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CONSTRUCTION MANAGEMENT
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TECHNICAL ASSIGNMENT #2

OFFICE/RETAIL BUILDING
WASHINGTON, D.C.



SUBMITTED: NOVEMBER 2, 2007

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EXECUTIVE SUMMARY

Technical assignment #2 analyzes the key features of the office/retail building in Washington, D.C. that affect project execution. These features include a detailed project schedule, site layout planning, an assemblies estimate, a detailed estimate, and a general conditions estimate.

The detailed project schedule indicates the notice to proceed date as August 15, 2006, and the substantial completion date for the base building as September 17, 2007. These dates are built around the owner's needs and contractor's milestone dates to keep them on track. The schedule reflects how the project was built, and activities are grouped per related trades and areas of work. Phasing is also shown throughout the schedule in certain areas, such as demolition and building envelope construction.

Site layout planning was observed throughout the phases of construction of the new curtain wall. A three-dimensional model was also developed to better visualize the process on the project site. The contractor's layout and coordination issues encountered are discussed.

An assemblies estimate was developed for the HVAC system to observe how the different elements make up the total cost of heating, ventilating, and air conditioning. R.S. Means Cost Data helped to compare the estimate to the actual contract value.

The building envelope was analyzed through the detailed estimate and then compared to the actual contract cost. The new envelope was broken down per exterior façade of the building, then each enclosure material was quantified and multiplied by its unit cost. R.S. Means Cost Data was used in this estimate. To further evaluate the detailed estimate, the effective overall ratio for \$/sf enclosure was calculated.

Finally, the general conditions estimate shows the various general conditions project and staffing costs for the duration of the project. Each cost in the general conditions was categorized by salaried staffing, office support, safety, temporary utilities, and miscellaneous expenses in a summary breakdown.

DETAILED PROJECT SCHEDULE

Key Project Dates

Project Awarded	5/31/06
Notice to Proceed Issued	8/15/06
Interior Demolition Complete	12/1/06
Exterior Demolition Complete	12/7/06
HVAC Operational	5/1/07
Begin Curtain Wall Installation	5/15/07
Ribbon/Punch Windows Watertight	6/1/07
Storefront Watertight	7/2/07
Electrical Services Complete	6/27/07
Lobby Complete	7/31/07
Curtain Wall Watertight	8/15/07
Base Building Substantial Completion	9/17/07
Core Finishes Complete	9/17/07
Curtain Wall Substantial Completion	9/25/07
Finishes at Curtain Wall/Site Complete	10/9/07

Demolition

Demolition served as a very extensive process on the office/retail building, as only the concrete slabs remained after the process was complete. Demolition permits were obtained right around the notice to proceed date of August 15, 2006, and abatement followed soon after. The interior demolition was a lengthy and selective process as all the existing office/retail spaces, as well as the MEP systems, were completely “guttled”. The exterior brick facades facing the two intersecting streets were torn down starting in the middle of September and lasting into December. Also, the ribbon/punch windows in the rear of the building were taken out to be replaced later. This fast-paced demolition process was completed on December 7, 2006.

Building Envelope

The new building envelope system consisted of the replacement of ribbon/punch windows in the rear of the building, a new glass storefront, and a glass and metal panel curtain wall. The ribbon/punch windows began to be replaced on January 10, 2007, and became watertight on June 1. The storefront installation lasted four and a half months, starting February 22, 2007 and watertight on July 2. Finally, the glass and metal panel curtain wall system began May 15, 2007 and became watertight three months later. The curtain wall went up fairly quickly due to prefabricated panels hoisted by a crane and put into place.

MEP/Finishes

Since the owner is able to lease the upper floors before the lower ones, the MEP system rough-ins as well as the finishes were constructed from the top down. Also, there was a lot more work to be done in the service core of floors 2-10, making the MEP rough-ins and finishes scheduled to be performed before the perimeter. The parking garage, penthouse, and lobby MEP rough-ins and room finishes were performed in order. The lobby was one of the last areas to be worked on since it included marble wall and floor tiles in its finishes. Since the lobby was used as a storage area for various materials and was a common traffic area, it worked best to complete these stone finishes towards the end of the project.

(See Appendix A for detailed project schedule)

SITE LAYOUT PLANNING – CURTAIN WALL

Site layout plans were developed for the various phases of curtain wall construction of the office/retail building. The congested site presented some challenges during this phase of construction, including the little amount of space to work with and the coordination concerns with the tenant contractors and subcontractors. For the new construction of the curtain wall, the glass panel placement was divided up into three phases.

Phase one included the curtain wall construction on the south façade of the building, facing the street level. A trailer with the glass panels delivery pulled just inside the chain link fence from the southwest construction access, which served as a staging area. A mobile crane with a 150 foot boom length was placed in approximate alignment with the center of the building. (See Appendices B.1 and B.4)

Phase two of the curtain wall and storefront construction consisted of the east façade facing the street level. The mobile crane was positioned at the center of the building. The glass panel staging area was located on a truck just north of the crane for easily accessible pick points. (See Appendices B.2 and B.4)

Phase three was a relatively short phase that involved only part of the west façade getting glass curtain wall panels. This section is all that is visible from the street because of the neighboring buildings. The crane was placed right at the parking garage entry, which caused the parking garage to be temporarily closed to the workers on site. This was inconvenient for all the workers who had to find parking elsewhere in the city or ride the metro to work, but looked like the best option at the time to get the panels in place. The general contractor made sure to time this phase simultaneously with the finishes in the three underground parking garage levels. (See Appendices B.3 and B.4)

The general contractor and the curtain wall contractor worked well together to come up with a game plan to construct the curtain wall panels and storefront. The general contractor did run into some trouble in coordination with other tenant contractors and subcontractors at times. For instance, the concrete subcontractor was performing slab chipping on the existing concrete floor slabs to make the curtain wall panels fit, and became behind schedule. This delayed the curtain wall glass panel placement of phase one, which in turn affected the delivery schedule for certain trades. The delivery area was very small and congested, and part of the fence was bumped out to encompass a lane of the road during the hours of 9:30 AM – 3:00 PM. The location of the trailer with the panels was very important as the pick point for the crane. This location was affected at times due to the delay caused by slab chipping, and the curtain wall contractor would sometimes have difficulty swinging panels. These coordination issues often come up when working with many different contractors on a congested site, and the general contractor on the office/retail building handled the site layout for the curtain wall erection relatively well.

ASSEMBLIES ESTIMATE - HVAC

R.S. Means Assemblies Cost Data 2007 was used to create an assemblies estimate for the office/retail building. The systems were broken up into categories including heat generating systems, cooling generating systems, distribution systems, terminal and package units, and exhaust systems.

The heating system used on this project is a large hydronic system with heat exchangers and unit heaters. The service area equals the area of all the office and retail space, along with the service core and corridor areas, which totals 361,660 square feet. A cooling tower system of chilled water and condenser water generates cool air in the office/retail building. The total service area of the cooling system is equal to that of the heating system. Variable air volume (VAV) boxes are located throughout the heated and cooled areas of the office and retail tenant space. These boxes provide air depending on the temperature demands of the specific room or area of the building. Several self-contained water cooled units and split system water cooled condensing units are included in the HVAC systems of the office/retail building. The water cooled unit systems are located in areas such as the first floor lobby, the B-1 level fitness center, and the elevator machine room. Split system water cooled condensing units are also located in select areas throughout the building, including the fire control room and the shuttle elevator machine room. Combined, these terminal and package units service around 10,000 square feet of space. Finally, a garage exhaust system is included in the assemblies estimate, which is broken down by bay of coverage. There are three garage levels with exhaust fans and ducts that service a total of six bays.

