along the perimeter of the site for safety. The site fence is locked every day once construction is complete for the day.

The new building will be constructed on spread footings with a temporary sheeting and shoring excavation system and rock bolting along the perimeter of the building. Reinforced concrete will be used to construct the perimeter and interior foundation walls and will be waterproofed. There will also be an under slab drainage system tied into the pumping system to control ground water. Portable bathrooms are located to the south east corner of the building and to the south of the subcontractors' job trailers. They are provided by Turner for the workers since the bathrooms in the building are under construction. Existing and new utilities are located along the perimeter of the building. The main water and electrical lines are located at the south of the building. There are separate dumpsters located to the west of the Turner job trailers for materials such as wood, metal, concrete, paper (office), etc. to provide for onsite separation of recyclables.

The phase of steel erection in the site plan shows the erection of steel for the cooling towers above A level-C.U.P. and for the placement of research equipment into the building through the openings on the vertical walls of level C and D using a mobile crane. The steel was shaken out on the A level- C.U.P. loading dock.

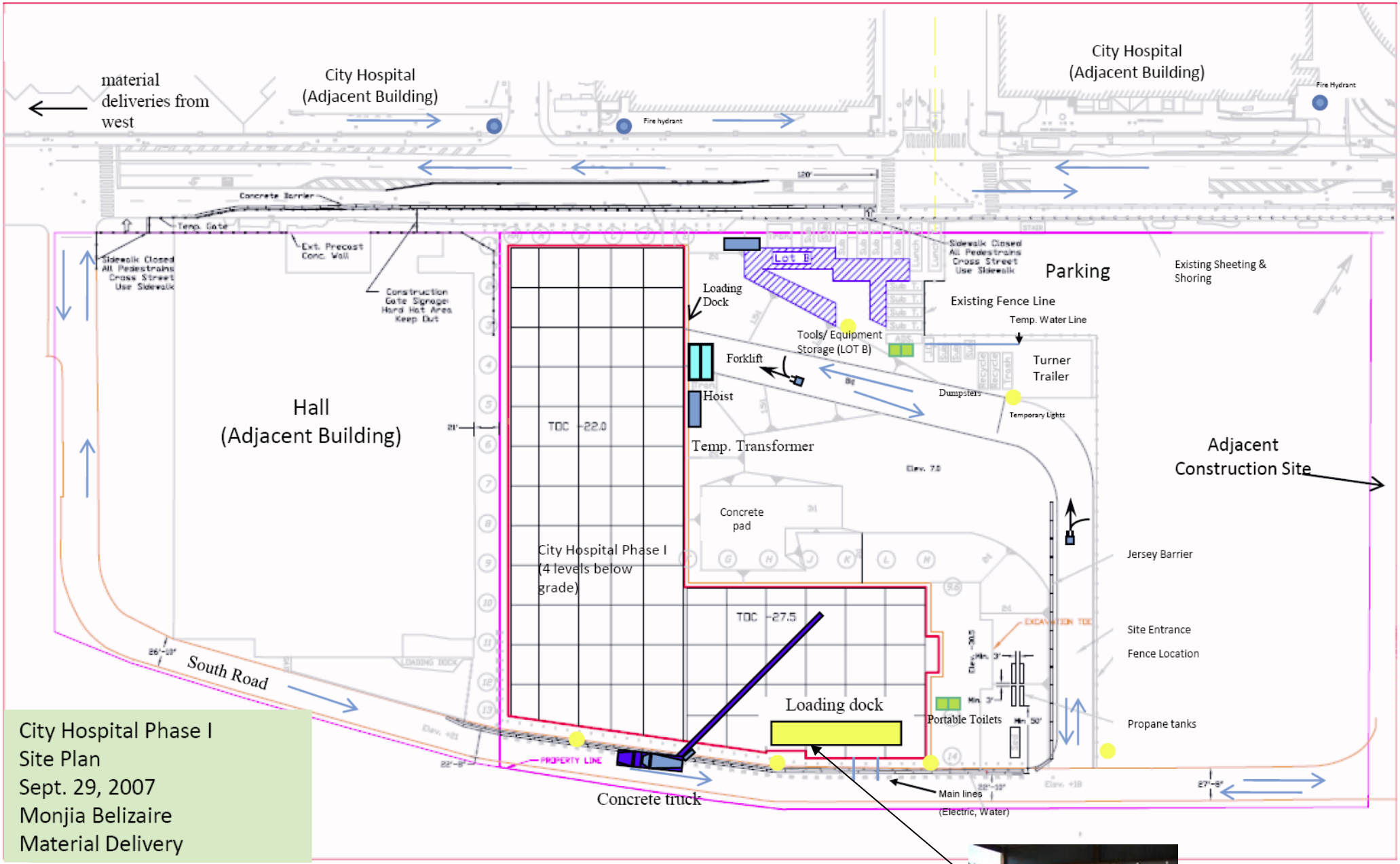


Figure 2.1 Site Plan: Material delivery

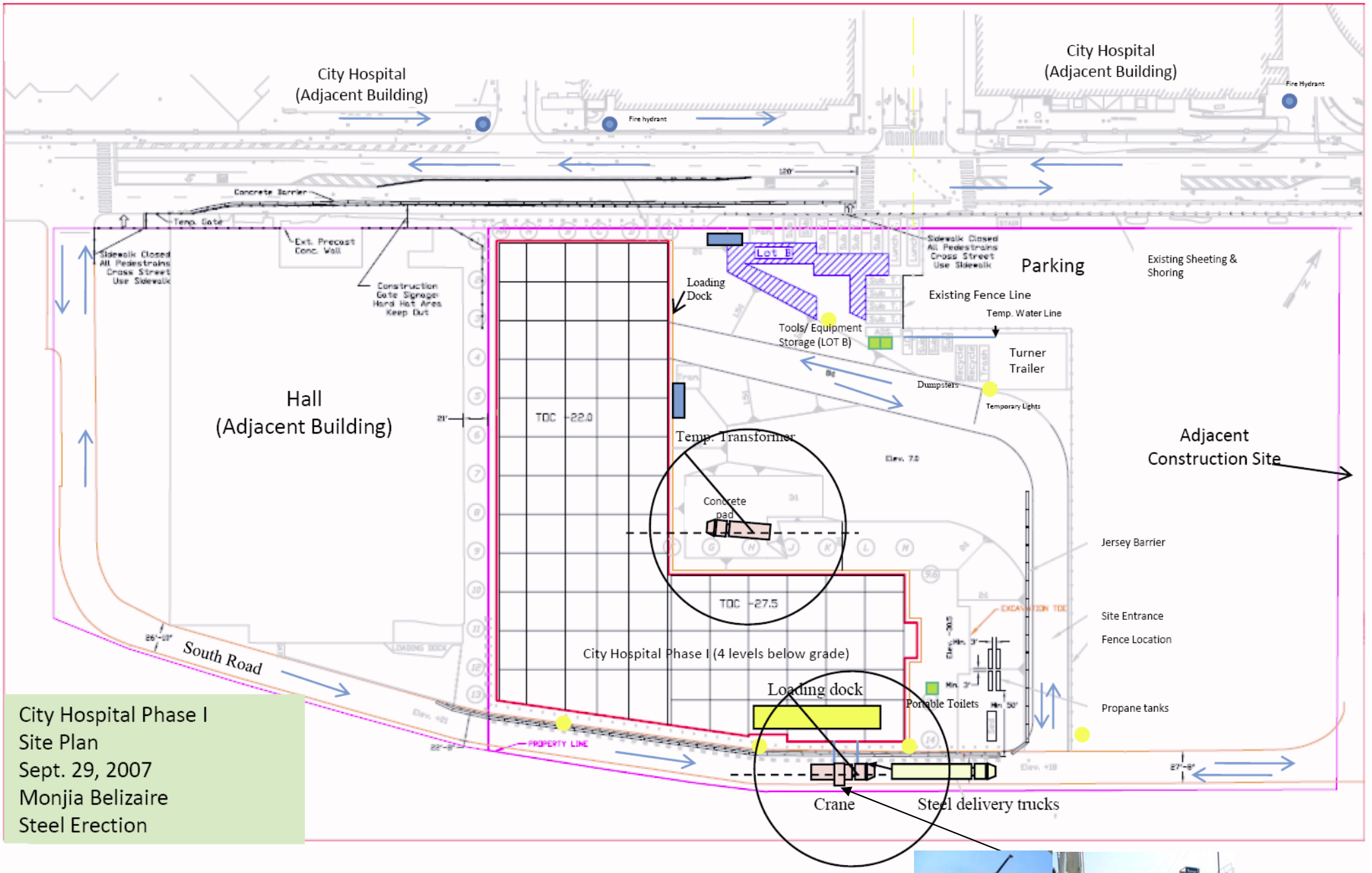


Figure 2.2 Site Plan: Steel Erection

II. General Conditions Estimate

The general conditions estimate is a detailed cost analysis of the general requirements for a project, for example temporary utilities, facilities, hoist, protection and safety, and clean-up. The general conditions estimate for the City Hospital project site can be viewed on the following page.

The general conditions estimate was developed through the use of RS Means Estimating and information supplied by Turner Construction. The general conditions estimate with staffing is approximately $6,000,000.00.

The City Hospital project site is unique and requires more resources than a typical project due to the fact that the structure will be LEED rated; therefore extra line items were required in the general conditions estimate. The amount of dumpsters required for recycling on this project will be much higher than a traditionally project. Other LEED items include cleaning and a LEED consultant as part of the general conditions. Special precautions and care is taken during construction, for example, after ducts are installed they are to be covered to prevent contamination, as shown in Figure 2.3 below, until final connections are made due to LEED requirement.

Project staffing includes a project manager, project controls personnel, field operations manager, project engineer, engineering administrative, assistant engineer, assistant project engineer, LEED/equipment personnel, MEP project engineer, MEP assistant engineer, MEP superintendent, Lead Superintendent, two Assistant Superintendents, Lead Safety, Safety, and two field engineers. The duration that each will spend on the City Hospital project is available in the general conditions estimate on the following page.

