Pershing Hill Elementary School

Fort Meade, MD

Technical Report 2

Cost and Schedule Analysis

October 28, 2009

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Table of Contents

Executive Summary

This report examines the project schedule, site layout, structural and general conditions costs for construction of Pershing Hill Elementary School. In addition this report summarizes the critical industry issues that were discussed at the Annual PACE Roundtable. Construction of Pershing Hill Elementary School is divided into three areas. The first contractor on site is the abatement contractor, who started abatement of the existing school in July of 2009, and substantial completion is scheduled for February of 2011. Three site plans were developed for the different phases of construction. No ramps were needed during excavation, and a movable crane will be used for steel erection.

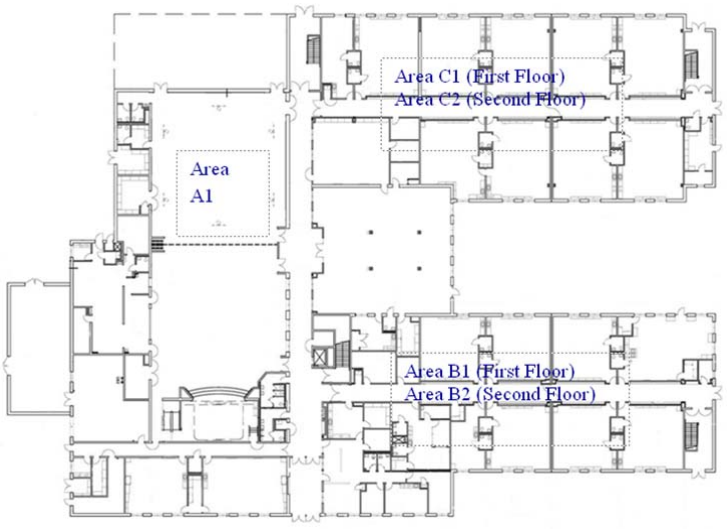
The structural system estimate using a typical bay came in around 21% higher than the value of the actual bid packages for concrete and structural steel. While the fact that the contracts were awarded to the low bidders contributed to the difference, the economy was the primary cause. My general conditions estimate found the general conditions to be 12.7% which is an appropriate estimate considering all the work the construction manager is responsible for on this project.

The PACE Roundtable contained a morning session featuring an industry panel, three breakout sessions, and an afternoon session highlighted by a student panel. I chose to attend the "Energy and the Building Industry" breakout session where different renewable energy options including solar and geothermal were discussed, along with the state and federal initiatives for incorporating renewable energy into a project.

Detailed Project Schedule

A detailed project schedule broken down by trade can be found in Appendix A. Because this is a multiple prime project, the activities were divided among the trades according to which bid package is responsible for that activity. There are 15 prime contractors on this project that are responsible for: sitework, abatement, demolition, concrete, masonry, steel, general works, roofing, windows, kitchen equipment, casework, technical wiring, mechanical (both plumbing and HVAC), fire protection, and electrical work. The first contractor on site is the abatement contractor, who started abatement of the existing school in July of 2009, and substantial completion is scheduled for February of 2011.

The schedule references "Area A," "Area B," and "Area C." These are three areas that the building was divided into for construction. Area A contains the gym and cafeteria. Areas B and C primarily contain classrooms, although Area C also contains the media room. A figure showing how the three areas are divided is provided below. In general work follows the sequence B, A, C as described in Tech 1.



Site Layout Planning

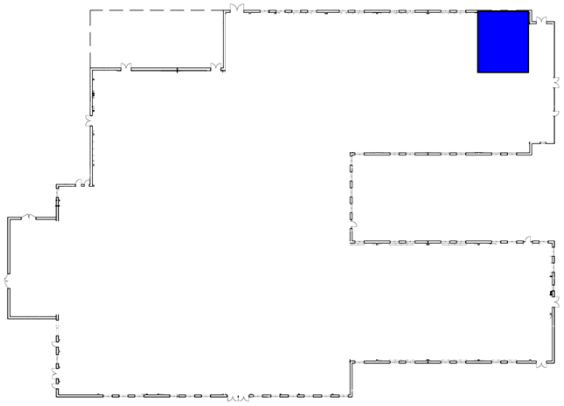
Scale site plans were developed for the excavation, superstructure, and finish phases of the project. These plans can be found in Appendix B. The construction manager (Jacobs) is on-site during all phases of construction, but the number of specialty contractors varies depending on the phase. During excavation, the site work contractor is present, as well as the contractors responsible for temporary utilities. As the project progresses, more contractors arrive at the site as the project progresses and the building is ready for them to start. In addition the staffing of the contractors changes according to how much work they need to do during that phase. As a result, the number of site trailers varies during the different phases, as well as the number of support facilities (tool trailers, portable toilets, etc…). Due to the extent of excavation on this project, no ramps are needed, as only the areas surrounding the footers and foundation walls will be excavated from the building footprint. No ramps will be needed for the sediment basins, as those have sloped earth sides that will be planted with grasses.

For steel erection, a movable crane will be used. This crane will have four different locations during the three different phases of the erection. Because of the size of area A (which includes the gym and cafeteria) two different locations were needed. All four locations are shown on the superstructure drawing, with a lay down area for that phase which allows the crane to reach the steel and the location on the building.

During the final phases of construction the west sediment basin is filled in and graded over. Since the north-western area of the site fence would need to be taken out to install the pavement, it would make sense to turn it into a second site gate to allow easier site access.

Detailed Structural Systems Estimate

For the detailed structural systems estimate a typical bay was selected from area C. Once that bay was examined, the resulting quantities were extrapolated to find an estimate for the entire building. All costs were taken from RS Means, and the data from RS means can be found in Appendix C. It was assumed for items which RS Means chose not to report a labor, material, or equipment cost those items did not contribute to additional labor, equipment, or material costs. For the concrete formwork, four uses were assumed. Since RS Means reported costs for 4" thick and 6" thick slab on grade, and the slab in the typical bay is 5", interpolation was used. Interpolation was used in all instances where the exact number for this project was between two reported numbers. For the structural elements that were shared between two or more bays, only half of the quantity for the element was used (to avoid it being counted twice when extrapolated). A diagram showing the area used for a typical bay is shown below.



The excel spreadsheet with the quantities and costs can be found on the following page.

Trade	Description	Item	Materials	Labor	Equipment	Cost (Total; Inc. O&P)	Qty.	Unit	Total
Concrete	5" Thick Slab on Grade	Concrete	$124.00	$47.25	$0.36	$211.50	13.7	C.Y.	$2,889
	Wall Footing	Concrete	$147.00	$89.50	$0.54	$300.00	10.6	C.Y.	$3,183
	Slab on Grade Formwork	Formwork	$0.92	$4.41		$7.85	19.8	S.F.C.A.	$155
	Footing Formwork	Formwork	$2.42	$2.50		$6.55	154.4	S.F.C.A.	$1,011
	Finish Slab on Grade	Manual Screed and Bull Float		$0.22		$0.22	882.4	S.F.	$194
	Elevated Slab	Concrete	$294.00	$267.00	$24.50	$765.00	10.8	C.Y.	$8,250
	Elevated Slab Formwork	Formwork	$3.26	$3.73		$9.40	49.3	S.F.	$463
	Subtotal		$6,976.44	$5,325.71	$274.87				$16,146
	Extrapolated Across Entire Building		$344,552.82	$263,026.53	$13,575.35				$797,421.15
	With Location Factor (.93)		$320,434.12	$244,614.67	$12,625.07				**$741,601.67**
Masonry	Masonry Pier 1 (x4)	Masonry	$3.73	$3.58		$9.55	66.0	S.F.	$630
	Masonry Pier 19 (x2)	Masonry	$3.73	$3.58		$9.55	52.8	S.F.	$504
	Brick Veneer	Masonry	$5.65	$6.75		$13.75	670.0	S.F.	$9,213
	Concrete Block	CMU and Grout	$2.37	$3.76		$6.13	670.0	S.F.	$4,107
	Safety Net	Building Exterior	$1.59			$1.75	186.3	S.F.	$326
	Scaffolding	Building Exterior		$120.00		$186.00	1.9	C.S.F.	$346
	Forklift	Forklift		$1,550.00	$2,225.00	$4,800.00	0.1	Month	$583
	Subtotal		$4,228.62	$4,947.80	$0.00				$15,710
	Extrapolated Across Entire Building		$208,843.42	$244,362.31	$0.00				$775,868.20
	With Location Factor (.93)		$194,224.38	$227,256.94	$0.00				**$721,557.43**
Steel	Structural Members	W10x15	$25.00	$4.06	$2.90	$37.00	51.3	L.F.	$1,896
	Structural Members	W14x22	$43.00	$2.46	$1.76	$53.00	7.5	L.F.	$398
	Structural Members	W16x26	$43.00	$2.44	$1.74	$53.00	29.5	L.F.	$1,563
	Open Web Joist	16K6	$8.25	$1.96	$1.12	$13.70	29.7	L.F.	$406
	Open Web Joist	20K5	$8.20	$1.76	$1.00	$13.15	353.0	L.F.	$4,641
	Open Web Joist	18KCS2	$9.40	$1.76	$1.00	$14.50	163.1	L.F.	$2,365
	Structural Members	W21x62	$102.00	$3.41	$1.81	$121.00	14.9	L.F.	$1,800
	Bearing Plate BP 1(x3)	1/2" Thick Plate	$30.50			$33.50	0.2	S.F.	$8
	Bearing Plate BP 6	3/4" Thick Plate	$46.00			$50.50	0.2	S.F.	$8
	Lentel L1 (x2)	W8x21	$34.50	$4.06	$2.90	$48.00	10.0	L.F.	$480
	C5 Column (x2)	HSS 9"x5"x1/2"	$65.50	$2.39	$1.71	$78.50	20.0	L.F.	$1,570
	C6 Column (x2)	HSS 9"x5"x3/8"	$65.50	$2.39	$1.71	$78.50	15.0	L.F.	$1,178
	Floor Decking	Floor Decking	$2.97	$0.38	$0.04	$3.98	882.4	S.F.	$3,512
	Roof Decking	Roof Decking	$2.18	$0.34	$0.03	$3.03	882.4	S.F.	$2,674
	Subtotal		$16,258.00	$2,075.21	$939.98				$22,499
	Extrapolated Across Entire Building		$802,950.88	$102,490.69	$46,423.84				$1,111,178.95
	With Location Factor (.93)		$746,744.32	$95,316.34	$43,174.17				**$1,033,396.42**

As can be seen from the table above, the total estimated cost for the concrete portion of the structural system is $741,602. The total estimated cost for the masonry portion is $721,557 and the total estimated cost for the steel portion is $1,033,396. Comparing the estimated cost of the structural masonry to the actual value of the bid package yields no useful information, as the bid package contained several non-structural elements that increased the cost. However, it is possible to compare the estimates to the actual bid values for the concrete and structural steel bid packages.

When comparing the cost of my estimates to the cost of the actual bid packages, my estimate comes in high. This is expected due to Pershing Hill Elementary School being a low bid project with multiple bidders, and the current economy. While I estimated a cost of $741,601 for the concrete bid package the accepted bid was $612,350 representing a difference of 21%. While I estimated a cost of $1,033,396 for the structural steel the accepted bid was $853,200, also representing a difference of 21%. While I would expect my estimate to be higher because this is a low bid project, I wouldn't have expected it to be higher by that magnitude if I hadn't previously talked to the project manager from the construction manager (Jacobs).

When I received the information on the cost of the bid packages, Mr. Nigudkar informed me that the bids received were much lower than he and his team had expected based on similar projects due to the economy. As an example, he pointed to Freetown Elementary School which was bid out 2 years ago. Its size and design were very similar to Pershing Hill Elementary School, it was for the same owner (Anne Arundel County Public Schools), and the work was performed by many of the same contractors. Mr Nigudkar informed me that when Freetown Elementary School was bid out, the total cost for the bid packages was $17.4 million. Since the total cost for the bid packages on Pershing Hill Elementary School is $13.3 million, this represents a 24% decrease from Freetown Elementary School two years ago. Mr. Nigudkar felt the economy was the primary cause for this decrease, and noted that when Pershing Hill Elementary School was bid out they had only expected the cost to be around 5% lower than that of Freetown Elementary School.

General Conditions Estimate

A general conditions estimate was developed for this project that includes all project and staffing costs. Because staffing costs and CM fees are proprietary; averages for the appropriate job titles from RS Means were used for staffing costs, and an average of the CM fee for a $10,000,000 project was taken from RS Means and extrapolated. Costs for aerial photos (required per the contract documents), testing, temporary utilities, trailer rental, field office expenses, and temporary fencing were also taken from RS Means.

Although RS Means provides the cost for individual tests, it is impossible to accurately predict how many of each test will be needed on this particular job as that number can increase due to a variety of conditions. Additional concrete pours, being required to redo any area, soil conditions requiring undercutting, or having a prior test fail would all require additional testing. Therefore the minimum and maximum amount of a $10,000,000 building was averaged, and extrapolated to arrive at a likely cost for this building. RS Means data for the general conditions estimate can be found in Appendix D.

For most items that require periodic payment throughout the project, total project duration of 88 weeks (20 months) was used. This corresponds to the date from which the abatement starts (6/10/09) to the date of substantial completion (2/17/11). Because this team plans to keep an assistant superintendent on site during punch list activities (but not other project team members) 2 months (9 weeks) were added for punch list activities and project closeout to the relevant activities.

For the site fence, it is possible to rent or buy a fence. To find which is more economical, 20 month duration was used. The cost for a 6' high fence in RS Means is $5.45 for up to 12 months. Since the 20 month duration is 2 "up to twelve month" units, the cost of renting is $10.90 per L.F. Since the cost of buying is $11.15 per L.F. it is more economical to rent the site fence for this project. When calculating the amount of fence needed, a waste factor of 10% was used.

As can be seen from the chart below, when the location factor was taken into account, the total estimated general conditions were $1,694,443. This represents 12.7% of the total project costs. When I corresponded with the project manager he said "assume the CM fee and general conditions to be around 12%" so I feel this is a reasonable number.

		Cost	Quantity	Unit	Total
Staffing	Project Manager	$2975	88	week	$261,800
	Superintendent	$2750	88	week	$242,000
	Assistant Super.	$2475	97	week	$240,075
	Project Engineer	$1800	88	week	$158,400
	Clerk	$590	88	week	$51,920
CM Fee		4.6		% of Project	$614,384
Aerial Photos	8" x 10" Color	$1592	6	Set	$9,552
Testing		$55965	1	project	$55,965
Temporary Utilities	Heating	$35	872	CSF Flr	$30,084
	Lighting	$29.4	872	CSF Flr	$25,659
	Temp. Power	$86	872	CSF Flr	$75,297
	Trailer Rental	$310	22	month	$6,820
Field Office Expenses	Office Equipment	$171	22	month	$3,762
	Office Supplies	$94	22	month	$2,057
	Telephone bill	$88	22	month	$1,936
	Lights and HVAC	$165	22	month	$3,630
Temporary Fencing	6' High Fence	$10.9	3545	L.F.	$38,641
Estimated Cost	$1,821,982	Location Factor	0.93	**Total Cost**	**$1,694,443**

Critical Industry Issues

During the PACE Roundtable Meeting I attended the "Energy and the Building Industry" breakout sessions. I was surprised that the discussion started as broadly as it did, and still ended up narrowing down to specific buildings by the afternoon session. I think the more general discussion about different types of energy, the problems with the current energy use, and the reasons to explore alternatives was helpful in framing the specific discussions in the afternoon session. Without that discussion beforehand, a lot of the conversation in the afternoon session could have been sidetracked and wouldn't have been as heavily focused on the different types of systems that could be implemented in specific types of buildings.

I found the discussions about the different types of systems to be very helpful. Joseph Hirsch discussed the fact that his thesis project (also an elementary school) is using a geothermal MEP system. This was very interesting to me as my thesis building does not employ a geothermal system and Michael Arnold mentioned in the opening session that the schools he is working on are tending to move towards LEED certification, geothermal systems, and energy modeling. Since some school systems are moving in that direction, I think that is an analysis that could prove interesting for my project.

At lunch I talked briefly with Mr. Arnold, and I feel that his experience in school construction could be helpful for my project. Since he is working on geothermal school projects, if I decide to pursue that topic for my analysis talking to him about the construction issues involved would be especially beneficial. At the Roundtable Meeting Mr. Arnold mentioned a class that his company was developing to help familiarize their employees with geotechnical

work, since they were seeing more of it. Mr. Arnold emailed me after the meeting saying that the course should be complete by the end of November at which time I should email him. Although it would likely be too late by that point to incorporate any information from that course into Tech 3, it could prove to be valuable background research for my Final Proposal.

Another system that was mentioned in the afternoon "Energy and the Building Industry" session was a cylindrical solar panel. This was brought up by Ilie Javier, who mentioned that it was used by the solar decathlon team. The trade name of the specific system was Solyndra. I did not know anything about Solyndra prior to this session; but its website's claim that it "enables its customers to realize significant savings on installation costs" is very promising, as one of the chief challenges to adopting solar energy is the high upfront costs.

A reoccurring theme was the federal and state incentives for green energy as well as solar incentives, which help to defray the additional upfront costs. Dsire.org, which turned out to be http://www.dsireusa.org/ was mentioned near the end of the session as a good website for finding the applicable incentives for a particular state. If I decide to pursue adding an active solar system as one of my proposals, dsireusa.org could be helpful in accounting for the applicable incentives and Solyndra's system might prove to be more economical than traditional systems making it easier to recoup the upfront costs.

Financial analysis was also discussed in this session. While grant money and incentives were the focus of this subject, calculating lifecycle costs was also discussed. A representative from McClour informed us that schools, as institutional owners, tend to be interested in a 10-15 year look forward. This will be important to keep in mind for any financial analysis when deciding if it is likely to be adapted.

In addition to the breakout sessions there was a morning session highlighted by an industry panel and an afternoon session highlighted by a student panel. In the morning session the industry panel topic was the state of the construction industry. Representatives talked about how the economic downturn has affected their companies, as well as how it has changed what they are seeing in the industry

In the afternoon session, in addition to the student panel, summaries of the the other breakout sessions were presented. I was surprised to hear that owners are moving towards more bid work. The justification given was that owners perceive they can get a better price by bidding the jobs out. Since the downturn has caused more companies to look outside their traditional specialty areas, and into new types of construction, it would make more sense that owners would get a better price (because there are more bidders than in a good economy). However, I would be weary as an owner if the contractors on my job had little experience with similar buildings. The "Business and Networking" session talked about addressing this issue through joint venture projects, which allow a company to build its resume in a particular area.

The third breakout session was focused on "BIM Executive Planning." The summery of the session focused on how to get everyone on board, the owner's role in BIM, the legal issues in model transfer, and the value of BIM verses the project delivery method. I was not surprised to hear that design-build projects benefit most from building integration modeling, but wonder how much of that is due to the contractor getting involved (and using BIM) earlier in the project.

