

# SAINT VINCENT HEALTH CENTER

## Technical Assignment 1

Advisor: Dr. David Riley

October 4<sup>th</sup>, 2010

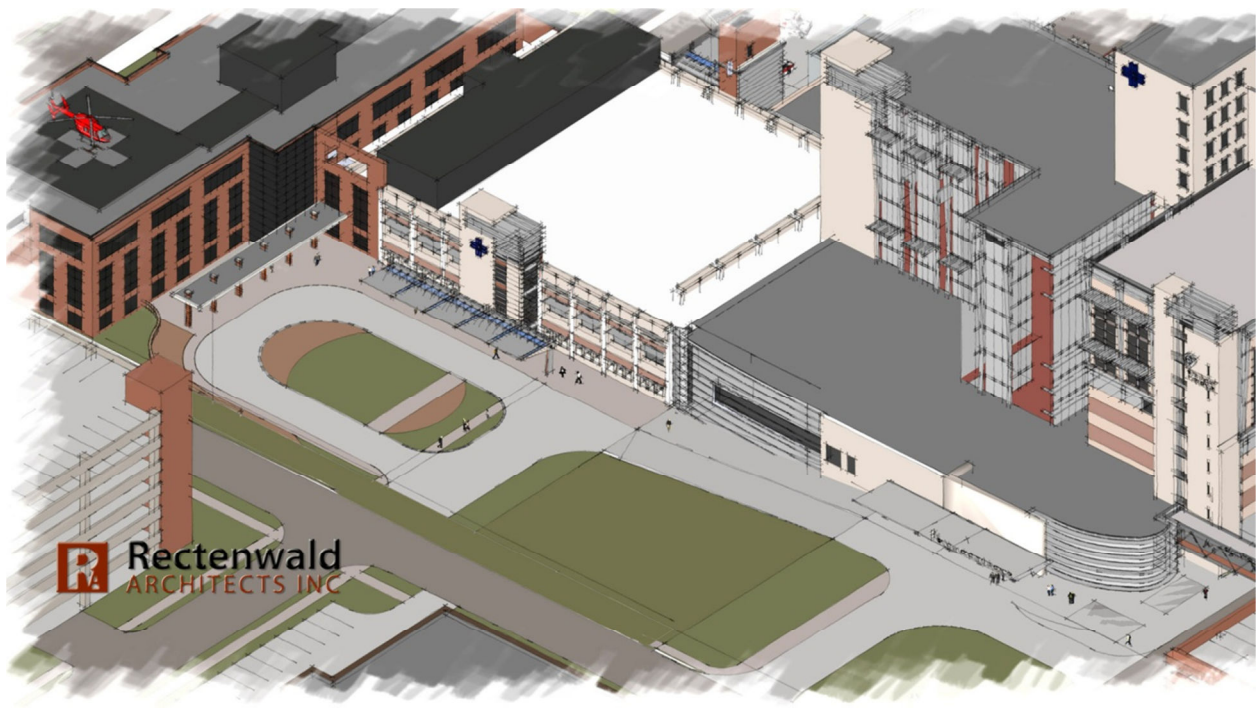
*Tyler Jaggi*  
*CM Option*

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View from Hardner Building



## Executive Summary

This technical report is focused on understanding the building systems, costs, and schedule of the Saint Vincent Health Center Infill Building as well as getting to know the client. There is a project summary schedule that gives a brief schedule of the major project activities and milestones that take place during the design and construction of Saint Vincent Health Center Infill Building in Erie, PA located on the Saint Vincent Health Center block. A detailed explanation of the building systems includes items such as, building enclosures, mechanical, electrical, and structural systems. This project is going for LEED certification with the hopes of obtaining a Silver LEED rating.

Saint Vincent is building the new Infill Building to expand and upgrade their Emergency Department and Operating Rooms. In the basement, of the new building they are putting in a new Central MEP Plant that will replace the entire MEP services for the entire complex of buildings.

The Saint Vincent Infill Building is a three phase project (All Phases shown in **Appendix B**): Phase I is new Ambulance Entrance Addition. Phase II is Temporary connector corridor along the west side of the site so the existing connector can be removed to allow for access to the new building. Phase III is the new inlet building itself. With three phases, a lot of coordination must be done to not fall behind schedule. A critical sequencing issue is not to interrupt flow of hospital operations at ED and movement between the existing hospital and the MOB (Medical Office Building / Hardner Building) to the North. Appendix B shows the phasing diagrams.

An estimate is compared to the actual cost of the building and discussed further along in the report using RS Means and D4 cost estimating programs. The D4 adjusted estimate was close to the estimated project cost, but the RS Means was about \$20 million off. This could be because Saint Vincent's new addition will largely be made up of new operating rooms which cost tremendously more than the typical patient room.

Finally, the project delivery system is analyzed and discusses the relationship between the contractors and the owners. The construction manager, E.E. Austin & Son, Inc., represents the owner and holds all of the contracts with the trades. A staffing plan was laid out showing the number of office staff the general contract has for this project and the responsibilities of each staff member.

Overall, this report has given a more detailed understanding of the project and how the project is being constructed. It will be beneficial to know this information for the following technical reports and the proposal that will be submitted later in the semester.

# Client Information

**Owner / Client** – Saint Vincent Health System

**History** - Founded by the Sisters of Saint Joseph in 1875, Saint Vincent Health Center is the Erie area's first hospital. Saint Vincent has evolved into an integrated Health System, providing patients with an outpatient network spread across the entire region. Saint Vincent remains a member of the Erie community, and continues to provide a continuum of services to fit your health care needs. Over the next 130 years, the original building was expanded, other buildings were constructed and the health center "campus" was formed. Saint Vincent Health System grew to encompass sites such as other health care facilities and physician practices that are in the regional community.

**Purpose of building** - Saint Vincent is building the new Infill Building to expand and upgrade their Emergency Department and Operating Rooms. In the basement of the new building they are putting in a new Central MEP Plant that will replace the entire MEP services for the entire complex of buildings.

**General Building Data:**

- Location : Erie, PA
- Occupancy Type: Medical
- Gross Building Area : 104,660 SF
- Number Of Stories : 3 (1 below ground)
- Total Building Cost: Approx. \$ 45 Mil.

**Scheduling / Sequencing** – This is a three phase project: Phase I is new Ambulance Entrance Addition. Phase II is Temporary connector corridor along the west side of the site so the existing connector can be removed to allow for access to the new building. Phase III is the new inlet building itself. With three phases, a lot of coordination must be done to not fall behind schedule.

A critical sequencing issue is not to interrupt flow of hospital operations at ED and movement between the existing hospital and the MOB (Medical Office Building / Hardner Building) to the North.

**Phase Occupancy** – The new emergency ambulance entrance (Phase I) is being constructed now so until it is complete, ambulances and patients will continue to use the existing emergency department entrance off of 24<sup>th</sup> Street. During Phase II, when Phase I is all complete, all ED traffic (patients and ambulances) will use the new Ambulance Entrance for access to the Emergency Department (ED), down the connector corridor. During Phase III, after the temporary connector on the west side is complete at the end of Phase II, pedestrian ED traffic will use the entrance at the southwest corner of that new temporary connector. Ambulance traffic will continue using the new Ambulance Entrance.



