



TECHNICAL ASSIGNMENT #2: COST AND METHODS ANALYSIS

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Construction Management

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Aloft & Element Hotels at Arundel Mills

Hanover, Maryland

November 2, 2007

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2.1 Executive Summary

The following technical report provides an analysis of the cost of several aspects of the building, as well as, an in depth look into the construction methods of the project. This report presents the detailed project schedule utilized by the project team, and also a site plan for the finishes phase of the project. An estimate of the roof assemblies for the buildings will also be examined, in addition to a detailed estimate of the structural system of the Aloft Building. A general conditions estimate for the Aloft and Element Hotel project can also be found within this technical assignment.

The project schedule breaks down the sequence of construction for the job. A floor by floor sequencing will be utilized as the buildings are constructed simultaneously. A well organized site plan during the finish phase of construction will be implemented in order to maximize production, and to alleviate site congestion. The estimate prepared for the roof assembly is well below the actual costs of the roof, which is consistent with other estimates that were prepared using R.S. Means 2007 for this project. A detailed estimate for the structural system of the Aloft building reveals a total cost of just over \$1 million, which appears to be a bit low in hindsight of the \$14.5 million dollar cost of the Aloft building. The estimated cost of the general conditions for the overall project is nearly \$3.1 million which is approximately 8.6% of the total project cost.

2.2 Detailed Project Schedule

Please refer to Appendix A of this report to reference the detailed project schedule consisting of approximately 200 activities.

The 16 month construction schedule was developed to meet the owner's requirements. The schedule demonstrates the project team's effort to generate the most productive schedule possible given the requirements of the building. The attached schedule has been organized by major phases of construction with each phase being broken down into trade sequencing for the Aloft, Element, and parking structure. The parking structure will be built as the Aloft & Element buildings are constructed simultaneously floor by floor.

Construction of the Aloft & Element Hotel Project will continue through the winter months, which may prove to be a challenge for the project team. Nevertheless, Whiting-Turner and its subcontractors are continually referring to and tracking the schedule in order to complete the project on time.

2.3 Site Layout Planning

Finish Phase

A plan visually explaining the logistics of the Aloft & Element Hotel Project site during the finish phase can be found in Appendix B. A three dimensional model of the site was created in Google Sketch Up to act as a visual aid which depicts the activities occurring during the finish phase of the project to a great extent. Figures 1, 2, 3, and 4 below are snapshots of the model and give a general idea of what the site will look like during this phase.

Figure 1. View from East of Site



Figure 2. View from South of Site



Figure 3. View from West of Site



Figure 4. View from North of Site



During the finish phase illustrated, man and material hoists will serve as quick transportation from floor to floor for material and trade workers. One way traffic will be utilized for material deliveries to alleviate site congestion. The on-site parking structure will serve as home for the temporary offices of Whiting-Turner and its subcontractors. This structure will also be used for construction parking throughout the finish phase. Man and material hoists located on the exterior of the hotels buildings will transport materials and workers quickly from floor to floor to maximize production. In order to minimize inefficiency, dumpsters and portable restrooms will also be kept in close proximity to the building perimeters.

2.4 Assemblies Estimate

An assemblies estimate was developed for the roofing of the Aloft and Element Hotel Project using R.S. Means 2007. Tables I, II, and III below summarize the cost of the roof assemblies for each building. Table IV defines the estimated cost of the roofing of the entire project. The roof costs for each project have been adjusted for time and location in Table IV. Quantity take-off notes for the roof assemblies can be found in Appendix C.

Table I. Aloft Roof Assemblies Estimate

ALOFT							
CATEGORY	R.S. MEANS ITEM #	DESCRIPTION	QUANTITY	UNIT	MAT. \$	INST. \$	TOTAL \$
Single Ply Membrane B3010 120	3300	EPDM, 60 mils, fully adhered	14,814	SF	\$ 1.03	\$ 0.82	\$ 27,405.90
Preformed Metal B3010 130	1050	Steel, galvanized, 24 ga., 1.43 P.S.F.	4,524	SF	\$ 1.96	\$ 1.79	\$ 16,965.00
Roof Deck Rigid Insulation B3010 320	4010	Composites with 1-1/2" polyisocyanurate and 1" fiberboard	14,814	SF	\$ 1.56	\$ 0.54	\$ 31,109.40
Flashing B3010 430	150	Aluminum .040" thick	3,442	SF	\$ 1.95	\$ 2.98	\$ 16,969.06
Gutters B3010 610	300	Box, aluminum, .032" thickness, 5", mill	104	LF	\$ 3.09	\$ 4.48	\$ 787.28
Downspouts B3010 620	100	Aluminum, rectangular, 2"x3", embossed mill. 020" thickness	43	VLF	\$ 1.00	\$ 2.83	\$ 164.69
TOTAL							\$ 93,401.33

Table II. Element Roof Assemblies Estimate

ELEMENT							
CATEGORY	R.S. MEANS ITEM #	DESCRIPTION	QUANTITY	UNIT	MAT. \$	INST. \$	TOTAL \$
Single Ply Membrane B3010 120	3300	EPDM, 60 mils, fully adhered	15,394	SF	\$ 1.03	\$ 0.82	\$ 28,478.90
Roof Deck Rigid Insulation B3010 320	4010	Composites with 1-1/2" polyisocyanurate and 1" fiberboard	15,394	SF	\$ 1.56	\$ 0.54	\$ 32,327.40
Flashing B3010 430	150	Aluminum .040" thick	1,715	SF	\$ 1.95	\$ 2.98	\$ 8,454.95
Gutters B3010 610	300	Box, aluminum, .032" thickness, 5", mill	48	LF	\$ 3.09	\$ 4.48	\$ 363.36
Downspouts B3010 620	100	Aluminum, rectangular, 2"x3", embossed mill. 020" thickness	26	VLF	\$ 1.00	\$ 2.83	\$ 99.58
TOTAL							\$ 69,724.19

Table III. Parking Structure Roof Assemblies Estimate

PARKING STRUCTURE							
CATEGORY	R.S. MEANS ITEM #	DESCRIPTION	QUANTITY	UNIT	MAT. \$	INST. \$	TOTAL \$
Single Ply Membrane B3010 120	3300	EPDM, 60 mils, fully adhered	340	SF	\$ 1.03	\$ 0.82	\$ 629.00
Roof Deck Rigid Insulation B3010 320	4010	Composites with 1-1/2" polyisocyanurate and 1" fiberboard	340	SF	\$ 1.56	\$ 0.54	\$ 714.00
Flashing B3010 430	150	Aluminum .040" thick	162	SF	\$ 1.95	\$ 2.98	\$ 798.66
Gutters B3010 610	300	Box, aluminum, .032" thickness, 5", mill	20	LF	\$ 3.09	\$ 4.48	\$ 151.40
Downspouts B3010 620	100	Aluminum, rectangular, 2"x3", embossed mill. 020" thickness	24	VLF	\$ 1.00	\$ 2.83	\$ 91.92
TOTAL							\$ 2,384.98

Table IV. Total Estimated Roof Cost with Adjustments

BUILDING	SUBTOTAL	TIME MULTIPLIER	LOCATION MULTIPLIER	TOTAL
Aloft	\$ 93,401.33	X 1.042	X 0.93	\$ 90,511.49
Element	\$ 69,724.19	X 1.042	X 0.93	\$ 67,566.92
Parking Structure	\$ 2,384.98	X 1.042	X 0.93	\$ 2,311.19
TOTAL				\$ 160,389.61

The estimated value of approximately \$160,000 is much less than the actual cost of the roofing for the project. An actual cost of \$350,000 far exceeds the value derived by using R.S. Means. This discrepancy is consistent with the square foot estimate prepared using R.S. Means in a previous technical report, which was over \$5 million less than the actual project costs.