Figure 2.3: Covered duct

General Conditions					
		Quantity	Unit	Unit Cost	Total
Personel					**$2,874,190.00**
0131	Project Manager	104	week	2025.00	$210,600.00
0131	Project Control Tools	104	week	1770.00	$184,080.00
0131	Field Operations Manager	104	week	1770.00	$184,080.00
0131	Project Engineer	104	week	1655.00	$172,120.00
0131	Engineering Adminstrative	104	week	670.00	$69,680.00
0131	Assisstant Engineer	98	week	1550.00	$151,900.00
0131	LEED/Equipment	104	week	1550.00	$161,200.00
0131	MEP Project Eningeer	104	week	1655.00	$172,120.00
0131	MEP Assistant Eningeer	98	week	1655.00	$162,190.00
0131	Superintendent	104	week	1875.00	$195,000.00
0131	MEP Superintendent	104	week	1875.00	$195,000.00
0131	Assistant Superintendent	98	week	1655.00	$162,190.00
0131	Assistant Superintendent	98	week	1655.00	$162,190.00
0131	Lead Safety	104	week	875.00	$91,000.00
0131	Safety	104	week	870.00	$90,480.00
0131	Lead Superintendent	104	week	1875.00	$195,000.00
0131	Field Engineer	98	week	1150.00	$112,700.00
0131	Field Engineer	98	week	1150.00	$112,700.00
0131	Laborer	104	week	865.00	$89,960.00
0131	Laborer	104	week	865.00	$89,960.00
0131	Laborer	104	week	865.00	$89,960.00
0131	Laborer	104	week	865.00	$89,960.00
0131	Laborer	104	week	865.00	$89,960.00
0131	Intern	11	week	640.00	$7,040.00
0131	Intern	11	week	640.00	$7,040.00
Temporary Facilities					**$744,680.00**
0154	Tools & Supplies	24	months	445.00	$10,680.00
0154	Temporary Structures	2	LS	2500.00	$5,000.00
0154	Loading Dock Platform & Doors	6	LS	5000.00	$30,000.00
0154	Loading Platforms	3	LS	3000.00	$9,000.00
0154	Gang Ladders	8	LS	2000.00	$16,000.00
0154	Ramps	9	LS	2000.00	$18,000.00
0154	Toilet Enclosures	9	LS	2000.00	$18,000.00
0154	Guard Stations	1	LS	4000.00	$4,000.00
0154	Construction Road/Parking	24	months	2000.00	$48,000.00
0154	Dust Control/ Street Cleaning	24	months	2000.00	$48,000.00
0154	Temporary Site Hydrants	2	ea.	10000.00	$20,000.00
0154	Perimter Enclosure	15000	sf	5.00	$75,000.00
0154	Dehumidifiers	5	months	36000.00	$180,000.00
0154	Heating/Exhaust	5	months	49000.00	$245,000.00
0154	Snow Removal	6	months	3000.00	$18,000.00
Hoisting					**$166,000.00**
0154	Temporary Elevator Operator	7	months	18000.00	$126,000.00
0154	Crane Rental	2	months	10000.00	$20,000.00
0154	Crane Operator	2	months	10000.00	$20,000.00
Temporary Utilities					**$758,600.00**
0151	Temporary Heating & Cooling Install.	1	LS	10000.00	$10,000.00
0151	Temporary Heating & Cooling Removal	1	LS	10000.00	$10,000.00
0151	Temporary Heating & Cooling Fuel Cost	12	months	5000.00	$60,000.00
0151	Temporary Heating & Cooling Personnel	12	months	5000.00	$60,000.00
0151	Temporary Light & Power Current Charges	7008957	KWH	0.08	$553,400.00
0151	Temporary Plumbing Install.	1	LS	10000.00	$10,000.00
0151	Water Charges	24	LS	1000.00	$24,000.00
0151	Temporary Toilet Rentals	24	months	1000.00	$24,000.00
0151	Temporary Toilet Main.	24	months	300.00	$7,200.00
Cleaning					**$514,250.00**
0174	General Exterior Cleaning	16	months	5000.00	$80,000.00
0174	General Interior Cleaning	8	months	12000.00	$96,000.00
0174	Buggies	20	ea.	1000.00	$20,000.00
0174	Broom/Shovels	100	ea.	100.00	$10,000.00
0174	Dirt Chutes Rental	12	months	2000.00	$24,000.00
0174	Dirt Chutes Maint.	12	months	1000.00	$12,000.00
0174	Dirt Chutes Installation	1	LS	5000.00	$5,000.00
0174	Dirt Chute Dismantle	1	LS	2000.00	$2,000.00
0174	Rubbish Removal	175	picks	550.00	$96,250.00
0174	Site & Street Cleaning (Maintance)	24	months	2000.00	$48,000.00
0174	Site & Street Cleaning (Equipment)	12	months	3000.00	$36,000.00
0174	Glass Cleaning	1	LS	10000.00	$10,000.00
0174	Final Cleaning	1	LS	75000.00	$75,000.00
Protection & Safety					**$629,375.00**
0131	Personnel on site EMT	19	months	8000.00	$152,000.00
0131	Carpenter (Protection Maintance)	1	LS	30000.00	$30,000.00
0131	Protection & Safety for Public	4235	LS	85.00	$359,975.00
0551	Stair Rails	2000	LF	5.00	$10,000.00
0154	Interior Cables/Protection	2000	LF	5.00	$10,000.00
1044	Fire Extinguishers	100	ea.	90.00	$9,000.00
0154	First Aid Supplies	8	ea.	300.00	$2,400.00
0121	Protected Completed Work in Place	1	LS	15000.00	$15,000.00
0154	Temporary Roofing	2	LS	10000.00	$20,000.00
0154	Sill Covers	1	LS	2000.00	$2,000.00
1026	Corner Guards	100	ea.	50.00	$5,000.00
0156	Site Fence Maint.	24	months	500.00	$12,000.00
0156	Site Fence Removal	1	LS	2000.00	$2,000.00
Misc. General Requirements					**$177,000.00**
0158	Project Signs	2	LS	7500.00	$15,000.00
0221	Surveys	38	CD	1500.00	$57,000.00
0241	Site Preparation	1	LS	105000.00	$105,000.00
	TOTAL				**$5,864,095.00**

Figure 2.4 GC Estimate

III. Project Schedule

The detailed project schedule for City Hospital is a 34 month schedule for a 266,000 square foot research facility. This is a very tight schedule for a project of this size and magnitude due to the fact that future phases will be constructed as Phase I is closing out in an overlapping technique, so if any phase fails to meet its schedule, it will have a domino effect that will affect all the other phases of the project and ultimately lead to inconvenience other aspects of the project, if the project is going to meet its scheduled completion date. The schedule includes the design, procurement and the construction phases of the project.

Turner Construction divided the activities in the schedule between the central utility plant and the research space. This allows for trades to move as quickly as possible through the building while staying out of each other's way in the process. The site work included in Phase I includes grading and the paving of the South Road and installation of new water service, storm and sanitary sewers, and electrical services. The critical activities and key milestones are outlined in the schedule. For example, steel construction began on July 27, 2006. This date is a crucial date for the schedule due to the timing and delivery of the mill order. The building is scheduled to be weather tight on June 6, 2007 after 11 months of construction. Completing this milestone is important to avoid excess moisture that may cause serious damage or health risk. To save time in the schedule, the concrete shear walls were poured in single lifts ranging from forty to seventy-five feet. The shear walls were the highest ever poured in the region using the EFCO plate girder system as shown in Figure 2.5. The fit-out of the research space includes masonry partitions, drywall ceilings, resinous floors and epoxy paint. Whereas C.U.P fit-out consist of chillers, boilers, and air handler and is designed for future expansion.