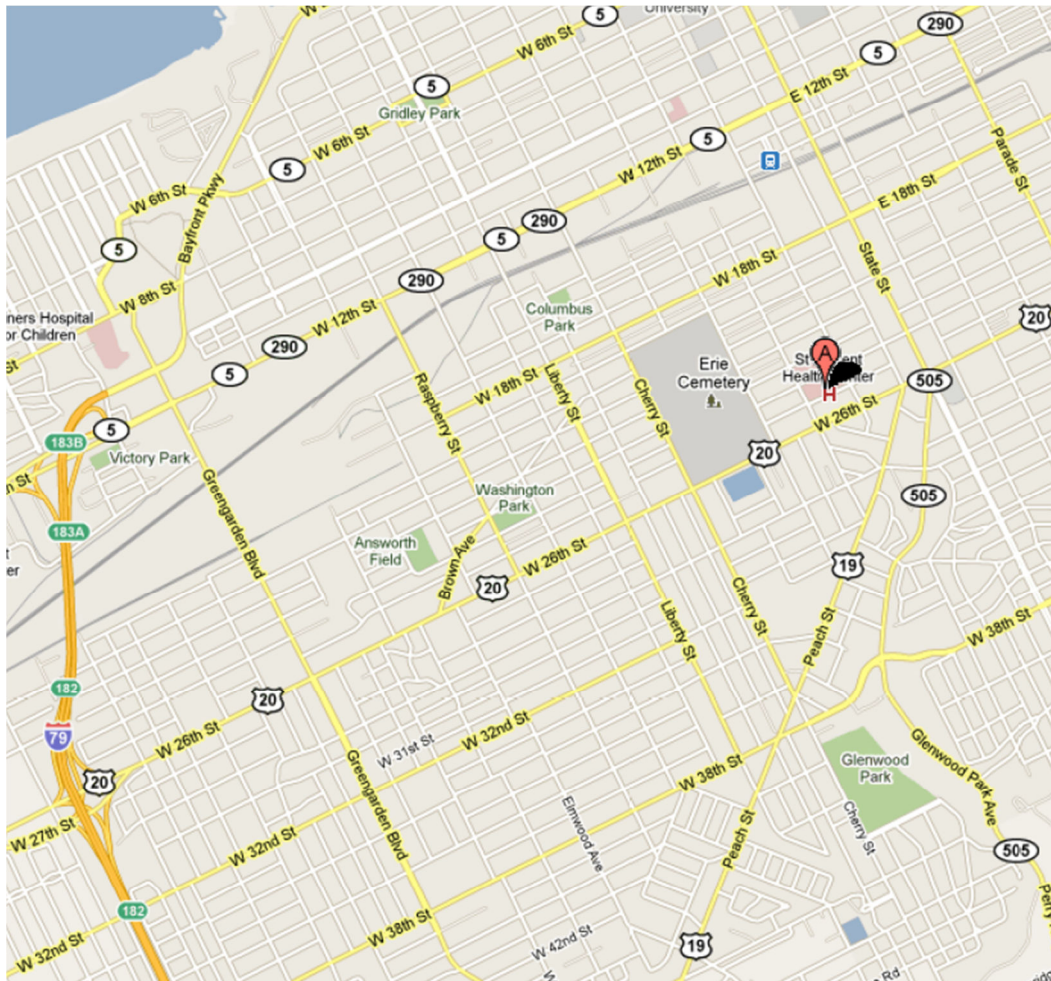
# Local Conditions

## Erie, PA

**Surroundings** – Downtown Erie, one block from Route 20 (W. 26<sup>th</sup> St.). Site is two miles away from Interstate 79.

**Traffic/Roads** – Site surrounded by four roads (West 23<sup>th</sup> & 25<sup>rd</sup> Streets, Sassafras St. and Myrtle St.) The Site is only a few miles from Interstate 79 & 90. Site is also close to Lake Erie.

**Site access** – Phase II site access will be from Myrtle Street (West side of site).



**Existing Civil conditions** – There have been numerous unforeseen underground utility conflicts: existing water lines being deeper than shown on drawings and conflicting with new storm sewer lines, existing sanitary sewer lines being in a different location than anticipated and running through a grade beam and finding an electrical duct bank that was not shown on any existing drawings.

**Weather / Climate** - The climate of Erie is typical of the Great Lakes. Erie is located in the Snow Belt. Erie's winters are typically cold, with heavy lake effect snow, but also with occasional stretches of mild weather that causes accumulated snow to melt. Erie lies in the humid continental zone. The city experiences a full range of weather events, including snow, ice, rain, thunderstorms and fog. Erie is 13th on the list of snowiest places in the United States, averaging 88 inches per year. With all this snow in the winter months, the schedule should be adjusted for this because of loss of work time, delays, and work inefficiency due to cold and snowy weather. Snow removal should also be considered in the schedule and cost estimate.

**Climate data for Erie International Airport**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
<b>Record high °F</b>	73	75	82	89	91	100	99	96	99	89	82	75	100
<b>Average high °F</b>	33.5	35.4	44.7	55.6	67.4	76.2	80.4	79.0	72.0	61.0	49.3	39.6	57.8
<b>Daily mean °F</b>	26.9	28.2	36.5	46.8	58.1	67.4	72.1	70.9	64.0	53.3	42.9	32.7	49.9
<b>Average low °F</b>	20.3	20.9	28.2	37.9	48.7	58.5	63.7	62.7	55.9	45.5	36.4	26.8	42.1
<b>Record low °F</b>	-18	-16	-9	7	26	32	44	37	33	23	6	-11	-18
<b>Rainfall inches</b>	2.53	2.28	3.13	3.38	3.34	4.28	3.28	4.21	4.73	3.92	3.96	3.73	42.77
<b>Snowfall inches</b>	26.3	17.3	11.2	2.3	Trace	0.0	0.0	0.0	0.0	0.3	9.0	25.3	91.7
<b>Record high °C</b>	22.8	23.9	27.8	31.7	32.8	37.8	37.2	35.6	37.2	31.7	27.8	23.9	37.8
<b>Average high °C</b>	0.83	1.89	7.06	13.11	19.67	24.56	26.89	26.11	22.22	16.11	9.61	4.22	14.33
<b>Daily Mean °C</b>	-2.83	-2.11	2.5	8.22	14.5	19.67	22.28	21.61	17.78	11.83	6.06	0.39	9.94
<b>Average low °C</b>	-6.5	-6.17	-2.11	3.28	9.28	14.72	17.61	17.06	13.28	7.5	2.44	-2.89	5.61
<b>Record low °C</b>	-27.8	-26.7	-22.8	-13.9	-3.3	0	6.7	2.8	0.6	-5	-14.4	-23.9	-27.8
<b>Rainfall mm</b>	64.3	57.9	79.5	85.9	84.8	108.7	83.3	106.9	120.1	99.6	100.6	94.7	1,086.4
<b>Snowfall cm</b>	66.8	43.9	28.4	5.8	Trace	0	0	0	0	0.8	22.9	64.3	232.9