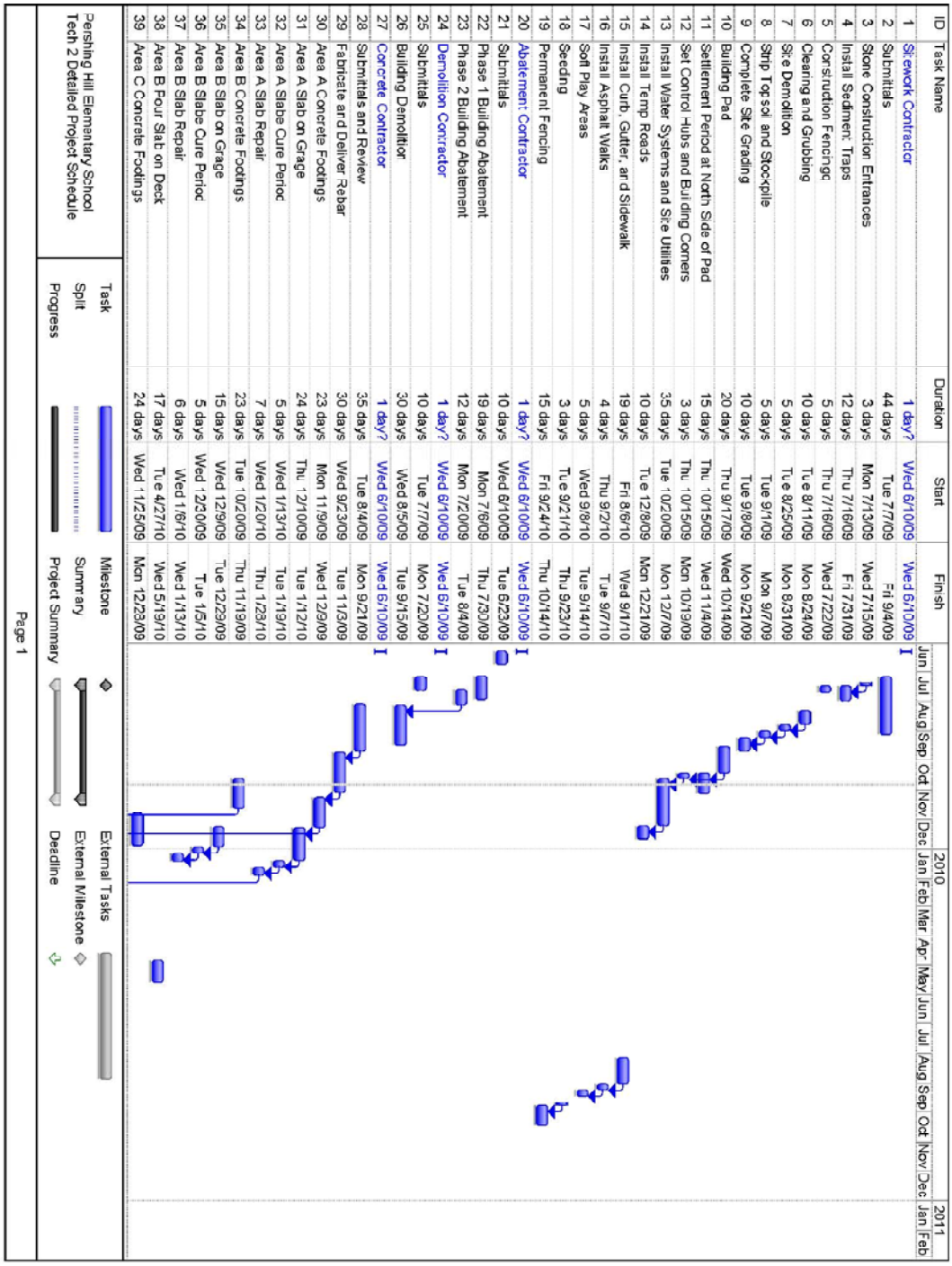
The student panel focused on "Communication Patterns of the Now Generation" which the industry representatives felt was a misnomer. The industry member's feedback focused on the strong use of email as opposed to traditional methods of communication, namely telephone

calls. The main complaint the industry members had was that email was used for urgent items, when it does not facilitate an immediate response. Although everyone seemed to harmonize on the point that certain communication methods are more appropriate for certain tasks, little discussion was given to how to select the best method. Instead the student panel seemed to conclude that experience and clear communication of expectations by supervisors will best allow someone to decide; while the industry members in the audience seemed to feel that an overreliance on email was the primary fault.

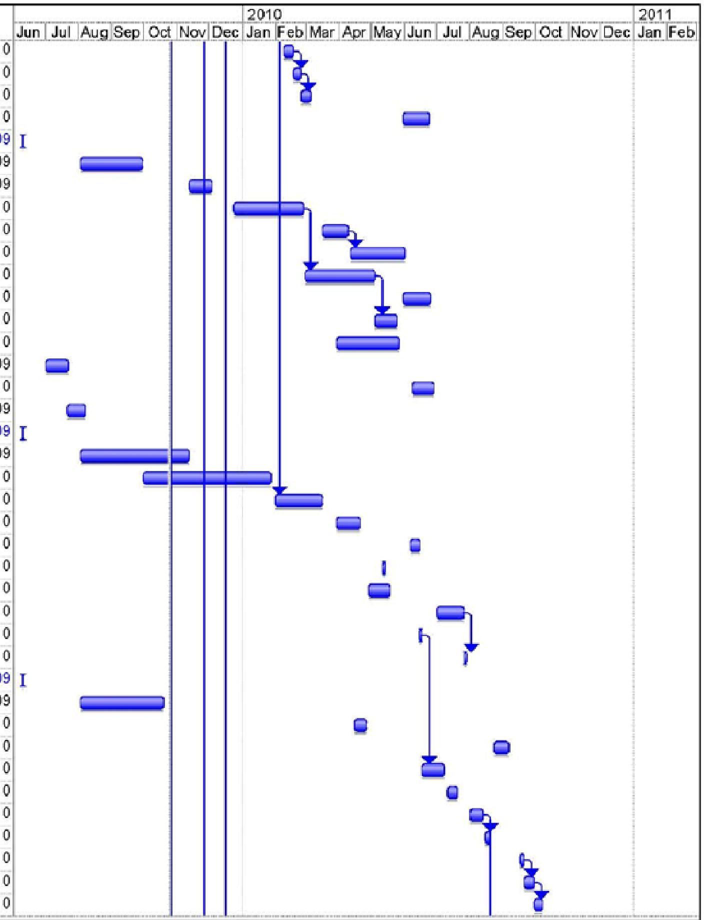
I feel that the PACE Roundtable was a good opportunity, and the contacts I made will help me as I continue my thesis project. I particularly enjoyed the chance to hear what the industry members thought of my generation's communication patterns, and have to admit that I much prefer email to phone calls. Before the student panel discussion I did not consider any negatives to email, so that was enlightening.

Appendix A

Detailed Project Schedule



ID	Task Name	Duration	Start	Finish
40	Area C Slab on Grage	7 days	Tue 2/9/10	Wed 2/17/10
41	Area C Slabe Cure Period	5 days	Thu 2/18/10	Wed 2/24/10
42	Area C Slab Repair	7 days	Thu 2/25/10	Fri 3/5/10
43	Area C Pour Slab on Deck	19 days	Mon 5/31/10	Thu 6/24/10
44	Masonry Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
45	Submittals and Review	42 days	Mon 8/3/09	Tue 9/29/09
46	Area A CMU at Concrete Footings	15 days	Fri 11/13/09	Thu 12/3/09
47	Area A CMU Bearing Walls	47 days	Thu 12/24/09	Fri 2/26/10
48	Area A Exterior Brick Veneer	18 days	Wed 3/17/10	Fri 4/9/10
49	Area A Interior CMU Walls	37 days	Mon 4/12/10	Tue 6/1/10
50	Area B CMU Bearing Walls	47 days	Mon 3/1/10	Tue 5/4/10
51	Area B Exterior Brick Veneer	20 days	Mon 5/31/10	Fri 6/25/10
52	Area B Interior CMU Walls	15 days	Wed 5/5/10	Tue 5/25/10
53	Area C CMU Bearing Walls	43 days	Tue 3/30/10	Thu 5/27/10
54	Area C Exterior Brick Veneer	15 days	Thu 7/2/09	Wed 7/22/09
55	Area C Interior CMU Walls-Foor 1	14 days	Wed 6/9/10	Mon 6/28/10
56	Area C Interior CMU Walls-Foor 2	13 days	Wed 7/22/09	Fri 8/7/09
57	Steel Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
58	Submittals and Review	74 days	Mon 8/3/09	Thu 11/12/09
59	Fabricate and Deliver	85 days	Thu 10/1/09	Wed 1/27/10
60	Area A Roof Joists and Metal Deck	32 days	Mon 2/1/10	Tue 3/16/10
61	Area B Structural Steel	16 days	Tue 3/30/10	Tue 4/20/10
62	Area B Roof Joist and Metal Deck	7 days	Mon 6/7/10	Tue 6/15/10
63	Area B CMU Wall Supports	3 days	Wed 5/12/10	Fri 5/14/10
64	Area C Structural Steel	14 days	Thu 4/29/10	Tue 5/18/10
65	Area C Roof Joist and Metal Deck	17 days	Fri 7/2/10	Mon 7/26/10
66	Area C First Floor CMU Wall Supports	3 days	Tue 6/15/10	Thu 6/17/10
67	Area C Second Floor CMU Wall Supports	3 days	Tue 7/27/10	Thu 7/29/10
68	General Works Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
69	Submittals and Review	56 days	Mon 8/3/09	Mon 10/19/09
70	Area A Architectural Louvers	7 days	Fri 4/16/10	Mon 4/26/10
71	Aluminum Entrance Canopies	10 days	Tue 8/24/10	Mon 9/6/10
72	Area A Paint Prime and First Finish Coat	15 days	Fri 6/18/10	Thu 7/8/10
73	Area A Ceiling Grid	7 days	Mon 7/12/10	Tue 7/20/10
74	Area A Paint Second Finish Coat	10 days	Mon 8/2/10	Fri 8/13/10
75	Basketball Backboards in Gym	5 days	Mon 8/16/10	Fri 8/20/10
76	Area A Drop Ceiling Tiles	2 days	Fri 9/17/10	Mon 9/20/10
77	Area A VCT	7 days	Tue 9/21/10	Wed 9/29/10
78	Area A Doors and Hardware	6 days	Thu 9/30/10	Thu 10/7/10

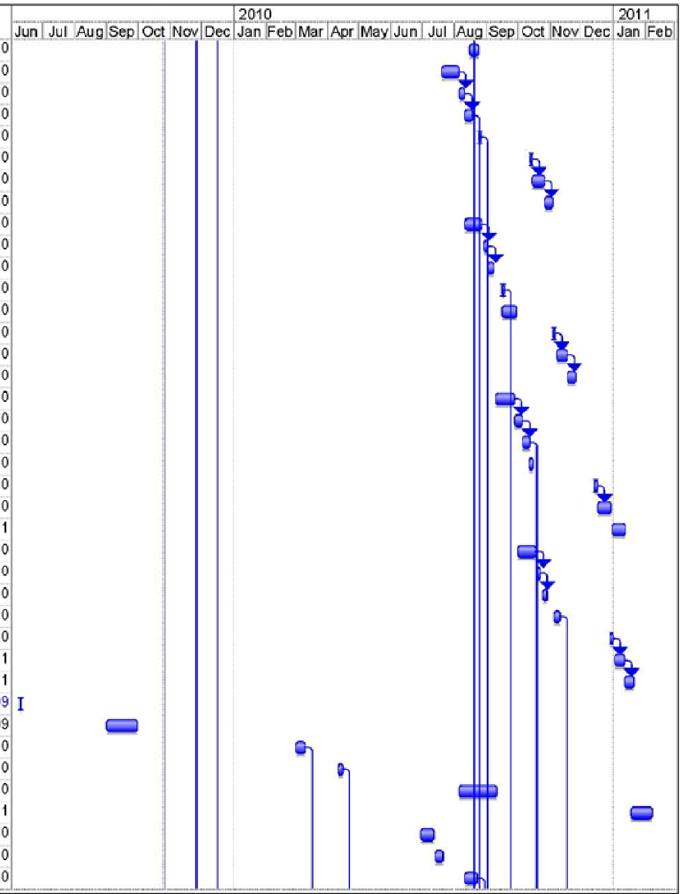


Pershing Hill Elementary School
Tech 2 Detailed Project Schedule

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

Page 2

ID	Task Name	Duration	Start	Finish
79	Areas B & C Architectural Louvers	7 days	Mon 8/16/10	Tue 8/24/10
80	Area B Drywall-Floor 1	12 days	Wed 7/21/10	Thu 8/5/10
81	Area B Paint Prime and First Finish Coat-Fl 1	4 days	Fri 8/6/10	Wed 8/11/10
82	Area B Ceiling Grid-Fl 1	5 days	Thu 8/12/10	Wed 8/18/10
83	Area B Paint Second Finish Coat-Fl 1	2 days	Wed 8/25/10	Thu 8/26/10
84	Area B Drop Ceiling Tiles-Fl 1	2 days	Wed 10/13/10	Thu 10/14/10
85	Area B VCT-Fl 1	8 days	Fri 10/15/10	Tue 10/26/10
86	Area B Doors and Hardware-Fl 1	6 days	Wed 10/27/10	Wed 11/3/10
87	Area B Drywall-Floor 2	12 days	Thu 8/12/10	Fri 8/27/10
88	Area B Paint Prime and First Finish Coat-Fl 2	4 days	Mon 8/30/10	Thu 9/2/10
89	Area B Ceiling Grid-Fl 2	3 days	Fri 9/3/10	Tue 9/7/10
90	Area B Paint Second Finish Coat-Fl 2	2 days	Thu 9/16/10	Fri 9/17/10
91	Elevator Installation	10 days	Thu 9/16/10	Wed 9/29/10
92	Area B Drop Ceiling Tiles-Fl 2	2 days	Thu 11/4/10	Fri 11/5/10
93	Area B VCT-Fl 2	8 days	Mon 11/8/10	Wed 11/17/10
94	Area B Doors and Hardware-Fl 2	6 days	Thu 11/18/10	Thu 11/25/10
95	Area C Drywall-Floor 1	12 days	Fri 9/10/10	Mon 9/27/10
96	Area C Paint Prime and First Finish Coat-Fl 1	6 days	Tue 9/28/10	Tue 10/5/10
97	Area C Ceiling Grid-Fl 1	5 days	Wed 10/6/10	Tue 10/12/10
98	Area C Paint Second Finish Coat-Fl 1	4 days	Tue 10/12/10	Fri 10/15/10
99	Area C Drop Ceiling Tiles-Fl 1	3 days	Tue 12/14/10	Thu 12/16/10
100	Area C VCT-Fl 1	9 days	Fri 12/17/10	Wed 12/29/10
101	Area C Doors and Hardware-Fl 1	9 days	Fri 12/31/10	Wed 1/12/11
102	Area C Drywall-Floor 2	12 days	Fri 10/1/10	Mon 10/18/10
103	Area C Paint Prime and First Finish Coat-Fl 2	4 days	Tue 10/19/10	Fri 10/22/10
104	Area C Ceiling Grid-Fl 2	5 days	Mon 10/25/10	Fri 10/29/10
105	Area C Paint Second Finish Coat-Fl 2	4 days	Fri 11/5/10	Wed 11/10/10
106	Area C Drop Ceiling Tiles-Fl 2	3 days	Wed 12/29/10	Fri 12/31/10
107	Area C VCT-Fl 2	7 days	Mon 1/3/11	Tue 1/11/11
108	Area C Doors and Hardware-Fl 2	7 days	Wed 1/12/11	Thu 1/20/11
109	Roofing Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
110	Submittals	22 days	Tue 9/1/09	Wed 9/30/09
111	Area A Roof Dry-In at Gym/Cafeteria	7 days	Tue 3/2/10	Wed 3/10/10
112	Area A Roof Dry-In (Remaining Area)	4 days	Mon 4/12/10	Thu 4/15/10
113	Fabricate Parapet Coping	26 days	Fri 8/6/10	Fri 9/10/10
114	Install Parapet Coping	15 days	Tue 1/18/11	Mon 2/7/11
115	Area B Roof Dry-In	9 days	Wed 6/30/10	Mon 7/12/10
116	Area C Roof Dry-In above Media Room	6 days	Wed 7/14/10	Wed 7/21/10
117	Area C Roof Dry-In	8 days	Thu 8/12/10	Mon 8/23/10

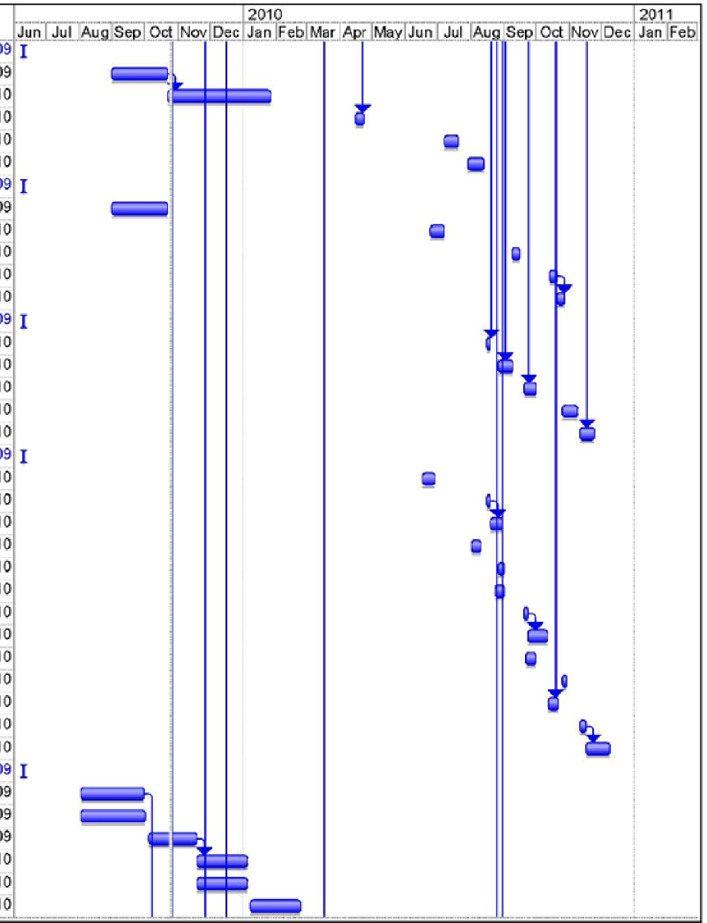


Pershing Hill Elementary School
Tech 2 Detailed Project Schedule

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

Page 3

ID	Task Name	Duration	Start	Finish
118	Windows Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
119	Submittals and Review	38 days	Tue 9/1/09	Thu 10/22/09
120	Fab and Deliver Exterior Windows	68 days	Fri 10/23/09	Tue 1/26/10
121	Area A Exterior Window Installation	6 days	Fri 4/16/10	Fri 4/23/10
122	Area B Exterior Window Installation	9 days	Thu 7/8/10	Tue 7/20/10
123	Area C Exterior Window Installlation	11 days	Fri 7/30/10	Fri 8/13/10
124	Kitchen Equipment Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
125	Submittals and Review	38 days	Tue 9/1/09	Thu 10/22/09
126	Walk-In Installed	9 days	Fri 6/25/10	Wed 7/7/10
127	Install MEP Hook-Ups	5 days	Thu 9/9/10	Wed 9/15/10
128	Install Kitchen Equipment	5 days	Thu 10/14/10	Wed 10/20/10
129	Health Department Inspection	5 days	Thu 10/21/10	Wed 10/27/10
130	Casework Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
131	Area A Casework	4 days	Mon 8/16/10	Thu 8/19/10
132	Area B Basework-Fl 1	10 days	Fri 8/27/10	Thu 9/9/10
133	Area B Basework-Fl 2	10 days	Mon 9/20/10	Fri 10/1/10
134	Area C Basework-Fl 1	10 days	Tue 10/26/10	Mon 11/8/10
135	Area C Basework-Fl 2	10 days	Thu 11/11/10	Wed 11/24/10
136	Technical Wiring	1 day?	Wed 6/10/09	Wed 6/10/09
137	Area A Pull Data/ Voice Wiring	7 days	Fri 6/18/10	Mon 6/28/10
138	Area A Wall Mounted Devices	4 days	Mon 8/16/10	Thu 8/19/10
139	Area A Termination and Testing	7 days	Fri 8/20/10	Mon 8/30/10
140	Area B Pull Data/ Voice Wiring-Fl 1	7 days	Mon 8/2/10	Tue 8/10/10
141	Area B Wall Mounted Devices-Fl 1	4 days	Fri 8/27/10	Wed 9/1/10
142	Area B Pull Data/ Voice Wiring-Fl 2	7 days	Tue 8/24/10	Wed 9/1/10
143	Area B Wall Mounted Devices-Fl 2	4 days	Mon 9/20/10	Thu 9/23/10
144	Area B Termination and Testing	12 days	Fri 9/24/10	Mon 10/11/10
145	Area C Pull Data/ Voice Wiring-Fl 1	7 days	Wed 9/22/10	Thu 9/30/10
146	Area C Wall Mounted Devices-Fl 1	4 days	Tue 10/26/10	Fri 10/29/10
147	Area C Pull Data/ Voice Wiring-Fl 2	7 days	Wed 10/13/10	Thu 10/21/10
148	Area C Wall Mounted Devices-Fl 2	4 days	Thu 11/11/10	Tue 11/16/10
149	Area C Termination and Testing	16 days	Wed 11/17/10	Wed 12/8/10
150	Mechanical Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
151	Rooftop Submittals and Review	43 days	Mon 8/3/09	Wed 9/30/09
152	Area A Coordinated Drawings	44 days	Mon 8/3/09	Thu 10/1/09
153	Area B Coordinated Drawings-Fl 1	33 days	Mon 10/5/09	Wed 11/18/09
154	Area B Coordinated Drawings-Fl 2	33 days	Thu 11/19/09	Mon 1/4/10
155	Area C Coordinated Drawings-Fl 1	33 days	Thu 11/19/09	Mon 1/4/10
156	Area C Coordinated Drawings-Fl 2	33 days	Fri 1/8/10	Tue 2/23/10