The total estimated cost of the HVAC system of the office/retail building using R.S. Means Assemblies Cost Data and a location factor of 99.1 is nearly \$6.53 million. This value is fairly accurate considering the actual contract value of the mechanical and plumbing contract was worth \$9.52 million.

ASSEMBLIES ESTIMATE - HVAC					
Category	Item #	Description	Service Area (SF)	Cost/SF	System Cost
Heat Generating Systems	D3020 104	Large Heating System, Hydronic, Unit Heaters	361,660	\$6.00	\$2,169,960
Cooling Generating Systems	D3030 115	Chilled Water, Cooling Tower System	361,660	\$10.95	\$3,960,177
Distribution Systems	D3040 138	VAV Terminal Units	361,660	\$1.26	\$455,692
Terminal & Package Units	D3050 160	Self-Contained, Water Cooled Unit System	8,186	\$6.36	\$52,063
Terminal & Package Units	D3050 170	Split System With Air Cooled* Condensing Units	446	\$6.00	\$2,676
Other HVAC Systems/Equip	D3090 320	Garage Exhaust System	3 4" outlets w/ 2 bays	-	\$12,915
Subtotal:					\$6,585,829
Location Factor:					99.1
TOTAL COST OF HVAC SYSTEM:					\$6,526,556

DETAILED ESTIMATE - BUILDING ENVELOPE SYSTEM

The building envelope system scope of work for the office/retail building consists of several parts, including ribbon/punch windows, storefront, curtain wall, and brick repair/restoration. The following is a detailed breakdown of the costs associated with the work performed, using R.S. Means Building Construction Cost Data 2008 values. This breakdown did not include overhead and profit or equipment costs for placing the glass and metal panels, storefront, and brick repair/restoration. Also, the brick repair/restoration breakdown of costs assumed that all damaged brick was to be replaced with new brick and did not include repointing costs since the quantity was unknown. The total cost calculated for the building envelope system, including the location factor adjustment, came out to be about \$3.14 million, while the effective overall ratio for the new enclosure was \$44/sf. The actual cost of the building envelope system was around \$7.92 million, which is likely due to the high equipment costs cranes and hoists used for installing the building envelope.

DETAILED ESTIMATE - BUILDING ENVELOPE							
RIBBON/PUNCH WINDOWS							
RS Means #	Item	Description	Façade	Quantity	Unit	Cost / Unit	Cost
07 92 10.10	Caulking and Sealant Options	Silicone Rubber	North	3,532	LF	\$3.50	\$12,362
	Caulking and Sealant Options	Silicone Rubber	West	3,287	LF	\$3.50	\$11,505
08 51 13.10	Aluminum Sash	Picture Window	North	7,607	SF	\$16.99	\$129,243
	Aluminum Sash	Picture Window	West	7,784	SF	\$16.99	\$132,250
08 81 30.10	Reduce Heat Transfer Glass	1" Thick Unit	North	6,538	SF	\$26.35	\$172,276
	Reduce Heat Transfer Glass	1" Thick Unit	West	6,690	SF	\$26.35	\$176,282
STOREFRONT							
RS Means #	Item	Description	Façade	Quantity	Unit	Cost / Unit	Cost
07 92 10.10	Caulking and Sealant Options	Silicone Rubber	East	2,274	LF	\$3.50	\$7,959
	Caulking and Sealant Options	Silicone Rubber	South	2,178	LF	\$3.50	\$7,623
08 43 13.10	Aluminum Framed Entrance Doors	6'x10' Opening	East	4	EA	\$610	\$2,440
	Aluminum Framed Entrance Doors	6'x10' Opening	South	6	EA	\$610	\$3,660
08 43 13.20	Storefront Systems	Commercial Grade	East	3,286	SF	\$18.48	\$60,725
	Storefront Systems	Commercial Grade	South	3,022	SF	\$18.48	\$55,847
CURTAIN WALL							
RS Means #	Item	Description	Façade	Quantity	Unit	Cost / Unit	Cost
05 58 27.90	Window Guards	Metal Panels	East	2,402	SF	\$24.66	\$59,233
	Window Guards	Metal Panels	South	3,883	SF	\$24.66	\$95,755
	Window Guards	Metal Panels	West	2,813	SF	\$24.66	\$69,369
07 92 10.10	Caulking and Sealant Options	Silicone Rubber	East	9,062	LF	\$3.50	\$31,717
	Caulking and Sealant Options	Silicone Rubber	South	8,901	LF	\$3.50	\$31,154
	Caulking and Sealant Options	Silicone Rubber	West	2,971	LF	\$3.50	\$10,399
08 44 13.10	Glazed Curtain Walls	Avg Double Glazed Alum	East	17,347	SF	\$51.65	\$895,973
	Glazed Curtain Walls	Avg Double Glazed Alum	South	17,040	SF	\$51.65	\$880,116
	Glazed Curtain Walls	Avg Double Glazed Alum	West	5,688	SF	\$51.65	\$293,785
BRICK REPAIR/RESTORATION							
RS Means #	Item	Description	Façade	Quantity	Unit	Cost / Unit	Cost
04 21 13.13	Brick Veneer Masonry	Std. Select Common	ALL	3,050	SF	\$9.80	\$29,890
Subtotal:						\$3,169,561	
Location Factor:						99.1	
TOTAL COST OF BUILDING ENVELOPE SYSTEM:						\$3,141,035	

GENERAL CONDITIONS ESTIMATE

The general conditions estimate summary is used to show how the contractor broke up its costs for general conditions items. The office/retail building project lasted 13 months with an additional month for commissioning. A full-time project manager, assistant project manager, superintendent, and assistant superintendent were among eight salaried employees figured into the salaried staffing costs in the summary. After the substantial completion date, the senior project engineer, project engineer, chief field engineer, and project accountant left for another job, while the remainder of the staff stayed to complete the close-out items. The project executive on the job split his time among three jobs and was figured in for about five months of the project duration. A contractor's fee of 4% was included in the general conditions. The cost summary for salaried staffing totaled about \$1.17 million.

The office support summary item included all the supplies and set-up equipment used to operate from the temporary third floor office, totaling around \$128,000. Safety was also factored into the general conditions summary, and included safety equipment, perimeter protection, and covered walkways, which came out to be \$47,500 in cost. Temporary utilities on the office/retailed building included temporary power, fire protection, and port-a-johns, totaling nearly \$147,000. The miscellaneous items cost about \$1.98 million, bringing the total cost of general conditions to \$3,475,614.

(See Appendix C for detailed breakdown of G.C. costs)

GENERAL CONDITIONS SUMMARY	
Description	Amount
Salaried Staffing	\$1,170,400
Office Support	\$128,254
Safety	\$47,500
Temporary Utilities	\$146,945
Other	\$1,982,515
TOTAL:	\$3,475,614

APPENDIX A

DETAILED PROJECT SCHEDULE

Detailed Project Schedule

Office/Retail Building - Washington, D.C.