2.5 Detailed Structural Systems Estimate

A detailed estimate for the structural system of the Aloft Hotel building was prepared using R.S. Means 2007. Please refer to Appendix D to view detailed quantity take-off tables for the footings and piers of the Aloft building. A table with detailed take-offs for 8" hollow core precast planks, load bearing light gage stud framing which supports the plank, and the structural steel members can also be found in Appendix D. The planks, stud framing and structural steel members were only quantified for a typical floor. Table V below, summarizes the total estimated cost for the structural system of the Aloft hotel.

Table V. Estimated Cost of Aloft Structural System

STRUCTURAL COMPONENT	COST
8" Hollow Core Precast Planks	\$ 96,400
Load Bearing Stud Framing	\$ 13,900
Structural Steel	\$ 7,700
Multiply for Seven Floors	X 7
Footings	\$ 163,700
Piers	\$ 18,400
TOTAL COST	\$ 1,008,100

2.6 General Conditions Estimate

A general conditions estimate was prepared for the Aloft and Element Hotel project using cost data provided by Whiting-Turner. With this estimate added in, the approximate total cost of the project comes in just under \$36 million. The estimated cost of the general conditions is approximately 8.6% of the total contract value for the project. The estimate shown on the following page in Table VI has been broken down into several different sub categories for organizational purposes. Staffing costs have been categorized into preconstruction and construction phases.

Table VI. Breakdown of General Conditions

DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
PRECONSTRUCTION STAFF				
Senior Project Manager	MO	\$ 14,000.00 @ 100 %	3	\$ 42,000.00
Project Manager	MO	\$ 10,000.00 @ 100 %	4	\$ 40,000.00
Project Engineer	MO	\$ 7,000.00 @ 100 %	4	\$ 28,000.00
Project Engineer	MO	\$ 7,000.00 @ 100 %	4	\$ 28,000.00
Secretary	MO	\$ 4,500.00 @ 100 %	4	\$ 18,000.00
CONSTRUCTION STAFF				
Senior Project Manager	MO	\$ 14,000.00 @ 25 %	16	\$ 56,000.00
Project Manager	MO	\$ 10,000.00 @ 100 %	16	\$ 160,000.00
Superintendent	MO	\$ 10,000.00 @ 100 %	16	\$ 160,000.00
Field Engineer	MO	\$ 7,000.00 @ 100 %	16	\$ 112,000.00
Project Engineer	MO	\$ 7,000.00 @ 100 %	16	\$ 112,000.00
Project Engineer	MO	\$ 7,000.00 @ 100 %	16	\$ 112,000.00
Secretary	MO	\$ 4,500.00 @ 100 %	16	\$ 72,000.00
TRAVEL				
Fuel & Maintenance	MO	\$ 1,350.00	16	\$ 21,600.00
FIELD OFFICE & EQUIPMENT				
Job Trailer	MO	\$ 1,500.00	16	\$ 24,000.00
Cleaning Services	MO	\$ 200.00	16	\$ 3,200.00
Storage	MO	\$ 300.00	16	\$ 4,800.00
Shipping Expenses	MO	\$ 750.00	16	\$ 12,000.00
Office furniture	MO	\$ 250.00	16	\$ 4,000.00
Copy Machine	MO	\$ 250.00	16	\$ 4,000.00
Computers	MO	\$ 250.00	16	\$ 4,000.00
Internet	MO	\$ 40.00	16	\$ 640.00
Fax	LS	\$ 200.00	1	\$ 200.00
Misc. Supplies	LS	\$ 450.00	16	\$ 7,200.00
ON-SITE ENGINEERING				
Building Survey	LS	\$ 20,000.00	1	\$ 20,000.00
Site Engineering	LS	\$ 30,000.00	1	\$ 30,000.00
Crane Survey	LS	\$ 2,000.00	1	\$ 2,000.00
TEMPORARY EQUIPMENT & MATERIALS				
Material Hoist	MO	\$ 6,000.00	10	\$ 60,000.00
Man Hoist (2 on site)	MO	\$ 2,500.00	20	\$ 50,000.00
Misc. Labor	MO	\$ 700.00	16	\$ 11,200.00
Signage	MO	\$ 100.00	16	\$ 1,600.00
Stairs/Ladders	MO	\$ 1,700.00	16	\$ 27,200.00
Forklift	MO	\$ 1,500.00	16	\$ 24,000.00
Scaffolding	MO	\$ 700.00	10	\$ 7,000.00
Tools & Equipment	MO	\$ 1,000.00	16	\$ 16,000.00
TEMPORARY UTILITIES				
Heat	MO	\$ 15,000.00	5	\$ 75,000.00
Restrooms	MO	\$ 1,200.00	16	\$ 19,200.00
Electric	MO	\$ 6,500.00	16	\$ 104,000.00
Water	MO	\$ 500.00	16	\$ 8,000.00
Cellular Service	MO	\$ 450.00	16	\$ 7,200.00
Telephone/Fax	MO	\$ 1,200.00	16	\$ 19,200.00
DOCUMENTATION				
Drawings & Specification	LS	\$ 40,000.00	1	\$ 40,000.00
Photographs	LS	\$ 4,000.00	1	\$ 4,000.00
As-Build Drawings	LS	\$ 1,000.00	1	\$ 1,000.00
O&M Manuals	LS	\$ 1,000.00	1	\$ 1,000.00
SAFETY				
Barricades	MO	\$ 3,000.00	16	\$ 48,000.00
First Aid	MO	\$ 300.00	16	\$ 4,800.00
Fire Protection / Extinguishers	MO	\$ 100.00	16	\$ 1,600.00
Perimeter Protection	MO	\$ 3,500.00	12	\$ 42,000.00
SITE PROTECTION				
Security	MO	\$ 2,000.00	16	\$ 32,000.00
Traffic / Pedestrian Control	MO	\$ 2,000.00	16	\$ 32,000.00
Dust Infiltration Protection	MO	\$ 1,500.00	12	\$ 18,000.00
Weather Protection	MO	\$ 1,800.00	12	\$ 21,600.00
CLEAN UP				
Daily Clean Up	MO	\$ 8,500.00	16	\$ 136,000.00
Final Clean	LS	\$ 60,000.00	1	\$ 60,000.00
Dumpsters	MO	\$ 6,500.00	16	\$ 104,000.00
Trash Chutes	MO	\$ 1,200.00	10	\$ 12,000.00
Maintenance	MO	\$ 250.00	16	\$ 4,000.00
INSURANCE				
General Liability Insurance	LS	\$ 300,000.00	1	\$ 300,000.00
FEE	LS	2%	1	\$ 720,000.00
TOTAL GENERAL CONDITIONS COST				\$ 3,089,240.00