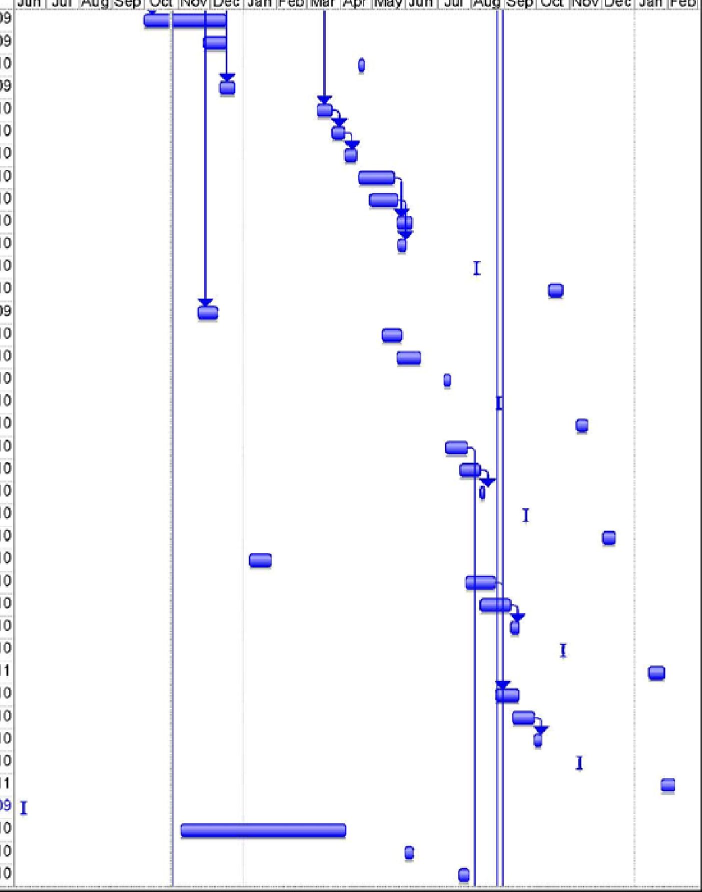


Pershing Hill Elementary School
Tech 2 Detailed Project Schedule

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

Page 4

ID	Task Name	Duration	Start	Finish
157	Fabricate and Deliver Equipment	54 days	Thu 10/1/09	Tue 12/15/09
158	Gas and Domestic Water Services	16 days	Wed 11/25/09	Wed 12/16/09
159	Set Gas Meter and Exterior Chiller	5 days	Mon 4/19/10	Fri 4/23/10
160	Area A Underground Plumbing	10 days	Thu 12/10/09	Wed 12/23/09
161	Area A Ductwork at Gym/Cafeteria	10 days	Thu 3/11/10	Wed 3/24/10
162	Overhead Plumbing Rough-In at Gym/Cafeteria	8 days	Thu 3/25/10	Mon 4/5/10
163	Plumbing Insulation in Gym/Cafeteria	9 days	Tue 4/6/10	Fri 4/16/10
164	Boiler Room	25 days	Mon 4/19/10	Fri 5/21/10
165	Area A Rough-In	19 days	Thu 4/29/10	Tue 5/25/10
166	Boiler Inspection	10 days	Tue 5/25/10	Mon 6/7/10
167	Area A OH Mech and Plumbing Insulation	5 days	Wed 5/26/10	Tue 6/1/10
168	Area A Final Ceiling Inspection	1 day	Fri 8/6/10	Fri 8/6/10
169	Area A Testing and Balancing	9 days	Wed 10/13/10	Mon 10/25/10
170	Area B Underground Plumbing	12 days	Fri 11/20/09	Mon 12/7/09
171	Area B Ductwork-Fl 1	14 days	Tue 5/11/10	Fri 5/28/10
172	Area B Mech and Plumbing Rough-In Fl 1	16 days	Tue 5/25/10	Tue 6/15/10
173	Area B Mech and Plumbing Insulation-Fl 1	4 days	Wed 7/7/10	Mon 7/12/10
174	Area B Final Ceiling Inspection-Fl 1	1 day	Fri 8/27/10	Fri 8/27/10
175	Area B Testing and Balancing-Fl 1	8 days	Mon 11/8/10	Wed 11/17/10
176	Area B Ductwork-Fl 2	14 days	Fri 7/9/10	Wed 7/28/10
177	Area B Mech and Plumbing Rough-In Fl 2	13 days	Thu 7/22/10	Mon 8/9/10
178	Area B Mech and Plumbing Insulation-Fl 2	4 days	Tue 8/10/10	Fri 8/13/10
179	Area B Final Ceiling Inspection-Fl 2	1 day	Tue 9/21/10	Tue 9/21/10
180	Area B Testing and Balancing-Fl 2	8 days	Thu 12/2/10	Mon 12/13/10
181	Area C Underground Plumbing	14 days	Thu 1/7/10	Tue 1/26/10
182	Area C Ductwork-Fl 1	20 days	Tue 7/27/10	Mon 8/23/10
183	Area C Mech and Plumbing Rough-In Fl 1	20 days	Tue 8/10/10	Mon 9/6/10
184	Area C Mech and Plumbing Insulation-Fl 1	6 days	Tue 9/7/10	Tue 9/14/10
185	Area C Final Ceiling Inspection-Fl 1	1 day	Tue 10/26/10	Tue 10/26/10
186	Area C Testing and Balancing-Fl 1	11 days	Fri 1/14/11	Fri 1/28/11
187	Area C Ductwork-Fl 2	16 days	Tue 8/24/10	Tue 9/14/10
188	Area C Mech and Plumbing Rough-In Fl 2	14 days	Thu 9/9/10	Tue 9/28/10
189	Area C Mech and Plumbing Insulation-Fl 2	5 days	Wed 9/29/10	Tue 10/5/10
190	Area C Final Ceiling Inspection-Fl 2	1 day	Wed 11/10/10	Wed 11/10/10
191	Area C Testing and Balancing-Fl 2	9 days	Wed 1/26/11	Mon 2/7/11
192	Fire Protection Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
193	FS Coordinated Drawings	110 days	Wed 11/4/09	Tue 4/6/10
194	Area A Sprinkler Rough-In	6 days	Tue 6/1/10	Tue 6/8/10
195	Area A Sprinkler Drops and Heads	8 days	Wed 7/21/10	Fri 7/30/10

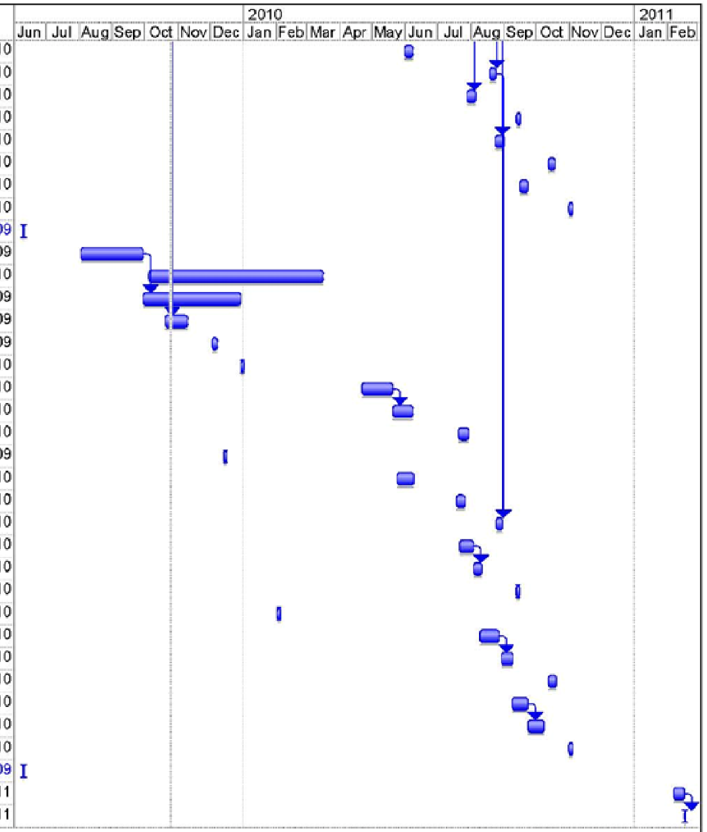


Pershing Hill Elementary School
Tech 2 Detailed Project Schedule

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

Page 5

ID	Task Name	Duration	Start	Finish
196	Area B Sprinkler Rough-In Fl-1	6 days	Tue 6/1/10	Tue 6/8/10
197	Area B Sprinkler Drops and Heads Fl-1	4 days	Thu 8/19/10	Tue 8/24/10
198	Area B Sprinkler Rough-In Fl-2	6 days	Thu 7/29/10	Thu 8/5/10
199	Area B Sprinkler Drops and Heads Fl-2	4 days	Mon 9/13/10	Thu 9/16/10
200	Area C Sprinkler Rough-In Fl-1	7 days	Tue 8/24/10	Wed 9/1/10
201	Area C Sprinkler Drops and Heads Fl-1	4 days	Wed 10/13/10	Mon 10/18/10
202	Area C Sprinkler Rough-In Fl-2	6 days	Thu 9/16/10	Thu 9/23/10
203	Area C Sprinkler Drops and Heads Fl-2	4 days	Mon 11/1/10	Thu 11/4/10
204	Electrical Contractor	1 day?	Wed 6/10/09	Wed 6/10/09
205	Submittals and Review	42 days	Mon 8/3/09	Tue 9/29/09
206	Coordinated Drawings	117 days	Mon 10/5/09	Tue 3/16/10
207	Fab and Deliver Equipment	65 days	Wed 9/30/09	Tue 12/29/09
208	Site Temporary Lighting and Power	15 days	Tue 10/20/09	Mon 11/9/09
209	Underslab Electrical at Gym/Cafeteria	3 days	Thu 12/3/09	Mon 12/7/09
210	Area A Underslab Electrical	3 days	Wed 12/30/09	Fri 1/1/10
211	Area A Electrical Rough-In	21 days	Thu 4/22/10	Thu 5/20/10
212	Area A Pull Power/ Lighting Wiring	13 days	Fri 5/21/10	Tue 6/8/10
213	Area A Drop Lights	8 days	Wed 7/21/10	Fri 7/30/10
214	Area B Underslab Electrical	3 days	Mon 12/14/09	Wed 12/16/09
215	Area B Electrical Rough-In Fl-1	12 days	Tue 5/25/10	Wed 6/9/10
216	Area B Pull Power/ Lighting Wiring Fl 1	6 days	Mon 7/19/10	Mon 7/26/10
217	Area B Drop Lights Fl 1	4 days	Wed 8/25/10	Mon 8/30/10
218	Area B Electrical Rough-In Fl-2	9 days	Thu 7/22/10	Tue 8/3/10
219	Area B Pull Power/ Lighting Wiring Fl 2	6 days	Wed 8/4/10	Wed 8/11/10
220	Area B Drop Lights Fl 2	3 days	Mon 9/13/10	Wed 9/15/10
221	Area C Underslab Electrical	3 days	Tue 2/2/10	Thu 2/4/10
222	Area C Electrical Rough-In Fl-1	14 days	Tue 8/10/10	Fri 8/27/10
223	Area C Pull Power/ Lighting Wiring Fl 1	9 days	Mon 8/30/10	Thu 9/9/10
224	Area C Drop Lights Fl 1	5 days	Wed 10/13/10	Tue 10/19/10
225	Area C Electrical Rough-In Fl-2	11 days	Thu 9/9/10	Thu 9/23/10
226	Area C Pull Power/ Lighting Wiring Fl 2	11 days	Fri 9/24/10	Fri 10/8/10
227	Area C Drop Lights Fl 2	4 days	Mon 11/1/10	Thu 11/4/10
228	All Project Team Members	1 day?	Wed 6/10/09	Wed 6/10/09
229	Final Building Inspection	8 days	Mon 2/7/11	Wed 2/16/11
230	Obtain Use and Occupancy Permit	1 day	Thu 2/17/11	Thu 2/17/11



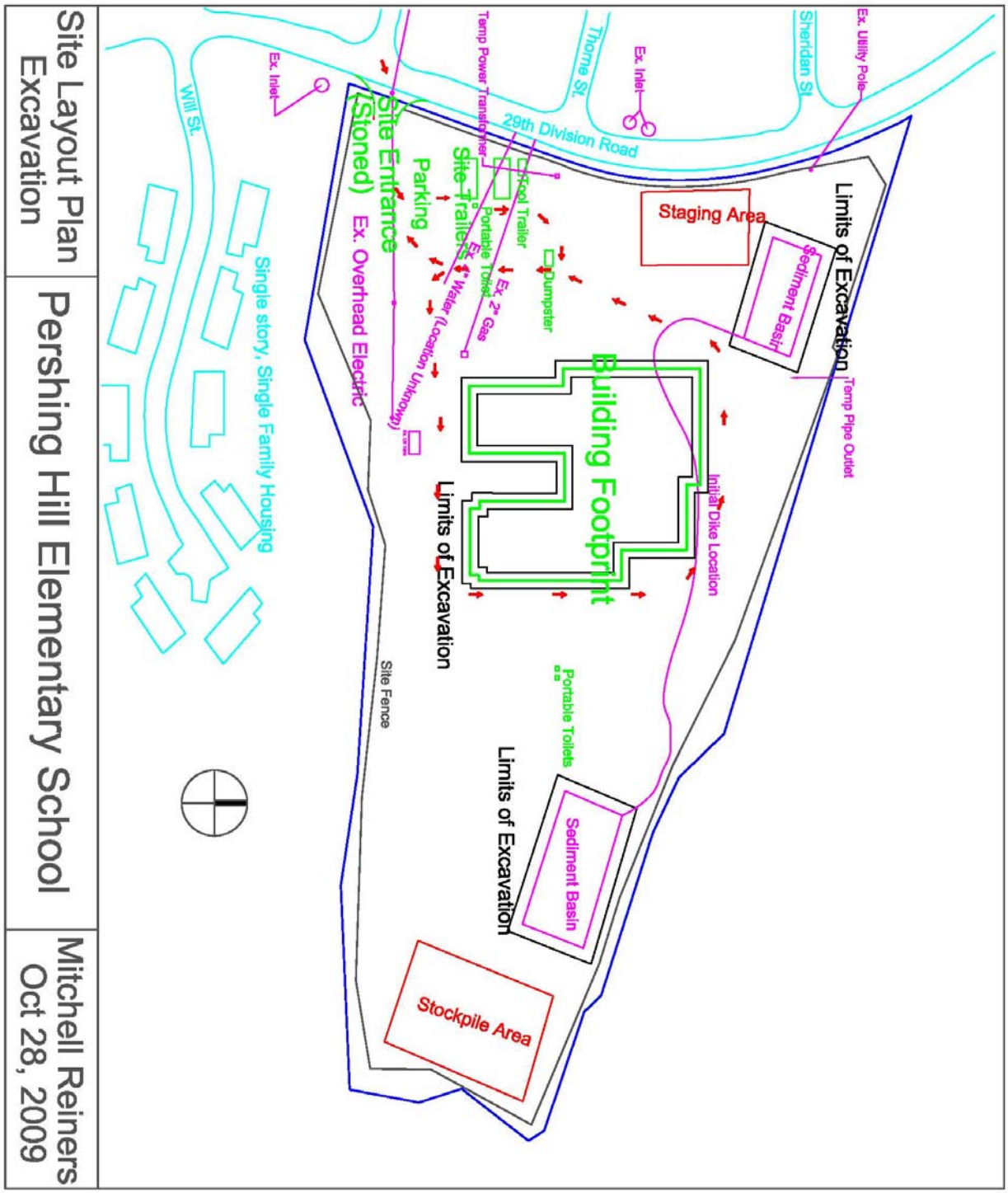
Pershing Hill Elementary School
Tech 2 Detailed Project Schedule

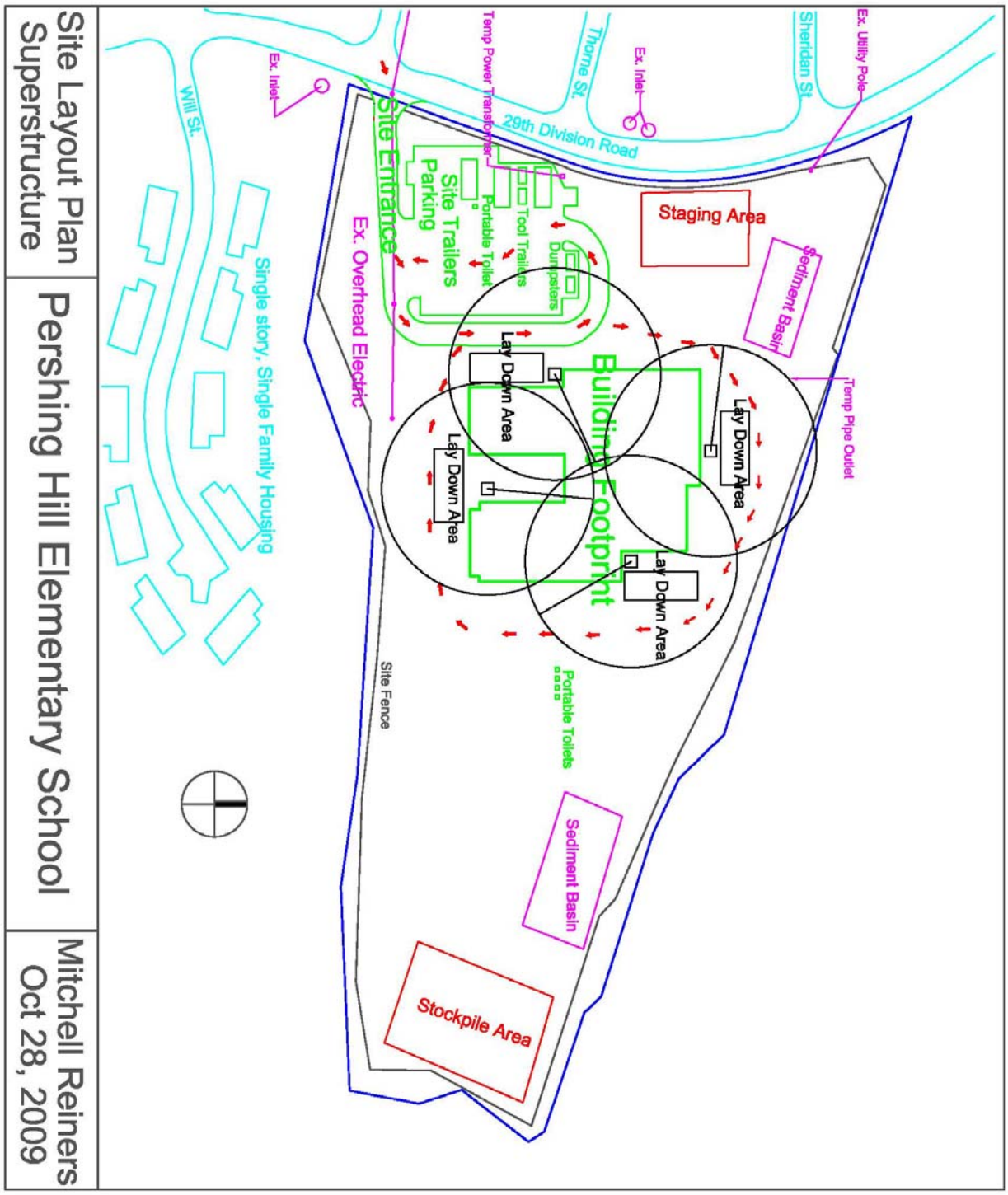
Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

