2010

GLOBAL VASCULAR INSTITUTE
BUFFALO, NY

Madison Smith
CONSTRUCTION MANAGEMENT
Dr. Riley

TECHNICAL ASSIGNMENT TWO

TECHNICAL ASSIGNMENT TWO

MADISON SMITH – CM

EXECUTIVE SUMMARY

Technical Assignment Two is designed to document the existing conditions of the Global Vascular Institute site in further detail. The Global Vascular Institute (GVI) project consists of three major construction structures. These include the main core building, a link between the new GVI building and the existing Buffalo General Hospital, and an addition to the adjacent central plant. The core building of this project is to be 10 stories and 450,000 SF of new construction. The link is 4 stories and 14735 SF and the central plant is 2 stories and 8627 SF. The difficulty of this project is that it is located at the center of Buffalo, NY, a highly dense urban area. This new construction is occurring in the medical section of the city, right across the street from a major hospital (Buffalo General Hospital) so all surrounding facilities must remain open and functional throughout the construction process.

Major criteria that were assessed in this assignment include a detailed project schedule, site layout plans, a detailed structural systems estimate, a general conditions estimate, and critical industry issues discussed at the 2010 PACE Roundtable. The detailed project schedule is a breakdown of the schedule of the project that depicts the sequencing of trades as work progresses through the building. The site layout plans include an excavation plan and a superstructure plan which depict the key features of the site during that phase of construction. The detailed structural system estimate was performed for the structural steel and concrete used in all three components of the projects. The general conditions estimate consists of the projected costs for supervision/personnel, construction facilities/equipment, temporary utilities and other miscellaneous project costs. Lastly, a summary of the critical issues discussed at the 2010 PACE Roundtable is included in the report.

TABLE OF CONTENTS

Detailed Project Schedule

*See APPENDIX A for the Detailed Project Schedule.

The Global Vascular Institute project consists of three major components which include the main GVI core building, the link between the GVI core and the existing Buffalo General Hospital, and additions to the adjacent central power plant. All three of these components are sequenced to be constructed at the same time. The schedule in APPENDIX A is broken down so that each of the three components individual schedules is separated from the others. The central plant schedule is then broken down further into three sections for each of the addition areas of the building. All major milestones of the project are shown in Table 1.

The first phase of the project was to demolish the existing 4 story community mental health clinic that was on the core building site. This phase was completed prior to the approval from the City of Buffalo and the State of New York to perform the new construction of GVI. With the site cleared and receiving the notice to proceed on July 7, 2009, the next major phase was excavation work. This was scheduled to begin in September 2009 and to be completed by November 2009. Additional excavation for the central plant utility tunnel was set to begin in February 2010 and take only 4 days to complete. Foundation work was planned to begin during the excavation phase and continue till February 2010. This consists of piles, piles caps, grade beams. The foundation work for the central plant though would not begin until January 2010.

The first major milestone after the notice to proceed was to mobilize the crane for the erection of steel on January 11, 2010 with the process of the superstructure construction being scheduled to top off in July 2010. During this phase, enclosure work began in July with the milestone of a dry building to be accomplished in November 2010. Rough-In and finish work began in June and will continue until May 2011. After testing/balance and the punch lists being performed from September 2011 to October 2011, substantial completion and turnover of the sub-basement to level three of the building is set for October 2011. This is required by the owner so that operations between GVI and Buffalo General Hospital can begin to be coordinated. Turnover and Occupancy of the building is set for December 2011. See Appendix A for the Project Summary Schedule.

MILESTONE	DATE
Notice to Proceed	7/7/2009
Top Out	7/13/2010
Building Dry	11/30/2010
Substantial Completion (1st)	10/17/2011
Substantial Completion (Final)	12/12/2011

Table 1: Lists of Milestones and Dates

SITE LAYOUT PLANNING

***See APPENDIX B for the Site Layout Plans**

Figure 1: Google Map Image of GVI Site and Surrounding Area

The site for the Global Vascular Institute is located at the center of multiple medical facilities in downtown Buffalo, NY, as shown above in Figure 2. GVI is located directly north of the existing Buffalo General Hospital. Part of the construction of the GVI project is to create a 4 story link between the existing and new structure. The project is also two blocks north of the Roswell Park Cancer Institute which is a cancer research facility. Directly east of the GVI site is the Central Power Plant which supplies power to Buffalo General Hospital and will also supply power to GVI. Adjacent to the Central Plant and across the street (Ellicott St.) to the west of the GVI site are parking areas that are available to use during the construction of the project.

EXCAVATION SITE LAYOUT

Due to all of the nearby existing structures, the size of the available space on the site is limited. All of the trailers are located along the edges of the site so that they are easily accessible to the trades. The excavation will proceed from the South-West corner of the site to the North-East corner. This will allow less congestion and increased flow through the site since the trucks will be entering the site from the west and exiting to the East. The soil stockpile is located near the exit as well so that the equipment performing the excavation can follow the flow pattern of the site and will not block the entrance. Additional material storage is located in the South-East corner so that it is easily accessible to all three of the structures of the project and remains out of the way of the equipment. See Appendix B for ***Excavation Phase Site Plan.***

SUPERSTRUCTURE SITE LAYOUT

Due to the limited open space of the site, the most beneficial location for the tower crane is to have it located along the East side of the building. This will allow the crane to reach the entire core building area and the link building area. The trailers will remain in the same location as those of the excavation phase, but just of different trades. The soil stockpile space will be replaced by steel shakeout due to that space being the largest open space available on the site. Additional material storage will remain in the same location as in the excavation phase since it is centrally located between the three components. See Appendix B for ***Superstructure Phase Site Plan.***

CONTRACTOR LAYOUT CRITIQUE

The layouts shown in Appendix B are both similar to the actual layouts used by the contractors with the exception of a few small changes. One space that was required to remain the same during the duration of the construction of the project was the open space for the owner. This space was required so that the owner could utilize it for their needs. One difference between the actual excavation plan and the excavation plan shown in Appendix B is that the actual plan had additional soil stockpile space located in some of the space occupied by dumpsters. This was changed in the Appendix B plan because it would be easier just to have all of the soil in one place. Overall, the site layouts plans used by the contractors meet the needs of the site and the trades to its fullest potential. Everything is laid out so that it is easily accessible, there is steady flow across the site so that congestion is limited, and with the materials located between all three components, there is no disturbing the other structures during construction.

DETAILED STRUCTURAL SYSTEMS ESTIMATE

*See APPENDIX C for the complete Structural System Estimate.

The superstructure of the Global Vascular Institute is primarily structural steel columns and beams with composite decking. The foundations are mostly composed of cast-in-place concrete. A typical bay in each of the three structures (core building, link, and central plant) was broken down and takeoffs were performed. Figure 2a, 2b, and 2c below show the location of the typical bay used for each takeoff and estimate.

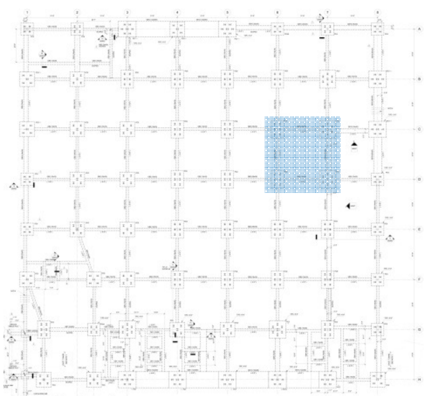


Figure 2a: Core Building Typical Bay

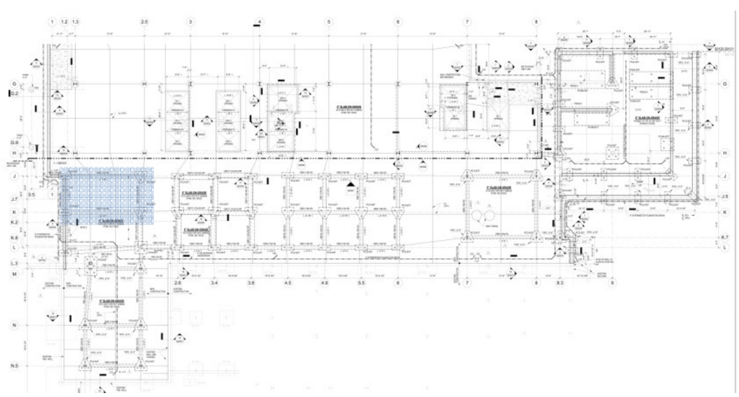


Figure 2b: Link Typical Bay

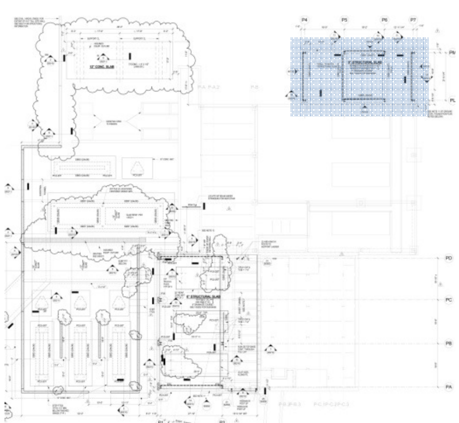


Figure 2c: Central Plant Typical Bay

Table 2 shows a cost breakdown of the superstructure based on CSI Masterformat groupings. A more detailed breakdown is available in Appendix C. The takeoffs in Appendix C are broken down by each building and then by material. All of the costs for materials, labor, equipment, and total O&P were obtained from RS Means 2010 Building Construction Cost Data. The construction of the superstructure occurred during the 2010 year so a time modification was not necessary. The SF of each typical bay and the overall SF of the building were used to extrapolate the total cost of the building.

COST BREAKDOWN SUMMARY	
COMPONENT	**COST**
031100 – Concrete Formwork	$248651.47
032100 – Concrete Reinforcing Steel	$140766.69
033000 – Cast-In-Place Concrete	$3434796.64
051223 – Steel Columns	$7607438.25
051223 – Steel Beams	$31327652.85
053133 – Steel Decking	$1159912.96
TOTAL:	**$44,845,175.95**

Table 2: Cost Breakdown Summary

Some of the assumptions used with RS Means to determine the pricing for each item include:

- All formwork was one use.
- The cost of formwork and rebar for the pile caps is included in the cost of the concrete.
- Not all steel column and beam sizing were listed in RS Means so the next closest size member costs were used.

GENERAL CONDITIONS ESTIMATE

***See APPENDIX D for the complete General Conditions Estimate.**

Table 3 shows a summary of the line items of the general conditions estimate for the Global Vascular Institute. This summary is an approximation and does not reflect the actual costs of the general conditions agreed upon by Turner Construction Company.

