

MERCY MEDICAL CENTER
REPLACEMENT CLINICAL TOWER
BALTIMORE, MARYLAND



NICOLE C JENKINS
CONSTRUCTION MANAGEMENT
DR. DAVID RILEY
OCTOBER 5, 2007
TECHNICAL ASSIGNMENT 1



*In care of the sick, great tenderness above all things.
- Catherine McAuley, Founder, Sisters of Mercy*

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Executive Summary

The major components of the Replacement Tower include the project schedule, construction site, client information, conditions of the site surroundings, project delivery method, and the staffing plan of the project. The project will use a guaranteed maximum price plus cost, with Whiting-Turner Contracting Company as the contractor and Ellerbe Becket as the Architect, MEP engineer, and structural Engineer. Construction will commence May 2007 and end December 2010. An estimate has been completed through the use of RS means 2007 and D4 estimating software. The major costs of the project include the MEP systems as well as the concrete costs. The site on which the building is being constructed has a slope of 30' from St. Paul Street to Calvert Street. Demolition will include 3 and 4 story townhomes on St. Paul Street, as well as a 10-level parking garage.

Project Schedule Summary

The project schedule shows that preconstruction is one of the longer activities within the project. This is due to the various permits being obtained for the site as well as relocation of the utilities. The total time frame for preconstruction is approximately ¾ of a year, allowing the company time to address any problems on site and to ensure that all processes on site are done with high quality. Demolition of the existing garage and the Hendrickson house (townhouse), also contribute to the preconstruction time period. Excavation begins 7 months after the initial preconstruction activity, and the drilling of piles begins as month after. Curtain wall procurement in another large activity on the project. This is due to the amount of curtain wall being procured. Curtain wall installation is also a large activity, due to the number of stories in the building. MEP fit-out is the 3rd longest activity on the schedule.

See In Appendix

Building Systems Summary

Yes	No	Scope Of Work
X		Demolition Required
X		Cast-in- Place concrete
	X	Structural Steel
	X	Precast concrete
X		Mechanical System
X		Electrical System
	X	Masonry
X		Curtain wall
X		Support of Excavation

Demolition

All existing structures are to be removed along with paving, surfacing, and hardscape elements. The existing structures included are the Calvert parking garage, which is to be replaced, and a remaining townhouse on Calvert Street.

Areas in the existing hospital will require demolition. Levels G and 1 that will connect the proposed tunnel to the existing structure, will require demolition. Demolition will also be required at level 3(L)- bridge connections. All debris will be disposed of off-site. Excavation will require careful consideration due to the fact that, there is a difference in elevation. The difference in elevation is

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approximately 30' from St. Paul Street to Calvert Street. St. Paul Street will need 3 levels of excavation below grade, while Calvert Street will need excavation for 1 level below grade.

Cast-in-Place Concrete

Building will be a cast-in-place system with reinforced concrete, with interior columns 30" square and exterior columns at 24" square. Concrete weight for floor construction, walls and slab on grade will be 6000 psi. For columns the weight will be 8000 psi, and for lower levels it will be 10000 psi. The reinforced steel will be ASTM A615 Grade 60, with some requiring Grade 75.

Mechanical System

Proper ventilation within a medical facility is very critical. The various services require that certain areas of the medical center need more ventilation than others. The main concern with ventilation is the prevention of cross contamination between rooms, and the prevention of air-borne infection spreading. The systems installed must be efficient and possess a long life span, to keep maintenance minimal. The medical center will employ the use of a chilled water system as well as a steam system. The chilled water will be purchased from Comfort Link, who will be responsible for the transport of the water as well as the chilled water piping and the heat exchangers. The contract with Comfort link is still under negotiation. The steam water will be purchased from Trigen, who will be responsible for transport to the building. Cooling devices will be installed to keep the temperature of the water below 140 degrees F, to decrease the amount of condensation before entering the building drainage system. The mechanical rooms are located on the 7th floor of the tower as well as the mechanical penthouse of the tower. There are a total of 23 AHU's each with capacities ranging from 32,000 CFM to 60,000 CFM. All air handling units will be associated with a return fan, and will be equipped with an economizing control to provide free cooling during appropriate outdoor conditions. The duct work for the building will include medium-pressure duct work from the AHU's to the ATU's. There will be low-pressure for downstream ductwork, which will distribute air to the various spaces in the hospital. Filtration criteria for various spaces in the hospital vary with their uses. All inpatient areas will require two filter beds, while all labs, administrative areas and food prep areas will require one filter bed.

Fire Suppression

The building will use both wet standpipe and automatic sprinkler systems. In all areas of the hospital a light hazard wet system will be installed, except for the electrical, mechanical and communication rooms. Sprinkler risers will be installed in the trash chutes and Linen chutes. All standpipe risers will have fire department valves included with them. An electric fire pump will be installed along with dry pipe sprinklers at the loading dock and drop-off canopies. All elevator machine rooms and electrical rooms will have sprinkler protection. All sprinkler systems will be tied in with a new fire fighters control panel (FFCP).

Electrical System

The illumination levels within the hospital have an effect on the patients stay, and therefore require a detailed analysis, based on the area being occupied. Visual comfort, usage and task complexity are the main focus of the analysis. Areas such as labs, exam rooms and procedure rooms require illumination levels at higher levels, than a patient's room or a lobby.

The emergency power requirements play an important role in the operation of the hospital. If the normal service of the building were ever interrupted the emergency would be relied on to provide power for the time being. Emergency power will be divided into a Life Safety branch and a critical branch. The life safety will support Egress lighting, exit signs, the fire alarm system, medical gas alarms and the paging system. The critical system will support the illumination for the nurse call system, the telephone equipment and the mechanical equipment.

The materials used for the electrical wiring are as follows. Raceways will consist of electrical metallic tubing, with minimum sizing at ¾ inch. For below grade, non-metallic tubing will be used. 80 PVC for without encasement and 40 PVC for with encasement. The Busway will use aluminum or copper conductors over the entire length. They will be enclosed in non-ventilated prefabricated steel. The wires and cables will use #12 AWG, with THWN, THWN or XHHW insulation. Conductors will be color coded and labeled.

