

Surgery Expansion Phase 1

Children's National Medical Center

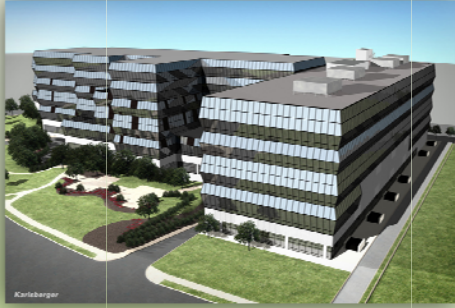
111 Michigan Avenue, NW • Washington, DC 20010

Andrea Klein • Construction Management • Advised By Dr. Messner

Technical Report 2

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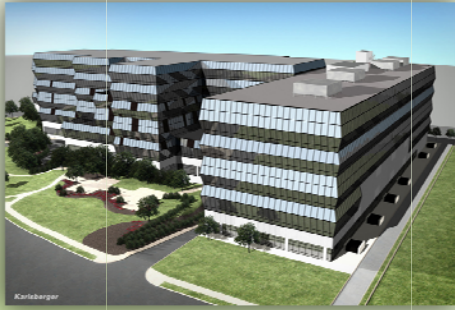
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Executive Summary

Technical Assignment 2 concentrated on preconstruction activities. The tasks included creating a detailed project schedule, a site layout plan for an important phase of construction, an estimate of one assembly type, a detailed estimate of a primary system, and a general conditions estimate.

The detailed project estimate required breaking the project into phases, and determining the total length of the project. The Surgery Expansion project consists of two (2) primary phases, which are separated into smaller pieces by bays. It was found the total duration of construction is sixty-five weeks (65) or fifteen (15) months. Looking more closely at the phases, it was determined the layout plan for Phase 1A was the most critical. Phase 1A is begins and ends the construction and requires the most work in terms of planning.

An estimate for the interior partitions was prepared for the assemblies estimate. Due to the nature of this project as a renovation, much of the time spent in construction will be on partitions. The mechanical system, specifically the Heating, Ventilation and Air-Conditioning duct work was examined for the detailed estimate. The five (5) new air-handling units were also included in this estimate. Estimating the general conditions was not difficult; however each line item had to be divided into a manageable time period in order to calculate future cost/schedule savings.



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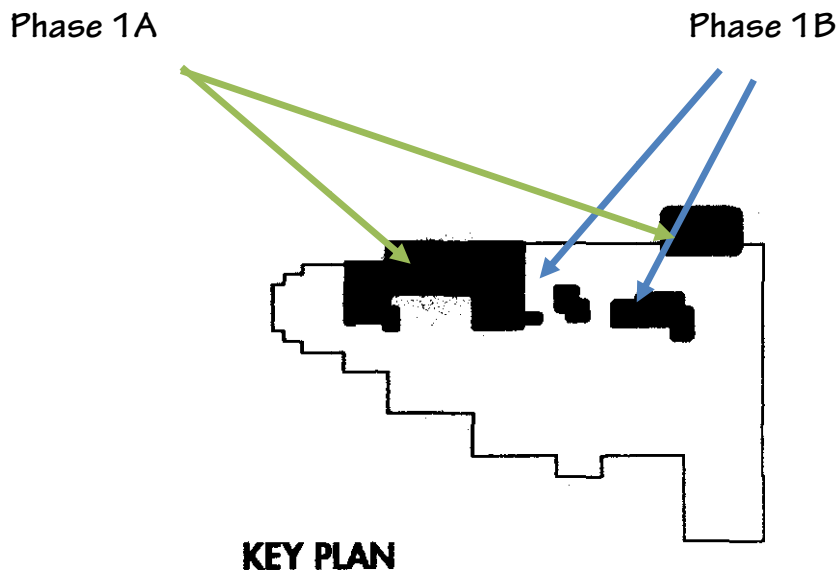
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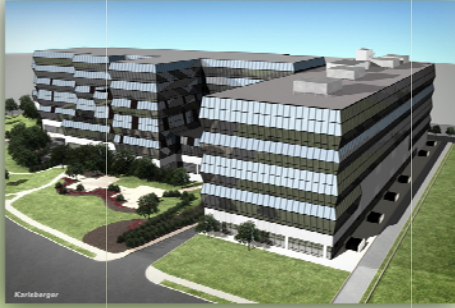
A. Detailed Project Schedule (Appendix A)