LINE ITEM	UNIT	UNIT RATE	QUANTITY	TOTAL COST
Construction Manager Personnel	MONTH	$78,474.07	27	$2,118,800.00
Temporary Facilities	MONTH	$6,887.04	27	$185,950.00
Temporary Utilities	MONTH	$7,020.74	27	$189,560.00
Miscellaneous Costs	MONTH	$7,620.37	27	$205,750.00
			TOTAL:	**$2,700,060.00**

Table 3: General Conditions Estimate Summary

The general conditions estimate was broken down into four main categories which include, Construction Manager Personnel, Temporary Facilities, Temporary Utilities, and Miscellaneous Costs. **Construction Manager Personnel** includes the major players involved on the project from Turner Construction Company (construction manager). The **Temporary Facilities** consist of items such as the jobsite trailer, site fence, mobile phones, dumpsters, and signage. These are all items that are necessary for the construction management team to be able to work on and complete the project on time at the project site. The **Temporary Utilities** are the items that are necessary for functionality of the site. This includes items such as IT/Network service, power installation and consumption, and potable water. Lastly, the **Miscellaneous Costs** account for all other items that do not fall into any of the other categories. This would be things such as progress photographs, document reproduction, and travel expenses.

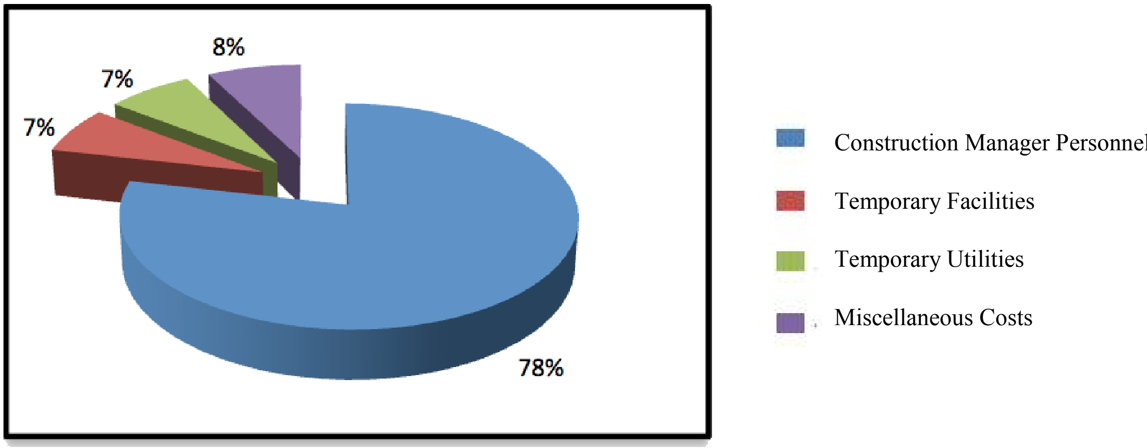


Figure 3: General Conditions Breakdown by Percent

Figure 3 depicts the breakdown of general conditions costs based on percentage. This shows that the vast majority, 78%, of the general conditions costs are from the construction manager personnel staffing costs.

CRITICAL INDUSTRY ISSUES

The 2010 PACE Roundtable was held on October 27-28. Along with industry and student discussion panels, there were three main break-out sessions pertaining to the following issues:

- Sustainability/Green Building
- Technology Applications
- Process Innovation

BREAK-OUT SESSION #1

For the first break-out session, I attended the discussion on Transformation: What are the innovations that will transform our industry. It was led by Professor Messner and the main focus of the session was about new innovations in the construction industry. The discussion was formatted so that industry members and students would openly exchange information about new technologies and techniques that they had either heard about being used or had personally used on a project. Some of these ideas included BIM, prefabrication, wireless technologies, Latista (a web-based program), laser scanning, rapid prototyping, etc. Along with the actual technologies, the idea of tying all of these technologies together was discussed.

Also, the importance of creating metric systems to compare the difference technologies and techniques used was brought up. If there is no data to support these ideas, the ability to market these products would be extremely difficult. Clients need to be able to see that investing in these new innovations will save them time and money in the long run for their project. One example of an organization that is currently promoting their product well is USGB (U.S. Green Building) with LEED. Information about other projects is available on their website to evaluate so that clients can see the benefits of pursuing LEED on their project.

Another topic discussed was how work out in the field would embrace these new technologies. When you have people that have been working in the construction industry since before any of these ideas were even thought of, it can be difficult to change a person's methods of doing things. This session was ended with a short discussion of how to integrate these ideas into the construction industry. Some ideas were to educate students learning about the construction industry more about BIM and these ideas while they are still in school. That way when they start their first job they are ready to start to apply these ideas to the projects that they are working on right away. Another idea was to increase BIM training and such for a company's current

employees. With this training, people are always learning about these new technologies and techniques that could be used on the projects that they are currently working on.

BREAK-OUT SESSION #2

For the second break-out session, I attended the discussion on The Smart GRID: Energy impacts in the building industry. It was led by Professor Riley and the main focus of the session was about what a Smart Grid is and how a building can be connected into it. The four main issues discussed with a Smart Grid were power generation and distribution, advanced metering, the use of smaller distributed power plants, and energy efficiency and controls. Of these four, two were discussed in further detail.

The first of these topics further discussed was advanced metering. This topic pertains to when during the day buildings are using the most power and where in the building the most power is being used. With the use of advanced metering, both of these issues can be tracked within the building and then controls can be put into place to reduce energy consumption during peak hours and in turn save money on energy costs.

The second topic of energy efficiency and controls deals with not wasting energy and having buildings meet more restrictions than just what the current codes require. One type of load that was discussed that can be reduced in a building is phantom loads. These are the items that when plugged in, continue to draw power even in when there are turned off. A solution to this problem would be to either unplug the items from the wall or to connect them to a power strip and then turn the power strip off when those items are not in use. Another technique discussed to increase efficiency of the building is the use of controls. One example of this is having individual occupant controls so that each person can adjust their space to their comfort. Also, the training of maintenance workers of the building on the controls of the building was also discussed. If the controls set-up for the building are not maintained properly and not used the way that they were intended, the opportunity for savings of energy and costs is lost. The last idea of energy efficiency and controls discussed was load leveling. This idea was described as the “holy grail” of the Smart GRID. This idea involves energy storage; storing up energy during the night when energy is cheaper and then using this energy during the day. For example, ice would be made during the night, and then during the day, the ice would be melted to cool the building. This idea of load leveling has begun an advance in battery design so that they can have an extended life and better efficiency.

SURPRISING INFORMATION LEARNED

Of everything discussed, a few specific ideas really caught my attention because I had never heard of anything like it before. One of these ideas was a product that Armstrong produces. It is an electrically charged ceiling tile that is when an LED is clipped to it, it turns on. When you touch the ceiling tile though, you don't feel the charge. Another topic that surprised me was cyber security. It never occurred to me that hackers could use your energy consumption levels to determine when you are not home.

ISSUES APPLIED TO GVI

Some of the topics that were discussed and could be researched further and applied to the Global Vascular Institute are the use and implementation of BIM. This could be extremely useful as that GVI is a hospital with advanced medical research. Using BIM would help to work out coordination issues with the MEP trades before installation issues in the field arise saving time and costs. Other topics that could be applied to GVI would be the use of PV panels as a part of the façade of the building. Since the façade is so different from all the buildings around it anyway and the system is comprised mostly of aluminum panels, the addition of PV panels could be a possible solution to reducing energy costs.

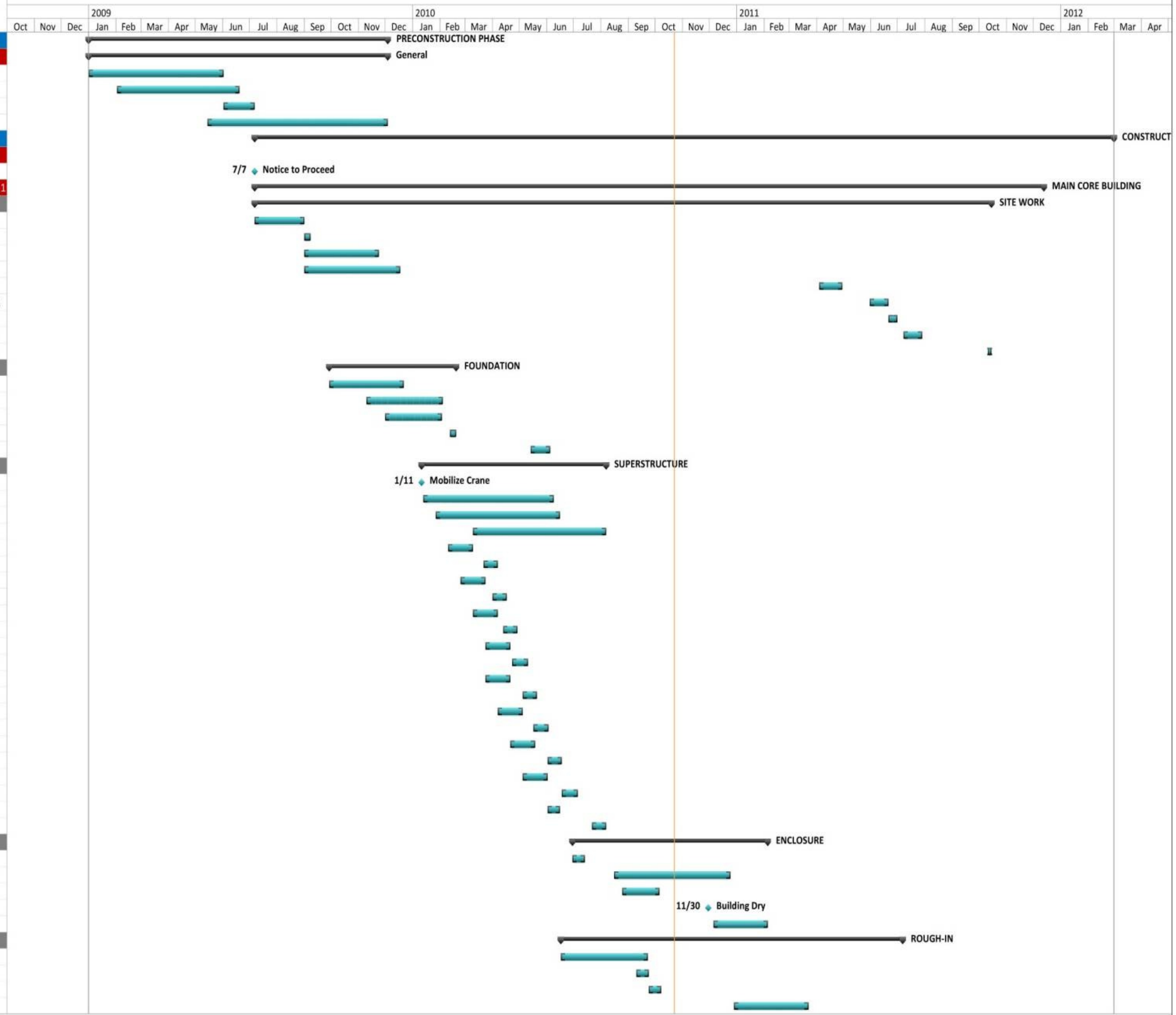
KEY CONTACTS

Individuals that attended the PACE roundtable event that could be helpful in the future for research on the Global Vascular Institute include Charles Tomasco with Truland Systems Corporation, Stan Carlat with Hensel Phelps, Tyler Swartzwelder with Gilbane Building Company, and John Bechtel with Office of the Physical Plant, and a few others from the breakout sessions.

