2010

GLOBAL VASCULAR INSTITUTE
BUFFALO, NY

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CONSTRUCTION MANAGEMENT
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TECHNICAL ASSIGNMENT ONE

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MADISON SMITH – CM

EXECUTIVE SUMMARY

Technical Assignment One is designed to document the existing conditions of the Global Vascular Institute site, as well as determining what may have affected the design and construction of the project. The Global Vascular Institute (GVI) project consists of three major construction parts. These include the main core building, a link between the new GVI building and the existing Buffalo General Hospital, and an addition to the adjacent central plant. The core building of this project is to be 10 stories and 450,000 SF of new construction. The link is 4 stories and 14735 SF and the central plant is 2 stories and 8627 SF. The difficulty of this project is that it is located at the center of Buffalo, NY, a highly dense urban area. This new construction is occurring in the medical section of the city, right across the street from a major hospital (Buffalo General Hospital) so all surrounding facilities must remain open and functional throughout the construction process.

Major criteria that were assessed in this assignment include a project summary schedule, a project cost evaluation, and an existing conditions site layout. The project summary schedule shows a general breakdown of major events in the preconstruction and preconstruction of the project. It depicts the project starting construction in September 2009 and being substantial complete by December 2011. The project cost evaluation uses online estimating software to compare the projected cost of the project to that of industry standards. The existing conditions site layout along with the local conditions summary shows a general breakdown of what currently exists on the site and what type of factors affect the complexity of the project. An analysis of the client's information and goals for the project are also summarized, as well as the construction team's methods to complete these goals, which is explained in the project delivery system organization and staffing plan charts.

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PROJECT SCHEDULE SUMMARY:

*See APPENDIX A for the Project Summary Schedule.

The Global Vascular Institute project consists of three major components which include the main GVI core building, the link between the GVI core and the existing Buffalo General Hospital, and additions to the adjacent central power plant. All three of these components are sequenced to be constructed at the same time. The first phase of the project is to demolish the existing 4 story community mental health clinic that is on the core building site. This phase was completed prior to the approval from the City of Buffalo and the State of New York to perform the new construction of GVI. With the site cleared and receiving the notice to proceed, the next major phase was excavation work. This was scheduled to begin in September 2009 for the core building and link components and to be completed by November 2009. Foundation work was planned to begin during the excavation phase and continue till February 2010. This consists of piles, piles caps, grade beams. The foundation work for the central plant though would not begin until January 2010. The first major milestone after the notice to proceed was to mobilize the crane for the erection of steel on January 11, 2010 with the process of the superstructure construction being scheduled to top off in August 2010. During this phase, enclosure work began in July with the milestone of a dry building to be accomplished in November 2010. Rough-In and finish work began in June and will continue until May 2011. After testing/balance and the punchlists being performed from September 2011 to October 2011, substantial completion of the building is set for October 2011. Turnover and Occupancy of the building is set for December 2011. See APPENDIX A for the Project Summary Schedule.

BUILDING SYSTEMS SUMMARY:

BUILDING SYSTEMS CHECKLIST		
YES	**NO**	**WORK SCOPE**
X		Demolition Required
X		Structural Steel Frame
X		Cast in Place Concrete
X		Precast Concrete
X		Mechanical System
X		Electrical System
	X	Masonry
X		Curtain Wall
X		Support of Excavation

Table 1: Building Systems Checklist

SUSTAINABLE FEATURES

The Global Vascular Institute project will not pursue a LEED Certification. It will however be including several sustainable features in to the project. These features include:

- Lockers/showers for the staff
- Bike racks
- Energy efficiency for the equipment
- Heat recovery (all rooms except the Operating and Procedure rooms)
- Lighting control
- Natural lighting utilizing the atrium and link
- Green roofing (Healing Garden and 2nd floor patio)
- Sun shades (east and west sides of the building)

DEMOLITION

The existing Buffalo General Hospital mental health facility located on the GVI site was demolished prior to the approval of City and State officials to construct the new Global Vascular Institute. Once approvals were obtained, some additional demolition is required. None of the demolition requires the removal of asbestos or lead paint.

CORE BUILDING

For the core GVI site, this will include concrete sidewalks, curbing, retaining walls, concrete pads, brick pavers, asphalt pavement, landscaping, sewer structures and piping, light poles, and conduit.

LINK

For the link between the new GVI building and the existing Buffalo General Hospital, demolition is required on a segment of the Buffalo General Hospital. This link is connecting to Buffalo General Hospital at a side entrance to the building. A few major items to be removed from this area will be an existing stairs, elevator and elevator shaft. In addition, the exterior wall from the first level to the third floor level will also be removed. This consists of an aluminum window system and E.I.F.S. and brick exterior walls. This area can be seen highlighted in red in figure 1. Demolition is also required on the sub-basement and basement levels. Some additional materials that need to be removed throughout the entire link area include CMU partitions, doors, windows, carpeting, acoustic ceiling tiles, wall mounted signs, terrazzo flooring, HVAC equipment, plumbing utilities, vents, fans, interior/exterior concrete slabs, and concrete curbs.

Figure 1: 1st Floor Demolition Plan for Link

CENTRAL PLANT

There is also demolition required at two exterior locations around the central plant; the Northeast corner and the Southwest corner. Materials to be removed include sidewalks, silo foundations, concrete stairs and retaining walls, light fixtures, mechanical equipment, asphalt paving, electrical utilities, overhead door, and glass/aluminum storefront system.

STRUCUTRAL STEEL FRAME

The structural system of GVI is a structural steel framing system. The structural steel framing system will be built up on a pile/pile cap and grade beam foundation. The building will be constructed with an 8 x 8 column grid. Figure 2 shows a typical framing floor plan. Table 2 shows the size of the structural steel beams used on each floor. (More sizes than those noted are used on each floor. Only a general breakdown is shown.) The column sizes used per floor are much more varied than the beams sizes. The columns are spliced every 2 floors.

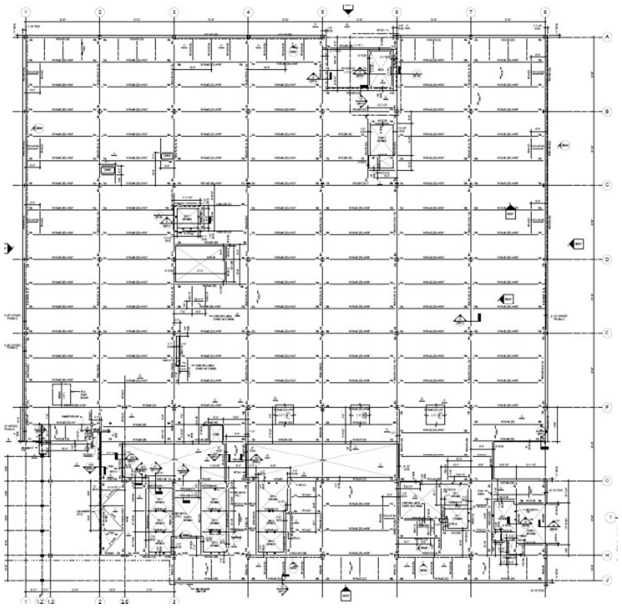


Figure 2: Typical Framing Plan

Structural Steel Beam Table	
Steel Beam Size	**Level**
W18x40	Basement
W16x31	1
W18x40	2
W18x40 W33x118	3
W18x40 W21x44	4
W21x44	5
W27x84	6
W33x118 W21x44	7
W21x44 W27x94	8
W18x35 W24x62	9
W16x31 W18x50	Roof

Table 2: Steel Beam Schedule

A moment frame system is used along the perimeter of the building. Braced frames are used along the gridlines. Figure 3 shows one of the exterior framing elevations.