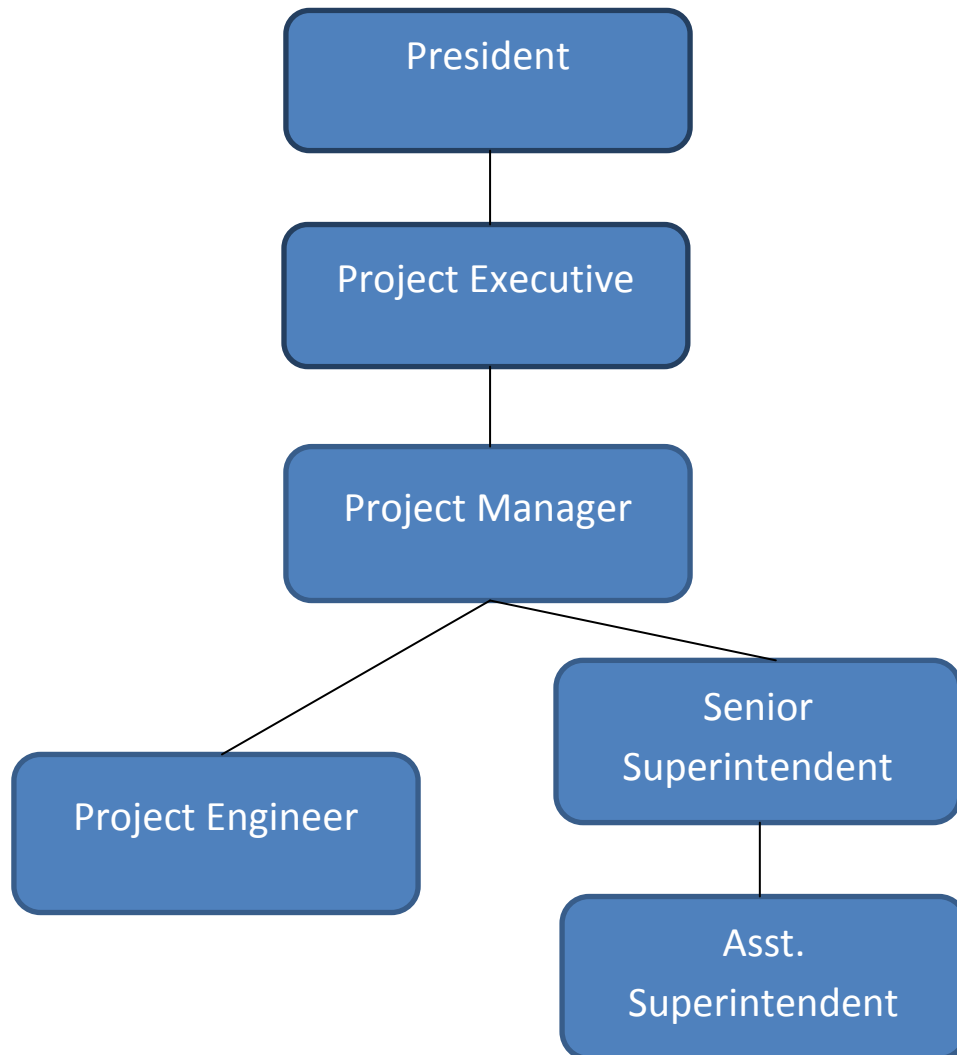
## Project Delivery System

**Appendix A:** Sub and supplier list attached for each of the trades in phase I. The phase II portion will not be out to bid until mid-October. All prime bids were submitted to the architect's office and opened privately. Awards were based on price scope and value. All contracts/P.O.'s are written through the Construction Manager. (EE Austin).

The structure of the organizational chart shows that a solid blue line denotes a legal contract that binds the two parties. This is the case for all of the subcontractors with regard to EE Austin, the construction manager. Saint Vincent Health Center has contracts between the architect, construction manager and engineers; however, there is no legal tie between the parties. EE Austin is the CM-At-Risk, owner representative. The contract between Saint Vincent and Austin is cost of construction, plus % fee.



## Staffing Plan



EE Austin (CM) - Staffing Plan

### **Saint Vincent Project Staff Requirements:**

Architect (3), Owner (3), MEP Engineer (3), Civil Engineer (2), Safety Manager (1), Construction Manager (4), Superintendent (1), Asst. Superintendent (1), Perry(6), Spaeder (6) Mayer Bros( Excavation, backfill & trucking with EEA) (6), Masons(5), EEA General Trades (2)

E.E. Austin & Son staffing plan for their company on this project looks as shown in the above figure. It includes a President, Project Executive, Project Manager, Project Engineer, Superintendent and an Asst.

Superintendent. The lines on the figure show the relationship of who reports to whom. The Project Executive takes care of the administrative items. The Project Engineer is in charge of the typical engineering functions and the Project Manager is in charge of RFI's and submittals. The superintendents are responsible for different field duties.

On this project, the management staff (P, PE, PM, PE) is located at the home office, which is just a few minutes away. The field staff (superintendents and carpenters) is stationed at the jobsite in the existing adjacent building. Typically, the management staff visits the site 2-3 times a week for progress meetings, safety inspections and conflict resolution.

## Site Plan

The site plan along with phasing diagrams for Phases I, II & III are in **Appendix B**

The site for the Saint Vincent Health Center Addition is located between two existing hospital structures. The Hardner Building, located north of the site, is the Medical Office Building for Saint Vincent. The Existing Hospital building is also constricting the site for the new Infill building between the Hardner and existing hospital building. The new addition is designed to connect the two existing buildings, add additional operating and patient rooms along with replacing the central plant for the MEP services for the entire complex.

The property line is the whole block of the Saint Vincent complex. The boundaries of construction are the fenced in area by the site work access on 23th Street. There are no field office trailers on site because of the importance of space to work. Saint Vincent has generously made room for everyone's field office space in the existing Hardner building (electric and utilities included). There are no temporary utilities that are provided by the CM, all is done by Saint Vincent and the existing buildings surrounding the site. There is a dumpster pick-up near the site access on 23<sup>rd</sup> Street there is little area for material laydown. Materials and equipment are held in warehouses, if possible, until they are needed.

There are multiple places to park all around the complex for worker parking. Patient walk patterns will not be able to be on site because of the new temporary connecting corridor, which will block the front of the hospital from the construction work. The only place where pedestrian patterns could be a concern is on 23<sup>rd</sup> Street. The site is fenced off from pedestrians, but with trucks and equipment leaving and entering the site will have to watch out for other cars, although this street usually is not busy. Workers need to be cautious of pedestrians walking on the sidewalk.

## Project Schedule Summary

The project summary schedule is in Appendix C

The following project summary schedule is based off a more detailed schedule provided by EE Austin & Son, Inc., the construction manager on the project. The site work consists of demolishing the existing connecting corridor (Phase I) and then constructing the new emergency entrance. There is also civil work done during this time dealing with sanitary and storm lines. Following Phase I work is the construction of the temporary connecting corridor (Phase II).

After Phase II is complete, starts the substructure which includes excavation and constructing the foundations along the existing hospital buildings (phase III). The superstructure is a steel frame with composite metal decking and follows the substructure of the building. Since actual construction on this project is only starting Phase 1, this schedule isn't 100% certain. The start of Phase 3 (the main Infill Building itself) won't be started until next May. The interior design of this space is not even developed yet so the actual project finish date is unknown. I had to estimate on the schedule of the interior work and finishes for Phase 3 which I guessed would end around the start of July, 2012.

## **Building Systems Summary**

### **MEP System:**

#### **Central Plant (lower Level):**

The new boiler plant will serve the existing hospital and for future expansion. A new chiller plant will serve this addition and be set up for future expansion. The Central Plant will leave room for even more possible future expansions. The control system will be an automated system. All systems described will be designed with the intent of reaching the LEED "Silver" Certification.

#### **Steam systems:**

The Steam System will have five (5) 350hp boilers including piping and accessories. It will include all valves for future additions to the steam system at this time. There will be space left for two additional 350 hp boilers, including valves for the future addition to the steam system at this time.

The system will have a new flue stack routed up along the existing North building. System shall include steam header, feed water, surge tank, chemical treatment, blow down separator, water softeners, flue gas economizer, ventilation, temperature controls, ect. All systems shall be sized for the addition of a future boiler.

There will be new piping through the new addition and connected to the existing mains located in the ceiling space of the lower level of the existing building.

Heating water will be supplied by two steam-to-water heat exchangers; one standby. The heating/reheat system will be served by two variable speed, based mounted, pumps; one pump will run while the other remains standby. Each floor will have an independent, direct return piping arrangement.

#### **Chilled water/Condenser water:**

Build a new chiller plant to serve this addition and future additions. Provide a new two cell cooling tower on the new ground floor roof. Provide sound attenuating louvered screen wall.

New cooling tower pumps & chilled water pump package shall include headers, valves, drives, controls, and provisions for future additions to the system. The pump packages are located in the lower level chiller room.

Provide (2) 750 ton centrifugal chillers/pumps to the chiller plant. (Adequate space will be left in the Plant for an additional 750 ton chiller and an additional cell to the cooling tower on the roof to serve the future. Size piping for future additional chilled water load.)

#### **Ventilation:**

Provide a new dedicated ventilation system in Chiller and Boiler rooms. The Chiller Room will be built to meet ASHRAE Guideline 15. The Boiler Room shall include combustion air fans and a general exhaust system. System will provide intake and relief louvers associated with the chiller, boiler ventilation systems and the central storage HVAC unit. There will be ventilation and exhaust

ductwork and sound attenuating louvers to serve new generators. They will route the generator exhaust up along the new East stair tower.