APPENDIX A: PROJECT SUMMARY SCHEDULE

TECHNICAL ASSIGNMENT #1 GLOBAL VASCULAR INSTITUTE MADISON SMITH

ID	Task Name	Duration	Start	Finish
1	PRECONSTRUCTION PHASE	241 days	Thu 1/1/09	Thu 12/3/09
2	General	241 days	Thu 1/1/09	Thu 12/3/09
3	Design Phase	108 days	Thu 1/1/09	Mon 6/1/09
4	Demolition	100 days	Mon 2/2/09	Fri 6/19/09
5	Permit	25 days	Tue 6/2/09	Mon 7/6/09
6	Bid & Award	145 days	Fri 5/15/09	Thu 12/3/09
7	CONSTRUCTION PHASE	692 days	Tue 7/7/09	Wed 2/29/12
8	GENERAL			
9	Notice to Proceed	0 days	Tue 7/7/09	Tue 7/7/09
10	MAIN CORE BUILDING	635 days	Tue 7/7/09	Mon 12/12/11
11	SITE WORK	594 days	Tue 7/7/09	Fri 10/14/11
12	Mobilization	40 days	Tue 7/7/09	Mon 8/31/09
13	Site Fence	5 days	Tue 9/1/09	Mon 9/7/09
14	Excavation	60 days	Tue 9/1/09	Mon 11/23/09
15	Retaining System	78 days	Tue 9/1/09	Thu 12/17/09
16	Granite Curbs	20 days	Mon 4/4/11	Fri 4/29/11
17	Sidewalks	15 days	Tue 5/31/11	Mon 6/20/11
18	Asphalt Paving Entrance/Parking	8 days	Tue 6/21/11	Thu 6/30/11
19	Curbs	15 days	Fri 7/8/11	Thu 7/28/11
20	Topsoil & Plantings	4 days	Tue 10/11/11	Fri 10/14/11
21	FOUNDATION	103 days	Tue 9/29/09	Thu 2/18/10
22	Piles	60 days	Tue 9/29/09	Mon 12/21/09
23	Foundation Walls	62 days	Tue 11/10/09	Wed 2/3/10
24	Pile Caps and Grade Beams	46 days	Tue 12/1/09	Tue 2/2/10
25	Backfill Foundation Wall	5 days	Fri 2/12/10	Thu 2/18/10
26	Slab-On-Grade	16 days	Fri 5/14/10	Fri 6/4/10
27	SUPERSTRUCTURE	150 days	Mon 1/11/10	Fri 8/6/10
28	Mobilize Crane	0 days	Mon 1/11/10	Mon 1/11/10
29	Structural Steel	105 days	Wed 1/13/10	Tue 6/8/10
30	Steel Decking - Basement	100 days	Wed 1/27/10	Tue 6/15/10
31	Layout/MEP Sleeves, Pour Stops - Basement	108 days	Wed 3/10/10	Fri 8/6/10
32	Steel Decking - 1st Floor	20 days	Wed 2/10/10	Tue 3/9/10
33	Layout/MEP Sleeves, Pour Stops - 1st Level	12 days	Mon 3/22/10	Tue 4/6/10
34	Steel Decking - 2nd Level	20 days	Wed 2/24/10	Tue 3/23/10
35	Layout/MEP Sleeves, Pour Stops - 2nd Level	12 days	Thu 4/1/10	Fri 4/16/10
36	Steel Decking - 3rd Level	20 days	Wed 3/10/10	Tue 4/6/10
37	Layout/MEP Sleeves, Pour Stops - 3rd Level	12 days	Tue 4/13/10	Wed 4/28/10
38	Steel Decking - 4th Level	20 days	Wed 3/24/10	Tue 4/20/10
39	Layout/MEP Sleeves, Pour Stops - 4th Level	12 days	Fri 4/23/10	Mon 5/10/10
40	Steel Decking - 5th Level	20 days	Wed 3/24/10	Tue 4/20/10
41	Layout/MEP Sleeves, Pour Stops - 5th Level	12 days	Wed 5/5/10	Thu 5/20/10
42	Steel Decking - 6th Level	20 days	Wed 4/7/10	Tue 5/4/10
43	Layout/MEP Sleeves, Pour Stops - 6th Level	13 days	Mon 5/17/10	Wed 6/2/10
44	Steel Decking - 7th Level	20 days	Wed 4/21/10	Tue 5/18/10
45	Layout/MEP Sleeves, Pour Stops - 7th Level	12 days	Wed 6/2/10	Thu 6/17/10
46	Steel Decking - 8th Level	20 days	Wed 5/5/10	Tue 6/1/10
47	Layout/MEP Sleeves, Pour Stops - 8th Level	12 days	Fri 6/18/10	Mon 7/5/10
48	Steel Decking - Roof	10 days	Wed 6/2/10	Tue 6/15/10
49	Layout/MEP Sleeves, Pour Stops - Roof	12 days	Thu 7/22/10	Fri 8/6/10
50	ENCLOSURE	158 days	Wed 6/30/10	Fri 2/4/11
51	Roof Deck	10 days	Wed 6/30/10	Tue 7/13/10
52	Curtain Wall Installation	95 days	Mon 8/16/10	Fri 12/24/10
53	Skylights	30 days	Wed 8/25/10	Tue 10/5/10
54	Building Dry	0 days	Tue 11/30/10	Tue 11/30/10
55	Curtain Wall Trim/Finish	45 days	Mon 12/6/10	Fri 2/4/11
56	ROUGH-IN	275 days	Thu 6/17/10	Wed 7/6/11
57	MEP Coordination - Sub-basement	70 days	Thu 6/17/10	Wed 9/22/10
58	MEP Coordination - Basement	10 days	Fri 9/10/10	Thu 9/23/10
59	MEP Coordination - 1st Level	10 days	Fri 9/24/10	Thu 10/7/10
60	MEP Coordination - 2nd Level	60 days	Wed 12/29/10	Tue 3/22/11



Project: Detailed Schedule
Date: Sat 10/23/10

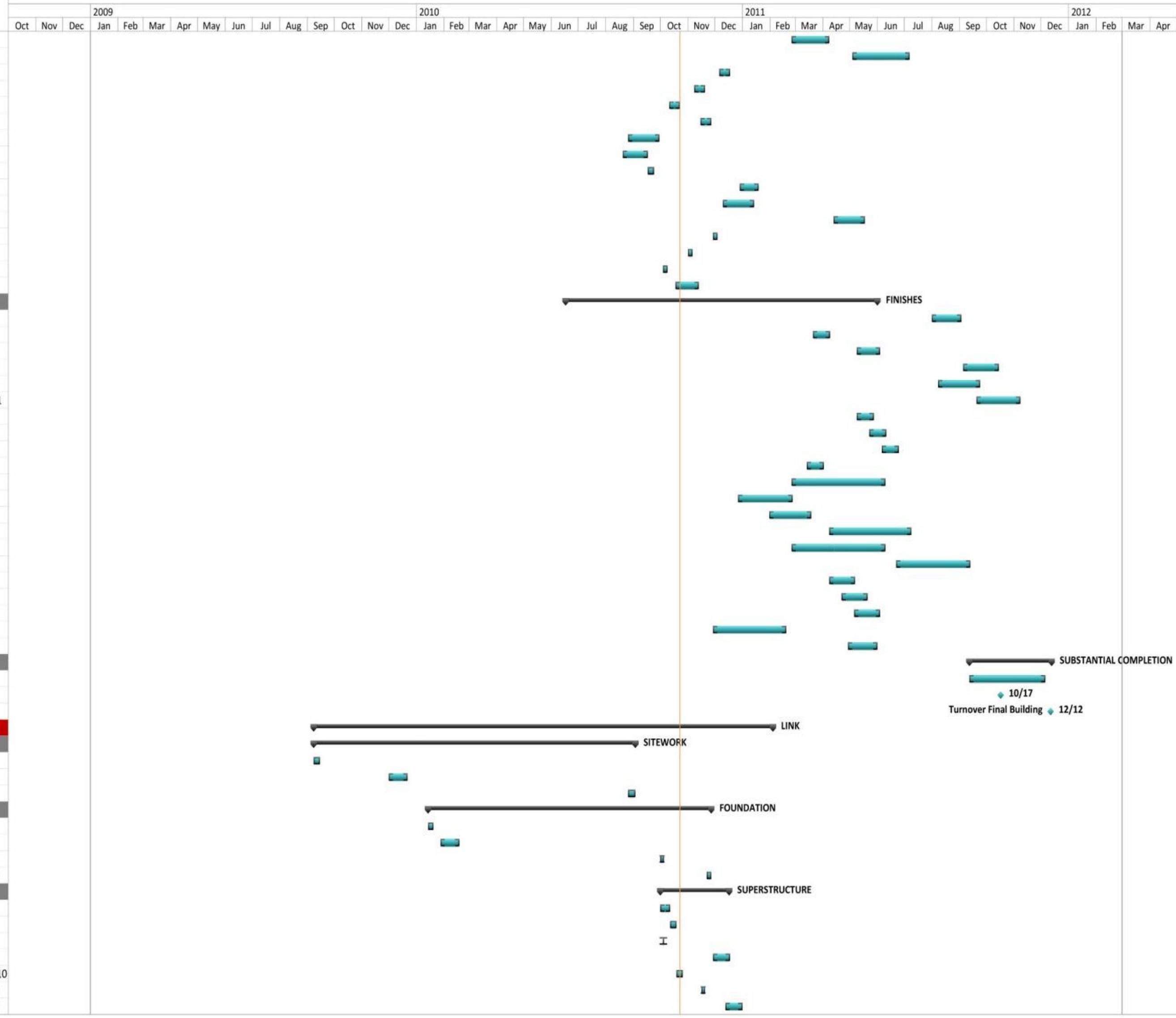
Task		Summary		External Milestone		Inactive Summary		Manual Summary Rollup	
Split		Project Summary		Inactive Task		Manual Task		Manual Summary	
Milestone		External Tasks		Inactive Milestone		Duration-only		Start-only	

