Technical Assignment #2

Nathanael Paist
Construction Management
Faculty Adviser: Dr. Messner
Two Liberty Center
Arlington, VA

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Executive Summary

Detailed Project Schedule:

- Structure Complete – March 7, 2007
- Building Enclosed – June 1, 2007
- Phased Completion by Floor – July 24 - September 8, 2007

Site Layout Planning:

- Centrally located trailers for supervision
- One-way vehicular site traffic
- Tower crane with 360° range of operation

Assemblies Estimate of Building Façade:

- Under $40 per SF of façade
- Pre-cast Concrete Panels and Aluminum Frames Window Walls

Detailed Structural Systems Estimate:

- Structural cost of just under $500 per CY of concrete
- At over 14,000 CY of concrete, total structural cost is $7.3 Million
- Entire structure is cast-in-place concrete placed with crane and bucket

General Conditions Estimate:

- Costs based on 19 month duration of construction
- Half of on-site staffing is on site for only 60% of the duration
- General Conditions costs of $1.7 Million, or $90,000 per month

Detailed Project Schedule

(*See Appendix 2.A for detailed schedule)*

Key Project Dates:

1. Begin Foundation Work……... 12 December 2005
2. Complete Concrete Structure……... 7 March 2007
3. Complete Pre-cast Concrete Façade……. 1 June 2007
4. Owner Acceptance – Ground Floor……. 9 August 2007
5. Owner Acceptance – Second Floor…….. 24 July 2007
6. Owner Acceptance – Third Floor …… 27 July 2007
7. Owner Acceptance – Fourth Floor……... 1 August 2007
8. Owner Acceptance – Fifth Floor…….. 14 August 2007
9. Owner Acceptance – Sixth Floor……. 17 August 2007
10. Owner Acceptance – Seventh Floor……. 15 August 2007
11. Owner Acceptance – Eighth Floor……... 30 August 2007
12. Owner Acceptance – Ninth Floor…… 8 September 2007
13. Substantial Completion…… 8 September 2007

Sequence of Structure and Façade:

With a Cast-In-Place concrete structure, there is little ability to overlap the structural tasks. Each floor must be complete before the floor above it can be cast. To keep the structural schedule short, the time to cast each floor is kept to between 9 and 13 days. The façade of the building is installed by elevation, starting with the south side and working clockwise around the building to finish with the East side. Windows are then installed in a horizontal sequence of three floors at a time. Since the windows are installed in this horizontal sequence, the crew installing the windows must wait until the façade is nearly complete, so the window installers can't start working until 5 days before the façade is complete.

Sequencing of Interior Work:

Interior work is completed in a sequence that allows for phased completion by floor. Each crew works each floor start to finish and then moves on to the floor above to repeat the process. This sequencing method allows for the tenants to begin their fit-out as each floor is completed, instead of waiting for the substantial completion of the building. The phased completion of each floor is in approximate one week increments, with some small scheduling differences for certain floors. These scheduling differences occur in the durations for punch lists and cleaning tasks, with the construction tasks maintaining a more consistent duration per floor.

Site Layout Planning – Construction Phase

(See Appendix 2.B for Site Utilization Plan)

Temporary Facilities:

There are a total of seven trailers on-site. The largest of the seven trailers is for the owner and is centrally located on the site, allowing the management for the owner to oversee all site activity. Since there are multiple projects occurring on the site, Clark Construction has a total of five trailers on site. Three of the trailers for Clark are located in the same central location as the owner's trailer. The other two trailers for Clark are located on the south end of the site near the entrance for vehicular site traffic, allowing the general contractor to oversee traffic and manage the site deliveries. The final trailer is a smaller trailer located on the far west side of the site which is being used by one of the subcontractors.

Site Safety and Access:

Liberty Center is located in a rapidly developing area and is surrounded by heavily trafficked roads and sidewalks. To control and minimize the hazards to pedestrian and vehicular traffic, the site is surrounded by a system of protection. Concrete Jersey Barriers are surrounding all sides of the site except for around the existing and operating building, One Liberty Center. There is a structural covered

walkway located on the South side of the site inside of the jersey barriers to protect the pedestrians along this road from overhead hazards and the danger of vehicular traffic on the adjacent road.

Construction Activity:

With the location of the tower crane, the concrete staging area, and the on-site vehicular traffic pattern, construction activity will flow easily without congestion. The crane can pick and drop from all site locations around the building and all areas of the building perimeter. For deliveries that may be too large to bring in to the site, the crane has the ability to pick from trucks on two of the streets surrounding the site. Concrete staging is set up on the west side of the site, just outside of the jersey barriers, allowing concrete deliveries to pull up, unload, and pull away without the delays of driving onto the site. The street where the concrete staging is located is a less trafficked road which will minimize the impact of concrete deliveries on local traffic.

Assemblies Estimate of Building Façade

(See Appendix 2.C for assemblies estimate and take-off sheet)

Assemblies Estimate Summary Table:

Exterior Walls and Windows			
	Area of Precast Panels (SF)	Area of Window Walls (SF)	Punch Windows (each)
West Elevation	7300	7070	56
South Elevation	12145	7465	91
East Elevation	13015	1425	84
North Elevation	18940	290	112
Totals	51400	16250	343
	Total Surface Area of Exterior Walls (SF)		67650
	Total Cost of Exterior Walls		$2,590,000.00
		Cost/SF of façade	**$38.29**

Façade Construction:

The assembly of the façade for Two Liberty Center consists of aluminum framed window wall sections, and architectural pre-cast concrete panels with punch windows. The overall façade of the building is 75% pre-cast concrete panels and 25% window wall sections. Each face of the building varies, with the majority of the window walls located at the main entrances to the building and on the architectural tower at the Southwest corner of the building. Main entrances for the building are taken off as paired aluminum framed glass doors.

Detailed Structural Systems Estimate

(See Appendix 2.D for structural estimate and take-off sheets)

Structural Estimate Summary Table:

		3000 PSI Conc. (CY)	5000 PSI Conc. (CY)	6000 PSI Conc. (CY)	Formwork (SF)	Reinforcing Steel (lbs)
Footings						
	Subtotals	1,170	0	0	10,635	35,089
Columns						
	Subtotals	0	537	434	54,662	364,493
Shear Walls						
	Subtotals	0	567	0	31,225	17,020
Beams						
	Subtotals	0	738	0	35,390	276,683
Slabs						
	Subtotals	0	7,989	0	347,875	239,667
Totals		2,340	11,673	868	611,699	1,626,237
	Total Concrete (CY)			14,881		
	Total Formwork Area (SF)				611,699	
	Total Reinforcing Steel (tons)					813
			Total Cost of Concrete Structure ($/CY)			**$490.56**

Description of Structural System:

The structural system for Two Liberty Center is a reinforced cast-in-place concrete structure with four underground levels and nine above ground. The foundation consists of spread concrete footings located under each of the structural columns at the lowest level. The building structure consists of concrete columns and beams supporting 8" typical elevated concrete slabs. There are four shear walls at the core of the building spanning from grade to roof.

Description of Structural Take-Off:

` The following guidelines and assumptions were used to take-off the concrete structure of this building:

- All concrete is placed with a crane and bucket
- Formwork is single use job-built plywood
- Reinforcing steel is calculated based on average pounds per CY of concrete
- Concrete beam lengths were taken at an average length per floor

General Conditions Estimate:

(See Appendix 2.E for General Conditions Estimate)

Description of General Conditions Estimate:

The estimated total cost for the General Conditions of Two Liberty Center total just over $1.7 Million. These costs do not include any home office overhead. Monthly costs are based on a construction duration of 19 months from the start of foundation work to the substantial completion of the building. Staffing costs are based on a Project Manager and Superintendent for the entire 19 months, and a Project Engineer and Assistant Superintendent for 60% of the duration, or 12 months. Other monthly costs included are the 7 trailers, temporary utilities, crane rental, and dumpster rental and service. Costs for Bonds and Insurance are based on an upper-level average percentage of general conditions costs. Costs for fencing and barriers are escalated by the large site with other buildings to be constructed.

General Conditions Estimate Summary Table:

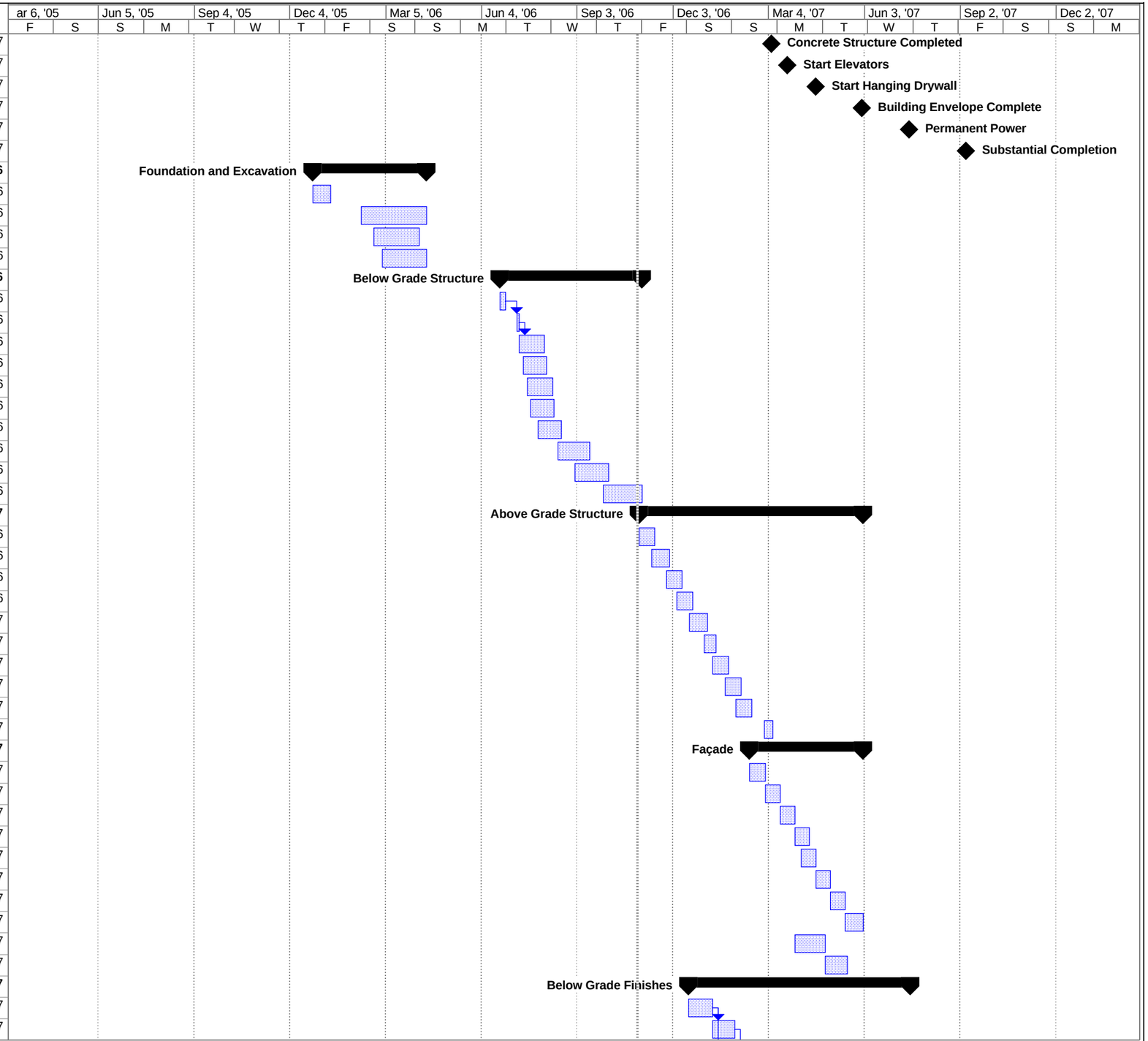
General Conditions Estimate			
Qty	CSI Number	Description	Total Incl. O&P
0.000	13101500100	Permits Rule of Thumb, most cities, maximum	2.0%
0.000	13102000100	Performance Bond, for buildings, maximum	2.5%
0.000	13103500250	All-risk Insurance, maximum	.62%
50.000	13107000120	Field engineer, average	81,528.61
80.000	13107000200	Field Personnel, project manager, average	212,500.38
50.000	13107000240	Field Personnel, superintendent, minimum	113,088.08
80.000	13107000280	Field Personnel, superintendent, maximum	225,124.17
57.000	13215000200	Construction Photographs, 4 shots, 2 prints ea., in	22,426.15
1.000	14505000100	Field Testing, for building, costing $10,000,000, m	34,820.61
1,800.000	15108000600	Temporary Utilities, power for job duration, incl. ele	97,518.74
38.000	15205000250	Office Trailer, furnished, rent per month, 20' x 8', e	6,771.82
76.000	15205000350	Office Trailer, furnished, rent per month, 32' x 8', e	14,335.15
19.000	15205000550	Office Trailer, furnished, rent per month, 50' x 12',	6,288.12
19.000	15205500100	Field Office Expense, office equipment rental, ave	3,144.06
19.000	15205500120	Field Office Expense, office supplies, average	1,868.85
19.000	15205500140	Field Office Expense, telephone bill; avg. bill/mont	4,485.23
19.000	15205500160	Field Office Expense, field office lights & HVAC	2,154.67
400.000	15407551510	Scaffolding Specialties, sidewalk bridge, tubular st	14,096.56
2,560.000	15602500250	Temporary Fencing, chain link, rented up to 12 mo	12,280.42
360.000	15906000500	Rent crane tower, static, 130' high, 106 job 6,200 l	656,121.24
200.000	22203500440	Rubbish handling, chute, circular, prefabricated ste	15,884.93
160.000	22203500800	Rubbish handling, dumpster, 30 C.Y., 10 ton capa	111,930.90
1,200.000	28402002200	Median barrier, precast concrete, double face, 3' -	72,586.77
		Totals	**$1,708,955.44**

