



Technical Assignment #2

Cost and Methods Analysis

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Table of Contents

A. Executive Summary 3

B. Detailed Project Schedule 4

C. Site Layout Planning 6

D. Assemblies Estimate for Fire Protection System 7

E. Detailed Structural System Estimate 8

F. General Conditions Estimate 10

Appendix A.....13

Appendix B.....14

Appendix C.....15

Appendix D.....16



A. Executive Summary

The second technical assignment for Ursinus College Residence Hall 2, located in Collegeville, Pennsylvania, analyzes key features of the project that affect project execution. These key features are the project schedule, a specific construction site plan, an assembly's estimate, detailed structural estimate, and a general conditions estimate.

Residence Hall 2 is one part of a three part construction plan that Ursinus College (UC) is currently undertaking. The first item analyzed in this assignment is a detailed project schedule. This schedule is highlighted by many key activities and milestones that are broken down in to a floor by floor sequence. It shows construction beginning in May 2006 with a substantial completion and building turnover date in late July 2007. The next item analyzed is the site layout plan. A site layout plan was developed for a specific construction phase, structural sequence, that illustrates how the site is set up and where trades are located at this time in construction. The third analysis is an assembly's estimate of the sprinkler system used in Residence Hall 2. This project utilizes a wet pipe system with a dry standpipe in each major stairwell. The next item completed is a detailed structural estimate. This project is built with CMU load bearing walls and precast plank as the structural system. A cost analysis of this will allow for other structural systems cost comparison to the one being utilized. The last item in this assignment is the calculation of a general conditions estimate for a 14 month timeframe. Certain items were provided by the construction manager, and other items were added in order to complete the general conditions estimate.



B. Detailed Project Schedule

Please see Appendix A for Detailed Project Schedule

The detailed project schedule for Residence Hall 2 is a 14 month schedule for a 52,144 square foot dormitory located on the North campus of Ursinus College (UC). This is a very tight schedule for a project of this size and the completion date is not negotiable. The project must be completed for the start of the Fall 2007 semester at the college. Warfel Construction Company (WCC) has an outstanding relationship with UC and will execute this project in the time frame that has been provided. WCC broke the schedule down in to a floor by floor sequence so as the project continued, the different subcontractors could keep moving from one floor to the next. Below are some of the key project milestones for Residence Hall 2.

Key Project Milestones

WCC Mobilizes	May 15, 2006
Deep Dynamic Compaction	May 2, 2006
Ground Floor Footings	June 6, 2006
Ground Floor CMU Load Bearing Walls	June 14, 2006
Precast Plank Completion	October 20, 2006
Building Enclosure	December 7, 2006
MEP Rough-ins	January 12, 2007
Interior Finishes	May 21, 2007
FF&E	July 25, 2007
Final Landscaping	May 27, 2007
System Start-up and Testing	June 26, 2007
Owner Occupancy	July 30, 2007
Fall Semester Begins	August 27, 2007

Superstructure

Residence Hall 2 is constructed of cast in place continuous/strip concrete footings, load bearing CMU walls, precast hollow core plank, minor structural steel, and wood roof trusses. It is essential that the footings and load bearing walls be ready for the first delivery of plank scheduled for July 27, 2006. Before excavation for these footings could begin, Deep Dynamic Compaction of the site had to occur in order to properly treat unsuitable soils. The plank is being delivered from Portage, Pennsylvania which is over four hours from the site and delays will prove to be costly for completing the rest of the

superstructure on schedule. The remainder of the superstructure will be constructed on a floor by floor basis. Once the plank is erected the CMU load bearing walls will be constructed and prepared for the next floor of plank. All four floors must be completed by October 20, 2006 in or to stay on track for building enclosure by December 7, 2006.

Interior Sequence

The interior phases of this project are on a floor by floor basis. Each trade will move through the building completing their scope of work starting with the ground floor and finishing with the fourth floor. There is repetition and redundancy to this project and that should allow for trades to move as quickly as possible through the building while staying out of each other's way in the process. The first trades to start will be the plumbing contractor and electrical contractor because they must rough-in underslab conduit and piping prior to superstructure completion. The typical sequence of trades through a floor is as follows:

- Interior Metal Stud Walls
- Plumbing Rough-ins
- Electrical Rough-ins
- HVAC Rough-ins
- Sprinkler Rough-ins
- Drywall
- Painting
- Plank Topping
- Wood Doors and Trim
- Millwork
- Acoustical Ceiling Grid
- Electrical Fixtures
- HVAC Fixtures
- Flooring

As one trade finishes their scope they will move to the next floor and begin work on that level. The average time allowed for a single floor completion is 8 months. Keep in mind that each trade will move forward once work is complete so all four floors will be completed on schedule for project completion

Landscaping and FF&E

Ursinus College is performing these activities on their own as they have an Office of Physical Plant. This allows the college to save money on certain fees and other costs. Currently the college has a preliminary set of landscaping drawings that are out for approval and they are awaiting bids for the furniture for Residence Hall 2. Both are scheduled to be completed by the project completion date, July 30, 2007.