Activity ID	Activity Name	Original Durat...	Start	Finish	2006												2007												2008					
					Qtr 1			Qtr 2			Qtr 3			Qtr 4			Qtr 1			Qtr 2			Qtr 3			Qtr 4			Qtr 1					
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar			
Office/Retail Building - Washington, D.C.					09-Oct-07, Office/Retail Building - Washington, D.C.																													
General					17-Sep-07, General																													
GENRL01	Design Phase	167	03-Jan-06	25-Aug-06	Design Phase																													
GENRL02	Procurement Phase	34	13-Apr-06	31-May-06	Procurement Phase																													
GENRL03	Project Awarded	0		31-May-06	♦ Project Awarded																													
GENRL04	Obtain Building Permit	84	15-May-06	12-Sep-06	Obtain Building Permit																													
GENRL05	Notice to Proceed	0	15-Aug-06		♦ Notice to Proceed																													
GENRL06	Final Punchlist/Inspections/Cleaning	32	02-Aug-07	17-Sep-07	Final Punchlist/Inspections/Cleaning																													
GENRL07	Base Building Substantial Completion	0		17-Sep-07	♦ Base Building Substantial Completion																													
Demolition					07-Dec-06, Demolition																													
DEMO01	Obtain Interior Demolition Permit	14	01-Aug-06	18-Aug-06	Obtain Interior Demolition Permit																													
DEMO02	Abatement/Environmental	22	16-Aug-06	15-Sep-06	Abatement/Environmental																													
DEMO03	Interior Demolition	65	30-Aug-06	01-Dec-06	Interior Demolition																													
DEMO04	Interior Demolition Complete	0		01-Dec-06	♦ Interior Demolition Complete																													
DEMO05	Penthouse Demolition	40	30-Aug-06	25-Oct-06	Penthouse Demolition																													
DEMO06	Exterior Demolition	40	13-Sep-06	07-Nov-06	Exterior Demolition																													
DEMO07	Exterior Demolition Complete	0		07-Dec-06	♦ Exterior Demolition Complete																													
DEMO08	Concrete Demolition (Slab Edge/Pit/Curbs/etc.)	20	08-Nov-06	07-Dec-06	Concrete Demolition (Slab Edge/Pit/Curbs/etc.)																													
Structure					29-Aug-07, Structure																													
Concrete					23-Jan-07, Concrete																													
CONC01	Concrete Infills	60	26-Oct-06	23-Jan-07	Concrete Infills																													
Steel					20-Mar-07, Steel																													
STEEL01	Install Structural Steel	20	09-Nov-06	08-Dec-06	Install Structural Steel																													
STEEL02	Install Cornice Structural Frame	20	24-Jan-07	20-Feb-07	Install Cornice Structural Frame																													
STEEL03	Install Eyebrow/Canopy Structural Frame	20	21-Feb-07	20-Mar-07	Install Eyebrow/Canopy Structural Frame																													
Stone					29-Aug-07, Stone																													
STONE01	Install Exterior Stone Watertable	15	24-Jan-07	13-Feb-07	Install Exterior Stone Watertable																													
STONE02	Install Exterior Stone Columns Levels 1-2	13	15-May-07	01-Jun-07	Install Exterior Stone Columns Levels 1-2																													
STONE03	Install Exterior Stone Columns Levels 1-Roof	60	06-Jun-07	29-Aug-07	Install Exterior Stone Columns Levels 1-Roof																													
Roofing					20-Mar-07, Roofing																													
ROOF01	Build Parapets/Demo EMR Roof/Install Roofing	40	24-Jan-07	20-Mar-07	Build Parapets/Demo EMR Roof/Install Roofing																													
Building Envelope					25-Sep-07, Building Envelope																													
Brick					29-Jan-07, Brick																													
ENVL01	Restore Brick Facade W&N (15 bays @ 10 floors)	75	11-Oct-06	29-Jan-07	Restore Brick Facade W&N (15 bays @ 10 floors)																													
Strip Windows					01-Jun-07, Strip Windows																													
ENVL02	Install Ribbon/Punch Windows 9-10 (32)	24	10-Jan-07	12-Feb-07	Install Ribbon/Punch Windows 9-10 (32)																													
ENVL03	Install Ribbon/Punch Windows 7-8 (28)	20	13-Feb-07	12-Mar-07	Install Ribbon/Punch Windows 7-8 (28)																													
ENVL04	Install Ribbon/Punch Windows 5-6 (28)	20	13-Mar-07	09-Apr-07	Install Ribbon/Punch Windows 5-6 (28)																													
ENVL05	Install Ribbon/Punch Windows 3-4 (28)	20	10-Apr-07	07-May-07	Install Ribbon/Punch Windows 3-4 (28)																													
ENVL06	Install Ribbon/Punch Windows 1-2 (24)	18	08-May-07	01-Jun-07	Install Ribbon/Punch Windows 1-2 (24)																													
ENVL07	Ribbon/Punch Windows Watertight	0		01-Jun-07	♦ Ribbon/Punch Windows Watertight																													

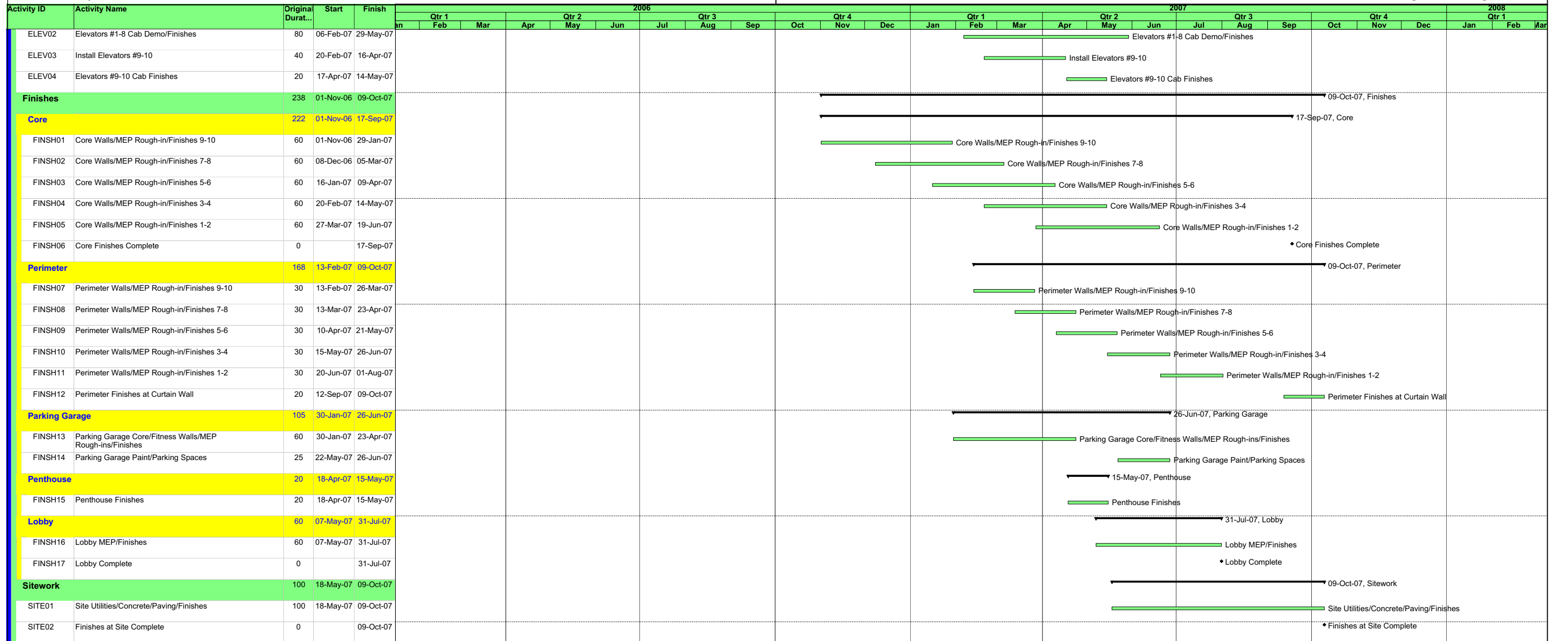
Detailed Project Schedule

Office/Retail Building - Washington, D.C.