Finish-only
Deadline
Progress

Page 1

TECHNICAL ASSIGNMENT #1 GLOBAL VASCULAR INSTITUTE MADISON SMITH

ID	Task Name	Duration	Start	Finish
61	MEP Coordination - 3rd Level	30 days	Fri 2/25/11	Thu 4/7/11
62	MEP Coordination - 4th Level	46 days	Wed 5/4/11	Wed 7/6/11
63	MEP Coordination - 5th Level	10 days	Mon 12/6/10	Fri 12/17/10
64	MEP Coordination - 6th Level	10 days	Mon 11/8/10	Fri 11/19/10
65	MEP Coordination - 7th Level	10 days	Mon 10/11/10	Fri 10/22/10
66	MEP Coordination - 8th Level	10 days	Mon 11/15/10	Fri 11/26/10
67	Metal Stud Installation - Sub-Basement	25 days	Thu 8/26/10	Wed 9/29/10
68	Metal Stud Installation - Basement	20 days	Fri 8/20/10	Thu 9/16/10
69	Metal Stud Installation - 1st Level	5 days	Fri 9/17/10	Thu 9/23/10
70	Metal Stud Installation - 2nd Level	15 days	Wed 12/29/10	Tue 1/18/11
71	Metal Stud Installation - 3rd Level	25 days	Fri 12/10/10	Thu 1/13/11
72	Metal Stud Installation - 4th Level	25 days	Wed 4/13/11	Tue 5/17/11
73	Metal Stud Installation - 5th Level	5 days	Mon 11/29/10	Fri 12/3/10
74	Metal Stud Installation - 6th Level	5 days	Mon 11/1/10	Fri 11/5/10
75	Metal Stud Installation - 7th Level	5 days	Mon 10/4/10	Fri 10/8/10
76	Metal Stud Installation - 8th Level	20 days	Mon 10/18/10	Fri 11/12/10
77	FINISHES	249 days	Thu 6/17/10	Tue 5/31/11
78	MEP Coordination - Sub-basement	25 days	Mon 8/1/11	Fri 9/2/11
79	MEP Coodination - Basement	15 days	Mon 3/21/11	Fri 4/8/11
80	MEP Coordination - 1st Level	20 days	Mon 5/9/11	Fri 6/3/11
81	MEP Coordination - 2nd Level	30 days	Mon 9/5/11	Fri 10/14/11
82	MEP Coordination - 3rd Level	35 days	Mon 8/8/11	Fri 9/23/11
83	MEP Coordination - 4th Level	35 days	Tue 9/20/11	Mon 11/7/11
84	MEP Coordination - 5th Level	15 days	Mon 5/9/11	Fri 5/27/11
85	MEP Coordination - 6th Level	15 days	Mon 5/23/11	Fri 6/10/11
86	MEP Coordination - 7th Level	15 days	Mon 6/6/11	Fri 6/24/11
87	MEP Coordination - 8th Level	15 days	Mon 3/14/11	Fri 4/1/11
88	Drywall Install/Finishing/Paint - Sub-Basement	75 days	Fri 2/25/11	Thu 6/9/11
89	Drywall Install/Finishing/Paint - Basement	45 days	Mon 12/27/10	Fri 2/25/11
90	Drywall Install/Finishing/Paint - 1st Level	35 days	Mon 1/31/11	Fri 3/18/11
91	Drywall Install/Finishing/Paint - 2nd Level	66 days	Fri 4/8/11	Fri 7/8/11
92	Drywall Install/Finishing/Paint - 3rd Level	75 days	Fri 2/25/11	Thu 6/9/11
93	Drywall Install/Finishing/Paint - 4th Level	59 days	Wed 6/22/11	Mon 9/12/11
94	Drywall Install/Finishing/Paint - 5th Level	21 days	Fri 4/8/11	Fri 5/6/11
95	Drywall Install/Finishing/Paint - 6th Level	21 days	Fri 4/22/11	Fri 5/20/11
96	Drywall Install/Finishing/Paint - 7th Level	21 days	Fri 5/6/11	Fri 6/3/11
97	Drywall Install/Finishing/Paint - 8th Level	60 days	Mon 11/29/10	Fri 2/18/11
98	Firestopping	23 days	Fri 4/29/11	Tue 5/31/11
99	SUBSTANTIAL COMPLETION	66 days	Mon 9/12/11	Mon 12/12/11
100	Testing/Balance	61 days	Mon 9/12/11	Mon 12/5/11
101	Turnover to Owner (SB-Level 3)	0 days	Mon 10/17/11	Mon 10/17/11
102	Turnover Final Building	0 days	Mon 12/12/11	Mon 12/12/11
103	LINK	368 days	Tue 9/8/09	Thu 2/3/11
104	SITEWORK	258 days	Tue 9/8/09	Thu 9/2/10
105	Demolition	5 days	Tue 9/8/09	Mon 9/14/09
106	Sanitary and Storm Lines	15 days	Tue 12/1/09	Mon 12/21/09
107	Excavation	6 days	Thu 8/26/10	Thu 9/2/10
108	FOUNDATION	227 days	Thu 1/14/10	Fri 11/26/10
109	Piles	4 days	Thu 1/14/10	Tue 1/19/10
110	Pile Caps and Grade Beams	15 days	Thu 1/28/10	Wed 2/17/10
111	Backfill	2 days	Fri 10/1/10	Mon 10/4/10
112	Concrete Floor - Sub-Basement	5 days	Mon 11/22/10	Fri 11/26/10
113	SUPERSTRUCTURE	55 days	Fri 10/1/10	Thu 12/16/10
114	Erect Steel - Sub-Basement	7 days	Fri 10/1/10	Mon 10/11/10
115	Erect Steel - Basement	5 days	Tue 10/12/10	Mon 10/18/10
116	Steel Decking - Basement	1 day	Mon 10/4/10	Mon 10/4/10
117	Concrete Floor - Basement	15 days	Mon 11/29/10	Fri 12/17/10
118	Erect Steel - 1st Level	5 days	Tue 10/19/10	Mon 10/25/10
119	Steel Decking - 1st Level	4 days	Tue 11/16/10	Fri 11/19/10
120	Concrete Floor - 1st Level	15 days	Mon 12/13/10	Fri 12/31/10

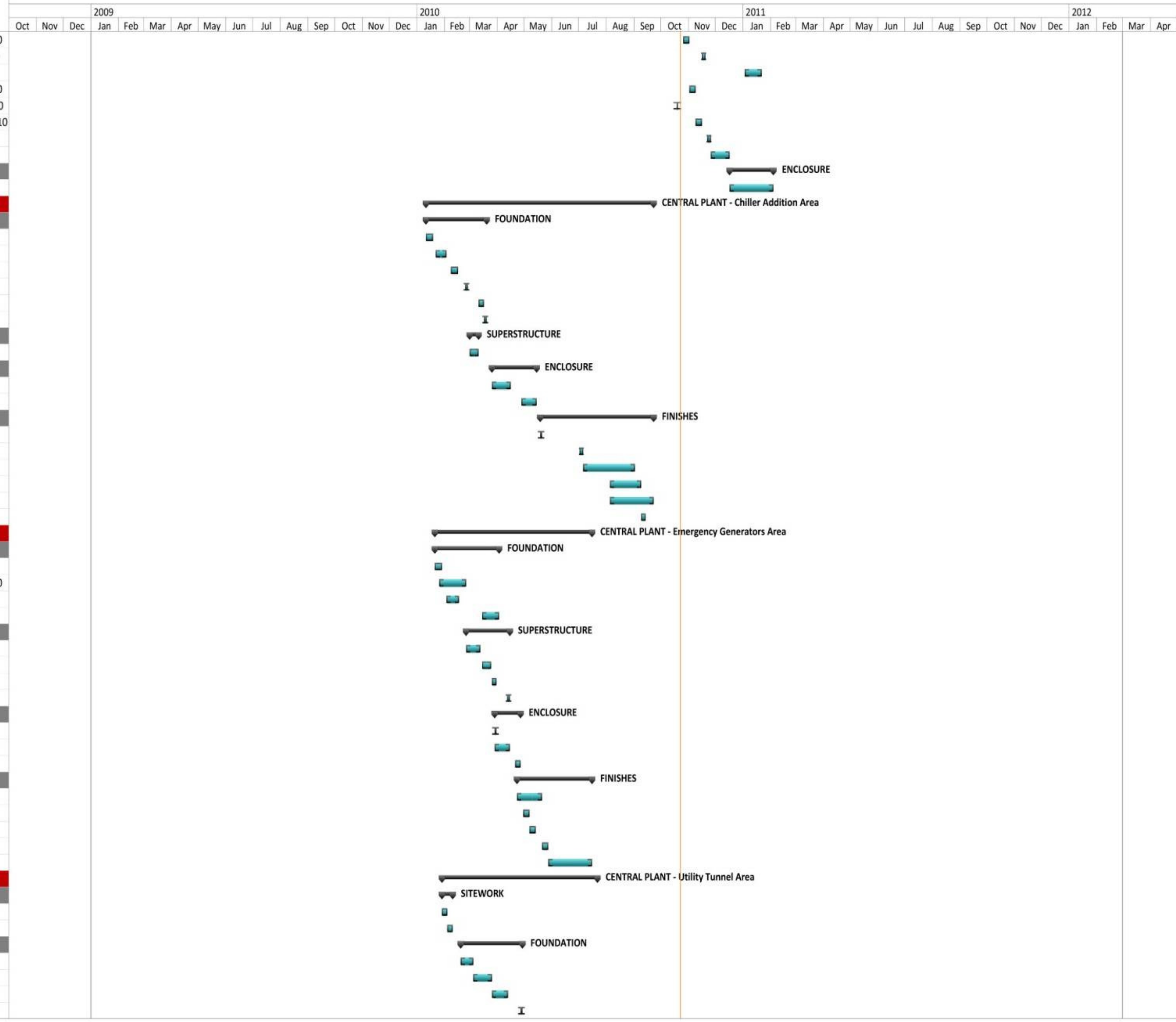


Project: Detailed Schedule
Date: Sat 10/23/10

Task, Split, Milestone, Summary, Project Summary, External Tasks, External Milestone, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, Deadline, Progress