C. Site Layout Planning

Please See Appendix B for Site Layout Plan

The site where Residence Hall 2 is being built is a clear site with only minor slopes during construction. The site layout plan illustrates the location of temporary trailers, the crane, site access, site mobility for deliveries, staging areas, dumpsters, portable toilets, and temporary electric during the construction of the superstructure of the building. Access to the site is through one of two places. The main entrance by the construction trailers is directly off one of the colleges main roads and the deliveries entrance for the precast plank, masonry, and steel is off to the West of the building next to a parking lot. The crane for this project will be located on the North side of the building located directly at the center. The crane that the precast plank manufacturer uses to set the plank can reach all lifts necessary during this phase of the project from that specific location. Concrete delivery for slab on grade and footings is noted on the site layout plan as well. There are only two storage trailers on the site. One is a WCC storage trailer and the second is a storage trailer for the plumbing subcontractor. The site is located on the colleges North campus and the only building near this project is directly to the South across the street.

Even though this site plan is specifically for the superstructure phase of this project, similar traffic and delivery patterns will be utilized throughout the entire project. It is an open site and therefore they have capacity to move trailers or staging areas if need be. All tools on site are brought by workers and few are left on site each night. Since WCC is the general contractor all tools are locked in their site trailer. Safety is a huge issue for WCC and the college and the site fence around the entire perimeter is locked every day after construction is complete for that day. This was the best way for the contractor to use the site efficiently. The only time when traffic flow is interrupted on site is when precast hollow core plank is being set. In this case a controlled access zone must be established around the crane for safety reasons.



D. Assemblies Estimate for Fire Protection System

Please See Appendix C for Detailed Assemblies Takeoff

Residence Hall 2 utilizes two types of fire protection systems. The system in this building is a wet sprinkler system. There is a four inch standpipe that runs through the center of the building and supplies all floors with three inch mains. All sprinkler heads are quick response and there are fire extinguisher cabinets located throughout the residence hall. Also installed in this building are two dry standpipes in the East and West Stairs. Installation and all materials are included in this estimate. The following table represents a summary of the assembly estimate as well as the comparison to the fire protection bid number that WCC awarded to Precision Fire Protection. All numbers that are a part of the assembly estimate were taken from the RS Means Assemblies Estimating guide for 2006.

Table 1 Fire Protection System Cost Comparison

Fire Protection System Est.	Cost	% Project Cost	Cost/SF
Precision Fire	\$105,000	9.90%	\$2.01
Assemblies Estimate	\$206,341.50	19.40%	\$3.96
Difference	\$101,341.50		

Ursinus College Residence Hall 2 contains many added features that assist the fire protection system while serving another purpose. Two of these features are the pressure and fire treated wood roof trusses and the precast plank structural system. The total project cost for the project is \$10.6 million. As seen above the fire protection system accounts for only 9.9% of that cost. Several reasons for the discrepancy in cost between actual and estimated are that the assembly’s estimate includes equipment such as fire extinguishers and boxes, manual pull stations, and the emergency generator to which the emergency lighting is connected. Those pieces of the system account for roughly \$60,600. This is a very important system for the college as student safety ranks very high among the facilities department standards.



E. Detailed Structural System Estimate

Please See Appendix D for the Detailed Structural System Estimate

Residence Hall 2 is the second new dormitory that Ursinus College is building within the past 3 years. The previous dorm, Richter/North Hall, is located directly south of new site and has the exact structural system that Residence Hall 2 is using. This system uses cast in place continuous/strip footings, load bearing CMU walls, precast hollow core concrete plank, wood roof trusses, and minor structural steel. The construction of the superstructure began May 28, 2006 and is scheduled for completion on November 8, 2006.

The table on the next page highlights key features for the structural system and the cost associated with them. This estimate was produced while making several assumptions about the system itself.

Assumptions

- All concrete is 3000 psi
- All grout is 3000 psi
- Floors 2-4 are typical.
- Structural rebar reinforcement is a part of the concrete and masonry sections, they are not included in the metals section.
- Placement method is direct chute.
- Not all masonry was included because not all masonry is load bearing and a part of the structural system.
- No typical bay size was used for the precast hollow core plank.

Table 2 Detailed Structural Estimate Summary

Sitework	Quantity	Unit	Amount	Cost Per
Soil Excavation	328	CY	\$15,721.33	\$47.93/CY
Concrete				
Continuous Footing	208	CY	\$13,677.17	65.75/CY
SOG	152	CY	\$9,982.03	65.67/CY
PC Hollow Core Plank	39,774.29	SF	\$187,209.64	\$4.70/SF
Masonry				
Mortar	70	CY	\$3,476.43	\$49.66/CY
8x8x16 Concrete Block	35,199	PCS	\$92,322.98	\$2.62/PC
Metals				
Structural Steel	17	Tons	\$35,767.34	\$2,103.96/Ton
Woods and Plastics				
Structural Roof System	Trusses	Total Cost	\$48,796.81	
Thermal and Moisture				
Waterproofing	Ground Flr	Total Cost	\$13,162.51	
Finishes				
Gypsum/Nails/Paint	All System	Total Cost	\$9,756.24	
Total Estimate			\$547,652.80	\$10.52/SF

This detailed estimate was produced using ICE 2000 Estimating. It is broken into the cost for concrete, steel, plank, and minor waterproofing for the ground floor CMU walls. Also included in this section is the tonnage of steel and total cubic yards for the structural system. For a further breakdown in major structural system costs please see Appendix D.



