

November 2

Tech 2

2007

St. Elizabeth's New Psychiatric Hospital
2700 Martin Luther King Jr. Ave., SE
Washington, DC 20032

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I. EXECUTIVE SUMMARY

The new hospital was designed outward opposed to upward which resulted in fairly light structural loads. This allowed for a relatively simple structural design; however construction difficulties surfaced because of the complex building geometries and sheer size of the project. This forced the management team to meticulously plan erection sequences in order to keep to the prescribed schedule. It was decided that a single crane would be sufficient to serve the needs of the site, however, it would be interesting to investigate the impacts, both monetarily and time wise, of purchasing the services of a second crane. Load bearing masonry began at opposite wings of the building and worked its way to the center and as a result, the single crane was forced to frequently move cross site in order to follow production. Rearranging the sequencing into to a more linear progression or adding another crane seems worthy of further research.

The prospect of changing the interior CMU finish to a plastered surface, instead of paint, was a topic of discussion by the owner. Interest was expressed to eliminate the “block” look of painted CMU and the thought of an alternative covering came to attention. As a result, this document contains an interior assemblies estimate that will hopefully aid in a future take off of another, more suitable material.

In addition to the interior assemblies estimate, this document contains an expanded project schedule, a detailed site layout plan, a structural systems estimate and a general conditions estimate.

III. SITE LAYOUT OVERVIEW

The new hospital site is extremely large covering almost 17 acres of land. This vast amount of area allowed Tompkins, the general contractor, to work with a relatively wide open space to layout the site. The footprint of the hospital is extremely large itself covering 251,000 ft^2 , but because of intensive horizontal phasing, abundant amounts of space are available, even as construction progresses, for material storage and steel lay down areas to be comfortably dispersed around the site. Because of the sheer size of the site, Tompkins layout plan was relatively simple and straight forward, and was mostly left to the trades to decide on where to place stock.

There are temporary construction roads that encompass the site to allow for worker traffic to travel with relative ease. In addition to small vehicle travel, it was imperative to construct well engineered surfaces so that the 75ton mobile track crane could move cross site safely.

There is one main material lay down area near the entrance and there are other small areas found around site depending on trade location. Refer to the photo below for better visualization:



IV. ASSEMBLIES ESTIMATE: INTERIOR CONSTRUCTION

This estimate was put together by taking off quantities from a common “pod” of the hospital. The assemblies were then compared to those in the RS Means estimating guide and adjusted for likeness.

Assumptions Made:

- Square foot costs for this assembly are based solely on the “pods” interior systems which differ from other parts of the hospital. Therefore the extrapolated SF data is only accurate for these similar portions. However, an overall hospital estimate is provided using the assignable area square footage.
- A suspended metal security ceiling was put in place because of the criminally housed patients. As a result, finding a similar system for cost comparison was difficult and therefore the ceiling costs used below were bolstered to reflect the increased price of this system.

UNIFORMAT NUMBER	ASSEMBLY DESCRIPTION	QNTY.	UNIT	MATERIAL (\$)/UNIT	INSTL. (\$)/UNIT	TOTAL (\$)/UNIT	POD TOTALS
C1010 Partitions	8" CMU, Hollow, No Finish	14,600	S.F.	2.31	5.75	8.06	117,676.00
C1020 Interior Doors	Steel, Hollow, 1/2 Hour, 18ga. Vision	46	E.A.	835.00	375.00	1,210.00	55,660.00
	Steel, Hollow, 1/2 hour, 18ga., Full Panel	16	E.A.	710.00	365.00	1,075.00	17,200.00
C2010 Stair Constr.	Cement Fill Pan 24 Risers	3	E.A.	13,600.00	2.55	16,150.00	48,450.00
C3010 Wall Finishes	CMU, Epoxy Coatings, Avg.	26,300	S.F.	0.51	1.05	1.56	41,028.00
	GWB, Walls & Ceilings Primer & 2 Coats	2,900	S.F.	0.19	0.80	0.99	2,871.00
C3020 Floor Finishes	Polyethylene, In Rolls	14,000	S.F.	3.25	1.52	4.77	66,780.00
C3030 Ceiling Finishes	Accoustical, 5/8" Fiberglass Board 24"x24"	741	S.F.	141.00	144.00	285.00	211,185.00
	GWB, 5/8" F.R. Drywall	13,560	S.F.	0.87	2.45	3.32	45,019.20
	GWB, Walls & Ceilings Primer & 2 Coats	13500	S.F.	0.19	0.80	0.99	13,365.00
TOTAL							\$619,234