Appendix A.
Detailed Project Schedule

ID	Task Name	Duration	Start	Finish	Gantt Chart	
1	DESIGN	190 days	Tue 11/20/07	Mon 9/24/07	[Gantt bar from 11/20/07 to 9/24/07]	
2	50% CONSTRUCTION DOCUMENTS	0 days	Thu 2/1/07	Thu 2/1/07	[Gantt bar from 2/1/07 to 2/1/07]	
3	PERMITS	38 days	Thu 8/9/07	Mon 10/1/07	[Gantt bar from 8/9/07 to 10/1/07]	
4	BID/AWARD	109 days	Tue 5/8/07	Fri 10/5/07	[Gantt bar from 5/8/07 to 10/5/07]	
5	PROCUREMENT	242 days	Mon 5/21/07	Tue 4/22/08	[Gantt bar from 5/21/07 to 4/22/08]	
6	SITE PHASE 1	29 days	Mon 9/3/07	Thu 10/11/07	[Gantt bar from 9/3/07 to 10/11/07]	
7	INSTALL CONSTRUCTION ENTRANCES	1 day	Mon 9/3/07	Mon 9/3/07	[Gantt bar from 9/3/07 to 9/3/07]	
8	PREPARE PARKING / STAGING AREAS	4 days	Tue 9/4/07	Fri 9/7/07	[Gantt bar from 9/4/07 to 9/7/07]	
9	CLEAR / DEMO SITE	26 days	Mon 9/3/07	Thu 10/11/07	[Gantt bar from 9/3/07 to 10/11/07]	
10	SITE PHASE 2	78 days	Mon 10/15/07	Wed 1/30/08	[Gantt bar from 10/15/07 to 1/30/08]	
11	ROUGH GRADE	16 days	Mon 10/15/07	Fri 11/2/07	[Gantt bar from 10/15/07 to 11/2/07]	
12	SANITARY LINES	10 days	Mon 10/22/07	Fri 11/2/07	[Gantt bar from 10/22/07 to 11/2/07]	
13	RETAINING WALLS	21 days	Mon 10/22/07	Mon 11/19/07	[Gantt bar from 10/22/07 to 11/19/07]	
14	STORMWATER PIPING	20 days	Tue 11/6/07	Mon 12/3/07	[Gantt bar from 11/6/07 to 12/3/07]	
15	WATER LINES	20 days	Tue 11/20/07	Mon 12/17/07	[Gantt bar from 11/20/07 to 12/17/07]	
16	GAS SERVICE	10 days	Tue 12/4/07	Mon 12/17/07	[Gantt bar from 12/4/07 to 12/17/07]	
17	FINE GRADE SITE & BASE COURSE PAVING	11 days	Wed 11/16/08	Wed 1/30/08	[Gantt bar from 11/16/08 to 1/30/08]	
18	SITE ELECTRIC	31 days	Tue 12/18/07	Tue 1/29/08	[Gantt bar from 12/18/07 to 1/29/08]	
19	ALOFT FOUNDATIONS	20 days	Tue 11/6/07	Mon 12/3/07	[Gantt bar from 11/6/07 to 12/3/07]	
20	ELEMENT FOUNDATIONS	20 days	Mon 11/12/07	Fri 12/7/07	[Gantt bar from 11/12/07 to 12/7/07]	
21	ALOFT SUPERSTRUCTURE	73 days	Tue 12/4/07	Thu 3/13/08	[Gantt bar from 12/4/07 to 3/13/08]	
22	ERECT 1ST FLR COLS	4 days	Tue 12/4/07	Fri 12/7/07	[Gantt bar from 12/4/07 to 12/7/07]	
23	ERECT WALLS 1ST FLR	6 days	Mon 12/10/07	Fri 12/14/07	[Gantt bar from 12/10/07 to 12/14/07]	
24	ERECT/GROUT 2ND FLR PLANK	3 days	Mon 12/10/07	Wed 12/12/07	[Gantt bar from 12/10/07 to 12/12/07]	
25	2ND FLR 2" CONC. TOPPING	4 days	Mon 12/17/07	Thu 12/20/07	[Gantt bar from 12/17/07 to 12/20/07]	

Project: DETAILED PROJECT SCHED
Date: Fri 11/20/07



Milestone Summary
Project Summary



External Milestone
Deadline



ID	Task Name	Duration	Start	Finish	2006	2010
26	ERECT 2ND FLR COLS 3RD FLR BWS	3 days	Wed 12/26/07	Fri 12/28/07	I	
27	ERECT WALLS 2ND FLR	5 days	Wed 1/2/08	Tue 1/8/08	I	
28	ERECT/GROUT 3RD FLR PLANK	4 days	Thu 1/3/08	Tue 1/8/08	I	
29	ERECT 3RD FLR WALLS	4 days	Mon 1/7/08	Thu 1/10/08	I	
30	ERECT/GROUT 4TH FLR PLANK	5 days	Wed 1/16/08	Tue 1/22/08	I	
31	ERECT 4TH FLR WALLS	4 days	Wed 1/23/08	Mon 1/28/08	I	
32	ERECT/GROUT 5TH FLR PLANK	5 days	Tue 1/29/08	Mon 2/4/08	I	
33	ERECT 5TH FLR WALLS	4 days	Tue 2/5/08	Fri 2/8/08	I	
34	ERECT/GROUT 6TH FLR PLANK	5 days	Mon 2/11/08	Fri 2/15/08	I	
35	ERECT 6TH FLR WALLS	4 days	Mon 2/18/08	Thu 2/21/08	I	
36	ERECT/GROUT 7TH FLR PLANK	6 days	Thu 2/21/08	Thu 2/28/08	I	
37	ERECT 7TH FLR WALLS	4 days	Mon 3/3/08	Thu 3/6/08	I	
38	ERECT/GROUT ROOF PLANK	5 days	Fri 3/7/08	Thu 3/13/08	I	
39	ERECT STL FRAMING FOR ROOF SWOOF	3 days	Tue 3/11/08	Thu 3/13/08	I	
40	ELEMENT SUPERSTRUCTURE	66 days	Mon 12/17/07	Mon 3/17/08		
41	ERECT 1ST FLR COLS	5 days	Mon 12/17/07	Fri 12/21/07	I	
42	ERECT WALLS 1ST FLR	2 days	Mon 12/17/07	Tue 12/18/07	I	
43	ERECT/GROUT 2ND FLR PLANK	4 days	Wed 12/19/07	Mon 12/24/07	I	
44	2ND FLR 2" CONC. TOPPING	4 days	Wed 12/26/07	Mon 12/31/07	I	
45	ERECT 2ND FLR COLS 3RD FLR BWS	5 days	Mon 1/7/08	Fri 1/11/08	I	
46	ERECT WALLS 2ND FLR	5 days	Mon 1/7/08	Fri 1/11/08	I	
47	ERECT/GROUT 3RD FLR PLANK	4 days	Mon 1/14/08	Thu 1/17/08	I	
48	ERECT 3RD FLR WALLS	4 days	Wed 1/16/08	Mon 1/21/08	I	
49	ERECT/GROUT 4TH FLR PLANK	5 days	Wed 1/23/08	Tue 1/29/08	I	
50	ERECT 4TH FLR WALLS	4 days	Tue 1/29/08	Fri 2/1/08	I	