#### **Building Automation System (BAS):**

The existing Control System will be upgraded and include a new web based system. Upgrade will include replacement of existing controllers, cabling, new Application and Data Server, graphics, and owner training. The new boiler system, chiller/tower system, generator/ fuel system, HVAC units, exhaust fans, unit heaters, cabinet unit heaters, and all other new mechanical and electrical systems shall be connected to the BAS system. A new temperature control air compressor shall be provided, sized to serve new and existing systems.

#### **Plumbing:**

The Plumbing system will rework the existing hospital storm and sanitary sewer systems that currently discharge to the city sewers located on 24<sup>th</sup> Street. It will route new gravity sewers to the north and connect to new sanitary and storm stubs.

A new storm sump located in the lower level will serve an underfloor drain tile system and footing drains. A new sanitary ejector will serve the lower level floor drains and misc. plumbing fixtures. The new additions ground, first, and future floors storm and sanitary sewers will flow by gravity to the west side of the site.

A new domestic water, fire, and gas service will enter the new addition on the west side. The backflow preventers and meters shall conform to local requirements. The new system will extend and connect the new water and gas service to the existing main within the existing hospital. Also, it will extend a new water service to the MOB building.

The steam to water domestic hot water heaters will be added to the Central Plant to serve the new addition and back feed to serve the existing hospital. These (3) units are sized to serve the future additions and will be connected to the existing piping system.

#### **Medical gases:**

All medical gases and vacuum units will be upgraded to allow for increased capacity. This will include a new medical vacuum, anesthesia evacuation and medical air pumps that will be added to the existing system. Nitrous oxide & nitrogen tank systems will be further evaluated. The existing bulk oxygen tank will remain.

#### **Fuel oil:**

New fuel oil tanks/pumps/filter/piping serving the new generators and boiler will standby fuel needs. This equipment will be placed in new addition and allow for expansion of central plant.

#### **Fire Protection:**

Close coordination will be required between the City, the Owners Insurance Underwriter and the Design team. A new fire service will serve the existing hospital, this addition, and the Medical office building.

A new electric fire pump will serve the new addition and existing facility. There will be standpipes with floor control valve and drain in each stair tower that shall serve each floor. They will be extending a new fire line to serve the existing Hardener Building. They will also extend a new fire line to connect into the existing fire main located in the existing hospital.

The system will provide fire dept. connections, fire pump test header, and indicating valve. Relocate existing fire dept connections impacted by this project. The lower level will be fully sprinkled to Ordinary Hazard Group 2.

#### **Electrical System Description:**

The existing hospital is served by two 36KV primary services. Each service originates from separate substations. There are two 5MVA transformers that serve the hospital. Both transformers are energized and share the load of the hospital via a 4160V main-tie-main switchgear lineup in the lower level of the existing facility. The existing maximum load served by the two transformers is 4.4MVA.

Normal Power service for the addition will be an extension of the existing main-tie-main 4160V switchgear located in the lower level of the existing facility. A single 4160V feeder will be serve a medium voltage load interrupter switchgear lineup located in the lower level of the addition. The four feeder switches in this switchgear will serve the two new 1500KVA double ended unit substations. Space will be left in the lower level of the addition for a future new 4160V vacuum circuit breaker line up. This future 4160V gear shall be installed when the 5MVA transformers are replaced.

#### **Emergency Power for the Hospital:**

The new addition shall include two new 1000KW generators and new paralleling switchgear. The parallel switchgear was sized to include the addition of one future 1000KW generator.

#### **Building Envelope & Façade:**

*The Specifics on the building envelope are still being developed*

Most will be 8" CMU with rigid insulation & a 2" stone veneer. Some places will be aluminum siding panels, and some brick veneer to match the adjacent Harder Building. Masonry is not load bearing; they are for the veneer.

#### **Lighting System:**

*Design is only up to building enclosure. Therefore this system is not designed yet.*

#### **Roofing system:**

The Roofing system of the Saint Vincent Medical Center Infill Building is composed of W18x35 & W10x12 beams, W24x55 & W18x40 Girders. The roof structure will be steel composite decking with a concrete roof. This roof is designed to be the possible 3<sup>rd</sup> floor in the future, with columns of the existing structure sized for the expansion of 3 additional floors in the future.

#### **Structural system:**

The structural system for the Saint Vincent Health Center Infill Building consists of a steel frame structure supported by deep foundations. The current roof/future third floor along with the ground and first floors are framed with a 4" concrete slab on a 2" composite steel metal deck spanning between composite wide



flange steel framing. Steel beams and girders carry gravity loads to steel columns supported on concrete caissons. Special design features include transfer girders located on the roof / future 3<sup>rd</sup> floor to create large open spaces at the new operating rooms, steel bents cantilevering 40' at the front entry, and permanent drilled soldier pile and lagging walls to support deep excavations adjacent to existing buildings.

### **Sustainability Features:**

*Requesting more information on this topic.*

This project is a LEED certified project with the hope of attaining a Silver certification. The structure of the building is designed with the possibility of adding 3 additional floors in the future. New columns would line up with the existing column below them. These columns are sized larger than needed for the 3 story structure but are designed that way for the possibility of a 3 story addition.

There will also be solar shades to block some of the sun's rays from overheating the building.

In the basement of this new building, they are putting in a new state of the art Central MEP Plant that will replace the entire MEP services for the entire complex of buildings. This plant will be more efficient than the complex's existing one.

### **Demolition:**

There will be demolition during Phase II. Phase II will be demolishing the existing connecting corridor between the two existing buildings. This building is masonry brick with no harmful materials.

### **Excavation Support:**

The type of excavation support system being used is soldier piles & lagging. Some of these piles will be permanent near the existing building. Dewatering systems will be used if needed.

## Project Cost Evaluation

### **Actual Building Cost:**

Phase II and III of the Saint Vincent Health Center project have yet to be bid out because the design is not fully developed. The main building, the Infill Building, is only designed up to the enclosure. None of the interior is designed. No rooms, hallways, lighting, etc. has been design, which means it hasn't been bided on yet. The project team believes the total project cost will be approximately \$45 million.

Producing a major building system cost report is hard to do without having a detailed and accurate estimate on this project. All system estimates are in the tables and are giving in total cost and cost per square foot.

**PCS Estimated Cost:**

Back in February, PCS (Project and Construction Services, Inc.) did an estimate based on the early preliminary drawing, narratives, emails and verbal instructions. There have been changes to the designs to vary the cost estimate but this was Saint Vincent's rough estimate.

<b>PCS Schematic Design Estimate</b>							
Division	Building Component		Cost per SF	Shell Only 104,660 SF	Cost per SF	Total, w/Fit-out 104,660 SF	
1	General Conditions			See Below		See Below	
2	Demo & Site Work		\$6.50	\$680,070	\$6.50	\$680,070	
3	Excavation and Foundations		\$23.02	\$2,409,639	\$23.02	\$2,409,639	
4	Structural Systems		\$22.45	\$2,349,803	\$22.45	\$2,349,803	
5	Exterior Wall, Door & Glass systems		\$15.64	\$1,637,120	\$15.64	\$1,637,120	
6	Thermal & Moisture Protection		\$9.83	\$1,029,204	\$9.83	\$1,029,204	
7	Rough Carpentry & Misc. Metals		\$2.10	\$219,851	\$4.46	\$466,289	
8	Interior Wall, Door & Glass systems		\$2.64	\$276,400	\$16.37	\$1,713,150	
9	Floor, Wall & Ceiling Finishes		\$0.55	\$57,100	\$12.36	\$1,293,214	
10 - 12	Fixed Equipment & Specialties		\$0.00			\$580,510	
14	Conveying Systems (Future)			Not Included		Not Included	
15	Mechanical Systems						
	- Plumbing		\$4.59	\$480,488	\$17.49	\$1,831,005	
	- Fire Protection		\$0.84	\$88,124	\$4.82	\$504,881	
	- H.V.A.C.		\$9.58	\$1,002,600	\$67.45	\$7,059,567	
16	Electrical Systems		\$12.17	\$1,273,299	\$51.63	\$5,403,384	
		%	Cost per SF	Shell Only	Cost per SF	Total, w/Fit-out	
Subtotal All Trades Work			\$109.91	\$11,503,698	\$257.58	\$26,957,836	
General Conditions for Divisions 2 thru 16		9.00%	\$9.89	\$1,035,333	\$23.18	\$2,426,205	
Contractor Overhead and Profit for Div 2 thru 16		5.00%	\$5.99	\$626,952	\$14.04	\$1,469,202	
Escalate to Midpoint of Construction; Start 3/1/11		6.21%	\$7.82	\$818,220	\$18.32	\$1,917,421	
Contingency: Design, Estimating, Bidding		8.00%	\$10.69	\$1,118,736	\$25.05	\$2,621,653	
LEED Silver Premium		3.00%	\$4.33	\$453,088	\$10.14	\$1,061,770	
<b>Total Probable Construction Cost:</b>			Cost per SF	\$148.63	\$15,556,026	\$348.31	\$36,454,087

**D4 Project Estimate: Appendix D**

Appendix D has the detailed D4 cost Evaluation. The D4 adjusted estimate wasn't close to the estimated project cost before adjusting the square foot cost due to the time difference. This could be because Saint Vincent's new addition will be a large part of new operating rooms which cost tremendously more than the typical patient room.