-See appendix for take-off calculation and notes-

IV.I SQUARE FOOT EXTRAPOLATION AND CONSTRUCTION TOTAL

POD S.F. = 14,300

$$\$619,234/14,300ft^2 = 43.30 \frac{\$}{ft^2}$$

Assignable building square footage: 349,730

Overall Interior construction cost subtotal:

$$349,730ft^2 \times 43.40 \frac{\$}{ft^2}$$

$$= \$1,5143,309$$

Additional Cost Factors:

- O&P(assume 10%)
- Location factor: 99.1

$$\$1,5143,309 \times 1.10 \times .991 = \$16507721.14$$

Interior Construction Estimate Total:

\$16,508,000

V. DETAILED STRUCTURAL ESTIMATE

This estimate was formulated by using total building data that was provided by the contractor (*see pg. 16*). Accordingly, there were no additional calculations required to gain the overall building material quantities.

Assumptions Made:

- Lineal feet of formwork was calculated by typical single pour capabilities and 4 time reusal rate.
- Finishable concrete area was assumed to be the total building square footage, minus wall areas and plus roof slabs.
- CMU quantities were given in lineal feet and converted to ft^2 by multiplying the number of load bearing CMU by single face surface area.
- Cost data was derived from RS Means 2008

Additional Cost Factors:

- O& P(assume 10%)
- Location factor: 99.1

$$\$14,008,470.70 \times 1.10 \times .991 = \$15,270,633.15$$

Structural Systems Estimate Total:

\$15,271,000

VI. GENERAL CONDITIONS ESTIMATE SUMMARY

The data used to compile this estimate was pulled partly from a current pay application from the General Contractor.

The remaining items were put together logically by examining on site necessities through unit cost and monthly rates and estimated through RS Means.

Assumptions Made:

- Temporary utility costs, which includes job power, lighting and water, was based off an approximate figure of \$2,500 a week which came the asst. project manager.
- This estimate encompasses the general conditions costs of the GC **only** because of the availability of information. As a result, the construction management agency's staffing, job trailers, supplies etc. were excluded for accuracy sake.
- On site staffing percentages were logically applied.
- Individual Staff Salaries were derived from logical current day wages and RS Means references.
- Staff fringes and benefits assumed to be 25% of total staff salaries.
- Because of the lump sum contractual arrangement, the fee would not be shown, however for additional information, it is included here.

VI.I GENERAL CONDITIONS ESTIMATE
ST. ELIZABETH'S HOSPITAL

Schedule: **36 months**
 Estimated Volume: **\$ 140,000,000**
 Gross Area: **450,000 SF**

ITEM NO.	CONSTRUCTION	TOTAL
01110	MOBILIZATION	\$638,100
01120	DEMOBILIZATION	\$273,471
01130	JOB OFFICE	\$27,720
01300	TEMP UTILITIES	\$360,000
01310	DAILY CLEANUP	\$50,000
01320	FINAL CLEANUP	\$100,000
01320	SITE SIGNAGE	\$8,000
01601	OFFICE SUPPLIES	\$3,312
01602	OFFICE EQUIPMENT / FURNITURE	\$5,508
01603	TELEPHONE / FAX	\$8,064
01605	SCHEDULE MAINTENANCE & SUBMITTAL	\$200,000
01700	PROJECT STAFF - BASE	\$1,941,613
01810	PROJECT STAFF - FRINGES and BENEFITS	\$485,403
01840	BUILDERS RISK INSURANCE	\$508,000
01860	BONDS: PERFORMANCE, LABOR AND MATERIAL	\$1,617,337
	CONSTRUCTION SUBTOTAL	\$5,314,957
	TOTAL GENERAL CONDITIONS	\$5,315,000
	FEE	4.00% \$5,600,000
	TOTAL	\$10,915,000