F. General Conditions Estimate

The general conditions estimate for Residence Hall 2 was provided by Warfel Construction Company (WCC). These numbers were then expanded upon to reach a final general conditions estimate for this project. Ice 2000 Estimating was used to gather further cost information for the general conditions. The general conditions estimate has many items not present due to other parties paying for them. Since this is on a college campus the college provides many items such as temporary internet and paying for permits. Another factor in the cost is WCC provides many items on their own. At the home office they have an equipment yard and also have many construction items for the multiple projects they are involved with. This is also a very simple design so the general conditions cost is not very high.

General Conditions Estimate
Ursinus College
Residence Hall 2
Warfel Construction company

Personnel	Comments	Weeks	Hours/Wk	Price
Project Manager	2 PM's For Job	56	30	\$ 67,200.00
Director of Field Operations	Cost Provided by WCC	56	5	
Superintendent	Cost Provided by WCC	56	40	
Foreman	Cost Provided by WCC	56	40	
Building Surveyor	Cost Provided by WCC	56	5	
Safety Director	Cost Provided by WCC	56	10	
Laborers	Average 6 on Job	56	40	\$134,400.00
Subtotal Personnel				\$201,600.00

Cost Provided by WCC				\$123,635.00
Personnel Total				\$325,270.00
Temporary Facilities				
1 Jobsite Trailer	Cost Provided by WCC	56	40	\$ 6,000.00
Temporary Phone	Cost Provided by WCC	56		\$ 1,875.00
Temporary Toilets	Cost Provided by WCC	56		\$ 2,250.00
WCC Fax		56		\$ 1,875.00
Temporary Stairs	Cost Provided by WCC	56		\$ 4,000.00
Cell Phone Useage	Cost Provided by WCC	56		\$ 3,750.00
Cost Provided by WCC				\$ 19,750.00
Tax @ 6%				\$ 1,185.00
Temp. Facility Total				\$ 20,935.00
Equipment Rental				
Large Equipment	Allowance			\$ 10,000.00
Crane	Precast Plank Erection	15 days	550/Day	\$ 8,250.00
Small Tools	Bought by Field	56		\$ 5,000.00
Temporary Lifts	Allowance	56		\$ 1,000.00
Subtotal				\$ 24,250.00
Tax @ 6%				\$ 1,455.00
Equip. Rental Total				\$ 25,705.00
Temporary Utilities				
Electric	Temporary Electric	56	40	\$ 1,160.00
Water	Temporary Water	56	40	\$ 450.00
Ethernet	By College	56	40	\$ -
Temp. Utility Total				\$ 1,610.00
Facility Costs				

Permitting	By Owner			
Temporary Job Fence	2000ft	56		\$ 24,000.00
Dumpster		1	56	\$ 15,000.00
Final Cleaning				\$ 14,492.00
Drinking Water		56		\$ 375.00
Fac. Subtotal				\$ 53,867.00
Tax @ 6%				\$ 3,232.02
Facility Costs Total				\$ 57,099.02
Miscellaneous Items				
Mileage	All Parties Traveling	56		\$ 3,422.00
Job Sign				\$ 390.00
Job Clean up		56	cost/SF	\$ 19,814.72
Miscellaneous Items(General)		56		\$ 7,000.00
Total Miscellaneous Items				\$ 30,626.72
Tax @ 6%				\$ 1,837.60
Miscellaneous Items Total				\$ 32,464.32
General Conditions Total				\$463,083.34

This estimate comes in low as stated above. Possible reasons that were also stated above are that costs are being dispersed and are not getting charged to general conditions. The general conditions estimate is approximately 5% of the total project cost.



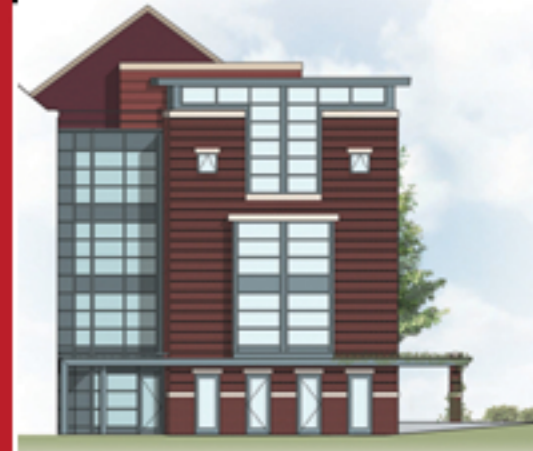
Appendix A

Detailed Project Schedule



Appendix B

Site Layout Plan For Superstructure



URSINUS COLLEGE
RESIDENCE HALL 2

COLLEGEVILLE, PA
WARFEL CONSTRUCTION
WRT DESIGNS

RUSTY HOFFMAN, CM

COLOR KEY

- GREEN = STORAGE
- BROWN = DUMPSTER
- BLUE = CRANE LOCATION
- CYAN = TRAILER/TRUCKS
- GRAY = ELECTRIC
- YELLOW = PORTABLE TOILET
- RED = SITE FENCE
- NAVY BLUE = RES. HALL 2