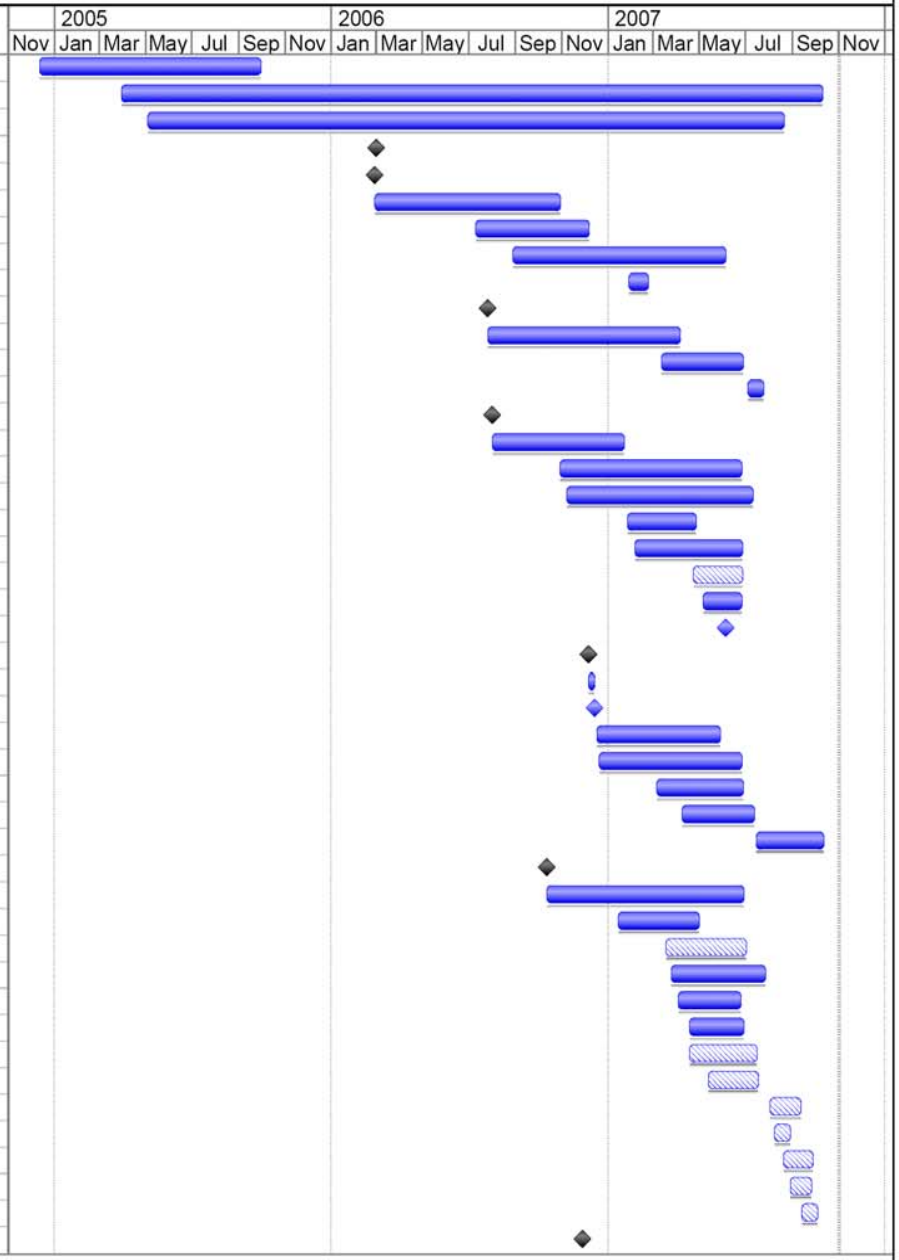
The project schedule is organized by the following trades or phases:

- Site work
- Concrete
- Steels & Metals
- Thermal/Moisture Protection
- Masonry
- Plumbing
- H.V.A.C.
- Electrical
- Fire Protection
- Equipment
- Finishes
- ATC
- Elevators
- Commissioning

Figure 2.5: Pouring of concrete shear wall

City Hospital
Figure 2.6 Project Schedule

ID	Task Name	Duration	Start	Finish
1	**Design Develpoment**	**210 days**	**Mon 12/13/04**	**Fri 9/30/05**
2	**Procurement of Services**	**664 days**	**Thu 3/31/05**	**Thu 10/11/07**
3	**Site work**	**602 days**	**Thu 5/5/05**	**Tue 8/21/07**
4	**Contract Awarded (Phase1)**	**1 day**	**Thu 3/2/06**	**Thu 3/2/06**
5	**Concrete**	**1 day**	**Tue 2/28/06**	**Tue 2/28/06**
6	Foundations	176 days	Tue 2/28/06	Mon 10/30/06
7	Slab on Grade	110 days	Tue 7/11/06	Thu 12/7/06
8	Prep & Pour Concrete on Deck	204 days	Tue 8/29/06	Tue 6/5/07
9	Prep & Pour Walls	20 days	Mon 1/29/07	Fri 2/23/07
10	**Steel & Metals**	**1 day**	**Thu 7/27/06**	**Thu 7/27/06**
11	Erect Steel & Metal Deck	185 days	Thu 7/27/06	Fri 4/6/07
12	Steel Stairs	78 days	Tue 3/13/07	Thu 6/28/07
13	AHU Grating Platform- (CUP)	15 days	Thu 7/5/07	Wed 7/25/07
14	**Thermal/Moisture Protection**	**1 day**	**Wed 8/2/06**	**Wed 8/2/06**
15	Spray on Fire Proofing (CUP)	126 days	Wed 8/2/06	Mon 1/22/07
16	Waterproofing Foundation Walls (CUP)	174 days	Mon 10/30/06	Tue 6/26/07
17	Waterproofing Foundation Walls (Research)	178 days	Wed 11/8/06	Wed 7/11/07
18	Spray on Fire Proofing (Research)	66 days	Sat 1/27/07	Fri 4/27/07
19	Roofing (CUP)	102 days	Tue 2/6/07	Wed 6/27/07
20	Temporary Roofing (research)	47 days	Tue 4/24/07	Wed 6/27/07
21	Waterproofing (Loading Dock)- CUP	37 days	Mon 5/7/07	Tue 6/26/07
22	Building Weathertight	1 day	Wed 6/6/07	Wed 6/6/07
23	**Masonry**	**1 day**	**Thu 12/7/06**	**Thu 12/7/06**
24	Mobilize Masonry & Set up Scaffold	6 days	Thu 12/7/06	Thu 12/14/06
25	Exterior Skin Start	1 day	Fri 12/15/06	Fri 12/15/06
26	Masonry (Exterior)- (C.U.P.)	118 days	Mon 12/18/06	Tue 5/29/07
27	Masonry (Interior)- (CUP)	135 days	Thu 12/21/06	Tue 6/26/07
28	Masonry (Interior)-(Research)	82 days	Wed 3/7/07	Thu 6/28/07
29	Masonry (Exterior)- (Research)	70 days	Mon 4/9/07	Fri 7/13/07
30	Exterior walls	65 days	Mon 7/16/07	Fri 10/12/07
31	**Plumbing**	**1 day**	**Fri 10/13/06**	**Fri 10/13/06**
32	Domestic Water Hangers/Rough-ins (CUP)	188 days	Fri 10/13/06	Fri 6/29/07
33	Natural Gas Piping/Equip./Connections (CUP)	78 days	Mon 1/15/07	Tue 5/1/07
34	Sanit./ Storm & Acid Waste Hangers/Rough-in (Research)	76 days	Mon 3/19/07	Mon 7/2/07
35	In Wall Plumbing Rough-in (Research)	90 days	Mon 3/26/07	Fri 7/27/07
36	Process Chilled Water Hangers/ Rough-in (Research)	59 days	Wed 4/4/07	Mon 6/25/07
37	Domestic Water Hangers/ Rough-in (Research)	52 days	Thu 4/19/07	Fri 6/29/07
38	Medical Gas Hangers/ Rough-in (Research)	63 days	Thu 4/19/07	Mon 7/16/07
39	In-Wall Plumbing Rough-in (Research)	48 days	Mon 5/14/07	Wed 7/18/07
40	Domestic Water Fixtures/ Finishes (Research)	29 days	Fri 8/3/07	Wed 9/12/07
41	Install & Pipe Dom. Hot Water Generator (CUP)	15 days	Thu 8/9/07	Wed 8/29/07
42	Medical Gas Oulets/ Finishes (Research)	29 days	Tue 8/21/07	Fri 9/28/07
43	Install & Pipe Service Air & Vacuum Equip. (CUP)	20 days	Thu 8/30/07	Wed 9/26/07
44	Piping Insulation (CUP)	15 days	Fri 9/14/07	Thu 10/4/07
45	**H.V.A.C.**	**1 day**	**Wed 11/29/06**	**Wed 11/29/06**



