

CAMPUS SQUARE BUILDING

1426 North Third Street, Harrisburg, PA

Andrew Martin
Construction Management

Tech Assignment #2
October 28, 2009
Dr. Chris Magent



Campus Square Building

Harrisburg, PA

Technical Assignment 2

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Executive Summary

The objective of this technical report is to familiarize the reader to the Campus Square building in Harrisburg, Pennsylvania. Within the report contains a detailed project schedule, site layout plans for major phases of construction, a detailed structural systems estimate, a general conditions estimate, and a reflection of the 2009 PACE Roundtable Conference.

Construction on the Campus Square building was scheduled to begin late April, 2008, once Wohlsen received a formal Notice to Proceed. The core and shell portion of the project was completed late August, 2009. Structural steel was scheduled to be inspected by early January, 2009, and have the building shell watertight by the end of December, 2008.

The construction of the Campus Square can be broken down into four major phases: demolition & excavation, substructure, superstructure, and finishes. Because of the urban location of the project, site logistics was extremely important in ensuring the successful delivery of the building. Located in downtown Harrisburg, Pennsylvania, the site is confined by existing overhead electrical lines, surrounding structures, as well as vehicular and pedestrian traffic flow. Furthermore, throughout construction, the power lines were required to be active, as well as ensuring traffic would not be impeded. These constraints led to unique logistical strategies during the construction phase.

A detailed structural system estimate was performed which includes all structural members and assemblies, both substructure and superstructure. Using the structural quantities collected in various typical bays, an estimated total cost and square foot cost was determined to be \$2,195,414.67 (\$29.27/SF).

Estimated general conditions costs for the project was determined to be \$1,061,419, which is approximately 11% of the total project cost. The estimated sum is assumed to be slightly higher than the actual estimate due to the summarized unit costs used.

The Energy and the Building Industry breakout session at the 2009 PACE Roundtable Conference covered various topics related to energy usage and preservation, in particular, how it related to the construction industry. Furthermore, the session highlighted several potential thesis research topics, including building lifecycle studies and solar technologies.

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B. Site Layout Planning

The construction of the Campus Square building can be broken into four main phases of work: demolition/excavation, substructure, superstructure, and finishes.

Demolition/Excavation

Campus Square is located on an existing site of a service station, and required the removal of the existing fuel tanks, as well as soil remediation. The service station was demolished, as well as all of the existing asphalt and concrete used in the parking areas. Access to the site was limited during all phases of construction due to its urban location, which limited site utilization. Below is a map of the general area which indicates important off-site spaces used as parking, material and equipment storage, dumpster locations, and lay-down space. Because space was limited during construction, soil stockpiling could not be used, and required removal from the site.



Image provided by Google Maps

- Campus Square Site
- Dumpster Storage
- Contractor Parking Lot
- Material Storage & Lay-down

Substructure

Once excavation was completed, access to the excavation pit was accomplished by means of an earth ramp into the space in order to allow for geothermal work to be accomplished, as well as pouring of the foundation walls and spread footings for the concrete piers. The mechanical basement space was constructed first, with work then arraying outward from the center of the site. Concrete was pumped into the site from vehicles staged around the perimeter of the

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building. After the foundation walls and piers were finished, backfilling of the area was performed from the limited space surrounding the building site along the adjacent roads.

Superstructure

Erection of steel on the Campus Square building was scheduled to begin August 21, 2008. The erection process began with steel located in the center of the building, above the basement space. Once steel in the core of the building was completed, the remainder of the steel was erected from site south to north. This erection strategy was chosen in order to efficiently sequence the elevated deck work with the steel placement, as well as providing adequate space for the crane to operate within the confines of the site. Material storage and lay-down space was first done offsite on the Susquehanna Street lot or the space provided adjacent to the building site.