TECHNICAL ASSIGNMENT
#2

METHODS ANALYSIS
OCTOBER 30, 2006

ATHLETIC FIELDS

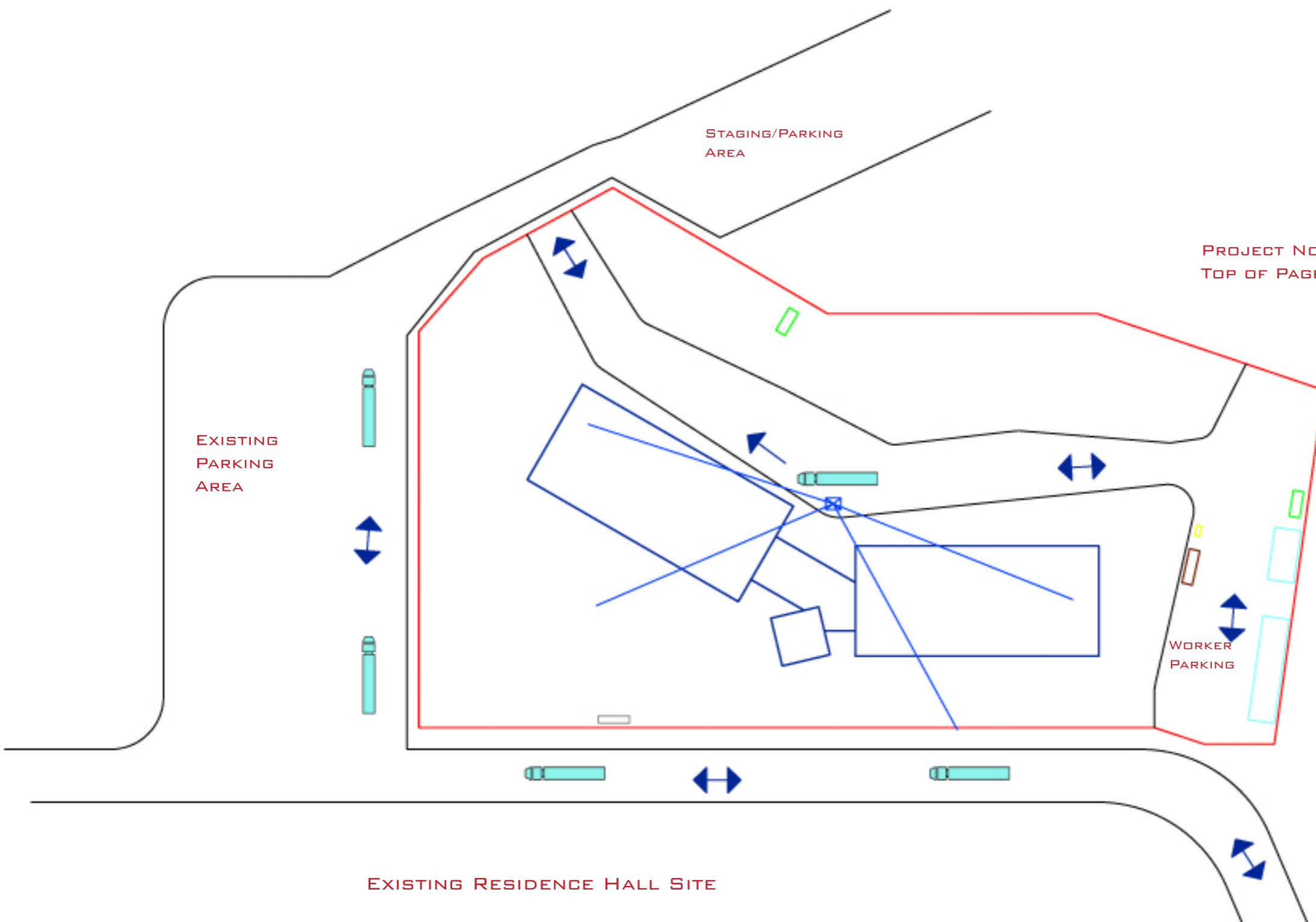
STAGING/PARKING
AREA

PROJECT NORTH
TOP OF PAGE

EXISTING
PARKING
AREA

WORKER
PARKING

EXISTING RESIDENCE HALL SITE





Appendix C

Detailed Assemblies System Takeoff

Spec. Sec.	System Component	Quantity	Unit	Cost	Total Cost	Cost/SF
15500	Wet Sprinkler System	1 Floor	2000 SF	\$9,498.52		\$4.75
	Ground Floor	6,399 SF	Cost/10,000 SF	\$2.30	\$ 14,717.70	\$2.30
	First Floor	11,655 SF	Cost/10,000 SF	\$2.30	\$ 26,806.50	\$2.30
	Second Floor	11,580 SF	Cost/10,000 SF	\$2.30	\$ 26,634.00	\$2.30
	Third Floor	10,930 SF	Cost/10,000 SF	\$2.30	\$ 25,139.00	\$2.30
	Fourth Floor	11,580 SF	Cost/10,000 SF	\$2.30	\$ 26,634.00	\$2.30
				Total	\$ 119,931.20	\$2.30
15500	4" Wet Standpipe Riser	1	Cost/10' Floor	\$5,200	\$ 5,200.00	
	4" Wet Standpipe Add. Floor	3	Cost/10'Floor	\$1,500	\$ 4,500.00	
				Total	\$ 9,700.00	\$0.19
15500	Single Extinguisher	13	Cost Each	\$191	\$ 2,483.00	
	Manual Pull Station	18	Cost Each	\$135	\$ 2,430.00	
				Total	\$ 4,913.00	\$0.09
15520	4"Dry Standpipes In Stairs	2	Cost/10' Floor	\$3,825	\$ 7,650.00	
	Each Additional Floor	6	Cost/10' Floor	\$1,410	\$ 8,460.00	
				Total	\$ 16,110.00	\$0.31
16610	125kW Emergency Generator	1	Cost/kW	\$445.50	\$ 55,687.50	\$1.07
				Total Fire Protection System Cost	\$ 206,341.70	\$3.95



Appendix D

Detailed Structural System Estimate



Detailed Structural System Estimate

Structural Steel

Table 3 Shop Bill of Material #1

No.	Shape	Length	Assembly Mark	Cost