Project: City Hospital1b
Date: Thu 11/1/07

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

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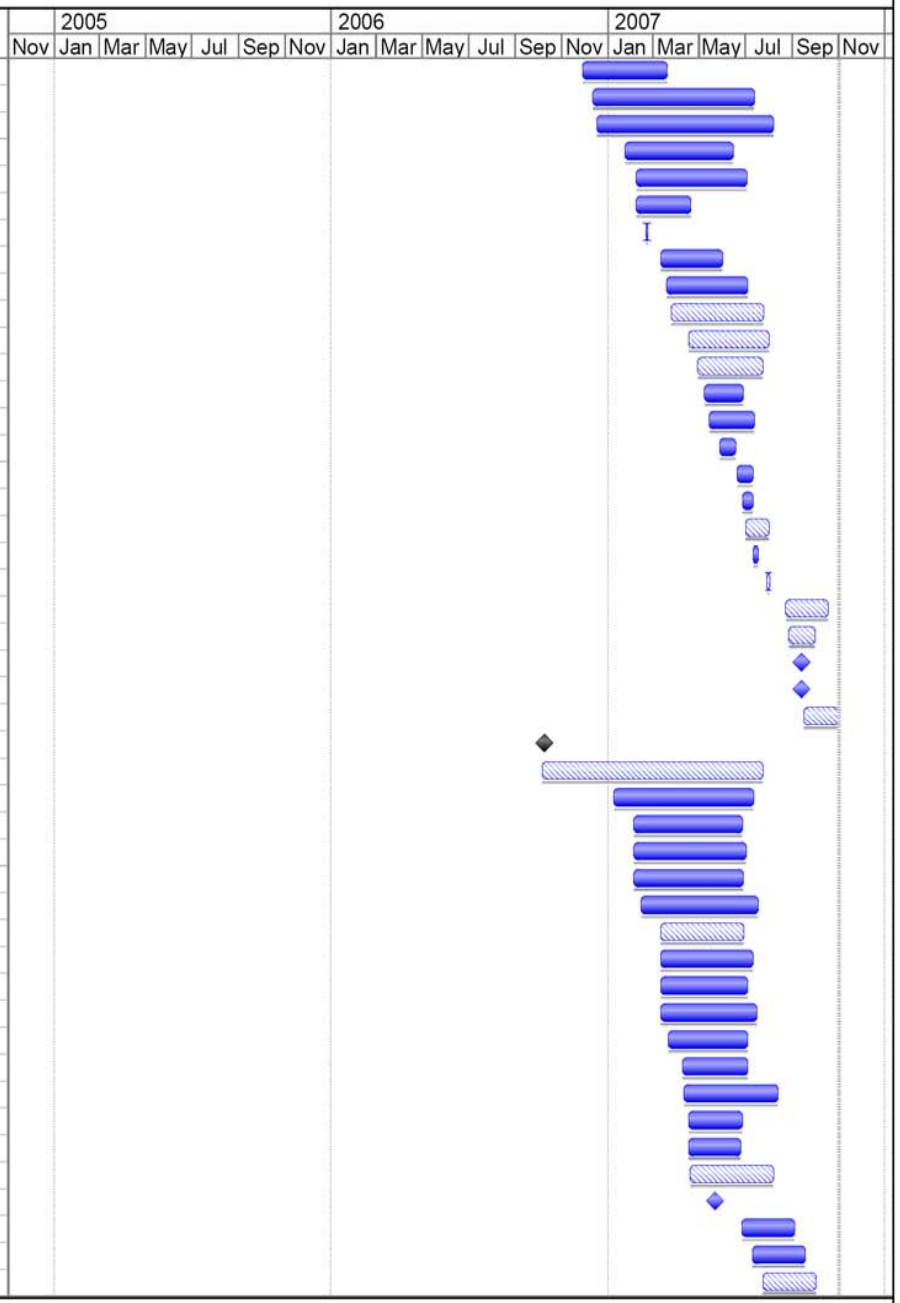
City Hospital
Figure 2.6 Project Schedule