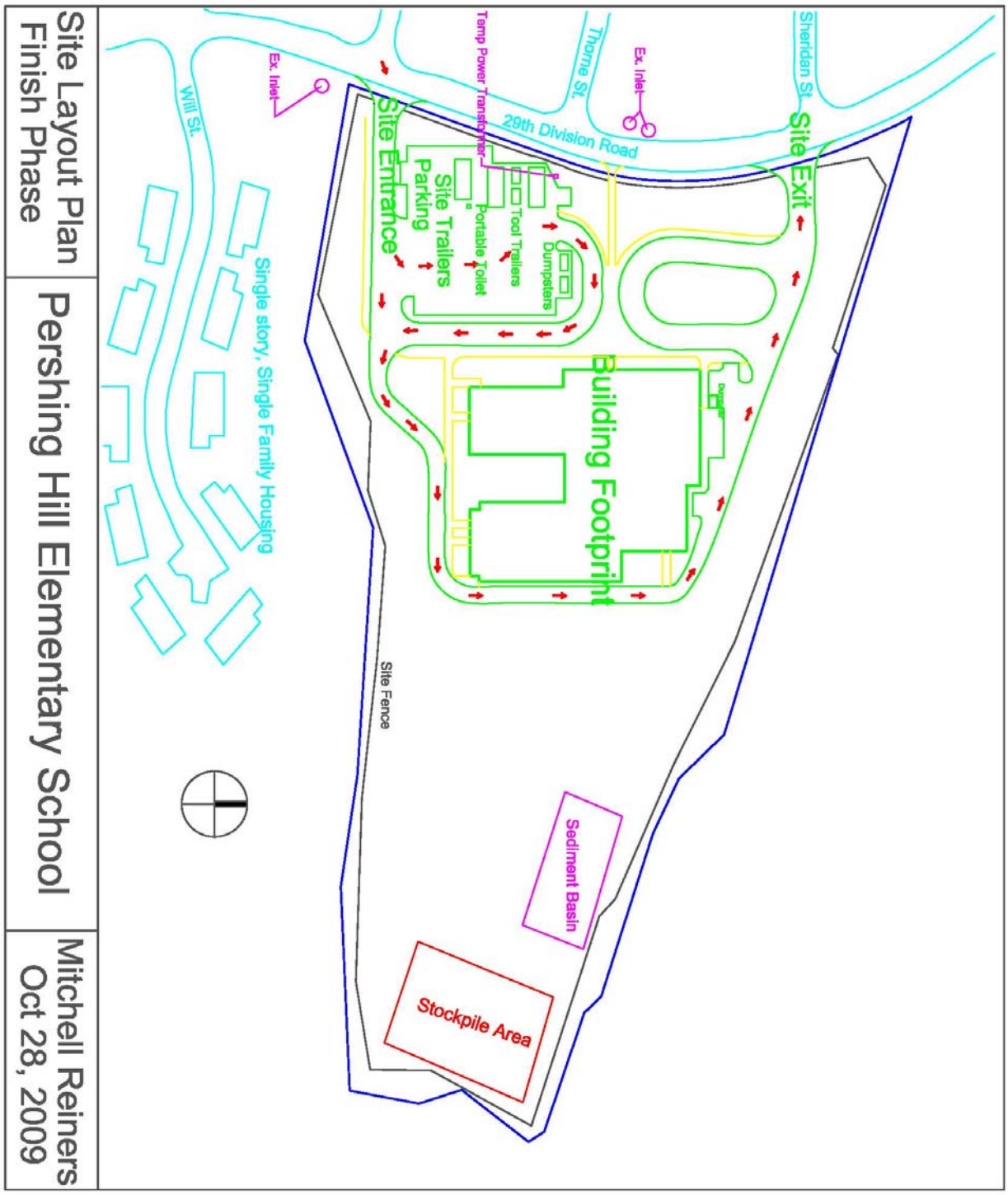
Page 6

Appendix B

Scale Site Plans

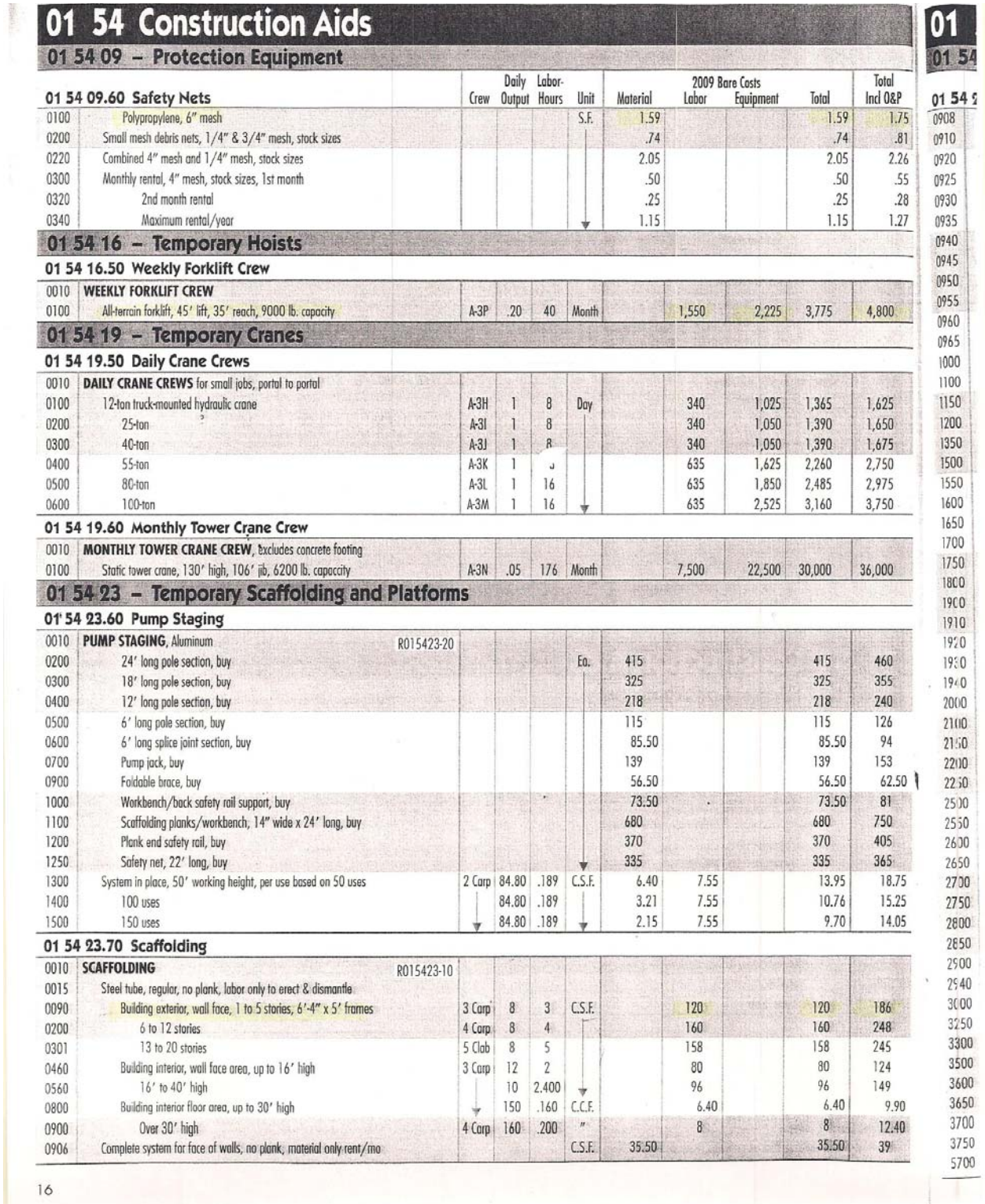



Site Layout Plan
Superstructure
Pershing Hill Elementary School
Mitchell Reiners
Oct 28, 2009
29th Division Road
Thorne St.
Sheridan St.
Ex. Utility Pole
Ex. Inlet
Ex. Inlet
Will St.
Temp Power Transformer
Site Entrance
Ex. Overhead Electric
Site Trailers
Parking
Portable Toilet
Tool Trailers
Dumpsters
Staging Area
Sediment Basin
Temp Pipe Outlet
Building Footprint
Lay Down Area
Lay Down Area
Lay Down Area
Lay Down Area
Site Fence
Portable Toilets
Sediment Basin
Stockpile Area
Single story, Single Family Housing


Site Layout Plan
Finish Phase
Pershing Hill Elementary School
Mitchell Reiners
Oct 28, 2009
Sheridan St.
Site Exit
Thorne St.
Ex. Inlet
29th Division Road
Temp Power Transformer
Site Entrance
Site Trailers
Parking
Portable Toilet
Tool Trailers
Dumpsters
Building Footprint
Ex. Inlet
Will St.
Single story, Single Family Housing
Site Fence
Sediment Basin
Stockpile Area

Appendix C

RS Means 2009 Data for Structural System Estimate



01 54 Construction Aids

01 54 09 – Protection Equipment

	01 54 09.60 Safety Nets	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0100	Polypropylene, 6" mesh				S.F.	1.59			1.59	1.75
0200	Small mesh debris nets, 1/4" & 3/4" mesh, stock sizes					.74			.74	.81
0220	Combined 4" mesh and 1/4" mesh, stock sizes					2.05			2.05	2.26
0300	Monthly rental, 4" mesh, stock sizes, 1st month					.50			.50	.55
0320	2nd month rental					.25			.25	.28
0340	Maximum rental/year					1.15			1.15	1.27

01 54 16 – Temporary Hoists

01 54 16.50 Weekly Forklift Crew

0010	**WEEKLY FORKLIFT CREW**									
0100	All-terrain forklift, 45' lift, 35' reach, 9000 lb. capacity	A-3P	.20	40	Month		1,550	2,225	3,775	4,800

01 54 19 – Temporary Cranes

01 54 19.50 Daily Crane Crews

0010	**DAILY CRANE CREWS** for small jobs, portal to portal									
0100	12-ton truck-mounted hydraulic crane	A-3H	1	8	Day		340	1,025	1,365	1,625
0200	25-ton	A-3I	1	8			340	1,050	1,390	1,650
0300	40-ton	A-3J	1	8			340	1,050	1,390	1,675
0400	55-ton	A-3K	1	8			635	1,625	2,260	2,750
0500	80-ton	A-3L	1	16			635	1,850	2,485	2,975
0600	100-ton	A-3M	1	16			635	2,525	3,160	3,750

01 54 19.60 Monthly Tower Crane Crew

0010	**MONTHLY TOWER CRANE CREW**, Excludes concrete footing									
0100	Static tower crane, 130' high, 106' jib, 6200 lb. capacity	A-3N	.05	176	Month		7,500	22,500	30,000	36,000

01 54 23 – Temporary Scaffolding and Platforms

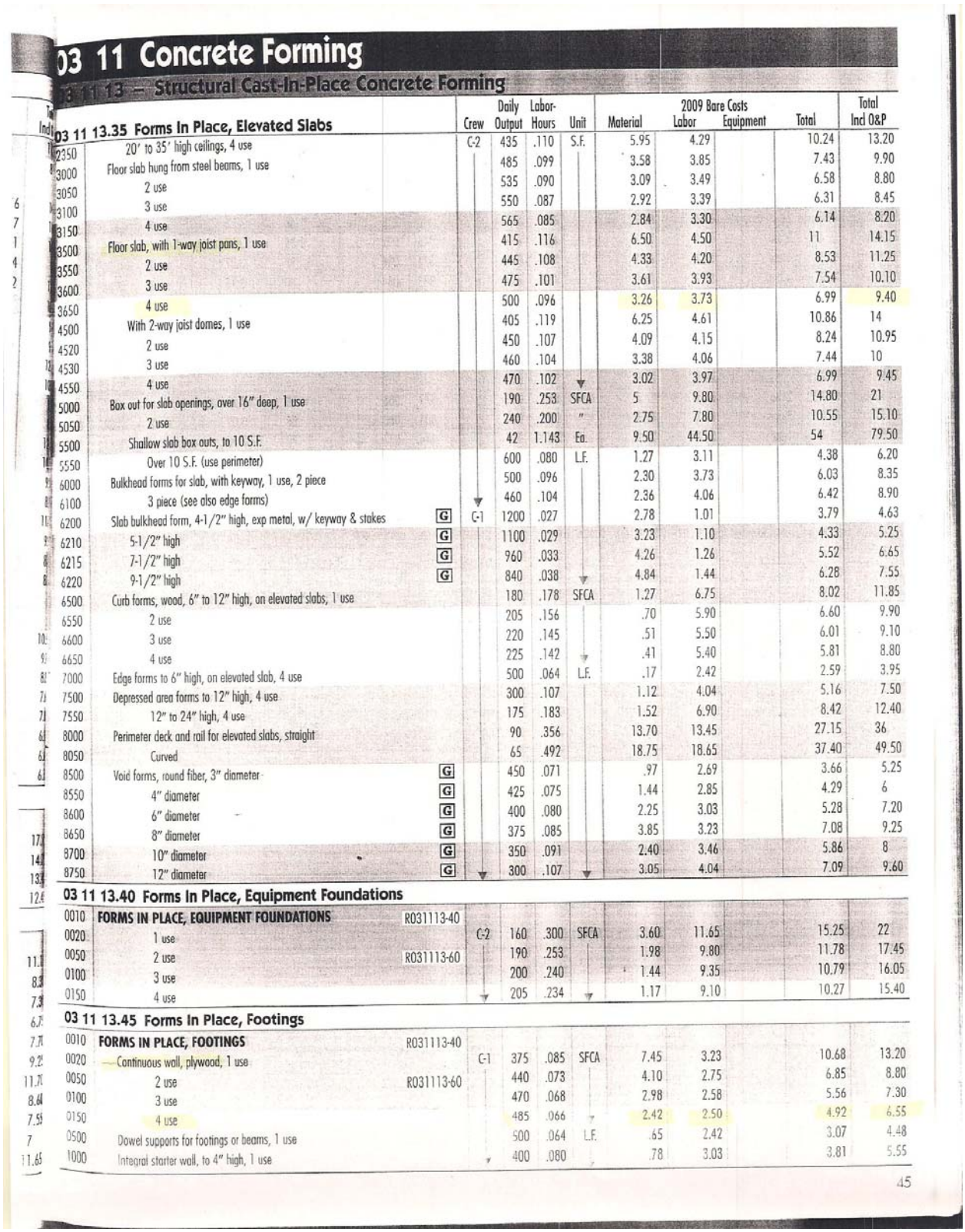
01 54 23.60 Pump Staging

0010	**PUMP STAGING**, Aluminum R015423-20									
0200	24' long pole section, buy				Ea.	415			415	460
0300	18' long pole section, buy					325			325	355
0400	12' long pole section, buy					218			218	240
0500	6' long pole section, buy					115			115	126
0600	6' long splice joint section, buy					85.50			85.50	94
0700	Pump jack, buy					139			139	153
0900	Foldable brace, buy					56.50			56.50	62.50
1000	Workbench/back safety rail support, buy					73.50			73.50	81
1100	Scaffolding planks/workbench, 14" wide x 24' long, buy					680			680	750
1200	Plank end safety rail, buy					370			370	405
1250	Safety net, 22' long, buy					335			335	365
1300	System in place, 50' working height, per use based on 50 uses	2 Carp	84.80	.189	C.S.F.	6.40	7.55		13.95	18.75
1400	100 uses		84.80	.189		3.21	7.55		10.76	15.25
1500	150 uses		84.80	.189		2.15	7.55		9.70	14.05

01 54 23.70 Scaffolding

0010	**SCAFFOLDING** R015423-10									
0015	Steel tube, regular, no plank, labor only to erect & dismantle									
0090	Building exterior, wall face, 1 to 5 stories, 6'-4" x 5' frames	3 Carp	8	3	C.S.F.		120		120	186
0200	6 to 12 stories	4 Carp	8	4			160		160	248
0301	13 to 20 stories	5 Clab	8	5			158		158	245
0460	Building interior, wall face area, up to 16' high	3 Carp	12	2			80		80	124
0560	16' to 40' high		10	2.400			96		96	149
0800	Building interior floor area, up to 30' high		150	.160	C.C.F.		6.40		6.40	9.90
0900	Over 30' high	4 Carp	160	.200	"		8		8	12.40
0906	Complete system for face of walls, no plank, material only rent/mo				C.S.F.	35.50			35.50	39

16



03 11 Concrete Forming

03 11 13 – Structural Cast-In-Place Concrete Forming

			Crew	Daily Output	Labor-Hours	Unit	Material	2009 Bare Costs Labor	Equipment	Total	Total Incl O&P
03 11 13.35 Forms In Place, Elevated Slabs											
2350	20' to 35' high ceilings, 4 use		C-2	435	.110	S.F.	5.95	4.29		10.24	13.20
3000	Floor slab hung from steel beams, 1 use			485	.099		3.58	3.85		7.43	9.90
3050	2 use			535	.090		3.09	3.49		6.58	8.80
3100	3 use			550	.087		2.92	3.39		6.31	8.45
3150	4 use			565	.085		2.84	3.30		6.14	8.20
3500	Floor slab, with 1-way joist pans, 1 use			415	.116		6.50	4.50		11	14.15
3550	2 use			445	.108		4.33	4.20		8.53	11.25
3600	3 use			475	.101		3.61	3.93		7.54	10.10
3650	4 use			500	.096		3.26	3.73		6.99	9.40
4500	With 2-way joist domes, 1 use			405	.119		6.25	4.61		10.86	14
4520	2 use			450	.107		4.09	4.15		8.24	10.95
4530	3 use			460	.104		3.38	4.06		7.44	10
4550	4 use			470	.102		3.02	3.97		6.99	9.45
5000	Box out for slab openings, over 16" deep, 1 use			190	.253	SFCA	5	9.80		14.80	21
5050	2 use			240	.200	"	2.75	7.80		10.55	15.10
5500	Shallow slab box outs, to 10 S.F.			42	1.143	Ea.	9.50	44.50		54	79.50
5550	Over 10 S.F. (use perimeter)			600	.080	L.F.	1.27	3.11		4.38	6.20
6000	Bulkhead forms for slab, with keyway, 1 use, 2 piece			500	.096		2.30	3.73		6.03	8.35
6100	3 piece (see also edge forms)			460	.104		2.36	4.06		6.42	8.90
6200	Slab bulkhead form, 4-1/2" high, exp metal, w/ keyway & stakes	G	C-1	1200	.027		2.78	1.01		3.79	4.63
6210	5-1/2" high	G		1100	.029		3.23	1.10		4.33	5.25
6215	7-1/2" high	G		960	.033		4.26	1.26		5.52	6.65
6220	9-1/2" high	G		840	.038		4.84	1.44		6.28	7.55
6500	Curb forms, wood, 6" to 12" high, on elevated slabs, 1 use			180	.178	SFCA	1.27	6.75		8.02	11.85
6550	2 use			205	.156		.70	5.90		6.60	9.90
6600	3 use			220	.145		.51	5.50		6.01	9.10
6650	4 use			225	.142		.41	5.40		5.81	8.80
7000	Edge forms to 6" high, on elevated slab, 4 use			500	.064	L.F.	.17	2.42		2.59	3.95
7500	Depressed area forms to 12" high, 4 use			300	.107		1.12	4.04		5.16	7.50
7550	12" to 24" high, 4 use			175	.183		1.52	6.90		8.42	12.40
8000	Perimeter deck and rail for elevated slabs, straight			90	.356		13.70	13.45		27.15	36
8050	Curved			65	.492		18.75	18.65		37.40	49.50
8500	Void forms, round fiber, 3" diameter	G		450	.071		.97	2.69		3.66	5.25
8550	4" diameter	G		425	.075		1.44	2.85		4.29	6
8600	6" diameter	G		400	.080		2.25	3.03		5.28	7.20
8650	8" diameter	G		375	.085		3.85	3.23		7.08	9.25
8700	10" diameter	G		350	.091		2.40	3.46		5.86	8
8750	12" diameter	G		300	.107		3.05	4.04		7.09	9.60
03 11 13.40 Forms In Place, Equipment Foundations											
0010	**FORMS IN PLACE, EQUIPMENT FOUNDATIONS**	R031113-40									
0020	1 use		C-2	160	.300	SFCA	3.60	11.65		15.25	22
0050	2 use	R031113-60		190	.253		1.98	9.80		11.78	17.45
0100	3 use			200	.240		1.44	9.35		10.79	16.05
0150	4 use			205	.234		1.17	9.10		10.27	15.40
03 11 13.45 Forms In Place, Footings											
0010	**FORMS IN PLACE, FOOTINGS**	R031113-40									
0020	Continuous wall, plywood, 1 use		C-1	375	.085	SFCA	7.45	3.23		10.68	13.20
0050	2 use	R031113-60		440	.073		4.10	2.75		6.85	8.80
0100	3 use			470	.068		2.98	2.58		5.56	7.30
0150	4 use			485	.066		2.42	2.50		4.92	6.55
0500	Dowel supports for footings or beams, 1 use			500	.064	L.F.	.65	2.42		3.07	4.48
1000	Integral starter wall, to 4" high, 1 use			400	.080		.78	3.03		3.81	5.55