Activity ID	Activity Name	Original Durat...	Start	Finish	2006												2007												2008		
					Qtr 1			Qtr 2			Qtr 3			Qtr 4			Qtr 1			Qtr 2			Qtr 3			Qtr 4					
					Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Storefront																	02-Jul-07, Storefront														
ENVL08	Install Storefront NE Thru Lobby	42	22-Feb-07	20-Apr-07													Install Storefront NE Thru Lobby														
ENVL09	Install Storefront Beyond Lobby	50	23-Apr-07	02-Jul-07													Install Storefront Beyond Lobby														
ENVL10	Storefront Watertight	0		02-Jul-07													Storefront Watertight														
Curtainwall																	25-Sep-07, Curtainwall														
ENVL11	Curtain Wall Installation Start	0	15-May-07														Curtain Wall Installation Start														
ENVL12	Install Curtain Wall & Metal Panel System 1-2	13	15-May-07	01-Jun-07													Install Curtain Wall & Metal Panel System 1-2														
ENVL13	Install Curtain Wall & Metal Panel System 3-4	13	04-Jun-07	20-Jun-07													Install Curtain Wall & Metal Panel System 3-4														
ENVL14	Install Curtain Wall & Metal Panel System 5-6	13	21-Jun-07	10-Jul-07													Install Curtain Wall & Metal Panel System 5-6														
ENVL15	Install Curtain Wall & Metal Panel System 7-8	13	11-Jul-07	27-Jul-07													Install Curtain Wall & Metal Panel System 7-8														
ENVL16	Install Curtain Wall & Metal Panel System 9-10	13	30-Jul-07	15-Aug-07													Install Curtain Wall & Metal Panel System 9-10														
ENVL17	Curtain Wall Watertight	0		15-Aug-07													Curtain Wall Watertight														
ENVL18	Install Exterior Curtain Wall Snap Covers/Seal	28	16-Aug-07	25-Sep-07													Install Exterior Curtain Wall Snap Covers/Seal														
ENVL19	Install Interior Curtain Wall Firesafing/Stolls/Closures	28	16-Aug-07	25-Sep-07													Install Interior Curtain Wall Firesafing/Stolls/Closures														
ENVL20	Curtain Wall Substantial Completion	0		25-Sep-07													Curtain Wall Substantial Completion														
Miscellaneous																	29-Aug-07, Miscellaneous														
ENVL22	Install Eyebrow/Canopy (Curtain Wall Scope)	20	19-Jun-07	17-Jul-07													Install Eyebrow/Canopy (Curtain Wall Scope)														
ENVL23	Install Roof Cornice (Curtain Wall Scope)	20	02-Aug-07	29-Aug-07													Install Roof Cornice (Curtain Wall Scope)														
Mechanical, Electrical, Plumbing																	27-Jun-07, Mechanical, Electrical, Plumbing														
MEP01	Submit & Review Mechanical Equipment	30	16-Aug-06	27-Sep-06													Submit & Review Mechanical Equipment														
MEP02	Submit & Review Electrical Equipment	30	16-Aug-06	27-Sep-06													Submit & Review Electrical Equipment														
MEP03	Make Safe All MEP Systems	10	16-Aug-06	29-Aug-06													Make Safe All MEP Systems														
MEP04	Fabricate & Deliver Mechanical Equipment	60	28-Sep-06	22-Dec-06													Fabricate & Deliver Mechanical Equipment														
MEP05	Fabricate & Deliver Electrical Equipment	90	28-Sep-06	06-Feb-07													Fabricate & Deliver Electrical Equipment														
MEP06	PH Ductwork, Piping, Rough-in of Mechanical Equipment	90	02-Nov-06	13-Mar-07													PH Ductwork, Piping, Rough-in of Mechanical Equipment														
MEP07	PH Conduit, Feeders, Branches for Electrical Rough-in	90	02-Nov-06	13-Mar-07													PH Conduit, Feeders, Branches for Electrical Rough-in														
MEP08	Duct/Pipe Mains on Floors B3-10	70	08-Dec-06	19-Mar-07													Duct/Pipe Mains on Floors B3-10														
MEP09	Garage MEP	40	08-Dec-06	05-Feb-07													Garage MEP														
MEP10	Install New Mechanical Equipment @ PH	70	26-Dec-06	03-Apr-07													Install New Mechanical Equipment @ PH														
MEP11	Install New Electrical Equipment @ PH	70	26-Dec-06	03-Apr-07													Install New Electrical Equipment @ PH														
MEP12	PH Tie-in of Mechanical Equipment	20	04-Apr-07	01-May-07													PH Tie-in of Mechanical Equipment														
MEP13	PH Tie-in of Electrical Equipment	20	04-Apr-07	01-May-07													PH Tie-in of Electrical Equipment														
MEP14	PH Install New Mechanical Enclosures	10	04-Apr-07	17-Apr-07													PH Install New Mechanical Enclosures														
MEP15	PH MEP Equipment Controls	40	04-Apr-07	30-May-07													PH MEP Equipment Controls														
MEP16	HVAC Operational	0		01-May-07													HVAC Operational														
MEP17	Exterior MEP Rough-in Floors 1-2	10	18-May-07	01-Jun-07													Exterior MEP Rough-in Floors 1-2														
MEP18	MEP TAB & Commissioning	20	31-May-07	27-Jun-07													MEP TAB & Commissioning														
MEP19	Exterior MEP Fitout Floors 1-2	10	04-Jun-07	15-Jun-07													Exterior MEP Fitout Floors 1-2														
MEP20	Electrical Services Complete	0		27-Jun-07													Electrical Services Complete														
Elevators																	29-May-07, Elevators														
ELEV01	Upgrade Elevators #1-8	40	08-Dec-06	05-Feb-07													Upgrade Elevators #1-8														