Project: DETAILED PROJECT SCHED
Date: Fri 1/2/07

Task Split Progress



Milestone Summary Project Summary



External Tasks External Milestone Deadline



ID	Task Name	Duration	Start	Finish	2008	2010
76	STORFRONTS & WINDOWS	40 days	Wed 2/13/08	Tue 4/8/08		
77	ALOFT ROOFING	101 days	Tue 3/11/08	Tue 7/29/08		
78	ROOF DRAINS	5 days	Tue 3/11/08	Mon 3/17/08		
79	BLOCKING & CURBS	5 days	Mon 3/17/08	Fri 3/21/08		
80	ROOFING	10 days	Mon 3/24/08	Fri 4/4/08		
81	SET ROOF TOP EQUIP & HOOK UP	68 days	Mon 4/7/08	Wed 7/9/08		
82	FLASHING COPING	11 days	Tue 7/15/08	Tue 7/29/08		
83	ELEMENT ROOFING	97 days	Mon 3/17/08	Tue 7/29/08		
84	ROOF DRAINS	5 days	Mon 3/17/08	Fri 3/21/08		
85	BLOCKING & CURBS	5 days	Mon 3/17/08	Fri 3/21/08		
86	ROOFING	10 days	Fri 3/21/08	Thu 4/3/08		
87	SET ROOF TOP EQUIP & HOOK UP	66 days	Mon 4/7/08	Mon 7/7/08		
88	FLASHING COPING	11 days	Tue 7/15/08	Tue 7/29/08		
89	ALOFT PORT COCHERE	108 days	Tue 3/11/08	Thu 8/7/08		
90	ERECT STL & MTL DECKING	8 days	Tue 3/11/08	Thu 3/20/08		
91	ROOFING	5 days	Tue 7/15/08	Mon 7/21/08		
92	ELECTRICAL	14 days	Mon 7/21/08	Thu 8/7/08		
93	ALOFT POOL ROOM	75 days	Tue 5/13/08	Mon 8/25/08		
94	CONSTRUCT POOL SHELL	5 days	Tue 5/13/08	Mon 5/19/08		
95	UNDERGROUND PIPING	3 days	Tue 5/20/08	Thu 5/22/08		
96	FOUNDATIONS	5 days	Mon 5/26/08	Fri 5/30/08		
97	STRUCTURAL STEEL	2 days	Tue 6/3/08	Wed 6/4/08		
98	ROOF DECK	4 days	Mon 6/9/08	Thu 6/12/08		
99	EIFS	5 days	Mon 6/23/08	Fri 6/27/08		
100	MTL PANELS	3 days	Mon 6/30/08	Wed 7/2/08		

Project DETAILED PROJECT SCHED
Date: Fri 1/12/07

Task Split Progress

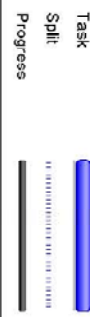
Milestone Summary Project Summary

External Tasks External Milestone Deadline



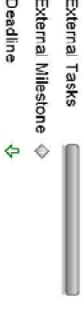
ID	Task Name	Duration	Start	Finish	2008																			
101	STOREFRONT AND ENTRANCES	4 days	Mon 7/7/08	Thu 7/10/08	Nov	Jan	a	Jul	Sep	Nov	Jan	Mar	a	Jul	Sep	Nov	Jan	Mar	a	Jul	Sep	Nov	Jan	Mar
102	HVAC ROUGH-IN	5 days	Wed 7/9/08	Tue 7/15/08																				
103	ELECTRICAL ROUGH-IN	5 days	Wed 7/9/08	Tue 7/15/08																				
104	PLUMBING ROUGH-IN	5 days	Wed 7/9/08	Tue 7/15/08																				
105	HANG FINISH & PAINT DRY/WALL	5 days	Wed 7/16/08	Tue 7/22/08																				
106	FINISHES & EQUIP	20 days	Tue 7/29/08	Mon 8/25/08																				
107	FLOOR FINISHES	11 days	Tue 7/29/08	Tue 8/12/08																				
108	ALOFT FLOORS 1-7 ROUGH-IN & FINISH	188 days	Mon 4/7/08	Wed 9/24/08																				
109	LAYOUT & TRACK	52 days	Mon 1/7/08	Tue 3/13/08																				
110	SPRAY ON FIREPROOFING	3 days	Tue 1/29/08	Thu 1/31/08																				
111	ELECTRICAL POWER MAINS/DISTRIBUTION	5 days	Mon 2/4/08	Fri 2/8/08																				
112	ELECTRICAL RISERS	54 days	Tue 1/8/08	Fri 3/21/08																				
113	HVAC DUCT & PIPE MAINS	5 days	Mon 2/4/08	Fri 2/8/08																				
114	HVAC DUCT & PIPE RISERS	54 days	Tue 1/8/08	Fri 3/21/08																				
115	HIM FRAMES/STUD FRAME WALLS	52 days	Mon 1/14/08	Tue 3/25/08																				
116	SPRINKLER MAINS AND BRANCHES	57 days	Tue 1/8/08	Wed 3/26/08																				
117	PRE ROCK DENSARMOUR	43 days	Mon 2/4/08	Wed 4/2/08																				
118	FIREPLACE	3 days	Mon 2/11/08	Wed 2/13/08																				
119	ELECTRICAL BRANCH/UV ROUGH	54 days	Tue 1/15/08	Fri 3/28/08																				
120	HVAC DUCT/PIPE BRANCHES	5 days	Mon 2/11/08	Fri 2/15/08																				
121	FIT-OUT ELEC. SERVICE RIMS	22 days	Thu 2/14/08	Fri 3/14/08																				
122	PLUMBING RISERS/SHOWER BASES	22 days	Thu 2/27/08	Fri 3/27/08																				
123	PLUMBING ROUGH/TEST & INSULATE	45 days	Thu 2/14/08	Wed 4/16/08																				
124	PERMANENT POWER AVAILABLE	0 days	Fri 3/14/08	Fri 3/14/08																				
125	WALL GYP BOARD	38 days	Mon 4/7/08	Wed 5/28/08																				