The schedule for the Surgery Expansion project was designed to limit the impact construction will have on the surrounding areas of the building still currently in use. Due to several delays, including asbestos abatement, the schedule has been changed multiple times, and several activities were completed prior to the notice to proceed. Planned duration for the project as of October 23, 2007, was sixty-five (65) weeks, or fifteen (15) months. The schedule is divided by phase, and easily defined areas. Each phase is then split into floors to further define the location of work being performed. There appears to be a large overlap on the schedules, but this is due to the division of activities, and is negligible.

Phase 1A of the schedule consists of the Decontamination Building, and the northern half of the building between column lines 3 and 11. A piece of Phase 1A south of the operating rooms has been isolated as the Decase Area. Two smaller areas are included as well with minor changes to the electrical panels already in place. Work is being performed on levels 1.5, 2, and 2.5, with enhancements to existing building elements on other floors. Phase 1B includes the operating room reception and waiting area. Each phase is planned to be completed in two sections with column lines acting as dividers. A west side, and east side, with the east side being generally larger.

Figure A.1





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B. Site Layout Planning (Appendix B)

Phase 1A

The attached site plan depicts Phase 1A of construction. Phase 1A is the construction of the ORs and their supporting areas, and the Decontamination building. There is no critical phase in this project, as a crane will not be used to erect or place any equipment, including the new air-handling unit. All the temporary equipment for Phase 1A will be in place and used for Phase 1B as well. As seen on the provided schedule, Phase 1B begins and ends within the time frame for Phase 1A.

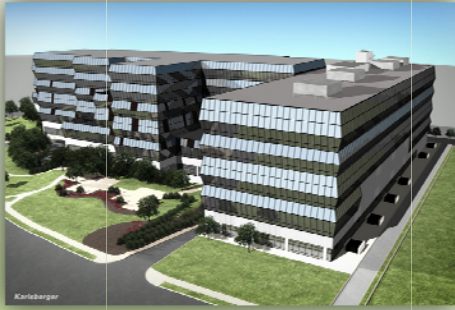
The temporary equipment required for this phase includes:

- Stair Tower: Provides access to the west most portion of renovation, is located next to the loading dock, and will jog east to enter the building directly above the loading dock
- Dumpster: Located on the eastern side of the loading dock, will be elevated as determined by the structural engineer
- Trash Chute: Connects to the second floor area of renovation, composed of 3' by 3' steel pieces
- Negative Air Flow Tunnel: Bisects the hallway between the renovation and the cafeteria kitchen, negative air flow machine located within the confines of the renovation to control dust

Note: The dumpster on the eastern side of the building is already in place and will be shared with other project Gilbane has already begun on site.

No temporary power facilities are needed, because the construction team has instructions on which receptacles in the building they may use. Also, there is a marked location for a proposed staging area, which will hopefully house excess materials.

Please See Appendix A for the full Site Plan.



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C. Assemblies Estimate: Interior Partitions

Assumptions

Assumptions for this portion of the project include the following:

- All partition walls are 10' tall

Exclusions

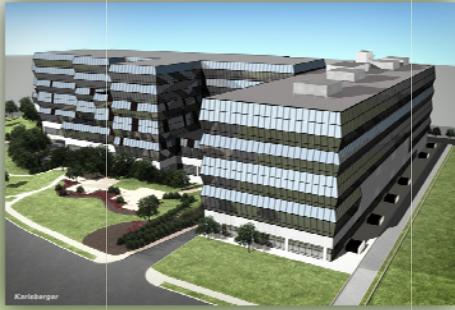
There are several exclusions for this estimate to follow the contract divisions.