TECHNICAL ASSIGNMENT #1 GLOBAL VASCULAR INSTITUTE MADISON SMITH

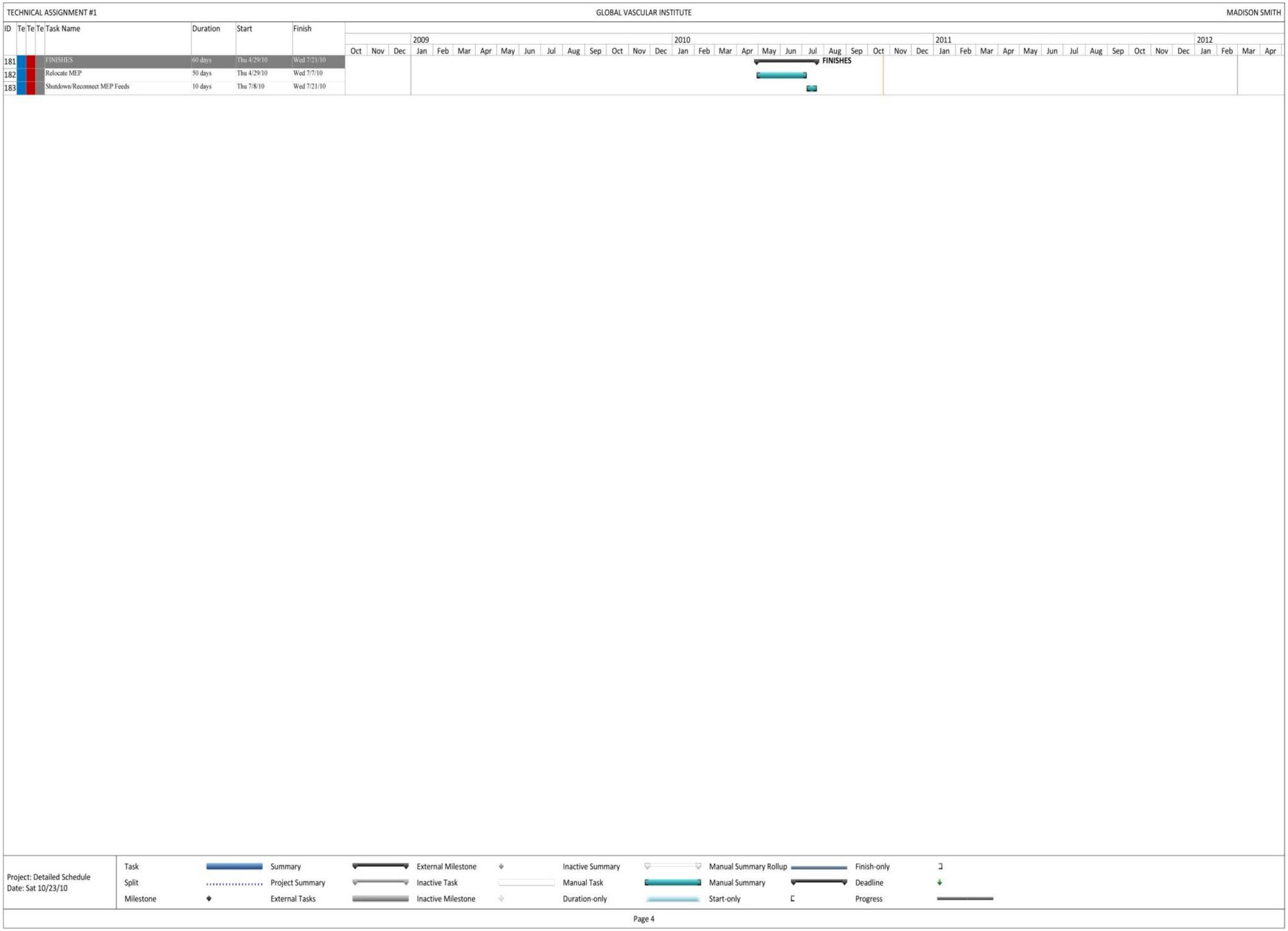
ID	Task Name	Duration	Start	Finish
121	Erect Steel - 2nd Level	5 days	Tue 10/26/10	Mon 11/1/10
122	Steel Decking - 2nd Level	4 days	Tue 11/16/10	Fri 11/19/10
123	Concrete Floor - 2nd Level	15 days	Mon 1/3/11	Fri 1/21/11
124	Erect Steel - 3rd Level	5 days	Tue 11/2/10	Mon 11/8/10
125	Steel Decking - 3rd Level	1 day	Tue 10/19/10	Tue 10/19/10
126	Erect Steel - Roof	5 days	Tue 11/9/10	Mon 11/15/10
127	Steel Decking - Roof	4 days	Mon 11/22/10	Thu 11/25/10
128	Install Roof/Expansion Joint	15 days	Fri 11/26/10	Thu 12/16/10
129	ENCLOSURE	35 days	Fri 12/17/10	Thu 2/3/11
130	Curtainwall	35 days	Fri 12/17/10	Thu 2/3/11
131	CENTRAL PLANT - Chiller Addition Area	183 days	Mon 1/11/10	Wed 9/22/10
132	FOUNDATION	50 days	Mon 1/11/10	Fri 3/19/10
133	Piles	6 days	Mon 1/11/10	Mon 1/18/10
134	Pile Caps and Grade Beams	8 days	Fri 1/22/10	Tue 2/2/10
135	Foundation Walls	6 days	Mon 2/8/10	Mon 2/15/10
136	Backfill	3 days	Wed 2/24/10	Fri 2/26/10
137	Underslab MEP	4 days	Thu 3/11/10	Tue 3/16/10
138	Slab-On-Grade	3 days	Wed 3/17/10	Fri 3/19/10
139	SUPERSTRUCTURE	8 days	Mon 3/1/10	Wed 3/10/10
140	Erect Steel	8 days	Mon 3/1/10	Wed 3/10/10
141	ENCLOSURE	36 days	Fri 3/26/10	Fri 5/14/10
142	Masonry Walls	15 days	Fri 3/26/10	Thu 4/15/10
143	Roofing and Flashing	13 days	Wed 4/28/10	Fri 5/14/10
144	FINISHES	91 days	Wed 5/19/10	Wed 9/22/10
145	Set Cooling Tower	2 days	Wed 5/19/10	Thu 5/20/10
146	Set Chiller	2 days	Fri 7/2/10	Mon 7/5/10
147	Pipe Chiller & Cooling Tower & Tie Ins	42 days	Tue 7/6/10	Wed 9/1/10
148	Chiller Controls	25 days	Thu 8/5/10	Wed 9/8/10
149	Chiller Electrical	35 days	Thu 8/5/10	Wed 9/22/10
150	Chiller Start-Up	3 days	Thu 9/9/10	Mon 9/13/10
151	CENTRAL PLANT - Emergency Generators Area	126 days	Thu 1/21/10	Thu 7/15/10
152	FOUNDATION	52 days	Thu 1/21/10	Fri 4/2/10
153	Piles	6 days	Thu 1/21/10	Thu 1/28/10
154	Pier Caps & Grade Beams & Foundation Walls	22 days	Tue 1/26/10	Wed 2/24/10
155	Underground Electrical	10 days	Wed 2/3/10	Tue 2/16/10
156	Underground Plumbing	15 days	Mon 3/15/10	Fri 4/2/10
157	SUPERSTRUCTURE	35 days	Thu 2/25/10	Wed 4/14/10
158	Erect Steel	12 days	Thu 2/25/10	Fri 3/12/10
159	Joists and Decking	8 days	Mon 3/15/10	Wed 3/24/10
160	Generator Exhaust Stack Curbs/Sleeves	3 days	Fri 3/26/10	Tue 3/30/10
161	Slab-On-Grade	3 days	Mon 4/12/10	Wed 4/14/10
162	ENCLOSURE	21 days	Mon 3/29/10	Mon 4/26/10
163	Exterior Doors/Windows	2 days	Mon 3/29/10	Tue 3/30/10
164	Masonry Walls	13 days	Mon 3/29/10	Wed 4/14/10
165	Roof Decking, Insulation & Roof	4 days	Wed 4/21/10	Mon 4/26/10
166	FINISHES	60 days	Fri 4/23/10	Thu 7/15/10
167	Fuel System Piping	20 days	Fri 4/23/10	Thu 5/20/10
168	Generator Installation	5 days	Fri 4/30/10	Thu 5/6/10
169	Install Fuel Tank	5 days	Fri 5/7/10	Thu 5/13/10
170	Fuel System Controls	5 days	Fri 5/21/10	Thu 5/27/10
171	Controls - Tie Generator into System	35 days	Fri 5/28/10	Thu 7/15/10
172	CENTRAL PLANT - Utility Tunnel Area	124 days	Fri 1/29/10	Wed 7/21/10
173	SITEWORK	8 days	Fri 1/29/10	Tue 2/9/10
174	Existing Structure Investigation	4 days	Fri 1/29/10	Wed 2/3/10
175	Tunnel Excavation	4 days	Thu 2/4/10	Tue 2/9/10
176	FOUNDATION	49 days	Fri 2/19/10	Wed 4/28/10
177	Slab-On-Grade	10 days	Fri 2/19/10	Thu 3/4/10
178	F/P/R Walls	15 days	Fri 3/5/10	Thu 3/25/10
179	F/P/R Ceiling	12 days	Fri 3/26/10	Mon 4/12/10
180	Backfill	2 days	Tue 4/27/10	Wed 4/28/10



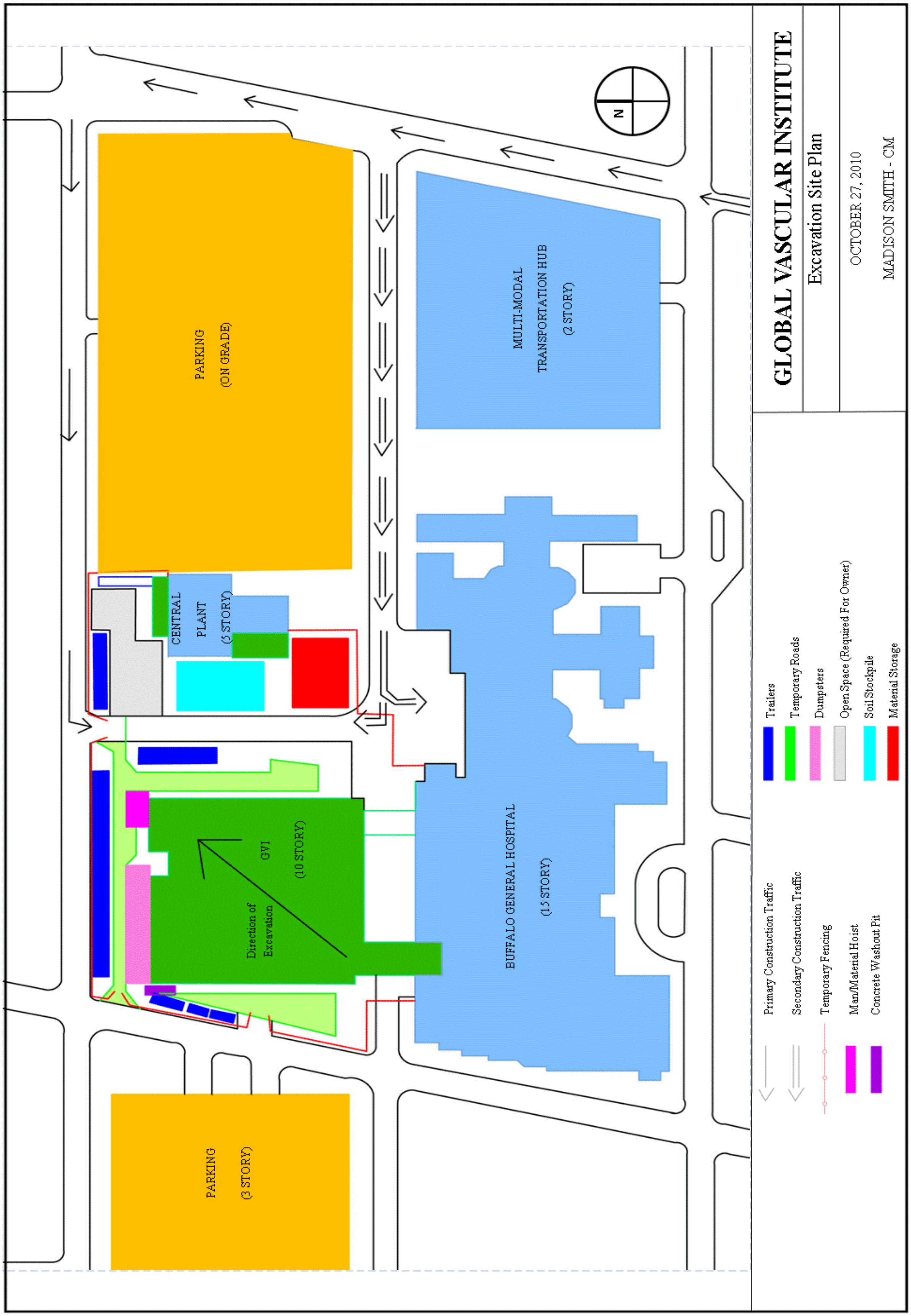
Project: Detailed Schedule
Date: Sat 10/23/10