<b>D4 Cost Estimation Building Comparison Info</b>		
<b>Project Name</b>	<b>Saint Vincent Health Center</b>	<b>Emergency &amp; Med-Surgical Pavilion</b>
Project Cost	Estimated \$45 Mil	\$30,555,440.00
Building Size (SF)	104,660	111,871
Site Size (SF)	Approx. 300,000	621,166
Building Use	Medical	Medical
Bid Date	1/1/2011	4/23/2003
Number of Floors	3 (1 below ground)	2
Projected Location	Erie, PA	NJ - Other

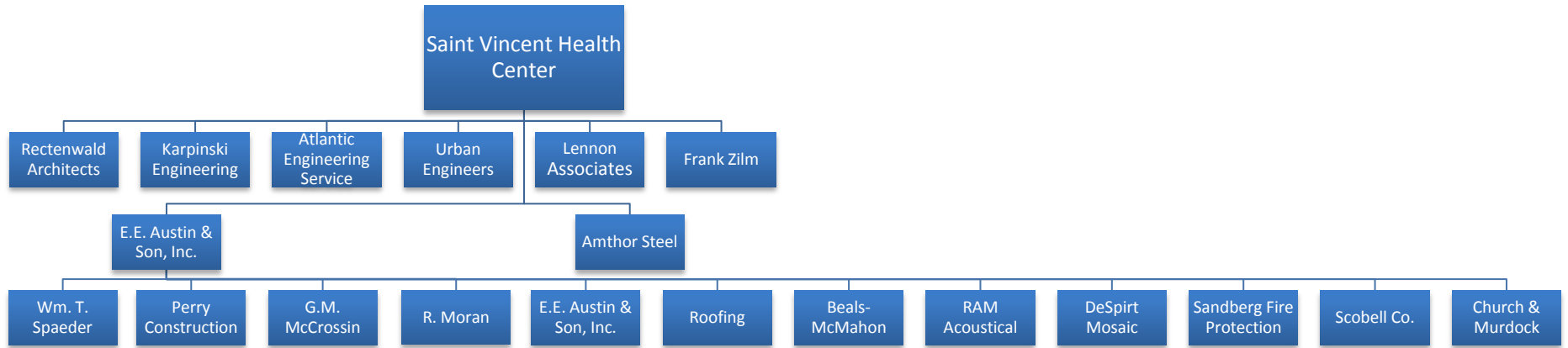
**RS Means 2010 Cost Estimate: Appendix D**

To develop an RS Means building cost estimate, RS Means – Cost Works online service was used. RS Means does not have an accurate building type to account for a Medical hospital with the same building systems as the Saint Vincent Health Center. SVHC has a whole floor of high technology operation rooms along with state of the art patient rooms. SVHC structural system is also sized for the future upward expansion, so the cost is higher than the typical two story hospital. No RS Means building type encompasses all of those systems so it was not expected to produce an accurate building cost estimate for this type of project. This RS Means estimate is nearly \$20 million less than the approximate estimate of \$45 million.

# Appendix A

## Saint Vincent Health Center Infill Building Organization Chart

9/27/2010



*Only Phase 1 Contracts with Construction Manager E.E. Austin & Son, Inc. shown*

# Appendix A

9/28/2010

## Saint Vincent Health Center Infill Building Contract Details

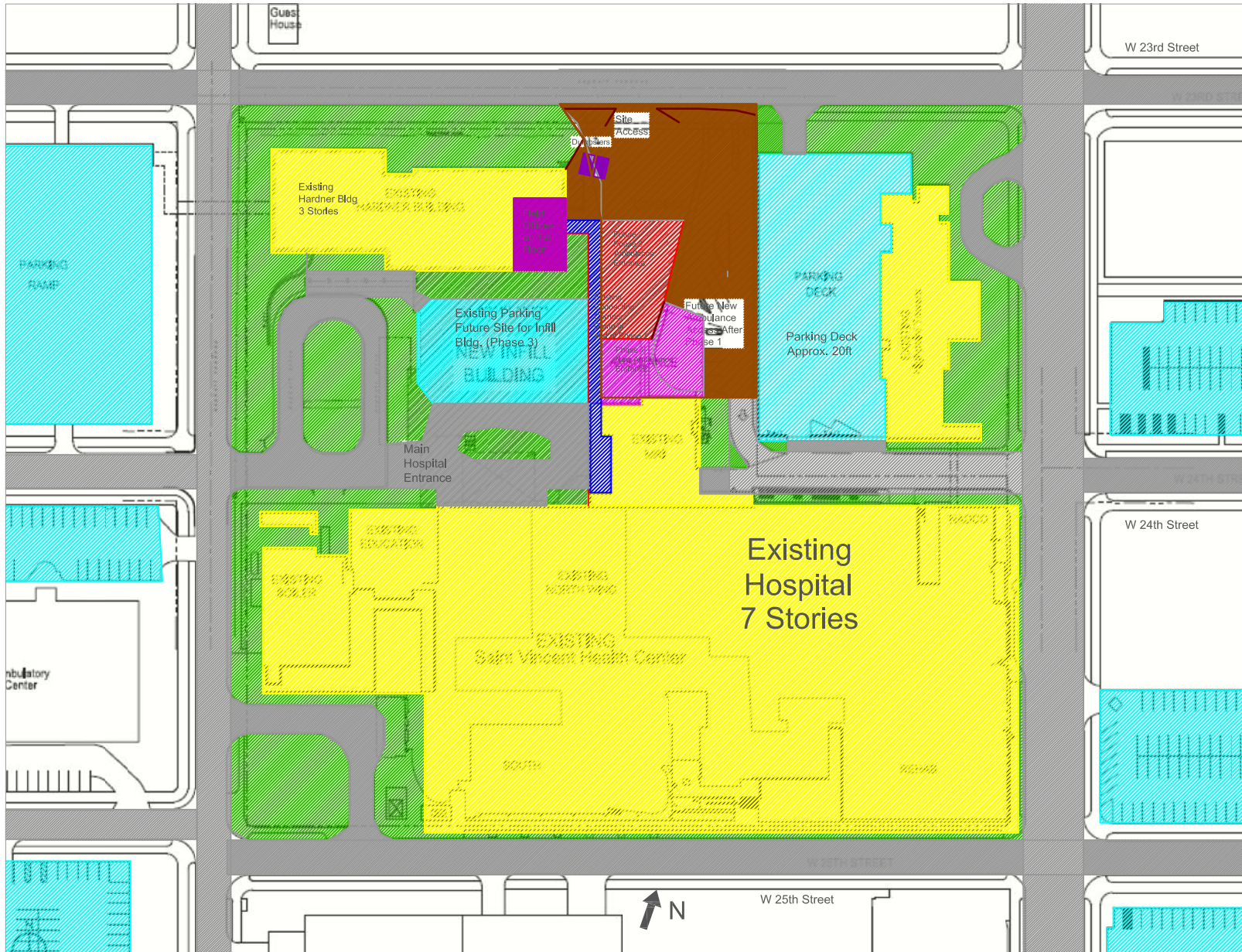
Role	Firm	Contact	Contract Type	Selection Process	Bonds Required	Insurance Required
<b>Owner</b>	Saint Vincent Health Center	Paul Matters				BR
<i>Contract with</i> <b>Architect</b>	Rectenwald Architects	Ken Hartsfield, A.I.A.	AIA B101, Lump Sum Fee for Services	Already contracted for master planning, continued contract to this project	?	WC, GL, PL
<i>Contract with</i> <b>Structural Engineer</b>	Atlantic Engineering Service	Andrew Verrengia, P.E.	?		?	WC, GL, PL
<b>Mechanical Engineer</b>	Karpinski Engineering	Ray Hoon, P.E.	?		?	WC, GL, PL
<b>Electrical Engineer</b>	Karpinski Engineering	Jim Cicero, P.E.	?		?	WC, GL, PL
<b>Civil Engineer</b>	Urban Engineers	John Morris	?		?	WC, GL, PL
<b>ED Consultant</b>	Lennon Associates	?	?		?	?
<b>OR Consultant</b>	Frank Zilm	Frank Zilm	?		?	?
<b>Structural Steel</b>	Amthor Steel	Terry Carrera	Lump Sum	Negotiated to place steel mill order	?	WC, GL, A, U
<b>Construction Manager</b>	E.E. Austin & Son, Inc.	Chuck Jenkins	Construction Management, Cost of Construction + % Fee	Proposal, interview, presentation	Payment & Performance Bond	WC, GL, A, U
<i>Contract with</i> <b>Ph. 1 Concrete Contractor</b>	Perry Construction	Rob Doyle	Lump Sum	Lowest Qualified Competitive Bid (LQCB)	None	WC, GL, A, U
<b>Ph. 1 Site Utilities</b>	Wm T. Spaeder	Steve Spaeder	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Earthwork, Flatwork, General Trades</b>	E.E. Austin & Son, Inc.	Ken Sherwin	Lump Sum (T&M for Earthwork)	LQCB	None	WC, GL, A, U
<b>Ph. 1 Caissons, Shoring</b>	G.M. McCrossin	Russell Kohler	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Masonry</b>	R. Moran Co.	Rick Moran	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Roofing</b>	<i>Not selected yet</i>		Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Studs, Drywall, Acoustical</b>	RAM Acoustical Corp.	Daryl Pitzer	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Tile &amp; Terrazo</b>	DeSpirt Mosaic & Marble Co.	Bill Buscaglia	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Painting</b>	Beals-McMahon	Mickey McMahon	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Sprinkler Contractor</b>	Sandberg Fire Protection	Rich Olson	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Plumbing Contractor</b>	Scobell Co.	Mark Klimow	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 HVAC Contractor</b>	Wm T. Spaeder	Steve Spaeder	Lump Sum	LQCB	None	WC, GL, A, U
<b>Ph. 1 Electrical</b>	Church & Murdock Electric	Jess Murdock	Lump Sum	LQCB	None	WC, GL, A, U

