TECHNICAL ASSIGNMENT 2

Cost and Schedule Analysis – October 24, 2008

BRIDGESIDE BUILDING II

Pittsburgh, PA

ERIK CARLSON

Construction Management

Dr. Messner

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This technical assignment analyzes the schedule, costs and site layouts for Bridgeside Building II in greater detail than the previous technical assignment. Also included is an overview of the PACE Roundtable. By constructing each of these documents a greater understanding of the building and project is developed.

The detailed schedule is approximately 200 items and shows the sequencing for each trade. The foundations took about 4 months to complete and the majority of the time was spent drilling and driving piles. Two crews were utilized so that one crew could be pre-drilling the holes and the other crew could drive the piles. Each concrete slab was divided into 3 pours that each took 2-3 days to complete. A learning curve developed which reduced the durations of the later floors. The majority of the interior finishes and MEP rough-ins followed a typical floor sequence. The typical sequence is floor 2-3-1-4-5-PH. Only a few trades followed a different sequence.

Site plans were developed to show the site layout during the foundation and superstructure phases. Space was limited during all phases which required planning to determine where materials could be stored and laid out. The foundation phase required two cranes to drill and drive the piles and also layout space for the steel piles. A temporary road was constructed to access the site and the space of the new Technology Drive can be used as a transportation route. During the superstructure phase a 75 ton crawler crane was used to erect the steel and a smaller truck crane was used for loading materials onto each level. JLG lifts and the truck crane were used to lift the metal panels and windows into place during installation.

A structural systems and general conditions estimate was performed using cost data from R.S. Means 2007. The structural estimate is composed of structural steel, concrete slabs and foundations, and steel H-Piles. The estimate totaled to $3,644,693. The total cost for general conditions is $945,288, which is 5.25% of the total project cost. Actual project data was also used to create the general conditions estimate.

The Pace Roundtable was a unique opportunity that allowed students to interact with industry members and discuss current construction issues. It was agreed upon that when the economy is slow, is a good time to invest in your people and allow them to develop new skill sets. It is also important to expand to new markets where you wouldn't normally pursue projects.

A. DETAILED PROJECT SCHEDULE

Key Schedule Dates and Durations

Item	Date	Total Duration
Notice to Proceed	11/2/2007	-
Foundation Complete	5/9/2008	123 Days
Final Concrete Slab Pour	7/9/2008	31 Days
Topping Out	5/12/2008	26 Days
Building Enclosure	9/18/2008	60 Days
Certificate of Occupancy	12/9/2008	-

Table A.1 - Key Dates

See Appendix A for a Detailed Project Schedule

Foundation Sequence

The foundation took approximately 4 months to construct and is comprised of steel piles and concrete pile caps, grade beams, piers and foundation walls. About 2 months were required for drilling and driving the piles. Two crews were utilized for the piles. One crew used an 80 ton crawler crane with a rotary hydraulic unit for the drilling and the other crew used a 60 ton truck crane with a hammer for the driving. The drilling crew started ahead of the driving crew because drilling is a much slower operation. A night crew was also utilized to accelerate the drilling schedule. Once the drilling was complete both cranes were used for driving the piles. With 1 month of pile work remaining the concrete crews were able to start forming and pouring the concrete foundation structures. They were sequenced in the following order; pile caps, grade beams and piers, then foundation walls.

Concrete Slab Sequence

The concrete pours started with the elevated slabs at floor 2 and worked up to the roof. Once the elevated slabs were completed, the slab on grade was poured. In addition to the sequencing shown on the detailed schedule, each floor was also broken up into three pours of equal size shown in Figure A.1. Since each elevated slab is the same shape and size and a typical pour sequence was used, a learning curve developed. Simon Panels were used for the formwork, which can be used multiple times. The learning curve most likely developed around tearing down and setting up the Simon Panels. Floors 2 and 3 took 8 days to pour then floors 4 and 5 decreased to 6 days. Table A.2 shows the pour sizes and durations for floors 2 and 4.

Floor	Pour	Square Feet	Duration
2	1	10,468	3 Days
2	2	11,579	3 Days
2	3	10,656	2 Days
4	1	10,850	2 Days
4	2	9,840	2 Days
4	3	11,900	2 Days

Table A.2 – Pour Durations

Figure A.1 - Pour Sequence

Structural Steel Sequence

The structural steel was erected by bay rather than by floor. This enabled the crane to travel the least amount possible. The 75 ton crawler crane was placed in the northeast corner and moved down the south side of the building. The crane moved in and out of the building footprint in order to reach the opposite side. The steel decking followed close to the structural steel because as the crane moved south there was no steel being erected over top of the steel decking workers. Once the building was topped out and the second floor decking was installed the concrete contractor was able to begin placing formwork and reinforcing. There were no lead time issues because the fabrication process was started early. However, due to limited lay down space the steel had to be delivered in multiple phases.

Interior Sequence

Since Bridgeside II is a shell building there is limited fit-out work to be completed. For the interior work that does need to be constructed a parade of trades is being utilized. Tables A.3 shows the typical floor sequence for the interior trades and some of the MEP trades. Also shown is the order of the parade of trades in Table A.4.

Trade	Floor Sequence
Interior Finishes	2-3-1-4-5-PH
F.P. Piping and Heads	1-2-3-4-5
Ductwork	2-3-4-5-1-Roof
Grilles, Registers, Diffusers	2-3-1-4-5
Electrical Rough-In	2-3-1-4-5

Table A.3 – Floor Sequence

Order	Interior Finish	Floor Sequence
1	Interior Metal Studs	2-3-4-1-5-PH
2	Hang/Tape/Finish GWB	2-3-1-4-5-PH
3	Paint Walls	2-3-1-4-5-PH
4	ACT Ceiling Grid	2-3-1-4-5
5	ACT Ceiling Tile	2-3-1-4-5
6	Ceramic Tile	1-2-3-4-5
7	Rubber Base	1-2-3-4-5-PH

Table A.4 – Interior Finish Sequence

B. SITE LAYOUT PLANNING

Foundation Site Plan

The project did not require any excavation however, there was extensive foundation work. The bulk of this work was drilling and driving steel H-Piles until bedrock was reached. The equipment used on site was an 80 ton crawler crane and a 60 ton truck crane. The crawler crane was equipped with a rotary hydraulic unit that was used to pre-drill the pile holes. The truck crane was then equipped with a hammer to drive the piles into place. Layout space was located on the north and south ends of the building to store the piles. Entering and exiting the site was accommodated with an access road off the existing Technology Drive and the new Technology Drive that was laid out but not paved. The contractor's trailers are located adjacent to the access road which is the main entrance to the site. The parking area surrounds the trailers and sits adjacent to the storage area for equipment and tools.

Superstructure Site Plan

The superstructure site plan includes the steel erection phase and the exterior façade phase. The structure is composed of structural steel and composite slabs. The façade is constructed of insulated metal panels, storefronts, and cast stone. The main issue for this phase of the project was layout space. The steel was fabricated and stored prior to the start of the project. It was then delivered to the site in phases because there wasn't enough room to store all of the steel on site. The route for the steel trucks was to travel on the future Technology Drive location and then exit on the existing Technology Drive. A 75 ton crawler crane was used to erect the steel. Since there is limited space for material storage, the exterior façade panels and windows were stored inside the building. Materials were lifted up to each floor with the 30 ton truck crane and the boom truck and then the JLG lifts were used to lift individual panels into place.