VI.II STAFFING BREAKDOWN

FIELD TEAM	% OF TIME ON PROJECT	ADJUSTED DURATION	SALARY (MONTHLY)	OVERALL COST (\$)
PX	0.25	9.00	10,416.00	93,744.00
PM	0.90	32.40	8,750.00	283,500.00
Asst. PM	1.00	36.00	7,083.00	254,988.00
Superintendant	0.90	32.40	7,083.00	229,489.20
Asst.Super.	1.00	36.00	5,833.00	209,988.00
Safety Super.	0.80	28.80	5,833.00	167,990.40
Project Engr.	1.00	36.00	5,416.00	194,976.00
Project Engr.	0.80	28.80	5,416.00	155,980.80
Field Engr.	1.00	36.00	5,416.00	194,976.00
Field Engr.	0.80	28.80	5,416.00	155,980.80
TOTAL				1941613.2

-See appendix for Pay App. and Calculations-

APPENDIX

Assemblies Calculations.....13-14

Unifomat II.....15

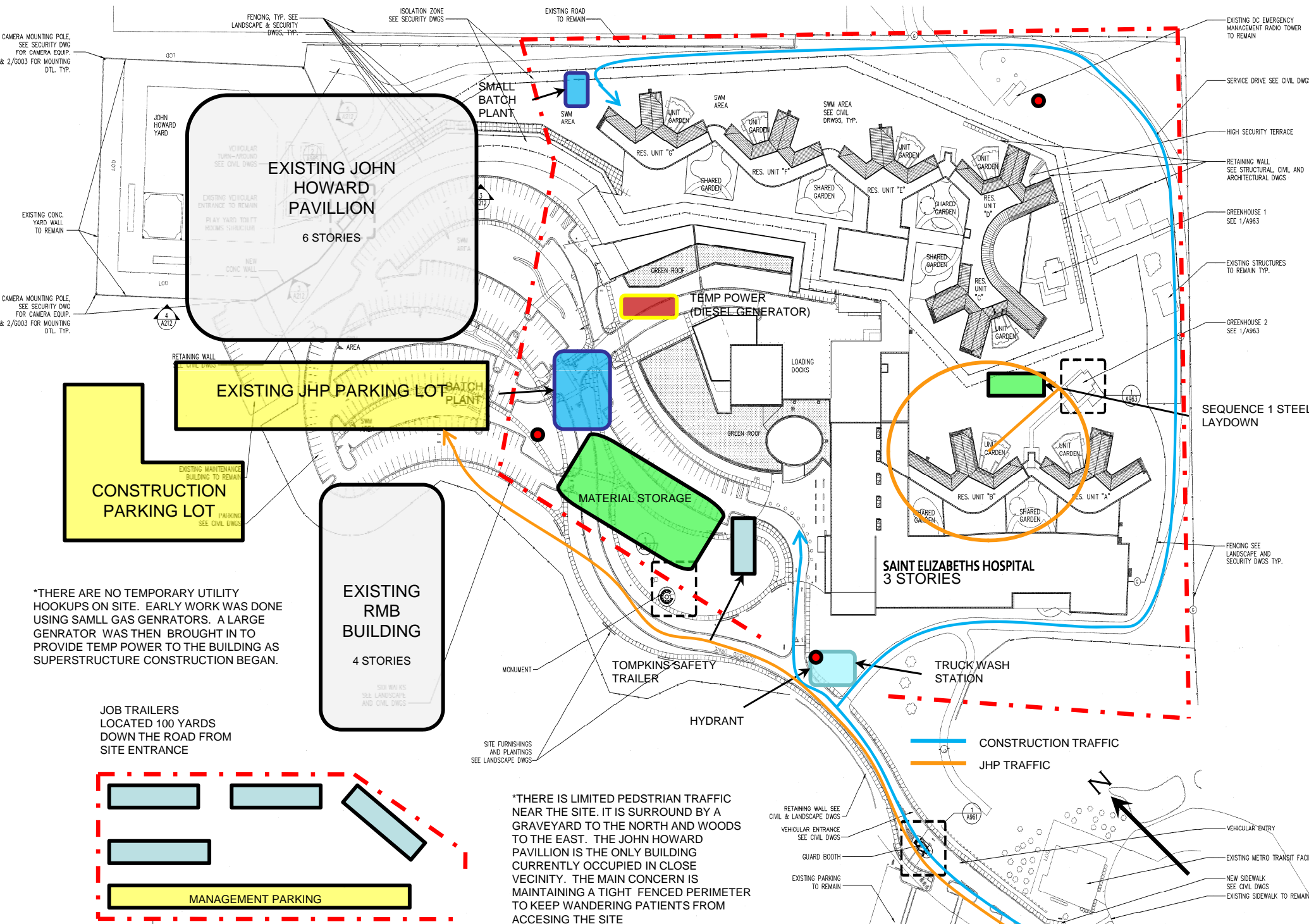
Structural Summary Sheet 16

Structural Material Costs..... 17

Pay App. For GC 18

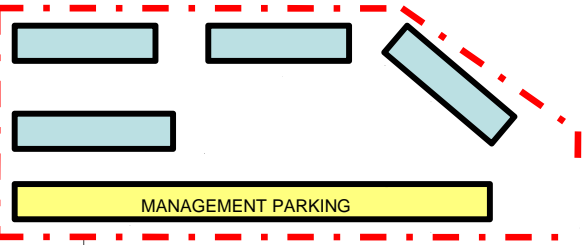
STRUCTURAL SYSTEMS ESTIMATE								
SAINT ELIZABETH'S HOSPITAL								
DIVISION	MATERIAL	UNIT	AMOUNT	MATERIAL (\$)/UNIT	LABOR (\$)/UNIT	EQUIPMENT (\$)/UNIT	M+L+E (\$)	SYSTEM TOTAL (\$)
03 30	Concrete	C.Y. Total	14,822					
03 30	Footings	C.Y.	1,103	106.00	12.70	0.41	119.11	131,378.33
03 30	S.O.G.	C.Y.	6,200	106.00	11.25	4.20	121.45	752,990.00
03 30	S.O.M.D.	C.Y.	7,519	138.00	14.90	5.55	158.45	1,191,385.55