Appendix 2.A

The Following Appendix Contains:

-Detailed Project Schedule

ID	Task Name	Duration	Start	Finish
1	Concrete Structure Completed	0 days	Wed 3/7/07	Wed 3/7/07
2	Start Elevators	0 days	Thu 3/22/07	Thu 3/22/07
3	Start Hanging Drywall	0 days	Wed 4/18/07	Wed 4/18/07
4	Building Envelope Complete	0 days	Fri 6/1/07	Fri 6/1/07
5	Permanent Power	0 days	Mon 7/16/07	Mon 7/16/07
6	Substantial Completion	0 days	Sat 9/8/07	Sat 9/8/07
7	**Foundation and Excavation**	**78 days**	**Mon 12/26/05**	**Wed 4/12/06**
8	Drill Piles	13 days	Mon 12/26/05	Wed 1/11/06
9	Excavate and Lag	44 days	Fri 2/10/06	Wed 4/12/06
10	Drill Tiebacks	31 days	Wed 2/22/06	Wed 4/5/06
11	Stress Tiebacks	30 days	Thu 3/2/06	Wed 4/12/06
12	**Below Grade Structure**	**98 days?**	**Thu 6/22/06**	**Fri 11/3/06**
13	Excavate and Place Tower Crane Footing	3 days?	Thu 6/22/06	Mon 6/26/06
14	Set Tower Crane	1 day?	Sat 7/8/06	Sun 7/9/06
15	B4 - Excavate and Place Footings - Pours 1-	18 days?	Mon 7/10/06	Wed 8/2/06
16	B4 - MEP Underslab Rough-in - Pours 1-5	16 days?	Fri 7/14/06	Fri 8/4/06
17	B4 - Prep subgrade - Pours 1-5	18 days?	Tue 7/18/06	Thu 8/10/06
18	B4 - Place Slab - Pours 1-5	16 days?	Fri 7/21/06	Fri 8/11/06
19	B3 - Frame and Place Slab - Pours 1-4	16 days?	Fri 7/28/06	Fri 8/18/06
20	B2 - Frame and Place Slab - Pours 1-6	22 days?	Wed 8/16/06	Thu 9/14/06
21	B1 - Frame and Place Slab - Pours 1-6	22 days?	Fri 9/1/06	Mon 10/2/06
22	Ground Floor - Frame and Place Slab - Pour	27 days?	Thu 9/28/06	Fri 11/3/06
23	**Above Grade Structure**	**153 days?**	**Wed 11/1/06**	**Fri 6/1/07**
24	2nd Floor - Frame and Place Slab - Pours 1-	11 days?	Wed 11/1/06	Wed 11/15/06
25	3rd Floor - Frame and Place Slab - Pours 1-4	13 days?	Mon 11/13/06	Wed 11/29/06
26	4th Floor - Frame and Place Slab - Pours 1-4	11 days?	Mon 11/27/06	Mon 12/11/06
27	5th Floor - Frame and Place Slab - Pours 1-4	11 days?	Thu 12/7/06	Thu 12/21/06
28	6th Floor - Frame and Place Slab - Pours 1-4	13 days?	Tue 12/19/06	Thu 1/4/07
29	7th Floor - Frame and Place Slab - Pours 1-4	9 days?	Tue 1/2/07	Fri 1/12/07
30	8th Floor - Frame and Place Slab - Pours 1-4	11 days?	Wed 1/10/07	Wed 1/24/07
31	9th Floor - Frame and Place Slab - Pours 1-4	11 days?	Mon 1/22/07	Mon 2/5/07
32	Roof Level - Frame and Place Slab - Pours 1	11 days?	Thu 2/1/07	Thu 2/15/07
33	Elevator Roof - Frame and Place Slab	6 days?	Wed 2/28/07	Wed 3/7/07
34	**Façade**	**78 days?**	**Wed 2/14/07**	**Fri 6/1/07**
35	Precast South Side	11 days?	Wed 2/14/07	Wed 2/28/07
36	Precast West Side	10 days?	Thu 3/1/07	Wed 3/14/07
37	Precast North Side	10 days?	Thu 3/15/07	Wed 3/28/07
38	Precast East Side	10 days?	Thu 3/29/07	Wed 4/11/07
39	Windows Floors 1-3	10 days?	Wed 4/4/07	Tue 4/17/07
40	Windows Floors 4-5	10 days?	Wed 4/18/07	Tue 5/1/07
41	Windows Floors 6-7	10 days?	Wed 5/2/07	Tue 5/15/07
42	Windows Floors 8-9	13 days?	Wed 5/16/07	Fri 6/1/07
43	Roof Field	21 days?	Thu 3/29/07	Thu 4/26/07
44	Roof edge and details	15 days?	Fri 4/27/07	Thu 5/17/07
45	**Below Grade Finishes**	**151 days?**	**Mon 12/18/06**	**Mon 7/16/07**
46	CMU Block	17 days?	Mon 12/18/06	Tue 1/9/07
47	Set Mechanical Equipment	15 days?	Wed 1/10/07	Tue 1/30/07