2	L4x3.5x5/16	5'-4"	3L1	\$ 72.00
2	L4x3.5x5/16	4'	3L2	\$ 54.00
112	L4x3.5x5/16	4'-8"	3L3	\$3,158.00
30	LL6x4x.5	7'-4"	3ML3A	\$6,123.00
3	LL6x4x.5	9'-4"	3ML3B	\$ 779.00
1	L6x4x.5	9'-4"	3ML4A	\$ 130.00
2	L8x6x.75	7'-4"	3ML9A	\$ 421.00
28	PL 7.5x3/8	1'	BP1	\$2,631.00
10	PL 7.5x3/8	10"	BP2	\$ 918.00
6	W8x31	12'-8"	3B1	\$1,600.00
1	W8x35	12'	3B2	\$ 301.00
1	W8x21	14'-8"	3B3	\$ 223.00
1	W8x31	12'	3B4	\$ 267.00
1	W8x31	14'-8"	3B5	\$ 327.00
1	W8x31	20'	3B6	\$ 446.00
2	W8x21	12'-8"	3B7	\$ 591.00
1	PL 14x3/8	20'	pa	\$ 519.00

2	PL 12x3/8	12'-8"	pb		\$ 601.00
3	W8x31	5'-3"	3B8		\$ 351.00
1	W8x10	5'-3"	3B9		\$ 39.00
3	W8x31	20'	3B10		\$1,337.00
1	W8x21	20'	3B11		\$ 304.00
4	W8x31	15'	3B12		\$1,070.00
3	TS12x8x5/8	16'-.5"	3B13		\$2,919.00
6	L4x4x.5	16'-.5"	aa		\$1,059.00
1	W12x35	16'-.5"	3B14		\$ 606.00

Table 4 Shop Bill of Material #2

No.	Shape	Length	Assembly Mark	Cost
2	TS4x4x.5	4'-9.5"	1c1	\$ 215.00
2	PL5.5x3/4	10.5"	pa	\$ 146.00
2	PL6x3/4	10"	ba	\$ 105.00
1	TS6x6x.5	12'-1.25"	1c2	\$ 106.00
1	PL6x3/4	1'-1"	pb	\$ 299.00
1	PL12x1	1'	bb	\$ 57.00
1	WT9x30	5.5"	wa	\$ 76.00
1	TS6x6x.5	2'-9.25"	1c3	\$ 154.00
1	PL6x.5	1'	pb	\$ 68.00
1	PL6x.5	10"	bb	\$ 146.00
1	WT6x6	2'-9"	wa	\$ 40.00
1	WT5x16.5	5.5"	wb	\$ 1.00
3	L6x4x.5	7'-4"	1ML3A	\$ 333.00
3	L6x4x.5	7'-4"		\$ 333.00

1	L6x4x.5	4'-8"	1ML3B		\$ 141.00
1	L6x4x.5	4'-8"	1L1		\$ 141.00
2	L4x3.5x5/16	5'-4"	1L2		\$ 72.00
2	L4x3.5x5/16	4'	1L3		\$ 54.00
1	L4x3.5x5/16	4'-8"	LP1		\$ 31.00
4	PL12x1/4	1'	LP2		\$ 235.00
2	PL6x1/4	10"			\$ 97.00
20	3/4" Anchor	1'-2"			\$3,283.00