### Insurance Key

BR - Builders' Risk  
 WC - Worker's Compensation & Employer Liability  
 GL - Commercial General Liability  
 PL - Professional Liability (Errors & Omissions)  
 A - Automotive  
 U - Commercial Umbrella



# Appendix B

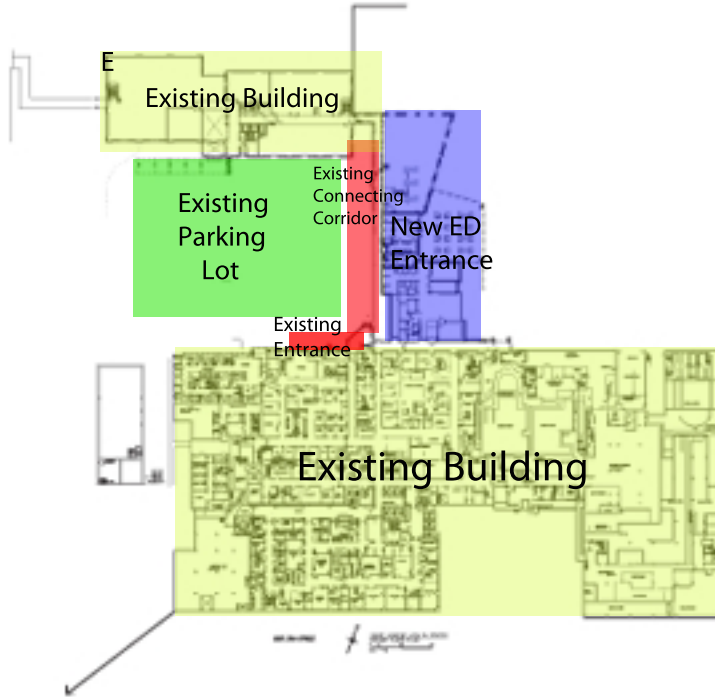


## Legend

- Existing Bldgs
- Site Work Area
- Parking
- Grass
- Paving
- Phase 1 Work
- Phase 2 Work
- Phase 3 Work

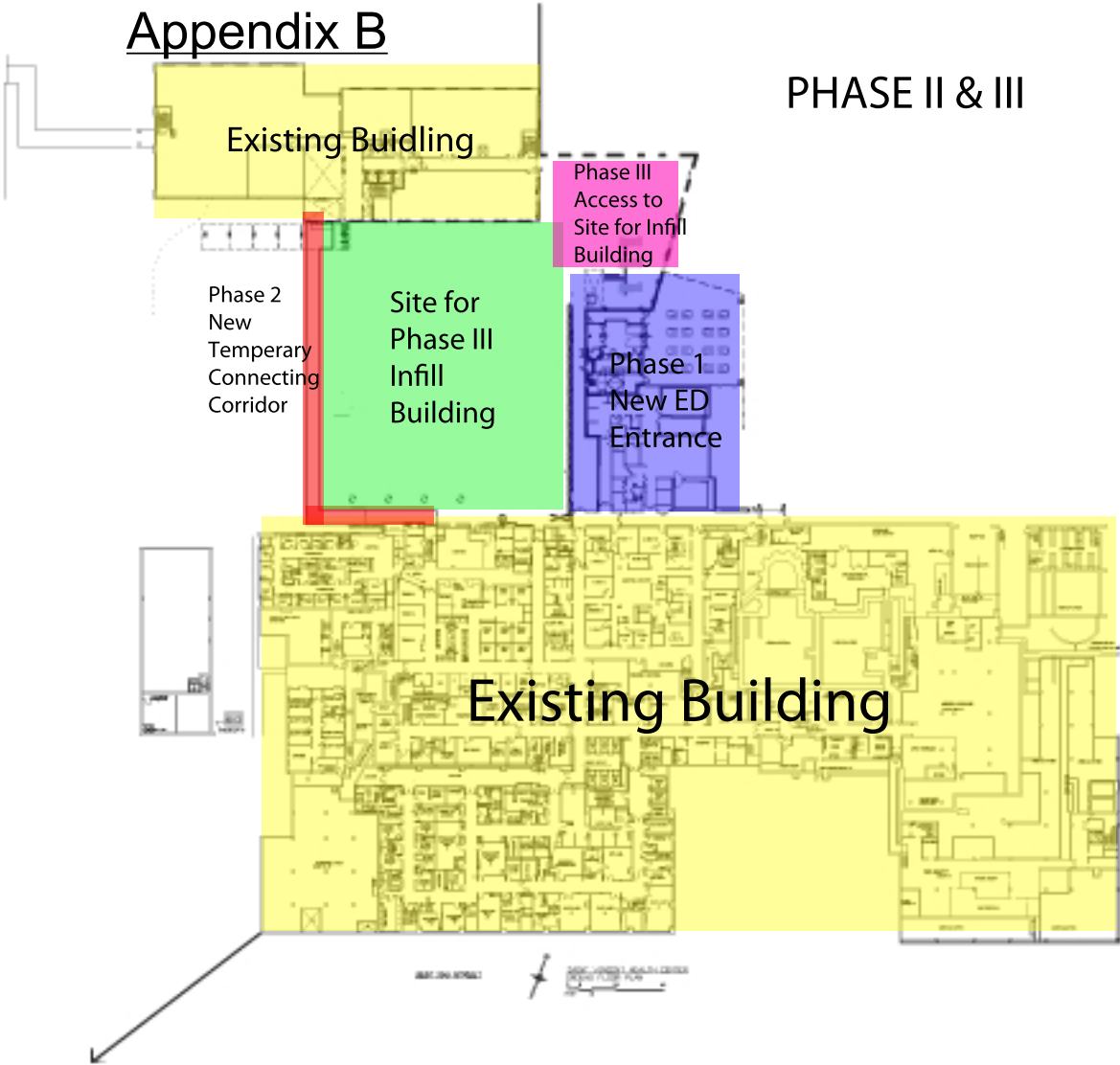
Tyler Jaggi -CM 10/4/10	Infill Bldg -Existing Conditions Saint Vincent Health Center	SP100
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# Appendix B PHASE I