45

03 11 Concrete Forming

03 11 13 – Structural Cast-In-Place Concrete Forming

03 11 13.65 Forms In Place, Slab On Grade

			Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
2000	Curb forms, wood, 6" to 12" high, on grade, 1 use		C-1	215	.149	SFCA	2.83	5.65		8.48	11.85
2050	2 use			250	.128		1.57	4.85		6.42	9.25
2100	3 use			265	.121		1.13	4.57		5.70	8.35
2150	4 use			275	.116	▼	.92	4.41		5.33	7.85
3000	Edge forms, wood, 4 use, on grade, to 6" high			600	.053	L.F.	.38	2.02		2.40	3.55
3050	7" to 12" high			435	.074	SFCA	.74	2.79		3.53	5.15
3500	For depressed slabs, 4 use, to 12" high			300	.107	L.F.	.56	4.04		4.60	6.85
3550	To 24" high			175	.183		.76	6.90		7.66	11.60
4000	For slab blockouts, to 12" high, 1 use			200	.160		.63	6.05		6.68	10.10
4050	To 24" high, 1 use			120	.267		.80	10.10		10.90	16.55
4100	Plastic (extruded), to 6" high, multiple use, on grade		▼	800	.040	▼	5.50	1.51		7.01	8.40
5000	Screed, 24 ga. metal key joint, see Div. 03 15 05.25										
5020	Wood, incl. wood stakes, 1" x 3"		C-1	900	.036	L.F.	.68	1.35		2.03	2.84
5050	2" x 4"			900	.036	"	.63	1.35		1.98	2.78
6000	Trench forms in floor, wood, 1 use			160	.200	SFCA	1.48	7.55		9.03	13.35
6050	2 use			175	.183		.81	6.90		7.71	11.65
6100	3 use			180	.178		.59	6.75		7.34	11.10
6150	4 use			185	.173	▼	.48	6.55		7.03	10.70
8760	Void form, corrugated fiberboard, 6" x 12", 10' long	G	▼	240	.133	S.F.	.84	5.05		5.89	8.75

03 11 13.85 Forms In Place, Walls

0010	**FORMS IN PLACE, WALLS**	R031113-10									
0100	Box out for wall openings, to 16" thick, to 10 S.F.		C-2	24	2	Ea.	21.50	78		99.50	145
0150	Over 10 S.F. (use perimeter)	R031113-40	"	280	.171	L.F.	1.78	6.65		8.43	12.30
0250	Brick shelf, 4" w, add to wall forms, use wall area abv shelf										
0260	1 use	R031113-60	C-2	240	.200	SFCA	1.87	7.80		9.67	14.10
0300	2 use			275	.175		1.03	6.80		7.83	11.70
0350	4 use			300	.160		.75	6.20		6.95	10.45
0500	Bulkhead, wood with keyway, 1 use, 2 piece		▼	265	.181	L.F.	1.68	7.05		8.73	12.75
0600	Bulkhead forms with keyway, 1 piece expanded metal, 8" wall	G	C-1	1000	.032		4.26	1.21		5.47	6.55
0610	10" wall	G		800	.040		4.84	1.51		6.35	7.65
0620	12" wall	G	▼	525	.061	▼	5.80	2.31		8.11	10
0700	Buttress, to 8' high, 1 use		C-2	350	.137	SFCA	7.05	5.35		12.40	16
0750	2 use			430	.112		3.89	4.34		8.23	11.05
0800	3 use			460	.104		2.83	4.06		6.89	9.40
0850	4 use			480	.100		2.33	3.89		6.22	8.60
1000	Corbel or haunch, to 12" wide, add to wall forms, 1 use			150	.320	L.F.	1.95	12.45		14.40	21.50
1050	2 use			170	.282		1.07	11		12.07	18.25
1100	3 use			175	.274		.78	10.65		11.43	17.40
1150	4 use			180	.267		.63	10.35		10.98	16.80
2000	Wall, job-built plywood, to 8' high, 1 use			370	.130	SFCA	2.62	5.05		7.67	10.70
2050	2 use			435	.110		1.61	4.29		5.90	8.40
2100	3 use			495	.097		1.17	3.77		4.94	7.15
2150	4 use			505	.095		.95	3.70		4.65	6.80
2400	Over 8' to 16' high, 1 use			280	.171		9.40	6.65		16.05	20.50
2450	2 use			345	.139		1.34	5.40		6.74	9.85
2500	3 use			375	.128		.96	4.98		5.94	8.75
2550	4 use			395	.122		.78	4.73		5.51	8.20
2700	Over 16' high, 1 use			235	.204		2.71	7.95		10.66	15.30
2750	2 use			290	.166		1.49	6.45		7.94	11.65
2800	3 use			315	.152		1.08	5.95		7.03	10.40
2850	4 use			330	.145		.88	5.65		6.53	9.70
3000	For architectural finish, add			1820	.026		2.72	1.03		3.75	4.58

03 30 Cast-In-Place Concrete

03 30 53 – Miscellaneous Cast-In-Place Concrete

	03 30 53.40 Concrete In Place	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
1040	Maximum reinforcing	C-14A	17.82	11.223	C.Y.	910	450	43	1,403	1,750
1100	Columns, round, tied, 12" diameter, minimum reinforcing		20.97	9.537		350	380	36.50	766.50	1,025
1120	Average reinforcing		15.27	13.098		670	525	50	1,245	1,625
1140	Maximum reinforcing		12.11	16.515		1,100	660	63	1,823	2,300
1200	16" diameter, minimum reinforcing		31.49	6.351		315	255	24.50	594.50	765
1220	Average reinforcing		19.12	10.460		635	420	40	1,095	1,400
1240	Maximum reinforcing		13.77	14.524		1,025	580	55.50	1,660.50	2,100
1300	20" diameter, minimum reinforcing		41.04	4.873		315	195	18.60	528.60	670
1320	Average reinforcing		24.05	8.316		610	335	32	977	1,225
1340	Maximum reinforcing		17.01	11.758		1,025	470	45	1,540	1,900
1400	24" diameter, minimum reinforcing		51.85	3.857		294	155	14.75	463.75	580
1420	Average reinforcing		27.06	7.391		620	296	28	944	1,175
1440	Maximum reinforcing		18.29	10.935		1,000	440	42	1,482	1,825
1500	36" diameter, minimum reinforcing		75.04	2.665		310	107	10.20	427.20	520
1520	Average reinforcing		37.49	5.335		595	214	20.50	829.50	1,025
1540	Maximum reinforcing		22.84	8.757		990	350	33.50	1,373.50	1,675
1900	Elevated slabs, flat slab with drops, 125 psf Sup. Load, 20' span	C-14B	38.45	5.410		299	216	19.85	534.85	685
1950	30' span		50.99	4.079		340	163	14.95	517.95	645
2100	Flat plate, 125 psf Sup. Load, 15' span		30.24	6.878		278	275	25	578	765
2150	25' span		49.60	4.194		300	168	15.40	483.40	610
2300	Waffle const., 30" domes, 125 psf Sup. Load, 20' span		37.07	5.611		267	225	20.50	512.50	665
2350	30' span		44.07	4.720		255	189	17.30	461.30	595
2500	One way joists, 30" pans, 125 psf Sup. Load, 15' span		27.38	7.597		297	305	28	630	830
2550	25' span		31.15	6.677		294	267	24.50	585.50	765
2700	One way beam & slab, 125 psf Sup. Load, 15' span		20.59	10.102		305	405	37	747	1,000
2750	25' span		28.36	7.334		297	294	27	618	810
2900	Two way beam & slab, 125 psf Sup. Load, 15' span		24.04	8.652		296	345	32	673	900
2950	25' span		35.87	5.799		256	232	21.50	509.50	665
3100	Elevated slabs including finish, not									
3110	including forms or reinforcing									
3150	Regular concrete, 4" slab	C-8	2613	.021	S.F.	1.36	.75	.28	2.39	2.94
3200	6" slab		2585	.022		2.01	.76	.29	3.06	3.68
3250	2-1/2" thick floor fill		2685	.021		.87	.73	.27	1.87	2.37
3300	Lightweight, 110# per C.F., 2-1/2" thick floor fill		2585	.022		1.17	.76	.29	2.22	2.76
3400	Cellular concrete, 1-5/8" fill, under 5000 S.F.		2000	.028		.78	.99	.37	2.14	2.76
3450	Over 10,000 S.F.		2200	.025		.75	.90	.34	1.99	2.55
3500	Add per floor for 3 to 6 stories high		31800	.002			.06	.02	.08	.12
3520	For 7 to 20 stories high		21200	.003			.09	.03	.12	.18
3540	Equipment pad, 3' x 3' x 6" thick	C-14H	45	1.067	Ea.	58	42	.58	100.58	130
3550	4' x 4' x 6" thick		30	1.600		84	63	.86	147.86	191
3560	5' x 5' x 8" thick		18	2.667		140	105	1.44	246.44	320
3570	6' x 6' x 8" thick		14	3.429		188	135	1.85	324.85	420
3580	8' x 8' x 10" thick		8	6		395	236	3.24	634.24	805
3590	10' x 10' x 12" thick		5	9.600		655	380	5.20	1,040.20	1,300
3800	Footings, spread under 1 C.Y.	C-14C	28	4	C.Y.	209	153	.92	362.92	470
3825	1 C.Y to 5 C.Y.		43	2.605		221	99.50	.60	321.10	400
3850	Over 5 C.Y.		75	1.493		198	57	.34	255.34	305
3900	Footings, strip, 18" x 9", unreinforced	C-14L	40	2.400		120	89.50	.65	210.15	271
3920	18" x 9", reinforced	C-14C	35	3.200		157	122	.74	279.74	365
3925	20" x 10", unreinforced	C-14L	45	2.133		117	79.50	.58	197.08	252
3930	20" x 10", reinforced	C-14C	40	2.800		147	107	.64	254.64	330
3935	24" x 12", unreinforced	C-14L	55	1.745		116	65	.47	181.47	229
3940	24" x 12", reinforced	C-14C	48	2.333		147	89.50	.54	237.04	300

62

03 30 Cast-In-Place Concrete

03 30 53 – Miscellaneous Cast-In-Place Concrete

	03 30 53.40 Concrete In Place	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
3945	36" x 12", unreinforced	C-14L	70	1.371	C.Y.	113	51	.37	164.37	203
3950	36" x 12", reinforced	C-14C	60	1.867		141	71.50	.43	212.93	266
4000	Foundation mat, under 10 C.Y.		38.67	2.896		255	111	.67	366.67	455
4050	Over 20 C.Y.		56.40	1.986		218	76	.46	294.46	360
4200	Wall, free-standing, 8" thick, 8' high	C-14D	45.83	4.364		195	173	16.65	384.65	500
4250	14' high		27.26	7.337		251	291	28	570	760
4260	12" thick, 8' high		64.32	3.109		175	124	11.90	310.90	400
4270	14' high		40.01	4.999		191	199	19.10	409.10	540
4300	15" thick, 8' high		80.02	2.499		166	99.50	9.55	275.05	345
4350	12' high		51.26	3.902		166	155	14.90	335.90	440
4500	18' high		48.85	4.094		191	163	15.65	369.65	480
4520	Handicap access ramp, railing both sides, 3' wide	C-14H	14.58	3.292	L.F.	300	130	1.78	431.78	535
4525	5' wide		12.22	3.928		310	155	2.12	467.12	580
4530	With 6" curb and rails both sides, 3' wide		8.55	5.614		310	221	3.03	534.03	690
4535	5' wide		7.31	6.566		315	259	3.55	577.55	750
4650	Slab on grade, not including finish, 4" thick	C-14E	60.75	1.449	C.Y.	127	57	.43	184.43	230
4700	6" thick	"	92	.957	"	121	37.50	.29	158.79	193
4751	Slab on grade, incl. troweled finish, not incl. forms									
4760	or reinforcing, over 10,000 S.F., 4" thick	C-14F	3425	.021	S.F.	1.35	.76	.01	2.12	2.63
4820	6" thick		3350	.021		1.97	.78	.01	2.76	3.34
4840	8" thick		3184	.023		2.70	.82	.01	3.53	4.19
4900	12" thick		2734	.026		4.04	.96	.01	5.01	5.90
4950	15" thick		2505	.029		5.10	1.04	.01	6.15	7.15
5000	Slab on grade, incl. textured finish, not incl. forms									
5001	or reinforcing, 4" thick	C-14G	2873	.019	S.F.	1.31	.70	.01	2.02	2.49
5010	6" thick		2590	.022		2.05	.77	.01	2.83	3.43
5020	8" thick		2320	.024		2.68	.86	.01	3.55	4.24
5200	Lift slab in place above the foundation, incl. forms,									
5210	reinforcing, concrete and columns, minimum	C-14B	2113	.098	S.F.	7.45	3.94	.36	11.75	14.75
5250	Average		1650	.126		8.15	5.05	.46	13.66	17.30
5300	Maximum		1500	.139		8.85	5.55	.51	14.91	18.95
5500	Lightweight, ready mix, including screed finish only,									
5510	not including forms or reinforcing									
5550	1:4 for structural roof decks	C-14B	260	.800	C.Y.	138	32	2.94	172.94	205
5600	1:6 for ground slab with radiant heat	C-14F	92	.783		143	28.50	.28	171.78	200
5650	1:3:2 with sand aggregate, roof deck	C-14B	260	.800		132	32	2.94	166.94	198
5700	Ground slab	C-14F	107	.673		132	24.50	.24	156.74	182
5900	Pile caps, incl. forms and reinf., sq. or rect., under 5 C.Y.	C-14C	54.14	2.069		172	79	.48	251.48	315
5950	Over 10 C.Y.		75	1.493		167	57	.34	224.34	273
6000	Triangular or hexagonal, under 5 C.Y.		53	2.113		127	81	.49	208.49	267
6050	Over 10 C.Y.		85	1.318		152	50.50	.30	202.80	246
6200	Retaining walls, gravity, 4' high see Div. 32 32 13.10	C-14D	66.20	3.021		153	120	11.55	284.55	365
6250	10' high		125	1.600		146	63.50	6.10	215.60	266
6300	Cantilever, level backfill loading, 8' high		70	2.857		175	113	10.90	298.90	380
6350	16' high		91	2.198		166	87.50	8.40	261.90	330
6800	Stairs, not including safety treads, free standing, 3'-6" wide	C-14H	83	.578	LF Nose	6.20	23	.31	29.51	42.50
6850	Cast on ground		125	.384	"	5	15.10	.21	20.31	29
7000	Stair landings, free standing		200	.240	S.F.	5.25	9.45	.13	14.83	20.50
7050	Cast on ground		475	.101	"	4	3.98	.05	8.03	10.65

03 35 Concrete Finishing

03 35 29 – Tooled Concrete Finishing

	03 35 29.30 Finishing Floors	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010	**FINISHING FLOORS**									
0020	Manual screed finish	C-10	4800	.005	S.F.		.18		.18	.27
0100	Manual screed and bull float		4000	.006			.22		.22	.32
0125	Manual screed, bull float, manual float		2000	.012			.43		.43	.64
0150	Manual screed, bull float, manual float & broom finish		1850	.013			.47		.47	.70
0200	Manual screed, bull float, manual float, manual steel trowel		1265	.019			.68		.68	1.02
0250	Manual screed, bull float, machine float & trowel (walk-behind)	C-10C	1715	.014			.50	.02	.52	.78
0300	Power screed, bull float, machine float & trowel (walk-behind)	C-10D	2400	.010			.36	.05	.41	.59
0350	Power screed, bull float, machine float & trowel (ride-on)	C-10E	4000	.006			.22	.06	.28	.39
0400	Integral topping and finish, using 1:1:2 mix, 3/16" thick	C-10B	1000	.040		.10	1.37	.24	1.71	2.44
0450	1/2" thick		950	.042		.26	1.44	.25	1.95	2.74
0500	3/4" thick		850	.047		.39	1.61	.28	2.28	3.18
0600	1" thick		750	.053		.52	1.83	.32	2.67	3.68
0800	Granolithic topping, laid after, 1:1:1-1/2 mix, 1/2" thick		590	.068		.29	2.32	.41	3.02	4.28
0820	3/4" thick		580	.069		.43	2.36	.41	3.20	4.50
0850	1" thick		575	.070		.57	2.38	.42	3.37	4.70
0950	2" thick		500	.080		1.15	2.74	.48	4.37	5.95
1200	Heavy duty, 1:1:2, 3/4" thick, preshrunk, gray, 20 MSF		320	.125		.73	4.29	.75	5.77	8.15
1300	100 MSF		380	.105		.39	3.61	.63	4.63	6.55
1600	Exposed local aggregate finish, minimum	1 Cefi	625	.013		.22	.49		.71	.97
1650	Maximum		465	.017		.66	.66		1.32	1.69
1800	Floor abrasives, .25 psf, aluminum oxide		850	.009		.44	.36		.80	1.01
1850	Silicon carbide		850	.009		.61	.36		.97	1.20
2000	Floor hardeners, metallic, light service, .50 psf, add		850	.009		.51	.36		.87	1.09
2050	Medium service, .75 psf		750	.011		.76	.41		1.17	1.43
2100	Heavy service, 1.0 psf		650	.012		1.01	.47		1.48	1.80
2150	Extra heavy, 1.5 psf		575	.014		1.52	.53		2.05	2.45
2300	Non-metallic, light service, .50 psf		850	.009		.23	.36		.59	.78
2350	Medium service, .75 psf		750	.011		.34	.41		.75	.98
2400	Heavy service, 1.00 psf		650	.012		.45	.47		.92	1.19
2450	Extra heavy, 1.50 psf		575	.014		.68	.53		1.21	1.53
2800	Trap rock wearing surface for monolithic floors									
2810	2.0 psf	C-10B	1250	.032	S.F.	.03	1.10	.19	1.32	1.90
3000	Floor coloring, dusted on, minimum (0.6 psf), add to above	1 Cefi	1300	.006		.43	.24		.67	.81
3050	Maximum (1.0 psf), add to above	"	625	.013		.71	.49		1.20	1.50
3100	Colored powder only				Lb.	.71			.71	.78
3600	1/2" topping using 0.6 psf powdered color	C-10B	590	.068	S.F.	4.86	2.32	.41	7.59	9.30
3650	1/2" topping using 1.0 psf powdered color	"	590	.068		5.15	2.32	.41	7.88	9.60
3800	Dustproofing, solvent-based, 1 coat	1 Cefi	1900	.004		.17	.16		.33	.43
3850	2 coats		1300	.006		.61	.24		.85	1.02
4000	Epoxy-based, 1 coat		1500	.005		.15	.20		.35	.46
4050	2 coats		1500	.005		.29	.20		.49	.62
4400	Stair finish, float		275	.029			1.11		1.11	1.63
4500	Steel trowel finish		200	.040			1.53		1.53	2.24
4600	Silicon carbide finish, .25 psf		150	.053		.44	2.04		2.48	3.47

	03 35 29.35 Control Joints, Saw Cut									
0010	**CONTROL JOINTS, SAW CUT**									
0100	Sawcut in green concrete									
0120	1" depth	C-27	2000	.008	L.F.	.07	.31	.07	.45	.60
0140	1-1/2" depth		1800	.009		.10	.34	.08	.52	.70
0160	2" depth		1600	.010		.13	.38	.09	.60	.81
0200	Clean out control joint of debris	C-28	6000	.001			.05		.05	.07

04 05 Common Work Results for Masonry

04 05 23 – Masonry Accessories

04 05 23.95 Wall Plugs

		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010	**WALL PLUGS** (for nailing to brickwork)									
0020	26 ga., galvanized, plain	1 Bric	10.50	.762	C	31	31		62	81
0050	Wood filled	"	10.50	.762	"	104	31		135	161