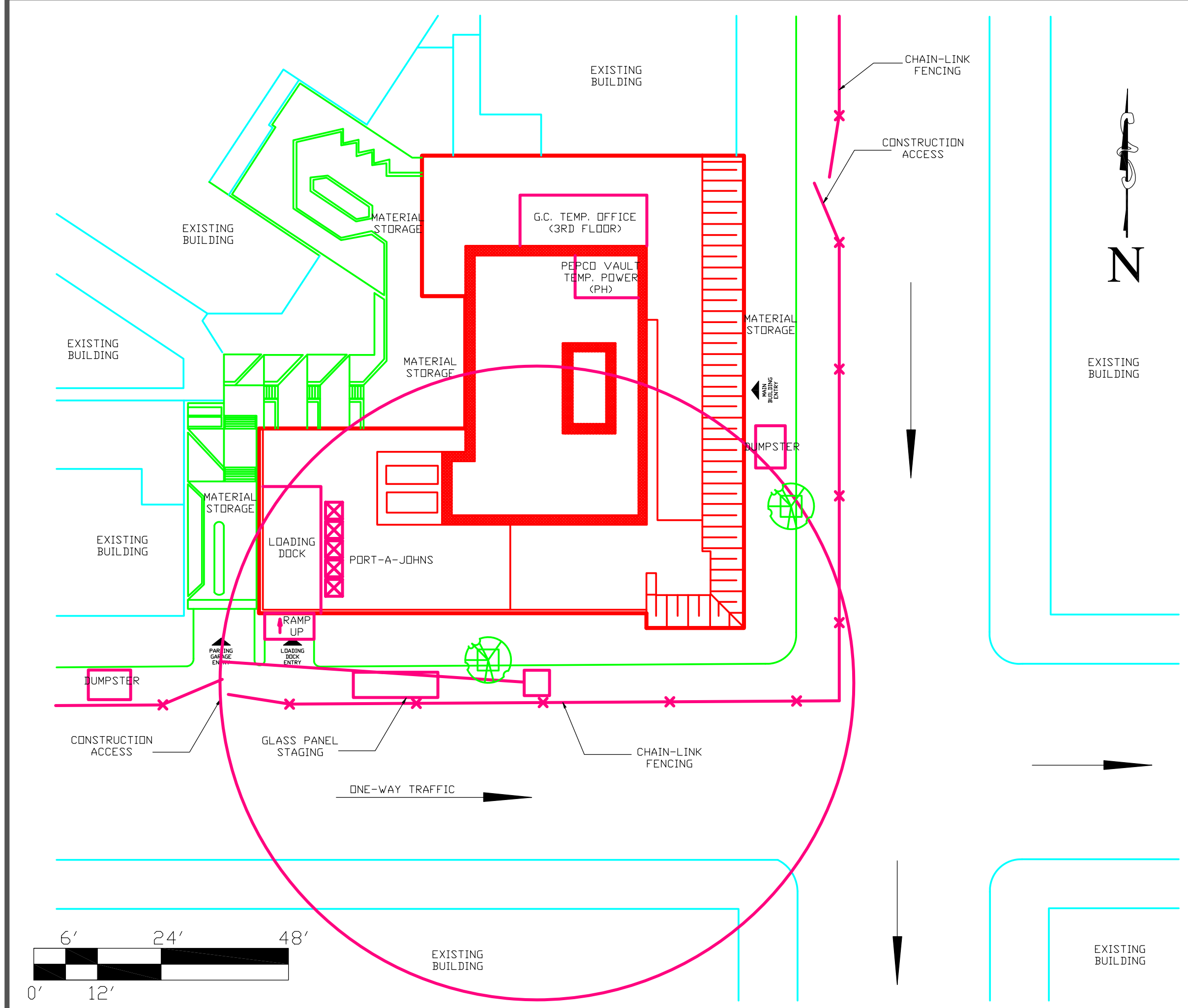
Detailed Project Schedule

Office/Retail Building - Washington, D.C.