- Bulkheads are excluded
- Doors and movable walls are excluded
- Interior storefronts are excluded
- No finishing costs are incorporated (separate contract)

Figure C.1

Interior Partitions Cost					
Wall Type	Length (lf)	Height (ft)	Area (sf)	Cost/sf	Total Cost
1A	86.5	10	865	4.58	\$3,961.70
2	134	10	1340	3.72	\$4,984.80
3	386.5	10	3865	3.72	\$14,377.80
3A	1119.5	10	11195	4.58	\$51,273.10
4	52	10	520	2.62	\$1,362.40
4A	223.5	10	2235	3.48	\$7,777.80
6A	9	10	90	3.48	\$313.20
7A	25	10	250	6.28	\$1,570.00
9A	16.5	10	165	6.30	\$1,039.50
10	39	10	390	5.46	\$2,129.40
10A	349.5	10	3495	6.34	\$22,158.30
12A	22	10	220	4.31	\$948.20
14	161.5	10	1615	2.33	\$3,762.95
23	67.5	10	675	2.65	\$1,788.75
Total Cost					\$117,447.90

Please See Appendix C for the background information and calculations.



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D. Detailed Mechanical Estimate (Appendix D)

Renovating office spaces to surgical suites requires extensive mechanical changes. Since five (5) new air-handling units are going to be put into place, this estimate focuses on the units, and the duct work required. Additional items for air distribution are also included, but please refer to the following list of assumptions and exclusions for more information. RS Means 2007 was used to price out the equipment. A Trane wholesaler provided the information for the air-handling units. Please see [Figure D.1](#) for the total estimate chart.

Assumptions

Assumptions for this portion of the project include the following:

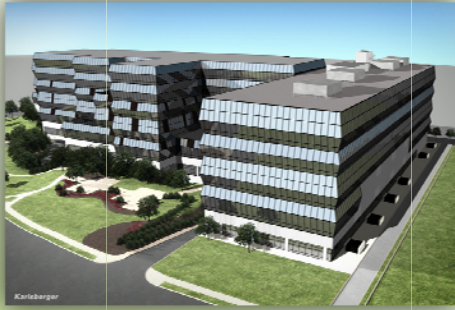
- 100% of connections
- High-pressure ductwork
- Galvanized Steel 24 ga
- Duct Hangers are placed every 10'
- \$2-\$3 per cfm was used for the modular air-handling units, based on quote from a Trane wholesaler local to Washington, DC
- \$4.25 per cfm was used for the custom air-handling unit, based on a quote from the same Trane wholesaler

Exclusions

Exclusions for this project include the following:

- Fire-dampers
- Fans
- Smoke Detectors
- Volume Dampers
- Access Doors
- Insulation
- Piping for hot and chilled water
- No demolition or relocation work was considered in this estimate

Please See Appendix D for the background information and calculations.



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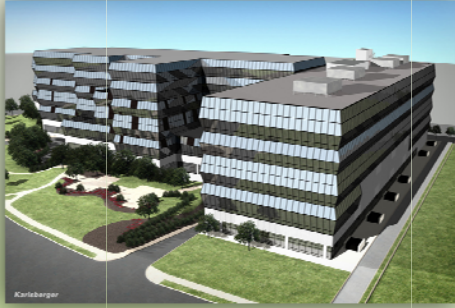
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Figure D.1

HVAC Estimate				
Item Description	Quantity	Unit	Cost/unit	Cost
Air Handling Units				
Modular	8500 (4)	cfm	3	\$102,000.00
Custom	17000	cfm	4.25	\$72,250.00
Ductwork	58750	lbs	4.11	\$241,463.00
Add 100% Fittings				\$380,101.00
Duct Hangers*	1003	ea	13	\$13,039.00
Diffusers*	250	ea	184	\$46,000.00
VAV Units*	45	ea	315	\$14,175.00
Total Cost				\$869,028.00
*The costs for these items are an average				



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E. General Conditions Estimate

The general conditions are calculated for the time period of July 1, 2007 to September 30, 2008. This covers a period of sixty-five (65) weeks, or fifteen (15) months. Please see Figure E.1.

