

Existing Construction Conditions

Nathanael Paist

Construction Management

Faculty Adviser: Dr. Messner

Two Liberty Center

Arlington, VA

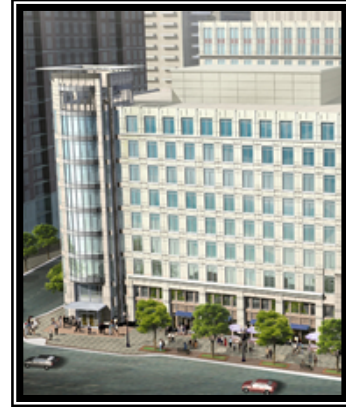


Table of Contents

1.	Executive Summary	2
2.	Project Schedule Summary	3
3.	Building Systems Summary	4
4.	Project Cost Evaluation	5
5.	Appendix ECC.A	8
6.	Appendix ECC.B	10
7.	Appendix ECC.C	12

Existing Construction Conditions

Nathanael Paist

Construction Management

Faculty Adviser: Dr. Messner

Two Liberty Center

Arlington, VA



Executive Summary

Project Schedule Summary:

- Design issued for bid – March 21, 2005
- Begin Excavation and Foundations – December 26, 2005
- Substantial Completion – September 8, 2007
- Interior space turned over for fit-out in phases per floor

Building Systems Summary:

- Shell and Core office building with below grade parking structure
- Soldier piles with wood lagging as excavation support
- Cast in place reinforced concrete frame and slabs
- Pre-cast concrete exterior wall panels with areas of glass curtain wall
- Central plant chilled water system serving 12 factory built Air Handling Units
- 2 main 3000A switchboards with a 1200A retail bus gutter

Project Cost Evaluation:

- \$34 Million building costs at \$109 per square foot
- *D4 Cost 2002* parametric estimate of \$33.7 Million
- *CostWorks 2005* square foot estimate of \$91 per square foot

Project Schedule Summary

(See Appendix ECC.A for MS Project Summary Schedule)

Key Project Dates:

1. Schematic Design Begins..... 14 April 2004
2. Design Issued for Bid..... 21 March 2005
3. Begin Foundations and Excavation..... 26 December 2005
4. Start Above Grade Structure..... 15 August 2006
5. Design Complete..... 17 April 2007
6. Start Hanging Drywall..... 18 April 2007
7. Substantial Completion..... 8 September 2007

Key Sequencing Elements:

Foundation footings and slab on grade are to be completed before the start of the concrete frame structure. The structural frame is erected in sequence starting with the columns at the slab on grade, followed by the first elevated slab, then repeating that sequence placing entire levels of columns followed by the full slabs above them. Once the concrete structure is completed to the roof-level slab, the erection of the pre-cast concrete panel façade begins. The exterior walls are erected from the ground to roof at each face before moving the crane and beginning the next face. Following the completion of the final face of exterior wall, the windows and glass are installed per floor, beginning at the ground level and working up to the ninth level. Interior finishes begin prior to each floor's windows and glass being installed. Turn over to the owner is performed per floor as that floor is completed.

Building Systems Summary

(See Appendix ECC.B for Building Systems Checklist)

Construction:

Two Liberty Center is a shell and core office building being constructed as part of a three building expansion of the Liberty Center complex. The project is being delivered under a modified design-bid-build method. Modification to the traditional method includes the involvement of the general contractor as a negotiator during the design phase. For their services on the project, the general contractor is held under a cost plus fee contract with a guaranteed maximum price. Trade contracts were awarded after a competitive bid, and were selected on the basis of lowest cost with the most reliable scope of work.

Support of Excavation:

Excavation for Two Liberty Center was performed as part of a larger excavation for all three of the buildings. With the L-shape of the large excavation, the site for Two Liberty Center has only three excavation walls to support. Two sides of the excavation are adjacent to the streets and are supported by traditional soldier piles with wood lagging and tie-backs. The third side of the excavation is adjacent to the existing One Liberty Center and is supported by an existing concrete retaining wall. There was no dewatering system necessary for this excavation, although some water had to be removed with pumps prior to the start of foundation work.

Cast-in-Place Concrete:

The super structure of the building is composed of reinforced cast-in-place concrete slabs and frame. All elevated slabs are 8" thick and slabs for floors 2 through 9 are post-tensioned to accommodate a typical bay size of 20'x 40'. The foundation consists of cast-in-place concrete spread footings with a 5" thick cast-in-place slab on grade.

Curtain Wall:

The building enclosure is a combination of pre-cast concrete panels with some areas of glass curtain wall systems. Glass curtain walls are located in two major areas: around the ground floor of the building, and up the architectural glass tower above the

main entrance to the building. Pre-cast concrete panels make up the rest of the façade and they are finished with traditional punch windows.

Mechanical System:

Conditioned air for Two Liberty Center is supplied by 12 Factory-Built Air Handling Units with chilled water cooling coils and electric heating coils. Cooling capacity is provided through a central chilled water plant consisting of 2 centrifugal water chilling units and 2 roof-top cooling towers. Air volume is digitally controlled for multiple zones provided by Variable-Air-Volume boxes.

Electrical System:

Service for the building is provided through a 277/480V, 3-phase, 4-wire, 8000A Utility Service Junction Box. Distribution through the building is handled by two 277/480V, 3-phase, 4-wire, 3000A switchboards, with an additional 277/480V, 3-phase, 4-wire, wye-connected, 1200A Bus Gutter for Retail service connection. Total connected loads for the two switchboards, MS1 and MS2, are 1852kVA and 2784kVA respectively, in addition to a total connected load for the retail bus gutter of 1203kVA. Emergency power will be provided through a diesel engine driven electric generator set rated for 277/480V, 3-phase, 4-wire, for a minimum 550kW/687.5kVA load.