The Utility Company, Baltimore Gas and Electric (BG&E) will provide the normal electrical service to the replacement tower. BG&E will be providing two 400amp 13.2Kv primary feeders to the medical center's primary switchboard. These are to be incased in concrete and routed internally. The configuration of the switchboard will be medium-tie-medium .The 15KV primary switchboard will have bussing at 1200amp, with 600amp medium voltage circuit interrupters for the feeders. Two double ended substations a north substation and south substation will be supplied. Each substation will have two 2000 KVA 13.2KV to 480/277V three phase 4 wire dry type transformers with 4000amp distribution. The electrical system will be a new 480/277V, 3 Phase, 4 Wire Switchgear. The system will mainly be used to feed the new center as well as major mechanical loads and building loads. The dry type transformers will provide 208/120volt power for smaller mechanical loads, building loads, as well as receptacles and lighting.

Emergency service will include three 1000Kw natural gas generators. A 750Kw diesel generator will be provided for the life safety systems of the medical center. This portion of the electrical system is essential for a medical facility because, it ensures that in an emergency, operations within the building can continue. The general scheme of the emergency service is as follows:

1. Parallel switch gearing will be provided for the three generators.
2. Transfer switches for critical, life safety and equipment components will be located within the penthouse. All transfer switches are separate.

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3. Feeders at 480V will be routed from the generator to the emergency distribution system in the electrical room.

Uninterruptable power systems will be provided for the Hospitals IT data server, and all telecommunication rooms. The UPS will be approximately 1500Kva with an input of 480V, and an output of 208/120V three phase.

Curtain Wall

The curtain wall is a custom pre-fabricated and pre-glazed unitized equalized curtain wall system. A 2 ½" to 3" wide by 8" exposed mullion aluminum framing is to be provided. The curtain wall includes a combination of insulated vision glass and insulated spandrel glass panels. This curtain wall is to be located at all exterior windows. The glass types are as follows:

Glass Type 1: 1 inch clear low-E coated insulated glass units constructed of ¼ inch clear, heat strengthened exterior light with a high transmittance low-E coating applied to the Number 2 surface, ½ inch air space, and ¼ inch clear, interior light.

Glass Type 2: 1 inch spandrel glass assembly constructed ¼ inch tinted exterior heat strengthened light and ¼" clear heat strengthened light with opacifier on number 3 surface.

Support for Excavation

The support of excavation will primarily consist of sheeting and shoring. All necessary precautions will be taken to prevent excess water of the site. Excavation requires careful attention due to the unlevel site, the building site slopes down 30' from St. Paul Street to Calvert Street.

Project Cost Evaluation

Model Type: Hospital, 4-8 Story Face Brick with Concrete Block Back-up / R/Conc. Frame

Location: BALTIMORE, MD

Stories:6

Story Height (l.f.):12

Floor Area (s.f.):681,265

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Data Release: 2007

Wage Rate: Union

Basement: Not included

Construction Cost

$\$101,123,500.00/681,265=\$148.43/\text{SF}$

Total Cost

$\$132,674,032/681,265=\$194.7/\text{SF}$

Major Building Systems

Mechanical

$\$20,135,500/\text{SF}=\$29.5/\text{SF}$

Electrical

$\$15,913,000/\text{SF}=\$23.3/\text{SF}$

Plumbing

$\$4,734,500/\text{SF}=\$6.94/\text{SF}$

Fire Protection

$\$1,502,000/\text{SF}=\$2.2/\text{SF}$

Structural

$\$14,169,500/\text{SF}=\$20/\text{SF}$

Exterior Brick and Curtain Wall

$\$5,653,500/\text{SF}=\$8.29/\text{SF}$

Interiors

$\$24,183,000/\text{SF}=\$35.49/\text{SF}$

Elevators

$\$3,585,500/\text{SF}=\$5.26/\text{SF}$

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Equipment

\$8,796,000/SF=\$12.9/SF

Furnishings

\$2,451,000/SF=\$3.59/SF

Based on the results from RS Means 2007, the estimated cost of the building is lower than the estimated cost obtained by the contractor. This is due to a series of differences in the building used to estimate and the actual building. Although the proposed building is a hospital, the number of stories within the building is only 6 stories while the replacement tower contains 17 stories. This affects all major building systems costs, and the construction cost of the building. The results of the D4 Cost works estimate had a similar outcome. The project followed a similar format of the actual hospital, but there is a large difference in the estimated price. This could be for the following reasons,

- Change Orders were not included in the estimate in D4, which can contribute more cost to the estimated cost.
- All equipment was not specified in the estimate, the hospital requires special equipment such as operating areas, x-ray machines and various others. This void in the equipment reduces the total cost substantially.
- Also the furnishings of the building are not accounted for appropriately.

Difference Breakdown

*included in mechanical

Building System	D4 Cost	RS means
Electrical	\$15,288,851	\$15,913,000
Mechanical	\$27,061,191	\$20,135,500
Structural	\$10,733,569	\$14,169,500
Plumbing	\$9,779,005*	\$4,734,500
Equipment	\$2,321,977	\$8,796,000
Furnishings	\$617,090	\$ 2,451,000