Inclusions:

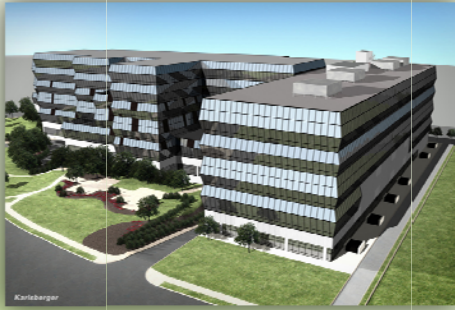
The general conditions estimate includes the following items:

- Project Staffing costs
*** Sr. PM, General Super, MEP Super are billed at 50% as they are working on both projects on site.***
- Computer Equipment and Software
- Printer, Fax/Copy Machines
- Cell Phones
- Travel Expenses
- Office Supplies
- General Liability Insurance

Exclusions:

This estimate excludes the following items:

- Jobsite Trailer- The Gilbane site office is located within the building in the sixth (6th) floor shell space.
- Utilities- No utilities are included because the owner is paying for them, and no separate temporary utilities are required
- Cleaning Services- Janitorial services are provided by the owner
- Telephone System- Is installed and paid for by the owner
- Computer Networking Charges- These charges are being covered by the other Gilbane project on site



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Figure E.1

General Conditions Estimate				
Item Description	Quantity	Unit	Rate	Total
Job Staffing				
Senior Project Manager	65	wks	1878	\$122,070.00
Assistant Project Manager	65	wks	3208	\$208,520.00
General Superintendent	65	wks	1878	\$122,070.00
Superintendent	65	wks	1500	\$97,500.00
MEP Superintendent	65	wks	1915	\$124,475.00
Engineer	65	wks	2432	\$158,080.00
Fringe Benefits	65	wks	25%	\$208,178.75
Field Office Equipment				
Copy Machine	4	Mo	720	\$2,880.00
Digital Camera & Software	1	ea	500	\$500.00
Fax Machine	1	ea	400	\$400.00
Furniture	6	Sta	1000	\$6,000.00
Computer/Printer	4	ea	2400	\$9,600.00
TV, VCR, Safety Tapes	1	ea	700	\$700.00
Field Office Expenses				
Bottled Water	4	Mo	200	\$800.00
Construction Signage	1	ls	1200	\$1,200.00
Pro Log Software	3	ea	300	\$900.00
Sure Trak Software	1	ea	500	\$500.00
Pro Log Web- Software	1	ea	7000	\$7,000.00
Pro Log Web- Monthly Maintenance	15	Mo	300	\$4,500.00
Internet Connection (DSL)	15	Mo	650	\$9,750.00
First Aid Supplies	1	LS	1500	\$1,500.00
Blueprinting	15	Mo	400	\$6,000.00
Postage, Shipping & Express	15	Mo	600	\$9,000.00
Progress Photos	12	Mo	200	\$2,400.00
Records Transport/Retention	1	Est	2000	\$2,000.00
Small Tools & Supplies	12	Mo	100	\$1,200.00
Stationary, Paper & Supplies	12	Mo	600	\$7,200.00
CAD Equipment & Usage Fees	80	hr	60	\$4,800.00
Cell Phones	62	Mo	110	\$6,820.00
Job Travel Expenses	15	Mo	1800	\$27,000.00
Fire Extinguisher	2	ea	50	\$100.00
Dumpster Fees	65	wks	800	\$52,000.00
General Liability Insurance	15	Mo	5000	\$75,000.00
General Conditions Costs			Total	\$1,280,643.75