Project Cost Evaluation

(See Appendix ECC.C for detailed cost reports and data sheets))

Actual Building Costs:

Building Construction Costs:

- \$34,000,000.00
- \$109.00 per SF

Parametric Estimate:

Expected costs for Two Liberty Center have been estimated based on data from similar buildings using the *D4 Cost 2002* estimating software. Buildings from the database were selected for comparison based on building type, building size, location and basic design features. Three buildings were selected and then averaged using the Smart Averaging feature. All three buildings were new construction office buildings with concrete foundations and concrete floors. Two of the three buildings were constructed in the same general region as Two Liberty Center, with of those two also being a second building of a complex built to complement the first, and the other of the two having an attached parking facility similar to Two Liberty Center. The following chart outlines the source data and reports the final data for Two Liberty Center, including the adjustment for location and total square footage:

Parametric Estimate for Two Liberty Center					
building	location	year built	size (SF)	Cost/SF	Cost
Woodlands Two	MD	1998	120,000	\$41.76	\$5,623,260.00
Netplex Plaza	VA	1999	171,800	\$47.84	\$8,153,214.00
Ha-Lo Headquarters	IL	1998	267,300	\$151.21	\$40,134,138.00
Two Liberty Center	VA	2005	180,000	\$186.98	\$33,656,395.00

(Reports from D4 Cost 2002 can be found in Appendix ECC.C)

The estimate from the *D4 Cost 2002* software has produced a number accurate to the millions, with the actual building cost at \$34 Million and the estimated cost at \$33.6 Million.

Square Foot Estimate:

This estimate was performed using the square foot modeling feature of *R.S. Means – Cost Works 2005* software. Since Two Liberty Center has two major components, the below grade parking structure and the above grade office building, two estimates were performed and the addition of the two is meant to produce a single cost estimate for Two Liberty Center. The following chart summarizes the square footage estimate produced:

Summary Chart for Square Foot Cost Estimate:

Garage Estimate			
Model Type: Garage, Underground Parking, Reinforced Concrete / R/Conc. Frame			
Stories (Ea.): 4		Location:	Arlington, VA
Story Height (L.F.): 10		Data Release:	2005
Floor Area (S.F.): 130000		Wage Rate:	Union
Basement: Not Applicable			
		Cost/SF	Cost
	Sub-Total	\$37.84	\$4,919,325.00
	GENERAL CONDITIONS (Overhead & Profit) 25%	\$9.46	\$1,230,000.00
	ARCHITECTURAL FEES 8%	\$3.78	\$492,000.00
	CLASS A MODIFIER 15%	\$7.66	\$996,198.75
	TOTAL GARAGE COST	\$58.75	\$7,637,523.75
Office Building Estimate			
Model Type: Office, 5-10 Story, Precast Concrete Panel / R/Conc. Frame			
Stories (Ea.): 9		Location:	Arlington, VA
Story Height (L.F.): 12		Data Release:	2005
Floor Area (S.F.): 180000		Wage Rate:	Union
Basement: Not Included			
		Cost/SF	Cost
	Sub-Total	\$75.39	\$13,570,875.00
	GENERAL CONDITIONS (Overhead & Profit) 25%	\$18.85	\$3,392,500.00
	ARCHITECTURAL FEES 6%	\$5.66	\$1,018,000.00
	CLASS A MODIFIER 15%	\$14.99	\$2,697,206.25
	TOTAL OFFICE BUILDING COST	\$114.89	\$20,678,581.25
Total Building Cost			
Model Type: Office with Subgrade Garage, 9 Story Office with 4 Story Garage			
Stories (Ea.): 13		Location:	Arlington, VA
Story Height (L.F.): 12		Data Release:	2005
Floor Area (S.F.): 310,000		Wage Rate:	Union
		Cost/SF	Cost
	GARAGE COST	\$58.75	\$7,637,523.75
	OFFICE BUILDING COST	\$114.89	\$20,678,581.25
	TOTAL COSTS	\$91.34	\$28,316,105.00

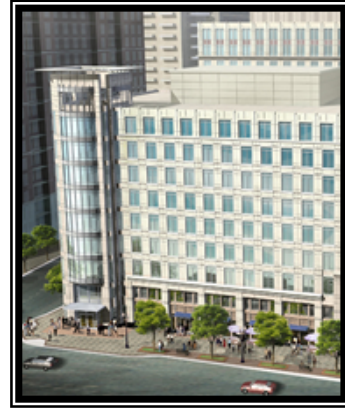
(Detailed Reports from Cost Works 2005 can be found in Appendix ECC.C)

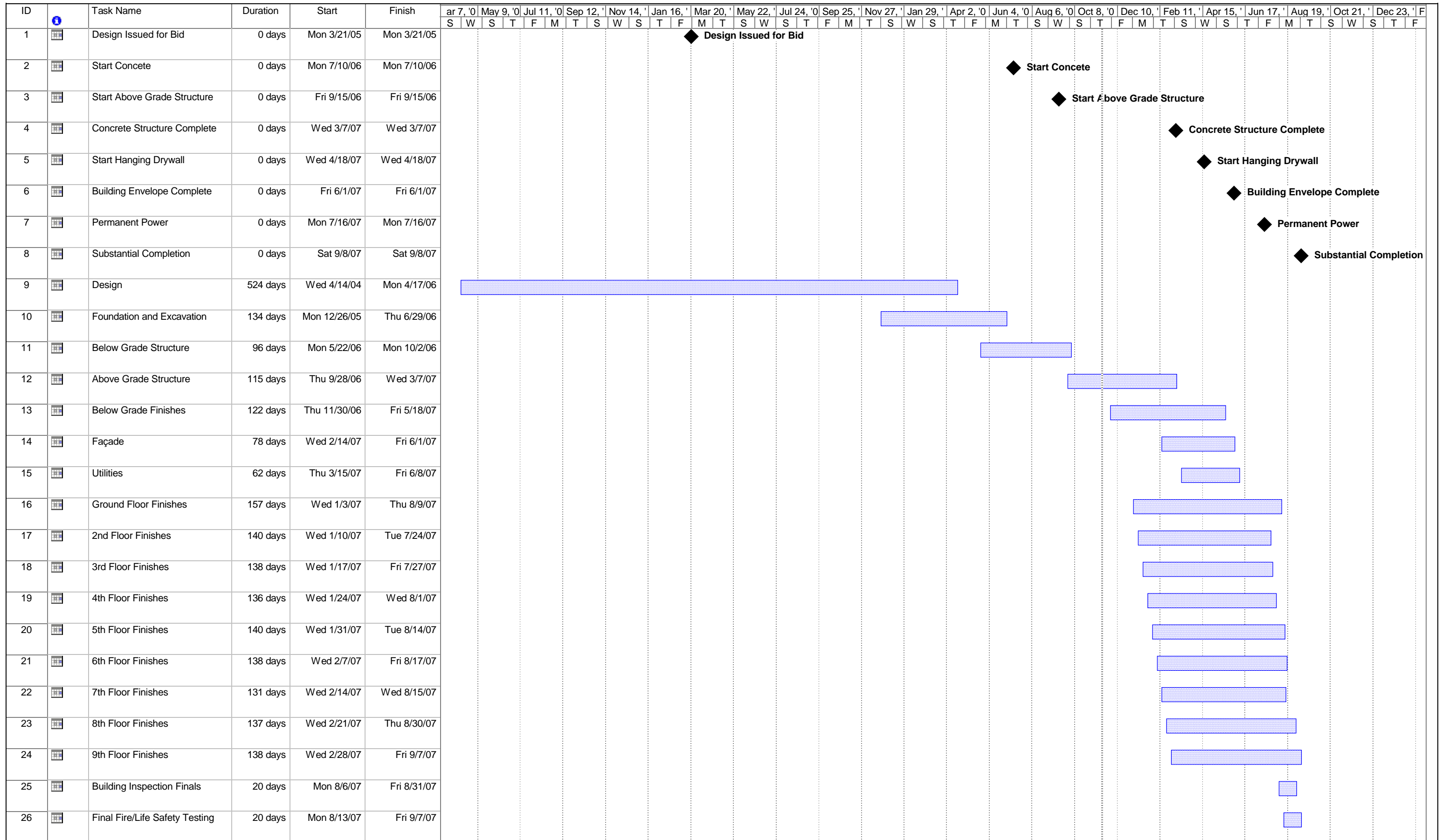
The estimate above is only accurate to the ten millions, with the actual building cost at \$34 Million and the estimate at \$28 Million. Inaccuracies in this method of estimating can be attributed to the lower level of detail as to the systems installed. The numbers produced from the software were modified by a factor of 15% to account for the extra money spent for Class A status. The owner of this building has taken the initiative to build a higher end and more efficient building than the typical office building.