See Appendix B for the Foundation and Superstructure Site Plans

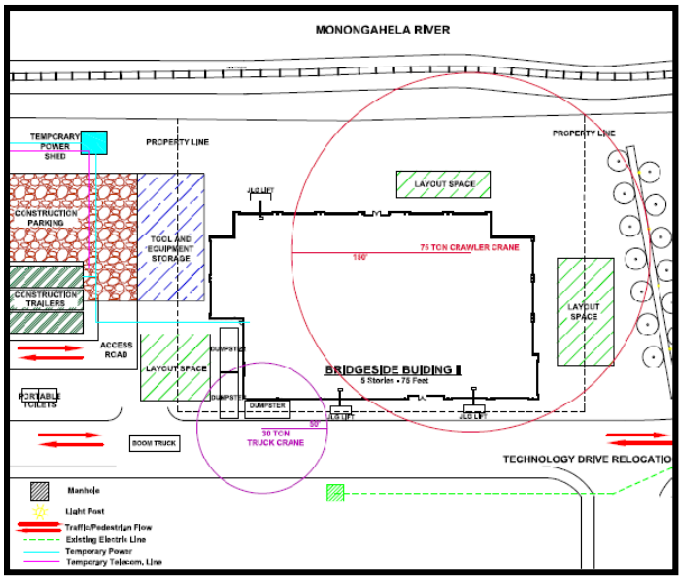


Figure B.1 – Superstructure Site Plan

C. DETAILED STRUCTURAL SYSTEMS ESTIMATE

Detailed Structural Estimate Summary				
Description	**Quantity**	**Unit**	**Avg. Cost/Unit**	**Total Cost**
031113 - Concrete Forming	12,949	SFCA	$6.10	$65,487
032110 - Reinforcing Steel	1,700	CSF / Tons	$45.00 / $1831.25	$122,209.35
033105 - Structural Concrete	2,360	CY	$116.50	$277,255
033105 - Placing Concrete	2,360	CY	$35.58	$70,005
033529 - Finishing Floors	167,253	SF	$0.46	$76,936
051223 - Structural Steel	745	Tons	$3,300	$2,459,430
053113 - Steel Decking	165,589	SF	$3.07	$550,556
316216 - Steel Piles	1,710	VLF	$38.00	$59,630
			Subtotal	**$3,681,509**
			Location Factor	0.99
			Total	**$3,644,693**

Table C.1 – Structural Estimate Summary

The detailed structural estimate was performed using cost data from R.S. Means 2007. Bridgeside II is constructed of structural steel and composite slabs with steel floor deck. The foundation is composed of steel H-Piles and concrete pile caps, piers, grade beams and foundation walls. The structural beams on floors 2 through 5 are almost typical therefore the beam takeoff was performed on level 2 and applied to levels 3 through 5. The steel columns and roof framing were taken off in full. There were limited variations of foundation structures therefore each structure was able to be taken off in full. The structural estimate totaled to **$3,644,693** and the actual cost of the superstructure is **$3,725,927**. The difference in cost is expected because a generic cost per ton was used for the structural steel rather than pricing each member. Also the formwork was estimated using 4 use job-built plywood and Simon Panels were used for construction.

See Appendix C for a Detailed Structural Estimate and Takeoff Notes

Assumptions:

- Location factor for Pittsburgh = 0.99
- Rebar cover was not taken into consideration – rebar was assumed to run from edge to edge
- No waste factors were used
- Floor 2 was used as a typical floor for structural framing
- A typical reinforcing layout and amount was used for the concrete grade beams
- 4 use job-built plywood was used for the formwork
- The foundation pile depth ranged from 45-55 feet therefore 50 feet was used for each pile

D. GENERAL CONDITIONS ESTIMATE

General Conditions Estimate Summary	
Description	**Total Cost**
General Expenses	$60,348
Project Staff	$263,050
Temporary Utilities	$132,245
Fees and Permits	$456,797
CM Fee	$32,848
Total	**$945,288**

Table D.1 – GC Estimate Summary

Table D.1 shows a summary of the General Condition Estimate which is broken up into general expenses, project staff, temporary utilities, fees and permits and the CM Fee. The estimate totaled to **$945,288** which is **5.25%** of the contract value. Each of the general conditions is priced per month, week or lump sum and most of the items span the entire length of the project, which is 14 months. The cost data was obtained primarily from R.S. Means 2007 and also from actual project data. The Pittsburgh Technology Center is controlled by one owner therefore some of the utilities could be tapped into neighboring buildings. Turner Construction was able to save money by digging a trench to the Pittsburgh Biotech Building and running power and telephone lines back to the site. Duquesne Light, the utility company, provided a temporary transfer switch and a shed was built to house a meter and panel. Parking did not have to be paid for however, there is limited space on site.

See Appendix D for the General Conditions Estimate

E. CRITICAL INDUSTRY ISSUES

Mentor Session

The first session of the morning was a discussion about a possible mentorship where each AE student would be paired with an industry member. Each team was composed of two or three students and an industry member. It was our task to brainstorm ideas about what would make a mentorship successful, the benefits for students and industry members, and process for evaluation. Our team decided that it would be best if the selection process was random because it would be difficult to make a selection as a second year student and in life you don't always get to pick who you work with but you have to make the most out of it. We also decided that it is important to have set times where the student and industry member can have a conversation even if there is nothing to talk about. This way it is always in each person's schedule and if something does come up the time is already set aside. A method for evaluation is also important for the mentorship. It should involve a third party and it will help determine if the mentorship is an appropriate match otherwise the student and industry member will both be wasting their time.

The industry member I teamed with was John Bechtel from the Office of Physical Plant. He has already proved to be a beneficial contact because I have been able to talk to him about LEED for another class and I am positive that he would be willing to help me with any LEED or general building questions for my thesis. When we met as a group to discuss the mentorship the consensus was that the mentorship had to be kept separate from internships and recruiting. Also many people thought that the mentors should be assigned by option. However, during students' second year in AE they have not yet chosen an option.

Energy and Economy

Out of the three breakout sessions the Energy and Economy seemed to draw the most interest. This is most likely due to the status of our current economy. We started off by discussing alternative forms of energy, technology and procurement methods. Historically subcontractors use to buy materials at a cheaper price before they were needed for the project. However, with the constant fluctuation in the cost of materials that could be risky because the material price might drop. European technology has started to become more prevalent in the United States because it provides greater long-term cost savings as long as the initial costs can be afforded. An item from this breakout session that could be beneficial to my thesis project was our discussion about mill order processes. Buying steel early can be risky but it can also be rewarding. By fabricating typical steel shapes before the design is complete, you prevent the risk of escalation and the mill order is simpler which can reduce fabrication costs. The project team for Bridgeside II decided to purchase their steel early and prevented any delays from lead times. This is a topic I could potentially research further and explore the benefits for my project.

Another item we talked about is the opportunities for developers and contractors in the current economy. Developers have the opportunity to purchase incomplete buildings and renovate or complete them at a lower cost. For contractors there are a lot of renovation jobs especially in the energy retrofit market. Currently the growing markets include data centers, federal work and healthcare facilities. The tanking markets include gaming, residential and speculative office buildings. This applies to my thesis project because Bridgeside II is a speculative office building. Currently there are no arranged tenants and

until the building is at least 50% leased the Ferchill Group cannot start their next project in the technology center. We ended our discussion of energy and economy by talking about investing in people. In a slow economy it is important to invest in your people and allow them to explore new areas that can benefit the company in the long run.