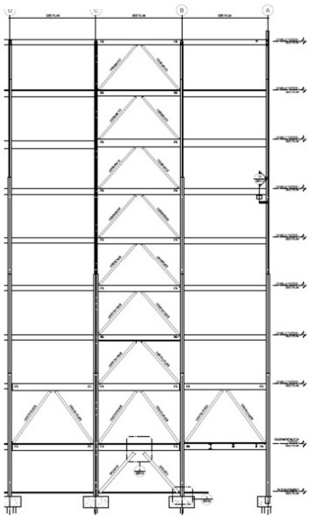


Figure 3: Braced Frame of Gridline 1

Composite steel floor slabs are used throughout the building. As shown in Figure 4. They consist of 4 ½" NWC on 3" deep, 18 Gage composite steel deck.

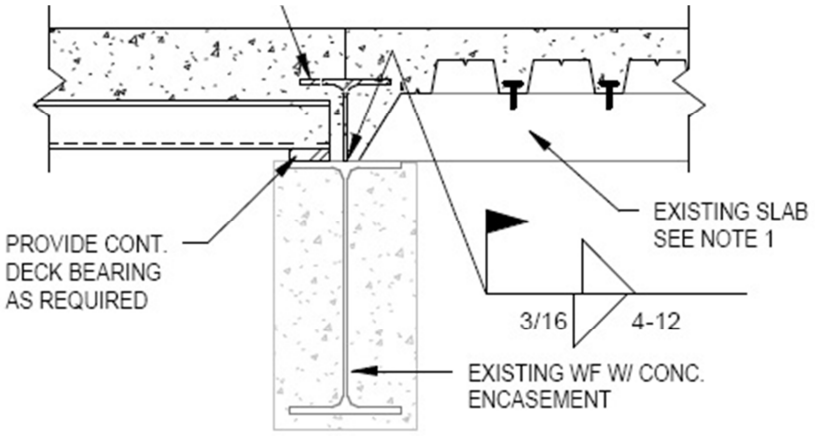


Figure 4: Typical Composite Floor Slab

CAST IN PLACE CONCRETE

Cast-in-place concrete will be reinforced and used for pile caps, foundation walls, grade beams, SOG, concrete tunnel from GVI core building to the central plant and in composite deck construction.

PRECAST CONCRETE

Precast concrete panels are used on the exterior of the building on ground level as can be seen in figure 5a, 5b, and 5c. The areas of precast concrete are highlighted in green. There is also a small area of precast concrete panels located on the south exterior elevation as well. The panels will be finished with a radius texture with a 3/16" grout joint between panels. Detail of the finish texture can be seen in figure 6.

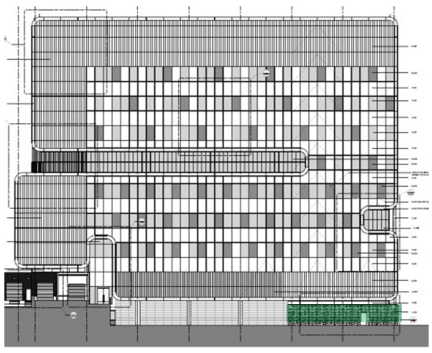


Figure 5a: East Exterior Elevation

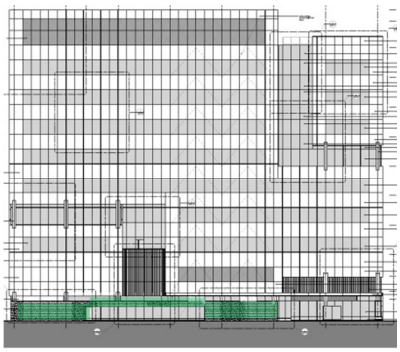


Figure 5b: North Exterior Elevation

Figure 5c: West Exterior Elevation

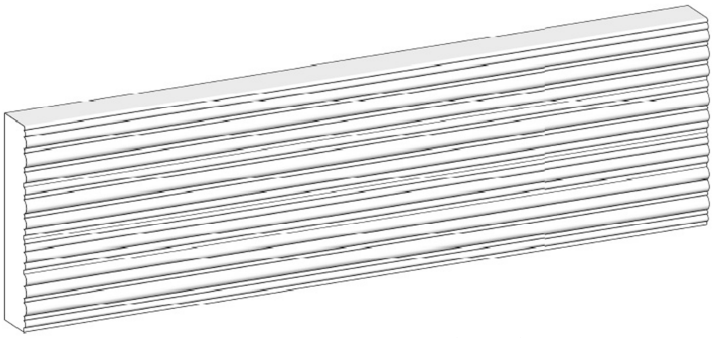


Figure 6: Precast Finish Detail

MECHANICAL SYSTEM

There are two mechanical rooms located in the core GVI building. They are located from the basement level to the 2nd level, as well as from the 8th level to the roof, as can be seen in figure 7. The mechanical system type used is Variable Air Volume (VAV) and single zone. These systems will be supplied by air-handling units located in the basement and in the Penthouse mechanical room. Table 3 describes the location of each AHU, where it supplies to and the type of system that AHU uses.

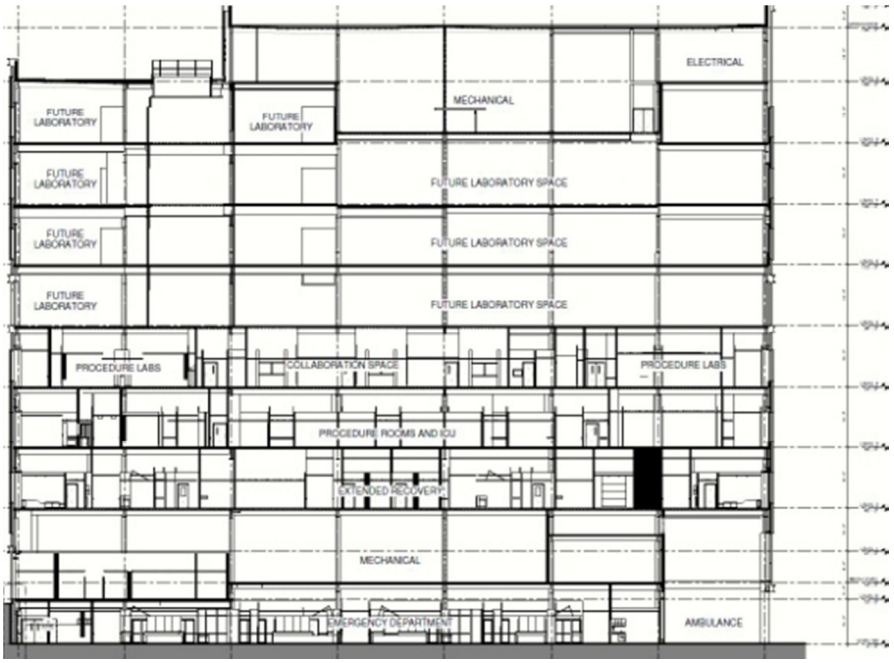


Figure 7: Floor Usage Section View

The central plant will house the required 3 chillers and 2 cooling towers for GVI. Two of the existing chillers will be replaced with two nominal 2400 ton dual compressor centrifugal chiller systems and two of the existing cooling towers will be replaced with two nominal 7200gpm cooling towers. To distribute chilled water to GVI, a new 10'x10' concrete tunnel will be constructed from the central plant to GVI. The tunnel will connect to GVI

at the Basement Level Mechanical room. A 16" chilled water supply pipe will run through this tunnel to supply GVI with chilled water with a 24" return pipe to the central plant. The central plant will supply high pressure steam to GVI as well. No new boilers will new to be added or replaced. The two existing boilers discharge 85psi steam and are 60,000lb/h and 30,000lb/h. The tunnel will also house the 18" high pressure steam main to GVI. At the basement mechanical room, the main will split into a 12" main to supply Buffalo General Hospital and an 8" main to supply GVI.