Appendix ECC.A

The following appendix contains:

- Summary Project Schedule





Project: Two Liberty Center.mpp
Date: Fri 11/17/06

Task Progress Summary External Tasks Deadline

Split Milestone Project Summary External Milestone

Appendix ECC.B

The following appendix contains:

- Building Systems Summary Checklist



Building Systems Summary Checklist

Yes	No	Work Scope
	X	Demolition Required
	X	Structural Steel Frame
X		Cast in Place Concrete
	X	Pre-cast Concrete
X		Mechanical System
X		Electrical System
	X	Masonry
X		Curtain Wall
X		Support of Excavation

Appendix ECC.C

The following appendix contains:

- *D4 Cost 2002* report for Two Liberty Center
- *D4 Cost 2002* reports for comparison buildings
- *CostWorks 2005* square foot estimate summary for Office Building
- *CostWorks 2005* square foot estimate summary for Parking Structure



Estimate of Probable Cost

Two Liberty - Jun 2005 - VA - Arlington

Prepared By: **Nathanael Paist**
Penn State AE - Construction Management

Prepared For: **Existing Construction Conditions**

Building Sq. Size: **180000**
 Bid Date:
 No. of floors: **9**
 No. of buildings: **1**
 Project Height:
 1st Floor Height: **10**
 1st Floor Size: **20000**

Site Sq. Size: **255802**
 Building use: **Office**
 Foundation: **CON**
 Exterior Walls: **CUR**
 Interior Walls: **DRY**
 Roof Type: **BAL**
 Floor Type: **CON**
 Project Type: **NEW**

Division		Percent	Sq. Cost	Amount
00	Bidding Requirements	2.22	4.15	746,187
	Bidding Requirements	2.22	4.15	746,187
01	General Requirements	7.08	13.25	2,384,488
	General Requirements	7.08	13.25	2,384,488
02	Site Work	2.01	3.76	677,686
	Site Work	2.01	3.76	677,686
03	Concrete	13.86	25.91	4,663,932
	Concrete	13.86	25.91	4,663,932
04	Masonry	1.92	3.59	646,092
	Masonry	1.92	3.59	646,092
05	Metals	6.18	11.56	2,080,251
	Metals	6.18	11.56	2,080,251
06	Wood & Plastics	0.33	0.61	110,423
	Wood & Plastics	0.33	0.61	110,423
07	Thermal & Moisture Protection	0.92	1.72	308,906
	Thermal & Moisture Protection	0.92	1.72	308,906
08	Doors & Windows	11.47	21.45	3,861,413
	Doors & Windows	11.47	21.45	3,861,413
09	Finishes	2.22	4.15	746,506
	Finishes	2.22	4.15	746,506
10	Specialties	1.72	3.21	577,348
	Specialties	1.72	3.21	577,348
12	Furnishings	0.69	1.29	232,993
	Furnishings	0.69	1.29	232,993
13	Special Construction	0.21	0.40	71,942
	Special Construction	0.21	0.40	71,942
14	Conveying Systems	2.67	5.00	900,187
	Conveying Systems	2.67	5.00	900,187
15	Mechanical	4.71	8.80	1,584,114
	Mechanical	4.71	8.80	1,584,114
16	Electrical	1.63	3.06	550,260
	Electrical	1.63	3.06	550,260
21	Fire Suppression	2.93	5.47	985,059
	Fire Suppression	2.93	5.47	985,059
22	Plumbing	2.11	3.95	711,466
	Plumbing	2.11	3.95	711,466

23	HVAC	14.58	27.25	4,905,676
	HVAC	14.58	27.25	4,905,676
26	Electrical	11.25	21.04	3,786,421
	Electrical	11.25	21.04	3,786,421
31	Earthwork	2.04	3.81	685,482
	Earthwork	2.04	3.81	685,482
32	Exterior Improvements	4.93	9.23	1,660,906
	Exterior Improvements	4.93	9.23	1,660,906
33	Utilities	2.31	4.33	778,658
	Utilities	2.31	4.33	778,658
Total Building Costs		100.00	186.98	33,656,395
Total Site Costs		100.00	0.00	0
Total Project Costs		--	--	33,656,395

Estimate of Probable Cost

Woodlands Two - Aug 1998 - MD - Other

Prepared By:	DRBrasher, Inc.	Prepared For:	
	5560 Sterrett Place, #300		
	Columbia, MD 21044		
	Fax:		Fax:
Building Sq. Size:	120000	Site Sq. Size:	376224
Bid Date:	8/1/1998	Building use:	Office
No. of floors:	4	Foundation:	CON
No. of buildings:	1	Exterior Walls:	PRE
Project Height:	65.4	Interior Walls:	GYP
1st Floor Height:	10	Roof Type:	EPD
1st Floor Size:	30000	Floor Type:	CON
		Project Type:	NEW