APPENDIX B.1

PHASE 1 OF CURTAIN WALL

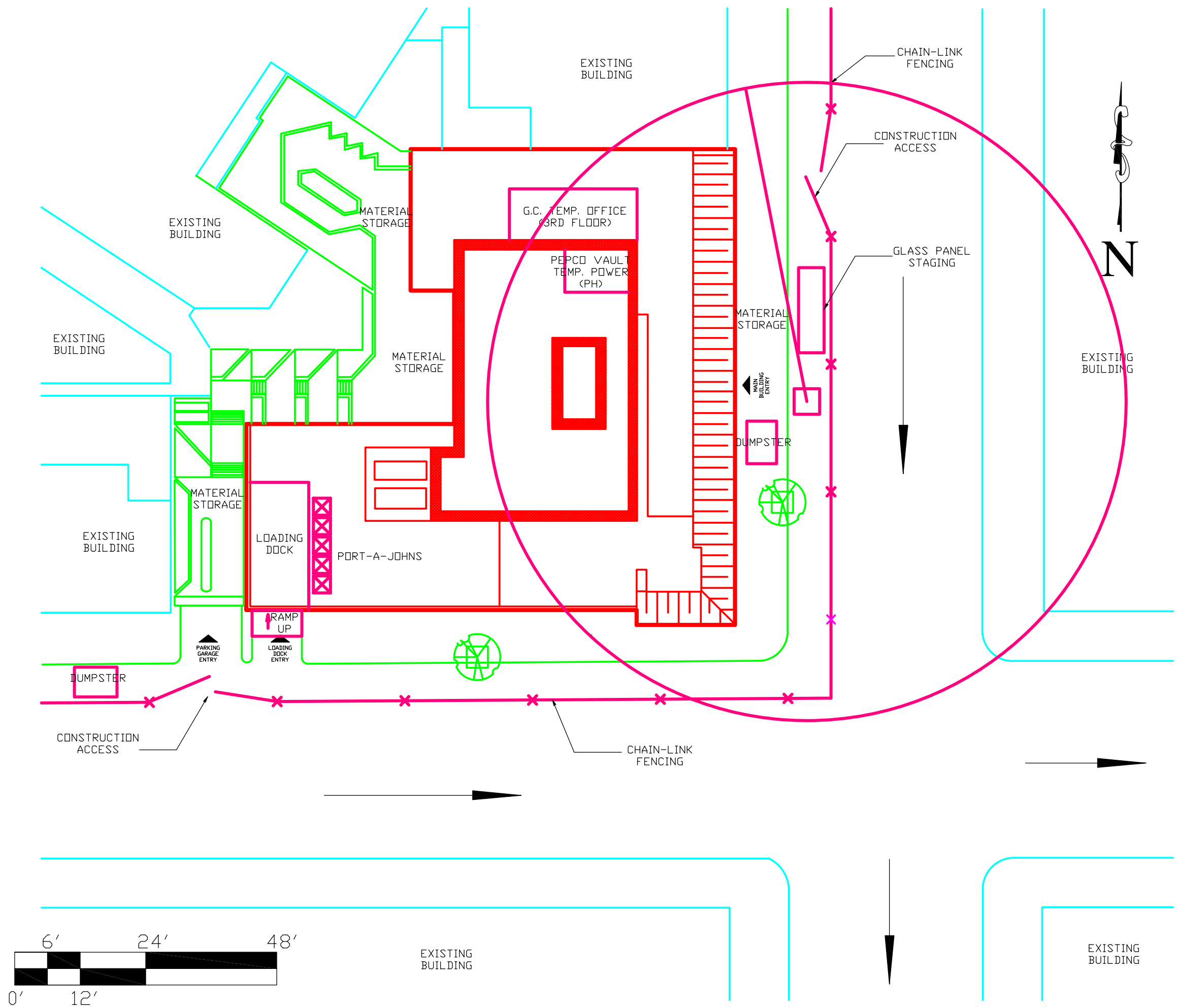


DEREK BAUER
 NOVEMBER 2, 2007

CURTAIN WALL PHASE 1
 OFFICE/RETAIL BUILDING

APPENDIX B.2

PHASE 2 OF CURTAIN WALL



DEREK BAUER

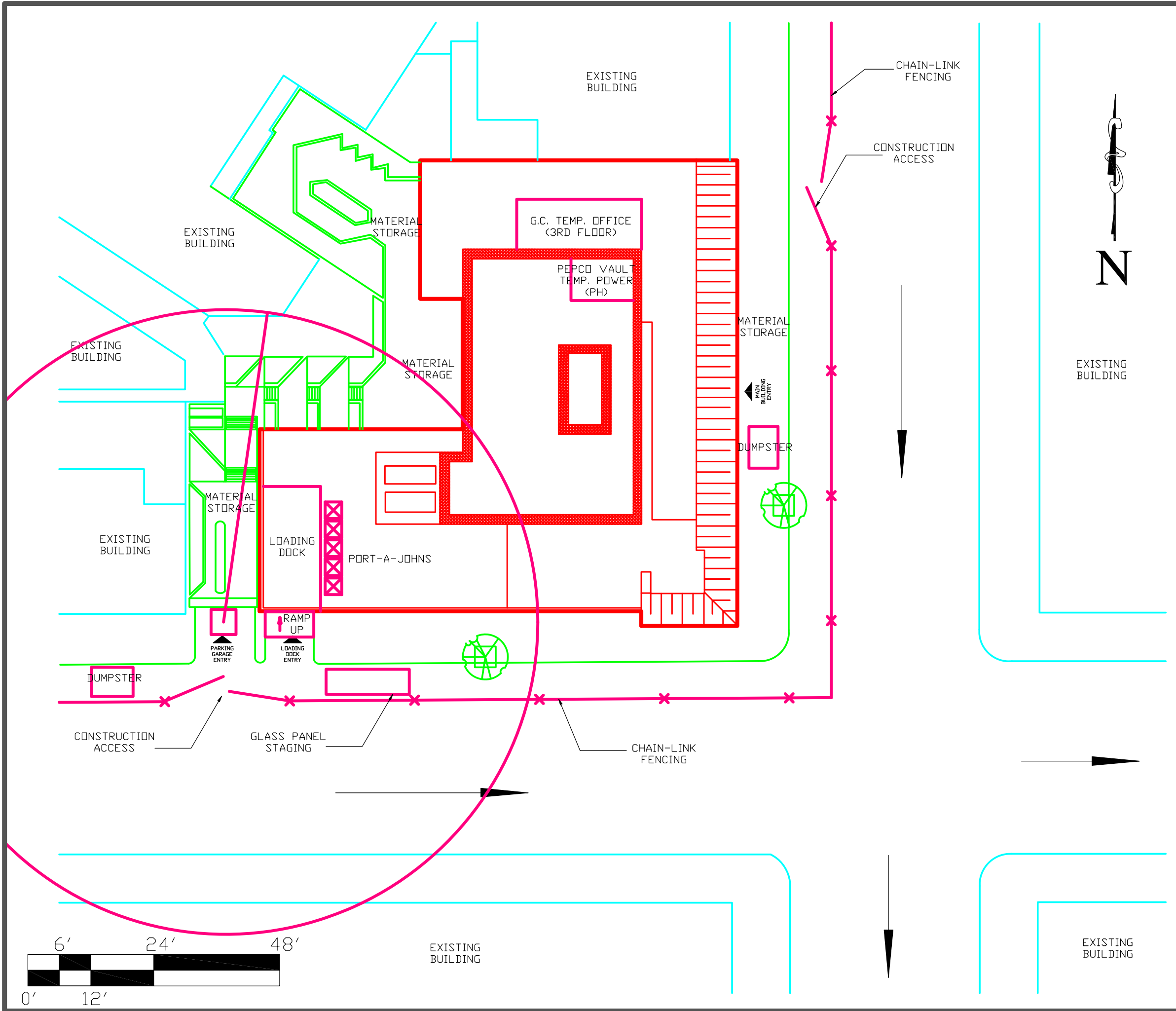