Mechanical Systems Breakdown			
AHU No.	**Service Area**	**Location**	**System Type**
OR-1	Procedure Room Level 2, 3	Basement MER	VAV
OR-2	Procedure Room Level 2, 3	Basement MER	VAV
OR-3	Procedure Room Level 2, 3	Basement MER	VAV
HOTEL/ICU-1	Hotel & ICU Level 1, 2, 3	Basement MER	VAV
HOTEL/ICU-2	Hotel & ICU Level 1, 2, 3	Basement MER	VAV
ED-1	Emergency Department Level SB	Basement MER	VAV
ED-2	Emergency Department Level SB	Basement MER	VAV
CORE-1	South Core Levels SB, B,1,2,3	Basement MER	VAV
LINK-1	Link Levels B, 1,2,3	Roof of Link	VAV
ELEV-P-1	Elevator Shaft Pressurization	Penthouse MER	Single Zone
ELEV-P-2	Elevator Shaft Pressurization	Penthouse MER	Single Zone
ELEV-P-3	Elevator Shaft Pressurization	Penthouse MER	Single Zone
ELEV-P-4	Elevator Shaft Pressurization	Penthouse MER	Single Zone
STAIR-1	Stairwells	Penthouse MER	Single Zone
STAIR-2	Stairwells	Penthouse MER	Single Zone
STAIR-3	Stairwells	Penthouse MER	Single Zone
ANIM-1	Vivarium	Penthouse MER	VAV
ANIM-2	Vivarium (standby)	Penthouse MER	VAV
LAB-1	Wet Labs	Penthouse MER	VAV
LAB-2	Wet Labs	Penthouse MER	VAV
LAB-3	Wet Labs	Penthouse MER	VAV
OFF-1	Offices & Meeting Spaces	Penthouse MER	VAV
OFF-2	Offices & Meeting Spaces	Penthouse MER	VAV
OFF-3	Offices & Meeting Spaces	Penthouse MER	VAV
CORE-2	South Core Levels 4,5,6,7,8	Penthouse MER	VAV

Table 3: Mechanical Systems Breakdown

A zoned sprinkler system by floor will be used. There will be a floor control valve with tamper switch and flow switch for each riser and for each zone. The entire building will consist of a wet standpipe and sprinkler system.

ELECTRICAL SYSTEM

NGrid supplies the electrical service for GVI. A new substation will be constructed at the central plant. It will consist of four 5000/6650 kVA AA/FA oil-filler power transformers and two double-ended switchgear assemblies rated 5kV, 1200A, 350 MVA fault rating.

For the GVI building, two double-ended 480Y/277 V unit substations will be constructed. One will be located in the main electrical room on level B and the other will be in the penthouse electrical room. Refer to figure 7 for locations. Each unit substation will be 480V, 3 phase, 4 wire, plus ground. This will then be further transformed down to 208Y/120 V, 3 phase, 4 wire, plus ground. This lower voltage will mostly be used for receptacles and miscellaneous equipment.

Three new 2,000kW, 480V stand-by rated diesel generators will be installed in addition to the existing (1) 765kW Detroit Diesel, (2) 750kW Onan diesel, and (1) 500kW Caterpillar diesel generators.

CURTAIN WALL

The curtain wall system is comprised of Low-E glass and painted aluminum panels. The use of glass and aluminum are used in horizontal stripes around the building, as can be seen in figure 9. This system is used around all sides of the building. A section of the curtain wall is shown in figure 8. This composition is also used for the exterior of the Link.

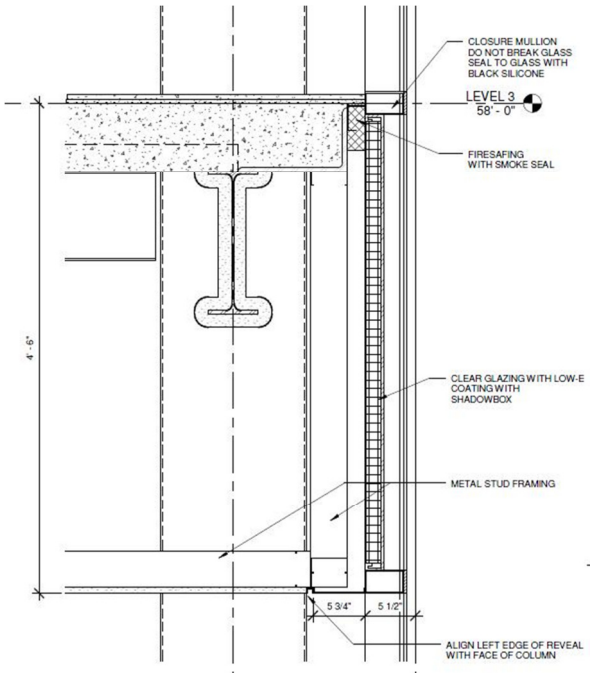


Figure 8: Wall Section of Curtain

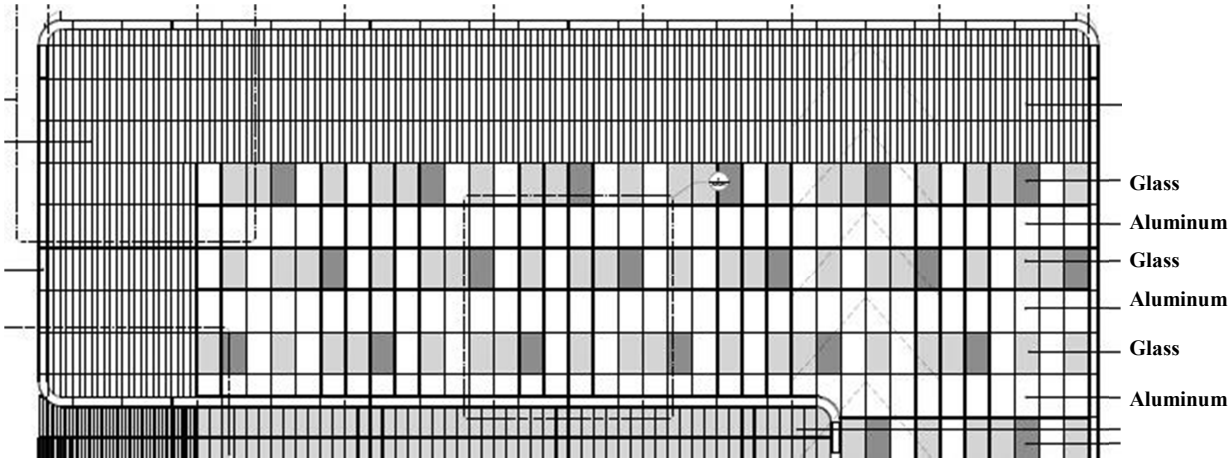


Figure 9: East Elevation Describing Curtain Wall Layout

SUPPORT OF EXCAVATION

A limited amount of excavation is required for GVI. The major foundation system used is piles which will just be driven down into the soil. Only one story of the building will be partially below grade. The type of support will be soldier piles with lagging. The location of the shoring is shown in figure 10, marked by the dashed green line.