Division	Percent	Sq. Cost	Amount
00 Bidding Requirements	6.90	2.72	325,983
01 General Requirements	1.85	0.73	87,477
03 Concrete	14.18	5.58	670,063
04 Masonry	2.56	1.01	121,077
05 Metals	17.20	6.77	812,401
06 Wood & Plastics	1.75	0.69	82,814
07 Thermal & Moisture Protection	2.97	1.17	140,384
08 Doors & Windows	8.39	3.30	396,474
09 Finishes	9.31	3.67	439,993
10 Specialties	1.18	0.47	55,926
12 Furnishings	0.60	0.24	28,497
14 Conveying Systems	3.74	1.47	176,919
15 Mechanical	21.70	8.54	1,025,039
16 Electrical	7.65	3.01	361,574
Total Building Costs	100.00	39.37	4,724,621
02 Site Work	100.00	2.39	898,639
Total Site Costs	100.00	2.39	898,639
Total Project Costs	--	--	5,623,260

Estimate of Probable Cost

Project Notes

Woodlands Two - Aug 1998 - MD - Other

*Columbia, Maryland

*Construction Period Oct 98 to Sep 99

Special Project Notes

Located within the Gateway Corporate Park in Columbia, Maryland, Woodlands Two is a 4-story, Class #A# office building. DRBrasher was hired by Corporate Development Services, LLC, a subsidiary of Corporate Office Properties Trust, one of the largest REIT developers in the Maryland area.

The challenge of this project was meeting the client's request of designing a building that was different, yet complimentary to a previously built office building on the same property.

The site was a heavily wooded area and DRBrasher wanted to preserve as much as possible to capitalize and maximize the views that would be seen from the office windows. The storm water management was already in place between the two buildings. There were environmental wetland areas, which needed to be preserved as well. To take advantage of these areas, a walking path was designed around the natural areas for the tenant's enjoyment and relaxation and to provide a connection for the two buildings.

Corporate Development Services requested a building designed for not only today's technology users but for the future as well. The 30,000-square-foot large floor plates were structurally designed for 100 psf live load per floor to accommodate the dense population of office users today. These large floor plates allowed for open space plans, which are a must for many of today's tenants. Fiber optics were installed in the building and the electrical systems were enhanced. The mechanical system was designed with multiple systems per floor to provide flexibility for tenant users.

Woodlands Two has a unique wing-shaped design, which gives it a monumental presence, emphasizing and projecting the curve of the building and provides for more exterior windows. For the exterior skin of the building, DRBrasher chose the SlenderWall# system manufactured by the Smith-Midland Corporation. The system is an integrated precast-concrete brick finish with precast accent band panels. The curved precast panels set this building apart from other buildings in the corporate park. The architect was able to achieve the desired design of combined masonry and precast in one panel, which saved significant cost over the conventional brick veneer and precast method. This system allowed the building to be constructed with a masonry appearance in the dead of winter without cold weather delays and added costs for winterized construction. The system's erection time also provided cost savings.

To coincide with the building's exterior, the interior had to be upscale. The interior finishes included granite flooring in the lobby, with custom wood millwork and glass. These finishes continued into the elevators. But one of the most unique features of the interior is an 11-foot 6-inch ceiling height with a back-lit luminous ceiling system, which created the illusion of a skylight and of a much higher ceiling. By using this system to create an atrium effect, the architect was able to maximize the rentable square footage area per floor.

Woodlands Two recently won a NAIOP (National Association of Industrial and Office Properties) Design of Excellence Award 2000 for the office building mid-rise 3-4 floors category.

MANUFACTURERS/SUPPLIERS

DIV 03: Precast Concrete Brick Finish: SlenderWall# by Smith Midland Corporation.
DIV 07: Roof Insulation: Owens Corning; Membrane Roof: Firestone.
DIV 08: Entrances & Storefronts: YKK AP America. Wood & Plastic Doors: Marshfield DoorSystems.
DIV 09: Floor Tile: Dal-Tile; Resilient Flooring: Azrock; Carpet: Monterey Spoolcraft; Gypsum Board: United States Gypsum; Painting: Duron.
DIV 14: Elevators: Otis.

Photo Courtesy of James Parker Photography

*Illustrations in the D4COST CD-ROM Architectural Library are reproduced, with permission, from the pages of Design Cost Data magazine, (c) DCD.

Unless noted otherwise illustrations are copyrights of the architectural firm in "Prepared By" on the Sources tab. Illustrations are for reference only and may not be reproduced by users of D4COST.

Estimate of Probable Cost

Netplex Plaza - Nov 1999 - VA - Other

Prepared By:

Davis Carter Scott
1676 International Drive, #500
McLean, VA 22102

Prepared For:

Building Sq. Size: **171809**
 Bid Date: **11/1/1999**
 No. of floors: **4**
 No. of buildings: **1**
 Project Height: **66**
 1st Floor Height: **14**
 1st Floor Size: **14629**

Fax: **151759**
 Site Sq. Size: **151759**
 Building use: **Office**
 Foundation: **CON**
 Exterior Walls: **MAS**
 Interior Walls: **GYP**
 Roof Type: **BUP**
 Floor Type: **CON**
 Project Type: **NEW**

Division		Percent	Sq. Cost	Amount
01	General Requirements	7.58	3.37	579,730
03	Concrete	34.13	15.19	2,610,400
04	Masonry	8.55	3.81	653,970
05	Metals	4.91	2.19	375,517
06	Wood & Plastics	1.13	0.50	86,457
07	Thermal & Moisture Protection	2.19	0.97	167,223
08	Doors & Windows	5.74	2.56	439,374
09	Finishes	8.89	3.96	679,955
10	Specialties	0.38	0.17	29,437
12	Furnishings	0.43	0.19	32,523
13	Special Construction	0.68	0.30	52,000
14	Conveying Systems	3.14	1.40	240,316
15	Mechanical	16.57	7.38	1,267,098
16	Electrical	5.68	2.53	434,636
Total Building Costs		100.00	44.52	7,648,636
02	Site Work	100.00	3.32	504,578
Total Site Costs		100.00	3.32	504,578
Total Project Costs		--	--	8,153,214

Estimate of Probable Cost

Project Notes

Netplex Plaza - Nov 1999 - VA - Other

*Reston, Virginia

*Construction Period May 2000 to Feb 2001

Special Project Notes:

Located along the fast-growing Dulles Airport Corridor, Netplex Plaza is at home in the edge city of Reston, Virginia. The site lies immediately adjacent to Sunset Hills Road which bounds its northern edge. The location assures a strong presence along Sunset Hills Road, not withstanding its visibility from the Dulles Airport access road.