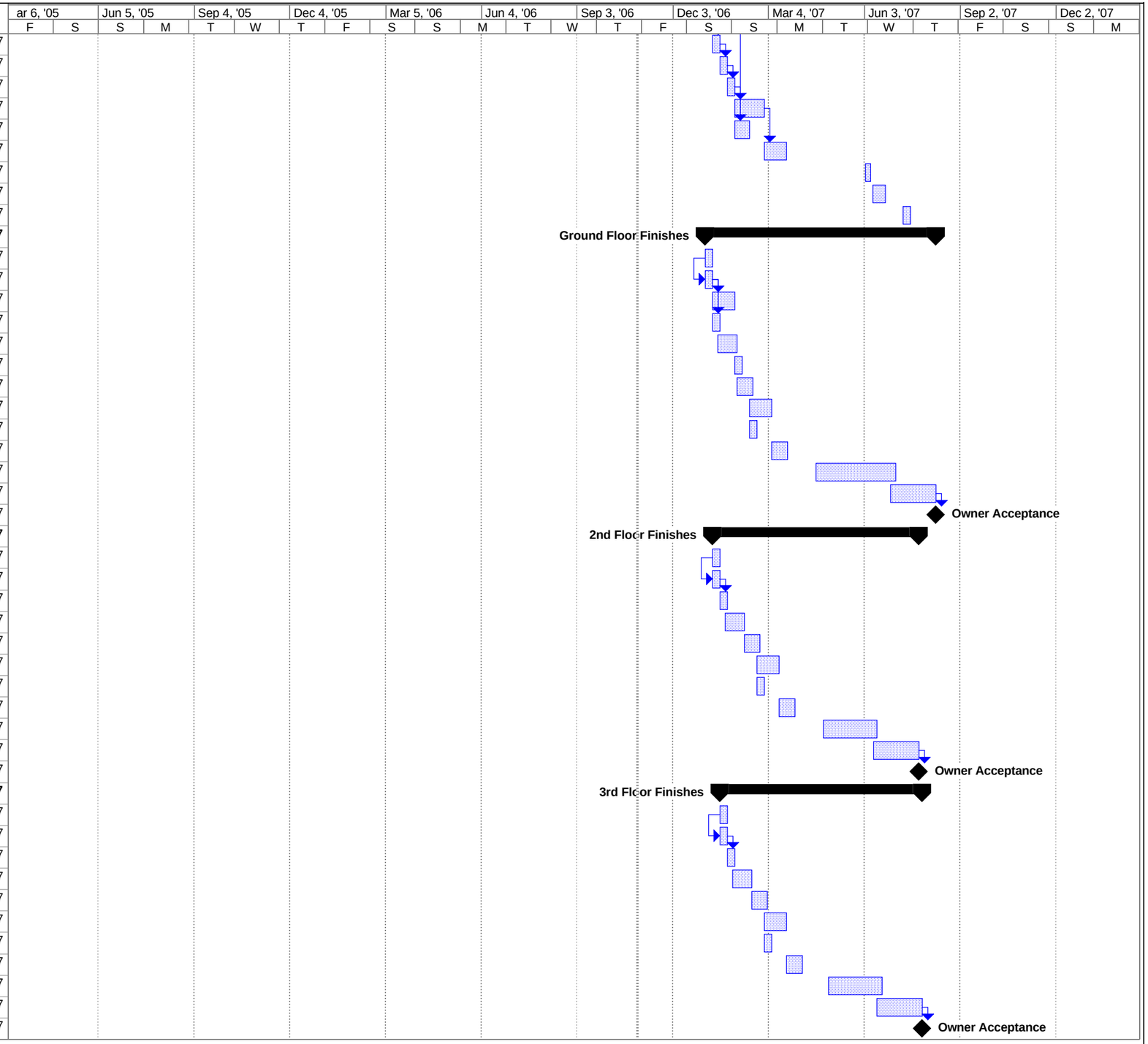


Project: Detailed Schedule
Date: Mon 10/30/06

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks | Group By Summary

Progress | Summary | Rolled Up Milestone | Split | Project Summary | Deadline

ID	Task Name	Duration	Start	Finish
50	Set Switchgear	5 days?	Wed 1/10/07	Tue 1/16/07
51	Set CT Cabinets	5 days?	Wed 1/17/07	Tue 1/23/07
52	Set Electrical Room Panels	5 days?	Wed 1/24/07	Tue 1/30/07
48	Rough In Mechanical Equipment Pipe	20 days?	Wed 1/31/07	Tue 2/27/07
53	Wire and Connect Equipment	10 days?	Wed 1/31/07	Tue 2/13/07
49	Connect Mechanical Equipment	15 days?	Wed 2/28/07	Tue 3/20/07
54	Set Transformers	5 days?	Mon 6/4/07	Fri 6/8/07
55	Pull Wire to Transformers	10 days?	Mon 6/11/07	Fri 6/22/07
56	Energize Electrical Room	5 days?	Tue 7/10/07	Mon 7/16/07
57	**Ground Floor Finishes**	**157 days?**	**Wed 1/3/07**	**Thu 8/9/07**
58	Layout	5 days?	Wed 1/3/07	Tue 1/9/07
59	MEP Risers	5 days?	Wed 1/3/07	Tue 1/9/07
60	CMU Block	15 days?	Wed 1/10/07	Tue 1/30/07
64	Install Duct	5 days?	Wed 1/10/07	Tue 1/16/07
65	Overhead MEP Rough-In	14 days?	Mon 1/15/07	Thu 2/1/07
61	Set Emergency Generator	5 days?	Wed 1/31/07	Tue 2/6/07
62	Frame Out Interior Walls	11 days?	Fri 2/2/07	Fri 2/16/07
63	MEP Wall Rough-In	15 days?	Wed 2/14/07	Tue 3/6/07
66	Install Fire-Stop	5 days?	Wed 2/14/07	Tue 2/20/07
67	MEP Close-In Inspections	11 days?	Wed 3/7/07	Wed 3/21/07
68	Finishes and Fixtures	54 days?	Wed 4/18/07	Mon 7/2/07
69	Punchlists and Cleaning	31 days?	Thu 6/28/07	Thu 8/9/07
70	Owner Acceptance	0 days	Thu 8/9/07	Thu 8/9/07
71	**2nd Floor Finishes**	**140 days?**	**Wed 1/10/07**	**Tue 7/24/07**
72	Layout	5 days?	Wed 1/10/07	Tue 1/16/07
73	MEP Risers	5 days?	Wed 1/10/07	Tue 1/16/07
76	Install Duct	5 days?	Wed 1/17/07	Tue 1/23/07
77	Overhead MEP Rough-In	14 days?	Mon 1/22/07	Thu 2/8/07
74	Frame Out Interior Walls	11 days?	Fri 2/9/07	Fri 2/23/07
75	MEP Wall Rough-In	15 days?	Wed 2/21/07	Tue 3/13/07
78	Install Fire-Stop	5 days?	Wed 2/21/07	Tue 2/27/07
79	MEP Close-In Inspections	11 days?	Wed 3/14/07	Wed 3/28/07
80	Finishes and Fixtures	37 days?	Wed 4/25/07	Thu 6/14/07
81	Punchlists and Cleaning	31 days?	Tue 6/12/07	Tue 7/24/07
82	Owner Acceptance	0 days	Tue 7/24/07	Tue 7/24/07
83	**3rd Floor Finishes**	**138 days?**	**Wed 1/17/07**	**Fri 7/27/07**
84	Layout	5 days?	Wed 1/17/07	Tue 1/23/07
85	MEP Risers	5 days?	Wed 1/17/07	Tue 1/23/07
88	Install Duct	5 days?	Wed 1/24/07	Tue 1/30/07
89	Overhead MEP Rough-In	14 days?	Mon 1/29/07	Thu 2/15/07
86	Frame Out Interior Walls	11 days?	Fri 2/16/07	Fri 3/2/07
87	MEP Wall Rough-In	15 days?	Wed 2/28/07	Tue 3/20/07
90	Install Fire-Stop	5 days?	Wed 2/28/07	Tue 3/6/07
91	MEP Close-In Inspections	11 days?	Wed 3/21/07	Wed 4/4/07
92	Finishes and Fixtures	37 days?	Mon 4/30/07	Tue 6/19/07
93	Punchlists and Cleaning	31 days?	Fri 6/15/07	Fri 7/27/07
94	Owner Acceptance	0 days	Fri 7/27/07	Fri 7/27/07

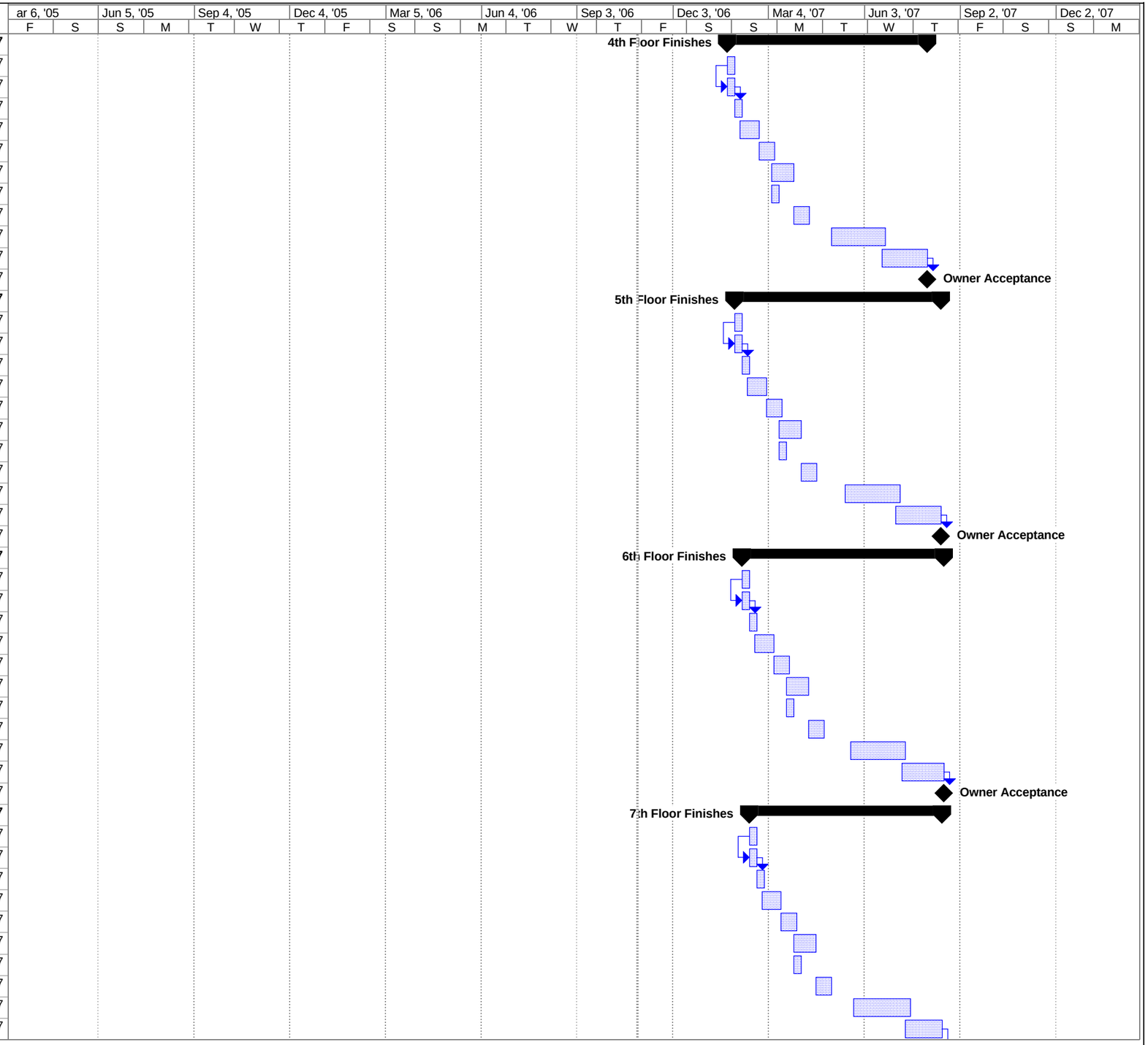


Project: Detailed Schedule.mpp
Date: Mon 10/30/06

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks | Group By Summary

Progress | Summary | Rolled Up Milestone | Split | Project Summary | Deadline

ID	Task Name	Duration	Start	Finish
95	**4th Floor Finishes**	**136 days?**	**Wed 1/24/07**	**Wed 8/1/07**
96	Layout	5 days?	Wed 1/24/07	Tue 1/30/07
97	MEP Risers	5 days?	Wed 1/24/07	Tue 1/30/07
100	Install Duct	5 days?	Wed 1/31/07	Tue 2/6/07
101	Overhead MEP Rough-In	14 days?	Mon 2/5/07	Thu 2/22/07
98	Frame Out Interior Walls	11 days?	Fri 2/23/07	Fri 3/9/07
99	MEP Wall Rough-In	15 days?	Wed 3/7/07	Tue 3/27/07
102	Install Fire-Stop	5 days?	Wed 3/7/07	Tue 3/13/07
103	MEP Close-In Inspections	11 days?	Wed 3/28/07	Wed 4/11/07
104	Finishes and Fixtures	37 days?	Thu 5/3/07	Fri 6/22/07
105	Punchlists and Cleaning	31 days?	Wed 6/20/07	Wed 8/1/07
106	Owner Acceptance	0 days	Wed 8/1/07	Wed 8/1/07
107	**5th Floor Finishes**	**140 days?**	**Wed 1/31/07**	**Tue 8/14/07**
108	Layout	5 days?	Wed 1/31/07	Tue 2/6/07
109	MEP Risers	5 days?	Wed 1/31/07	Tue 2/6/07
112	Install Duct	5 days?	Wed 2/7/07	Tue 2/13/07
113	Overhead MEP Rough-In	14 days?	Mon 2/12/07	Thu 3/1/07
110	Frame Out Interior Walls	11 days?	Fri 3/2/07	Fri 3/16/07
111	MEP Wall Rough-In	15 days?	Wed 3/14/07	Tue 4/3/07
114	Install Fire-Stop	5 days?	Wed 3/14/07	Tue 3/20/07
115	MEP Close-In Inspections	11 days?	Wed 4/4/07	Wed 4/18/07
116	Finishes and Fixtures	38 days?	Wed 5/16/07	Fri 7/6/07
117	Punchlists and Cleaning	31 days?	Tue 7/3/07	Tue 8/14/07
118	Owner Acceptance	0 days	Tue 8/14/07	Tue 8/14/07
119	**6th Floor Finishes**	**138 days?**	**Wed 2/7/07**	**Fri 8/17/07**
120	Layout	5 days?	Wed 2/7/07	Tue 2/13/07
121	MEP Risers	5 days?	Wed 2/7/07	Tue 2/13/07
124	Install Duct	5 days?	Wed 2/14/07	Tue 2/20/07
125	Overhead MEP Rough-In	14 days?	Mon 2/19/07	Thu 3/8/07
122	Frame Out Interior Walls	11 days?	Fri 3/9/07	Fri 3/23/07
123	MEP Wall Rough-In	15 days?	Wed 3/21/07	Tue 4/10/07
126	Install Fire-Stop	5 days?	Wed 3/21/07	Tue 3/27/07
127	MEP Close-In Inspections	11 days?	Wed 4/11/07	Wed 4/25/07
128	Finishes and Fixtures	38 days?	Mon 5/21/07	Wed 7/11/07
129	Punchlists and Cleaning	30 days?	Mon 7/9/07	Fri 8/17/07
130	Owner Acceptance	0 days	Fri 8/17/07	Fri 8/17/07
131	**7th Floor Finishes**	**131 days?**	**Wed 2/14/07**	**Wed 8/15/07**
132	Layout	5 days?	Wed 2/14/07	Tue 2/20/07
133	MEP Risers	5 days?	Wed 2/14/07	Tue 2/20/07
136	Install Duct	5 days?	Wed 2/21/07	Tue 2/27/07
137	Overhead MEP Rough-In	14 days?	Mon 2/26/07	Thu 3/15/07
134	Frame Out Interior Walls	11 days?	Fri 3/16/07	Fri 3/30/07
135	MEP Wall Rough-In	15 days?	Wed 3/28/07	Tue 4/17/07
138	Install Fire-Stop	5 days?	Wed 3/28/07	Tue 4/3/07
139	MEP Close-In Inspections	11 days?	Wed 4/18/07	Wed 5/2/07
140	Finishes and Fixtures	38 days?	Thu 5/24/07	Mon 7/16/07
141	Punchlists and Cleaning	25 days?	Thu 7/12/07	Wed 8/15/07