Panels

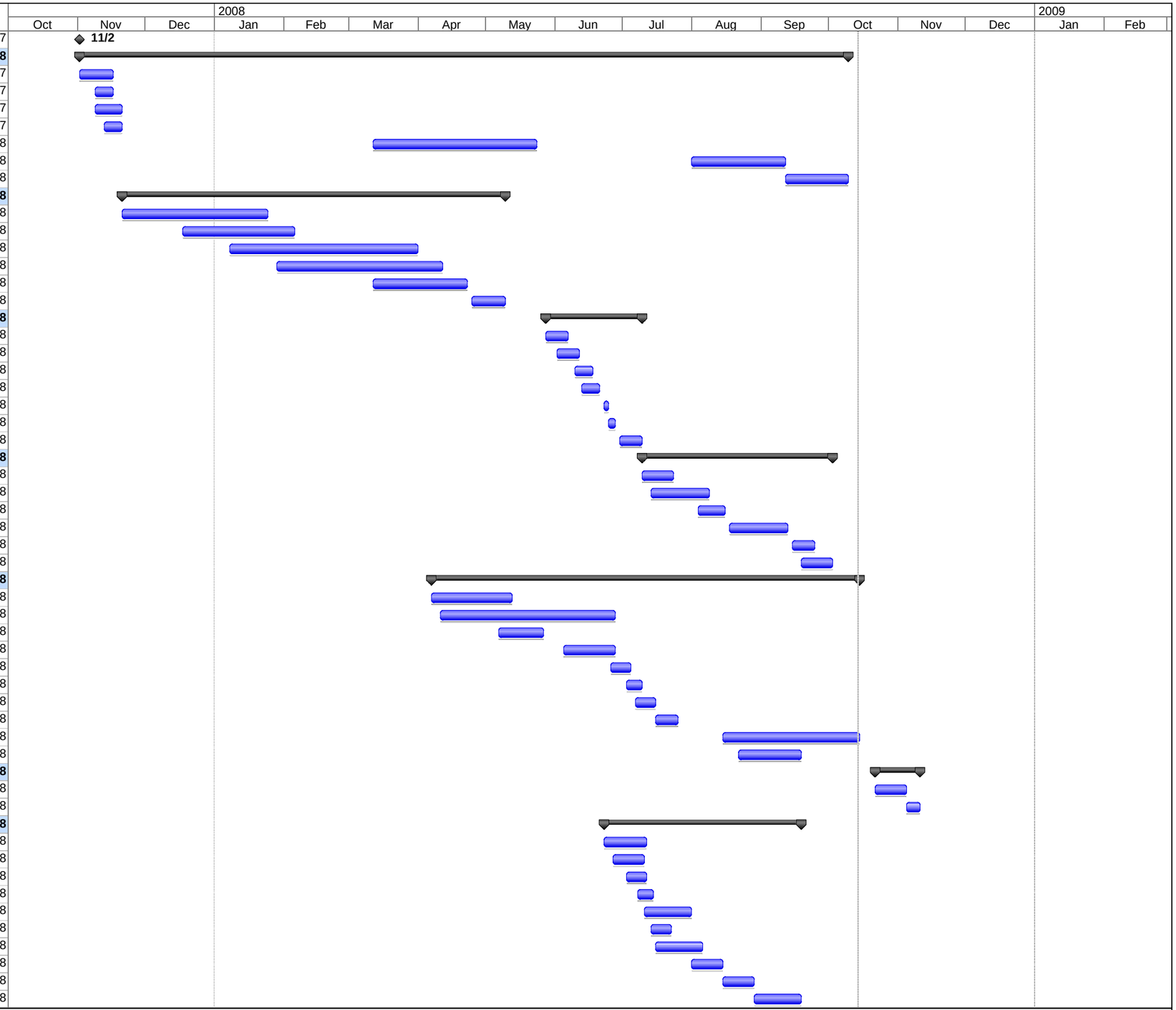
The final session of the roundtable was a student and industry panel. The student panel talked about balancing their academic lives with their social lives. Each panel member shared how they cope with the balancing act that is required by students. The industry panel member each gave some incite as to where they thought the industry was heading. Companies are going to start changing their roles. This means that they will have to explore new projects, new delivery systems, and new technology such as BIM. Owners are becoming more engineer savvy and want to be involved in the building process. This will lead to more design build projects. It was also a shared opinion that prefabricated products will be used more because they can be installed quicker and provide a greater quality with less waste.

Thoughts and Opinions

Overall I found the roundtable to be beneficial because it is a rare opportunity to be able to discuss current issues with a group of industry members from different companies and markets. I was surprised by how optimistic the industry members were about the economy. They see the poor economy as a growing opportunity and a way to move their company into markets they wouldn't normally pursue work in. I was also surprised at the fact that even though each industry member came from a different company with a different strategy they each seemed to have similar opinions about industry issues.

APPENDIX A: DETAILED PROJECT SCHEDULE

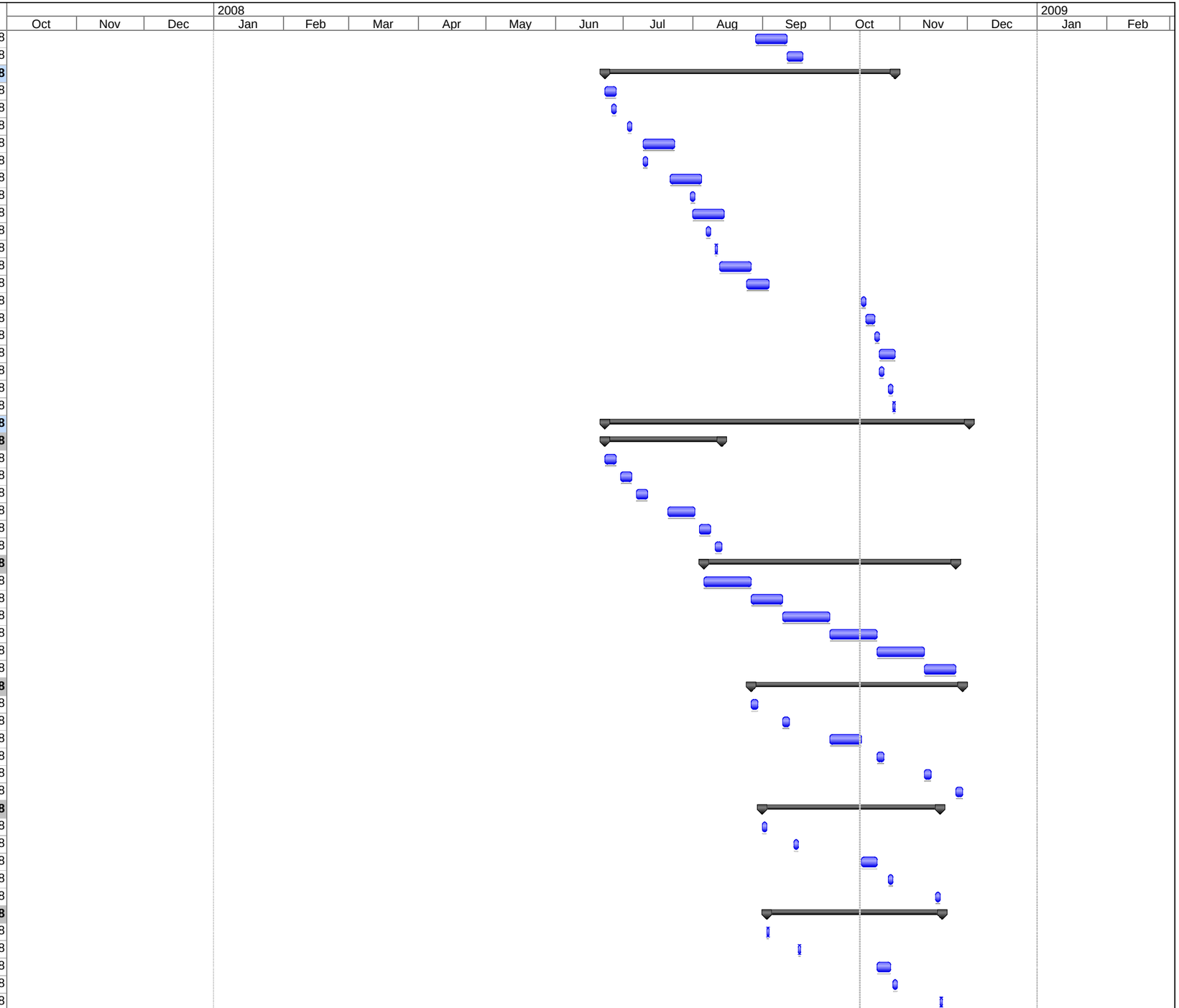
ID	Task Name	Duration	Start	Finish
1	Notice to Proceed	0 days	Fri 11/2/07	Fri 11/2/07
2	**Site Construction**	**245 days**	**Fri 11/2/07**	**Thu 10/9/08**
3	Mobilization	11 days	Fri 11/2/07	Fri 11/16/07
4	Erosion and Sediment Controls	6 days	Fri 11/9/07	Fri 11/16/07
5	Site Clearing/Preparation/Fence	8 days	Fri 11/9/07	Tue 11/20/07
6	Construction Entrance and Temp Road	6 days	Tue 11/13/07	Tue 11/20/07
7	Backfill and Site Grading	53 days	Wed 3/12/08	Fri 5/23/08
8	Site Utilties/Concrete/Pavers	30 days	Fri 8/1/08	Thu 9/11/08
9	Landscaping	20 days	Fri 9/12/08	Thu 10/9/08
10	**Foundations**	**123 days**	**Wed 11/21/07**	**Fri 5/9/08**
11	Pre-drill Piles	47 days	Wed 11/21/07	Thu 1/24/08
12	Install H-Piles	36 days	Tue 12/18/07	Tue 2/5/08
13	Concrete Pile Caps	60 days	Tue 1/8/08	Mon 3/31/08
14	Concrete Grade Beams and Piers	54 days	Tue 1/29/08	Fri 4/11/08
15	Concrete Foundation Walls	30 days	Wed 3/12/08	Tue 4/22/08
16	Grout Base Plates	11 days	Fri 4/25/08	Fri 5/9/08
17	**Concrete**	**31 days**	**Wed 5/28/08**	**Wed 7/9/08**
18	Slab on Deck Level 2	8 days	Wed 5/28/08	Fri 6/6/08
19	Slab on Deck Level 3	8 days	Mon 6/2/08	Wed 6/11/08
20	Slab on Deck Level 4	6 days	Tue 6/10/08	Tue 6/17/08
21	Slab on Deck Level 5	6 days	Fri 6/13/08	Fri 6/20/08
22	Pour Metal Stair Pans	2 days	Mon 6/23/08	Tue 6/24/08
23	Penthouse Slab on Deck	3 days	Wed 6/25/08	Fri 6/27/08
24	Slab on Grade	8 days	Mon 6/30/08	Wed 7/9/08
25	**Masonry**	**61 days**	**Thu 7/10/08**	**Thu 10/2/08**
26	Interior Masonry Level 1	10 days	Thu 7/10/08	Wed 7/23/08
27	Exterior Cast Stone West Elevation	20 days	Mon 7/14/08	Fri 8/8/08
28	Exterior Cast Stone North Elevation	10 days	Mon 8/4/08	Fri 8/15/08
29	Exterior Cast Stone East Elevation	20 days	Mon 8/18/08	Fri 9/12/08
30	Exterior Cast Stone South Elevation	8 days	Mon 9/15/08	Wed 9/24/08
31	Balcony Pavers	10 days	Fri 9/19/08	Thu 10/2/08
32	**Structural/Misc. Steel**	**137 days**	**Mon 4/7/08**	**Tue 10/14/08**
33	Erect Structural Steel	26 days	Mon 4/7/08	Mon 5/12/08
34	Detailing and Decking	56 days	Fri 4/11/08	Fri 6/27/08
35	Stair ST-1/ST-2	14 days	Wed 5/7/08	Mon 5/26/08
36	Exterior Metal Stud Framing East Elev.	17 days	Thu 6/5/08	Fri 6/27/08
37	Exterior Metal Stud Framing North Elev.	7 days	Thu 6/26/08	Fri 7/4/08
38	Exterior Metal Stud Framing West Elev.	5 days	Thu 7/3/08	Wed 7/9/08
39	Exterior Metal Stud Framing South Elev.	7 days	Mon 7/7/08	Tue 7/15/08
40	Exterior Metal Studs at Mechanical Room	8 days	Wed 7/16/08	Fri 7/25/08
41	Railings and Handrails	43 days	Fri 8/15/08	Tue 10/14/08
42	Aluminum Sunshades	20 days	Fri 8/22/08	Thu 9/18/08
43	**Woods and Plastics**	**14 days**	**Wed 10/22/08**	**Mon 11/10/08**
44	Vanity Tops	10 days	Wed 10/22/08	Tue 11/4/08
45	Reception Desk	4 days	Wed 11/5/08	Mon 11/10/08
46	**Thermal and Moisture Protection**	**64 days**	**Mon 6/23/08**	**Thu 9/18/08**
47	Spray on Fireproofing Level 1-5 Shafts	15 days	Mon 6/23/08	Fri 7/11/08
48	Insulation and Vapor Barrier East Elev.	10 days	Fri 6/27/08	Thu 7/10/08
49	Insulation and Vapor Barrier North Elev.	7 days	Thu 7/3/08	Fri 7/11/08
50	Insulation and Vapor Barrier West Elev.	5 days	Tue 7/8/08	Mon 7/14/08
51	Metal Panels East Elev.	15 days	Fri 7/11/08	Thu 7/31/08
52	Insulation and Vapor Barrier South Elev.	7 days	Mon 7/14/08	Tue 7/22/08
53	Roof Insulation and Membrane	15 days	Wed 7/16/08	Tue 8/5/08
54	Metal Panels North Elevation	10 days	Fri 8/1/08	Thu 8/14/08
55	Metal Panels West Elevation	10 days	Fri 8/15/08	Thu 8/28/08
56	Metal Coping and Roof Flashing	15 days	Fri 8/29/08	Thu 9/18/08