ACTUAL COST: \$ 158,381,990

RS MEANS COST: \$132,674,032

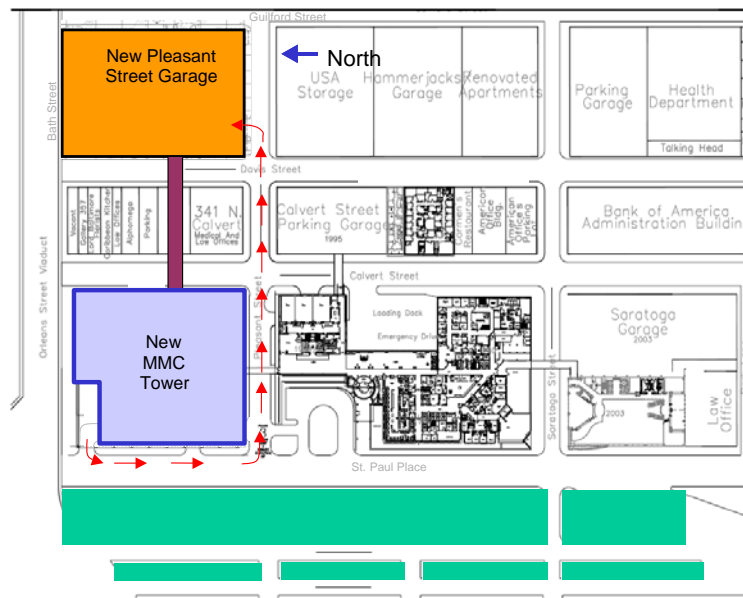
D4 COST: \$ 108,624,225

D4 Cost Estimate-See in Appendix

Local Conditions

The local conditions play an important role in the construction phase of the project. Because the building is located near the existing hospital, construction parking will be located away from the building site. The hospital has established a new parking area for patients, and visitors, and an access way to the hospital.

The layout of the building is arranged in a way to provide effective use for the city of Baltimore. The Primary entrance is located on St. Paul Place, to make available accommodating vehicular drop-off for patients. The main entrance is located on Calvert Street along with a loading dock. In addition to these entrances another is located on the east side of the building on the third (lobby) level, with access from a new bridge connecting to the new Pleasant Street Garage.



The building is organized in a manner where each entrance provides specific access to designated areas. The primary entrance on St. Paul Place will be used for public access, while the secondary entrance on Calvert Street will be used for emergency access. Outpatient access areas will primarily be located on the lower floors while inpatient access will be located on the upper floors. Patient and public elevator access will be separated, to allow more privacy to the patient.

Its location near the city center provides multiple opportunities for visiting families as well as the outpatients. The Replacement tower is located within walking distance of the city center, known for its variety of cuisine. Nearby is the Inner Harbor, this area is known for its historical culture and as well as its Harbor. The area is also home to various museums and sports arenas. The Mount Vernon Cultural District is known also for its museums and history as well.

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Client Information

The owner of the project is Mercy Health Services <http://www.mdmercy.com>. The mission of mercy health services is to “provides and promotes health services for the people of Baltimore of every creed, color, economic and social condition.” Mercy Medical Center is a catholic based facility, with an affiliated university. Mercy medical center is an active part of the surrounding community, providing outreach programs as well as neighborhood health centers.

Mercy medical center was founded on November 11, 1874 in Baltimore, Maryland by the six sisters of mercy. The facility had formally been the Baltimore City Hospital, located near a school house on the corner of Calvert and Saratoga Streets, the building showed little promise. After 134 years of successful operation, Mercy medical center is recognized as one of the nation’s top 100 hospitals, due to high quality, and high performance within the field of health services. They have also been named one of America’s 10 Best Women’s centers. Mercy offers health services such as internal medicine, obstetrics,

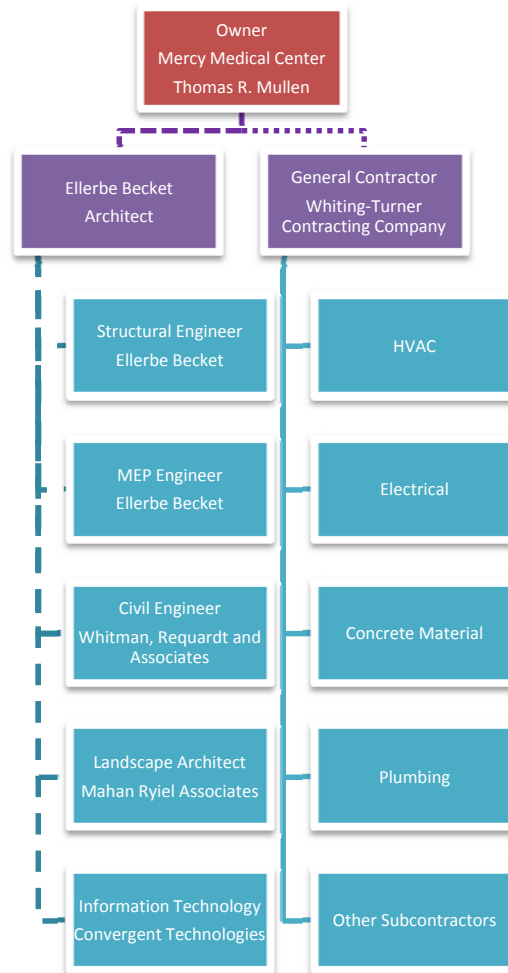
gynecology, urology, pediatrics, gastroenterology, cardiology, cosmetic surgery, ophthalmology, rehabilitative care and emergency medicine.

The primary reason for the expansion of the mercy medical center is due to the growing population of the Baltimore city, and to provide adequate facilities for the growing population. The project construction will be completed in phases to allow patients to enter the building floor by floor, as the MEP systems are being installed. Adequate safety precautions need to be taken into consideration, when it comes to ventilation. Air will be circulated throughout the construction of the building to ensure that no contamination of air occurs. Completing this project to the owner's satisfaction will require that the patients needs be put first.

Project Delivery System

The project delivery will be guaranteed maximum price with a cost plus fee. The GMP is applied towards the contractors, Whiting-Turner Contracting Company and the cost plus fee is applied to Ellerbe Becket Incorporated along with the consultant companies. The GMP/Cost plus fee method was used due to the circumstances under which the project was awarded. The selection of the firm was through an extensive design competition, numerous site visits and a final proposal phase. This entire process spanned several months before the project was awarded. GMP/Cost plus fee contracts are used on projects where the contract is drawn up before the design development phase had begun; this was the case for this project. Each potential candidate had their own design scheme for the project, so the contract had to be standard for all candidates. This method is for to the owner's benefit, it ensures that the price is set. If money is saved on the project the owner will keep the savings, if money is lost the owner pays nothing extra, and the contractor takes on the additional costs. Lump sum contracts will be used for all relations between the contractor and the subcontractors. The subcontractors will be paid according to the payment schedule.