Project: DETAILED PROJECT SCHED
Date: Fri 11/2/07



ID	Task Name	Duration	Start	Finish	2008	2010
151	FINISH HARDWARE	41 days	Mon 6/30/08	Mon 8/25/08		
152	M/E/P DEVICING & TRIM	43 days	Mon 6/30/08	Wed 8/27/08		
153	MISC ACCESSORIES	41 days	Mon 6/30/08	Mon 8/25/08		
154	LAUNDRY EQUIP	5 days	Wed 8/20/08	Tue 8/26/08		
155	CLEAN-UP & CONTRACTOR PUNCH-LIST	49 days	Mon 7/7/08	Thu 9/11/08		
156	A/E PUNCH-LIST	44 days	Mon 7/21/08	Thu 9/18/08		
157	COMPLETE PUNCHLIST & LOCK	43 days	Mon 7/28/08	Wed 9/24/08		
158	ELEMENT FLOORS 1-7 ROUGH-IN & FINISH	195 days	Wed 1/16/08	Tue 10/14/08		
159	LAYOUT & TRACK	48 days	Wed 1/16/08	Fri 3/21/08		
160	SPRAY ON FIREPROOFING	4 days	Tue 2/9/08	Fri 2/9/08		
161	ELECTRICAL POWER MAINS/DISTRIBUTION	5 days	Mon 2/11/08	Fri 2/15/08		
162	ELECTRICAL RISERS	48 days	Wed 1/23/08	Fri 3/28/08		
163	HVAC DUCT & PIPE MAINS	5 days	Mon 2/11/08	Fri 2/15/08		
164	HVAC DUCT & PIPE RISERS	48 days	Thu 1/24/08	Mon 3/31/08		
165	H/M FRAMES/STUD FRAME WALLS	48 days	Thu 1/24/08	Mon 3/31/08		
166	SPRINKLER MAINS AND BRANCHES	62 days	Thu 1/24/08	Fri 4/18/08		
167	PRE-ROCK DENSARMOUR	45 days	Wed 2/6/08	Tue 4/8/08		
168	ELECTRICAL BRANCH/IV ROUGH	50 days	Tue 1/29/08	Mon 4/7/08		
169	HVAC DUCT/PIPE BRANCHES	8 days	Mon 2/18/08	Wed 2/27/08		
170	FIT-OUT ELEC. SERVICE RMS	21 days	Mon 2/25/08	Mon 3/24/08		
171	PLUMBING RISERS/SHOWER BASES	45 days	Wed 2/13/08	Tue 4/15/08		
172	PLUMBING ROUGH/TEST & INSULATE	47 days	Thu 2/21/08	Fri 4/25/08		
173	PERMANENT POWER AVAILABLE	0 days	Mon 3/24/08	Mon 3/24/08		
174	WALL GYPBOARD	47 days	Fri 4/4/08	Mon 6/9/08		
175	FRAME HARD CEILINGS	30 days	Tue 4/15/08	Mon 5/26/08		

Project: DETAILED PROJECT SCHED
Date: Fri 1/12/07



ID	Task Name	Duration	Start	Finish	2008	2010
201	LAUNDRY EQUIP	5 days	Tue 9/9/08	Mon 9/15/08	Nov-Jan	Jan-Mar
202	CLEAN-UP & CONTRACTOR PUNCHLIST	51 days	Wed 7/23/08	Wed 10/1/08	Jul-Sep	Nov-Jan
203	AE PUNCHLIST	45 days	Wed 8/6/08	Tue 10/7/08	Jul-Sep	Nov-Jan
204	COMPLETE PUNCHLIST & LOCK	45 days	Wed 8/13/08	Tue 10/14/08	Jul-Sep	Nov-Jan
205	ALOFT FF&E	26 days	Mon 8/18/08	Mon 9/22/08	Jul-Sep	Nov-Jan
206	ELEMENT FF&E	31 days	Tue 8/26/08	Tue 10/7/08	Jul-Sep	Nov-Jan
207	FINISH SITEWORK	60 days	Mon 7/7/08	Fri 9/26/08	Jul-Sep	Nov-Jan
208	FINAL INSPECTIONS	45 days	Tue 8/26/08	Mon 10/27/08	Jul-Sep	Nov-Jan
209	ALOFT SUBSTANTIAL COMPLETION/TCCO	0 days	Tue 10/7/08	Tue 10/7/08	Jul-Sep	Nov-Jan
210	ELEMENT SUBSTANTIAL COMPLETION/TCCO	0 days	Mon 10/27/08	Mon 10/27/08	Jul-Sep	Nov-Jan
211	PROJECT CLOSEOUT	51 days	Tue 10/28/08	Tue 1/6/09	Jul-Sep	Nov-Jan
212	CERTIFICATE OF OCCUPANCY	0 days	Tue 1/6/09	Tue 1/6/09	Jul-Sep	Nov-Jan