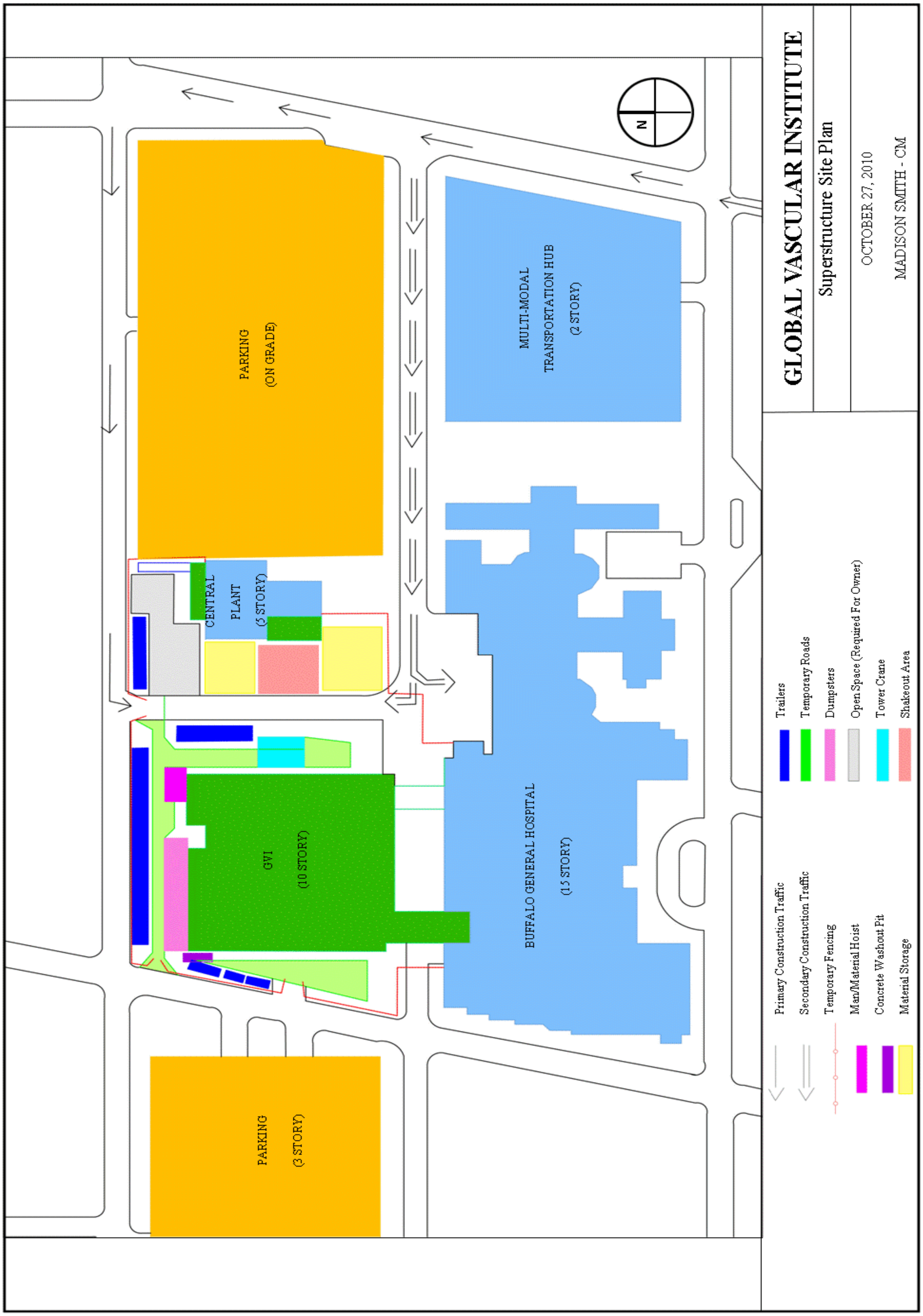
Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Deadline | Progress

Page 3


TECHNICAL ASSIGNMENT #1
GLOBAL VASCULAR INSTITUTE
MADISON SMITH
ID
Te
Te
Te
Task Name
Duration
Start
Finish
2009
2010
2011
2012
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
181
FINISHES
60 days
Thu 4/29/10
Wed 7/21/10
182
Relocate MEP
50 days
Thu 4/29/10
Wed 7/7/10
183
Shutdown/Reconnect MEP Feeds
10 days
Thu 7/8/10
Wed 7/21/10
FINISHES
Project: Detailed Schedule
Date: Sat 10/23/10
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress
Page 4

APPENDIX B: SITE LAYOUT PLANS


GLOBAL VASCULAR INSTITUTE
Excavation Site Plan
OCTOBER 27, 2010
MADISON SMITH - CM
N
PARKING
(ON GRADE)
MULTI-MODAL
TRANSPORTATION HUB
(2 STORY)
CENTRAL
PLANT
(5 STORY)
GVI
(10 STORY)
Direction of
Excavation
BUFFALO GENERAL HOSPITAL
(15 STORY)
PARKING
(3 STORY)
Primary Construction Traffic
Secondary Construction Traffic
Temporary Fencing
Man/Material Hoist
Concrete Washout Pit
Trailers
Temporary Roads
Dumpsters
Open Space (Required For Owner)
Soil Stockpile
Material Storage


GLOBAL VASCULAR INSTITUTE
Superstructure Site Plan
OCTOBER 27, 2010
MADISON SMITH - CM
N
PARKING
(ON GRADE)
MULTI-MODAL
TRANSPORTATION HUB
(2 STORY)
CENTRAL
PLANT
(5 STORY)
GVI
(10 STORY)
BUFFALO GENERAL HOSPITAL
(15 STORY)
PARKING
(3 STORY)
Primary Construction Traffic
Secondary Construction Traffic
Temporary Fencing
Man/Material Hoist
Concrete Washout Pit
Material Storage
Trailers
Temporary Roads
Dumpsters
Open Space (Required For Owner)
Tower Crane
Shakeout Area

APPENDIX C: DETAILED STRUCTURAL SYSTEM ESTIMATE

TAKE-OFFS

CORE BUILDING

PILE CAPS

ID	QUANTITY	WIDTH (FT)	LENGTH (FT)	DEPTH (FT)	REBAR TYPE	REBAR QUANTITY	REBAR WEIGHT	CONCRETE (CY)	REBAR TOTAL WEIGHT (LBS)
PC6	3	7.75	11.00	4.33	11.00	22.00	5.313	41.01	3287.42
PC7	1	10.167	11.00	5.00	11.00	21.00	5.313	20.71	1180.83
							TOTAL:	61.73	4468.25

GRADE BEAMS

ID	WIDTH (FT)	LENGTH (FT)	DEPTH (FT)	REBAR TYPE	REBAR QUANTITY	REBAR WEIGHT	CONCRETE (CY)	REBAR TOTAL WEIGHT (LBS)
GB2	1.5	94.5	1.5	6.00	6	1.50	7.88	850.5
GB10	2.83	31.5	2.5	6.00	14	1.50	8.25	661.5
						TOTAL:	16.13	1512.00

SLAB-ON-GRADE (24 LBS/CY BLENDED STEEL/POLYPROPYLENE FIBERS

WIDTH (FT)	LENGTH (FT)	THICKNESS	AREA (SF)	CONCRETE (CY)	REBAR TOTALWEIGHT (LBS)
31.5	31.5	0.4167	992.25	15.31	367.53
			TOTAL:	15.31	367.53

COLUMNS

ID	SPLICE 1	LENGTH (FT)	SPLICE 2	LENGTH (FT)	SPLICE 3	LENGTH (FT)	SPLICE 4	LENGTH (FT)	SPLICE 5	LENGTH (FT)
D-6	W14x257	41.38	W14x193	36.00	W14x145	36.00	W14x109	36.00	W14x68	34.50
D-7	W14x283	41.38	W14x211	36.00	W14x159	36.00	W14x120	36.00	W14x82	34.50
E-6	W14x257	41.38	W14x193	36.00	W14x145	36.00	W14x109	36.00	W14x68	34.50
E-7	W14x283	41.38	W14x211	36.00	W14x159	36.00	W14x120	36.00	W14x82	34.50

BEAMS

ID	QUANTITY	UNIT	TYPE	LENGTH (FT)
BASEMENT	4	LF	W21x44	31.50
BASEMENT	1	LF	W27x84	31.50
BASEMENT	1	LF	W27x76	31.50
LEVEL ONE	5	LF	W16x31	31.50
LEVEL ONE	2	LF	W21x44	31.50
LEVEL TWO	4	LF	W18x40	31.50
LEVEL TWO	2	LF	W24x76	31.50
LEVEL THREE	4	LF	W33x118	31.50
LEVEL THREE	2	LF	W36x135	31.50
LEVEL FOUR	4	LF	W21x44	31.50
LEVEL FOUR	2	LF	W24x84	31.50
LEVEL FIVE	4	LF	W27x84	31.50
LEVEL FIVE	2	LF	W30x108	31.50
LEVEL SIX	4	LF	W27x84	31.50
LEVEL SIX	2	LF	W30x108	31.50
LEVEL SEVEN	4	LF	W21x44	31.50
LEVEL SEVEN	1	LF	W24x84	31.50
LEVEL SEVEN	1	LF	W36x135	31.50
LEVEL EIGHT	1	LF	W24x62	31.50
LEVEL EIGHT	2	LF	W21x44	31.50
LEVEL EIGHT	2	LF	W27x84	31.50
LEVEL EIGHT	1	LF	W33x118	31.50
LEVEL EIGHT	2	LF	W8x10	10.50
LEVEL NINE	1	LF	W27x84	31.50
ROOF	6	LF	W16x31	31.50
ROOF	2	LF	W24x76	31.50

METAL DECK (3000PSI)

ID	DECK TYPE	UNIT	AREA (SF)	THICKNESS (FT)	CONCRETE (CY)
FD01	3"	SF	7938	0.625	183.75
FD02	3"	SF	992.25	0.625	22.97
RD01	1 1/2"	SF	992.25	0	0.00
		TOTAL:	9922.5		206.72

LINK

PILE CAPS

ID	QUANTITY	WIDTH (FT)	LENGTH (FT)	DEPTH (FT)	REBAR TYPE	REBAR QUANTITY	REBAR WEIGHT	CONCRETE (CY)	REBAR TOTAL WEIGHT (LBS)
PC3-63T	2	5.50	5.167	2.83	6.00	5.00	1.50	5.96	82.5
PC2-63T	2	5.50	2.50	3.33	7.00	8.00	2.04	3.39	179.872
							TOTAL:	9.35	262.372

GRADE BEAMS

ID	WIDTH (FT)	LENGTH (FT)	DEPTH (FT)	REBAR TYPE	REBAR QUANTITY	REBAR WEIGHT	CONCRETE (CY)	REBAR TOTAL WEIGHT (LBS)
GB2	1.50	35.08	1.50	6.00	6.00	1.50	2.92	315.72
GB16	2.50	16.5	3.00	8.00	8.00	2.67	4.58	352.44
GB17	1.00	51.58	1.50	8.00	4.00	2.67	2.87	550.87
						TOTAL:	10.37	262.372

SLAB-ON-GRADE (24 LBS/CY BLENDED STEEL/POLYPROPYLENE FIBERS

WIDTH (FT)	LENGTH (FT)	THICKNESS	AREA (SF)	CONCRETE (CY)	REBAR TOTALWEIGHT (LBS)
31.5	35.08	0.67	1105.02	27.42	658.10
			TOTAL:	27.42	658.10