ID	Task Name	Duration	Start	Finish
46	Bolier System- Install Boiler Breeching (CUP)	81 days	Wed 11/29/06	Tue 3/20/07
47	ACU System Rough-in	154 days?	Wed 12/13/06	Fri 7/13/07
48	AHU- Rough-In Ductwork (CUP)	168 days	Mon 12/18/06	Tue 8/7/07
49	Duct Riser Rough-in (Research)	104 days	Wed 1/24/07	Fri 6/15/07
50	Duct Main Rough-in (Research)	104 days	Thu 2/8/07	Tue 7/3/07
51	Duct Main Rough-in (Research)	52 days	Thu 2/8/07	Fri 4/20/07
52	Set Chiller #1 and #2 (CUP)	2 days	Wed 2/21/07	Thu 2/22/07
53	Install Branch Duct and Air Valves (Research)	60 days	Mon 3/12/07	Fri 6/1/07
54	Duct Branches Hangers/ Rough-in (Research)	77 days	Tue 3/20/07	Wed 7/4/07
55	Install Mech. Piping (Research)	88 days	Mon 3/26/07	Wed 7/25/07
56	Duct & Piping Insulation (Research)	76 days	Wed 4/18/07	Wed 8/1/07
57	Steam Piping Hangers/ Rough-in (Research)	62 days	Mon 4/30/07	Tue 7/24/07
58	Trim-out (CUP)	37 days	Wed 5/9/07	Thu 6/28/07
59	Install VCV Boxes-Level A- (Research)	44 days	Tue 5/15/07	Fri 7/13/07
60	Steam Piping Hangers/Rough-in (Research)	15 days	Tue 5/29/07	Mon 6/18/07
61	Hot Water Piping Hangers & Rough-in (Research)	15 days	Thu 6/21/07	Wed 7/11/07
62	Hang CHU's & Final Connections	10 days	Thu 6/28/07	Wed 7/11/07
63	Steam Piping Final Connections (Research)	23 days	Mon 7/2/07	Wed 8/1/07
64	Hang Unit Heaters & Connections (Research)	5 days	Thu 7/12/07	Wed 7/18/07
65	Set Cooling Towers	4 days	Mon 7/30/07	Thu 8/2/07
66	CUP Mechanical Equipment Start-up	40 days	Fri 8/24/07	Thu 10/18/07
67	Duct Accessories (Research)	25 days	Tue 8/28/07	Mon 10/1/07
68	Cooling Towers Start Up	1 day	Fri 9/14/07	Fri 9/14/07
69	Coolling Towers Start-Up	1 day	Fri 9/14/07	Fri 9/14/07
70	CUP Mechanical Equip. Commissioning	33 days	Mon 9/17/07	Wed 10/31/07
71	**Electrical**	**1 day**	**Tue 10/10/06**	**Tue 10/10/06**
72	Elect. Power/Light./Fire Alarm Rough-In (CUP)	210 days	Sat 10/7/06	Tue 7/24/07
73	Security Rough-in (CUP)	134 days	Tue 1/9/07	Thu 7/12/07
74	Install Electrical Equip. (CUP)	103 days	Mon 2/5/07	Wed 6/27/07
75	Install Electrical Power Panels (CUP)	106 days	Mon 2/5/07	Mon 7/2/07
76	Install Electrical Lighting Panels (CUP)	104 days	Mon 2/5/07	Thu 6/28/07
77	Telecommunications/ Data Rough-in (CUP)	111 days	Wed 2/14/07	Wed 7/18/07
78	Electrical Power Rough-in (Research)	80 days	Mon 3/12/07	Fri 6/29/07
79	Electrical Lighting Rough-in (Research)	88 days	Mon 3/12/07	Wed 7/11/07
80	Electrical Security Rough-in (Research)	83 days	Mon 3/12/07	Wed 7/4/07
81	In-Wall Electrical Rough-in (Research)	91 days	Mon 3/12/07	Mon 7/16/07
82	Run Commun. Ductbank for Tele./Data (Research)	75 days	Thu 3/22/07	Wed 7/4/07
83	Corridor Electrical Rough-in (Research)	62 days	Tue 4/10/07	Wed 7/4/07
84	Electrical Fire Alarm Rough-in (Research)	88 days	Thu 4/12/07	Mon 8/13/07
85	Heating Hot Water Hangers/ Rough-in (Research)	51 days	Wed 4/18/07	Wed 6/27/07
86	Chilled Water Mains Hanger/ Rough-in (Research)	49 days	Wed 4/18/07	Mon 6/25/07
87	Telecommunications/ Data Rough-in (Research)	78 days	Fri 4/20/07	Tue 8/7/07
88	Permanent Power	1 day	Wed 5/23/07	Wed 5/23/07
89	Electrical Power Panel/ Outlet Finishes (CUP)	50 days	Wed 6/27/07	Tue 9/4/07
90	Electrical Lighting Panel/ Fixture Finishes (CUP)	50 days	Wed 7/11/07	Tue 9/18/07
91	Electrical Fire Alarm Devices/ Finishes (CUP)	50 days	Wed 7/25/07	Tue 10/2/07



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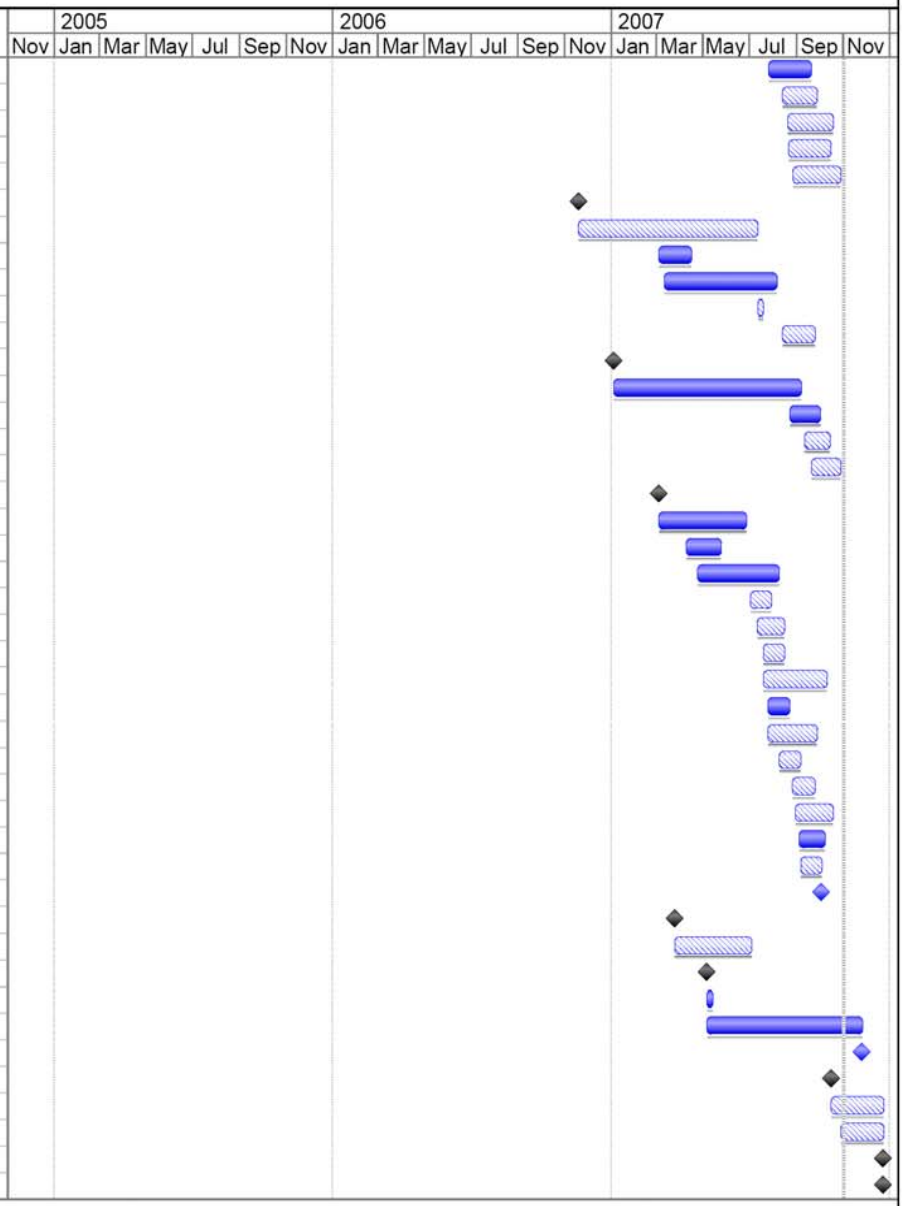
City Hospital
Figure 2.6 Project Schedule