Project DETAILED PROJECT SCHED
Date: Fri 11/2/07

Task Split Progress

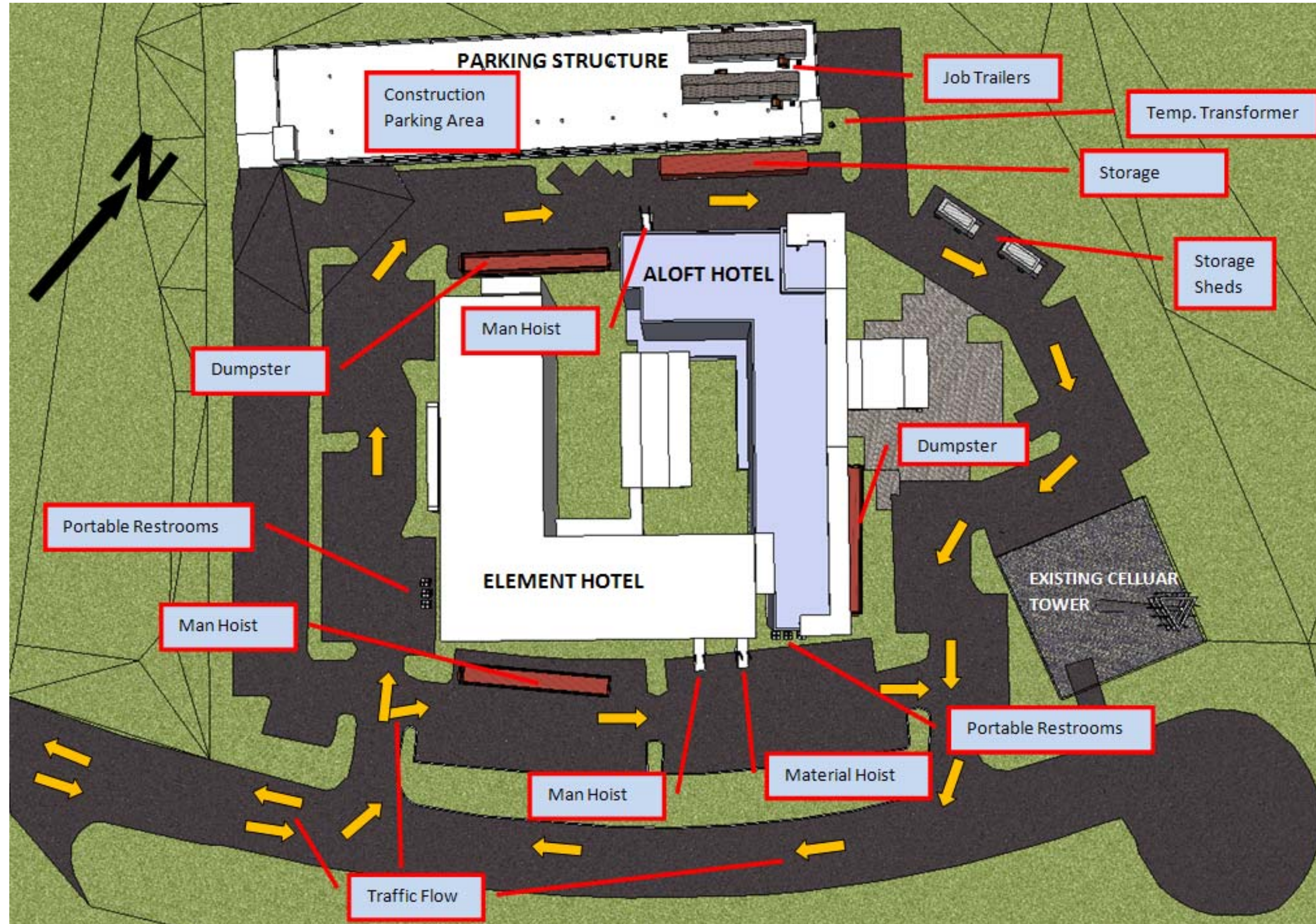
Milestone Summary Project Summary

External Tasks External Milestone Deadline

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Appendix B.

Finishes Phase Site Plan



Appendix C.

Roof Assemblies Take-offs

ROOF AREA (SF)

ALOFT

EPDM
2ND FLOOR PLAN

66' x 5' = 330
56' x 8' = 448
24' x 8' = 192
74' x 5' = 370
36' x 14' = 504

ROOF PLAN

5' x 10' = 50
10' x 10' = 100
178' x 38' = 6,764
146' x 8' = 1,168
46' x 52' = 2,392
28' x 10' = 280
188' x 10' = 1,880
24' x 14' = 336

14,814 SF

STANDING SEAM METAL

36' x 44' = 1,584
70' x 42' = 2,940

4,524 SF

ELEMENT

EPDM
2ND FLOOR PLAN

12' x 48' = 576
16' x 8' = 128
5' x 22' = 110
8' x 9' = 72

UPPER ROOF PLAN

50' x 7' = 350
10' x 28' = 280
114' x 52' = 5,928
150' x 52' = 7,800
10' x 15' = 150

15,394 SF

PARKING STRUCTURE

EPDM
2(17' x 10') =

340 SF

ROOF EDGES → METAL COPING

A LOFT

PREFINISHED METAL COPING (LF)

1ST FLOOR PLAN

$$(2 \times 36') + 74' + 6' + 4' + 2(42') + 2(70') + 2(42') + 6' + 58' + 56' + 24' = 608$$

608 LF

2ND FLOOR PLAN

$$13' + 36' + 14' = 63$$

1761 LF x 1.5 FT

2642 SF

ROOF PLAN

$$188' + 34' + 18' + 9' + 3' + 14' + 164' + 10' + 10' + 20' + 178' + 20' + 2' + 18' + 86' + 52' + 16' + 10' + 34' + 106' + 12' + 32' + 4' + 7' + 7' + 18' + 1' + 9' = 1090$$

ELEMENT

PREFINISHED METAL COPING (LF)

1ST FLOOR PLAN

$$38' + 16' + 28' + 8' + 9' + 9' = 108$$

740 LF x 1.5 FT

1110 SF

UPPER ROOF PLAN

$$58' + 7' + 7' + 24' + 9' + 28' + 10' + 2' + 114' + 98' + 9' + 2(22') + 2(10') + 24' + 150' + 2(8') + 20' = 632$$

PARKING STRUCTURE

COPING (LF)

$$2(17') + 2(10') = 54$$

$$2(17') + 2(10') = 54$$

108 LF x 1.5 FT

162 SF

GUTTER (LF)

ALOFT
34' + 70'

ELEMENT
48'

PARKING
2(10')

172 LF

DOWNSPOUTS (VLF)

ALOFT
1' + 16' + 16' + 10'

ELEMENT
6' + 10' + 10'

PARKING
12' + 12'

109 VLF

FLASHING

1.5 FT WIDE

ALOFT
1.5 FT (66' + 50' + 16' + 8' + 44' + 2' + 20' + 1' + 10' + 20' + 3' + 16'
+ 12' + 9' + 16' + 1' + 6' + 7' + 16' + 5' + 18' + 18' + 7' + 7'
+ 50 + 50 + 3(52) + 23(4')) = 799.5

ELEMENT
1.5 FT (11' + 48' + 8' + 20 + 20 + 9 + 9 + 22 + 22 + 10
+ 40' + 40' + 40' + 20(4'))

604.5

PARKING → NONE

1004 SF

Appendix D.