04 21 Clay Unit Masonry

04 21 13 – Brick Masonry

04 21 13.13 Brick Veneer Masonry

			Crew	Daily Output	Labor-Hours	Unit	Material	Labor	Equipment	Total	Total Incl O&P
0010	**BRICK VENEER MASONRY**, T.L. lots, excl. scaff., grout & reinforcing	R042110-20									
0015	Material costs incl. 3% brick and 25% mortar waste										
0020	Standard, select common, 4" x 2-2/3" x 8" (6.75/S.F.)		D-8	1.50	26.667	M	535	990		1,525	2,075
0050	Red, 4" x 2-2/3" x 8", running bond			1.50	26.667		840	990		1,830	2,425
0100	Full header every 6th course (7.88/S.F.)	R042110-50		1.45	27.586		840	1,025		1,865	2,475
0150	English, full header every 2nd course (10.13/S.F.)			1.40	28.571		835	1,050		1,885	2,525
0200	Flemish, alternate header every course (9.00/S.F.)			1.40	28.571		840	1,050		1,890	2,525
0250	Flemish, alt. header every 6th course (7.13/S.F.)			1.45	27.586		840	1,025		1,865	2,475
0300	Full headers throughout (13.50/S.F.)			1.40	28.571		835	1,050		1,885	2,525
0350	Rowlock course (13.50/S.F.)			1.35	29.630		835	1,100		1,935	2,600
0400	Rowlock stretcher (4.50/S.F.)			1.40	28.571		845	1,050		1,895	2,525
0450	Soldier course (6.75/S.F.)			1.40	28.571		840	1,050		1,890	2,525
0500	Sailor course (4.50/S.F.)			1.30	30.769		845	1,150		1,995	2,650
0601	Buff or gray face, running bond, (6.75/S.F.)			1.50	26.667		840	990		1,830	2,425
0700	Glazed face, 4" x 2-2/3" x 8", running bond			1.40	28.571		1,725	1,050		2,775	3,500
0750	Full header every 6th course (7.88/S.F.)			1.35	29.630		1,650	1,100		2,750	3,500
1000	Jumbo, 6" x 4" x 12",(3.00/S.F.)			1.30	30.769		1,775	1,150		2,925	3,675
1051	Norman, 4" x 2-2/3" x 12" (4.50/S.F.)			1.45	27.586		1,100	1,025		2,125	2,775
1100	Norwegian, 4" x 3-1/5" x 12" (3.75/S.F.)			1.40	28.571		1,150	1,050		2,200	2,850
1150	Economy, 4" x 4" x 8" (4.50 per S.F.)			1.40	28.571		940	1,050		1,990	2,625
1201	Engineer, 4" x 3-1/5" x 8", (5.63/S.F.)			1.45	27.586		615	1,025		1,640	2,225
1251	Roman, 4" x 2" x 12", (6.00/S.F.)			1.50	26.667		980	990		1,970	2,575
1300	S.C.R. 6" x 2-2/3" x 12" (4.50/S.F.)			1.40	28.571		1,175	1,050		2,225	2,900
1350	Utility, 4" x 4" x 12" (3.00/S.F.)			1.35	29.630		1,500	1,100		2,600	3,325
1360	For less than truck load lots, add						15			15	16.50
1400	For battered walls, add							30%			
1450	For corbels, add							75%			
1500	For curved walls, add							30%			
1550	For pits and trenches, deduct							20%			
1999	Alternate method of figuring by square foot										
2000	Standard, sel. common, 4" x 2-2/3" x 8", (6.75/S.F.)		D-8	230	.174	S.F.	3.60	6.45		10.05	13.75
2020	Standard, red, 4" x 2-2/3" x 8", running bond (6.75/SF)			220	.182		5.65	6.75		12.40	16.50
2050	Full header every 6th course (7.88/S.F.)			185	.216		6.60	8.05		14.65	19.45
2100	English, full header every 2nd course (10.13/S.F.)			140	.286		8.50	10.60		19.10	25.50
2150	Flemish, alternate header every course (9.00/S.F.)			150	.267		7.55	9.90		17.45	23.50
2200	Flemish, alt. header every 6th course (7.13/S.F.)			205	.195		6	7.25		13.25	17.60
2250	Full headers throughout (13.50/S.F.)			105	.381		11.30	14.15		25.45	34
2300	Rowlock course (13.50/S.F.)			100	.400		11.30	14.85		26.15	35
2350	Rowlock stretcher (4.50/S.F.)			310	.129		3.80	4.79		8.59	11.45
2400	Soldier course (6.75/S.F.)			200	.200		5.65	7.45		13.10	17.50
2450	Sailor course (4.50/S.F.)			290	.138		3.80	5.15		8.95	12
2600	Buff or gray face, running bond, (6.75/S.F.)			220	.182		6	6.75		12.75	16.85
2700	Glazed face brick, running bond			210	.190		11.15	7.10		18.25	23

81

04 22 Concrete Unit Masonry

04 22 10 – Concrete Masonry Units

	04 22 10.14 Concrete Block, Back-Up	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl
1100	6" thick	D-8	430	.093	S.F.	2.25	3.46		5.71	
1150	8" thick		395	.101		2.37	3.76		6.13	
1200	10" thick		320	.125		3.18	4.65		7.83	
1250	12" thick	D-9	300	.160		3.59	5.80		9.39	
	04 22 10.16 Concrete Block, Bond Beam									
0010	**CONCRETE BLOCK, BOND BEAM**, C90, 2000 psi									
0020	Not including grout or reinforcing									
0125	Regular block, 6" thick	D-8	584	.068	L.F.	2.21	2.55		4.76	
0130	8" high, 8" thick	"	565	.071		2.51	2.63		5.14	
0150	12" thick	D-9	510	.094		3.43	3.42		6.85	
0525	Lightweight, 6" thick	D-8	592	.068		2.53	2.51		5.04	
0530	8" high, 8" thick	"	575	.070		3.06	2.59		5.65	
0550	12" thick	D-9	520	.092		4.12	3.35		7.47	
2000	Including grout and 2 #5 bars									
2100	Regular block, 8" high, 8" thick	D-8	300	.133	L.F.	5.15	4.95		10.10	
2150	12" thick	D-9	250	.192		6.60	7		13.60	
2500	Lightweight, 8" high, 8" thick	D-8	305	.131		5.70	4.87		10.57	
2550	12" thick	D-9	255	.188		7.30	6.85		14.15	
	04 22 10.18 Concrete Block, Column									
0010	**CONCRETE BLOCK, COLUMN** or pilaster									
0050	Including vertical reinforcing (4-#4 bars) and grout									
0160	1 piece unit, 16" x 16"	D-1	26	.615	V.L.F.	18.65	22.50		41.15	
0170	2 piece units, 16" x 20"		24	.667		24.50	24		48.50	
0180	20" x 20"		22	.727		35.50	26.50		62	
0190	22" x 24"		18	.889		49.50	32.50		82	
0200	20" x 32"		14	1.143		53.50	41.50		95	
	04 22 10.19 Concrete Block, Insulation Inserts									
0010	**CONCRETE BLOCK, INSULATION INSERTS**									
0100	Styrofoam, plant installed, add to block prices									
0200	8" x 16" units, 6" thick				S.F.	1.81			1.81	
0250	8" thick					1.81			1.81	
0300	10" thick					2.13			2.13	
0350	12" thick					2.24			2.24	
0500	8" x 8" units, 8" thick					1.49			1.49	
0550	12" thick					1.81			1.81	
	04 22 10.23 Concrete Block, Decorative									
0010	**CONCRETE BLOCK, DECORATIVE**, C90, 2000 psi									
0020	Embossed, simulated brick face									
0100	8" x 16" units, 4" thick	D-8	400	.100	S.F.	3.51	3.72		7.23	
0200	8" thick		340	.118		4.83	4.37		9.20	
0250	12" thick		300	.133		6.35	4.95		11.30	
0400	Embossed both sides									
0500	8" thick	D-8	300	.133	S.F.	5.40	4.95		10.35	
0550	12" thick	"	275	.145	"	6.85	5.40		12.25	
1000	Fluted high strength									
1100	8" x 16" x 4" thick, flutes 1 side,	D-8	345	.116	S.F.	4.16	4.31		8.47	
1150	Flutes 2 sides		335	.119		5.05	4.44		9.49	
1200	8" thick		300	.133		6.55	4.95		11.50	
1250	For special colors, add					.41			.41	
1400	Deep grooved, smooth face									
1450	8" x 16" x 4" thick	D-8	345	.116	S.F.	2.71	4.31		7.02	
1500	8" thick	"	300	.133	"	4.67	4.95		9.62	

86

04 22 Concrete Unit Masonry

04 22 10 – Concrete Masonry Units

	04 22 10.23 Concrete Block, Decorative	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
8300	6" thick, hollow	D-8	310	.129	S.F.	3.49	4.79		8.28	11.10
8350	8" thick, hollow	↓	290	.138	↓	4.73	5.15		9.88	13
8500	For stacked bond, add						26%			
8550	For high rise construction, add per story	D-8	67.80	.590	M.S.F.		22		22	33.50
8600	For scored block, add					10%				
8650	For honed or ground face, per face, add				Ea.	.38			.38	.40
8700	For honed or ground end, per end, add				"	2.98			2.98	3.20
8750	For bullnose block, add					10%				
8800	For special color, add					13%				
	04 22 10.24 Concrete Block, Exterior									
0010	**CONCRETE BLOCK, EXTERIOR**, C90, 2000 psi									
0020	Reinforced alt courses, tooled joints 2 sides									
0100	Normal weight, 8" x 16" x 6" thick	D-8	395	.101	S.F.	2.49	3.76		6.25	8.45
0200	8" thick		360	.111		3.65	4.13		7.78	10.25
0250	10" thick	↓	290	.138		4.27	5.15		9.42	12.55
0300	12" thick	D-9	250	.192		4.52	7		11.52	15.55
0500	Lightweight, 8" x 16" x 6" thick	D-8	450	.089		2.75	3.30		6.05	8.05
0600	8" thick		430	.093		3.67	3.46		7.13	9.30
0650	10" thick	↓	395	.101		4.31	3.76		8.07	10.45
0700	12" thick	D-9	350	.137	↓	6.30	4.98		11.28	14.55
	04 22 10.26 Concrete Block Foundation Wall									
0010	**CONCRETE BLOCK FOUNDATION WALL**, C90 / C145									
0050	Normal-weight, cut joints, horiz joint reinf, no vert reinf									
0200	Hollow, 8" x 16" x 6" thick	D-8	455	.088	S.F.	2.56	3.27		5.83	7.75
0250	8" thick		425	.094		2.68	3.50		6.18	8.25
0300	10" thick	↓	350	.114		3.49	4.25		7.74	10.30
0350	12" thick	D-9	300	.160		3.91	5.80		9.71	13.10
0500	Solid, 8" x 16" block, 6" thick	D-8	440	.091		2.55	3.38		5.93	7.90
0550	8" thick	"	415	.096		3.73	3.58		7.31	9.55
0600	12" thick	D-9	350	.137	↓	5.40	4.98		10.38	13.50
	04 22 10.28 Concrete Block, High Strength									
0010	**CONCRETE BLOCK, HIGH STRENGTH**									
0050	Hollow, reinforced alternate courses, 8" x 16" units									
0200	3500 psi, 4" thick	D-8	440	.091	S.F.	2.15	3.38		5.53	7.45
0250	6" thick		395	.101		2.41	3.76		6.17	8.35
0300	8" thick	↓	360	.111		3.57	4.13		7.70	10.20
0350	12" thick	D-9	250	.192		4.40	7		11.40	15.45
0500	5000 psi, 4" thick	D-8	440	.091		2.39	3.38		5.77	7.75
0550	6" thick		395	.101		2.99	3.76		6.75	9
0600	8" thick	↓	360	.111		4.05	4.13		8.18	10.70
0650	12" thick	D-9	300	.160	↓	6	5.80		11.80	15.40
1000	For 75% solid block, add					30%				
1050	For 100% solid block, add					50%				
	04 22 10.30 Concrete Block, Interlocking									
0010	**CONCRETE BLOCK, INTERLOCKING**									
0100	Not including grout or reinforcing									
0200	8" x 16" units, 2,000 psi, 8" thick	D-1	245	.065	S.F.	2.69	2.37		5.06	6.55
0300	12" thick		220	.073		3.98	2.64		6.62	8.40
0350	16" thick	↓	185	.086		6	3.14		9.14	11.35
0400	Including grout & reinforcing, 8" thick	D-4	245	.131		7.60	4.70	.52	12.82	16
0450	12" thick		220	.145		9.20	5.25	.58	15.03	18.65
0500	16" thick	↓	185	.173	↓	11.55	6.20	.69	18.44	23

05 12 Structural Steel Framing

05 12 23 – Structural Steel for Buildings

	05 12 23.05 Canopy Framing		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010	**CANOPY FRAMING**										
0020	6" and 8" members, shop fabricated	G	E-4	3000	.011	Lb.	1.80	.48	.04	2.32	2.89
	05 12 23.10 Ceiling Supports										
0010	**CEILING SUPPORTS**										
1000	Entrance door/folding partition supports, shop fabricated	G	E-4	60	.533	L.F.	30	24	2.23	56.23	78.50
1100	Linear accelerator door supports	G		14	2.286		137	103	9.60	249.60	345
1200	Lintels or shelf angles, hung, exterior hot dipped galv.	G		267	.120		20.50	5.40	.50	26.40	32.50
1250	Two coats primer paint instead of galv.	G		267	.120		17.75	5.40	.50	23.65	29.50
1400	Monitor support, ceiling hung, expansion bolted	G		4	8	Ea.	475	360	33.50	868.50	1,200
1450	Hung from pre-set inserts	G		6	5.333		510	241	22.50	773.50	1,025
1600	Motor supports for overhead doors	G		4	8		242	360	33.50	635.50	950
1700	Partition support for heavy folding partitions, without pocket	G		24	1.333	L.F.	68.50	60.50	5.60	134.60	188
1750	Supports at pocket only	G		12	2.667		137	121	11.15	269.15	375
2000	Rolling grilles & fire door supports	G		34	.941		58.50	42.50	3.94	104.94	145
2100	Spider-leg light supports, expansion bolted to ceiling slab	G		8	4	Ea.	195	181	16.75	392.75	555
2150	Hung from pre-set inserts	G		12	2.667	"	210	121	11.15	342.15	460
2400	Toilet partition support	G		36	.889	L.F.	68.50	40	3.72	112.22	151
2500	X-ray travel gantry support	G		12	2.667	"	234	121	11.15	366.15	485
	05 12 23.15 Columns, Lightweight										
0010	**COLUMNS, LIGHTWEIGHT**										
1000	Lightweight units (lally), 3-1/2" diameter		E-2	780	.072	L.F.	6.10	3.13	2.23	11.46	14.50
1050	4" diameter		"	900	.062	"	8.95	2.71	1.93	13.59	16.55
5800	Adjustable jack post, 8' maximum height, 2-3/4" diameter	G				Ea.	33			33	36.50
5850	4" diameter	G				"	53			53	58
	05 12 23.17 Columns, Structural										
0010	**COLUMNS, STRUCTURAL**	R051223-10									
0015	Made from recycled materials										
0020	Shop fab'd for 100-ton, 1-2 story project, bolted connections										
0800	Steel, concrete filled, extra strong pipe, 3-1/2" diameter		E-2	660	.085	L.F.	49.50	3.70	2.64	55.84	63.50
0830	4" diameter			780	.072		55	3.13	2.23	60.36	68.50
0890	5" diameter			1020	.055		65.50	2.39	1.71	69.60	78.50
0930	6" diameter			1200	.047		87	2.03	1.45	90.48	101
0940	8" diameter			1100	.051		87	2.22	1.58	90.80	102
1100	For galvanizing, add					Lb.	.40			.40	.44
1300	For web ties, angles, etc., add per added lb.		1 Sswk	945	.008		1.50	.38		1.88	2.32
1500	Steel pipe, extra strong, no concrete, 3" to 5" diameter	G	E-2	16000	.004		1.50	.15	.11	1.76	2.03
1600	6" to 12" diameter	G		14000	.004		1.50	.17	.12	1.79	2.09
1700	Steel pipe, extra strong, no concrete, 3" diameter x 12'-0"	G		60	.933	Ea.	185	40.50	29	254.50	305
1750	4" diameter x 12'-0"	G		58	.966		270	42	30	342	400
1800	6" diameter x 12'-0"	G		54	1.037		515	45	32	592	680
1850	8" diameter x 14'-0"	G		50	1.120		910	49	35	994	1,125
1900	10" diameter x 16'-0"	G		48	1.167		1,325	51	36.50	1,412.50	1,575
1950	12" diameter x 18'-0"	G		45	1.244		1,775	54	38.50	1,867.50	2,075
3300	Structural tubing, square, A500GrB, 4" to 6" square, light section	G		11270	.005	Lb.	1.50	.22	.15	1.87	2.19
3600	Heavy section	G		32000	.002	"	1.50	.08	.05	1.63	1.84
4000	Concrete filled, add					L.F.	4.04			4.04	4.45
4500	Structural tubing, sq, 4" x 4" x 1/4" x 12'-0"	G	E-2	58	.966	Ea.	248	42	30	320	375
4550	6" x 6" x 1/4" x 12'-0"	G		54	1.037		405	45	32	482	560
4600	8" x 8" x 3/8" x 14'-0"	G		50	1.120		880	49	35	964	1,075
4650	10" x 10" x 1/2" x 16'-0"	G		48	1.167		1,625	51	36.50	1,712.50	1,925
5100	Structural tubing, rect, 5" to 6" wide, light section	G		8000	.007	Lb.	1.50	.30	.22	2.02	2.41
5200	Heavy section	G		12000	.005		1.50	.20	.15	1.85	2.16

05 12 Structural Steel Framing

05 12 23 – Structural Steel for Buildings

			Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
05 12 23.45 Lintels											
0950	500 to 2,000 lb.					Lb.	.45			.45	.50
1000	Over 2,000 lb.					↓	.40			.40	.44
2000	Steel angles, 3-1/2" x 3", 1/4" thick, 2'-6" long	G	1 Bric	47	.170	Ea.	16.20	6.90		23.10	28.50
2100	4'-6" long	G		26	.308		29	12.45		41.45	51
2600	4" x 3-1/2", 1/4" thick, 5'-0" long	G		21	.381		37	15.45		52.45	64.50
2700	9'-0" long	G	↓	12	.667	↓	67	27		94	115
05 12 23.60 Pipe Support Framing											
0010	**PIPE SUPPORT FRAMING**										
0020	Under 10#/L.F., shop fabricated	G	E-4	3900	.008	Lb.	2.01	.37	.03	2.41	2.91
0200	10.1 to 15#/L.F.	G		4300	.007		1.98	.34	.03	2.35	2.81
0400	15.1 to 20#/L.F.	G		4800	.007		1.95	.30	.03	2.28	2.72
0600	Over 20#/L.F.	G	↓	5400	.006	↓	1.92	.27	.02	2.21	2.62
05 12 23.65 Plates											
0010	**PLATES**	R051223-80									
0015	Made from recycled materials										
0020	For connections & stiffener plates, shop fabricated										
0050	1/8" thick (5.1 Lb./S.F.)	G				S.F.	7.65			7.65	8.40
0100	1/4" thick (10.2 Lb./S.F.)	G					15.30			15.30	16.85
0300	3/8" thick (15.3 Lb./S.F.)	G					23			23	25.50
0400	1/2" thick (20.4 Lb./S.F.)	G					30.50			30.50	33.50
0450	3/4" thick (30.6 Lb./S.F.)	G					46			46	50.50
0500	1" thick (40.8 Lb.S.F.)	G				↓	61			61	67.50
2000	Steel plate, warehouse prices, no shop fabrication										
2100	1/4" thick (10.2 Lb./S.F.)	G				S.F.	11.20			11.20	12.35
05 12 23.70 Stressed Skin Steel Roof and Ceiling System											
0010	**STRESSED SKIN STEEL ROOF & CEILING SYSTEM**										
0020	Double panel flat roof, spans to 100'	G	E-2	1150	.049	S.F.	12	2.12	1.51	15.63	18.50
0100	Double panel convex roof, spans to 200'	G		960	.058		19.50	2.54	1.81	23.85	28
0200	Double panel arched roof, spans to 300'	G	↓	760	.074	↓	30	3.21	2.29	35.50	41
05 12 23.75 Structural Steel Members											
0010	**STRUCTURAL STEEL MEMBERS**	R051223-10									
0015	Made from recycled materials										
0020	Shop fab'd for 100-ton, 1-2 story project, bolted connections										
0100	W 6 x 9	G	E-2	600	.093	L.F.	14.85	4.06	2.90	21.81	26.50
0120	x 15	G		600	.093		25	4.06	2.90	31.96	37
0140	x 20	G		600	.093		33	4.06	2.90	39.96	46.50
0300	W 8 x 10	G		600	.093		16.50	4.06	2.90	23.46	28.50
0320	x 15	G		600	.093		25	4.06	2.90	31.96	37
0350	x 21	G		600	.093		34.50	4.06	2.90	41.46	48
0360	x 24	G		550	.102		39.50	4.43	3.17	47.10	54.50
0370	x 28	G		550	.102		46	4.43	3.17	53.60	62
0500	x 31	G		550	.102		51	4.43	3.17	58.60	67.50
0520	x 35	G		550	.102		58	4.43	3.17	65.60	74.50
0540	x 48	G		550	.102		79	4.43	3.17	86.60	98
0600	W 10 x 12	G		600	.093		19.80	4.06	2.90	26.76	32
0620	x 15	G		600	.093		25	4.06	2.90	31.96	37
0700	x 22	G		600	.093		36.50	4.06	2.90	43.46	50
0720	x 26	G		600	.093		43	4.06	2.90	49.96	57
0740	x 33	G		550	.102		54.50	4.43	3.17	62.10	71
0900	x 49	G		550	.102		81	4.43	3.17	88.60	100
1100	W 12 x 16	G		880	.064		26.50	2.77	1.98	31.25	36
1300	x 22	G	↓	880	.064	↓	36.50	2.77	1.98	41.25	47