ID	Task Name	Duration	Start	Finish
92	Telecommunications/ Data Outlets/ Finishes(CUP)	40 days	Fri 7/27/07	Thu 9/20/07
93	Electrical Lighting Fixtures/ Finishes (Research)	34 days	Tue 8/14/07	Fri 9/28/07
94	Security, F/A, Data System Trimout (Research)	44 days	Tue 8/21/07	Fri 10/19/07
95	Electrical Security Devices/ Finishes (CUP)	40 days	Wed 8/22/07	Tue 10/16/07
96	Electrical Power Trimout (Research)	45 days	Tue 8/28/07	Mon 10/29/07
97	**Fire Protection**	**1 day**	**Mon 11/20/06**	**Mon 11/20/06**
98	Sprinklers Rough-in and Equip. Install. (CUP)	170 days	Mon 11/20/06	Thu 7/12/07
99	Corridor Fire Protection Rough-in (Research)	31 days	Mon 3/5/07	Mon 4/16/07
100	Install Fire Suppression System (Research)	106 days	Mon 3/12/07	Mon 8/6/07
101	Sprinklers Testing (CUP)	5 days	Fri 7/13/07	Thu 7/19/07
102	Install sprinkler Hood & Heads (Research)	31 days	Tue 8/14/07	Tue 9/25/07
103	**Equipment**	**1 day**	**Fri 1/5/07**	**Fri 1/5/07**
104	Metal Doors & Hardware- (Research)	177 days	Fri 1/5/07	Fri 9/7/07
105	Toilet & Locker Room Finishes (Research)	28 days	Fri 8/24/07	Tue 10/2/07
106	Metal Door & Hardware- (CUP)	24 days	Wed 9/12/07	Mon 10/15/07
107	Install Equip., Casework, & Furniture (Research)	27 days	Fri 9/21/07	Mon 10/29/07
108	**Finishes**	**1 day**	**Mon 3/5/07**	**Mon 3/5/07**
109	Layout Partitions (Research)	83 days	Mon 3/5/07	Wed 6/27/07
110	Stud Framing & Drywall (Research)	34 days	Tue 4/10/07	Fri 5/25/07
111	Hang Gypsum Board Walls (Research)	77 days	Wed 4/25/07	Thu 8/9/07
112	Frame Gypsum Board Ceilings (Research)	20 days	Tue 7/3/07	Mon 7/30/07
113	Hang Ceiling Gypsum Board (Research)	26 days	Thu 7/12/07	Thu 8/16/07
114	Ceiling and Flooring Painting- (CUP)	20 days	Fri 7/20/07	Thu 8/16/07
115	Interior Finishes- (CUP)	60 days	Fri 7/20/07	Thu 10/11/07
116	Ceramic Tile (Research)	21 days	Thu 7/26/07	Thu 8/23/07
117	Painting (Research)	47 days	Thu 7/26/07	Fri 9/28/07
118	Install Acoustical Ceiling- (CUP)	20 days	Fri 8/10/07	Thu 9/6/07
119	Lay-in Ceiling Tile	22 days	Mon 8/27/07	Tue 9/25/07
120	Resinous Floor Finish (Research)	36 days	Fri 8/31/07	Fri 10/19/07
121	Install Flooring (Research)	24 days	Wed 9/5/07	Mon 10/8/07
122	Install Flooring- (CUP)	20 days	Fri 9/7/07	Thu 10/4/07
123	Interior Finishes Complete	1 day	Thu 10/4/07	Thu 10/4/07
124	**ATC**	**1 day**	**Mon 3/26/07**	**Mon 3/26/07**
125	Install ATC Systems (Research)	73 days	Mon 3/26/07	Wed 7/4/07
126	**Elevators**	**1 day**	**Mon 5/7/07**	**Mon 5/7/07**
127	Elevator Installation (C.U.P.)	6 days	Mon 5/7/07	Mon 5/14/07
128	Elevator Installation (Research)	146 days	Mon 5/7/07	Mon 11/26/07
129	Elevators Finish	1 day	Mon 11/26/07	Mon 11/26/07
130	**Commissioning**	**1 day**	**Wed 10/17/07**	**Wed 10/17/07**
131	Punchlist	49 days	Wed 10/17/07	Mon 12/24/07
132	MEP Commissioning/ Test and Balance	40 days	Tue 10/30/07	Mon 12/24/07
133	Temp. Cert. of Occupany	1 day	Mon 12/24/07	Mon 12/24/07
134	Substanstial Completion	1 day	Mon 12/24/07	Mon 12/24/07



Project: City Hospital1b
Date: Thu 11/1/07

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

Monjia Belizaire
Construction Management

IV. Assemblies Estimate

An assemblies estimate was created for the Telecommunications system for City Hospital. The telecommunication system includes a raceway support system for all essential low voltage communication wiring provided in the building. The raceway support system shall include rough-in, outlet boxes, conduit, junction boxes, etc. to accommodate various parts of the system. Cabling will be installed for the telephone system, security system (door access, card reader system), data system (CAT 6 copper cabling), and television system. Phones and data jacks are provided in each room. This wiring system installed will ensure the research space runs as a state of the art research facility and provides sufficient communication abilities. The telecommunication system is powered from the life safety and critical branches of the electrical system per code. The total estimate for the telecommunication system estimate is approximately $800,000.