COLUMNS

ID	SPLICE 1	LENGTH (FT)
J-1.2	HSS 16x4x5.16	45
J.7-1.2	HSS 16x4x5.16	63
J-2.4	HSS 16x4x5.16	63

J.7-2.4	HSS 16x4x5.16	63

BEAMS

ID	QUANTITY	UNIT	TYPE	LENGTH (FT)
BASEMENT	2	LF	W21x155	35.08
BASEMENT	1	LF	W24x62	35.08
BASEMENT	3	LF	W14x22	10.50
LEVEL ONE	1	LF	W10x12	21.00
LEVEL ONE	1	LF	W14x22	21.00
LEVEL ONE	2	LF	W16x36	10.50
LEVEL ONE	1	LF	W16x26	31.50
LEVEL TWO	1	LF	W10x12	21.00
LEVEL TWO	1	LF	W16x31	31.50
LEVEL TWO	1	LF	W14x22	21.00
LEVEL TWO	1	LF	W16x36	10.50
LEVEL THREE	3	LF	W10x12	5.00
LEVEL THREE	1	LF	W36x150	26.25
LEVEL THREE	2	LF	W27x84	26.25
LEVEL THREE	1	LF	W27x94	26.25
LEVEL THREE	3	LF	W16x26	10.50
LEVEL FOUR	1	LF	W27x84	31.50
LEVEL FOUR	1	LF	W30x99	31.50
LEVEL FOUR	3	LF	W21x48	21.00
LEVEL FOUR	1	LF	W21x44	21.00
LEVEL FOUR	1	LF	W30x90	21.00
LEVEL FOUR	1	LF	W27x84	21.00
LEVEL FOUR	2	LF	W14x22	10.50
LEVEL FOUR	2	LF	W10x12	5.00

METAL DECK (3000PSI)

ID	DECK TYPE	UNIT	AREA (SF)	THICKNESS (FT)	CONCRETE (CY)
FD01	3"	SF	2976.75	0.625	68.91
RD01	1 1/2"	SF	992.25	0	0.00
		TOTAL:	3969		68.91

CENTRAL PLANT

PILE CAPS

ID	QUANTITY	WIDTH (FT)	LENGTH (FT)	DEPTH (FT)	REBAR TYPE	REBAR QUANTITY	REBAR WEIGHT	CONCRETE (CY)	REBAR TOTAL WEIGHT (LBS)
PC3-20T	8	5.5	5.167	2.5	7	3	2.04	21.05	89.76
							TOTAL:	21.05	89.76

GRADE BEAMS

ID	WIDTH (FT)	LENGTH (FT)	DEPTH (FT)	REBAR TYPE	REBAR QUANTITY	REBAR WEIGHT	CONCRETE (CY)	REBAR TOTAL WEIGHT (LBS)
GB53	2.00	49.59	3.00	8	6	2.67	11.02	794.35
GB58	1.00	49.59	1.00	7	2	2.04	1.84	202.31
GB60	2.00	86.67	6.00	8	8	2.67	38.52	1851.27
						TOTAL:	51.38	2847.93

SLAB-ON-GRADE (#7@12"O.C. & #4@12"O.C.)

WIDTH (FT)	LENGTH (FT)	THICKNESS (FT)	AREA (SF)	CONCRETE (CY)	REBAR TOTALWEIGHT (LBS)
21.67	49.58	0.67	1074.40	26.66	367.88
			TOTAL:	26.66	367.88

COLUMNS

ID	SPLICE 1	LENGTH (FT)
P4-PL	W12x58	47
P4-PM	W12x58	45
P5-PL	W12x58	47
P5-PM	W12x58	45
P6-PL	W12x58	47
P6-PM	W12x58	45
P7-PL	W12x58	47
P7-PM	W12x58	45

BEAMS

ID	QUANTITY	UNIT	TYPE	LENGTH (FT)
ROOF	2	LF	W18x35	21.67
ROOF	4	LF	W18x35	18.67
ROOF	2	LF	W18x35	13.25
ROOF	7	LF	W16x26	21.67

METAL DECK (3000PSI)

ID	DECK TYPE	UNIT	AREA (SF)	THICKNESS (FT)	CONCRETE (CY)
RD01	1 1/2"	SF	992.25	0	0.00
		TOTAL:	992.25		0.00

CORE PRICING								
DESCRIPTION	QUANTITY	UNIT	BARE MATERIAL	BARE LABOR	BARE EQUIPMENT	BARE TOTAL	TOTAL O&P	TOTAL COST
FORMWORK								
GRADE BEAMS	441.00	SFCA	$ 2.30	$ 3.67	$ -	$ 2,632.77	$ 8.20	$ 3,616.20
SLAB-ON-GRADE	0.926	SFCA	$ 0.27	$ 2.10	$ -	$ 2.19	$ 3.54	$ 3.28
ELEVATED SLABS	0.926	SFCA	$ 0.12	$ 2.52	$ -	$ 2.44	$ 4.02	$ 3.72
							TOTAL:	$ 3,623.20
							ADJUSTED TOTAL:	$ 164,312.15
REBAR								
GRADE BEAMS	0.76	TONS	$ 800.00	$ 935.00	$ -	$ 1,311.66	$ 2,375.00	$ 1,795.50
SLAB-ON-GRADE	0.18	TONS	$ 760.00	$ 650.00	$ -	$ 259.11	$ 1,875.00	$ 344.56
							TOTAL:	$ 2,140.06
							ADJUSTED TOTAL:	$ 97,051.67
CONCRETE								
PILE CAPS	61.73	CY	$ 140.00	$ 59.50	$ 0.40	$ 12,338.88	$ 246.00	$ 15,184.42
GRADE BEAMS	16.13	CY	$ 290.00	$ 450.00	$ 41.50	$ 12,604.94	$ 1,075.00	$ 17,338.85
SLAB-ON-GRADE	15.31	CY	$ 113.00	$ 39.50	$ 0.33	$ 2,340.40	$ 186.00	$ 2,848.35
ELEVATED SLABS	5581.41	SF	$ 1.96	$ 0.79	$ 0.29	$ 16,967.48	$ 3.67	$ 20,483.76
							TOTAL:	$ 55,855.39
							ADJUSTED TOTAL:	$ 2,533,041.77
COLUMNS								
W14x257	82.75	LF	$ 149.00	$ 3.68	$ 2.25	$ 12,820.46	$ 172.00	$ 14,233.00
W14x283	82.75	LF	$ 149.00	$ 3.68	$ 2.25	$ 12,820.46	$ 172.00	$ 14,233.00
W14x193	72.00	LF	$ 149.00	$ 3.68	$ 2.25	$ 11,154.96	$ 172.00	$ 12,384.00
W14x211	72.00	LF	$ 149.00	$ 3.68	$ 2.25	$ 11,154.96	$ 172.00	$ 12,384.00
W14x145	72.00	LF	$ 149.00	$ 3.68	$ 2.25	$ 11,154.96	$ 172.00	$ 12,384.00
W14x159	72.00	LF	$ 149.00	$ 3.68	$ 2.25	$ 11,154.96	$ 172.00	$ 12,384.00
W14x109	72.00	LF	$ 149.00	$ 3.68	$ 2.25	$ 11,154.96	$ 172.00	$ 12,384.00
W14x120	72.00	LF	$ 149.00	$ 3.68	$ 2.25	$ 11,154.96	$ 172.00	$ 12,384.00
W14x68	69.00	LF	$ 91.50	$ 3.49	$ 2.13	$ 6,701.28	$ 109.00	$ 7,521.00
W14x82	69.00	LF	$ 111.00	$ 3.58	$ 2.19	$ 8,057.13	$ 131.00	$ 9,039.00
							TOTAL:	$ 119,330.00
							ADJUSTED TOTAL:	$ 5,411,615.50
BEAMS								
W21x44	2856.00	LF	$ 54.50	$ 3.60	$ 1.63	$ 170,588.88	$ 68.00	$ 194,208.00
W27x84	2079.00	LF	$ 104.00	$ 3.22	$ 1.45	$ 225,924.93	$ 121.00	$ 251,559.00
W27x76	31.50	LF	$ 104.00	$ 3.22	$ 1.45	$ 3,423.11	$ 121.00	$ 3,811.50
W16x31	1039.50	LF	$ 38.50	$ 2.95	$ 1.80	$ 44,958.38	$ 49.00	$ 50,935.50
W18x40	126.00	LF	$ 43.50	$ 3.99	$ 1.80	$ 6,210.54	$ 56.50	$ 7,119.00
W24x76	252.00	LF	$ 94.00	$ 3.45	$ 1.56	$ 24,950.52	$ 111.00	$ 27,972.00
W33x118	315.00	LF	$ 146.00	$ 3.26	$ 1.47	$ 47,479.95	$ 168.00	$ 52,920.00
W36x135	189.00	LF	$ 167.00	$ 3.28	$ 1.48	$ 32,462.64	$ 191.00	$ 36,099.00
W24x84	189.00	LF	$ 104.00	$ 3.55	$ 1.60	$ 20,629.35	$ 136.00	$ 25,704.00
W30x108	63.00	LF	$ 134.00	$ 3.19	$ 1.44	$ 8,733.69	$ 154.00	$ 9,702.00
W24x62	66.58	LF	$ 76.50	$ 3.45	$ 1.56	$ 5,426.94	$ 92.00	$ 6,125.36
W8x10	21	LF	$ 12.40	$ 4.42	$ 2.70	$ 409.92	$ 24.00	$ 504.00
							TOTAL:	$ 666,659.36
							ADJUSTED TOTAL:	$ 30,233,001.98
METAL DECKING								
FD01	7938.63	SF	$ 2.00	$ 0.55	$ 0.04	$ 20,561.04	$ 4.03	$ 31,992.66
FD02	992.25	SF	$ 2.00	$ 0.55	$ 0.04	$ 2,569.93	$ 4.03	$ 3,998.77
RD01	992.25	SF	$ 2.00	$ 0.55	$ 0.04	$ 2,569.93	$ 4.03	$ 3,998.77
							TOTAL:	$ 39,990.19
							TOTAL:	$ 887,598.20
							BUILDING ADJUSTED TOTAL:	$ 40,252,578.34

LINK PRICING								
DESCRIPTION	QUANTITY	UNIT	BARE MATERIAL	BARE LABOR	BARE EQUIPMENT	BARE TOTAL	TOTAL O&P	TOTAL COST
FORMWORK								