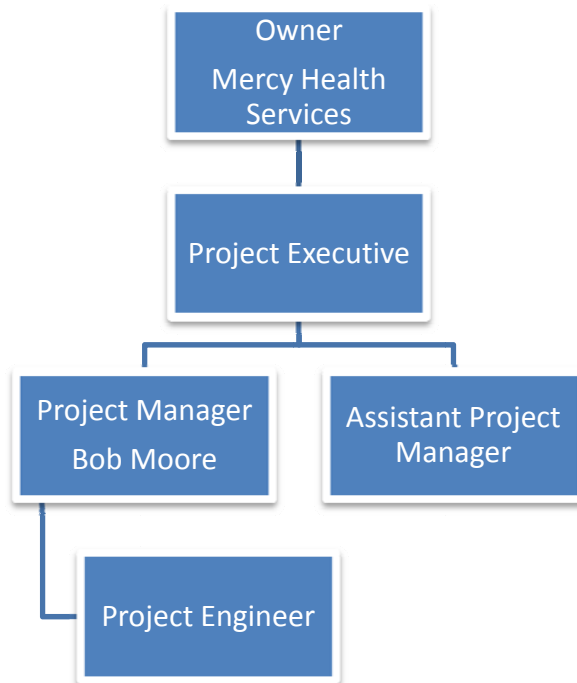
Organizational Chart



- GMP
- Lump Sum
- Cost Plus Fee

Staffing Plan

The general staffing plan includes a project executive, project manager, an assistant project manager and a project engineer. All actions within the project must be finalized through the project executive, to ensure the best possible outcome on the project. The project manager will be responsible for reducing any possible risk on the project, both onsite and offsite. The project manager along with the assistant PM will keep a close watch on unforeseen conditions on site, material delays, subcontractor irresponsibility to keep additional costs and delays to a minimum. All decisions made should directly benefit the project. The project engineer will be responsible for coordinating all the engineering activities on the project.



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Appendix

D4 Cost Estimate

Estimate of Probable Cost

Project Information

Prepared By	Payette Associates, Inc. 285 Summer Street Boston, MA 02210 Phone: Fax:	Prepared For	Nicole C. Jenkins Phone: Fax:
Projected Size	681265	Projected Location	MD - Baltimore
Building Height	214	Projected Date	May 2007
Building Use	Medical	Foundation	CAS
Number of Buildings	1	Exterior Wall	PRE
Site Size	0	Interior Wall	GYP
1st Floor Size		Roof Type	EPD
1st Floor Height		Floor Type	TER
Number of Floors	17	Project Type	NEW

Building Costs

Division #	Label	Projected %	Projected Sq. Cost	Projected
00	Bidding Requirements	12.09	19.14	13,036,609
	<i>Bidding Requirements</i>	<i>12.09</i>	<i>19.14</i>	<i>13,036,609</i>
01	General Requirements	0.38	0.61	413,685
	<i>General Requirements</i>	<i>0.38</i>	<i>0.61</i>	<i>413,685</i>
03	Concrete	9.95	15.76	10,733,569
	<i>Cast-In-Place</i>	<i>9.95</i>	<i>15.76</i>	<i>10,733,569</i>
05	Metals	8.75	13.85	9,437,125
	<i>Metals</i>	<i>8.75</i>	<i>13.85</i>	<i>9,437,125</i>
06	Wood & Plastics	4.20	6.65	4,531,450
	<i>Wood & Plastics</i>	<i>4.20</i>	<i>6.65</i>	<i>4,531,450</i>
07	Thermal & Moisture Protection	1.50	2.37	1,613,412
	<i>Thermal & Moisture Protection</i>	<i>1.50</i>	<i>2.37</i>	<i>1,613,412</i>
08	Doors & Windows	8.38	13.27	9,041,450
	<i>Doors & Windows</i>	<i>8.38</i>	<i>13.27</i>	<i>9,041,450</i>
09	Finishes	10.14	16.06	10,940,042
	<i>Finishes</i>	<i>10.14</i>	<i>16.06</i>	<i>10,940,042</i>
10	Specialties	0.52	0.83	564,420
	<i>Specialties</i>	<i>0.52</i>	<i>0.83</i>	<i>564,420</i>
11	Equipment	2.15	3.41	2,321,977

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	Equipment	2.15	3.41	2,321,977
12	Furnishings	0.57	0.91	617,090
	Furnishings	0.57	0.91	617,090
14	Conveying Systems	2.10	3.32	2,264,969
	Conveying Systems	2.10	3.32	2,264,969
15	Mechanical	25.09	39.72	27,061,191
	Fire Protection	1.70	2.70	1,838,597
	HVAC	14.14	22.39	15,250,790
	Plumbing	9.07	14.35	9,779,005
	Testing, Adjusting & Balancing	0.18	0.28	192,799
16	Electrical	14.17	22.44	15,288,851
	Electrical	14.17	22.44	15,288,851
	Total Building Costs	100	158.33	107,865,841

		Non-Building Costs		
Division #	Label	Projected %	Projected Sq. Cost	Projected
02	Site Work	100.00	NA	758,384
	Site Work	100.00	--	758,384
	Total Non-Building Costs	100	NA	758,384
Total Project Costs		--	--	108,624,225

Project Notes

Estimate Based On Case: MD950109 - University Hospitals of Cleveland

Location: OH - Cleveland

Date: Jul 1990

Building Size: 584,000

*Cleveland, Ohio

*Construction Period Sep 90 to Feb 94

Special Project Notes

The conceptual design of the project was developed around a "grand portal" situated at the terminus of a park-like setting, encompassing a superblock of prestigious arts and academic buildings. This new entry, with its landscaped forecourt and reflecting pool, asserts the institution's leadership role and serves as an

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inviting welcome for the visitor. Throughout the hospital, circulation is oriented toward exterior windows, reinforcing the relationship with the hospital's front lawn which helps orient patients and visitors and provides an interior environment focused on the landscape.