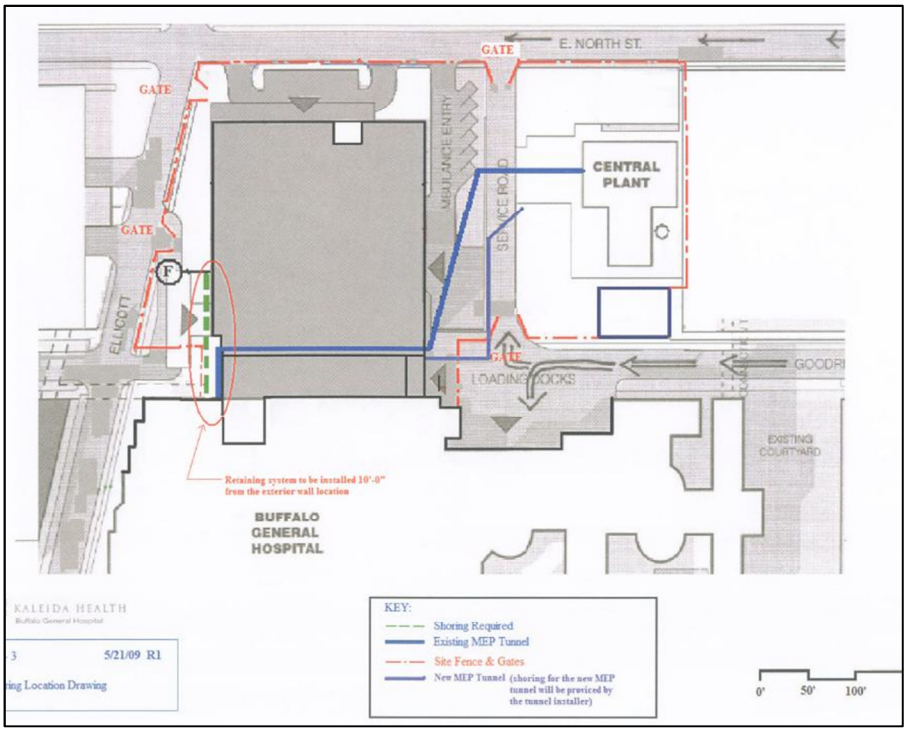


Figure 10: Shoring Layout

PROJECT COST ESTIMATE

The actual construction costs are based on the GMP calculations provided by Turner Construction Company. The amounts do not represent actual bid costs on the project but are reflective of the Design Development Budget.

PROJECT PARAMETERS

Square Footage of Building:	450,000 SF
Building Perimeter:	900 LF

CONSTRUCTION COST (Actual)

Actual:	$146,863,897
Per SF:	$309.45

TOTAL PROJECT COST

Actual:	$171,459,163
Per SF:	$381.33

MAJOR BUILDING SYSTEM COST ESTIMATE

BUILDING SYSTEM COST		
SYSTEM	**ACTUAL**	**COST/SF**
Concrete	$7,867,215	$16.58
Masonry	$301,009	$0.63
Metals	$19,628,663	$41.35
Wood & Plastics	$2,861,450	$6.03
Thermal & Moisture Protection	$3,709,845	$7.82
Doors & Windows	$18,277,446	$38.51
Finishes	$14,013,284	$29.53
Specialties	$1,874,294	$3.95
Equipment	$270,000	$0.57
Furnishings	$80,000	$0.17
Conveying Systems	$4,438,049	$9.35
Fire Suppression	$2,610,425	$5.50
Plumbing	$7,007,530	$14.77
Mechanical	$28,855,666	$60.80
Electrical	$25,453,347	$53.63
Earthwork	$5,170,685	$10.89
Exterior Improvements	$1,069,720	$2.25
Utilities	$799,738	$1.69
Transportation	$94,000	$0.20

Table 4: Building System Cost Breakdown

R.S. MEANS SQUARE FOOT ESTIMATE

***See APPENDIX B for RSMeans CostWorks 2010 Square Foot Cost Estimate Reports**

Actual:	$98,173,500
Per SF:	$207.40

D4COST ESTIMATE

***See APPENDIX C for D4Cost Parametric Estimate Report**

Actual:	$81,810,441
Per SF:	$172.83

COST COMPARISON

The compare the three estimates, the actual construction cost of the building will be used. The actual construction cost estimates do not include the cost of sitework, contingencies, allowances, and fees.

R.S. Means Comparison

The actual construction cost is approximately $48.6 million above the R.S. Means estimate, or approximately $100/SF more. Since the Global Vascular Institute is made up of three sections of construction, three separate estimates were performed in R.S. Means Costworks. The three sections include the main building of GVI, the link between GVI and the existing Buffalo General Hospital, and additions to the existing Central Plant adjacent to GVI. The reason for such a large difference in the actual and calculated cost estimates is due to a variety of assumptions made in the estimates.

Core Building Estimate

For the core building estimate, the building type hospital (4-8 story) is selected for R.S. Means. The actual GVI is more than just a hospital. It is also a state of the art heart and vascular research center. R.S. Means does not have a building type that resembles this type of construction other than "hospital." Also, R.S. Means does not accurately estimate hospitals that are over 8 stories. The GVI project is 10 stories. The wall/framing type used for the estimate does not accurately match the actual type used for GVI. A "face brick common brick back-up / concrete frame" was used in R.S. Means but the actually type for GVI is a curtain wall system consisting of low-E glass and aluminum panels.

Central Plant

For the central plant estimate, the building type selected in R.S. Means is factory (3 story). This does not accurately match the actual building type of the central plant which is more of an industrial power plant. The R.S. Means estimate does not include the replacement of new chillers and water towers in the central plant.

All of these differences contribute to a lower R.S. Means estimate. The R.S. Means Square Foot estimate is good to obtain just a general, "ballpark" estimate.

D4Cost Comparison

The actual construction cost is approximately $65,053,456 above the D4Cost Estimate or approximately $136.62/SF more. Three separate estimates were performed with the D4Cost Estimate software to obtain a complete construction estimate. Reasons for such a great difference in the actual construction cost and the D4Cost estimate were in part due to the fact that none of the case studies in the software are a perfect match to the Global Vascular Institute project. The GVI project is a very specific/unique project, so by comparing it to a general type hospital project will only give a general, wide based estimate. Also, as with the R.S. Means estimate, the cost of new chillers and cooling towers for the Central Plant were not included into the estimate, which will greatly reduce the overall estimate cost.

EXISTING SITE PLAN SUMMARY

Figure 11: Google Map Image of GVI Site and Surrounding Area

The site for the Global Vascular Institute is located at the center of multiple medical facilities in downtown Buffalo, NY. GVI is located directly north of the existing Buffalo General Hospital. Part of the construction of the GVI project is to create a 4 story link between the existing and new structure. The project is also two blocks north of the Roswell Park Cancer Institute which is a cancer research facility. Directly east of the GVI site is the Central Power Plant which supplies power to Buffalo General Hospital and will also supply power to GVI. Adjacent to the Central Plant and across the street (Ellicott St.) to the west of the GVI site are parking areas that are available to use during the construction of the project. See APPENDIX D for the existing conditions site plan.

LOCAL CONDITIONS

The Global Vascular Institute is located in the center of Buffalo, NY, in the medical district. This will cause some construction difficulty because Buffalo General Hospital must remain open and functional throughout the entire construction of GVI. Since the project is in a major city, obtaining an available skilled labor force for the construction will not be a problem.