GRADE BEAMS	337.5	SFCA	$ 2.30	$ 3.67	$ -	$ 2,014.88	$ 8.20	$ 2,767.50
SLAB-ON-GRADE	1.6	SFCA	$ 0.27	$ 2.10	$ -	$ 3.79	$ 3.54	$ 5.66
ELEVATED SLABS	1.6	SFCA	$ 0.12	$ 2.52	$ -	$ 4.22	$ 4.02	$ 6.43
							TOTAL:	$ 2,779.60
							ADJUSTED TOTAL:	$ 41,277.00
REBAR								
GRADE BEAMS	0.13	TONS	$ 800.00	$ 935.00	$ -	$ 227.61	$ 2,375.00	$ 311.57
SLAB-ON-GRADE	0.33	TONS	$ 760.00	$ 650.00	$ -	$ 463.96	$ 1,875.00	$ 616.97
							TOTAL:	$ 928.54
							ADJUSTED TOTAL:	$ 13,788.76
CONCRETE								
PILE CAPS	9.35	CY	$ 140.00	$ 59.50	$ 0.40	$ 1,868.87	$ 246.00	$ 2,299.86
GRADE BEAMS	10.37	CY	$ 290.00	$ 450.00	$ 41.50	$ 8,105.89	$ 1,075.00	$ 11,150.14
SLAB-ON-GRADE	27.42	CY	$ 113.00	$ 39.50	$ 0.33	$ 4,190.73	$ 186.00	$ 5,100.28
ELEVATED SLABS	1860.47	SF	$ 1.96	$ 0.79	$ 0.29	$ 5,655.83	$ 3.67	$ 6,827.92
							TOTAL:	$ 25,378.20
							ADJUSTED TOTAL:	$ 376,866.28
COLUMNS								
HSS 16x4x5.16	234.00	LF	$ 405.00	$ 45.00	$ 32.00	$ 112,788.00	$ 557.50	$ 130,455.00
							TOTAL:	$ 130,455.00
							ADJUSTED TOTAL:	$ 1,937,256.75
BEAMS								
W21x155	70.16	LF	$ 151.00	$ 3.83	$ 1.73	$ 10,984.25	$ 175.00	$ 12,278.00
W24x62	35.08	LF	$ 76.50	$ 3.45	$ 1.56	$ 2,859.37	$ 92.00	$ 3,227.36
W14x62	94.50	LF	$ 91.50	$ 3.49	$ 2.13	$ 9,177.84	$ 109.00	$ 10,300.50
W10x12	67.00	LF	$ 14.85	$ 4.42	$ 2.70	$ 1,471.99	$ 27.00	$ 1,809.00
W16x36	31.50	LF	$ 38.50	$ 2.95	$ 1.80	$ 1,362.38	$ 49.00	$ 1,543.50
W16x26	63.00	LF	$ 32.00	$ 2.65	$ 1.62	$ 2,285.01	$ 42.00	$ 2,646.00
W16x31	31.50	LF	$ 38.50	$ 2.95	$ 1.80	$ 1,362.38	$ 49.00	$ 1,543.50
W36x150	26.25	LF	$ 186.00	$ 3.28	$ 1.48	$ 5,007.45	$ 211.00	$ 5,538.75
W27x84	105.00	LF	$ 104.00	$ 3.22	$ 1.45	$ 11,410.35	$ 121.00	$ 12,705.00
W27x94	26.25	LF	$ 116.00	$ 3.22	$ 1.45	$ 3,167.59	$ 135.00	$ 3,543.75
W30x99	31.50	LF	$ 123.00	$ 3.19	$ 1.44	$ 4,020.35	$ 142.00	$ 4,473.00
W21x48	63	LF	$ 62.00	$ 3.60	$ 1.63	$ 4,235.49	$ 76.00	$ 4,788.00
W21x44	21	LF	$ 54.50	$ 3.60	$ 1.63	$ 1,254.33	$ 68.00	$ 1,428.00
W30x90	21	LF	$ 123.00	$ 3.19	$ 1.44	$ 2,680.23	$ 142.00	$ 2,982.00
							TOTAL:	$ 68,806.36
							ADJUSTED TOTAL:	$ 1,021,774.45
METAL DECKING								
FD01	2976.75	SF	$ 2.00	$ 0.55	$ 0.04	$ 7,709.78	$ 4.03	$ 11,996.30
RD01	992.25	SF	$ 2.00	$ 0.55	$ 0.04	$ 2,569.93	$ 4.03	$ 3,998.77
							TOTAL:	$ 15,995.07
							ADJUSTED TOTAL:	$ 237,526.79
							TOTAL:	$ 244,342.76
							BUILDING ADJUSTED TOTAL:	$ 3,628,490.03

CENTRAL PLANT PRICING

DESCRIPTION	QUANTITY	UNIT	BARE MATERIAL	BARE LABOR	BARE EQUIPMENT	BARE TOTAL	TOTAL 0&P	TOTAL COST
FORMWORK								
GRADE BEAMS	652.16	SFCA	$ 2.30	$ 3.67	$ -	$ 3,893.40	$ 8.20	$ 5,347.71
SLAB-ON-GRADE	1.98	SFCA	$ 0.27	$ 2.10	$ -	$ 4.69	$ 3.54	$ 7.01
ELEVATED SLABS	1.98	SFCA	$ 0.12	$ 2.52	$ -	$ 5.23	$ 4.02	$ 7.96
							TOTAL:	$ 5,362.68
							ADJUSTED TOTAL:	$ 43,062.33
REBAR								
GRADE BEAMS	1.42	TONS	$ 800.00	$ 935.00	$ -	$ 2,470.58	$ 2,375.00	$ 3,381.92
SLAB-ON-GRADE	0.18	TONS	$ 760.00	$ 650.00	$ -	$ 259.36	$ 1,875.00	$ 344.89
							TOTAL:	$ 3,726.81
							ADJUSTED TOTAL:	$ 29,926.26
CONCRETE								

PILE CAPS	21.05	CY	$ 140.00	$ 59.50	$ 0.40	$ 4,208.04	$ 246.00	$ 5,178.48
GRADE BEAMS	51.38	CY	$ 290.00	$ 450.00	$ 41.50	$ 40,149.85	$ 1,075.00	$ 55,228.52
SLAB-ON-GRADE	26.66	CY	$ 113.00	$ 39.50	$ 0.33	$ 4,074.60	$ 186.00	$ 4,958.95
							TOTAL:	$ 65,365.95
							ADJUSTED TOTAL:	$ 524,888.59
COLUMNS								
W12x58	368.00	LF	$ 72.00	$ 3.54	$ 2.16	$ 28,593.60	$ 87.50	$ 32,200.00
							TOTAL:	$ 32,200.00
							ADJUSTED TOTAL:	$ 258,566.00
BEAMS								
W18x35	144.52	LF	$ 43.50	$ 3.99	$ 1.80	$ 7,123.39	$ 56.50	$ 8,165.38
W16x26	21.67	LF	$ 32.00	$ 2.65	$ 1.62	$ 785.97	$ 42.00	$ 910.14
							TOTAL:	$ 9,075.52
							ADJUSTED TOTAL:	$ 72,876.43
METAL DECKING								
RD01	1075.00	SF	$ 2.00	$ 0.55	$ 0.04	$ 2,784.25	$ 4.03	$ 4,332.25
							TOTAL:	$ 4,332.25
							ADJUSTED TOTAL:	$ 34,787.97
							TOTAL:	$ 120,063.21
							BUILDING ADJUSTED TOTAL:	$ 964,107.58
							TOTAL ESTIMATE:	$ 44,845,175.95

APPENDIX D: GENERAL CONDITIONS ESTIMATE

GENERAL CONDTIONS ESTIMATE				
ITEM	**UNIT**	**UNIT RATE**	**QUANTITY**	**TOTAL COST**
CONSTRUCTION MANAGER PERSONNEL				
Senior Project Manager	WK	$ 3,000.00	120	$ 360,000.00
Project Manager	WK	$ 2,700.00	120	$ 324,000.00
Project Engineer	WK	$ 1,900.00	108	$ 205,200.00
Assistant Engineer	WK	$ 1,200.00	108	$ 129,600.00
Safety Manager	WK	$ 150.00	108	$ 16,200.00
Senior Superintendent	WK	$ 4,000.00	110	$ 440,000.00
Assistant Superintendent	WK	$ 1,900.00	100	$ 190,000.00
Assistant Superintendent	WK	$ 1,900.00	52	$ 98,800.00
Assistant Superintendent	WK	$ 1,900.00	52	$ 98,800.00
Assistant Superintendent	WK	$ 1,900.00	52	$ 98,800.00
MEP Superintendent	WK	$ 2,200.00	52	$ 114,400.00
Estimating Expenses	LS	$ 43,000.00	1	$ 43,000.00
			TOTAL:	$ 2,118,800.00
TEMPORARY FACILITIES				
Field Office Trailer Set-up	LS	$ 2,200.00	1	$ 2,200.00
Field Office Trailer Rental	MTH	$ 500.00	27	$ 13,500.00
Field Office Trailer Removal	LS	$ 2,400.00	1	$ 2,400.00
Construction Site Fence	MTH	$ 625.00	27	$ 16,875.00
Survey/Layout Equipment	MTH	$ 225.00	27	$ 6,075.00
Gang Box	MTH	$ 55.00	27	$ 1,485.00
Tools/Equipment	MTH	$ 675.00	27	$ 18,225.00
Clean-up Equipment	WK	$ 30.00	96	$ 2,880.00
Fire Extingushers	MTH	$ 80.00	27	$ 2,160.00
Field Copier/Fax/Printer	MTH	$ 400.00	27	$ 10,800.00
Computer/LAN Equipment	MTH	$ 2,500.00	27	$ 67,500.00
Mobile Phones	MTH	$ 350.00	27	$ 9,450.00
Personal Protective Equipment	MTH	$ 100.00	27	$ 2,700.00
Signage	LS	$ 2,700.00	1	$ 2,700.00
Dumpsters	MTH	$ 1,000.00	27	$ 27,000.00
			TOTAL:	$ 185,950.00
TEMPORARY UTILITIES				
Field IT/Network Set-up	LS	$ 4,500.00	1	$ 4,500.00
Field Telephone Hook-up	LS	$ 1,700.00	1	$ 1,700.00
Field Telephone Service	MTH	$ 100.00	27	$ 2,700.00
Temporary Power Installation	LS	$ 14,500.00	1	$ 14,500.00
Temporary Power Consumption	MTH	$ 5,000.00	27	$ 135,000.00
Temporary Water/Sanitary Supply	LS	$ 2,000.00	1	$ 2,000.00
Temporary Toilets	MTH	$ 1,000.00	27	$ 27,000.00
Potable Water	MTH	$ 80.00	27	$ 2,160.00
			TOTAL:	$ 189,560.00
MISCELLANEOUS COSTS				
Progress Photographs	MTH	$ 400.00	27	$ 10,800.00
Document Reproduction	LS	$ 37,000.00	1	$ 37,000.00
Travel Expenses (Staff Vehicles)	MTH	$ 4,000.00	27	$ 108,000.00
Delivery/Shipping Expenses	MTH	$ 350.00	27	$ 9,450.00
Clean-up Expenses	WK	$ 500.00	27	$ 13,500.00
Misc. Field Expenses	MTH	$ 1,000.00	27	$ 27,000.00
			TOTAL:	$ 205,750.00
SUMMARY				
Construction Manager Personnel	MTH	$ 78,474.07	27	$ 2,118,800.00
Temporary Facilities	MTH	$ 6,887.04	27	$ 185,950.00
Temporary Utilities	MTH	$ 7,020.74	27	$ 189,560.00
Miscellaneous Costs	MTH	$ 7,620.37	27	$ 205,750.00
			TOTAL:	$ 2,700,060.00