The park setting is carried through to the interior with a quietly elegant palette of colors and finish materials. Texture, pattern and composition reinforce and harmonize with the architecture and the landscape. The background color palette includes a light willow green providing a basis for a melody of jewel-toned accents to play off of. While the background color ties the building together, the accents provide contrast in chroma, intensity and tonality bringing an identity to each department. An abundance of natural finished maple with cherry accents, along with granites, terrazzo, linoleum and patterned carpets, uplifting color schemes and plentiful natural light.

The design addressed several goals for the hospital: clarity in the circulations system, including segregation of public and inpatient traffic; natural light and views at elevator lobbies, primary corridors and destination points; and straightforward way-finding which does not rely solely upon signage. Primary circulation corridors are along the building's perimeter, and are defined by reputation of large arched windows with maple window seats. These "live-in" walls allow for overflow in family waiting areas and provide a quiet space for discussions among visitors and staff.

The programming was developed to minimize travel time and distance for staff within treatment areas, and maximize connections between inpatient and outpatient and support. Clustering patient rooms around satellite nurse stations allows direct monitoring and supervision of up to eight patients. To test the effectiveness of this design, full-scale room mock-ups were built. This design process was extended to other repetitive rooms such as the operating room and intensive care room.

Other design innovations associated with the project include:

- A new Oncology Center of Excellence, including the Ireland Cancer Center is located on the same floor as the inpatient bone marrow transplant unit. Similarly, the musculo/skeletal inpatient and outpatient departments are directly linked to the medical school.
- The clinic modules, including technically advanced procedure rooms, are designed for intense high-tech use that can be shared by both outpatient and inpatient departments via separate entrances. This allows for costs to be shared by the two departments.
- The new surgery facilities replace 21 operating rooms, and provide state-of-the-art accommodations for efficiency, cleanliness and flexibility. It also includes the addition of 70 critical care beds and 210 acute care beds.

Suppliers/Manufacturers

Exterior Walls -

Brick: Stone Creek Brick

Cast Stone: W.N. Russell & Co.

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Curtain Wall: Bruce Wall Systems

Roof - Firestone

Skylights: United Skys

Floors -

Linoleum & Vinyl: Forbo Industries

Granite: Granite Importers

Wood: Applied Radiant Energy Corp.

Carpet: Milliken Carpet

Interior Walls -

Gypsum Wallboard: United States Gypsum

Wallfinish: Zolatone

Elevators - Otis

*Photo courtesy of Payette Associates, Inc.