Table 5 Shop Bill of Material #3

No.	Shape	Length	Assembly Mark	Cost
1	W8x31	15'-11.25"	2B1	\$ 355.00
2	L8x4x1/2	8'-2"	aa	\$ 275.00
1	W8x21	23'-6"	2B2	\$ 357.00
1	W8x31	12'-1.25"	2B3	\$ 270.00
1	W8x21	13'-2.25"	2B4	\$ 200.00
1	W8x21	7'-6"	ma	\$ 114.00
1	W8x31	12'-8"	2B5	\$ 282.00
1	TS8x6x3/8	10'-7"	2B6	\$ 243.00
1	PL10x3/8	9'-4"	pa	\$ 200.00
2	PL7.5x3/8	1'	BP1	\$ 108.00
6	PL7.5x3/8	10"	BP2	\$ 311.00

Concrete Detailed Takeoff

Concrete	Mark	Quantity	Unit	Price
Ground Floor Footing	CF20	10.52	CY	\$ 2,904
	CF30	19.11	CY	\$ 4,279.00
	CF36	14.77	CY	\$ 3,222.00
	CF40	26.07	CY	\$ 5,039.00
	CF46	26.07	CY	\$ 5,562.00
	CF46A	5.33	CY	\$ 1,093.00
	CF50	33	CY	\$ 5,856.00
Ground Floor SOG	4" Slab	6,399	SF	\$ 5,214.70
First Floor Footing	CF20	8.15	CY	\$ 2,230.00
	CF30	22	CY	\$ 4,887.00
	CF36	11.67	CY	\$ 2,545.00
	CF40	27.19	CY	\$ 5,268.00
First Floor SOG	4" Slab	5,850	SF	\$ 4,767.20
Precast Plank	Thickness	Size	Pieces	Price
1st Floor	8"	8'-7"	5	\$ 902.00
	8"	14'-6"	2	\$ 610.00
	8"	13'	2	\$ 547.00
	8"	16'-6"	5	\$ 1,735.00
	8"	17'	3	\$ 1,072.00
	8"	9'-5"	5	\$ 990.00
	8"	25'-5"	12	\$ 6,415.00
	8"	18'-8"	9	\$ 3,533.00
	8"	26'-9"	18	\$10,125.00
	8"	18'-8"	7	\$ 2,748.00
2nd-4th Floor	8"	18'-8"	21	\$ 8,096.00

	8"	25'-5"	84	\$44,902.00
	8"	18'-8"	54	\$21,196.00
	8"	22'	24	\$11,103.00
	8"	21'-8"	22	\$10,023.00
	8"	27'-6"	20	\$11,277.00
	8"	9'-5"	33	\$6,537.00
	8"	25'-8"	37	\$19,970.00
	8"	26'-9"	54	\$30,375.00
	8"	16'-8"	21	\$7,359.00
Core Roof Area	8"	27'-6"	7	\$3,759.00
	8"	10'	4	\$841.00
	8"	23'	7	\$3,144.00
	8"	12'-6"	7	\$1,840.00
Total Concrete Cost				267,158.16

Masonry Detailed Takeoff

Masonry	Block Size	Linear Ft	Wall Height	Price
Ground Floor	8x8x16	640	10ft	\$19,828.00
1st Floor	8x8x16	856	10ft	\$29,185.00
2nd-4th Floor	8x8x16	2,244	10ft	\$111,326.00
	PSI	CY		Price
Voids w/Concrete	3000	197.3		\$14,905.44
Voids w/Grout	3000	196.7		\$13,878.13
Scaffold				\$18,010.24
Total Masonry				\$157,290.41

Detailed Wood Takeoff

Wood and Plastics	Truss Mark	Quantity	Price
Roof System	T1	42	\$22,189.00
	T2	24	\$6,717.00
	T3	13	\$3,220.00
	T4	1	\$134.00
	T5	25	\$11,658.00
	T6	7	\$1,746.00
	T7	32	\$12,587.00
	T8	12	\$9,818.00
Total System Estimate			\$68,069.00

- The following two pages are a printout of the estimate summary organized in CSI Unifomat from ICE 2000 Estimating.