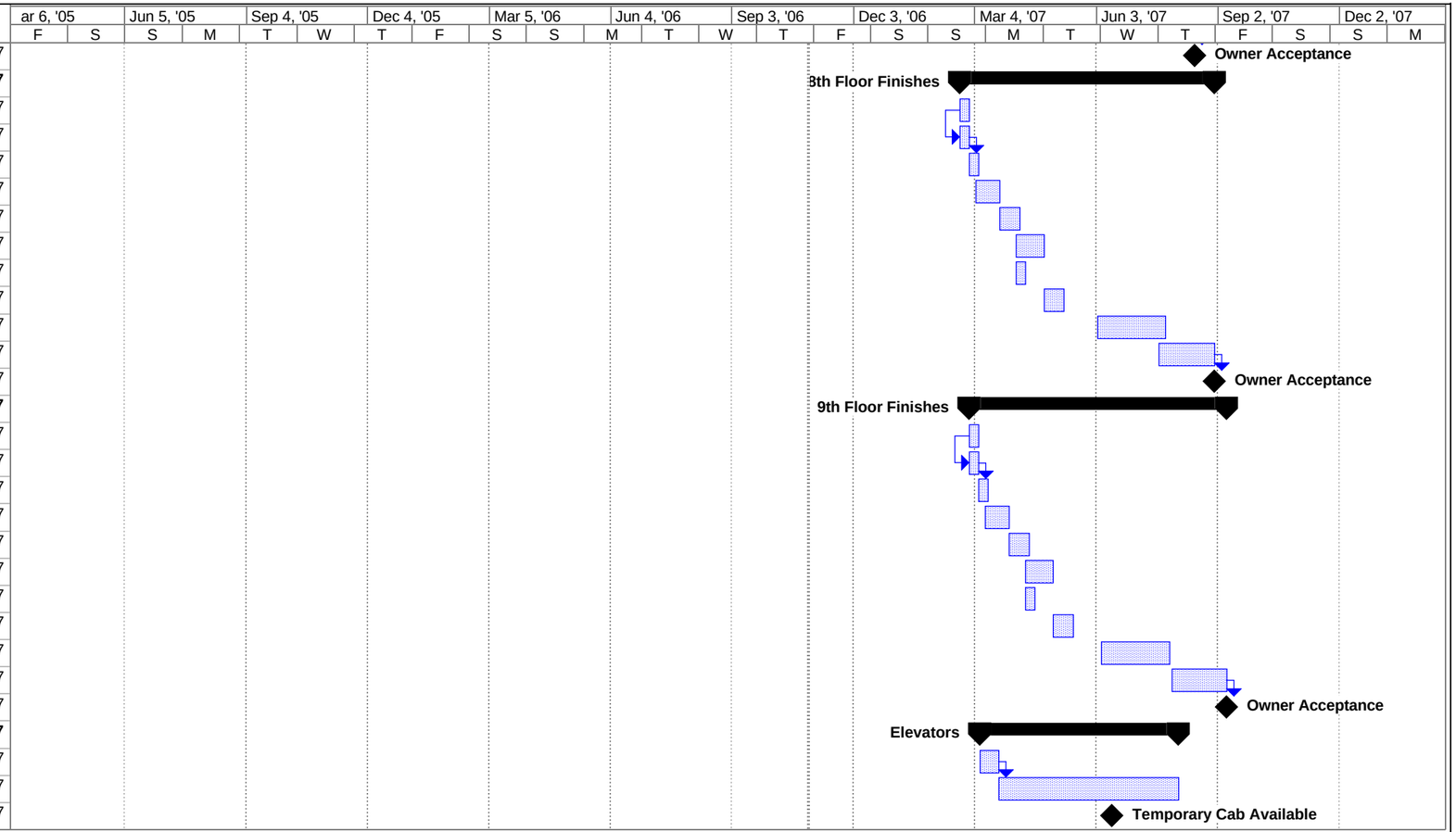


Project: Detailed Schedule.mpp
Date: Mon 10/30/06

Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks | Group By Summary

Progress | Summary | Rolled Up Milestone | Split | Project Summary | Deadline

ID		Task Name	Duration	Start	Finish
142		Owner Acceptance	0 days	Wed 8/15/07	Wed 8/15/07
143		**8th Floor Finishes**	**137 days?**	**Wed 2/21/07**	**Thu 8/30/07**
144		Layout	5 days?	Wed 2/21/07	Tue 2/27/07
145		MEP Risers	5 days?	Wed 2/21/07	Tue 2/27/07
148		Install Duct	5 days?	Wed 2/28/07	Tue 3/6/07
149		Overhead MEP Rough-In	14 days?	Mon 3/5/07	Thu 3/22/07
146		Frame Out Interior Walls	11 days?	Fri 3/23/07	Fri 4/6/07
147		MEP Wall Rough-In	15 days?	Wed 4/4/07	Tue 4/24/07
150		Install Fire-Stop	5 days?	Wed 4/4/07	Tue 4/10/07
151		MEP Close-In Inspections	11 days?	Wed 4/25/07	Wed 5/9/07
152		Finishes and Fixtures	37 days?	Mon 6/4/07	Tue 7/24/07
153		Punchlists and Cleaning	30 days?	Fri 7/20/07	Thu 8/30/07
154		Owner Acceptance	0 days	Thu 8/30/07	Thu 8/30/07
155		**9th Floor Finishes**	**139 days?**	**Wed 2/28/07**	**Sat 9/8/07**
156		Layout	5 days?	Wed 2/28/07	Tue 3/6/07
157		MEP Risers	5 days?	Wed 2/28/07	Tue 3/6/07
160		Install Duct	5 days?	Wed 3/7/07	Tue 3/13/07
161		Overhead MEP Rough-In	14 days?	Mon 3/12/07	Thu 3/29/07
158		Frame Out Interior Walls	11 days?	Fri 3/30/07	Fri 4/13/07
159		MEP Wall Rough-In	15 days?	Wed 4/11/07	Tue 5/1/07
162		Install Fire-Stop	5 days?	Wed 4/11/07	Tue 4/17/07
163		MEP Close-In Inspections	11 days?	Wed 5/2/07	Wed 5/16/07
164		Finishes and Fixtures	37 days?	Thu 6/7/07	Fri 7/27/07
165		Punchlists and Cleaning	31 days?	Mon 7/30/07	Sat 9/8/07
166		Owner Acceptance	0 days	Sat 9/8/07	Sat 9/8/07
167		**Elevators**	**107 days?**	**Thu 3/8/07**	**Fri 8/3/07**
168		Temporary Watertight	10 days?	Thu 3/8/07	Wed 3/21/07
169		Install Elevators	97 days?	Thu 3/22/07	Fri 8/3/07
170		Temporary Cab Available	0 days	Fri 6/15/07	Fri 6/15/07



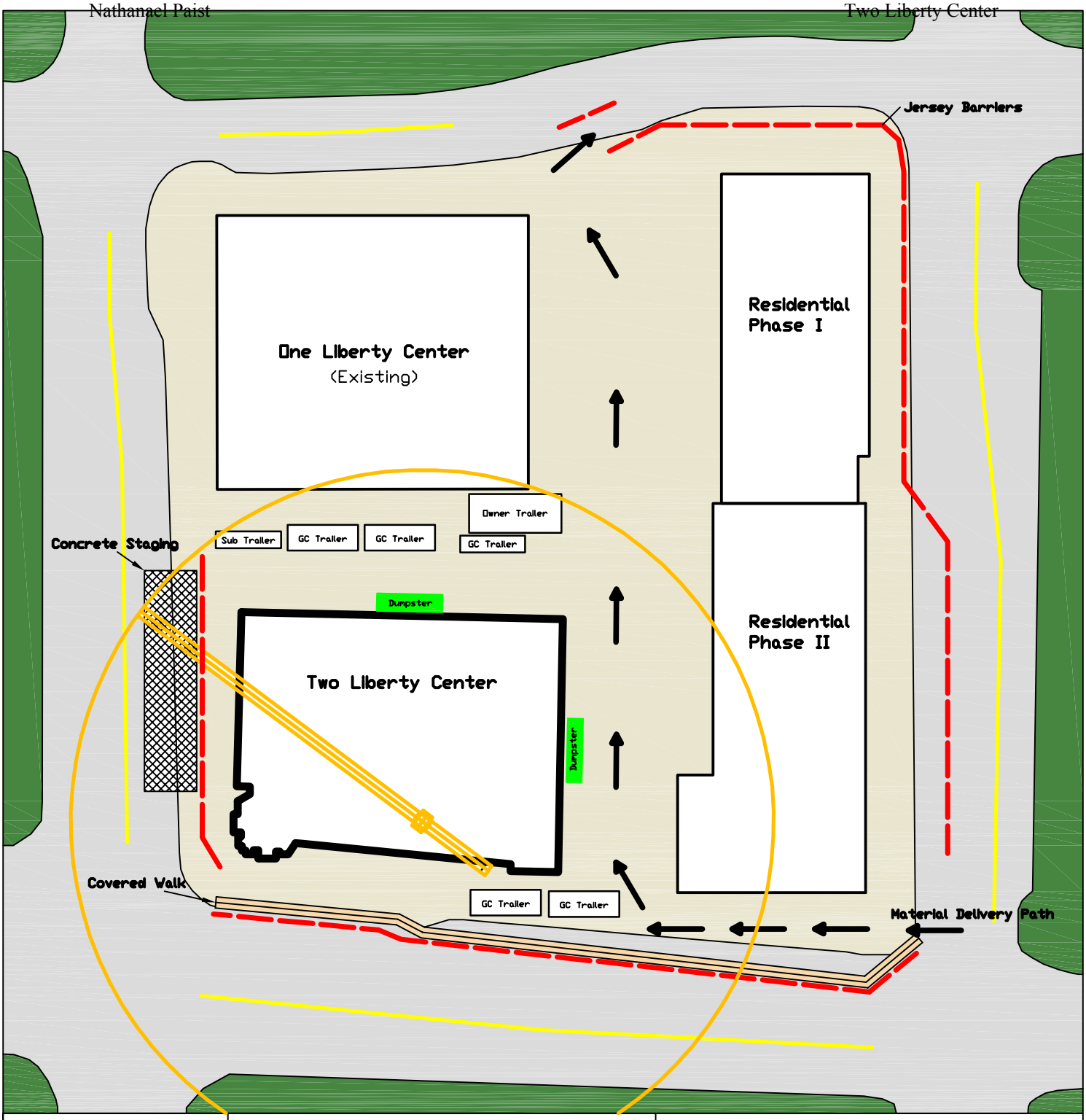
Project: Detailed Schedule.mpp
Date: Mon 10/30/06