Initiated in early 1999, the masterplan developed for this speculative office development, includes 90,000 square feet of office space and an adjacent 60,000 square feet for parking.

Contextualism plays a large role in designing buildings in the planned community of Reston. Netplex Plaza seeks to coexist with the countless low-rise commercial office buildings nearby, while re-composing the traditional elements of these buildings to create an aesthetic more in tune with this high-tech, fast-moving environment. The choice of masonry construction afforded the opportunity to design a building that has the economical leasing efficiency of a rectangular floorplate, without the visual brutality of a typical rectangular office building. Interior appointments include stone flooring, pendant and wall sconce light fixtures, and stainless steel to complete the contemporary look of the building.

A long and narrow site with a strong slope along its shortest length provided the first of many challenges. Because of the slope, Netplex Plaza appears to be six stories as viewed from the west and five stories as viewed from the east. The road leading into the development provides direct access to a pedestrian drop-off at the building's main entrance, one floor up from the entrance that serves on-grade parking on the other side. The main entrance also serves those coming from the level of structured parking to the south of the building. Fitting adequate landscaping and parking to the site was a challenge due to its narrowness and the proximity of numerous utility lines running through it and along its boundaries.

MANUFACTURERS/SUPPLIERS

DIV 07: Built-Up: Tamko; Metal: Petersen Aluminum.

DIV 08: Entrances & Storefronts, Metal Windows, Curtainwall: YKK AP America, Inc.; Metal Doors & Frames: Curries; Wood & Plastic Doors: Marshfield DoorSystems, Inc.

DIV 09: Resilient Flooring: Armstrong; Acoustical Treatment: Armstrong; Gypsum Board: United States Gypsum.

DIV 14: Elevators: Otis.

Photo Courtesy of Gunnar Westerlind

*Illustrations in the D4COST CD-ROM Architectural Library are reproduced, with permission, from the pages of Design Cost Data magazine, (c) DCD.

Unless noted otherwise illustrations are copyrights of the architectural firm in "Prepared By" on the Sources tab. Illustrations are for reference only and may not be reproduced by users of D4COST.

Estimate of Probable Cost

 Ha-Lo Headquarters - Aug 1998 - IL - Other

Prepared By:	Harbour Contractors, Inc.	Prepared For:	
	215 West Main Street		
	Plainfield, IL 60544		
	Fax:		Fax:
Building Sq. Size:	267334	Site Sq. Size:	239425
Bid Date:	8/1/1998	Building use:	Office
No. of floors:	7	Foundation:	CON
No. of buildings:	1	Exterior Walls:	CUR
Project Height:	93.6	Interior Walls:	DRY
1st Floor Height:	12	Roof Type:	MEM
1st Floor Size:	37528	Floor Type:	CON
		Project Type:	NEW

Division		Percent	Sq. Cost	Amount
00	Procurement and Contracting Require	2.14	3.02	806,423
01	General Requirements	12.81	18.03	4,820,568
03	Concrete	19.43	27.36	7,315,381
04	Masonry	1.78	2.51	670,284
05	Metals	9.45	13.31	3,558,652
06	Wood, Plastics, and Composites	0.20	0.28	75,295
07	Thermal and Moisture Protection	1.03	1.45	388,040
08	Openings	21.43	30.18	8,068,778
09	Finishes	1.42	2.00	534,876
10	Specialties	3.32	4.67	1,248,814
12	Furnishings	1.26	1.78	475,540
14	Conveying Systems	4.37	6.15	1,643,178
21	Fire Suppression	2.02	2.85	762,128
22	Plumbing	1.46	2.06	550,453
23	HVAC	10.08	14.20	3,795,463
26	Electrical	7.78	10.96	2,929,509
Total Building Costs		100.00	140.81	37,643,382
02	Existing Conditions	2.93	0.30	72,946
31	Earthwork	21.29	2.22	530,349
32	Exterior Improvements	51.59	5.37	1,285,023
33	Utilities	24.19	2.52	602,438
Total Site Costs		100.00	10.40	2,490,756
Total Project Costs		--	--	40,134,138

Estimate of Probable Cost

Project Notes

Ha-Lo Headquarters - Aug 1998 - IL - Other

*Niles, Illinois

*Construction Period Nov 98 to Oct 00

Special Project Notes

The conceptual ideas about the Ha-Lo Headquarters deal with urban planning, function and technology. The building is arranged like a simple and clear diagram. Its components are placed in a logical, rational and constructed way. Interest is in engineering and performance, rather than design and style. The result is a building of maximum transparency. Transparency deals with light. Traditionally light has been directed at the material fabric of a building, illuminating the solid. At the Ha-Lo Headquarters they are moving into a realm, where light is the essence of the design. The building is luminous, not illuminated. The facade acts as a fabric which moderates the natural and the artificial light, it becomes a screen. The functions are within an adaptable envelope, which responds to the exterior environmental conditions and creates the desired interior environment.

The 7-story building establishes the desired identity at Touhy and Leigh. Projecting loggias from entries at both ends. Building, parking and warehouse are organized through the landscaping like a collage of shifted geometries.

The functions are placed around a 7-story open court. The low floors are loft-type offices. The top 2 floors are showrooms and executive offices around a 2-story skycourt. This clear stacking is readable at the entry facade and contributes to the building's transparency.

Technology is not added, it is an integral part of the design. Technology is not exhibited, but working towards meeting the building's functional, spatial and environmental goals. Technology is advanced, but more in the way that proven and tested materials and components are put together than through invention. Newness is achieved through the elimination of the inessential.

The only way architecture can be new today is through assuming responsibility for more than form and aesthetic. Responsible architecture has to control its environment through design not solely through added technical and mechanical systems. Otherwise technology becomes self-purpose.

Daylight, solar energy and the idea that the skin of a building modulates its own climate have not yet been integrated as essential components in commercial design. The inclusion of these methodologies is a desirable goal. Through this, we can rededicate ourselves towards our natural reflexes and intuitive actions. The result: Buildings with high technology and low energy.

This meets an "eco-tech" approach. A building in harmony between people, technology and nature.

MANUFACTURERS/SUPPLIERS

DIV 07: Skylights: ASI Advanced Structural Systems; Modified Bituminous Membrane: The Garland Company.

DIV 08: Curtainwall: Gardner Metal Products; Insulated Glass Units: Viracon; Structural Glazing: ASI Advanced Structural Systems; Low Iron Glass: Eckelt; Hollow Metal Doors: Curries; Sliding Fire Doors: American Metal Door Co.; Glass Revolving Doors: Boon-Edam; Wood Doors: VT Industries.