Estimate Detail - Standard Construction Project

Detail - With Taxes and Insurance

Group 1: Divisions

Estimator :
Project Size : sqft

ItemCode	Description	Quantity	UM	Lab.Unit	Mat.Unit	Eqp.Unit	Sub.Unit	Eqp.Rent.Unit	Temp.Mat.Unit	Other Unit	Tot.UnitCost	TotalCost
Sitework												
02316.001	FINE GRADE FLOOR BY HAND	12,249.00	SQFT	0.4046							0.405	4,955.95
02316.022	WASHED GRAVEL SLAB FILL	226.83	CUYD	16.1864	5.120						21.306	4,833.00
02316.100	MACH EXCAV CONTINUOUS FTG		CUYD	6.9549		0.950					7.905	2,590.76
02316.102	FINE GRADE CONTINUOUS FTG	4,740.00	SQFT	0.4761							0.476	2,256.71
02316.130	MACH BACKFILL CONTINUOUS FTG	120.54	CUYD	8.5005		0.500					9.001	1,084.91
02316.134	EXCESS CONTINUOUS FOOTING SOIL	207.20	CUYD									
* Total Sitework											15,721.33	
Concrete												
03110.510	CONTINUOUS FOOTING EDGE FORMS	3,111.73	SQFT	4.4257	1.039						5.464	17,003.75
03150.650	SCREEDS FOR SLAB	1,469.88	LNFT	0.9219	0.320						1.242	1,825.44
03210.200	CONTINUOUS FOOTING REBAR	106.08	CWT	31.7857	26.750						58.536	6,209.66
03220.011	6x6 W2.1/W2.1 MESH	134.74	SQS	22.0080	10.650						32.658	4,400.31
03310.150	**CONC IN CONTINUOUS FOOTING**		****									
03310.151	3000 PSI DIRECT	207.20	CUYD	11.0090	55.000						66.009	13,677.17
03310.350	**CONC IN SLAB ON GRADE**		****									
03310.351	3000 PSI DIRECT	151.22	CUYD	11.0090	55.000						66.009	9,982.03
03315.971	* CONTINUOUS FOOTING LENGTH *	1,368.00	LNFT									
03315.976	* SOG AREA *	12,249.00	SQFT									
03350.132	FLOAT FINISH	12,249.00	SQFT	0.2754							0.275	3,373.37
03350.143	TROWEL FINISH TOPPING	39,774.29	SQFT	0.3442	0.077						0.421	16,744.98
03390.010	PROTECT & CURE	12,249.00	SQFT	0.1102	0.019						0.129	1,585.02
03390.010	PROTECT & CURE	39,774.29	SQFT	0.1102	0.019						0.129	5,146.79
03410.105	PC HOLLOW CORE PLANK	39,774.29	SQFT	1.1228	3.584						4.707	187,209.64
* Total Concrete											267,158.16	
Masonry												
04210.011	MORTAR	69.53	CUYD		50.000						50.000	3,476.43
04210.581	ADD FOR VEE CUT	31,608.00	SQFT	0.2280							0.228	7,206.62
04219.101	EXTERIOR TUBULAR SCAFFOLDING	31,608.00	SQFT	0.4698		0.100					0.570	18,010.24
04219.990	* MASONRY WALL AREA *	31,608.00	SQFT									
04220.102	FILL VOIDS W/ CONCRETE	197.29	CUYD	20.5520	55.000						75.552	14,905.44
04220.106	FILL VOIDS W/GROUT	196.71	CUYD	20.5520	50.000						70.552	13,878.13
04220.502	8X8X16 CONC BLOCK	35,198.82	PCS	1.9929	0.630						2.623	92,322.98
04224.122	MASONRY REBAR	158.36	CWT	20.5520	26.750						47.302	7,490.56
* Total Masonry											157,290.41	
Metals												
05129.101	STEEL BEAMS		****									
05129.102	I BEAMS	110.25	CWT	28.7300	35.000	5.000					68.730	7,577.72
05129.106	STRUCTURAL TUBING	36.75	CWT	38.3067	35.000	5.000					78.307	2,878.00
05129.121	STEEL COLUMNS		****									
05129.125	STRUCTURAL TUBING	7.31	CWT	28.7300	35.000	5.000					68.730	502.58
05129.181	BRACING		****									
05129.184	ANGLES	8.64	CWT	45.9680	35.000	10.000					90.968	785.91
05129.221	FLOOR ITEMS		****									
05129.221	FLOOR ITEMS		****									
05129.222	I BEAMS	16.40	CWT	28.7300	35.000	5.000					68.730	1,126.98
05129.224	ANGLES	125.59	CWT	38.3067	35.000	10.000					83.307	10,462.56
05129.224	ANGLES	20.23	CWT	38.3067	35.000	10.000					83.307	1,685.32
05129.225	TEES	2.26	CWT	38.3067	35.000	10.000					83.307	188.03
05129.227	STRUCTURAL TUBING	3.45	CWT	28.7300	35.000	5.000					68.730	236.98
05129.304	ASTM A572 50 KSI STEEL ADDER	117.95	CWT									
05129.501	SHOP PAINT		****									
05129.501	SHOP PAINT		****									
05129.505	TYPE A PAINT	3,482.73	SQFT	0.0990	0.154						0.253	879.74
05129.505	TYPE A PAINT	201.49	SQFT	0.0990	0.154						0.253	50.90
05129.601	ANCHOR BOLTS, 3/4"X14"	120.00	EACH	7.6080	5.608						13.216	1,585.90
05129.601	ANCHOR BOLTS, 3/4"X6"	152.00	EACH	7.6080	2.403						10.011	1,521.72
05129.700	BASE PLATE 10"X5"X3/4"	2.00	EACH	35.3600	6.762						42.122	84.24
05129.700	BASE PLATE 10"X6"X1/4"	2.00	EACH	35.3600	2.342						37.702	75.40
05129.700	BASE PLATE 10"X6"X3/4"	2.00	EACH	35.3600	7.025						42.385	84.77
05129.700	BASE PLATE 10"X7"X3/8"	16.00	EACH	35.3600	4.449						39.809	636.95
05129.700	BASE PLATE 11"X10"X3/8"	1.00	EACH	35.3600	66.443						101.803	101.80
05129.700	BASE PLATE 12"X12"X1"	1.00	EACH	35.3600	22.481						57.841	57.84
05129.700	BASE PLATE 12"X12"X1/4"	4.00	EACH	35.3600	5.620						40.980	163.92
05129.700	BASE PLATE 12"X7"X3/8"	30.00	EACH	35.3600	5.339						40.699	1,220.98
05129.700	BASE PLATE 12"X8"X1/2"	30.00	EACH	35.3600	7.494						42.854	1,285.61
05129.700	BASE PLATE 13"X6"X3/4"	1.00	EACH	35.3600	9.133						44.493	44.49
05129.700	BASE PLATE 15"X12"X3/8"	2.00	EACH	35.3600	108.208						143.568	287.14
05129.700	BASE PLATE 24"X14"X3/8"	1.00	EACH	35.3600	199.330						234.690	234.69
05129.700	BASE PLATE 33"X6"X1/2"	2.00	EACH	35.3600	15.573						50.933	101.87
05129.710	BASE PLATE GROUT	114.31	SQFT	6.1715	5.760						11.932	1,363.88
05129.715	1/4" STEEL BP TEMPLATE	94.00	EACH		5.760						5.760	541.44