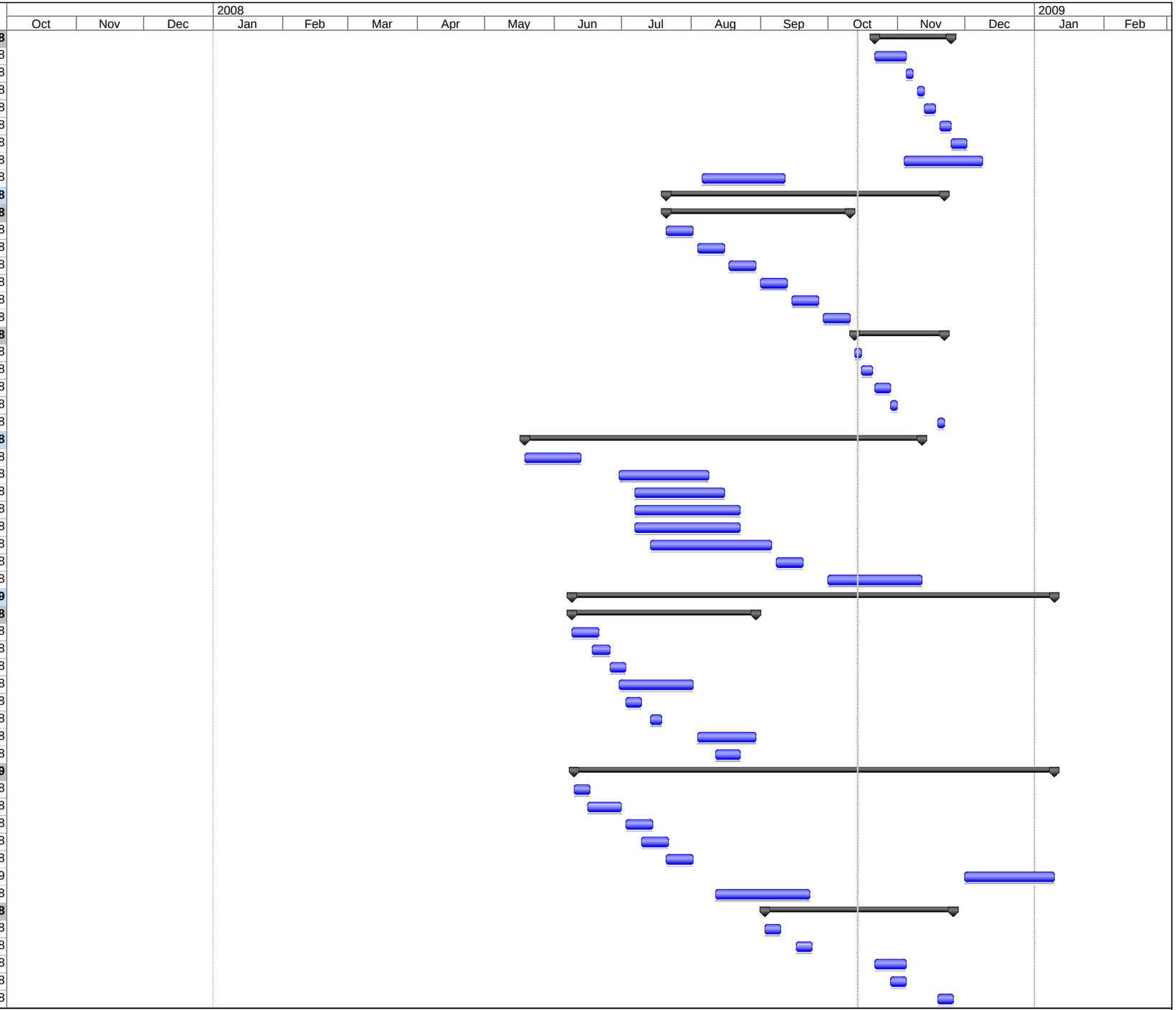
Project: Detailed Project Schedule.mp
Date: Tue 10/14/08