Parking fortunately is not a major issue on the project because there is a parking deck located right across the street from the site. There is also an additional parking lot next the central plant that is owned By Kaleida Health, an owner of the building.

Buffalo, NY has mild summers with relatively low humidity. The winters however can be quite extreme. The project site is located very close the Lake Erie so during the winter months there is a high risk of "lake effect snow" which could cause huge amounts of snow fall in a very short amount of time. This could cause both time delays as well as causing structural issues if there are high snow loads on the structure before it has been fully constructed.

For construction below the water table, well points or cofferdams will be used to create dry conditions.

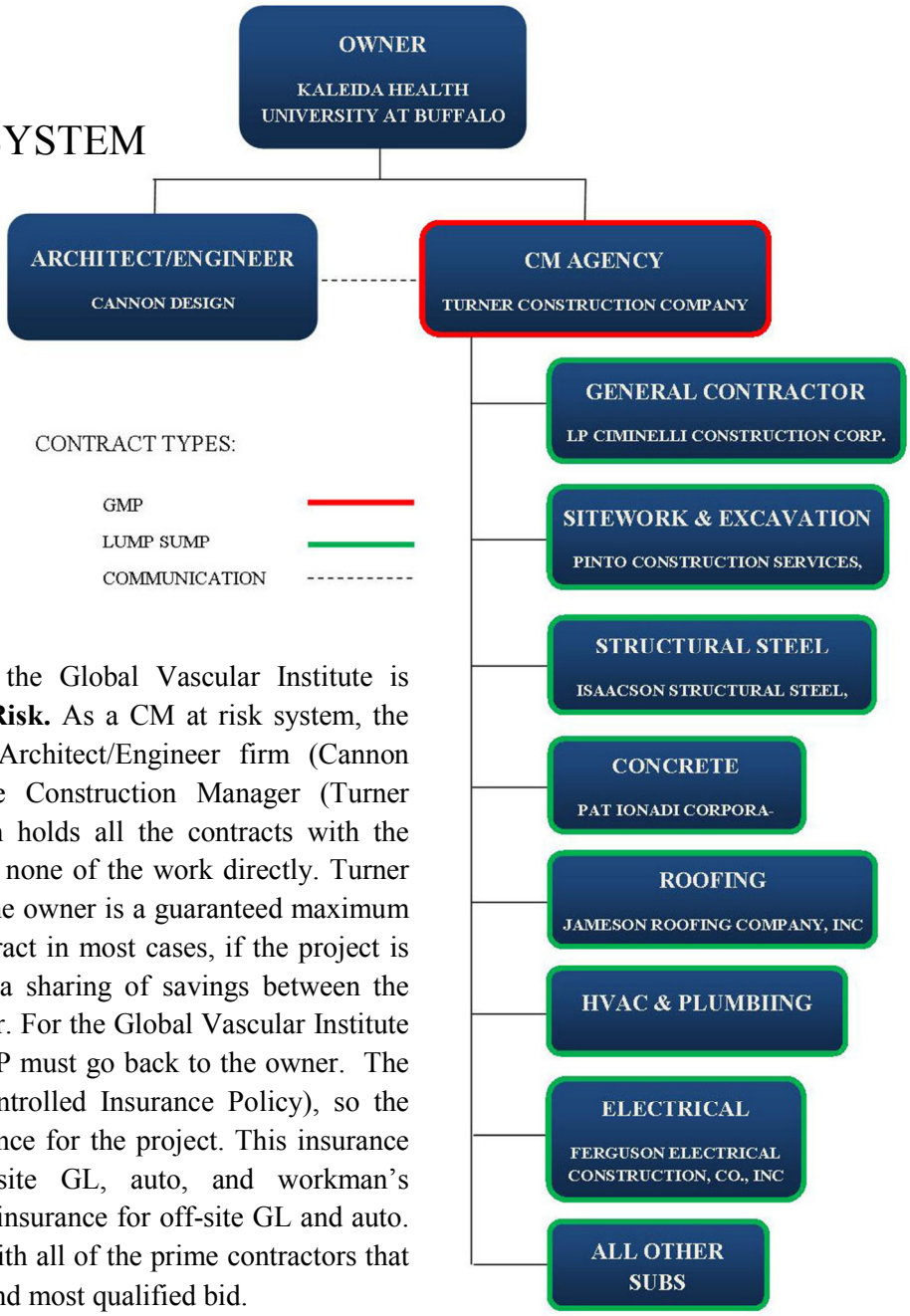
CLIENT INFORMATION

Kaleida Health and the University at Buffalo (UB) are co-owners of the Global Vascular Institute. Kaleida Health is the largest health care provider in Western New York. The largest hospital in its medical system is Buffalo General Hospital, which will become linked to the new GVI building. The University at Buffalo is state university located in Buffalo, New York and has medical department. Each owner will occupy 4 floors; Kaleida on the lower 4 and UB on the upper 4. Kaleida Health will be using the space for heart, vascular, and neurosurgery operations with an expanded emergency room. UB will have a clinical translational research center occupying its space. This will become part of the medical program at the University. Both of these owners required this new building for growth of their business and development of their technologies.

The cost and quality are of the upmost importance for both owners. The project is partially sate funded so staying on budget is vital. The quality is critical as well because this facility is being built for extremely detailed surgeries to be performed. The standards that are required for ventilation and vibration proof rooms are detrimental to the success of the building. The standards of safety are also very important for the construction of this project. There is a scheduled substantial completion date set for the end of December 2011 but this is not close-ended. This allows for safety to always remain a high priority.

There will be no phased occupancy of the building during the construction of the project. Both owners will move in to the building after substantial completion.

PROJECT DELIVERY SYSTEM



The project delivery method for the Global Vascular Institute is **Design-Bid-Build** with a **CM at Risk.** As a CM at risk system, the owner has a contract with the Architect/Engineer firm (Cannon Design) and a contract with the Construction Manager (Turner Construction). Turner Construction holds all the contracts with the prime contractors and will perform none of the work directly. Turner Construction's contract type with the owner is a guaranteed maximum price (GMP). For this type of contract in most cases, if the project is finished under the GMP, there is a sharing of savings between the owner and the construction manager. For the Global Vascular Institute though, any savings below the GMP must go back to the owner. The insurance is an OCIP (Owner Controlled Insurance Policy), so the owner will be providing the insurance for the project. This insurance will include builder's risk, on-site GL, auto, and workman's compensation. Turner will provide insurance for off-site GL and auto. Turner holds lump sum contracts with all of the prime contractors that were selected based on the lowest and most qualified bid.