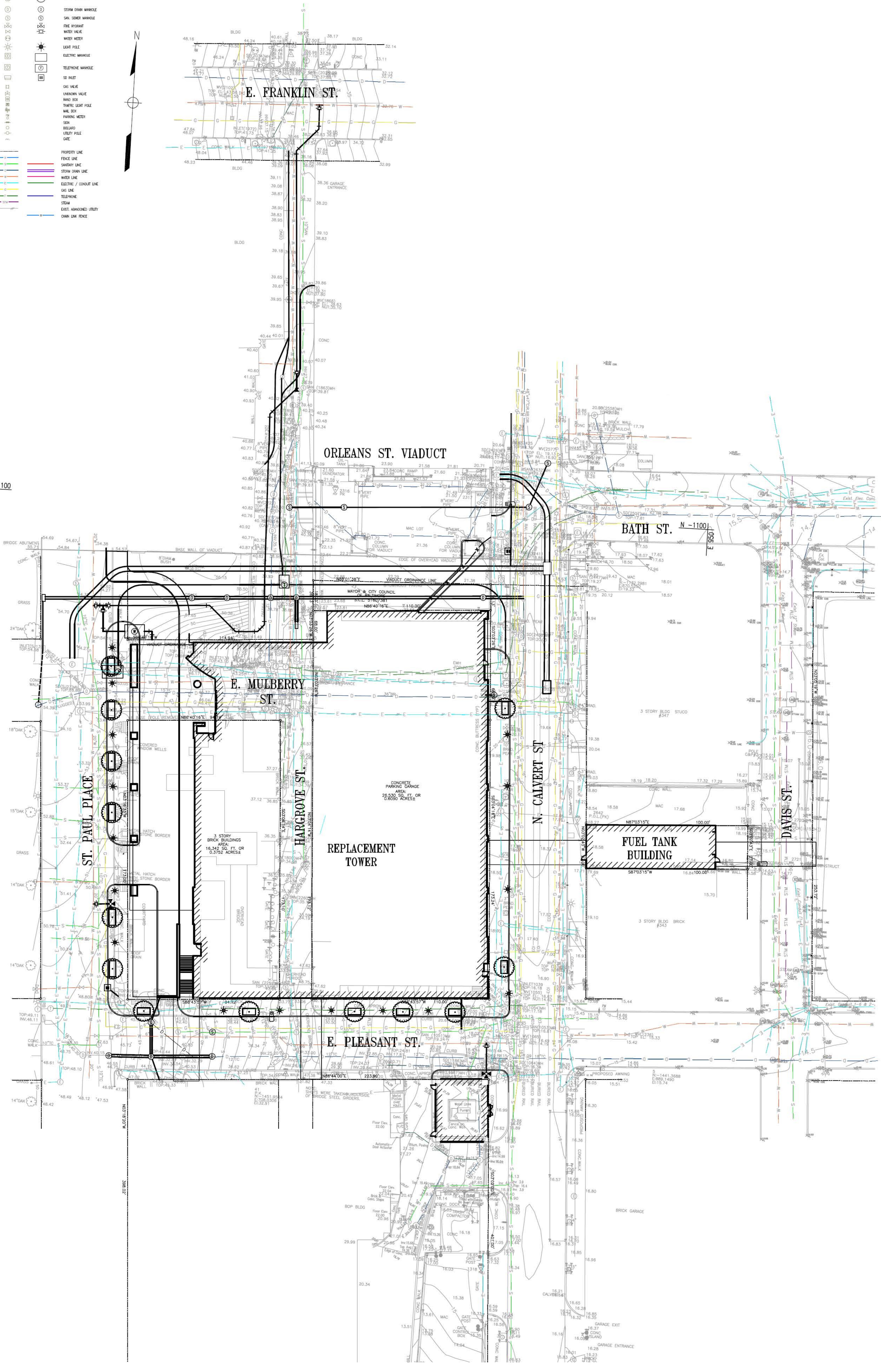
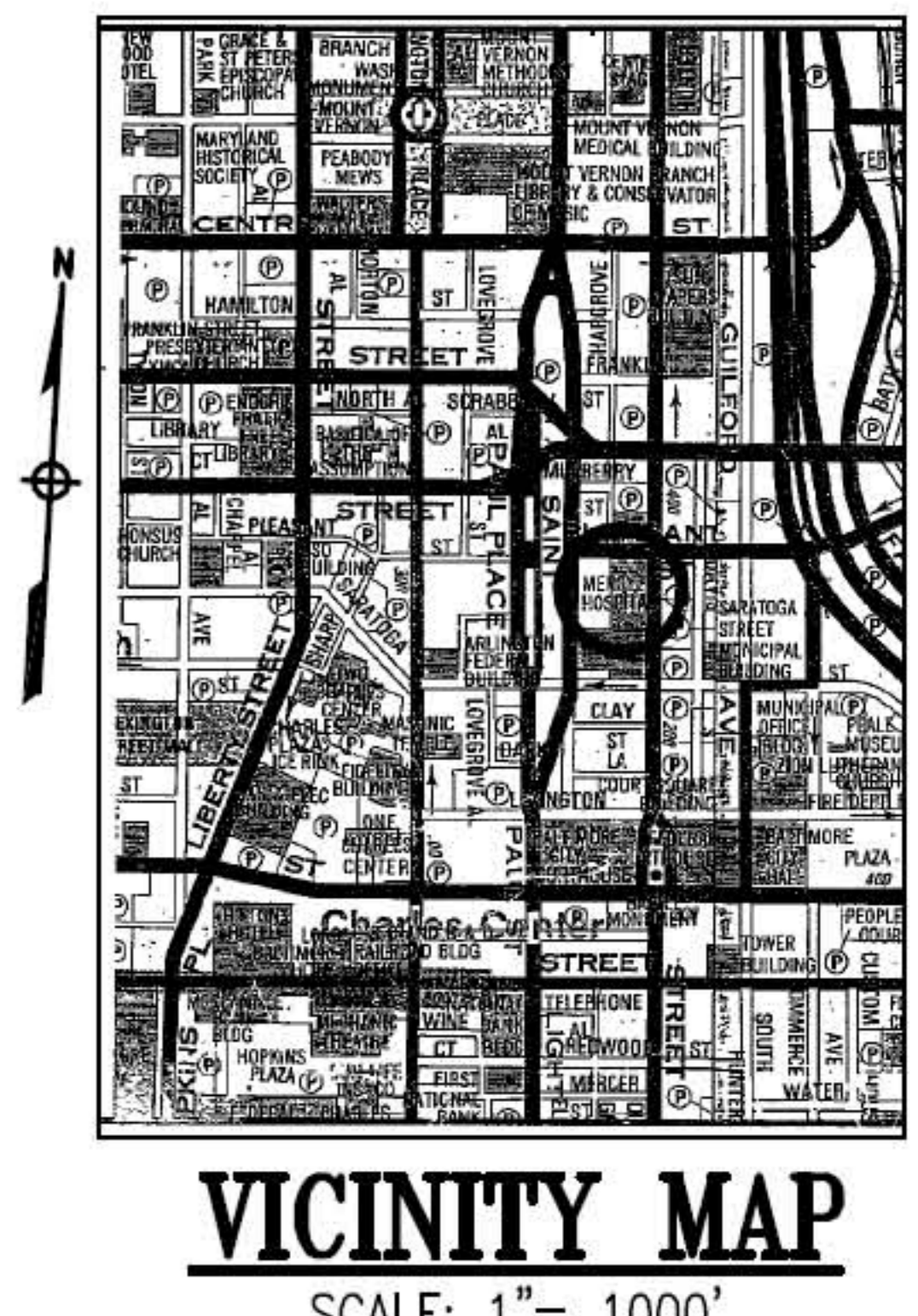
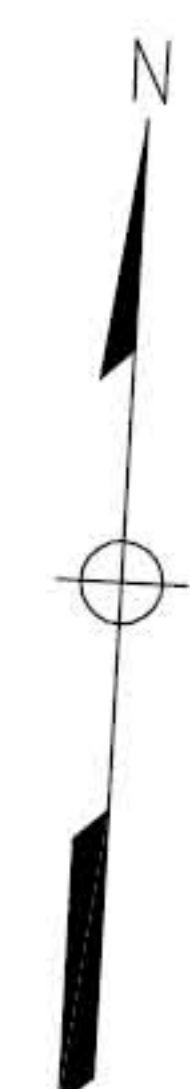
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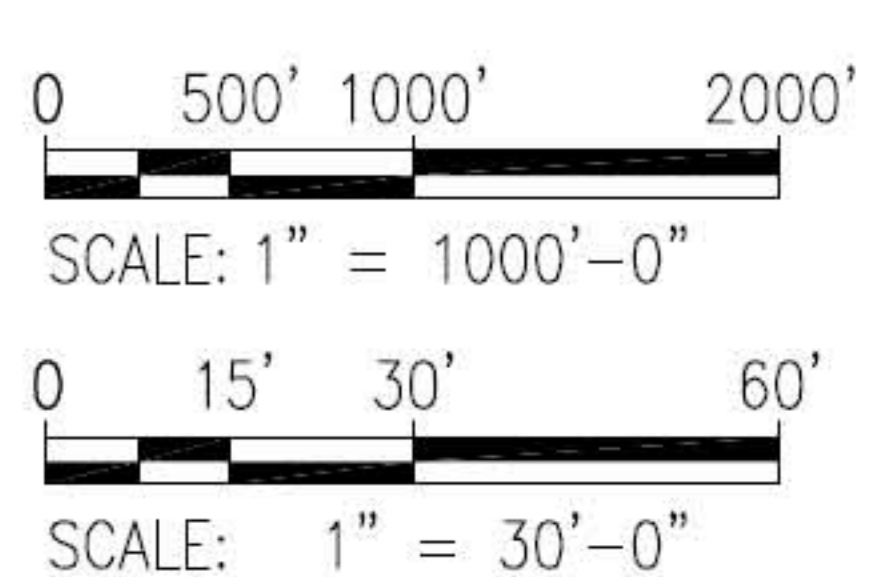
ID	Task Name	Duration	Start	2007				2008				2009				2010			
				1st Half		2nd Half		1st Half		2nd Half		1st Half		2nd Half		1st Half		2nd Half	
				Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	Preconstruction	287 days	Thu 5/3/07																
2	CON approval	0 days	Thu 5/17/07	◆ 5/17															
3	Early Bid Documents	0 days	Fri 6/8/07	◆ 6/8															
4	File for Foundations/Excavation	0 days	Mon 6/18/07	◆ 6/18															
5	Permitting	26 days	Mon 6/18/07																
6	Demolition of Existing Oxygen T	15 days	Tue 7/10/07																
7	Utility Relocation	101 days	Tue 7/10/07																
8	Garage Demolition	112 days	Fri 9/28/07																
9	Curtain Wall Procurement	355 days	Tue 10/16/07																
10	Excavation	108 days	Tue 1/8/08																
11	Caissons	61 days	Tue 5/13/08																
12	Foundation Walls	45 days	Tue 7/8/08																
13	Foundations	275 days	Tue 8/12/08																
14	CMU-Backup walls	70 days	Thu 1/8/09																
15	Brick Veneer	127 days	Thu 1/22/09																
16	Temporary Roofing Level 9	15 days	Tue 4/28/09																
17	Curtain Wall installation	200 days	Tue 2/24/09																
18	Fit out/MEP	273 days	Tue 6/30/09																
19	MEP Penthouse	224 days	Mon 9/7/09																
20	Commissioning	90 days	Wed 4/28/10																
21	Project Substantial Completion	0 days	Tue 8/31/10	◆ 8/31															