Assemblies System Estimate- Telecommunications				
	Takeoff Quantity	Units	Unit Price	Total
Data Raceway				
4" sleeves & seating	36	ea.	110	$3,960.00
4" X 8" Fire retardent plywood	56	sht.	216.01	$12,096.56
4" conduit- MDF	6,075	LF	31.33	$190,329.75
3" maxcell fabric innerduct	19000	LF	3.79	$72,010.00
Data Fiber				
12MM/128M fiber termination	16	ea.	1740.44	$27,847.04
Fiber backbone- 24 strands fiber	4,000	LF	40.53	$162,120.00
Data Outlets				
Tele. wall outlet	69	ea.	55.07	$3,799.83
Tele./Data wall outlet (voice)	21	ea.	55.07	$1,156.47
4 pair Cat 6- plenum rated cable- voice	23,115	LF	1.03	$23,808.45
4 pair Cat 6- plenum rated cable- voice/data	12,600	LF	1.03	$12,978.00
Copper backbone- 200 pair Cat 3	4,000	LF	13.16	$52,640.00
Testing & Labeling	1	LS	7788.09	$7,788.09
Tele./Data wall outlet (wireless)	15	ea.	55.07	$826.05
Communications hardware				
Cat 6 panels	8	ea.	2074.07	$16,592.56
Copper backbone patch panels	16	ea.	2074.07	$33,185.12
Fiber Backbone patch panels	16	ea.	2074.07	$33,185.12
Fiber OSP patch panel	1	ea.	2074.07	$2,074.07
Copper OSP 48 port patch panel	1	ea.	2074.07	$2,074.07
Telecommunication racks	36	ea.	1809.65	$65,147.40
Installation and connection of hardware	1	LS	25987.86	$25,987.86
Data Grounding				
Copper OSP lighting protection-MDF	3	ea.	1807.62	$5,422.86
Grounding bus bars	9	ea.	361.52	$3,253.68
2" conduit with #3/0 ground	500	LF	16.36	$8,180.00
#3/0 AWG	600	LF	2.51	$1,506.00
#6 AWG Telecom. Ground	1000	LF	2.94	$2,940.00
4" conduit with #3/0 ground	400	LF	38.22	$15,288.00
TOTAL				**$786,196.98**
Labor, equipment, and material included				
Location factor included				

Figure 2.7: Telecommunications Estimate

V. Structural System Estimate

The building structure consists of steel framing with concrete decking for the Research Facility. The major structural components of this building are concrete, steel, and masonry. In total there are approximately 4,300 tons of steel to be erected and 23,000 cubic yards of concrete to used used on the City Hospital project. The total estimate for the structural system was approximately $16,000,000.

The following table in Fig 2.8 provides a detailed estimate of the structural system with reference from RS Means Building Construction Cost Data, RS Means Costworks, and Turner Construction.

Structural System Estimate					
		Takeoff Quantity	Units	Unit Price	Total
Concrete					**$4,387,350.02**
0330	Column footings, 4000psi	1800	CY	113.62	$204,516.00
0330	Concrete pad, 4000 psi	800	CY	113.62	$90,896.00
0330	Wall footings, 4000 psi	1225	CY	113.62	$139,184.50
0330	Shear wall footings, 6000 psi	1880	CY	113.62	$213,605.60
0330	Pit slabs, 4000 psi	135	CY	113.62	$15,338.70
0330	Foundation walls, 4000 psi	4100	CY	113.62	$465,842.00
0330	Shear walls, 4000 psi	2445	CY	113.62	$277,800.90
0330	Pit walls, 4000 psi	147	CY	113.62	$16,702.14
0330	Oil/Elect. Slab, 4000 psi	130	CY	113.62	$14,770.60
0330	Oil/Elect. Walls, 4000 psi	250	CY	113.62	$28,405.00
0330	6" Slab on Grade	1,600	CY	103.29	$165,264.00
0330	Concrete walls @ loading dock	45	CY	113.62	$5,112.90
0330	Retaining wall @ loading dock	4	CY	113.62	$454.48
0330	Slab on metal deck	5750	CY	113.62	$653,315.00
0330	12" flat slab @ A level	60	CY	113.62	$6,817.20
0341	Precast Slab- 10" thick (Equip. access)	750	sfca	32.39	$24,292.50
0341	Precast Slab- 10" thick (oil vault access)	1700	sfca	32.39	$55,063.00
0311	Forms in Place, steel framed plywood	237,882	sfca	6.92	$1,646,143.44
0331	Placing concrete and vibrating, pumped	20,371	CY	17.86	$363,826.06
Masonry					**$2,266,419.12**
0154	Scaffolding	52,320	sf	6.20	$324,384.00
0422	8" CMU wall, reinforced, 8"X16"X*# thk	52,320	sf	16.72	$874,790.40
0422	4" CMU wall veneer	52,320	sf	11.07	$579,182.40
0721	Cavity insulation, foam glass	52,320	sf	3.64	$190,444.80
0405	Grouting (single)	102	opng	61.97	$6,320.94
0405	Grouting (pair)	25	opng	96.58	$2,414.50
0422	8" reinforced CMU, bond beam	8,640	sf	18.28	$157,939.20
0422	6" reinforced CMU, grout filled, bond beam	560	sf	18.70	$10,472.00
0422	6" reinforced CMU, bond beam	6,704	sf	17.97	$120,470.88
0405	CMU patching				$0.00
Metals					**$9,541,482.00**
0512	WF floor/ roof beams	1,100	ton	1652.65	$1,817,915.00
0512	WF columns	1,250	ton	1601.00	$2,001,250.00
0512	Column base plates, fabricated	200,000	lb	5.12	$1,024,000.00
0512	Built up, fabricated plate columns	750	ton	1936.69	$1,452,517.50
0512	Connections	150	ton	1859.23	$278,884.50
0512	Channels and angles, floor framing	100,000	lb	5.06	$506,000.00
0321	Reinforcing in Place	1,034	ton	1515.00	$1,566,510.00
0322	WWF 4X4- W1.4X W1.4	845	csf	42.00	$35,490.00
0322	WWF 6X6- W4.0X W4.0	2,650	csf	54.50	$144,425.00
0531	Metal floor deck, 3" deep, 22 ga.	270,000	sf	2.17	$585,900.00
0512	Bent plates edge form, 3/8" thk	3,850	lf	33.40	$128,590.00
TOTAL					**$16,195,251.14**

Stairs not included
Tools included in general conditions
Steel W members included in roof/beams and col. item
Labor, material, and equipment included

Figure 2.8 Structural System Estimate