NOVEMBER 2, 2007

CURTAIN WALL PHASE 2

OFFICE/RETAIL BUILDING

APPENDIX B.3

PHASE 3 OF CURTAIN WALL



CURTAIN WALL PHASE 3

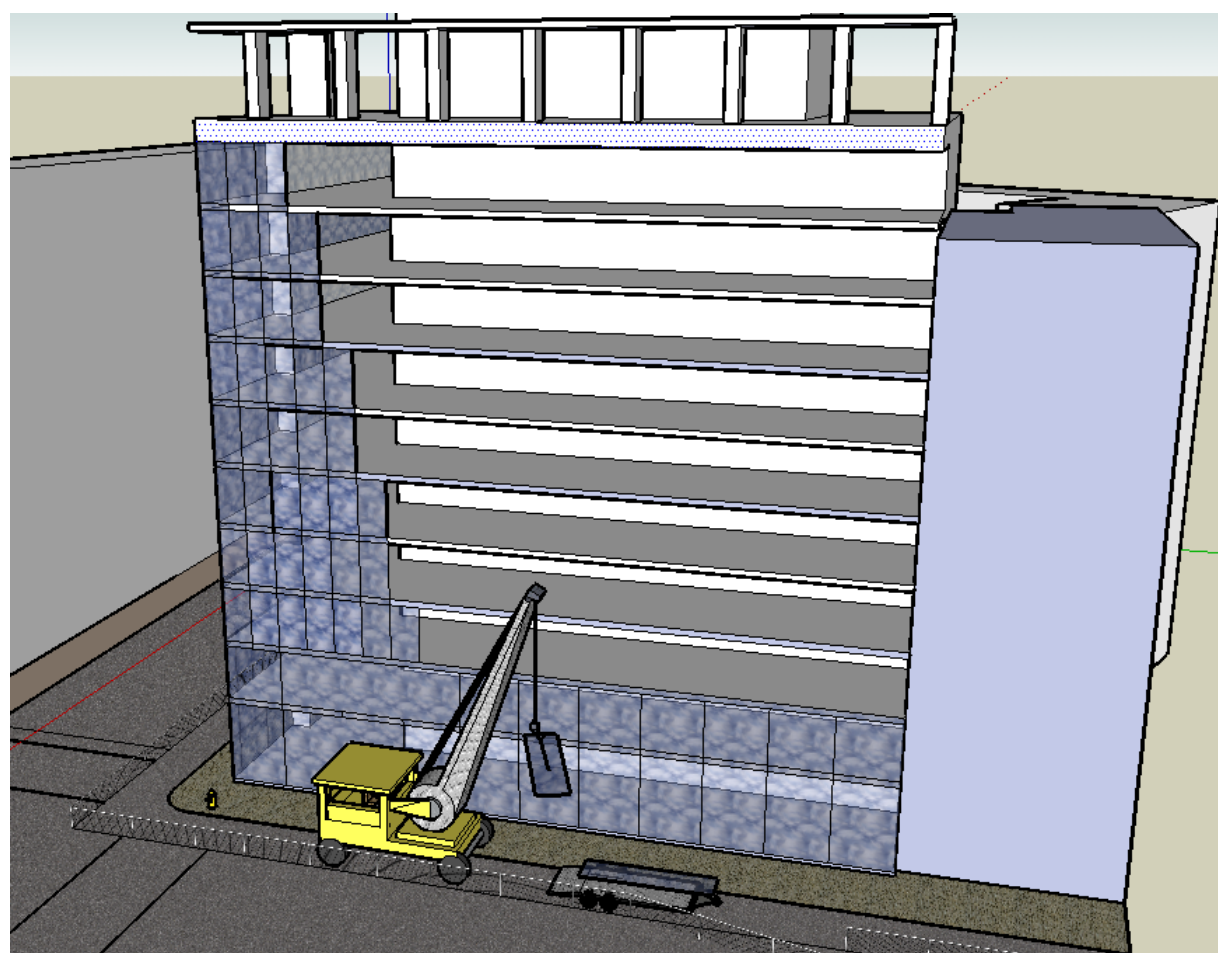
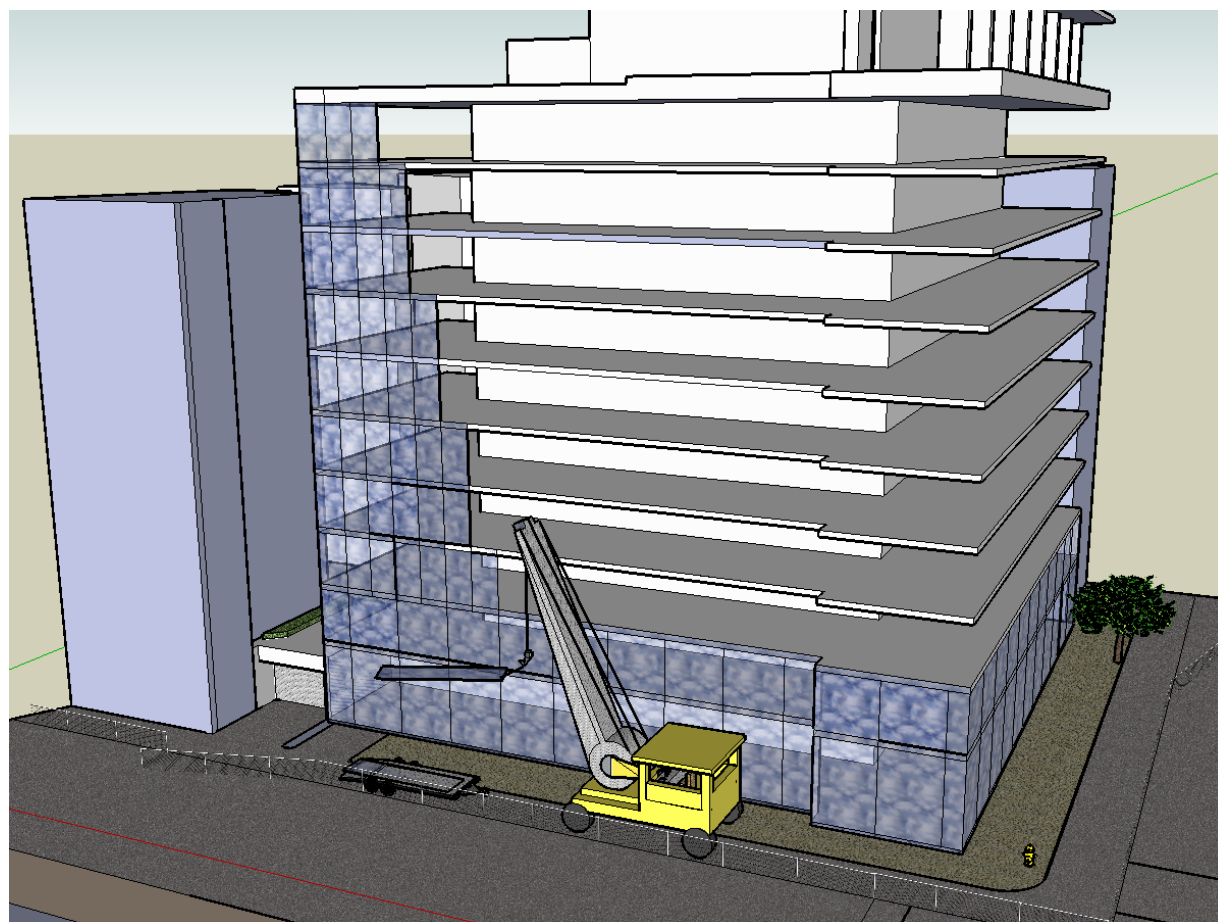
DEREK BAUER NOVEMBER 2, 2007