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

ID	Task Name	Duration	Start	Finish
57	Metal Panels South Elevation	10 days	Fri 8/29/08	Thu 9/11/08
58	Waterproofing Membrane at Balconies	5 days	Fri 9/12/08	Thu 9/18/08
59	**Doors and Windows**	**93 days**	**Mon 6/23/08**	**Wed 10/29/08**
60	Exterior Aluminum Entrance Doors	5 days	Mon 6/23/08	Fri 6/27/08
61	Hollow Metal Door Frames Level 2	2 days	Thu 6/26/08	Fri 6/27/08
62	Hollow Metal Door Frames Level 3	2 days	Thu 7/3/08	Fri 7/4/08
63	Punch Windows Level 1	10 days	Thu 7/10/08	Wed 7/23/08
64	Hollow Metal Door Frames Level 4	2 days	Thu 7/10/08	Fri 7/11/08
65	Punch Windows Level 2	10 days	Tue 7/22/08	Mon 8/4/08
66	Hollow Metal Door Frames Level 1	2 days	Thu 7/31/08	Fri 8/1/08
67	Punch Windows Level 3	10 days	Fri 8/1/08	Thu 8/14/08
68	Hollow Metal Door Frames Level 5	2 days	Thu 8/7/08	Fri 8/8/08
69	Hollow Metal Door Frames Penthouse	1 day	Mon 8/11/08	Mon 8/11/08
70	Punch Windows Level 4	10 days	Wed 8/13/08	Tue 8/26/08
71	Punch Windows Level 5	8 days	Mon 8/25/08	Wed 9/3/08
72	Doors and Hardware Level 1	2 days	Wed 10/15/08	Thu 10/16/08
73	Doors and Hardware Level 2	2 days	Fri 10/17/08	Mon 10/20/08
74	Doors and Hardware Level 3	2 days	Tue 10/21/08	Wed 10/22/08
75	Interior Glazing	5 days	Thu 10/23/08	Wed 10/29/08
76	Doors and Hardware Level 4	2 days	Thu 10/23/08	Fri 10/24/08
77	Doors and Hardware Level 5	2 days	Mon 10/27/08	Tue 10/28/08
78	Doors and Hardware Penthouse	1 day	Wed 10/29/08	Wed 10/29/08
79	**Interior Finishes**	**116 days**	**Mon 6/23/08**	**Mon 12/1/08**
80	**Interior Metal Studs**	**38 days**	**Mon 6/23/08**	**Wed 8/13/08**
81	Level 2	5 days	Mon 6/23/08	Fri 6/27/08
82	Level 3	5 days	Mon 6/30/08	Fri 7/4/08
83	Level 4	5 days	Mon 7/7/08	Fri 7/11/08
84	Level 1	10 days	Mon 7/21/08	Fri 8/1/08
85	Level 5	5 days	Mon 8/4/08	Fri 8/8/08
86	Penthouse	3 days	Mon 8/11/08	Wed 8/13/08
87	**Hang/Tape/Finish GWB**	**80 days**	**Wed 8/6/08**	**Tue 11/25/08**
88	Level 2	15 days	Wed 8/6/08	Tue 8/26/08
89	Level 3	10 days	Wed 8/27/08	Tue 9/9/08
90	Level 1	15 days	Wed 9/10/08	Tue 9/30/08
91	Level 4	15 days	Wed 10/1/08	Tue 10/21/08
92	Level 5	15 days	Wed 10/22/08	Tue 11/11/08
93	Penthouse	10 days	Wed 11/12/08	Tue 11/25/08
94	**Paint Walls**	**68 days**	**Wed 8/27/08**	**Fri 11/28/08**
95	Level 2	3 days	Wed 8/27/08	Fri 8/29/08
96	Level 3	3 days	Wed 9/10/08	Fri 9/12/08
97	Level 1	10 days	Wed 10/1/08	Tue 10/14/08
98	Level 4	3 days	Wed 10/22/08	Fri 10/24/08
99	Level 5	3 days	Wed 11/12/08	Fri 11/14/08
100	Penthouse	3 days	Wed 11/26/08	Fri 11/28/08
101	**ACT Ceiling Grid**	**57 days**	**Mon 9/1/08**	**Tue 11/18/08**
102	Level 2	2 days	Mon 9/1/08	Tue 9/2/08
103	Level 3	2 days	Mon 9/15/08	Tue 9/16/08
104	Level 1	5 days	Wed 10/15/08	Tue 10/21/08
105	Level 4	2 days	Mon 10/27/08	Tue 10/28/08
106	Level 5	2 days	Mon 11/17/08	Tue 11/18/08
107	**ACT Ceiling Tile**	**56 days**	**Wed 9/3/08**	**Wed 11/19/08**
108	Level 2	1 day	Wed 9/3/08	Wed 9/3/08
109	Level 3	1 day	Wed 9/17/08	Wed 9/17/08
110	Level 1	4 days	Wed 10/22/08	Mon 10/27/08
111	Level 4	2 days	Wed 10/29/08	Thu 10/30/08
112	Level 5	1 day	Wed 11/19/08	Wed 11/19/08



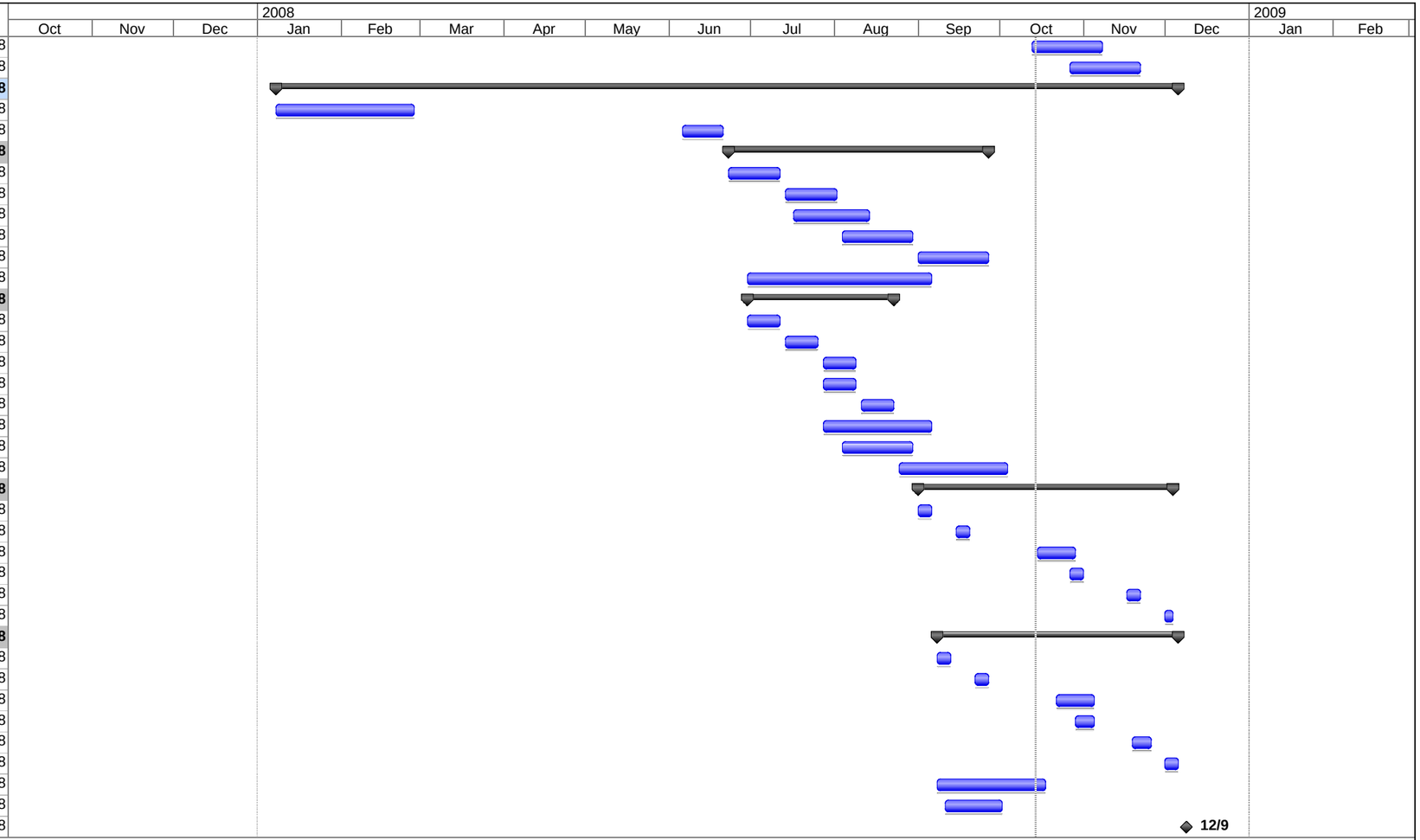
ID	Task Name	Duration	Start	Finish
113	**Ceramic Tile**	**24 days**	**Wed 10/22/08**	**Mon 11/24/08**
114	Level 1	10 days	Wed 10/22/08	Tue 11/4/08
115	Level 2	3 days	Wed 11/5/08	Fri 11/7/08
116	Level 3	3 days	Mon 11/10/08	Wed 11/12/08
117	Level 4	3 days	Thu 11/13/08	Mon 11/17/08
118	Level 5	3 days	Thu 11/20/08	Mon 11/24/08
119	Rubber Base Level 1-5	5 days	Tue 11/25/08	Mon 12/1/08
120	Toilet Partitions and Accessories	25 days	Tue 11/4/08	Mon 12/8/08
121	Elevator Rails/Door Frames/Cabs	27 days	Wed 8/6/08	Thu 9/11/08
122	**Fire Protection**	**90 days**	**Mon 7/21/08**	**Fri 11/21/08**
123	**Piping and Heads**	**60 days**	**Mon 7/21/08**	**Fri 10/10/08**
124	Level 1	10 days	Mon 7/21/08	Fri 8/1/08
125	Level 2	10 days	Mon 8/4/08	Fri 8/15/08
126	Level 3	10 days	Mon 8/18/08	Fri 8/29/08
127	Level 4	10 days	Mon 9/1/08	Fri 9/12/08
128	Level 5	10 days	Mon 9/15/08	Fri 9/26/08
129	Penthouse	10 days	Mon 9/29/08	Fri 10/10/08
130	**Building Core Heads**	**30 days**	**Mon 10/13/08**	**Fri 11/21/08**
131	Level 2	3 days	Mon 10/13/08	Wed 10/15/08
132	Level 3	3 days	Thu 10/16/08	Mon 10/20/08
133	Level 1	5 days	Wed 10/22/08	Tue 10/28/08
134	Level 4	3 days	Wed 10/29/08	Fri 10/31/08
135	Level 5	3 days	Wed 11/19/08	Fri 11/21/08
136	**Plumbing**	**127 days**	**Mon 5/19/08**	**Tue 11/11/08**
137	Underground Plumbing	19 days	Mon 5/19/08	Thu 6/12/08
138	RO/DI Water Equipment/Piping	30 days	Mon 6/30/08	Fri 8/8/08
139	Above Ground Storm Piping	30 days	Mon 7/7/08	Fri 8/15/08
140	Domestic Water	35 days	Mon 7/7/08	Fri 8/22/08
141	Rough-In Toilet Rooms	35 days	Mon 7/7/08	Fri 8/22/08
142	Above Ground Sanitary Piping	40 days	Mon 7/14/08	Fri 9/5/08
143	Gas Riser	10 days	Mon 9/8/08	Fri 9/19/08
144	Install Fixtures and Trim	30 days	Wed 10/1/08	Tue 11/11/08
145	**HVAC**	**155 days**	**Mon 6/9/08**	**Fri 1/9/09**
146	**Install Ductwork**	**60 days**	**Mon 6/9/08**	**Fri 8/29/08**
147	Level 2	10 days	Mon 6/9/08	Fri 6/20/08
148	Level 3	6 days	Wed 6/18/08	Wed 6/25/08
149	Level 4	5 days	Thu 6/26/08	Wed 7/2/08
150	Supply Air Shafts	25 days	Mon 6/30/08	Fri 8/1/08
151	Level 5	5 days	Thu 7/3/08	Wed 7/9/08
152	Level 1	5 days	Mon 7/14/08	Fri 7/18/08
153	Return/Outside Air	20 days	Mon 8/4/08	Fri 8/29/08
154	Rooftop Units	9 days	Tue 8/12/08	Fri 8/22/08
155	**Install HVAC Piping**	**154 days**	**Tue 6/10/08**	**Fri 1/9/09**
156	Level 2	5 days	Tue 6/10/08	Mon 6/16/08
157	Level 3	11 days	Mon 6/16/08	Mon 6/30/08
158	Level 4	8 days	Thu 7/3/08	Mon 7/14/08
159	Level 5	8 days	Thu 7/10/08	Mon 7/21/08
160	Level 1	10 days	Mon 7/21/08	Fri 8/1/08
161	Mechanical Room	30 days	Mon 12/1/08	Fri 1/9/09
162	Install Rooftop Units	30 days	Tue 8/12/08	Mon 9/22/08
163	**Install GRD's**	**60 days**	**Wed 9/3/08**	**Tue 11/25/08**
164	Level 2	5 days	Wed 9/3/08	Tue 9/9/08
165	Level 3	5 days	Wed 9/17/08	Tue 9/23/08
166	Level 1	10 days	Wed 10/22/08	Tue 11/4/08
167	Level 4	5 days	Wed 10/29/08	Tue 11/4/08
168	Level 5	5 days	Wed 11/19/08	Tue 11/25/08