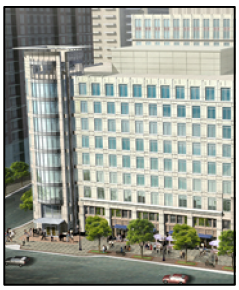
Task | Milestone | Rolled Up Task | Rolled Up Progress | External Tasks | Group By Summary
Progress | Summary | Rolled Up Milestone | Split | Project Summary | Deadline

Appendix 2.B

The Following Appendix Contains:

-Site Utilization Plan, Construction Phase





Site Utilization Plan	N
Construction Phase	Scale: NTS
Two Liberty Center	Nathanael Paist
Arlington, VA	Construction Management

Appendix 2.C

The Following Appendix Contains:

- Assemblies Estimate of Building Façade
- Take-off Sheet for Building Façade

Exterior Wall Assemblies Estimate - Two Liberty Center

Detail - Without Taxes and Insurance

Estimator : Nathanael Paist
Project Size : sqft

ItemCode	Description	Quantity	UM	Lab.Unit	Mat.Unit	Eqp.Unit	Sub.Unit	Eqp.Rent.Unit	Temp.Mat.Unit	Other Unit	Tot.UnitCost	TotalCost
03410.320	PRECAST PANEL ARCH FINISH	51,400.00	SQFT	16.8419	10.560						27.402	1,408,457.66
07210.161	1-1/2" RIGID INSULATION	51,400.00	SQFT	0.4291	0.448						0.877	45,082.94
07460.600	METAL SOFFIT	51,400.00	SQFT	2.9150	5.760						8.675	445,895.00
08120.315	PAIR ALUM GLASS DOOR	9.00	EACH				1,300.000				1,300.000	11,700.00
08510.010	WINDOWS	343.00	EACH				350.000				350.000	120,050.00
08910.020	EXTERIOR WINDOW WALL	16,250.00	SQFT				28.000				28.000	455,000.00
09260.011	4"MTL STUD W/GYPSUM-1 SIDE	51,400.00	SQFT	1.3376	0.640						1.978	101,648.64
Total Estimate												**2,587,834.24**

Assemblies Estimate Take-Off Sheet

Exterior Walls			
	Area of Precast Panels (SF)	Area of Window Walls (SF)	Punch Windows (each)
West Elevation	7300	7070	56
South Elevation	12145	7465	91
East Elevation	13015	1425	84
North Elevation	18940	290	112
Totals	51400	16250	343

Appendix 2.D

The Following Appendix Contains:

- Detailed Estimate of Structural Systems
- Take-off Sheets for Structural Systems

Two Liberty Center - Structural Estimate

Qty	CSI Number	Description	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P
1,170.000	33102200150	Structural concrete, ready mix, normal weight, 3000 psi, includes material			C.Y.	94,770.00	0.00	0.00	94,770.00	104,130.00
9,831.000	33102200400	Structural concrete, ready mix, normal weight, 5000 psi, includes material			C.Y.	884,790.00	0.00	0.00	884,790.00	973,269.00
434.000	33102200411	Structural concrete, ready mix, normal weight, 6000 PSI, includes materia			C.Y.	44,702.00	0.00	0.00	44,702.00	49,042.00
		SubTotals				**1,024,262.00**	**0.00**	**0.00**	**1,024,262.00**	**1,126,441.00**
738.000	33107000100	Structural concrete, placing, beam, small, elevated, with crane and bucke	45	1.6	C.Y.	0.00	33,948.00	15,867.00	49,815.00	69,741.00
971.000	33107000850	Structural concrete, placing, column, square or round, with crane and buc	70	1.029	C.Y.	0.00	28,644.50	13,302.70	41,947.20	58,745.50
1,170.000	33107002700	Structural concrete, placing, spread footing, with crane and bucket, over 5	100	0.72	C.Y.	0.00	24,570.00	11,232.00	35,802.00	49,725.00
7,989.000	33107001500	Structural concrete, placing, elevated slab, pumped, 6" to 10" thick, includ	160	0.4	C.Y.	0.00	91,873.50	37,548.30	129,421.80	183,747.00
567.000	33107005400	Structural concrete, placing, walls, with crane and bucket, 15" thick, includ	95	0.758	C.Y.	0.00	12,474.00	5,726.70	18,200.70	25,231.50
		SubTotals				**0.00**	**191,510.00**	**83,676.70**	**275,186.70**	**387,190.00**
10,635.000	31104303000	C.I.P. concrete forms, pile cap, square or rectangular, plywood, 1 use, inc	290	0.11	SFCA	25,098.60	37,966.95	0.00	63,065.55	86,675.25
54,662.000	31104107000	C.I.P. concrete forms, column, square, plywood, 36" x 36", 1 use, includes	200	0.16	SFCA	120,256.40	284,242.40	0.00	404,498.80	571,217.90
31,225.000	31104557800	C.I.P. concrete forms, walls, modular prefabricated plywood, to 8' high, 1	1,175	0.041	SFCA	52,458.00	42,466.00	0.00	94,924.00	123,651.00
35,390.000	31104051000	C.I.P. concrete forms, beams and girders, exterior spandrel, plywood, 18"	250	0.192	SFCA	106,170.00	226,496.00	0.00	332,666.00	468,917.50
347,875.000	31104201000	C.I.P. concrete forms, elevated slab, flat plate, plywood, to 15' high, 1 use	470	0.102	S.F.	1,391,500.00	1,182,775.00	0.00	2,574,275.00	3,374,387.50
		SubTotals				**1,695,483.00**	**1,773,946.35**	**0.00**	**3,469,429.35**	**4,624,849.15**
17.500	32106000500	Reinforcing steel, in place, footings, #4 to #7, A615, grade 60, incl access	2.1	15.238	Ton	13,300.00	10,150.00	0.00	23,450.00	31,500.00
182.000	32106000200	Reinforcing steel, in place, columns, #3 to #7, A615, grade 60, incl acces	1.5	21.333	Ton	145,600.00	147,420.00	0.00	293,020.00	400,400.00
8.500	32106000700	Reinforcing steel, in place, walls, #3 to #7, A615, grade 60, incl access. L	3	10.667	Ton	6,460.00	3,442.50	0.00	9,902.50	12,750.00
138.000	32106000100	Reinforcing steel, in place, beams and girders, #3 to #7, A615, grade 60,	1.6	20	Ton	110,400.00	104,880.00	0.00	215,280.00	293,250.00
120.000	32106000400	Reinforcing steel, in place, elevated slabs, #4 to #7, A615, grade 60, incl	2.9	11.034	Ton	102,000.00	50,400.00	0.00	152,400.00	195,000.00
		SubTotals				**377,760.00**	**316,292.50**	**0.00**	**694,052.50**	**932,900.00**
330,000.000	33503000250	Concrete finishing, floors, monolithic, machine trowel finish	550	0.015	S.F.	0.00	158,400.00	0.00	158,400.00	231,000.00
		SubTotals				**0.00**	**158,400.00**	**0.00**	**158,400.00**	**231,000.00**
		Totals				**$3,097,505.00**	**$2,440,148.85**	**$83,676.70**	**$5,621,330.55**	**$7,302,380.15**

Structural Estimate Summary Sheet

		3000 PSI Conc. (CY)	5000 PSI Conc. (CY)	6000 PSI Conc. (CY)	Formwork (SF)	Reinforcing Steel (lbs)
Footings	Level					
	Found.	1,170	-	-	10,635	35,089
	Subtotals	1,170	0	0	10,635	35,089
Columns	Level					
	B4	-	-	60	3,480	22,452
	B3	-	-	82	4,905	30,638
	B2	-	-	82	4,922	30,864
	B1	-	-	120	7,089	44,995
	1	-	-	90	4,904	33,836
	2	-	65	-	3,540	24,427
	3	-	65	-	3,540	24,427
	4	-	65	-	3,540	24,427
	5	-	65	-	3,540	24,427
	6	-	65	-	3,540	24,427
	7	-	65	-	3,540	24,427
	8	-	65	-	3,540	24,427
	9	-	69	-	3,814	26,031
	R	-	13	-	768	4,688
	Subtotals	0	537	434	54,662	364,493
Shear Walls						
	Wall A	-	236	-	12,428	7,077
	Wall B1	-	52	-	3,107	1,571
	Wall B2	-	72	-	4,194	2,158
	Wall C	-	207	-	11,496	6,214
	Subtotals	0	567	0	31,225	17,020
Beams	Level					
	B3-B1	-	325	-	18,062	121,955
	1	-	326	-	12,613	122,293
	2-Roof	-	58	-	3,168	21,694
	PH	-	29	-	1,547	10,741
	Subtotals	0	738	0	35,390	276,683
Slabs						
	ALL	-	7,989	-	347,875	239,667
	Subtotals	0	7,989	0	347,875	239,667
Totals						
		2,340	**11,673**	**868**	**611,699**	**1,626,237**

Reinforced Concrete Footings

Column Footings					
Column	Width 1 (feet)	Width 2 (feet)	Depth (inches)	Surface Area (SF)	Volume (CF)
B01	10	10	38	127	317
B02	12	12	43	172	516
B03	12.5	12.5	44	183	573
B04	12	12	43	172	516
B05	9	9	34	102	230
B06	11	11	41	150	413
B07	11	11	41	150	413
B08	15	15	52	260	975
B09	14	14	49	229	800
B10	15	15	52	260	975
B11	11.5	11.5	43	165	474
B12	10	12.5	41	154	427
B13	14.5	14.5	52	251	911
B14	12.5	12.5	52	217	677
B15	12.5	12.5	44	183	573
B16	15.5	15.5	54	279	1081
B17	12.5	12.5	44	183	573
B18	12.5	12.5	44	183	573
B19	12.5	12.5	44	183	573
B21	14	14	51	238	833
B22	14	14	51	238	833
B23	13	13	13	56	183
B24	15	25	60	400	1875
B25	12.5	12.5	43	179	560
B26	13	21	50	283	1138
B27	12	12	44	176	528
B28	12	12	44	176	528
B29	12	12	44	176	528
B30	14.5	14.5	52	251	911
B31	13	13	47	204	662
B32	17	21.5	55	353	1675
B33	10.5	10.5	39	137	358
B34	13.5	13.5	49	221	744
B35	14	14	51	238	833
B38	13	21	55	312	1251
B39	14	14	51	238	833
G01	5.5	8.5	30	70	117
G02	5.5	8.5	30	70	117
G03	5.5	8.5	30	70	117
G04	7	7	27	63	110
G05	6.5	6.5	25	54	88
G06	5.5	8.5	30	70	117
G07	7	7	27	63	110
G08	6.5	6.5	25	54	88
G09	7.5	7.5	30	75	141
G10	6.5	6.5	27	59	95
G11	5.5	8.5	25	58	97

Reinforced Concrete Footings

Column Footings					
Column	Width 1 (feet)	Width 2 (feet)	Depth (inches)	Surface Area (SF)	Volume (CF)
G12	7	7	30	70	123
G13	6.5	6.5	25	54	88
G14	5.5	8.5	30	70	117
G15	7	7	28	65	114
G16	7	7	25	58	102
G17	5.5	8.5	30	70	117
G18	7	7	27	63	110
G19	6.5	6.5	25	54	88
G20	6.5	6.5	25	54	88
G21	5.5	8.5	30	70	117
G22	5.5	8.5	30	70	117
G23	5.5	5.5	22	40	55
G24	6.5	6.5	25	54	88
G25	5	5	20	33	42
G26	6.5	6.5	25	54	88
G27	5.5	11	30	83	151
G28	8	8	30	80	160
G29	8	8	30	80	160
G30	7	7	27	63	110
G31	8	8	30	80	160
G32	8	8	30	80	160
G33	7.5	7.5	30	75	141
G34	6	9	30	75	135
G35	8.5	8.5	33	94	199
G36	8.5	8.5	33	94	199
G37	8.5	8.5	33	94	199
G38	8	8	30	80	160
G39	7	7	27	63	110
G40	5.5	8.5	30	70	117
G41	5.5	8.5	30	70	117
G42	5.5	8.5	30	70	117
G43	5.5	8.5	30	70	117
G44	5.5	8.5	30	70	117
G45	9.5	9.5	25	79	188
G46	10	10	30	100	250
	Formwork Area (SF) -			**10635**	
		Total 3000 PSI Concrete (CY) -			**1170**
		Reinforcing @ 30 lbs/CY -			**35089**