DIV 09: Ceramic Tile: Dal-Tile; Drywall, Metal Studs: United States Gypsum.

DIV 10: Access Flooring: Tate Access Floor; Toilet Partitions: Flush Metal Corp.; Toilet & Bath Accessories: American Specialties, Inc.

DIV 14: Elevators: Fujitec Co. Limited; Glass Cabs: Hauenstein & Burmeister Custom Cabs.

Photo Courtesy of Doug Snower

*Illustrations in the D4COST CD-ROM Architectural Library are reproduced, with permission, from the pages of Design Cost Data magazine, (c) DCD.

Unless noted otherwise illustrations are copyrights of the architectural firm in "Prepared By" on the Sources tab. Illustrations are for reference only and may not be reproduced by users of D4COST.

Office Building Cost Report

Project Name: Two Liberty Center

Model Type: Office, 5-10 Story, Precast Concrete Panel / R/Conc. Frame	
Stories (Ea.): 9	Location: Arlington, VA
Story Height (L.F.): 12	Data Release 2005
Floor Area (S.F.): 180000	Wage Rate: Union
Basement: Not Included	

Costs are derived from a building model with basic components. Scope differences and local market conditions can cause costs to vary.

		\$Cost/ Per S.F.	\$ Total Cost	% Of Sub-Total
A Substructure				2.7%
A1010	Standard Foundations	1.36	244,000.00	
A1030	Slab on Grade	0.45	81,000.00	
A2010	Basement Excavation	0.03	4,700.00	
A2020	Basement Walls	0.24	42,600.00	
B Shell				30.4%
B1010	Floor Construction	13.01	2,341,000.00	
B1020	Roof Construction	1.36	245,000.00	
B2010	Exterior Walls	6.26	1,126,000.00	
B2020	Exterior Windows	1.69	303,500.00	
B2030	Exterior Doors	0.15	27,100.00	
B3010	Roof Coverings	0.44	78,500.00	
C Interiors				19.8%
C1010	Partitions	1.77	319,500.00	
C1020	Interior Doors	1.38	248,000.00	
C1030	Fittings	0.63	112,500.00	
C2010	Stair Construction	1.24	223,000.00	
C3010	Wall Finishes	0.71	128,500.00	
C3020	Floor Finishes	5.47	985,500.00	
C3030	Ceiling Finishes	3.71	667,500.00	
D Services				45.9%
D1010	Elevators and Lifts	10.38	1,869,000.00	
D2010	Plumbing Fixtures	1.28	231,000.00	
D2020	Domestic Water Distribution	0.09	16,000.00	
D2040	Rain Water Drainage	0.04	7,975.00	
D3050	Terminal & Package Units	12.79	2,302,000.00	
D4020	Standpipes	0.08	14,500.00	
D5010	Electrical Service/Distribution	0.54	97,000.00	
D5020	Lighting and Branch Wiring	8.46	1,523,000.00	
D5030	Communications and Security	0.51	92,500.00	
D5090	Other Electrical Systems	0.41	73,500.00	
E Equipment & Furnishings				1.2%
E1090	Other Equipment	0.93	166,500.00	
		Sub-Total	75.39 13,570,875.00	100%
GENERAL CONDITIONS (Overhead & Pr		25%	18.85 3,392,500.00	
ARCHITECTURAL FEES		6%	5.66 1,018,000.00	
USER FEES		0%	0.00 0.00	
TOTAL BUILDING COST		99.90	17,981,375.00	

Garage Cost Report

Project Name: Two Liberty Center

Model Type: Garage, Underground Parking, Reinforced Concrete / R/Conc. Frame			
Stories (Ea.): 4		Location:	Arlington, VA
Story Height (L.F.): 10		Data Release	2005
Floor Area (S.F.): 130000		Wage Rate:	Union
Basement: Not Applicable			

Costs are derived from a building model with basic components. Scope differences and local market conditions can cause costs to vary.

			\$Cost/ Per S.F.	\$ Total Cost	% Of Sub-Total
A Substructure					22.0%
A1010	Standard Foundations		2.47	321,500.00	
A1030	Slab on Grade		2.33	302,500.00	
A2010	Basement Excavation		3.52	457,000.00	
B Shell					63.1%
B1010	Floor Construction		10.00	1,300,500.00	
B1020	Roof Construction		9.27	1,205,500.00	
B2010	Exterior Walls		2.90	376,500.00	
B2030	Exterior Doors		0.12	15,600.00	
B3010	Roof Coverings		1.57	203,500.00	
C Interiors					2.0%
C1010	Partitions		0.41	53,500.00	
C1020	Interior Doors		0.03	4,400.00	
C2010	Stair Construction		0.25	33,000.00	
C3010	Wall Finishes		0.05	6,725.00	
D Services					11.9%
D1010	Elevators and Lifts		1.07	139,500.00	
D2010	Plumbing Fixtures		0.23	29,800.00	
D2020	Domestic Water Distribution		0.06	7,650.00	
D2040	Rain Water Drainage		0.62	80,500.00	
D3050	Terminal & Package Units		0.09	11,700.00	
D4020	Standpipes		0.07	8,650.00	
D5010	Electrical Service/Distribution		0.09	11,100.00	
D5020	Lighting and Branch Wiring		1.90	247,500.00	
D5030	Communications and Security		0.32	41,700.00	
D5090	Other Electrical Systems		0.04	5,800.00	
E Equipment & Furnishings					1.1%
E1030	Vehicular Equipment		0.29	37,500.00	
E1090	Other Equipment		0.14	17,700.00	
		Sub-Total	37.84	4,919,325.00	100%
	GENERAL CONDITIONS (Overhead & Pr	25%	9.46	1,230,000.00	
	ARCHITECTURAL FEES	8%	3.78	492,000.00	
	USER FEES	0%	0.00	0.00	
	TOTAL BUILDING COST		51.09	6,641,325.00	