Project: Detailed Project Schedule.mp
Date: Tue 10/14/08

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

ID	Task Name	Duration	Start	Finish
169	Install FPB and VAV's	20 days	Mon 10/13/08	Fri 11/7/08
170	Install Boiler	20 days	Mon 10/27/08	Fri 11/21/08
171	**Electrical**	**239 days**	**Tue 1/8/08**	**Fri 12/5/08**
172	Temporary Power	37 days	Tue 1/8/08	Wed 2/27/08
173	Underground Electrical	11 days	Fri 6/6/08	Fri 6/20/08
174	**Above Ceiling Rough-In**	**70 days**	**Mon 6/23/08**	**Fri 9/26/08**
175	Level 2	15 days	Mon 6/23/08	Fri 7/11/08
176	Level 3	15 days	Mon 7/14/08	Fri 8/1/08
177	Level 1	20 days	Thu 7/17/08	Wed 8/13/08
178	Level 4	20 days	Mon 8/4/08	Fri 8/29/08
179	Level 5	20 days	Mon 9/1/08	Fri 9/26/08
180	Conduit/Power Rough-In - Elec Room	50 days	Mon 6/30/08	Fri 9/5/08
181	**Electrical Wall Rough-In**	**40 days**	**Mon 6/30/08**	**Fri 8/22/08**
182	Level 2	10 days	Mon 6/30/08	Fri 7/11/08
183	Level 3	10 days	Mon 7/14/08	Fri 7/25/08
184	Level 1	10 days	Mon 7/28/08	Fri 8/8/08
185	Level 4	10 days	Mon 7/28/08	Fri 8/8/08
186	Level 5	10 days	Mon 8/11/08	Fri 8/22/08
187	Fire Alarm Rough-In	30 days	Mon 7/28/08	Fri 9/5/08
188	Install Switchgear	20 days	Mon 8/4/08	Fri 8/29/08
189	Install Emergency Generator	30 days	Mon 8/25/08	Fri 10/3/08
190	**Install Devices/Trimout**	**68 days**	**Mon 9/1/08**	**Wed 12/3/08**
191	Level 2	5 days	Mon 9/1/08	Fri 9/5/08
192	Level 3	5 days	Mon 9/15/08	Fri 9/19/08
193	Level 1	10 days	Wed 10/15/08	Tue 10/28/08
194	Level 4	5 days	Mon 10/27/08	Fri 10/31/08
195	Level 5	5 days	Mon 11/17/08	Fri 11/21/08
196	Penthouse	3 days	Mon 12/1/08	Wed 12/3/08
197	**Install Light Fixtures**	**65 days**	**Mon 9/8/08**	**Fri 12/5/08**
198	Level 2	5 days	Mon 9/8/08	Fri 9/12/08
199	Level 3	5 days	Mon 9/22/08	Fri 9/26/08
200	Level 1	10 days	Wed 10/22/08	Tue 11/4/08
201	Level 4	5 days	Wed 10/29/08	Tue 11/4/08
202	Level 5	5 days	Wed 11/19/08	Tue 11/25/08
203	Penthouse	5 days	Mon 12/1/08	Fri 12/5/08
204	Install Fire Alarm Devices	30 days	Mon 9/8/08	Fri 10/17/08
205	Install Exterior Lighting Fixtures	15 days	Thu 9/11/08	Wed 10/1/08
206	Certificate of Occupancy	0 days	Tue 12/9/08	Tue 12/9/08



Project: Detailed Project Schedule.mp
Date: Tue 10/14/08

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

APPENDIX B: FOUNDATION AND SUPERSTRUCTURE SITE PLANS

MONONGAHELA RIVER

R.R. TRACKS

TEMPORARY POWER SHED

PROPERTY LINE

PROPERTY LINE

CONSTRUCTION PARKING

TOOL AND EQUIPMENT STORAGE

CONSTRUCTION TRAILERS

ACCESS ROAD

LAYOUT SPACE

50'

60 TON TRUCK CRANE

80 TON CRAWLER CRANE

140'

BRIDGESIDE BUIDING II

5 Stories - 75 Feet

LAYOUT SPACE

SUNOCO BUILDING

2 Stories

PORTABLE TOILETS

TECHNOLOGY DRIVE RELOCATION

Manhole

Light Post

Traffic/Pedestrian Flow

Existing Electric Line

Temporary Power

Temporary Telecom. Line

STRADA

25'