Reinforced Concrete Columns

Level B4 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	24	24	98	9408	56448
B02	24	24	98	9408	56448
B03	24	24	98	9408	56448
B04	24	24	98	9408	56448
B05	24	24	98	9408	56448
B06	24	24	98	9408	56448
B07	24	24	98	9408	56448
B08	24	24	98	9408	56448
B09	24	24	98	9408	56448
B10	24	30	98	10584	70560
B11	24	24	98	9408	56448
B12	24	24	98	9408	56448
B13	24	30	98	10584	70560
B14	24	24	98	9408	56448
B15	24	24	98	9408	56448
B16	24	30	98	10584	70560
B17	24	24	98	9408	56448
B18	24	24	98	9408	56448
B19	24	24	98	9408	56448
B21	24	30	98	10584	70560
B22	24	30	98	10584	70560
B23	24	24	98	9408	56448
B25	21	24	98	8820	49392
B26	24	24	98	9408	56448
B27	24	24	98	9408	56448
B30	24	30	98	10584	70560
B31	24	24	98	9408	56448
B32	24	24	98	9408	56448
G01	16	24	98	7840	37632
G02	16	24	98	7840	37632
G03	16	24	98	7840	37632
G04	16	24	98	7840	37632
G05	16	24	98	7840	37632
G06	16	24	98	7840	37632
G07	16	24	98	7840	37632
G08	16	24	98	7840	37632
G09	16	24	98	7840	37632
G10	16	24	98	7840	37632
G11	16	24	98	7840	37632
G12	16	24	98	7840	37632
G13	16	24	98	7840	37632
G15	16	24	98	7840	37632
G16	16	24	98	7840	37632
G18	16	24	98	7840	37632
G19	16	24	98	7840	37632
G20	16	24	98	7840	37632
G23	16	24	98	7840	37632
G24	16	24	98	7840	37632

Reinforced Concrete Columns

Level B4 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
G25	16	24	98	7840	37632
G26	16	24	98	7840	37632
G29	16	24	98	7840	37632
G30	16	24	98	7840	37632
G31	16	24	98	7840	37632
G32	16	24	98	7840	37632
G33	16	24	98	7840	37632
G45	20	32	98	10192	62720
G46	24	24	98	9408	56448
	Formwork Area (SF)			**3480**	
		Total 6000 PSI Concrete (CY) -			**60**
		Reinforcing Steel @ 375 lbs./CY			**22452**

Reinforced Concrete Columns

Level B3 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	24	24	98	9408	56448
B02	24	24	98	9408	56448
B03	24	24	98	9408	56448
B04	24	24	98	9408	56448
B05	24	24	98	9408	56448
B06	24	24	98	9408	56448
B07	24	24	98	9408	56448
B08	24	24	98	9408	56448
B09	24	24	98	9408	56448
B10	24	24	98	9408	56448
B11	24	24	98	9408	56448
B12	24	24	98	9408	56448
B13	24	24	98	9408	56448
B14	24	24	98	9408	56448
B15	24	24	98	9408	56448
B16	24	24	98	9408	56448
B17	24	24	98	9408	56448
B18	24	24	98	9408	56448
B19	24	24	98	9408	56448
B21	24	24	98	9408	56448
B22	24	24	98	9408	56448
B23	24	24	98	9408	56448
B24	24	24	98	9408	56448
B25	24	24	98	9408	56448
B26	24	24	98	9408	56448
B27	24	24	98	9408	56448
B28	24	24	98	9408	56448
B29	24	24	98	9408	56448
B30	24	24	98	9408	56448
B31	24	24	98	9408	56448
B32	24	24	98	9408	56448
B33	24	24	98	9408	56448
B34	24	24	98	9408	56448
B35	24	24	98	9408	56448
B38	24	24	98	9408	56448
B39	12	52	98	12544	61152
G01	16	24	98	7840	37632
G02	16	24	98	7840	37632
G03	16	24	98	7840	37632
G04	16	24	98	7840	37632
G05	16	24	98	7840	37632
G06	16	24	98	7840	37632
G07	16	24	98	7840	37632
G08	16	24	98	7840	37632
G09	16	24	98	7840	37632
G10	16	24	98	7840	37632
G11	16	24	98	7840	37632
G12	16	24	98	7840	37632

Reinforced Concrete Columns

Level B3 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
G13	16	24	98	7840	37632
G14	16	24	98	7840	37632
G15	16	24	98	7840	37632
G16	16	24	98	7840	37632
G17	16	24	98	7840	37632
G18	16	24	98	7840	37632
G19	16	24	98	7840	37632
G20	16	24	98	7840	37632
G21	16	24	98	7840	37632
G22	16	24	98	7840	37632
G23	16	24	98	7840	37632
G24	16	24	98	7840	37632
G25	16	24	98	7840	37632
G26	16	24	98	7840	37632
G27	16	24	98	7840	37632
G28	16	24	98	7840	37632
G29	16	24	98	7840	37632
G30	16	24	98	7840	37632
G31	16	24	98	7840	37632
G32	16	24	98	7840	37632
G33	16	24	98	7840	37632
G34	16	24	98	7840	37632
G35	16	24	98	7840	37632
G36	16	24	98	7840	37632
G37	16	24	98	7840	37632
G38	16	24	98	7840	37632
G39	16	24	98	7840	37632
G40	16	24	98	7840	37632
G41	16	24	98	7840	37632
G42	16	24	98	7840	37632
G43	16	24	98	7840	37632
G44	16	24	98	7840	37632
G45	20	32	98	10192	62720
G46	24	24	98	9408	56448
	Formwork Area (SF)			**4905**	
		Total 6000 PSI Concrete (CY) -			**82**
		Reinforcing Steel @ 375 lbs./CY			**30638**

Reinforced Concrete Columns

Level B2 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	24	24	98	9408	56448
B02	24	24	98	9408	56448
B03	24	24	98	9408	56448
B04	24	24	98	9408	56448
B05	24	24	98	9408	56448
B06	24	24	98	9408	56448
B07	24	24	98	9408	56448
B08	24	24	98	9408	56448
B09	24	24	98	9408	56448
B10	24	30	98	10584	70560
B11	24	24	98	9408	56448
B12	24	24	98	9408	56448
B13	24	30	98	10584	70560
B14	24	24	98	9408	56448
B15	24	24	98	9408	56448
B16	24	24	98	9408	56448
B17	24	24	98	9408	56448
B18	24	24	98	9408	56448
B19	24	24	98	9408	56448
B21	24	24	98	9408	56448
B22	24	24	98	9408	56448
B23	24	24	98	9408	56448
B24	24	24	98	9408	56448
B25	24	24	98	9408	56448
B26	24	24	98	9408	56448
B27	24	24	98	9408	56448
B28	24	24	98	9408	56448
B29	24	24	98	9408	56448
B30	24	24	98	9408	56448
B31	24	24	98	9408	56448
B32	24	24	98	9408	56448
B33	24	24	98	9408	56448
B34	24	24	98	9408	56448
B35	24	24	98	9408	56448
B38	24	24	98	9408	56448
B39	12	52	98	12544	61152
G01	16	24	98	7840	37632
G02	16	24	98	7840	37632
G03	16	24	98	7840	37632
G04	16	24	98	7840	37632
G05	16	24	98	7840	37632
G06	16	24	98	7840	37632
G07	16	24	98	7840	37632
G08	16	24	98	7840	37632
G09	16	24	98	7840	37632
G10	16	24	98	7840	37632
G11	16	24	98	7840	37632
G12	16	24	98	7840	37632

Reinforced Concrete Columns

Level B2 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
G13	16	24	98	7840	37632
G14	16	24	98	7840	37632
G15	16	24	98	7840	37632
G16	16	24	98	7840	37632
G17	16	24	98	7840	37632
G18	16	24	98	7840	37632
G19	16	24	98	7840	37632
G20	16	24	98	7840	37632
G21	16	24	98	7840	37632
G22	16	24	98	7840	37632
G23	16	24	98	7840	37632
G24	16	24	98	7840	37632
G25	16	24	98	7840	37632
G26	16	24	98	7840	37632
G27	16	24	98	7840	37632
G28	16	24	98	7840	37632
G29	16	24	98	7840	37632
G30	16	24	98	7840	37632
G31	16	24	98	7840	37632
G32	16	24	98	7840	37632
G33	16	24	98	7840	37632
G34	16	24	98	7840	37632
G35	16	24	98	7840	37632
G36	16	24	98	7840	37632
G37	16	24	98	7840	37632
G38	16	24	98	7840	37632
G39	16	24	98	7840	37632
G40	16	24	98	7840	37632
G41	16	24	98	7840	37632
G42	16	24	98	7840	37632
G43	16	24	98	7840	37632
G44	16	24	98	7840	37632
G45	20	32	98	10192	62720
G46	24	24	98	9408	56448
	Formwork Area (SF)			**4922**	
		Total 6000 PSI Concrete (CY) -			**82**
		Reinforcing Steel @ 375 lbs./CY			**30864**

Reinforced Concrete Columns

Level B1 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	24	24	145	13920	83520
B02	24	24	145	13920	83520
B03	24	24	145	13920	83520
B04	24	24	145	13920	83520
B05	24	24	145	13920	83520
B06	24	24	145	13920	83520
B07	24	24	145	13920	83520
B08	24	24	145	13920	83520
B09	24	24	145	13920	83520
B10	24	30	145	15660	104400
B11	24	24	145	13920	83520
B12	24	24	145	13920	83520
B13	24	30	145	15660	104400
B14	24	24	145	13920	83520
B15	24	24	145	13920	83520
B16	24	30	145	15660	104400
B17	24	24	145	13920	83520
B18	24	24	145	13920	83520
B19	24	24	145	13920	83520
B21	24	30	145	15660	104400
B22	24	30	145	15660	104400
B23	24	24	145	13920	83520
B24	24	24	145	13920	83520
B25	24	24	145	13920	83520
B26	24	24	145	13920	83520
B27	24	24	145	13920	83520
B28	24	24	145	13920	83520
B29	24	24	145	13920	83520
B30	24	30	145	15660	104400
B31	24	24	145	13920	83520
B32	24	24	145	13920	83520
B33	24	24	145	13920	83520
B34	24	24	145	13920	83520
B35	24	24	145	13920	83520
B38	24	24	145	13920	83520
B39	12	52	145	18560	90480
G01	16	24	145	11600	55680
G02	16	24	145	11600	55680
G03	16	24	145	11600	55680
G04	16	24	145	11600	55680
G05	16	24	145	11600	55680
G06	16	24	145	11600	55680
G07	16	24	145	11600	55680
G08	16	24	145	11600	55680
G09	16	24	145	11600	55680
G10	16	24	145	11600	55680
G11	16	24	145	11600	55680
G12	16	24	145	11600	55680