Figure 12: Project Organizational Chart

STAFFING PLAN

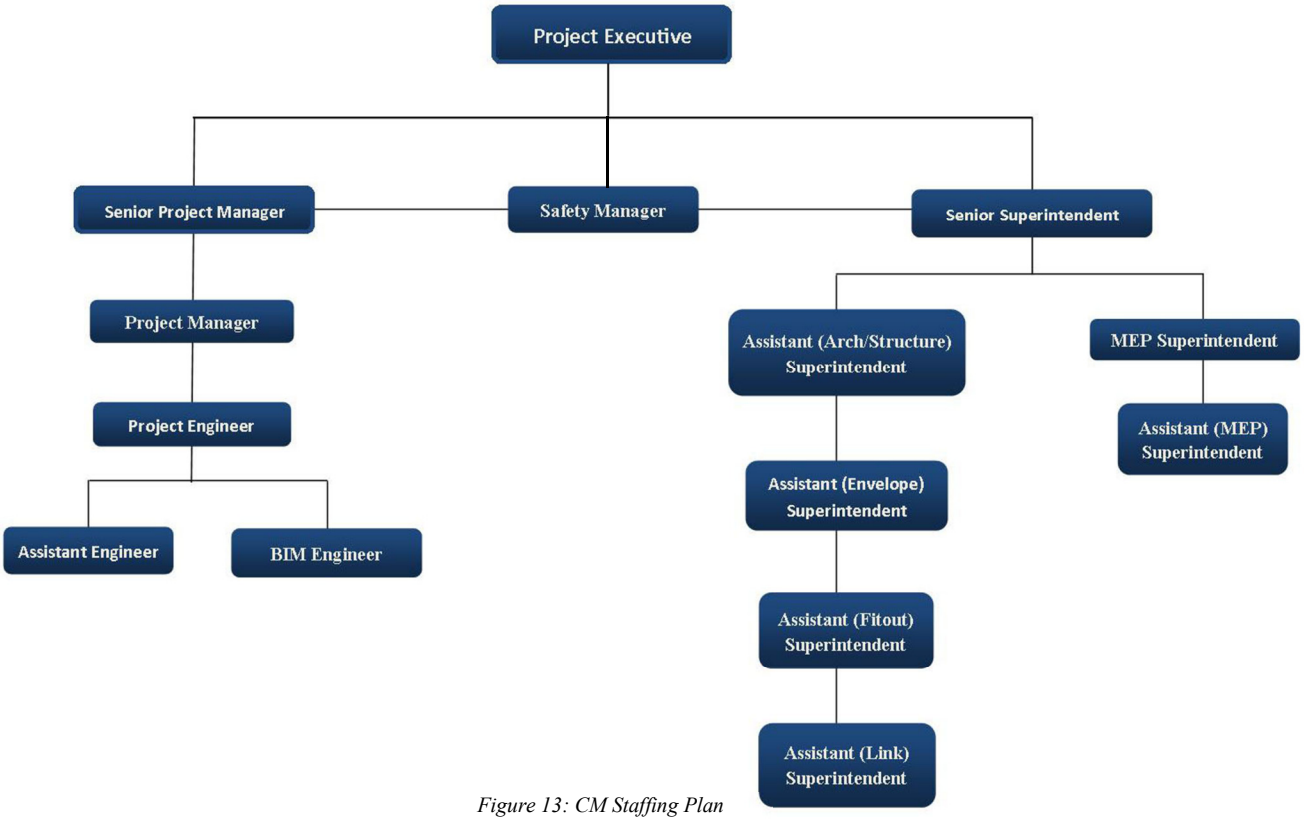
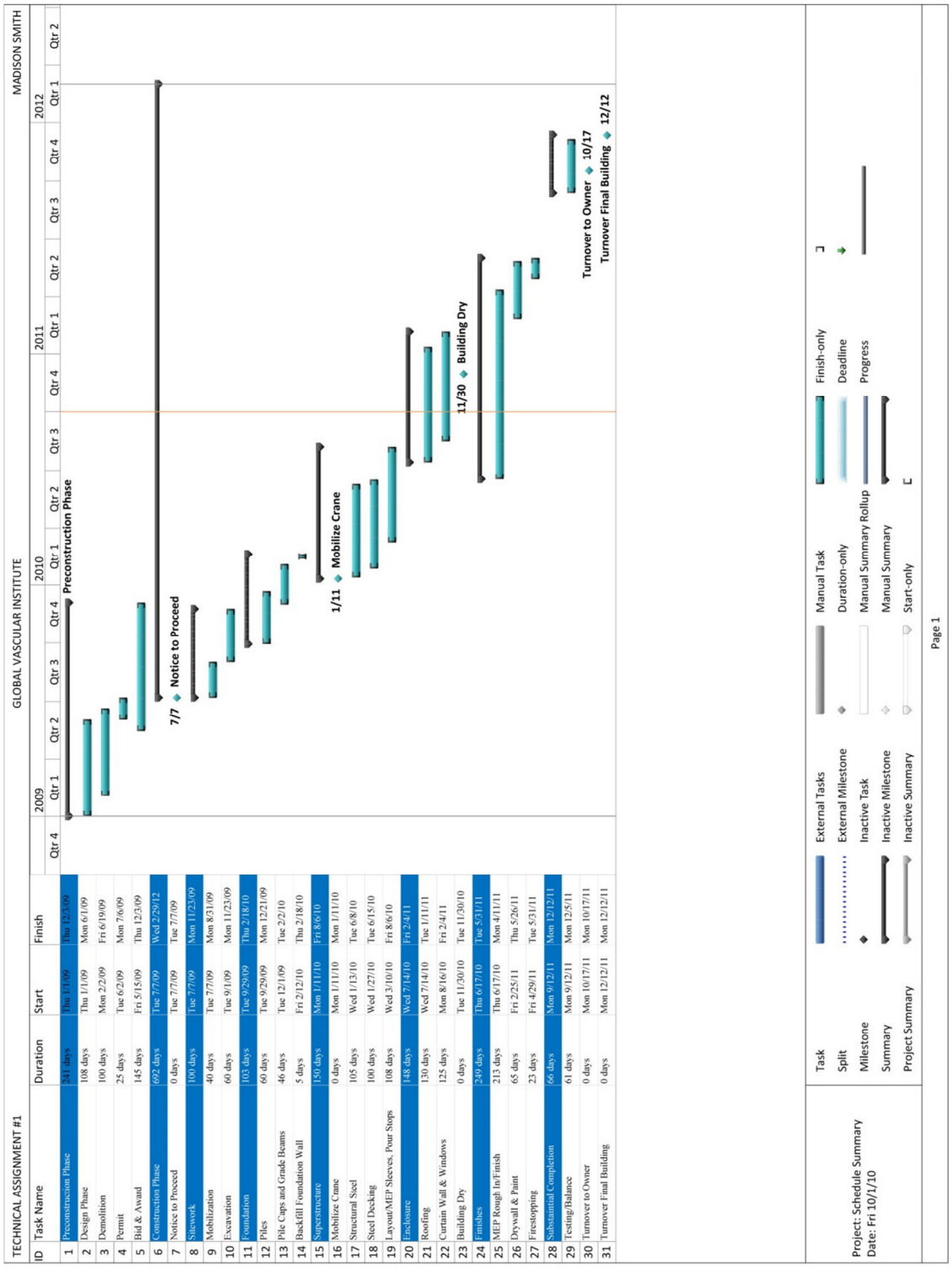


Figure 13: CM Staffing Plan

The organization of the staff for the Global Vascular Institute by Turner Construction is a traditional setup. It consists of three major staff divisions all reporting back to the project executive. The major divisions include a senior project manager, a safety manager, and a senior superintendent. Each of these divisions is then broken up further, as can be seen Figure #.

On this project, the project management staff is located in the Turner office. For this project, Turner was allowed to occupy offices during the duration of the construction, located in Buffalo General Hospital which is the existing hospital that the Global Vascular Institute will be connecting into. The field staff is located on the jobsite directly with the use of multiple field trailers. Since the management staff is located so closely to the jobsite, there is great communication between these two divisions. A safety manager is also involved on this project and has direct contact with both the management staff and the field staff, as well as with the project executive.