12.5' 50'

Erik Carlson

October 24,2008

Project Name

Bridgeside Building 2

Drawing Title

Foundation Site Plan

MONONGAHELA RIVER

R.R. TRACKS

TEMPORARY POWER SHED

PROPERTY LINE

CONSTRUCTION PARKING

TOOL AND EQUIPMENT STORAGE

CONSTRUCTION TRAILERS

ACCESS ROAD

JLG LIFT

LAYOUT SPACE

75 TON CRAWLER CRANE

150'

DUMPSTER

DUMPSTER

DUMPSTER

LAYOUT SPACE

BRIDGESIDE BUIDING II

5 Stories - 75 Feet

PORTABLE TOILETS

JLG LIFT

JLG LIFT

50'

30 TON TRUCK CRANE

BOOM TRUCK

PROPERTY LINE

LAYOUT SPACE

SUNOCO BUILDING

2 Stories

TECHNOLOGY DRIVE RELOCATION

Manhole

Light Post

Traffic/Pedestrian Flow

Existing Electric Line

Temporary Power

Temporary Telecom. Line

STRADA

25'

12.5' 50'

Erik Carlson

October 24,2008

Project Name

Bridgeside Building 2

Drawing Title

Superstructure Site Plan

APPENDIX C: DETAILED STRUCTURAL ESTIMATE AND TAKEOFF NOTES

Detailed Structural Estimate								
Description	**Quantity**	**Unit**	**Material**	**Labor**	**Equip.**	**O & P**	**$/Unit**	**Total Cost**
031113 - Concrete Forming								
Foundation Walls	2,879	SFCA	$0.86	$2.29		$1.37	$4.52	$13,012
Pile Caps	751	SFCA	$0.80	$2.90		$1.70	$5.40	$4,055
Piers	118	SFCA	$0.80	$2.90		$1.70	$5.40	$637
Grade Beams	8,944	SFCA	$0.56	$2.83		$1.66	$5.05	$45,167
Slab on Grade	258	SFCA	$0.71	$6.00		$3.44	$10.15	$2,615
							Total	**$65,487**
032110 - Reinforcing Steel								
Elevated Slabs	1,359	CSF	$12.75	$18.90		$13.35	$45.00	$61,160.85
Foundation Walls	2	Tons	$850	$630		$470	$1,950	$3,978.00
Pile Caps	13	Tons	$805	$365		$305	$1,475	$19,470.00
Piers	2	Tons	$850	$630		$470	$1,950	$3,997.50
Grade Beams	10	Tons	$850	$630		$470	$1,950	$19,500.00
Slab on Grade	313	CSF	$12.75	$18.90		$13.35	$45.00	$14,103.00
							Total	**$122,209**
033105 - Structural Concrete								
3000 psi - Foundation	715	CY	$104			$10	$114	$81,456
4000 psi - Slabs	1,645	CY	$108			$11	$119	$195,799
							Total	**$277,255**
033105 - Placing Concrete								
Elevated Slabs	1,258	CY		$14.20	$5.35	$8.45	$28.00	$35,237
Foundation Walls	41	CY		$19.90	$7.50	$11.60	$39.00	$1,594
Pile Caps	437	CY		$18.05	$6.85	$10.60	$35.50	$15,514
Piers	25	CY		$30.50	$11.55	$17.45	$59.50	$1,512
Grade Beams	211	CY		$11.05	$4.17	$6.28	$21.50	$4,541
Slab on Grade	387	CY		$15.30	$5.80	$8.90	$30.00	$11,607
							Total	**$70,005**
033529 - Finishing Floors								
Floor Slabs	167,253	SF		$0.32		$0.14	$0.46	$76,936
							Total	**$76,936**
051223 - Structural Steel								
Columns	145	Tons	$2,250	$375	$130	$545	$3,300	$479,692
Beams	466	Tons	$2,250	$375	$130	$545	$3,300	$1,537,689
Roof Beams	110	Tons	$2,250	$375	$130	$545	$3,300	$363,222
Penthouse Beams	4	Tons	$2,250	$375	$130	$545	$3,300	$14,537
Bracing	19	Tons	$2,250	$375	$130	$545	$3,300	$64,291
							Total	**$2,459,430**
053113 - Steel Decking								
Floor Decking	135,913	SF	$2.47	$0.39	$0.03	$0.58	$3.47	$471,618
Roof Decking	29,676	SF	$1.82	$0.35	$0.03	$0.46	$2.66	$78,938
							Total	**$550,556**
316216 - Steel Piles								
HP 10x57	1,390	VLF	$22.00	$3.87	$2.70	$4.43	$33.00	$45,870
HP 14x73	320	VLF	$28.50	$4.37	$4.09	$6.04	$43.00	$13,760
							Total	**$59,630**

Concrete Takeoff

Composite Slabs						
Location	Area (SF)	Thickness (in)	CY	SFCA	Reinforcing	Deck
SOG	31,340	4	386.9	257.7	W/6x6-W1.4xW1.4	
2	32,703	3	302.8	193.3	W/6x6-W1.4xW1.4	3" 20 GA. Steel
3	32,590	3	301.8	193.3	W/6x6-W1.4xW1.4	3" 20 GA. Steel
4	32,590	3	301.8	193.3	W/6x6-W1.4xW1.4	3" 20 GA. Steel
5	32,590	3	301.8	193.3	W/6x6-W1.4xW1.4	3" 20 GA. Steel
Roof	5,440	3	50.4	199.3	W/6x6-W1.4xW1.4	3" 20 GA. Steel
Roof	27,150					1.5" 20 GA. Steel
High Roof	2,526					1.5" 20 GA. Steel
		Total	**1,645.4**	**1,229.9**		

Pile Caps						
Detail Num.	Quantity	Area (SF)	Depth (ft)	CY	SFCA	Reinforcing
PC-2	16	26	3	46.2	66	#7 @ 8" EW
PC-3	27	64	3.5	224.0	112	9 #9 EW
PC-4	5	56	3.5	36.3	105	12 #9 EW
PC-6	1	441	3.5	57.2	90	#9 @ 12" EW
PC-7A	2	110	4.5	36.7	189	13 #9 EW
PC-9A	2	110	4.5	36.7	189	15 #9 EW
			Total	**437.0**	**751**	

Piers						
Detail Num.	Quantity	Area (SF)	Depth (ft)	CY	SFCA	Reinforcing
P1	15	4	4	8.9	46	6#7 #3@18"
P2	2	6.25	4	1.9	40	10#8 #3@12"
P3	12	8.25	4	14.7	32	10#8 #3@12"
			Total	**25.4**	**118**	

Foundation Walls						
Detail Num.	Length (ft)	Width (in)	Depth (ft)	CY	SFCA	Reinforcing
100	325	8	2	16.0	1,302.7	#5@12" H&V
102	81	12	5	15.0	820.0	#5@12" H&V EW
105	10	14	4	1.7	89.3	#5@12" H&V EW
106	69	8	4	6.8	557.3	#4@12" H&V EW
107	13	8	4	1.3	109.3	#4@12" H&V EW
			Total	**40.9**	**2,878.7**	

Grade Beams						
Num.	**Width (in)**	**Depth (in)**	**Length (ft)**	**CY**	**SFCA**	**Reinforcing**
GB 1	30	36	32	8.9	352	8#7 #4@12"
GB 2	30	36	32	8.9	352	8#7 #4@12"
GB 3	30	36	32	8.9	352	8#7 #4@12"
GB 4	24	36	20	4.4	200	8#7 #4@12"
GB 5	24	36	12	2.7	120	8#7 #4@12"
GB 6	30	36	32	8.9	352	8#7 #4@12"
GB 7	30	36	32	8.9	352	8#7 #4@12"
GB 8	24	36	18	4.0	180	8#7 #4@12"
GB 9	24	36	32	7.1	320	8#7 #4@12"
GB 10	24	36	18	4.0	180	8#7 #4@12"
GB 11	24	36	32	7.1	320	8#7 #4@12"
GB 12	24	36	32	7.1	320	8#7 #4@12"
GB 13	24	36	32	7.1	320	8#7 #4@12"
GB 14	24	36	32	7.1	320	8#7 #4@12"
GB 15	24	36	32	7.1	320	8#7 #4@12"
GB 16	24	36	32	7.1	320	8#7 #4@12"
GB 17	24	36	32	7.1	320	8#7 #4@12"
GB 18	24	36	32	7.1	320	8#7 #4@12"
GB 19	30	36	32	8.9	352	8#7 #4@12"
GB 20	30	36	32	8.9	352	8#7 #4@12"
GB 21	30	36	30	8.3	330	8#7 #4@12"
GB 22	30	36	30	8.3	330	8#7 #4@12"
GB 23	24	36	30	6.7	300	8#7 #4@12"
GB 24	24	36	30	6.7	300	8#7 #4@12"
GB 25	24	36	18.5	4.1	185	8#7 #4@12"
GB 26	24	36	18.5	4.1	185	8#7 #4@12"
GB 27	24	36	30	6.7	300	8#7 #4@12"
GB 28	30	36	30	8.3	330	8#7 #4@12"
GB 29	30	36	30	8.3	330	8#7 #4@12"
GB 30	30	36	30	8.3	330	8#7 #4@12"
			Total	**211.2**	**8944**	