# Appendix B

## PHASE II & III



Existing Building

Phase III  
Access to  
Site for Infill  
Building

Phase 2  
New  
Temporary  
Connecting  
Corridor

Site for  
Phase III  
Infill  
Building

Phase 1  
New ED  
Entrance

Existing Building

# Appendix C

# Summary Schedule

ID	Task Name	Duration	Start	Finish	2011												2012																	
					May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
1	Compete Civil Design	8 days	Mon 5/3/10	Wed 5/12/10	■ <b>Compete Civil Design</b>																													
2	Planning/Program	28 days	Mon 5/3/10	Wed 6/9/10	■ <b>Planning/Program</b>																													
3	Ph. 1 CD Bldg & Site	44 days	Mon 5/3/10	Thu 7/1/10	■ <b>Ph. 1 CD Bldg &amp; Site</b>																													
4	Subcontract Bid/Award	65 days	Wed 6/16/10	Tue 9/14/10	■ <b>Subcontract Bid/Award</b>																													
5	Start Ph. 1 work	0 days	Thu 6/24/10	Thu 6/24/10	6/24 ◆ <b>Start Ph. 1 work</b>																													
6	Demo Work	14 days	Thu 6/24/10	Tue 7/13/10	■ <b>Demo Work</b>																													
7	Sanitary & Storm lines	23 days	Wed 7/7/10	Fri 8/6/10	■ <b>Sanitary &amp; Storm lines</b>																													
8	Excavation & Shoring	38 days	Tue 8/10/10	Thu 9/30/10	■ <b>Excavation &amp; Shoring</b>																													
9	Ph.1 Concrete Work	54 days	Fri 9/17/10	Wed 12/1/10	■ <b>Ph.1 Concrete Work</b>																													
10	Steel Structure	15 days	Fri 9/24/10	Thu 10/14/10	■ <b>Steel Structure</b>																													
11	Exterior Shell	29 days	Fri 9/17/10	Wed 10/27/10	■ <b>Exterior Shell</b>																													
12	Ph.1 Interior Construction	52 days	Wed 10/6/10	Thu 12/16/10	■ <b>Ph.1 Interior Construction</b>																													
13	Start Ph.2 Construction	0 days	Fri 12/17/10	Fri 12/17/10	12/17 ◆ <b>Start Ph.2 Construction</b>																													
14	Ph.2 Caissons	22 days	Mon 12/20/10	Tue 1/18/11	■ <b>Ph.2 Caissons</b>																													
15	Ph.2 Site work	33 days	Wed 1/19/11	Fri 3/4/11	■ <b>Ph.2 Site work</b>																													
16	Ph.2 Basement Walls	20 days	Mon 3/7/11	Fri 4/1/11	■ <b>Ph.2 Basement Walls</b>																													
17	Temp. Connector to Ext. Bldg	15 days	Mon 4/4/11	Fri 4/22/11	■																													
18	Phase 3 Preconstruction	301 days	Tue 6/15/10	Tue 8/9/11	■ <b>Phase 3 Preconstruction</b>																													
19	Start of Phase 3 Construction	0 days	Mon 5/9/11	Mon 5/9/11	5/9 ◆ <b>Start of Phase 3 Construction</b>																													
20	Ph.3 Excavation/Foundations	55 days	Mon 5/9/11	Fri 7/22/11	■ <b>Ph.3 Excavation/Foundations</b>																													
21	Ph.3 Foundation Walls	39 days	Mon 6/27/11	Thu 8/18/11	■ <b>Ph.3 Foundation Walls</b>																													
22	Steel Erection	61 days	Tue 8/2/11	Tue 10/25/11	■ <b>Steel Erection</b>																													
23	Pour Interior floor slabs	30 days	Wed 9/28/11	Tue 11/8/11	■ <b>Pour Interior floor slabs</b>																													
24	Exterior Enclosure	85 days	Wed 10/12/11	Tue 2/7/12	■ <b>Exterior Enclosure</b>																													
25	MEP Equipment Installed	45 days	Wed 10/19/11	Tue 12/20/11	■ <b>MEP Equipment Installed</b>																													
26	Windows	62 days	Wed 11/30/11	Thu 2/23/12	■ <b>Windows</b>																													
27	Roofing	40 days	Thu 12/29/11	Wed 2/22/12	■ <b>Roofing</b>																													
28	Water Tight Building	0 days	Thu 2/23/12	Thu 2/23/12	2/23 ◆ <b>Water Tight Building</b>																													
29	Interior Finishes	125 days	Tue 1/3/12	Mon 6/25/12	■ <b>Interior Finishes</b>																													
30	Occupancy	0 days	Tue 6/26/12	Tue 6/26/12	6/26 ◆ <b>Occupancy</b>																													


Project: Tech 1 Summary Schedul Date: Fri 9/24/10	Task		External Milestone		Manual Summary Rollup	
	Split		Inactive Task		Manual Summary	
	Milestone		Inactive Milestone		Start-only	
	Summary		Inactive Summary		Finish-only	
	Project Summary		Manual Task		Deadline	
	External Tasks		Duration-only		Progress	