03 30	Form	L.F.	8,000	0.70	2.66		3.36	26,880.00
03 30	Finish	S.F.	440,000		0.49	0.02	0.51	224,400.00
03 21	Reinforcing steel	Tons	970	925.00	515.00		1,440.00	1,396,800.00
04 21	Standard bricks	Units	1,700,000	0.81	0.95		1.76	2,992,000.00
04 22	Load Bearing CMU	S.F.	277,778	2.07	3.62		5.69	1,580,556.82
05 12	Structural steel	Tons	1,600	2,200.00	330.00	165.00	2,695.00	4,312,000.00
05 21	Bar Joists	Tons	80	1,500.00	283.00	153.00	1,936.00	154,880.00
05 31	Metal deck	S.F.	440,000	2.29	0.49	0.05	2.83	1,245,200.00
							TOTAL	14,008,470.70

See appendix for quantity summary sheet



*THERE ARE NO TEMPORARY UTILITY HOOKUPS ON SITE. EARLY WORK WAS DONE USING SAMLL GAS GENRATORS. A LARGE GENRATOR WAS THEN BROUGHT IN TO PROVIDE TEMP POWER TO THE BUILDING AS SUPERSTRUCTURE CONSTRUCTION BEGAN.

JOB TRAILERS LOCATED 100 YARDS DOWN THE ROAD FROM SITE ENTRANCE



*THERE IS LIMITED PEDSTRIAN TRAFFIC NEAR THE SITE. IT IS SURROUND BY A GRAVEYARD TO THE NORTH AND WOODS TO THE EAST. THE JOHN HOWARD PAVILLION IS THE ONLY BUILDING CURRENTLY OCCUPIED IN CLOSE VECINITY. THE MAIN CONCERN IS MAINTAINING A TIGHT FENCED PERIMETER TO KEEP WANDERING PATIENTS FROM ACCESING THE SITE

STEEL ERECTION SEQUENCE 1C - ST. ELIZABETH'S HOSPITAL - NICHOLAS NIGRO 11/2/07 - 1/8"=20'