Steel Takeoff

Steel Column Takeoff				
Size	**Quantity**	**Length**	**lbs/ft**	**Tons**
W14x145	2	44.75	145	6.49
W10x49	5	44.75	49	5.48
W10x60	2	44.75	60	2.69
W12x72	4	44.75	72	6.44
W12x79	7	44.75	79	12.37
W10x45	1	44.75	45	1.01
W10x68	5	44.75	68	7.61
W12x87	5	44.75	87	9.73
W12x106	1	44.75	106	2.37
W12x96	5	44.75	96	10.74
W14x132	9	44.75	132	26.58
W14x99	2	44.75	99	4.43
W12x120	2	44.75	120	5.37
W10x39	1	44.75	39	0.87
W14x90	11	29	90	14.36
W10x33	13	29	33	6.22
W10x33	1	14.75	33	0.24
W12x40	3	29	40	1.74
W12x50	4	29	50	2.90
W12x53	12	29	53	9.22
W12x53	2	44.75	53	2.37
W12x45	1	29	45	0.65
W14x61	1	29	61	0.88
W12x65	1	44.75	65	1.45
W12x72	1	29	72	1.04
W14x72	1	29	72	1.04
HSS6x6x1/4	7	15.66	19.02	1.04
Total	**109**		**Total**	**145.36**

Penthouse Steel Takeoff				
Size	**Quantity**	**Length**	**lbs/ft**	**Tons**
20K3	5	30	6.7	0.50
12K1	7	12	5	0.21
20K4	2	30	7.6	0.23
10K1	2	18	5	0.09
W12x14	2	30	14	0.42
W10x12	7	18	12	0.76
W18x35	2	17	35	0.60
W16x26	3	32	26	1.25
W12x14	1	16.5	14	0.12
W8x10	4	12	10	0.24
Total	**35**		**Total**	**4.41**

Steel Bracing Takeoff				
Size	**Quantity**	**Length**	**lbs/ft**	**Tons**
HSS8x8x.375	24	20	37.69	9.05
HSS8x8x.5	4	10	48.85	0.98
HSS10x10x.5	8	20	55.66	4.45
HSS10x10x.625	4	10	76.33	1.53
W8x31	16	10	30	2.40
W10x54	4	10	54	1.08
Total	**60**		**Total**	**19.48**

Steel Beam Takeoff				
Size	Quantity	Length	lbs/ft	Tons
W21x44	296	32	44	208.38
W21x44	12	30	44	7.92
W24x62	60	30	62	55.80
W24x62	4	32	62	3.97
W16x26	12	32	26	4.99
W16x26	8	30	26	3.12
W24x68	20	30	68	20.40
W18x35	16	32	35	8.96
W18x35	8	18.5	35	2.59
W18x35	8	30	35	4.20
W16x31	20	18.5	31	5.74
W16x31	4	30	31	1.86
W24x94	8	32	94	12.03
W24x55	20	30	55	16.50
W24x55	16	32	55	14.08
W24x55	4	9.25	55	1.02
W18x40	28	32	40	17.92
W21x50	12	32	50	9.60
W21x50	16	30	50	12.00
W14x22	16	30	2	0.48
W24x103	8	32	103	13.18
W30x148	8	30	148	17.76
W12x19	8	18	19	1.37
W12x14	16	18	14	2.02
W12x26	4	18	26	0.94
W8x10	16	11	10	0.88
W8x18	12	11	18	1.19
W10x12	20	12.5	12	1.50
W10x12	16	17	12	1.63
W10x12	20	12	12	1.44
W10x39	4	20	39	1.56
W12x16	4	20	16	0.64
W10x45	4	20	45	1.80
W27x84	4	9.25	84	1.55
W27x84	4	32	84	5.38
C4x5.4	16	4.3	5.4	0.19
C4x5.4	48	3.25	5.4	0.42
C4x5.4	20	5	5.4	0.27
C5x6.7	16	10	6.7	0.54
C5x6.7	4	12	6.7	0.16
Total	**840**		**Total**	**465.97**

Roof Steel Takeoff				
Size	Quantity	Length	lbs/ft	Tons
W18x40	55	32	40	35.20
W18x40	3	30	40	1.80
22K7	15	32	9.7	2.33
22K5	9	32	8.8	1.27
22K6	17	32	9.2	2.50
14K1	8	18	5.2	0.37
W12x14	3	32	14	0.67
W12x14	1	16.5	14	0.12
W12x14	5	30	14	1.05
24K7	4	32	10.1	0.65
20K4	3	32	7.6	0.36
24K4	8	32	8.4	1.08
22K4	10	32	8	1.28
W14x22	7	32	22	2.46
W16x36	9	32	36	5.18
W16x36	1	30	36	0.54
W16x26	5	32	26	2.08
W16x26	3	30	26	1.17
W18x35	7	32	35	3.92
W18x35	4	30	35	2.10
W12x16	2	32	16	0.51
W10x12	10	18	12	1.08
W18x46	6	32	46	4.42
W12x19	1	20	19	0.19
W21x44	2	32	44	1.41
W21x50	1	32	50	0.80
W24x55	1	32	55	0.88
W27x84	1	32	84	1.34
W24x62	1	32	62	0.99
W14x30	1	18	30	0.27
W12x19	2	18.5	19	0.35
W27x84	5	18.5	84	3.89
W12x44	4	30	44	2.64
W24x76	6	30	76	6.84
W31x44	6	30	44	3.96
W30x90	3	30	90	4.05
W30x99	2	30	99	2.97
W30x108	1	30	108	1.62
W24x68	1	30	68	1.02
W30x116	1	30	116	1.74
W21x62	1	30	62	0.93
W16x31	3	30	31	1.40
W16x40	1	32	40	0.64
Total	**239**		**Total**	**110.07**

APPENDIX D: GENERAL CONDITIONS ESTIMATE

General Conditions Estimate				
Description	**Quantity**	**Unit**	**Cost/Unit**	**Total**
General Expenses				
Field Office	14	mo	$282	$3,948
Office Equipment	14	mo	$150	$2,100
Office Supplies	14	mo	$95	$1,330
Office Furniture	1	LS	$1,000	$1,000
Water and Ice	14	mo	$100	$1,400
Additional Plans	1	LS	$2,000	$2,000
Portable Toilets (2)	14	mo	$165	$4,620
Fire Extinguishers	7	ea	$50	$350
Final Clean-up	20,000	SF	$0.20	$4,000
Dumpsters (3)	20	pulls	$440	$26,400
On-Site Computers	2	ea	$1,500	$3,000
IT Maintenance	14	mo	$200	$2,800
First Aid Supplies	1	LS	$1,000	$1,000
Hardhats, Gloves, Glasses	1	LS	$1,500	$1,500
Courier Service	14	mo	$150	$2,100
Cell Phones	14	mo	$200	$2,800
Project Staff				
Superintendent	62	wks	$1,875	$116,250
Project Engineer	62	wks	$1,250	$77,500
Project Executive	15	wks	$2,500	$37,500
Summer Intern	13	wks	$600	$7,800
Building Mgmt. Consultant	1	LS	$24,000	$24,000
Temporary Utilities				
Temporary Lighting	1	LS	$80,000	$80,000
Temporary Water Tap Fees	1	LS	$45,000	$45,000
Temporary Heaters (15)	7	mo	$69	$7,245
Fees and Permits				
Subguard	1	LS	$161,757	$161,757
Building Permit	1	LS	$65,040	$65,040
Owner Contingency	1	LS	$230,000	$230,000
			Subtotal	**$912,440**
			CM Fee (3.6%	**$32,848**
			Total	**$945,288**