Reinforced Concrete Columns

Level B1 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
G13	16	24	145	11600	55680
G14	16	24	145	11600	55680
G15	16	24	145	11600	55680
G16	16	24	145	11600	55680
G17	16	24	145	11600	55680
G18	16	24	145	11600	55680
G19	16	24	145	11600	55680
G20	16	24	145	11600	55680
G21	16	24	145	11600	55680
G22	16	24	145	11600	55680
G23	16	24	145	11600	55680
G27	16	24	145	11600	55680
G28	16	24	145	11600	55680
G29	16	24	145	11600	55680
G30	16	24	145	11600	55680
G31	16	24	145	11600	55680
G32	16	24	145	11600	55680
G33	16	24	145	11600	55680
G34	16	24	145	11600	55680
G35	16	24	145	11600	55680
G36	16	24	145	11600	55680
G37	16	24	145	11600	55680
G38	16	24	145	11600	55680
G39	16	24	145	11600	55680
G40	16	24	145	11600	55680
G41	16	24	145	11600	55680
G42	16	24	145	11600	55680
G43	16	24	145	11600	55680
G44	16	24	145	11600	55680
G45	20	32	145	15080	92800
G46	24	24	145	13920	83520
	Formwork Area (SF)			**7089**	
		Total 6000 PSI Concrete (CY) -			**120**
		Reinforcing Steel @ 375 lbs./CY			**44995**

Reinforced Concrete Columns

Level 1 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	24	24	187	17952	107712
B02	24	24	187	17952	107712
B03	24	24	187	17952	107712
B04	24	24	187	17952	107712
B05	24	24	187	17952	107712
B06	24	24	187	17952	107712
B07	24	24	187	17952	107712
B08	24	24	187	17952	107712
B09	24	24	187	17952	107712
B10	24	24	187	17952	107712
B11	24	24	187	17952	107712
B12	24	24	187	17952	107712
B13	24	24	187	17952	107712
B14	24	24	187	17952	107712
B15	24	24	187	17952	107712
B16	24	24	187	17952	107712
B17	24	24	187	17952	107712
B18	24	24	187	17952	107712
B19	24	24	187	17952	107712
B20	24	24	187	17952	107712
B21	24	24	187	17952	107712
B22	24	24	187	17952	107712
B23	24	24	187	17952	107712
B24	24	24	187	17952	107712
B25	24	24	187	17952	107712
B26	24	24	187	17952	107712
B27	24	24	187	17952	107712
B28	24	24	187	17952	107712
B29	24	24	187	17952	107712
B30	24	24	187	17952	107712
B31	24	24	187	17952	107712
B32	24	24	187	17952	107712
B33	24	24	187	17952	107712
B34	24	24	187	17952	107712
B35	24	24	187	17952	107712
B36	24	24	187	17952	107712
B37	24	24	187	17952	107712
B38	24	24	187	17952	107712
B39	12	52	187	23936	116688
	Formwork Area (SF)			**4904**	
		Total 6000 PSI Concrete (CY) -			**90**
		Reinforcing Steel @ 375 lbs./CY			**33836**

Reinforced Concrete Columns

Level 2 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 3 Columns					
Col.	Width 1	Width 2	Height	Surface Ar	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 4 Columns					
Col.	Width 1	Width 2	Height	Surface Ar	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 5 Columns					
Col.	Width 1	Width 2	Height	Surface Ar	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 6 Columns					
Col.	Width 1	Width 2	Height	Surface Ar	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 7 Columns					
Col.	Width 1	Width 2	Height	Surface Ar	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 8 Columns					
Col.	Width 1	Width 2	Height	Surface Ar	Volume
B01	24	24	135	12960	77760
B02	24	24	135	12960	77760
B03	24	24	135	12960	77760
B04	24	24	135	12960	77760
B05	24	24	135	12960	77760
B06	24	24	135	12960	77760
B07	24	24	135	12960	77760
B08	24	24	135	12960	77760
B09	24	24	135	12960	77760
B10	24	24	135	12960	77760
B11	24	24	135	12960	77760
B12	24	24	135	12960	77760
B13	24	24	135	12960	77760
B14	24	24	135	12960	77760
B15	24	24	135	12960	77760
B16	24	24	135	12960	77760
B17	24	24	135	12960	77760
B18	24	24	135	12960	77760
B19	24	24	135	12960	77760
B20	24	24	135	12960	77760
B21	24	24	135	12960	77760
B22	24	24	135	12960	77760
B23	24	24	135	12960	77760
B24	24	24	135	12960	77760
B25	24	24	135	12960	77760
B26	24	24	135	12960	77760
B27	24	24	135	12960	77760
B28	24	24	135	12960	77760
B29	24	24	135	12960	77760
B30	24	24	135	12960	77760
B31	24	24	135	12960	77760
B32	24	24	135	12960	77760
B33	24	24	135	12960	77760
B34	24	24	135	12960	77760
B35	24	24	135	12960	77760
B36	24	24	135	12960	77760
B37	24	24	135	12960	77760
B38	24	24	135	12960	77760
B39	12	52	135	17280	84240
	Formwork Area (SF)			**3540**	
		Total 5000 PSI Concrete (CY) -			**65**
		Reinforcing Steel @ 375 lbs./CY			**24427**

Reinforced Concrete Columns

Level 9 Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B01	20	24	147	12936	70560
B02	20	24	147	12936	70560
B03	20	24	147	12936	70560
B04	20	24	147	12936	70560
B05	20	24	147	12936	70560
B06	24	24	147	14112	84672
B07	24	24	147	14112	84672
B08	24	24	147	14112	84672
B09	24	24	147	14112	84672
B10	24	24	147	14112	84672
B11	24	24	147	14112	84672
B12	24	24	147	14112	84672
B13	24	24	147	14112	84672
B14	24	24	147	14112	84672
B15	24	24	147	14112	84672
B16	24	24	147	14112	84672
B17	24	24	147	14112	84672
B18	24	24	147	14112	84672
B19	24	24	147	14112	84672
B20	24	24	147	14112	84672
B21	24	24	147	14112	84672
B22	24	24	147	14112	84672
B23	24	24	147	14112	84672
B24	24	24	147	14112	84672
B25	24	24	147	14112	84672
B26	24	24	147	14112	84672
B27	24	24	147	14112	84672
B28	24	24	147	14112	84672
B29	24	24	147	14112	84672
B30	24	24	147	14112	84672
B31	24	24	147	14112	84672
B32	24	24	147	14112	84672
B33	24	24	147	14112	84672
B34	24	24	147	14112	84672
B35	24	24	147	14112	84672
B36	24	24	147	14112	84672
B37	24	24	147	14112	84672
B38	24	24	147	14112	84672
B39	12	52	147	18816	91728
	Formwork Area (SF)			**3814**	
		Total 5000 PSI Concrete (CY) -			**69**
		Reinforcing Steel @ 375 lbs./CY			**26031**

Reinforced Concrete Columns

Roof Columns					
Col.	Width 1	Width 2	Height	Surface Area	Volume
B14	24	24	147	14112	84672
B17	24	24	147	14112	84672
B18	24	24	147	14112	84672
B21	24	24	147	14112	84672
B22	24	24	147	14112	84672
B25	12	24	147	10584	42336
P1	16	16	147	9408	37632
P2	16	16	147	9408	37632
P3	12	24	147	10584	42336
	Formwork Area (SF)			**768**	
		Total 5000 PSI Concrete (CY) -			**13**
		Reinforcing Steel @ 375 lbs./CY			**4688**

Reinforced Concrete Shear Wall

Shear Wall A					
Level	Area (SF)	Height (ft.)	Perimeter (ft.)	Surface Area (SF)	Volume (CF)
B4	41	8.2	80	656	336
B3	41	8.2	80	656	336
B2	41	8.2	80	656	336
B1	41	12	80	960	492
1	41	15.5	80	1240	636
2	41	11.25	80	900	461
3	41	11.25	80	900	461
4	41	11.25	80	900	461
5	41	11.25	80	900	461
6	41	11.25	80	900	461
7	41	11.25	80	900	461
8	41	11.25	80	900	461
9	41	12.25	80	980	502
ROOF	41	12.25	80	980	502
	Total Surface Area (SF) -			**12428**	
			Total Volume (CY -		**236**
		Reinforcing @ 30 lbs/CY			**7077**

Reinforced Concrete Shear Wall

Shear Wall B1					
Level	Area (SF)	Height (ft.)	Perimeter (ft.)	Surface Area (SF)	Volume (CF)
B4	9.1	8.2	20	164	75
B3	9.1	8.2	20	164	75
B2	9.1	8.2	20	164	75
B1	9.1	12	20	240	109
1	9.1	15.5	20	310	141
2	9.1	11.25	20	225	102
3	9.1	11.25	20	225	102
4	9.1	11.25	20	225	102
5	9.1	11.25	20	225	102
6	9.1	11.25	20	225	102
7	9.1	11.25	20	225	102
8	9.1	11.25	20	225	102
9	9.1	12.25	20	245	111
ROOF	9.1	12.25	20	245	111
	Total Surface Area (SF) -			**3107**	
			Total Volume (CY -		**52**
		Reinforcing @ 30 lbs/CY			**1571**

Reinforced Concrete Shear Wall

Shear Wall B2					
Level	Area (SF)	Height (ft.)	Perimeter (ft.)	Surface Area (SF)	Volume (CF)
B4	12.5	8.2	27	221.4	103
B3	12.5	8.2	27	221.4	103
B2	12.5	8.2	27	221.4	103
B1	12.5	12	27	324	150
1	12.5	15.5	27	418.5	194
2	12.5	11.25	27	303.75	141
3	12.5	11.25	27	303.75	141
4	12.5	11.25	27	303.75	141
5	12.5	11.25	27	303.75	141
6	12.5	11.25	27	303.75	141
7	12.5	11.25	27	303.75	141
8	12.5	11.25	27	303.75	141
9	12.5	12.25	27	330.75	153
ROOF	12.5	12.25	27	330.75	153
	Total Surface Area (SF) -			**4194**	
			Total Volume (CY -		**72**
		Reinforcing @ 30 lbs/CY			**2158**

Reinforced Concrete Shear Wall

Shear Wall C					
Level	Area (SF)	Height (ft.)	Perimeter (ft.)	Surface Area (SF)	Volume (CF)
B4	36	8.2	74	606.8	295
B3	36	8.2	74	606.8	295
B2	36	8.2	74	606.8	295
B1	36	12	74	888	432
1	36	15.5	74	1147	558
2	36	11.25	74	832.5	405
3	36	11.25	74	832.5	405
4	36	11.25	74	832.5	405
5	36	11.25	74	832.5	405
6	36	11.25	74	832.5	405
7	36	11.25	74	832.5	405
8	36	11.25	74	832.5	405
9	36	12.25	74	906.5	441
ROOF	36	12.25	74	906.5	441
	Total Surface Area (SF) -			**11496**	
			Total Volume (CY -		**207**
		Reinforcing @ 30 lbs/CY			**6214**

Reinforced Concrete Beams

Levels B3-B1 Typical Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
GB1	22	12	18	88	33
GB2	22	16	18	95	44
GB3	22	12	18	88	33
GB4	22	12	18	88	33
GB5	22	24	24	132	88
GB6	22	12	18	88	33
GB7	22	12	18	88	33
GB8	22	12	18	88	33
GB9	22	12	18	88	33
GB10	22	12	24	110	44
GB11	22	12	24	110	44
GB12	22	12	16	81	29
GB13	22	12	18	88	33
GB14	22	12	18	88	33
GB15	22	12	18	88	33
GB16	22	24	18	110	66
GB17	22	24	18	110	66
GB18	22	24	18	110	66
GB19	22	12	18	88	33
GB20	22	12	18	88	33
GB21	22	12	18	88	33
GB22	22	12	18	88	33
GB23	22	12	18	88	33
GB24	22	12	18	88	33
GB25	22	24	24	132	88
GB26	22	24	24	132	88
GB27	22	24	24	132	88
GB28	22	12	18	88	33
GB29	22	12	18	88	33
GB30	22	8	18	81	22
GB31	22	12	24	110	44
GB32	22	12	24	110	44
GB33	22	12	24	110	44
GB34	22	24	24	132	88
GB35	22	24	24	132	88
GB36	22	24	30	154	110
GB37	22	14	21	103	45
GB38	22	24	24	132	88
GB39	22	24	24	132	88
GB40	22	20	24	125	73
GB41	22	20	24	125	73
GB42	22	12	24	110	44
GB43	22	24	24	132	88
GB44	22	24	24	132	88
GB45	22	16	24	117	59
GB46	22	12	24	110	44