Detailed Quantity Take-offs

Table A-1. Aloft Footing Take-offs

FOOTING TYPE	DIMENSIONS (FT)			BOTTOM REINFORCEMENT				TOP REINFORCEMENT	
	WIDTH	LENGTH	DEPTH	BARS		TOTAL WIDTH WISE	TOTAL LENGTH WISE	BARS	TOTAL WIDTH WISE
F - 3.0	3.00	3.00	1.00	5 # 4	EWB	10.02	10.02		
F - 4.0	4.00	4.00	1.17	6 # 4	EWB	16.03	16.03		
F - 4.5	4.50	4.50	1.17	8 # 4	EWB	24.05	24.05		
F - 6.5	6.50	6.50	1.67	5 # 7	EWB	66.43	66.43		
F - 7.5	7.50	7.50	2.00	9 # 6	EWB	101.39	101.39		
F - 8.0	8.00	8.00	2.00	6 # 8	EWB	128.16	128.16		
F - 9.0	9.00	9.00	2.17	10 # 7	EWB	183.96	183.96		
F - 10.0	10.00	10.00	2.42	9 # 8	EWB	240.30	240.30		
F - 4.0x7.5	4.00	7.50	1.17	# 4 @ 8 "	o.c. EWB	30.06	30.06		
F - 9.0x16.0	9.00	16.00	2.17	# 7 @ 12 "	o.c. EWB	294.34	294.34		
F - 15.0x21.5	15.00	21.50	2.50	# 8 @ 12 "	o.c. EWB	861.08	861.08	# 6 @ 12 " o.c. EWT	484.40
F - 19.0x21.0	19.00	21.00	2.50	# 8 @ 12 "	o.c. EWB	1065.33	1065.33	# 6 @ 12 " o.c. EWT	599.30
F - 5.0xCONT	5.00	40.00	1.33	# 6 @ 10 "	o.c. EWB	360.48	360.48	# 6 @ 10 " o.c. LWT	
F - 5.0xCONT	5.00	22.00	1.33	# 6 @ 10 "	o.c. EWB	198.26	198.26	# 6 @ 10 " o.c. LWT	
F - 5.0xCONT	5.00	24.00	1.33	# 6 @ 10 "	o.c. EWB	216.29	216.29	# 6 @ 10 " o.c. LWT	
F - 8.0xCONT	8.00	50.00	2.00	# 7 @ 12 "	o.c. EWB	817.60	817.60	# 7 @ 12 " o.c. LWT	
F - 8.0xCONT	8.00	24.00	2.00	# 7 @ 12 "	o.c. EWB	392.45	392.45	# 7 @ 12 " o.c. LWT	
F - 8.0xCONT	8.00	20.00	2.00	# 7 @ 12 "	o.c. EWB	327.04	327.04	# 7 @ 12 " o.c. LWT	
F - 8.0xCONT	8.00	32.00	2.00	# 7 @ 12 "	o.c. EWB	523.26	523.26	# 7 @ 12 " o.c. LWT	
F - 9.0xCONT	9.00	52.00	2.17	# 7 @ 12 "	o.c. EWB	956.59	956.59	# 7 @ 12 " o.c. LWT	
F - 10.0xCONT	10.00	44.00	2.50	# 7 @ 12 "	o.c. EWB	899.36	899.36	# 7 @ 12 " o.c. LWT	
F - 10.0xCONT	10.00	60.00	2.50	# 7 @ 12 "	o.c. EWB	1226.40	1226.40	# 7 @ 12 " o.c. LWT	

KEY
EWB → EACH WAY BOTTOM
EWT → EACH WAY TOP
EWT → LENGTH WISE TOP

Table A-2. Aloft Footing Take-offs Continued.

FOOTING TYPE	SF OF FORMWORK PER FOOTING TYPE	CY OF CONC. PER FOOTING TYPE	LBS REBAR PER FOOTING TYPE	NO. OF TYPE	TOTAL SF OF FORMWORK	TOTAL CY OF CONC.	TOTAL LBS OF REBAR	R.S. MEANS 2007 UNIT PRICE			FORM-WORK COST	CONCRETE COST	REBAR COST
								FORMWORK (\$/SF)	CONCRETE (\$/CY)	REBAR (\$/TON)			
F - 3.0	12.00	0.33	20.04	14	168.00	4.67	280.56	\$ 8.05	\$ 420.00	\$ 1,725.00	\$ 1,352.40	\$ 1,960.00	\$ 241.98
F - 4.0	18.67	0.69	32.06	2	37.33	1.38	64.13	\$ 8.05	\$ 420.00	\$ 1,725.00	\$ 300.53	\$ 580.74	\$ 55.31
F - 4.5	21.00	0.88	48.10	2	42.00	1.75	96.19	\$ 8.05	\$ 420.00	\$ 1,725.00	\$ 338.10	\$ 735.00	\$ 82.97
F - 6.5	43.33	2.61	132.86	5	216.67	13.04	664.30	\$ 8.05	\$ 360.00	\$ 1,725.00	\$ 1,744.17	\$ 4,694.44	\$ 572.96
F - 7.5	60.00	4.17	202.77	7	420.00	29.17	1419.39	\$ 8.05	\$ 360.00	\$ 1,725.00	\$ 3,381.00	\$ 10,500.00	\$ 1,224.22
F - 8.0	64.00	4.74	256.32	1	64.00	4.74	256.32	\$ 8.05	\$ 360.00	\$ 1,550.00	\$ 515.20	\$ 1,706.67	\$ 198.65
F - 9.0	78.00	6.50	367.92	1	78.00	6.50	367.92	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 627.90	\$ 1,820.00	\$ 317.33
F - 10.0	96.67	8.95	480.60	1	96.67	8.95	480.60	\$ 8.05	\$ 280.00	\$ 1,550.00	\$ 778.17	\$ 2,506.17	\$ 372.47
F - 4.0x7.5	26.83	1.30	60.12	2	53.67	2.59	120.24	\$ 8.05	\$ 360.00	\$ 1,725.00	\$ 432.02	\$ 933.33	\$ 103.71
F - 9.0x16.0	108.33	11.56	588.67	1	108.33	11.56	588.67	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 872.08	\$ 3,235.56	\$ 507.73
F - 15.0x21.5	182.50	29.86	2690.94	1	182.50	29.86	2690.94	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 1,469.13	\$ 8,361.11	\$ 2,320.94
F - 19.0x21.0	200.00	36.94	3329.26	1	200.00	36.94	3329.26	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 1,610.00	\$ 10,344.44	\$ 2,871.48
F - 5.0xCONT	120.00	9.88	1081.44	1	120.00	9.88	1081.44	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 966.00	\$ 2,765.43	\$ 932.74
F - 5.0xCONT	72.00	5.43	594.79	3	216.00	16.30	1784.38	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 1,738.80	\$ 4,562.96	\$ 1,539.02
F - 5.0xCONT	77.33	5.93	648.86	1	77.33	5.93	648.86	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 622.53	\$ 1,659.26	\$ 559.65
F - 8.0xCONT	232.00	29.63	2452.80	1	232.00	29.63	2452.80	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 1,867.60	\$ 8,296.30	\$ 2,115.54
F - 8.0xCONT	128.00	14.22	1177.34	1	128.00	14.22	1177.34	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 1,030.40	\$ 3,982.22	\$ 1,015.46
F - 8.0xCONT	112.00	11.85	981.12	1	112.00	11.85	981.12	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 901.60	\$ 3,318.52	\$ 846.22
F - 8.0xCONT	160.00	18.96	1569.79	1	160.00	18.96	1569.79	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 1,288.00	\$ 5,309.63	\$ 1,353.95
F - 9.0xCONT	264.33	37.56	2869.78	1	264.33	37.56	2869.78	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 2,127.88	\$ 10,515.56	\$ 2,475.18
F - 10.0xCONT	270.00	40.74	2698.08	1	270.00	40.74	2698.08	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 2,173.50	\$ 11,407.41	\$ 2,327.09
F - 10.0xCONT	350.00	55.56	3679.20	1	350.00	55.56	3679.20	\$ 8.05	\$ 280.00	\$ 1,725.00	\$ 2,817.50	\$ 15,555.56	\$ 3,173.31
SUBTOTALS											\$ 28,954.51	\$ 114,750.31	\$ 25,207.90
SUBTOTAL COST OF FOOTINGS											\$168,912.72		
TIME MULTIPLIER											X 1.042		
LOCATION MULTIPLIER											X 0.93		
TOTAL COST OF PIERS											\$163,686.56		