05 12 Structural Steel Framing

05 12 23 – Structural Steel for Buildings

05 12 23.75 Structural Steel Members

			Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
1500	x 26	G	E-2	880	.064	L.F.	43	2.77	1.98	47.75	54
1520	x 35	G		810	.069		58	3.01	2.15	63.16	71
1560	x 50	G		750	.075		82.50	3.25	2.32	88.07	99
1580	x 58	G		750	.075		95.50	3.25	2.32	101.07	113
1700	x 72	G		640	.088		119	3.81	2.72	125.53	140
1740	x 87	G		640	.088		144	3.81	2.72	150.53	167
1900	W 14 x 26	G		990	.057		43	2.46	1.76	47.22	53
2100	x 30	G		900	.062		49.50	2.71	1.93	54.14	61.50
2300	x 34	G		810	.069		56	3.01	2.15	61.16	69
2320	x 43	G		810	.069		71	3.01	2.15	76.16	85.50
2340	x 53	G		800	.070		87.50	3.05	2.18	92.73	104
2360	x 74	G		760	.074		122	3.21	2.29	127.50	142
2380	x 90	G		740	.076		149	3.30	2.35	154.65	171
2500	x 120	G		720	.078		198	3.39	2.42	203.81	226
2700	W 16 x 26	G		1000	.056		43	2.44	1.74	47.18	53
2900	x 31	G		900	.062		51	2.71	1.93	55.64	63.50
3100	x 40	G		800	.070		66	3.05	2.18	71.23	80
3120	x 50	G		800	.070		82.50	3.05	2.18	87.73	98.50
3140	x 67	G		760	.074		111	3.21	2.29	116.50	130
3300	W 18 x 35	G	E-5	960	.083		58	3.67	1.95	63.62	72
3500	x 40	G		960	.083		66	3.67	1.95	71.62	81
3520	x 46	G		960	.083		76	3.67	1.95	81.62	92
3700	x 50	G		912	.088		82.50	3.87	2.06	88.43	100
3900	x 55	G		912	.088		91	3.87	2.06	96.93	109
3920	x 65	G		900	.089		107	3.92	2.08	113	127
3940	x 76	G		900	.089		125	3.92	2.08	131	147
3960	x 86	G		900	.089		142	3.92	2.08	148	165
3980	x 106	G		900	.089		175	3.92	2.08	181	201
4100	W 21 x 44	G		1064	.075		72.50	3.32	1.76	77.58	87.50
4300	x 50	G		1064	.075		82.50	3.32	1.76	87.58	98.50
4500	x 62	G		1036	.077		102	3.41	1.81	107.22	121
4700	x 68	G		1036	.077		112	3.41	1.81	117.22	131
4720	x 83	G		1000	.080		137	3.53	1.88	142.41	159
4740	x 93	G		1000	.080		153	3.53	1.88	158.41	177
4760	x 101	G		1000	.080		167	3.53	1.88	172.41	191
4780	x 122	G		1000	.080		201	3.53	1.88	206.41	229
4900	W 24 x 55	G		1110	.072		91	3.18	1.69	95.87	107
5100	x 62	G		1110	.072		102	3.18	1.69	106.87	120
5300	x 68	G		1110	.072		112	3.18	1.69	116.87	130
5500	x 76	G		1110	.072		125	3.18	1.69	129.87	145
5700	x 84	G		1080	.074		139	3.27	1.74	144.01	160
5720	x 94	G		1080	.074		155	3.27	1.74	160.01	179
5740	x 104	G		1050	.076		172	3.36	1.79	177.15	197
5760	x 117	G		1050	.076		193	3.36	1.79	198.15	220
5780	x 146	G		1050	.076		241	3.36	1.79	246.15	273
5800	W 27 x 84	G		1190	.067		139	2.96	1.58	143.54	159
5900	x 94	G		1190	.067		155	2.96	1.58	159.54	178
5920	x 114	G		1150	.070		188	3.07	1.63	192.70	214
5940	x 146	G		1150	.070		241	3.07	1.63	245.70	272
5960	x 161	G		1150	.070		266	3.07	1.63	270.70	299
6100	W 30 x 99	G		1200	.067		163	2.94	1.56	167.50	187
6300	x 108	G		1200	.067		178	2.94	1.56	182.50	203
6500	x 116	G		1160	.069		191	3.04	1.62	195.66	218

05 21 Steel Joist Framing

05 21 16 – Longspan Steel Joist Framing

	05 21 16.50 Longspan Joists		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
2320	28LH06, 16 Lb/LF	G	E-7	1800	.044	L.F.	18.05	1.96	1.12	21.13	24.50
2340	28LH11, 25 Lb/LF	G		1800	.044		28	1.96	1.12	31.08	35.50
2360	32LH08, 17 Lb/LF	G		1800	.044		19.20	1.96	1.12	22.28	25.50
2380	32LH13, 30 Lb/LF	G		1800	.044		34	1.96	1.12	37.08	42
2400	36LH09, 21 Lb/LF	G		1800	.044		23.50	1.96	1.12	26.58	30.50
2420	36LH14, 36 Lb/LF	G		1800	.044		40.50	1.96	1.12	43.58	49
2440	40LH10, 21 Lb/LF	G		2200	.036		23.50	1.60	.91	26.01	30
2460	40LH15, 36 Lb/LF	G		2200	.036		40.50	1.60	.91	43.01	48.50
2480	44LH11, 22 Lb/LF	G		2200	.036		25	1.60	.91	27.51	31.50
2500	44LH16, 42 Lb/LF	G		2200	.036		47.50	1.60	.91	50.01	56
2520	48LH11, 22 Lb/LF	G		2200	.036		25	1.60	.91	27.51	31.50
2540	48LH16, 42 Lb/LF	G		2200	.036		47.50	1.60	.91	50.01	56
2600	For less than 40-ton job lots										
2602	For 30 to 39 tons, add						10%				
2604	20 to 29 tons, add						20%				
2606	10 to 19 tons, add						30%				
2607	5 to 9 tons, add						50%	25%			
2608	1 to 4 tons, add						75%	50%			
2609	Less than 1 ton, add						100%	100%			
6000	For welded cross bridging, add							30%			

05 21 19 – Open Web Steel Joist Framing

	05 21 19.10 Open Web Joists		Crew	Daily Output	Labor-Hours	Unit	Material	Labor	Equipment	Total	Total Incl O&P
0010	**OPEN WEB JOISTS**										
0015	Made from recycled materials										
0020	K series, 40-ton lots, horiz. bridging, spans to 30', shop primer, minimum	G	E-7	15	5.333	Ton	1,825	235	134	2,194	2,550
0050	Average	G		12	6.667		2,050	294	167	2,511	2,950
0080	Maximum	G		9	8.889		2,450	390	223	3,063	3,625
0130	8K1, 5.1 Lb/LF	G		1200	.067	L.F.	5.20	2.94	1.67	9.81	12.65
0140	10K1, 5.0 Lb/LF	G		1200	.067		5.10	2.94	1.67	9.71	12.55
0160	12K3, 5.7 Lb/LF	G		1500	.053		5.80	2.35	1.34	9.49	11.95
0180	14K3, 6.0 Lb/LF	G		1500	.053		6.10	2.35	1.34	9.79	12.30
0200	16K3, 6.3 Lb/LF	G		1800	.044		6.40	1.96	1.12	9.48	11.65
0220	16K6, 8.1 Lb/LF	G		1800	.044		8.25	1.96	1.12	11.33	13.70
0240	18K5, 7.7 Lb/LF	G		2000	.040		7.85	1.76	1	10.61	12.80
0260	18K9, 10.2 Lb/LF	G		2000	.040		10.40	1.76	1	13.16	15.60
0410	Span 30' to 50', minimum	G		17	4.706	Ton	1,775	208	118	2,101	2,450
0440	Average	G		17	4.706		2,000	208	118	2,326	2,700
0460	Maximum	G		10	8		2,125	355	201	2,681	3,150
0500	20K5, 8.2 Lb/LF	G		2000	.040	L.F.	8.20	1.76	1	10.96	13.15
0520	20K9, 10.8 Lb/LF	G		2000	.040		10.80	1.76	1	13.56	16.05
0540	22K5, 8.8 Lb/LF	G		2000	.040		8.80	1.76	1	11.56	13.85
0560	22K9, 11.3 Lb/LF	G		2000	.040		11.30	1.76	1	14.06	16.60
0580	24K6, 9.7 Lb/LF	G		2200	.036		9.70	1.60	.91	12.21	14.45
0600	24K10, 13.1 Lb/LF	G		2200	.036		13.10	1.60	.91	15.61	18.20
0620	26K6, 10.6 Lb/LF	G		2200	.036		10.60	1.60	.91	13.11	15.45
0640	26K10, 13.8 Lb/LF	G		2200	.036		13.80	1.60	.91	16.31	19
0660	28K8, 12.7 Lb/LF	G		2400	.033		12.70	1.47	.84	15.01	17.40
0680	28K12, 17.1 Lb/LF	G		2400	.033		17.10	1.47	.84	19.41	22.50
0700	30K8, 13.2 Lb/LF	G		2400	.033		13.20	1.47	.84	15.51	17.95
0720	30K12, 17.6 Lb/LF	G		2400	.033		17.60	1.47	.84	19.91	23
0800	For less than 40-ton job lots										
0802	For 30 to 39 tons, add						10%				

05 21 Steel Joist Framing

05 21 19 – Open Web Steel Joist Framing

	05 21 19.10 Open Web Joists		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0804	20 to 29 tons, add						20%				
0806	10 to 19 tons, add						30%				
0807	5 to 9 tons, add						50%	25%			
0808	1 to 4 tons, add						75%	50%			
0809	Less than 1 ton, add						100%	100%			
1010	CS series, 40-ton job lots, horizontal bridging, shop primer										
1020	Spans to 30', minimum	G	E-7	15	5.333	Ton	1,875	235	134	2,244	2,625
1040	Average	G		12	6.667		2,100	294	167	2,561	3,000
1060	Maximum	G		9	8.889		2,475	390	223	3,088	3,650
1100	10CS2, 7.5 Lb/LF	G		1200	.067	L.F.	7.85	2.94	1.67	12.46	15.60
1120	12CS2, 8.0 Lb/LF	G		1500	.053		8.35	2.35	1.34	12.04	14.75
1140	14CS2, 8.0Lb/LF	G		1500	.053		8.35	2.35	1.34	12.04	14.75
1160	16CS2, 8.5 Lb/LF	G		1800	.044		8.90	1.96	1.12	11.98	14.40
1180	16CS4, 14.5 Lb/LF	G		1800	.044		15.15	1.96	1.12	18.23	21.50
1200	18CS2, 9.0 Lb/LF	G		2000	.040		9.40	1.76	1	12.16	14.50
1220	18CS4, 15.0 Lb/LF	G		2000	.040		15.70	1.76	1	18.46	21.50
1240	20CS2, 9.5 Lb/LF	G		2000	.040		9.95	1.76	1	12.71	15.10
1260	20CS4, 16.5 Lb/LF	G		2000	.040		17.25	1.76	1	20.01	23
1280	22CS2, 10.0 Lb/LF	G		2000	.040		10.45	1.76	1	13.21	15.65
1300	22CS4, 16.5 Lb/LF	G		2000	.040		17.25	1.76	1	20.01	23
1320	24CS2, 10.0 Lb/LF	G		2200	.036		10.45	1.60	.91	12.96	15.30
1340	24CS4, 16.5 Lb/LF	G		2200	.036		17.25	1.60	.91	19.76	23
1360	26CS2, 10.0 Lb/LF	G		2200	.036		10.45	1.60	.91	12.96	15.30
1380	26CS4, 16.5 Lb/LF	G		2200	.036		17.25	1.60	.91	19.76	23
1400	28CS2, 10.5 Lb/LF	G		2400	.033		11	1.47	.84	13.31	15.55
1420	28CS4, 16.5 Lb/LF	G		2400	.033		17.25	1.47	.84	19.56	22.50
1440	30CS2, 11.0 Lb/LF	G		2400	.033		11.50	1.47	.84	13.81	16.10
1460	30CS4, 16.5 Lb/LF	G		2400	.033		17.25	1.47	.84	19.56	22.50
1500	For less than 40-ton job lots										
1502	For 30 to 39 tons, add						10%				
1504	20 to 29 tons, add						20%				
1506	10 to 19 tons, add						30%				
1507	5 to 9 tons, add						50%	25%			
1508	1 to 4 tons, add						75%	50%			
1509	Less than 1 ton, add						100%	100%			
6200	For shop prime paint other than mfrs. standard, add						20%				
6300	For bottom chord extensions, add per chord	G				Ea.	44.50			44.50	48.5
6400	Individual steel bearing plate, 6" x 6" x 1/4" with J-hook	G	1 Bric	160	.050	"	9	2.03		11.03	12.9

05 21 23 – Steel Joist Girder Framing

	05 21 23.50 Joist Girders		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010	**JOIST GIRDERS**										
0015	Made from recycled materials										
7000	Joist girders, 40-ton job lots, shop primer, minimum	G	E-5	15	5.333	Ton	1,850	235	125	2,210	2,600
7020	Average	G		13	6.154		2,050	271	144	2,465	2,875
7040	Maximum	G		11	7.273		2,150	320	170	2,640	3,100
7100	For less than 40-ton job lots										
7102	For 30 to 39 tons, add						10%				
7104	20 to 29 tons, add						20%				
7106	10 to 19 tons, add						30%				
7107	5 to 9 tons, add						50%	25%			
7108	1 to 4 tons, add						75%	50%			
7109	Less than 1 ton, add						100%	100%			

05 21 Steel Joist Framing

05 21 23 – Steel Joist Girder Framing

	05 21 23.50 Joist Girders		Crew	Daily Output	Labor-Hours	Unit	Material	2009 Bare Costs Labor	Equipment	Total	Total Incl O&P
8000	Trusses, 40-ton job lots, shop fabricated WT chords, shop primer, average	G	E-5	11	7.273	Ton	6,675	320	170	7,165	8,100
8100	For less than 40-ton job lots						10%				
8102	For 30 to 39 tons, add						20%				
8104	20 to 29 tons, add						30%				
8106	10 to 19 tons, add						50%	25%			
8107	5 to 9 tons, add						75%	50%			
8108	1 to 4 tons, add						100%	100%			
8109	Less than 1 ton, add										

05 31 Steel Decking

05 31 13 – Steel Floor Decking

05 31 13.50 Floor Decking

	FLOOR DECKING	R053100-10									
0010	Made from recycled materials										
0015	Open decking, 3" deep, wide rib, 22 gauge, galvanized, under 50 squares	G	E-4	3600	.009	S.F.	3.54	.40	.04	3.98	4.65
3200	50-500 squares	G		3800	.008		2.83	.38	.04	3.25	3.84
3250	over 500 squares	G		4000	.008		2.55	.36	.03	2.94	3.48
3260	20 gauge, under 50 squares	G		3400	.009		4.12	.43	.04	4.59	5.35
3300	50-500 squares	G		3600	.009		3.30	.40	.04	3.74	4.39
3350	over 500 squares	G		3800	.008		2.97	.38	.04	3.39	3.98
3360	18 gauge, under 50 squares	G		3200	.010		5.35	.45	.04	5.84	6.70
3400	50-500 squares	G		3400	.009		4.26	.43	.04	4.73	5.50
3450	over 500 squares	G		3600	.009		3.84	.40	.04	4.28	4.98
3460	16 gauge, under 50 squares	G		3000	.011		7.05	.48	.04	7.57	8.65
3500	50-500 squares	G		3200	.010		5.60	.45	.04	6.09	7.05
3550	over 500 squares	G		3400	.009		5.05	.43	.04	5.52	6.35
3560	4-1/2" deep, long span roof, over 50 squares, 20 gauge	G		2700	.012		6.60	.54	.05	7.19	8.25
3700	18 gauge	G		2460	.013		8.50	.59	.05	9.14	10.45
3800	16 gauge	G		2350	.014		6.35	.62	.06	7.03	8.15
3900	6" deep, long span, 18 gauge	G		2000	.016		12.15	.72	.07	12.94	14.75
4100	16 gauge	G		1930	.017		9.10	.75	.07	9.92	11.40
4200	14 gauge	G		1860	.017		11.70	.78	.07	12.55	14.35
4300	7-1/2" deep, long span, 18 gauge	G		1690	.019		13.35	.86	.08	14.29	16.30
4500	16 gauge	G		1590	.020		10	.91	.08	10.99	12.70
4600	14 gauge	G		1490	.021		12.90	.97	.09	13.96	16
4700	For painted instead of galvanized, deduct						2%				
4800	For acoustical perforated, with fiberglass, add					S.F.	1.74			1.74	1.91
5000	Non-cellular composite deck, galv., 2" deep, 22 gauge	G	E-4	3860	.008		2.44	.37	.03	2.84	3.39
5200	20 gauge	G		3600	.009		2.71	.40	.04	3.15	3.74
5300	18 gauge	G		3380	.009		3.43	.43	.04	3.90	4.57
5400	16 gauge	G		3200	.010		4.30	.45	.04	4.79	5.60
5500	3" deep, galv., 22 gauge	G		3200	.010		2.66	.45	.04	3.15	3.79
5700	20 gauge	G		3000	.011		2.98	.48	.04	3.50	4.19
5800	18 gauge	G		2850	.011		3.65	.51	.05	4.21	4.97
5900	16 gauge	G		2700	.012		4.89	.54	.05	5.48	6.40
6000											

CN

05 31 23 – Steel Roof Decking

05 31 23.50 Roof Decking

	ROOF DECKING										
0010	Made from recycled materials										
0015	Open type, galv., 1-1/2" deep wide rib, 22 gauge, under 50 squares	G	E-4	4500	.007	S.F.	2.58	.32	.03	2.93	3.43

123

05 31 Steel Decking

05 31 23 – Steel Roof Decking

05 31 23.50 Roof Decking			Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
2200	50-500 squares CN	G	E-4	4900	.007	S.F.	2	.30	.03	2.33	2.7
2400	Over 500 squares	G		5100	.006		1.85	.28	.03	2.16	2.5
2600	20 gauge, under 50 squares	G		3865	.008		3.03	.37	.03	3.43	4.04
2650	50-500 squares	G		4170	.008		2.42	.35	.03	2.80	3.32
2700	Over 500 squares	G		4300	.007		2.18	.34	.03	2.55	3.03
2900	18 gauge, under 50 squares	G		3800	.008		3.91	.38	.04	4.33	5.05
2950	50-500 squares	G		4100	.008		3.13	.35	.03	3.51	4.1
3000	Over 500 squares	G		4300	.007		2.82	.34	.03	3.19	3.75
3050	16 gauge, under 50 squares	G		3700	.009		5.25	.39	.04	5.68	6.55
3060	50-500 squares	G		4000	.008		4.21	.36	.03	4.60	5.30
3100	Over 500 squares	G		4200	.008		3.79	.34	.03	4.16	4.82
3150	For intermediate rib instead of wide rib, deduct	G					.04			.04	.05
3160	For narrow rib instead of wide rib, add	G					.79			.79	.97