OFFICE/RETAIL BUILDING

APPENDIX B.4

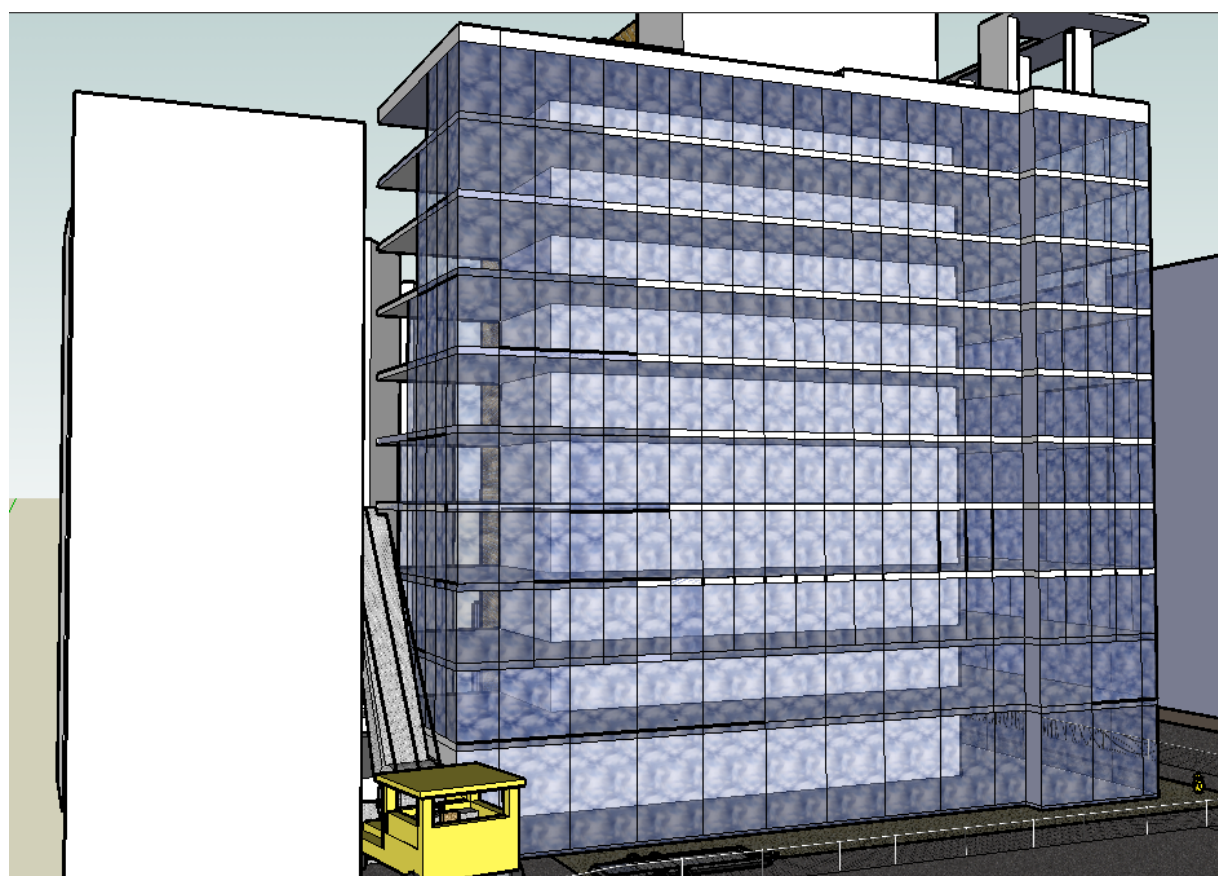
3-D PHASING OF CURTAIN WALL

PHASE 1



PHASE 2

PHASE 3



APPENDIX C

GENERAL CONDITIONS ESTIMATE

GENERAL CONDITIONS ESTIMATE						
Cost Code	Description	Lab/Mat	Quantity	Units	Unit Price	Amount
010030-A	Bonds/Insurance/Permits	Mat	1	LS	\$167,989	\$167,989
010040-A	Contractor's Fee	Mat	1	LS	\$1,343,912	\$1,343,912
010050-A	Company Owned Equipment	Mat	1	LS	\$16,250	\$16,250
010080-A	Vehicle Fuel	Mat	2	EA	\$2,500	\$5,000
010100-A	Preventive Maintenance	Lab	13	MO	\$385	\$5,000
010120-A	Parking Fees	Mat	1	LS	\$1,350	\$1,350
011280-A	Office & Sheds	Mat	1	LS	\$5,000	\$5,000
011300-A	Trailer Set-up/Takedown	Lab	1	LS	\$250	\$250
011320-A	Furniture	Mat	1	LS	\$727	\$727
011380-A	Office Security System	Mat	1	LS	\$5,100	\$5,100
011420-A	Office Clean-up Labor	Lab	13	MO	\$348	\$4,525
011450-A	Office Maintenance and Repairs	Lab	13	MO	\$108	\$1,400
012500-A	Telephone Monthly Charges	Mat	13	MO	\$1,162	\$15,100
012520-A	Telephone Co Installation Charges	Lab	1	LS	\$1,500	\$1,500
012550-A	Phone System Equipment & Installation	Lab/Mat	1	LS	\$3,500	\$3,500
012600-A	Jobsite Radios	Mat	8	EA	\$450	\$3,600
012620-A	Mobile Phone	Mat	13	MO	\$569	\$7,400
012650-A	Computer Equipment	Mat	10	EA	\$1,370	\$13,695
012670-A	Software	Mat	10	EA	\$70	\$702
012680-A	Phone/Data Cabling	Mat	10	EA	\$100	\$1,000
012720-A	Drinking Water in Office	Mat	57	WK	\$43	\$2,450
012730-A	Office Supplies	Mat	13	MO	\$808	\$10,500
012750-A	Office Equipment	Mat	13	MO	\$77	\$1,000
012760-A	Office Equipment Maintenance	Lab	13	MO	\$346	\$4,500
012780-A	Postage and Shipping	Mat	57	WK	\$246	\$14,000
012800-A	Drawing Reproduction	Mat	1	LS	\$7,000	\$7,000
012820-A	Record and As-Built Documents	Mat	1	LS	\$2,500	\$2,500
012850-A	Travel	Mat	13	MO	\$492	\$6,400
012880-A	Ceremonies/Meetings/Entertainment	Mat	13	MO	\$423	\$5,500
012900-A	Jobsite Progress Photos	Mat	13	MO	\$171	\$2,225
012950-A	Professional Photography	Mat	1	LS	\$10,400	\$10,400
013030-L	Rodman	Lab	57	WK	\$505	\$28,800
013050-A	Surveying Equipment	Mat	1	LS	\$8,520	\$8,520
013100-A	Survey Materials	Mat	1	LS	\$5,000	\$5,000
013150-A	Professional Engineering/Survey	Mat	1	LS	\$7,000	\$7,000
014010-L	Project Carpenter	Lab	57	WK	\$1,035	\$59,000
014020-L	Project Laborer	Lab	114	WK	\$704	\$80,240
014050-A	Warehouse Facilities - on site	Mat	1	LS	\$1,200	\$1,200
014200-A	Equipment Rental	Mat	1	LS	\$10,500	\$10,500
014450-L	Temp Elevator Operator	Lab	57	WK	\$613	\$34,944
014550-A	Rough Hardware	Mat	1	LS	\$1,500	\$1,500
014600-A	Small Tools	Mat	1	LS	\$7,000	\$7,000
014700-A	Protection Materials	Mat	1	LS	\$12,350	\$12,350
014750-S	Trash Haul-Off	Mat	57	WK	\$1,196	\$68,200

GENERAL CONDITIONS ESTIMATE (CONT.)						
014800-A	Office Clean-up	Mat	57	WK	\$27	\$1,538
014800-L	Office Clean-up	Lab	57	WK	\$260	\$14,792
014850-A	Trash Chute	Mat	1	LS	\$4,000	\$4,000
014900-A	Final Clean	Mat	1	LS	\$102,440	\$102,440
014900-L	Final Clean	Lab	1	LS	\$3,120	\$3,120
014950-A	Ice, Water and Cups	Mat	57	WK	\$29	\$1,680
015100-A	Temp Chainlink Fence	Mat	1	LS	\$7,500	\$7,500
015400-A	Temporary Toilets	Mat	5	EA	\$1,728	\$8,640
015450-A	Signs	Mat	1	LS	\$6,500	\$6,500
015550-A	Pest/Rodent Control	Mat	1	LS	\$2,000	\$2,000
016050-A	Safety Equipment and Supplies	Mat	1	LS	\$2,500	\$2,500
016150-A	Drug Testing	Mat	1	LS	\$320	\$320
016200-A	Perimeter Protection	Mat	1	LS	\$19,750	\$19,750
016200-L	Perimeter Protection	Lab	1	LS	\$20,750	\$20,750
016250-A	Covered Entrance and Walk	Mat	1	LS	\$2,500	\$2,500
017100-A	Temporary Power Consumption	Mat	13	MO	\$2,692	\$35,000
017200-A	Power Consumption w/HVAC	Mat	13	MO	\$6,154	\$80,000
017650-A	Building Weather Protection	Mat	1	LS	\$7,200	\$7,200
017700-A	Temporary Fire Protection	Mat	1	LS	\$2,105	\$2,105
018200-A	Curtain Wall Consultant	Mat	1	LS	\$3,000	\$3,000
019990-A	Miscellaneous General Conditions	Mat	1	LS	\$3,500	\$3,500
019999-L	Project Executive	Lab	5	MO	\$0	\$0
019999-L	Project Manager	Lab	14	MO	\$0	\$0
019999-L	Assistant Project Manager	Lab	14	MO	\$0	\$0
019999-L	Senior Project Engineer	Lab	13	MO	\$0	\$0
019999-L	Project Engineer	Lab	12	MO	\$0	\$0
019999-L	Superintendent	Lab	14	MO	\$0	\$0
019999-L	Assistant Superintendent	Lab	14	MO	\$0	\$0
019999-L	Chief Field Engineer	Lab	13	MO	\$0	\$0
019999-L	Project Accountant	Lab	13	MO	\$0	\$0
019999-L	Total Salaried Employees on Site	Lab	1	LS	\$1,170,400	\$1,170,400
TOTAL G.C. COSTS:					\$3,492,964	