Table A-3. Aloft Pier Take-offs

PIER TYPE	DIMENSIONS (FT)			REINFORCEMENT		NO. OF PIER TYPE	SF OF FORM-WORK PER PIER TYPE	CY OF CONC. PER PIER TYPE	LBS OF REBAR PER PIER TYPE	TOTAL SF OF FORM-WORK	TOTAL CY OF CONC	TOTAL LBS OF REBAR	R.S. MEANS 2007 UNIT COST					
	WIDTH	LENGTH	HEIGHT	VERTICAL	TIES								FORMWORK (\$/SF)	CONCRETE (\$/CY)	REBAR (\$/TON)	FORM-WORK COST	CONCRETE COST	REBAR COST
P-2	1.83	1.83	4.50	8 # 7	# 3 @ 12 "o.c.	2	33.00	0.56	85.99	66.00	1.12	171.98	8.05	\$ 360.00	\$ 2,525.00	\$ 531.30	\$ 403.33	\$ 217.13
P-3	2.00	5.67	3.50	20 # 8	# 3 @ 12 "o.c.	2	53.67	1.47	207.08	107.33	2.94	414.16	8.05	\$ 360.00	\$ 2,000.00	\$ 864.03	\$ 1,057.78	\$ 414.16
P-3	2.00	5.67	4.00	20 # 8	# 3 @ 12 "o.c.	2	61.33	1.68	236.66	122.67	3.36	473.32	8.05	\$ 360.00	\$ 2,000.00	\$ 987.47	\$ 1,208.89	\$ 473.32
P-3	2.00	5.67	5.67	20 # 8	# 3 @ 12 "o.c.	2	86.89	2.38	335.27	173.78	4.76	670.54	8.05	\$ 360.00	\$ 2,000.00	\$ 1,398.91	\$ 1,712.59	\$ 670.54
P-3	2.00	5.67	4.00	20 # 8	# 3 @ 12 "o.c.	2	61.33	1.68	236.66	122.67	3.36	473.32	8.05	\$ 360.00	\$ 2,000.00	\$ 987.47	\$ 1,208.89	\$ 473.32
P-4	2.00	2.00	2.00	8 # 8	# 3 @ 12 "o.c.	2	16.00	0.30	48.74	32.00	0.59	97.47	8.05	\$ 420.00	\$ 2,000.00	\$ 257.60	\$ 248.89	\$ 97.47
P-4	2.00	2.00	3.00	8 # 8	# 3 @ 12 "o.c.	1	24.00	0.44	73.10	24.00	0.44	73.10	8.05	\$ 420.00	\$ 2,000.00	\$ 193.20	\$ 186.67	\$ 73.10
P-4	2.00	2.00	4.33	8 # 8	# 3 @ 12 "o.c.	1	34.67	0.64	105.59	34.67	0.64	105.59	8.05	\$ 420.00	\$ 2,000.00	\$ 279.07	\$ 269.63	\$ 105.59
P-4	2.00	2.00	3.83	8 # 8	# 3 @ 12 "o.c.	1	30.67	0.57	93.41	30.67	0.57	93.41	8.05	\$ 420.00	\$ 2,000.00	\$ 246.87	\$ 238.52	\$ 93.41
P-6	2.00	6.33	5.67	22 # 10	# 3 @ 9 "o.c.	1	94.44	2.66	583.79	94.44	2.66	583.79	8.05	\$ 360.00	\$ 2,000.00	\$ 760.28	\$ 957.04	\$ 583.79
P-7	2.42	2.42	3.50	8 # 9	# 3 @ 12 "o.c.	1	33.83	0.76	107.92	33.83	0.76	107.92	8.05	\$ 420.00	\$ 2,000.00	\$ 272.36	\$ 317.97	\$ 107.92
P-7	2.42	2.42	5.67	8 # 9	# 3 @ 12 "o.c.	1	54.78	1.23	174.73	54.78	1.23	174.73	8.05	\$ 360.00	\$ 2,000.00	\$ 440.96	\$ 441.27	\$ 174.73
SUBTOTALS													\$ 7,219.51	\$ 8,251.46	\$ 3,484.49			
SUBTOTAL COST OF PIERS													\$18,955.46					
TIME MULTIPLIER													X 1.042					
LOCATION MULTIPLIER													X 0.93					
TOTAL COST OF PIERS													\$18,368.98					



Table A-4. Precast Plank Take-off for Typical Aloft Floor

SF OF 8" HOLLOW CORE PLANKS	R.S. MEANS 2007 UNIT PRICE (\$/SF)	TOTAL
9748	\$ 10.20	\$ 99,429.60
TIME MULTIPLIER		X 1.042
LOCATION MULTIPLIER		X 0.93
TOTAL COST OF PLANKS		\$ 96,353.25

Table A-5. Load Bearing Stud Framing Take-off for Typical Aloft Floor

LF OF LOAD BEARING STUD FRAMING	R.S. MEANS 2007 UNIT PRICE (\$/LF)	TOTAL COST
575	\$ 25.00	\$ 14,375.00
TIME MULTIPLIER		X 1.042
LOCATION MULTIPLIER		X 0.93
TOTAL COST OF BEARING STUD FRAMING		\$ 13,930.24

Table A-6. Structural Steel Take-off for Typical Aloft Floor

MEMBER	LENGTH (FT)	NO. OF TYPE	R.S. MEANS UNIT PRICE (\$/LF)	COST PER MEMBER	TOTAL COST
WT7 X 34	8.00	4	\$ 48.50	\$ 388.00	\$ 1,552.00
WT7 X 41	8.00	4	\$ 53.50	\$ 428.00	\$ 1,712.00
WT7 X 41	10.00	1	\$ 53.50	\$ 535.00	\$ 535.00
WT7 X 41	12.00	1	\$ 53.50	\$ 642.00	\$ 642.00
WT6 X 22.5	6.00	3	\$ 35.00	\$ 210.00	\$ 630.00
WT6 X 15	9.00	2	\$ 26.00	\$ 234.00	\$ 468.00
W6 X 12	6.00	1	\$ 26.00	\$ 156.00	\$ 156.00
W6 X 15	10.00	2	\$ 28.00	\$ 280.00	\$ 560.00
L8X8 X 1/2	5.00	4	\$ 40.00	\$ 200.00	\$ 800.00
HSS6X5 X 3/8	8.00	1	\$ 48.00	\$ 384.00	\$ 384.00
HSS6X5 X 3/8	10.00	1	\$ 48.00	\$ 480.00	\$ 480.00
SUBTOTAL					\$ 7,919.00
TIME MULTIPLIER					X 1.042
LOCATION MULTIPLIER					X 0.93
TOTAL COST OF PIERS					\$7,673.99