Project: Replacement Tower Date: Fri 10/5/07	Task		Milestone	◆	External Tasks	
	Split		Summary		External Milestone	◆
	Progress		Project Summary		Deadline	↓

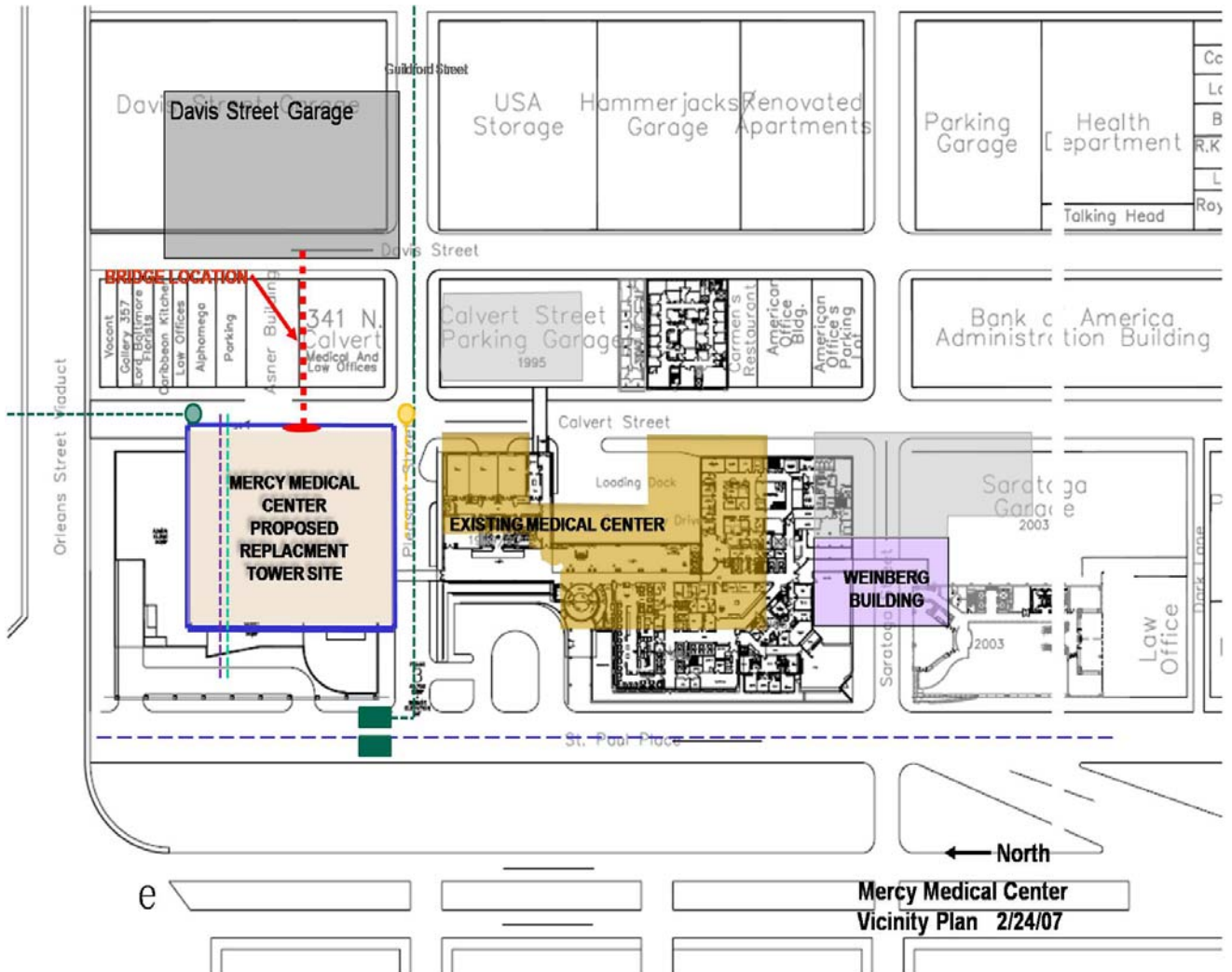
EXISTING	PROPOSED	DESCRIPTION
		WATER CONTOURS
		BRICK CONTOURS
		DRAINAGE SYSTEM
		DECIDUOUS TREE
		STORM DRAIN MANHOLE
		GAS VENT MANHOLE
		FIRE HYDRANT
		WATER METER
		WATER METER
		LIGHT POLE
		ELECTRIC MANHOLE
		TELEPHONE MANHOLE
		GP INLET
		GAS VALVE
		UNKNOWN VALVE
		MANHOLE BOX
		TRAFFIC LIGHT POLE
		MANHOLE BOX
		PARKING METER
		SIGN
		RAILROAD
		STREET POLE
		GATE
		PROPERTY LINE
		FENCE LINE
		SIDEWALK LINE
		STORM DRAIN LINE
		WATER LINE
		ELECTRIC / CONDUIT LINE
		GAS LINE
		TELEPHONE LINE
		STEAM LINE
		STEEL REINFORCED CONCRETE CURB AND FENCE