# Appendix D

D4 Cost Estimate							
Emergency & Med-Surgical Pavilion					Saint Vincent Health Center		
					Estimated Total Cost By:		
Code	Division Name	%	Sq. Cost	Adj. Cost/Sf	%	Cost/SF	Adj Cost/SF
00	Bidding Requirements	9.79	26.75	40.125	\$4,405,500	\$2,799,655	\$4,199,483
	Bonds & Certificates	1.03	2.81	4.209	\$462,311	\$293,680	\$440,520
	General Conditions	8.76	23.94	35.909	\$3,944,113	\$2,505,466	\$3,758,199
01	General Requirements	8.45	23.08	34.620	\$3,802,500	\$2,415,553	\$3,623,329
	Alternates/Alternatives	2.45	6.70	10.056	\$1,104,550	\$701,656	\$1,052,485
	Constr. Facilities & Temp. Controls	1.74	4.74	7.114	\$781,432	\$496,398	\$744,598
	Contract Closeout (Trade Cleanup)	1.16	3.16	4.734	\$520,022	\$330,340	\$495,510
	Summary Of Work (Insurance)	3.10	8.48	12.713	\$1,396,380	\$887,040	\$1,330,559
03	Concrete	4.36	11.91	17.865	\$1,962,000	\$1,246,501	\$1,869,751
	Cast-In-Place	4.36	11.91	17.860	\$1,961,680	\$1,246,142	\$1,869,213
04	Masonry	1.32	3.61	5.415	\$594,000	\$377,823	\$566,734
	Unit	1.32	3.61	5.416	\$594,866	\$377,884	\$566,826
05	Metals	5.39	14.73	22.095	\$2,425,500	\$1,541,642	\$2,312,463
	Fabrications	0.56	1.54	2.313	\$254,046	\$161,381	\$242,071
	Structural Framing	4.83	13.19	19.784	\$2,173,017	\$1,380,392	\$2,070,588
06	Wood & Plastics	4.21	11.50	17.250	\$1,894,500	\$1,203,590	\$1,805,385
	Architectural Woodwork	3.52	9.61	14.414	\$1,583,188	\$1,005,707	\$1,508,561
	Rough Carpentry	0.69	1.90	2.843	\$312,219	\$198,335	\$297,502
07	Thermal & Moisture Protection	8.19	22.36	33.540	\$3,685,500	\$2,340,198	\$3,510,296
	EIFS	0.22	0.60	0.898	\$98,673	\$62,681	\$94,022
	Exterior Wall Assemblies	5.18	14.15	21.225	\$2,331,264	\$1,480,917	\$2,221,375
	Fireproofing	0.54	1.46	2.193	\$240,902	\$153,031	\$229,547
	Firestopping	0.10	0.28	0.417	\$45,839	\$29,119	\$43,678
	Joint Sealers	0.11	0.31	0.459	\$50,441	\$32,042	\$48,063
	Membrane Roofing	1.83	5.00	7.504	\$824,215	\$523,576	\$785,364
	Waterproofing & Dampproofing	0.20	0.56	0.838	\$92,046	\$58,471	\$87,707
08	Doors & Windows	4.28	11.68	17.520	\$1,926,000	\$1,222,429	\$1,833,643
	Doors/Frames/Hardware	1.34	3.65	5.481	\$601,980	\$382,403	\$573,604
	Glazing	2.89	7.88	11.827	\$1,299,098	\$825,241	\$1,237,862
	Special Doors	0.05	0.14	0.208	\$22,827	\$14,501	\$21,751
09	Finishes	12.52	34.20	51.300	\$5,634,000	\$3,579,372	\$5,369,058
	Metal Stud/Gypsum Board	8.57	23.42	35.131	\$3,858,669	\$2,451,189	\$3,676,783
	Painting/Wall Coverings	0.91	2.49	3.741	\$410,892	\$261,016	\$391,524
	Resilient Flooring/Carpet	1.76	4.80	7.200	\$790,858	\$502,386	\$753,579
	Stone Flooring/Tile	1.28	3.49	5.229	\$574,329	\$364,838	\$547,257
10	Specialties	0.41	1.11	1.665	\$184,500	\$116,173	\$174,259
	Comp. & Cubicles/Curtain & IV Track	0.34	0.92	1.374	\$150,881	\$95,846	\$143,769
	Fire Protection	0.02	0.04	0.064	\$7,069	\$4,491	\$6,736
	Partitions	0.05	0.13	0.201	\$22,091	\$14,033	\$21,050
	Wall & Corner Guards	0.01	0.02	0.025	\$2,702	\$1,717	\$2,575
14	Conveying Systems	1.23	3.36	5.040	\$553,500	\$351,658	\$527,486
	Elevators	1.23	3.36	5.042	\$553,748	\$351,764	\$527,646
15	Mechanical	27.37	74.76	112.140	\$12,316,500	\$7,824,382	\$11,736,572
	Basic Materials & Methods	3.93	10.73	16.090	\$1,767,279	\$1,122,650	\$1,683,975
	Fire Protection	1.44	3.93	5.892	\$647,156	\$411,100	\$616,651
	Plumbing & HVAC	22.01	60.11	90.163	\$9,903,317	\$6,291,003	\$9,436,505
16	Electrical	12.48	34.09	51.135	\$5,616,000	\$3,567,859	\$5,351,789
	Basic Materials & Methods	11.76	32.12	48.179	\$5,291,897	\$3,361,636	\$5,042,454
	Testing	0.72	1.97	2.950	\$324,001	\$205,819	\$308,729
	<b>Total Building Costs</b>	<b>100.00</b>	<b>273.13</b>	<b>409.695</b>	<b>\$45,000,000</b>	<b>\$28,585,786</b>	<b>\$42,878,679</b>



# Appendix D

RS Means	Square Foot Cost Estimate Report	Cost Works
Estimate Name:	<b>Saint Vincent Health Center</b>	
	Erie , PA	
Building Type:	Hospital, 2-3 Story with Face Brick with Concrete Block Back-up / Steel Frame	
Location:	ERIE, PA	 <p>Costs are derived from a building model with basic components. Scope differences and market conditions can cause costs to vary significantly.</p>
Story Count:	3	
Story Height (L.F.):	14	
Floor Area (S.F.):	104660	
Labor Type:	Union	
Basement Included:	Yes	
Data Release:	Year 2010 Quarter 3	
Cost Per Square Foot:	\$231.95	
Building Cost:	\$24,275,500	

		% of Total	Cost Per S.F.	Cost
<b>A Substructure</b>		<b>3.00%</b>	<b>\$6.54</b>	<b>\$684,000</b>
A1010	Standard Foundations		\$1.96	\$205,500
A1030	Slab on Grade		\$1.51	\$158,000
A2010	Basement Excavation		\$1.12	\$117,500
A2020	Basement Walls		\$1.94	\$203,000
<b>B Shell</b>		<b>15.10%</b>	<b>\$32.78</b>	<b>\$3,431,000</b>
B1010	Floor Construction		\$18.52	\$1,938,000
B1020	Roof Construction		\$2.01	\$210,000
B2010	Exterior Walls		\$8.68	\$908,500
B2020	Exterior Windows		\$1.49	\$156,000
B2030	Exterior Doors		\$0.29	\$30,000
B3010	Roof Coverings		\$1.79	\$187,000
B3020	Roof Openings		\$0.01	\$1,500
<b>C Interiors</b>		<b>19.30%</b>	<b>\$41.72</b>	<b>\$4,366,000</b>
C1010	Partitions		\$7.88	\$825,000
C1020	Interior Doors		\$10.29	\$1,077,000
C1030	Fittings		\$0.82	\$85,500
C2010	Stair Construction		\$1.22	\$128,000
C3010	Wall Finishes		\$6.93	\$725,000
C3020	Floor Finishes		\$8.59	\$899,500
C3030	Ceiling Finishes		\$5.98	\$626,000
<b>D Services</b>		<b>54.80%</b>	<b>\$118.74</b>	<b>\$12,427,000</b>
D1010	Elevators and Lifts		\$4.77	\$499,500
D2010	Plumbing Fixtures		\$27.08	\$2,834,000
D2020	Domestic Water Distribution		\$11.26	\$1,178,500
D2040	Rain Water Drainage		\$0.48	\$50,500
D3010	Energy Supply		\$4.07	\$425,500
D3020	Heat Generating Systems		\$2.78	\$291,000
D3030	Cooling Generating Systems		\$5.91	\$618,500
D3090	Other HVAC Systems/Equip		\$35.42	\$3,707,000
D4010	Sprinklers		\$2.75	\$288,000
D4020	Standpipes		\$0.67	\$70,500
D5010	Electrical Service/Distribution		\$0.86	\$89,500
D5020	Lighting and Branch Wiring		\$14.10	\$1,475,500
D5030	Communications and Security		\$4.63	\$484,500
D5090	Other Electrical Systems		\$3.96	\$414,500
<b>E Equipment &amp; Furnishings</b>		<b>7.80%</b>	<b>\$16.80</b>	<b>\$1,758,000</b>
E1020	Institutional Equipment		\$10.28	\$1,075,500
E1090	Other Equipment		\$0.00	\$0
E2020	Moveable Furnishings		\$6.52	\$682,500
<b>F Special Construction</b>		<b>0.00%</b>	<b>\$0.00</b>	<b>\$0</b>
<b>G Building Sitework</b>		<b>0.00%</b>	<b>\$0.00</b>	<b>\$0</b>
SubTotal		100%	\$216.57	\$22,666,000
Contractor Fees (General Conditions,Overhead,Profit)		5.00%	\$10.83	\$1,133,500
Architectural Fees		2.00%	\$4.55	\$476,000
<b>Total Building Cost</b>			<b>\$231.95</b>	<b>\$24,275,500</b>