Technical Assignment #1

Nathanael Paist

Construction Management

Faculty Adviser: Dr. Messner

Two Liberty Center

Arlington, VA

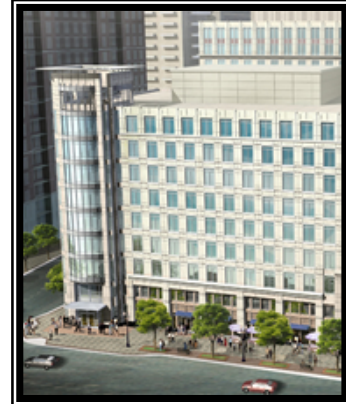


Table of Contents

1.	Executive Summary	2
2.	Site Plan of Existing Conditions	3
3.	Local Conditions	3
4.	Client Information	4
5.	Project Delivery System	5
6.	Staffing Plan	5
7.	Appendix 1.A	6

Technical Assignment #1

Nathanael Paist

Construction Management

Faculty Adviser: Dr. Messner

Two Liberty Center

Arlington, VA



Executive Summary

Site Plan of Existing Conditions:

- Vehicular traffic most critical along south side of the site
- Pedestrian traffic redirected away from east and west sides
- No available on-site parking

Local Conditions:

- Cast-in-place concrete structures and pre-cast concrete facades
- Reusable soils need to be shipped off-site and stored
- Small amounts of contaminated soils
- Long lead time on permitting by local County

Client Information:

- Investors led by a developer with focus on time and quality
- Phased occupancy schedule by floor
- Liquidated damages for occupancy delays

Project Delivery System:

- Modified design-bid-build with contractor negotiation during design
- Contractor under cost-plus-fee with guaranteed maximum price

Site Plan of Existing Conditions

(See Appendix 1.A for Site Plan Drawing)

Site Conditions:

Two Liberty Center is being constructed in downtown Ballston, a very rapidly developing and active section of Arlington County. The local conditions leave very little space for site activity and create potential complications with vehicular and pedestrian traffic. Vehicular traffic is most critical on the south side of the site, where the busiest adjacent street is, so the majority of site activity will need to take place on the east and west sides of the site or during the off-peak hours on the south side. Pedestrians are redirected to avoid the east and west sides of the site and provided with a covered walkway along the south side. Concrete jersey barriers line all sides of the site to protect the site and the pedestrians along the south side from vehicular accidents. There is no room for on-site parking, so contractors and site visitors need to make use of existing parking facilities in the area or take advantage of the close proximity to public transportation access.

Local Conditions

Regional Construction:

The Arlington area falls into the trends of the Washington DC market because of the close proximity and shared contractors. These contractors typically build structures with steel reinforced cast-in-place concrete, and have recently seen a trend with pre-cast concrete panel exterior wall construction.

Excavation:

This site was excavated as part of a larger excavation for all three of the buildings being built on the same complex. There was very little ground-water encountered during the excavation, but some water was removed from the site using standalone pumps. The soils being excavated contained some areas of rock that created the potential for some concealed conditions costs, but this rock was found to be soft enough for standard excavation methods. There were also contaminated samples of soil discovered during the

excavation. These contaminated sections of soil were removed from the site with minimal additional costs. Soil removal was a large portion of the estimated cost of excavation since there was not room on site or nearby for a stock pile. Soils to be reused were shipped to a remote location and stored until backfilling was ready to take place.

Local Constraints:

The governing local authorities added additional complications to the planning of this project. Permit review by the local county has an abnormally long lead time. This extended duration places emphasis on early completion of design to ensure construction will not be delayed by permitting. The local authority also places restrictions on the “noisy” working hours since this site is zoned for apartments as well as commercial and office. Noisy work can’t begin on site until after 7am on the weekdays and 10am on the weekends. These restrictions limit the types of activities that can occur on the site prior to those times.

Client Information

The owner of Two Liberty Center is an investor group led by The Shooshan Company, a full service real estate developing firm from the area. This building is being kept by the owner and will be leased to multiple tenants, so the owner is more involved and has a higher focus on quality than many other developers that focus on upfront savings. These expectations by the owner are exemplified in the high level of material quality being used in construction, including an efficient but slightly more expensive mechanical system as well as the high-end finishes for the lobby and entry areas.

There are already several floors of the building under lease upon completion so there is an aggressive move-in schedule being enforced by the owner. Tenant fit-out will occur in phases by floor and will overlap with construction activities on floors above the completed floors. The potential damages that the owner would incur should the occupancy schedule be delayed are included in the contract between the owner and the contractor as liquidated damages.

Project Delivery System

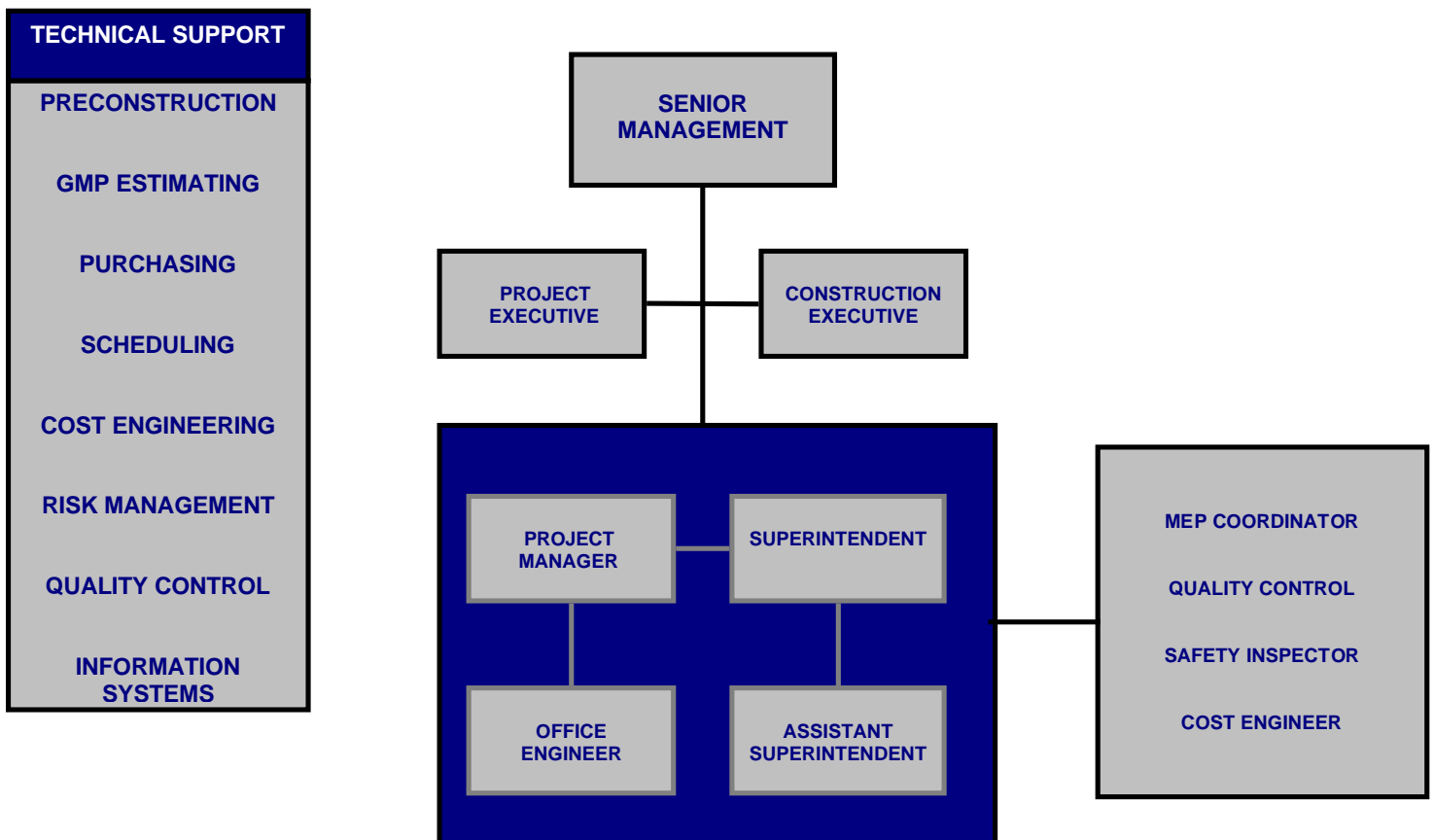
(See Appendix 1.B for Organizational Chart)