Reinforced Concrete Beams

Levels B3-B1 Typical Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
GB47	22	12	18	88	33
GB48	22	12	18	88	33
GB49	22	12	18	88	33
GB50	22	16	24	117	59
GB51	22	24	18	110	66
GB52	22	16	24	117	59
GB53	22	12	18	88	33
GB54	22	12	24	110	44
GB55	22	12	24	110	44
GB56	22	12	24	110	44
GB57	22	12	24	110	44
Total Forwork Area for Beam (SF) -				**6021**	
Total 5000 PSI Concrete for Beams (CY/floor) -					**108**
	Concrete Total for Levels B3-B1 -				**325**
	Formwork Area Total Levels B3-B1 -				**18062**
	Reinforcing Steel @ 375 lbs/CY -				**121955**

Reinforced Concrete Beams

Level 1 Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
1B1	16	29	30	119	97
1B2	16	29	30	119	97
1B3	16	12	20	69	27
1B4	16	12	20	69	27
1B5	16	12	24	80	32
1B6	16	20	20	80	44
1B7	16	24	20	85	53
1B8	16	16	24	85	43
1B9	16	24	30	112	80
1B10	16	24	20	85	53
1B11	16	12	18	64	24
1B12	16	24	30	112	80
1B13	16	16	24	85	43
1B14	16	10	20	67	22
1B15	16	24	30	112	80
1B16	16	24	54	176	144
1B17	16	20	24	91	53
1B18	16	10	54	157	60
1B19	16	14	26	88	40
1B20	16	24	26	101	69
1B21	16	14	24	83	37
1B22	16	36	24	112	96
1B23	16	36	24	112	96
1B24	16	30	24	104	80
1B25	16	12	24	80	32
1B26	16	12	24	80	32
1B27	16	20	24	91	53
1B28	16	20	24	91	53
1B29	16	12	20	69	27
1B30	16	24	48	160	128
1B31	16	12	24	80	32
1B32	16	20	24	91	53
1B33	16	20	24	91	53
1B34	16	20	24	91	53
1B35	16	12	35	109	47
1B36	16	18	24	88	48
1B37	16	24	45	152	120
1B38	16	24	20	85	53
1B39	16	24	26	101	69
1B40	16	12	35	109	47
1B41	16	24	35	125	93
1B42	16	24	35	125	93
1B43	16	18	45	144	90
1B44	16	16	45	141	80
1B45	16	24	63	200	168
1B46	16	24	45	152	120

Reinforced Concrete Beams

Level 1 Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
1B47	16	24	45	152	120
1B48	16	24	20	85	53
1B49	16	14	18	67	28
1B50	16	14	18	67	28
1B51	16	14	48	147	75
1B52	16	24	60	192	160
1B53	16	24	60	192	160
1B54	16	24	36	128	96
1B55	16	24	48	160	128
1B56	16	24	60	192	160
1B57	16	24	60	192	160
1B58	16	24	60	192	160
1B59	16	14	48	147	75
1B60	16	16	34	112	60
1B61	16	16	34	112	60
1B62	16	16	34	112	60
1B63	16	16	34	112	60
1B64	16	16	34	112	60
1B65	16	16	34	112	60
1B66	16	16	34	112	60
1B67	16	16	34	112	60
1B68	16	16	34	112	60
1B69	16	24	34	123	91
1B70	16	24	34	123	91
1B71	16	24	34	123	91
1B72	16	24	34	123	91
1B73	16	24	34	123	91
1B74	16	24	34	123	91
1B75	16	20	54	171	120
1B76	16	20	54	171	120
1B77	16	20	54	171	120
1B78	16	24	54	176	144
1B79	16	24	56	181	149
1B80	16	24	56	181	149
1B81	16	24	56	181	149
1B82	16	24	68	213	181
1B83	16	24	68	213	181
1B84	16	24	68	213	181
1B85	16	24	56	181	149
1B86	16	24	66	208	176
1B87	16	24	56	181	149
1B88	16	24	68	213	181
1B89	16	24	68	213	181
1B90	16	24	68	213	181
1B91	16	24	20	85	53
1B92	16	20	54	171	120

Reinforced Concrete Beams

Level 1 Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
1B93	16	20	36	123	80
1B94	16	20	36	123	80
1B95	16	20	36	123	80
1B96	16	24	68	213	181
1B97	16	24	68	213	181
Total Forwork Area for Beam (SF) -				**12613**	
Total 5000 PSI Concrete for Beams (CY/floor) -					**326**
	Reinforcing Steel @ 375 lbs/CY -				**122293**

Reinforced Concrete Beams

Levels 2-Roof Typical Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
TB1	22	20	24	125	73
TB2	22	20	10	73	31
TB3	22	24	12	88	44
TB4	22	24	12	88	44
TB5	22	16	8	59	20
TB6	22	24	12	88	44
TB7	22	20	12	81	37
TB8	22	20	12	81	37
TB9	22	20	12	81	37
TB10	22	44	10	117	67
TB11	22	24	12	88	44
TB12	22	24	12	88	44
Total Formwork Area for Beams (SF) -				1056	
Total 5000 PSI Concrete for Beams (CY/floor.)					19
	Concrete Total for Levels B3-B1(CY)				**58**
	Formwork Area Total Levels B3-B1 (SF)				**3168**
	Reinforcing Steel @ 375 lbs/CY -				**21694**

Reinforced Concrete Beams

Levels 2-Roof Typical Beams					
Beam	Length (ft.)	Width (in.)	Depth (in.)	Formwork Area (SF)	Volume (CF)
PHRB1	20	16	24	107	53
PHRB2	20	16	24	107	53
PHRB3	20	16	24	107	53
PHRB4	20	16	24	107	53
PHRB5	20	16	24	107	53
PHRB6	20	16	24	107	53
PHRB7	20	16	24	107	53
PHRB8	20	16	24	107	53
PHRB9	20	16	24	107	53
PHRB10	20	24	24	120	80
PHRB11	20	24	24	120	80
PHRB12	20	16	24	107	53
PHRB13	20	24	24	120	80
PHRB14	20	24	24	120	80
Total Formwork Area for Beams (SF) -				**1547**	
Total 5000 PSI Concrete for Beams (CY)					**29**
	Reinforcing Steel @ 375 lbs/CY -				**10741**

Reinforced Concrete Slab

Elevated Slabs					
Level	Area (SF)	Depth (in.)	Perimeter (ft.)	Formwork Area (SF)	Volume (CF)
B4	22000	5	650	542	9167
B3	35000	8	790	1053	23333
B2	35000	8	790	1053	23333
B1	35000	8	790	1053	23333
1	20000	8	900	1200	13333
2	20000	8	900	1200	13333
3	20000	8	900	1200	13333
4	20000	8	900	1200	13333
5	20000	8	900	1200	13333
6	20000	8	900	1200	13333
7	20000	8	900	1200	13333
8	20000	8	900	1200	13333
9	20000	8	900	1200	13333
Roof	20000	8	900	1200	13333
PH	4800	8	280	373	3200
	Total Formwork Area (SF) -			**347875**	
	Total Volume of 5000 PSI Concrete (CY) -				**7989**
		Reinforcing Steel @ 30 lbs/CY			**239667**

Appendix 2.E

The Following Appendix Contains:

- General Conditions Estimate

General Conditions Estimate			Duration: 19								
Qty	CSI Number	Description	Crew	Daily Output	Labor Hours	Unit	Bare Mat.	Bare Labor	Bare Equip.	Total	Total Incl. O&P
0.000	13101500100	Permits Rule of Thumb, most cities, maximum				Job					2.0%
0.000	13102000100	Performance Bond, for buildings, minimum				Job					2.5%
0.000	13103500250	All-risk Insurance, maximum				Job					.62%
50.000	13107000120	Field engineer, average				Week	0.00	52,336.11	0.00	52,336.11	81,528.61
80.000	13107000200	Field Personnel, project manager, average				Week	0.00	136,757.67	0.00	136,757.67	212,500.38
50.000	13107000240	Field Personnel, superintendent, minimum				Week	0.00	72,323.77	0.00	72,323.77	113,088.08
80.000	13107000280	Field Personnel, superintendent, maximum				Week	0.00	145,173.53	0.00	145,173.53	225,124.17
57.000	13215000200	Construction Photographs, 4 shots, 2 prints ea., in				Set	20,387.41	0.00	0.00	20,387.41	22,426.15
1.000	14505000100	Field Testing, for building, costing $10,000,000, mi				Project	0.00	0.00	0.00	0.00	34,820.61
1,800.000	15108000600	Temporary Utilities, power for job duration, incl. ele				CSF Flr	0.00	0.00	0.00	88,997.69	97,518.74
38.000	15205000250	Office Trailer, furnished, rent per month, 20' x 8', e				Ea.	6,156.20	0.00	0.00	6,156.20	6,771.82
76.000	15205000350	Office Trailer, furnished, rent per month, 32' x 8', e				Ea.	13,031.95	0.00	0.00	13,031.95	14,335.15
19.000	15205000550	Office Trailer, furnished, rent per month, 50' x 12',				Ea.	5,716.47	0.00	0.00	5,716.47	6,288.12
19.000	15205500100	Field Office Expense, office equipment rental, aver				Month	2,858.24	0.00	0.00	2,858.24	3,144.06
19.000	15205500120	Field Office Expense, office supplies, average				Month	1,698.95	0.00	0.00	1,698.95	1,868.85
19.000	15205500140	Field Office Expense, telephone bill; avg. bill/month				Month	4,077.48	0.00	0.00	4,077.48	4,485.23
19.000	15205500160	Field Office Expense, field office lights & HVAC				Month	1,958.79	0.00	0.00	1,958.79	2,154.67
400.000	15407551510	Scaffolding Specialties, sidewalk bridge, tubular st	3 Carp	45	0.533	L.F.	1,986.14	7,679.47	0.00	9,665.61	14,096.56
2,560.000	15602500250	Temporary Fencing, chain link, rented up to 12 mo	2 Clab	300	0.053	L.F.	5,736.25	3,824.17	0.00	9,560.41	12,280.42
360.000	15906000500	Rent crane tower, static, 130' high, 106 job 6,200 l				Day	0.00	0.00	596,473.85	596,473.85	656,121.24
200.000	22203500440	Rubbish handling, chute, circular, prefabricated ste	B1	30	0.8	L.F.	7,889.87	4,628.72	0.00	12,518.59	15,884.93
160.000	22203500800	Rubbish handling, dumpster, 30 C.Y., 10 ton capac				Week	0.00	0.00	0.00	0.00	111,930.90
1,200.000	28402002200	Median barrier, precast concrete, double face, 3' -	B29	340	0.165	L.F.	54,282.28	5,983.67	3,105.45	63,371.40	72,586.77
		Totals					**$125,780.03**	**$428,707.11**	**$599,579.30**	**$1,243,064.13**	**$1,708,955.44**