APPENDIX A: PROJECT SUMMARY SCHEDULE



ID	Task Name	Duration	Start	Finish
1	Preconstruction Phase	241 days	Thu 1/1/09	Thu 12/3/09
2	Design Phase	108 days	Thu 1/1/09	Mon 6/1/09
3	Demolition	100 days	Mon 2/2/09	Fri 6/19/09
4	Permit	25 days	Tue 6/2/09	Mon 7/6/09
5	Bid & Award	145 days	Fri 5/15/09	Thu 12/3/09
6	Construction Phase	692 days	Tue 7/7/09	Wed 2/29/12
7	Notice to Proceed	0 days	Tue 7/7/09	Tue 7/7/09
8	Sitework	100 days	Tue 7/7/09	Mon 11/23/09
9	Mobilization	40 days	Tue 7/7/09	Mon 8/31/09
10	Excavation	60 days	Tue 9/1/09	Mon 11/23/09
11	Foundation	103 days	Tue 9/29/09	Thu 2/18/10
12	Piles	60 days	Tue 9/29/09	Mon 12/21/09
13	Pile Caps and Grade Beams	46 days	Tue 12/1/09	Tue 2/2/10
14	Backfill Foundation Wall	5 days	Fri 2/12/10	Thu 2/18/10
15	Superstructure	150 days	Mon 1/11/10	Fri 8/6/10
16	Mobilize Cane	0 days	Mon 1/11/10	Mon 1/11/10
17	Structural Steel	105 days	Wed 1/13/10	Tue 6/8/10
18	Steel Decking	100 days	Wed 1/27/10	Tue 6/15/10
19	Layout/MEP Sleeves, Pour Stops	108 days	Wed 3/10/10	Fri 8/6/10
20	Enclosure	148 days	Wed 7/14/10	Fri 2/4/11
21	Roofing	130 days	Wed 7/14/10	Tue 1/11/11
22	Curtain Wall & Windows	125 days	Mon 8/16/10	Fri 2/4/11
23	Building Dry	0 days	Tue 11/30/10	Tue 11/30/10
24	Finishes	249 days	Thu 6/17/10	Tue 5/31/11
25	MEP Rough In/Finish	213 days	Thu 6/17/10	Mon 4/11/11
26	Drywall & Paint	65 days	Fri 2/25/11	Thu 5/26/11
27	Firestopping	23 days	Fri 4/29/11	Tue 5/31/11
28	Substantial Completion	66 days	Mon 9/12/11	Mon 12/12/11
29	Testing/Balance	61 days	Mon 9/12/11	Mon 12/5/11
30	Turnover to Owner	0 days	Mon 10/17/11	Mon 10/17/11
31	Turnover Final Building	0 days	Mon 12/12/11	Mon 12/12/11

APPENDIX B: R.S. MEANS COSTWORKS ESTIMATE REPORT

CORE BUILDING ESTIMATE

Edit the building parameter fields and then Calculate Building Cost

. Area (S.F.): 85000 - 345000	450000	
* Perimeter (L.F.):	900	
. Stories: 4 - 8	10	
. Story Height: 10.00 - 18.00	18	
* Contractor Fees:	0	%
* Architectural Fees:	0	%
* User Fees:	0.00	%

Hospital, 4-8 Story

Building Cost

Model:	Hospital, 4-8 Story with Face Brick with Structural Facing Tile / Steel Frame
Location:	BUFFALO, NY
Stories (Ea.):	10
Story Height:	18
Floor Area:	450,000
Basement:	Yes
Additive Cost:	$0.00
Cost per square foot:	$204.58
Building Cost:	$92,062,000.00

LINK ESTIMATE

Edit the building parameter fields and then Calculate Building Cost

. Area (S.F.): 85000 - 345000	14735	
* Perimeter (L.F.):	230	
. Stories: 4 - 8	4	
. Story Height: 10.00 - 18.00	15	
* Contractor Fees:	0	%
* Architectural Fees:	0	%
* User Fees:	0.00	%

Hospital, 4-8 Story

Building Cost

Model:	Hospital, 4-8 Story with Face Brick with Structural Facing Tile / Steel Frame
Location:	BUFFALO, NY
Stories (Ea.):	4
Story Height:	15
Floor Area:	14,735
Basement:	Yes
Additive Cost:	$0.00
Cost per square foot:	$298.24
Building Cost:	$4,394,500.00

CENTRAL PLANT ESTIMATE

Edit the building parameter fields and then Calculate Building Cost

. Area (S.F.): 17000 - 115000	8627	
* Perimeter (L.F.):	418	
. Stories: 2 - 3	2	
. Story Height: 10.00 - 18.00	18	
* Contractor Fees:	0	%
* Architectural Fees:	0	%
* User Fees:	0.00	%

Factory, 3 Story

Building Cost

Model:	Factory, 3 Story with Face Brick Common Brick Back-up / Steel Frame
Location:	BUFFALO, NY
Stories (Ea.):	2
Story Height:	18
Floor Area:	8,627
Basement:	No
Additive Cost:	$0.00
Cost per square foot:	$199.03
Building Cost:	$1,717,000.00

APPENDIX C: D4COST PARAMETRIC ESTIMATE REPORT

CORE BUILDING ESTIMATE

Case 1 - Baylor Regional Medical Center

Global Vascular Institute - Sep 2010 - NY - Buffalo

Prepared By:		Prepared For:	
	PageSoutherlandPage		
	3500 Maple Ave Suite 600		**100 High Street**
	Dallas, TX 75219		**Buffalo, NY 14203**
	Fax:		**Fax:**
Building Sq. Size:	**450000**	Site Sq. Size:	**1280664**
Bid Date:	**7/1/2009**	Building use:	**Medical**
No. of floors:	**10**	Foundation:	**PIL**
No. of buildings:	**1**	Exterior Walls:	**CUR**
Project Height:	**189**	Interior Walls:	**MSD**
1st Floor Height:	**18**	Roof Type:	**MEM**
1st Floor Size:	**49000**	Floor Type:	**COM**
		Project Type:	**NEW**

Division		Percent	Sq. Cost	Amount
03	**Concrete**	**21.62**	**36.55**	**16,448,882**
04	**Masonry**	**2.40**	**4.06**	**1,826,599**
05	**Metals**	**3.98**	**6.73**	**3,027,714**
06	**Wood & Plastics**	**3.77**	**6.37**	**2,864,564**
07	**Thermal & Moisture Protection**	**3.95**	**6.67**	**3,001,829**
08	**Doors & Windows**	**6.59**	**11.14**	**5,013,185**
09	**Finishes**	**11.11**	**18.78**	**8,452,040**
10	**Specialties**	**1.88**	**3.17**	**1,428,616**
11	**Equipment**	**0.99**	**1.68**	**753,810**
12	**Furnishings**	**0.40**	**0.67**	**303,327**
13	**Special Construction**	**0.24**	**0.40**	**180,422**
14	**Conveying Systems**	**2.45**	**4.15**	**1,865,792**
15	**Mechanical**	**25.85**	**43.69**	**19,661,356**
16	**Electrical**	**14.78**	**24.98**	**11,240,130**
Total Building Costs		**100.00**	**169.04**	**76,068,266**

CENTRAL PLANT ESTIMATE

Case 2 - Central Plant with Equipment Bay

GVI Central Plant - Sep 2010 - NY - Buffalo

Prepared By:		Prepared For:	
	DLW Architects + Planners, Inc.		
	5727 North 7th St, STE 300		**100 High Street**
	Phoenix, AZ 85014		**Buffalo, NY 14203**
	Fax:		**Fax:**
Building Sq. Size:	**8627**	Site Sq. Size:	**4791600**
Bid Date:	**7/1/2009**	Building use:	**Industrial**
No. of floors:	**2**	Foundation:	**CON**
No. of buildings:	**1**	Exterior Walls:	**MET**
Project Height:	**42**	Interior Walls:	**GYP**
1st Floor Height:	**18**	Roof Type:	**MET**
1st Floor Size:	**2156**	Floor Type:	**CON**
		Project Type:	**ADD/REN**