PLAN
SCALE: 1" = 30'

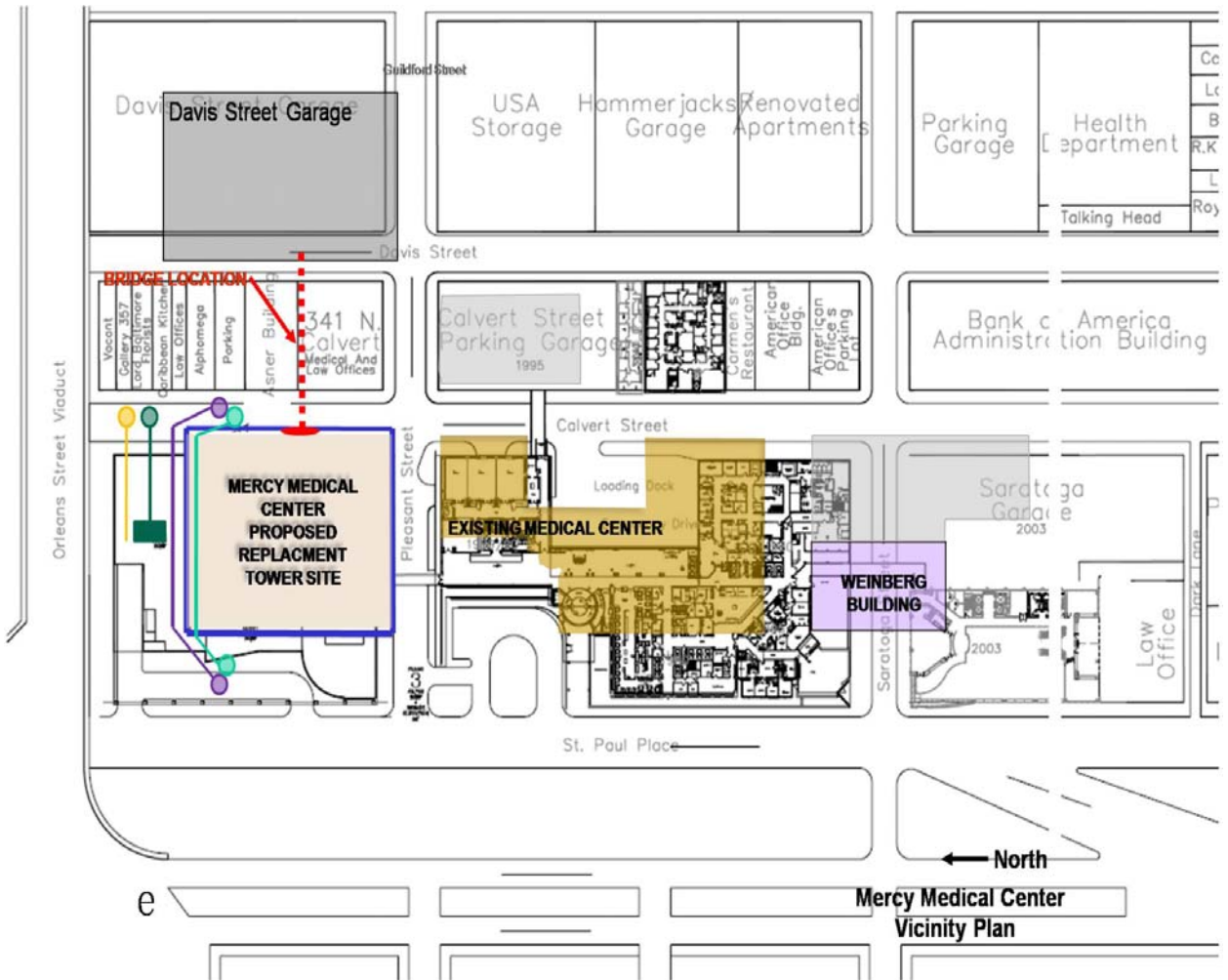


Existing to Remain Utilities



- Existing Verizon to remain - - - - -
- Existing Electrical to remain - - - - -
- Existing storm to remain - - - - -
- Existing Sanitary to remain - - - - -
- Existing water to remain - - - - -

Relocated Utilities



- Relocated Verizon ————
- Relocated Electrical ————
- Relocated Storm ————
- Relocated Sanitary ————