Estimate Detail - Standard Construction Project

Detail - With Taxes and Insurance

Group 1: Divisions

Estimator :
Project Size : sqft

ItemCode	Description	Quantity	UM	Lab.Unit	Mat.Unit	Eqp.Unit	Sub.Unit	Eqp.Rent.Unit	Temp.Mat.Unit	Other Unit	Tot.UnitCost	TotalCost
05129.990	* STRUCTURAL STEEL WEIGHT *	15.53	TONS									
05129.990	* STRUCTURAL STEEL WEIGHT *	1.01	TONS									
05129.991	* NO. OF BASE PLATES *	94.00	EACH									
* Total Metals											35,767.34	
Wood and plastics												
06110.140	NAILS & ROUGH HARDWARE	97.32	LBS		1.088					1.088		105.89
06110.400	TRUSS 9/12 PITCH 10' O"	80.00	EACH	69.5914	42.560					112.151		8,972.11
06110.400	TRUSS 9/12 PITCH 17' O"	86.00	EACH	69.5914	72.352					141.943		12,207.13
06110.400	TRUSS 9/12 PITCH 26' O"	51.00	EACH	69.5914	110.656					180.247		9,192.62
06110.400	TRUSS 9/12 PITCH 27' O"	32.50	EACH	69.5914	114.912					184.503		5,996.36
06110.400	TRUSS 9/12 PITCH 8' O"	19.00	EACH	69.5914	34.048					103.639		1,969.15
06110.420	FLAT TRUSS 40' O"	7.00	EACH	60.8925	158.464					219.357		1,535.50
06110.420	FLAT TRUSS 8' O"	1.00	EACH	60.8925	31.693					92.585		92.59
06112.503	* WOOD ROOF AREA *	7,790.50	SQFT									
06160.179	5/8" CDX PLYWOOD @ ROOF	560.00	SQFT	0.2246	0.750					0.975		545.78
06160.181	3/4" CDX PLYWOOD @ ROOF	9,172.13	SQFT	0.2418	0.650					0.892		8,179.70
* Total Wood and plastics											48,796.81	
Thermal and moisture protection												
07140.011	WATERPROOFING ON MASONRY	3,526.00	SQFT	0.4983	0.358					0.857		3,020.72
07210.040	2" foundation insulation	52.12	SQFT	0.6476	0.499					1.147		59.78
07210.091	3-1/2" BATT INSULATION	9,732.13	SQFT				0.250			0.250		2,433.03
07260.012	6MIL VISQUEEN SUBGRADE PAPER	134.74	SQS	1.1018	2.900					4.002		539.20
07310.100	ASPHALT SHINGLES	97.08	SQS	32.9250	30.707					63.632		6,177.49
07310.140	15 LB FELT 432 SQFT ROLL	22.53	ROLL	14.9240	12.480					27.404		617.36
07310.800	ROOFING NAILS	97.08	LBS		1.267					1.267		123.02
07530.011	MEMBRANE ROOFING	0.24	SQS	699.6000	100.000					799.600		191.90
* Total Thermal and moisture protection											13,162.51	
Finishes												
09250.432	5/8" FIRECODE GYP BD @ CEILING	7,790.50	SQFT		0.650					0.650		5,063.83
09250.500	NAILS FOR GYPSUM BOARD	77.91	LBS		0.768					0.768		59.83
09250.520	HANG GYPSUM BOARD @ CEILING	7,790.50	SQFT	0.2252						0.225		1,754.42
09250.550	FINISH GYPSUM BOARD @ CEILING	7,790.50	SQFT	0.3660						0.366		2,851.32
09970.101	FIELD PAINT		****									
09970.105	TYPE A PAINT	98.54	SQFT	0.1188	0.154					0.272		26.84
* Total Finishes											9,756.24	
Total Estimate											547,652.80	