Division		Percent	Sq. Cost	Amount
01	**General Requirements**	**18.14**	**38.27**	**330,190**
03	**Concrete**	**7.19**	**15.18**	**130,927**
04	**Masonry**	**4.85**	**10.24**	**88,300**
05	**Metals**	**7.49**	**15.81**	**136,408**
07	**Thermal and Moisture Protection**	**1.28**	**2.71**	**23,344**
08	**Openings**	**1.99**	**4.21**	**36,284**
09	**Finishes**	**3.13**	**6.60**	**56,918**
10	**Specialties**	**0.50**	**1.06**	**9,134**
12	**Furnishings**	**0.11**	**0.24**	**2,030**
21	**Fire Suppression**	**0.64**	**1.35**	**11,672**
22	**Plumbing**	**1.60**	**3.38**	**29,141**
23	**HVAC**	**24.22**	**51.12**	**441,024**
26	**Electrical**	**28.18**	**59.47**	**513,040**
28	**Electronic Safety and Security**	**0.67**	**1.41**	**12,179**
Total Building Costs		**100.00**	**211.03**	**1,820,591**

LINK ESTIMATE

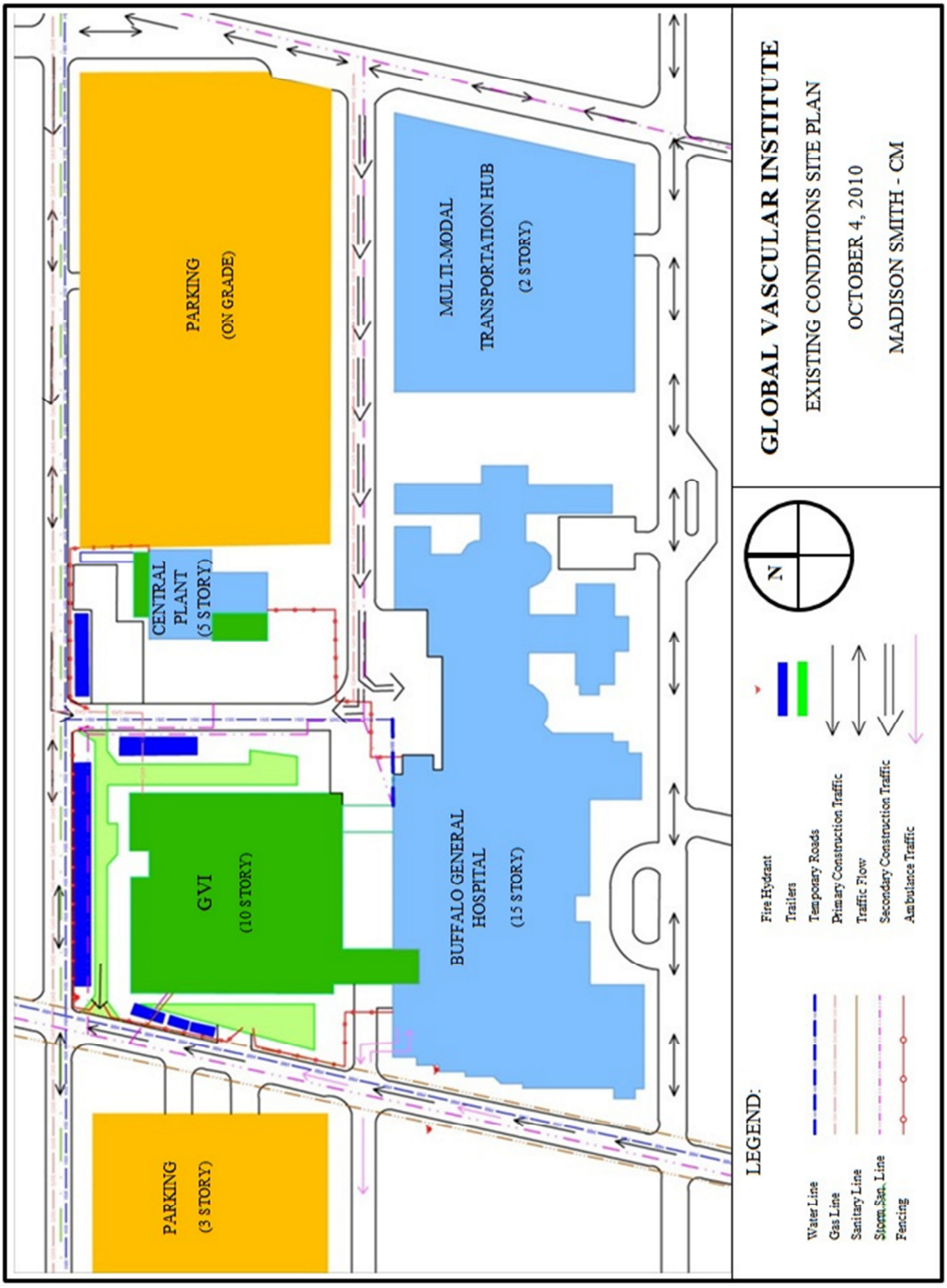
Case 3 - Hospital New Emergency Department Equipment

Global Vascular Institute - Sep 2010 - NY - Buffalo

Prepared By:		Prepared For:	
	IKM Incorporated		
	One PPG Place, Second Floor		**100 High Street**
	Pittsburgh, PA 15222		**Buffalo, NY 14203**
	Fax:		**Fax:**
Building Sq. Size:	**14735**	Site Sq. Size:	**78408**
Bid Date:	**7/1/2009**	Building use:	**Medical**
No. of floors:	**4**	Foundation:	**PIL**
No. of buildings:	**1**	Exterior Walls:	**CUR**
Project Height:	**65**	Interior Walls:	**MSD**
1st Floor Height:	**15**	Roof Type:	**MEM**
1st Floor Size:	**3684**	Floor Type:	**COM**
		Project Type:	**NEW**

Division		Percent	Sq. Cost	Amount
03	Concrete	7.78	20.71	305,202
04	Masonry	2.38	6.32	93,190
05	Metals	6.12	16.29	239,997
06	Wood, Plastics, and Composites	5.06	13.48	198,623
07	Thermal and Moisture Protection	4.55	12.12	178,520
08	Openings	6.74	17.94	264,320
09	Finishes	12.02	32.00	471,463
10	Specialties	0.82	2.19	32,215
11	Equipment	1.41	3.75	55,227
13	Special Construction	0.16	0.43	6,376
21	Fire Suppression	1.26	3.35	49,414
22	Plumbing	8.22	21.88	322,360
23	HVAC	21.87	58.19	857,471
26	Electrical	21.60	57.50	847,208
Total Building Costs		100.00	266.14	3,921,584

APPENDIX D: EXISTING SITE PLAN


PARKING
(ON GRADE)
MULTI-MODAL
TRANSPORTATION HUB
(2 STORY)
CENTRAL
PLANT
(5 STORY)
GVI
(10 STORY)
BUFFALO GENERAL
HOSPITAL
(15 STORY)
PARKING
(3 STORY)
GLOBAL VASCULAR INSTITUTE
EXISTING CONDITIONS SITE PLAN
OCTOBER 4, 2010
MADISON SMITH - CM
N
LEGEND:
Fire Hydrant
Trailers
Temporary Roads
Primary Construction Traffic
Traffic Flow
Secondary Construction Traffic
Ambulance Traffic
Water Line
Gas Line
Sanitary Line
Storm San. Line
Fencing