Project Delivery Method:

This project is being delivered under a modification of the traditional design-bid-build method. The contractor for this building was selected without bid by the owner and negotiated during the design phase. Negotiations included budgeting at several phases of design to assist the owner in making critical design criteria decisions. The contractor is being held under a cost-plus-fee contract with a guaranteed maximum price. After design was completed, the sub-contracts were released for a competitive bid and awarded based on lowest cost with most reliable scope.

Staffing Plan

The following chart represents the staffing plan used by the General Contractor for Two Liberty Center:

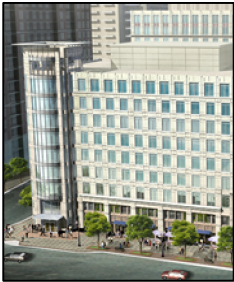
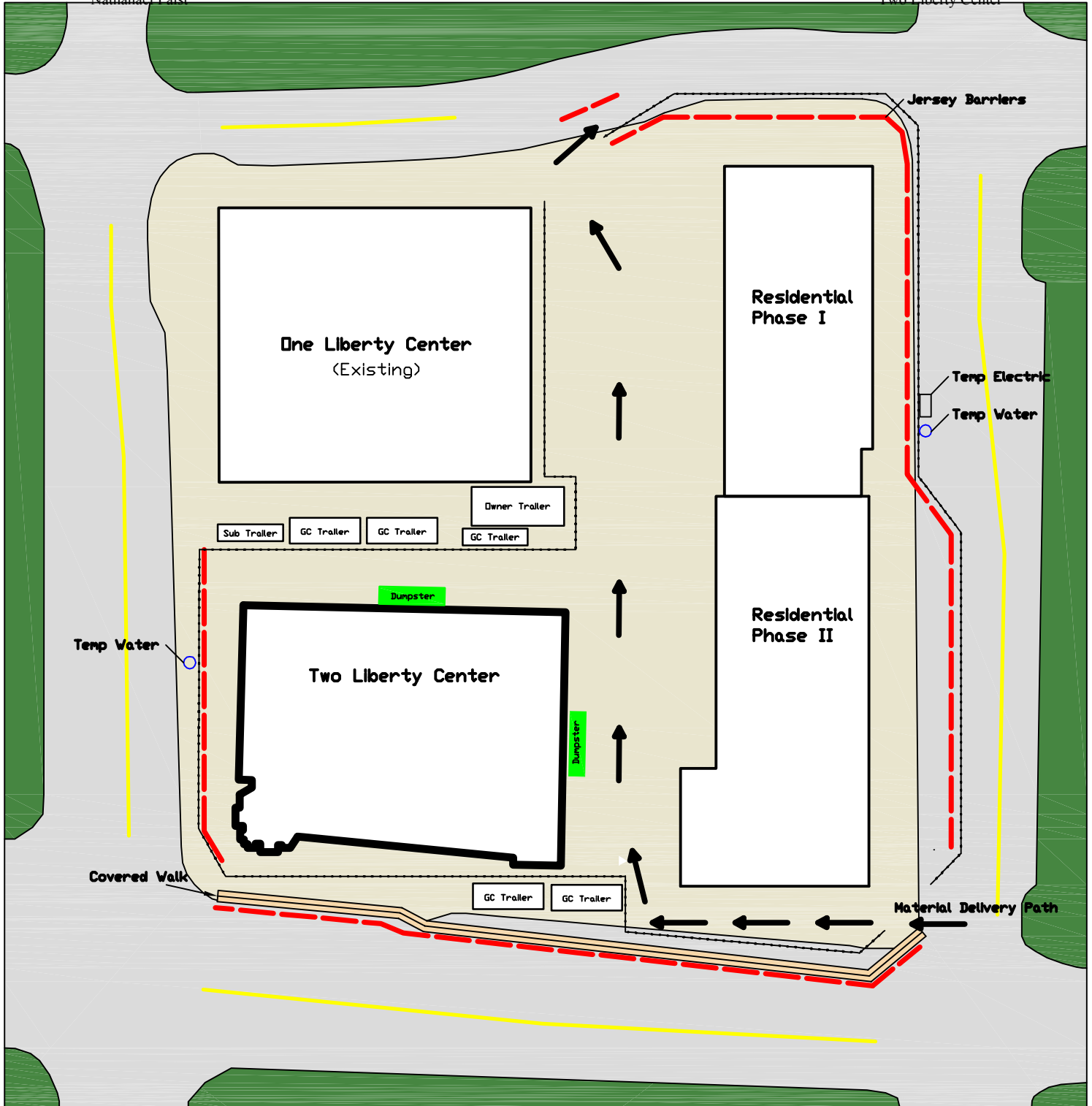


Appendix 1.A

The Following Appendix Contains:

- Site Plan of Existing Conditions





Site Utilization Plan

Existing Conditions

Two Liberty Center

Arlington, VA

Scale: NTS

Nathanael Paist

Construction Management