05 31 33 – Steel Form Decking

05 31 33.50 Form Decking

0010	**FORM DECKING**										
0015	Made from recycled materials										
6100	Slab form, steel, 28 gauge, 9/16" deep, uncoated	G	E-4	4000	.008	S.F.	1.72	.36	.03	2.11	2.57
6200	Galvanized	G		4000	.008		1.52	.36	.03	1.91	2.35
6220	24 gauge, 1" deep, uncoated	G		3900	.008		1.87	.37	.03	2.27	2.76
6240	Galvanized	G		3900	.008		2.20	.37	.03	2.60	3.12
6300	24 gauge, 1-5/16" deep, uncoated	G		3800	.008		1.99	.38	.04	2.41	2.91
6400	Galvanized	G		3800	.008		2.34	.38	.04	2.76	3.29
6500	22 gauge, 1-5/16" deep, uncoated	G		3700	.009		2.50	.39	.04	2.93	3.49
6600	Galvanized	G		3700	.009		2.55	.39	.04	2.98	3.55
6700	22 gauge, 2" deep uncoated	G		3600	.009		3.28	.40	.04	3.72	4.37
6800	Galvanized	G		3600	.009		3.22	.40	.04	3.66	4.30
7000	Sheet metal edge closure form, 12" wide with 2 bends, galv										
7100	18 gauge	G	E-14	360	.022	L.F.	5.30	1.04	.37	6.71	8.10
7200	16 gauge	G	"	360	.022	"	7.20	1.04	.37	8.61	10.15

05 35 Raceway Decking Assemblies

05 35 13 – Steel Cellular Decking

05 35 13.50 Cellular Decking

0010	**CELLULAR DECKING**										
0015	Made from recycled materials										
0200	Cellular units, galv, 2" deep, 20-20 gauge, over 15 squares	G	E-4	1460	.022	S.F.	10.20	.99	.09	11.28	13.1
0250	18-20 gauge	G		1420	.023		11.60	1.02	.09	12.71	14.7
0300	18-18 gauge	G		1390	.023		11.95	1.04	.10	13.09	15.10
0320	16-18 gauge	G		1360	.024		14.20	1.06	.10	15.36	17.60
0340	16-16 gauge	G		1330	.024		15.85	1.09	.10	17.04	19.45
0400	3" deep, galvanized, 20-20 gauge	G		1375	.023		11.25	1.05	.10	12.40	14.35
0500	18-20 gauge	G		1350	.024		13.60	1.07	.10	14.77	16.95
0600	18-18 gauge	G		1290	.025		13.55	1.12	.10	14.77	17.05
0700	16-18 gauge	G		1230	.026		15.25	1.18	.11	16.54	19
0800	16-16 gauge	G		1150	.028		16.65	1.26	.12	18.03	20.50
1000	4-1/2" deep, galvanized, 20-18 gauge	G		1100	.029		15.70	1.31	.12	17.13	19.70
1100	18-18 gauge	G		1040	.031		15.60	1.39	.13	17.12	19.75
1200	16-18 gauge	G		980	.033		17.55	1.48	.14	19.17	22
1300	16-16 gauge	G		935	.034		19.15	1.55	.14	20.84	24

Appendix D

RS Means 2009 Data for General Conditions Estimate

01 11 Summary of Work

01 11 31 – Professional Consultants

	01 11 31.10 Architectural Fees		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010	**ARCHITECTURAL FEES**	R011110-10									
0020	For new construction										
0060	Minimum					Project					4.90%
0090	Maximum										16%
0100	For alteration work, to $500,000, add to new construction fee										50%
0150	Over $500,000, add to new construction fee										25%
2000	For "Greening" of building	G									3%
	01 11 31.20 Construction Management Fees										
0010	**CONSTRUCTION MANAGEMENT FEES**										
0020	$1,000,000 job, minimum					Project					4.50%
0050	Maximum										7.50%
0300	$50,000,000 job, minimum										2.50%
0350	Maximum										4%
	01 11 31.30 Engineering Fees										
0010	**ENGINEERING FEES**	R011110-30									
0020	Educational planning consultant, minimum					Project					.50%
0100	Maximum					"					2.50%
0200	Electrical, minimum					Contract					4.10%
0300	Maximum										10.10%
0400	Elevator & conveying systems, minimum										2.50%
0500	Maximum										5%
0600	Food service & kitchen equipment, minimum										8%
0700	Maximum										12%
0800	Landscaping & site development, minimum										2.50%
0900	Maximum										6%
1000	Mechanical (plumbing & HVAC), minimum										4.10%
1100	Maximum										10.10%
1200	Structural, minimum					Project					1%
1300	Maximum					"					2.50%
4000	Consultant, using DOE software energy analysis, small bldg, min					SF Flr.					.25
4010	Maximum										.45
4020	Medium building, minimum										.15
4030	Maximum										.35
4040	Large building, minimum										.05
4050	Maximum										.25
	01 11 31.50 Models										
0010	**MODELS**										
0020	Cardboard & paper, 1 building, minimum					Ea.	700			700	770
0050	Maximum						1,600			1,600	1,750
0100	2 buildings, minimum						935			935	1,025
0150	Maximum						2,125			2,125	2,325
0200	Plexiglass and metal, basic layout					SF Flr.	.06			.06	.07
0210	Including equipment and personnel					"	.31			.31	.34
0300	Site plan layout, minimum					Ea.	1,350			1,350	1,475
0350	Maximum					"	2,250			2,250	2,475
	01 11 31.75 Renderings										
0010	**RENDERINGS** Color, matted, 20" x 30", eye level,										
0020	1 building, minimum					Ea.	1,950			1,950	2,150
0050	Average						2,775			2,775	3,075
0100	Maximum						4,450			4,450	4,900
1000	5 buildings, minimum						3,900			3,900	4,300
1100	Maximum						7,300			7,800	8,575

01 21 Allowances

01 21 61 – Cost Indexes

01 21 61.50 Material Index		Crew	Daily Output	Labor-Hours	Unit	Material	2009 Bare Costs Labor	Equipment	Total	Total Incl O&P
0010	**MATERIAL INDEX** (Reference) For over 930 zip code locations in									
0020	the U.S. and Canada, minimum (Elizabethtown, KY)				%	90.10%				
0040	Average					100%				
0060	Maximum (Ketchikan, AK)				▼	139.60%				

01 21 63 – Taxes

01 21 63.10 Taxes

0010	**TAXES**	R012909-80								
0020	Sales tax, State, average				%	4.91%				
0050	Maximum	R012909-85				7.25%				
0200	Social Security, on first $102,000 of wages						7.65%			
0300	Unemployment, combined Federal and State, minimum						.80%			
0350	Average						6.20%			
0400	Maximum				▼		11.76%			

01 31 Project Management and Coordination

01 31 13 – Project Coordination

01 31 13.20 Field Personnel

0010	**FIELD PERSONNEL**									
0020	Clerk, average				Week		380		380	590
0100	Field engineer, minimum						895		895	1,375
0120	Average						1,165		1,165	1,800
0140	Maximum						1,350		1,350	2,100
0160	General purpose laborer, average						1,250		1,250	1,925
0180	Project manager, minimum						1,650		1,650	2,550
0200	Average						1,925		1,925	2,975
0220	Maximum						2,175		2,175	3,375
0240	Superintendent, minimum						1,600		1,600	2,475
0260	Average						1,775		1,775	2,750
0280	Maximum						2,025		2,025	3,125
0290	Timekeeper, average				▼		1,040		1,040	1,600

01 31 13.30 Insurance

0010	**INSURANCE**	R013113-40								
0020	Builders risk, standard, minimum				Job					.24%
0050	Maximum	R013113-50								.64%
0200	All-risk type, minimum									.25%
0250	Maximum	R013113-60			▼					.67%
0400	Contractor's equipment floater, minimum				Value					.50%
0450	Maximum				"					1.50%
0600	Public liability, average				Job					2.02%
0800	Workers' compensation & employer's liability, average									
0850	by trade, carpentry, general				Payroll		17.30%			
0900	Clerical						.58%			
0950	Concrete						14.58%			
1000	Electrical						6.46%			
1050	Excavation						10.01%			
1100	Glazing						13.89%			
1150	Insulation						14.44%			
1200	Lathing						10.63%			
1250	Masonry						14.37%			
1300	Painting & decorating				▼		12.49%			

01 32 Construction Progress Documentation

01 32 13 – Scheduling of work

01 32 13.50 Scheduling	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010 **SCHEDULING**									
0020 Critical path, as % of architectural fee, minimum				%					.50%
0100 Maximum				"					1%
0300 Computer-update, micro, no plots, minimum				Ea.				455	500
0400 Including plots, maximum				"				1,455	1,600
0600 Rule of thumb, CPM scheduling, small job ($10 Million)				Job					.05%
0650 Large job ($50 Million +)									.03%
0700 Including cost control, small job									.08%
0750 Large job				▼					.04%

01 32 33 – Photographic Documentation

01 32 33.50 Photographs

0010 **PHOTOGRAPHS**									
0020 8" x 10", 4 shots, 2 prints ea., std. mounting				Set	475			475	520
0100 Hinged linen mounts					530			530	580
0200 8" x 10", 4 shots, 2 prints each, in color					415			415	460
0300 For I.D. slugs, add to all above					5.30			5.30	5.85
0500 Aerial photos, initial fly-over, 6 shots, 1 print ea., 8" x 10"					825			825	905
0550 11" x 14" prints					1,000			1,000	1,100
0600 16" x 20" prints					1,175			1,175	1,300
0700 For full color prints, add					40%				40%
0750 Add for traffic control area				▼	294			294	325
0900 For over 30 miles from airport, add per				Mile	5.30			5.30	5.85
1000 Vertical photography, 4 to 6 shots with									
1010 different scales, 1 print each				Set	1,100			1,100	1,200
1500 Time lapse equipment, camera and projector, buy					3,775			3,775	4,175
1550 Rent per month				▼	565			565	620
1700 Cameraman and film, including processing, B.&W.				Day	1,375			1,375	1,525
1720 Color				"	1,375			1,375	1,525

01 41 Regulatory Requirements

01 41 26 – Permits

01 41 26.50 Permits

0010 **PERMITS**									
0020 Rule of thumb, most cities, minimum				Job					.50%
0100 Maximum				"					2%

01 45 Quality Control

01 45 23 – Testing and Inspecting Services

01 45 23.50 Testing

0010 **TESTING** and Inspecting Services									
0015 For concrete building costing $1,000,000, minimum				Project				4,725	5,200
0020 Maximum								38,000	41,800
0050 Steel building, minimum								4,727	5,200
0070 Maximum								14,318	16,300
0100 For building costing, $10,000,000, minimum								30,091	33,100
0150 Maximum				▼				48,182	53,000
0200 Asphalt testing, compressive strength Marshall stability, set of 3				Ea.				145	165
0220 Density, set of 3								86	95
0250 Extraction, individual tests on sample				▼				136	150

12

01 45 Quality Control

01 45 23 – Testing and Inspecting Services

01 45 23.50 Testing	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
4735 Soil density, nuclear method, ASTM D2922				Ea.				35	38.67
4740 Sand cone method ASTM D1556								27	30.17
4750 Moisture content, ASTM D 2216								9	10
4780 Permeability test, double ring infiltrometer								500	550
4800 Permeability, var. or constant head, undist., ASTM D 2434								227	250
4850 Recompacted								250	275
4900 Proctor compaction, 4" standard mold, ASTM D 698								123	135
4950 6" modified mold								68	75
5100 Shear tests, triaxial, minimum								409	450
5150 Maximum								545	600
5300 Direct shear, minimum, ASTM D 3080								318	350
5350 Maximum								409	450
5550 Technician for inspection, per day, earthwork								210	231
5650 Rolling								268	295
5750 Roofing								244	256
5790 Welding				▼				257	283
5820 Non-destructive metal testing, dye penetrant				Day				310	341
5840 Magnetic particle								310	341
5860 Radiography								450	495
5880 Ultrasonic				▼				309	340
6000 Welding certification, minimum				Ea.				91	100
6100 Maximum				"				250	275
7000 Underground storage tank									
7500 Volumetric tightness test, <=12,000 gal				Ea.				435	478
7510 <=30,000 gal				"				613	675
7600 Vadose zone (soil gas) sampling, 10-40 samples, min.				Day				1,364	1,500
7610 Maximum				"				2,273	2,500
7700 Ground water monitoring inc. drilling 3 wells, min.				Total				4,545	5,000
7710 Maximum				"				6,364	7,000
8000 X-ray concrete slabs				Ea.				182	200
9000 Thermographic testing, for bldg envelope heat loss, average 2,000 S.F.				"					500

01 51 Temporary Utilities

01 51 13 – Temporary Electricity

01 51 13.80 Temporary Utilities	Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010 **TEMPORARY UTILITIES**									
0100 Heat, incl. fuel and operation, per week, 12 hrs. per day	1 Skwk	100	.080	CSF Flr	27	3.27		30.27	34.50
0200 24 hrs. per day	"	60	.133		52	5.45		57.45	66
0350 Lighting, incl. service lamps, wiring & outlets, minimum	1 Elec	34	.235		2.63	11.05		13.68	19.35
0360 Maximum	"	17	.471		5.70	22		27.70	39.50
0400 Power for temp lighting only, per month, min./month 6.6 KWH								.75	.83
0450 Maximum/month 23.6 KWH								2.85	3.14
0600 Power for job duration incl. elevator, etc., minimum								47	51.70
0650 Maximum				▼				110	121
1000 Toilet, portable, see Equip. Rental 01 54 33 in Reference Section									

14

01 52 Construction Facilities

01 52 13 – Field Offices and Sheds

01 52 13.20 Office and Storage Space		Crew	Daily Output	Labor-Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0010	**OFFICE AND STORAGE SPACE**									
0020	Trailer, furnished, no hookups, 20' x 8', buy	2 Skwk	1	16	Ea.	8,200	655		8,855	10,000
0250	Rent per month					163			163	179
0300	32' x 8', buy	2 Skwk	.70	22.857		12,200	935		13,135	15,000
0350	Rent per month					200			200	220
0400	50' x 10', buy	2 Skwk	.60	26.667		23,200	1,100		24,300	27,300
0450	Rent per month					281			281	310
0500	50' x 12', buy	2 Skwk	.50	32		27,900	1,300		29,200	32,700
0550	Rent per month					375			375	410
0700	For air conditioning, rent per month, add					41			41	45
0800	For delivery, add per mile				Mile	4.50			4.50	4.95
1000	Portable buildings, prefab, on skids, economy, 8' x 8'	2 Carp	265	.060	S.F.	85	2.41		87.41	97
1100	Deluxe, 8' x 12'	"	150	.107	"	95	4.26		99.26	112
1200	Storage boxes, 20' x 8', buy	2 Skwk	1.80	8.889	Ea.	4,675	365		5,040	5,700
1250	Rent per month					72			72	79
1300	40' x 8', buy	2 Skwk	1.40	11.429		6,400	465		6,865	7,775
1350	Rent per month					99			99	109
5000	Air supported structures, see Div. 13 31 13.13									

01 52 13.40 Field Office Expense

0010	**FIELD OFFICE EXPENSE**									
0100	Office equipment rental average				Month	155			155	171
0120	Office supplies, average				"	85			85	93.50
0125	Office trailer rental, see Div. 01 52 13.20									
0140	Telephone bill; avg. bill/month incl. long dist.				Month	80			80	88
0160	Lights & HVAC				"	150			150	165

01 54 Construction Aids

01 54 09 – Protection Equipment

01 54 09.50 Personnel Protective Equipment

0010	**PERSONNEL PROTECTIVE EQUIPMENT**									
0015	Hazardous waste protection									
0020	Respirator mask only, full face, silicone				Ea.	223			223	245
0030	Half face, silicone					33			33	36.50
0040	Respirator cartridges, 2 req'd/mask, dust or asbestos					5.30			5.30	5.85
0050	Chemical vapor					4.69			4.69	5.15
0060	Combination vapor and dust					9.70			9.70	10.65
0100	Emergency escape breathing apparatus, 5 min					465			465	510
0110	10 min					500			500	550
0150	Self contained breathing apparatus with full face piece, 30 min					1,750			1,750	1,925
0160	60 min					2,925			2,925	3,225
0200	Encapsulating suits, limited use, level A					905			905	995
0210	Level B					270			270	297
0300	Over boots, latex				Pr.	6.35			6.35	7
0310	PVC					21.50			21.50	24
0320	Neoprene					41.50			41.50	46
0400	Gloves, nitrile/PVC					21			21	23.50
0410	Neoprene coated					24			24	26.50

01 54 09.60 Safety Nets

0010	**SAFETY NETS**									
0020	No supports, stock sizes, nylon, 4" mesh				S.F.	1.10			1.10	1.21

01 56 Temporary Barriers and Enclosures

01 56 23 – Temporary Barricades

	01 56 23.10 Barricades	Crew	Daily Output	Labor Hours	Unit	2009 Bare Costs Material	Labor	Equipment	Total	Total Incl O&P
0020	5' high, 3 rail @ 2" x 8", fixed	2 Carp	20	.800	L.F.	4.99	32		36.99	55
0150	Movable	"	30	.533	"	4.17	21.50		25.67	37.50
0300	Stock units, 6' high, 8' wide, plain, buy				Ea.	435			435	480
0350	With reflective tape, buy				"	525			525	580
0400	Break-away 3" PVC pipe barricade									
0410	with 3 ea. 1' x 4' reflectorized panels, buy				Ea.	305			305	335
0500	Plywood with steel legs, 32" wide					72			72	79
0600	Telescoping Christmas tree, 9' high, 5 flags, buy					122			122	134
0800	Traffic cones, PVC, 18" high					8.40			8.40	9.25
0850	28" high					14.20			14.20	15.65
1000	Guardrail, wooden, 3' high, 1" x 6", on 2" x 4" posts	2 Carp	200	.080	L.F.	1.02	3.20		4.22	6.10
1100	2" x 6", on 4" x 4" posts	"	165	.097		2.16	3.87		6.03	8.35
1200	Portable metal with base pads, buy					19.75			19.75	21.50
1250	Typical installation, assume 10 reuses	2 Carp	600	.027		2.50	1.07		3.57	4.40
1300	Barricade tape, polyethylene, 7 mil, 3" wide x 500' long roll				Ea.	25			25	27.50
5000	Barricades, see Div. 01 54 33.40									

01 56 26 – Temporary Fencing

	01 56 26.50 Temporary Fencing									
0010	TEMPORARY FENCING	2 Clab	400	.040	L.F.	7.25	1.26		8.51	9.95
0020	Chain link, 11 ga., 5' high		300	.053		7.75	1.69		9.44	11.15
0100	6' high		400	.040		2.69	1.26		3.95	4.92
0200	Rented chain link, 6' high, to 1000' (up to 12 mo.)		300	.053		2.59	1.69		4.28	5.45
0250	Over 1000' (up to 12 mo.)	A-4	135	.178		5.05	6.80		11.85	16
0350	Plywood, painted, 2" x 4" frame, 4' high	"	110	.218		9.85	8.35		18.20	23.50
0400	4" x 4" frame, 8' high	2 Carp	100	.160		9.35	6.40		15.75	20.50
0500	Wire mesh on 4" x 4" posts, 4' high	"	80	.200		15.05	8		23.05	29
0550	8' high									

01 56 29 – Temporary Protective Walkways

	01 56 29.50 Protection									
0010	PROTECTION	1 Carp	75	.107	Tread	4.16	4.25		8.42	11.15
0020	Stair tread, 2" x 12" planks, 1 use		65	.123		1.39	4.92		6.31	9.10
0100	Exterior plywood, 1/2" thick, 1 use		60	.133		2.49	5.35		7.84	11
0200	3/4" thick, 1 use		350	.023	S.F.	.69	.91		1.60	2.18
2200	Sidewalks, 2" x 12" planks, 2 uses		750	.011		.23	.43		.66	.91
2300	Exterior plywood, 2 uses, 1/2" thick		650	.012		.34	.49		.83	1.13
2400	5/8" thick		600	.013		.42	.53		.95	1.29
2500	3/4" thick									

01 56 32 – Temporary Security

	01 56 32.50 Watchman									
0010	WATCHMAN				Hr.				25	27.50
0020	Service, monthly basis, uniformed person, minimum								45.45	50
0100	Maximum								31	34
0200	Person and command dog, minimum								54.55	60
0300	Maximum				Week				290	319
0500	Sentry dog, leased, with job patrol (yard dog), 1 dog				"				390	429
0600	2 dogs				Ea.				1,364	1,500
0800	Purchase, trained sentry dog, minimum				"				2,727	3,000
0900	Maximum									