Finishes

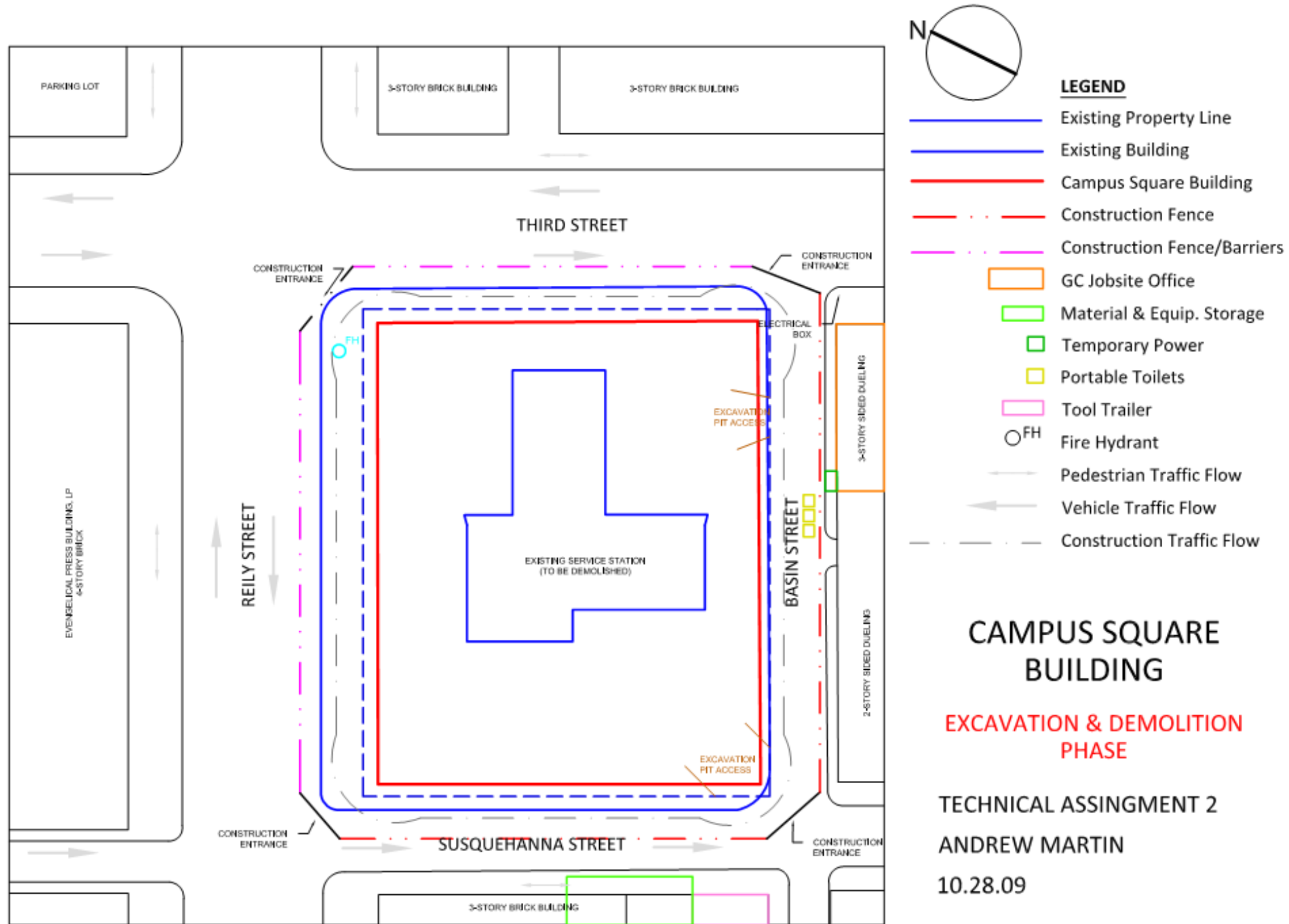
Once the building was enclosed and watertight, interior work would begin. Wohlsen sequenced this work by performing interior work from the top floor, down to the first. This was done in order to protect finish work, as well as mitigate workflow traffic within the building. Construction debris needed to be taken and recycled into various dumpsters adjacent to the site.

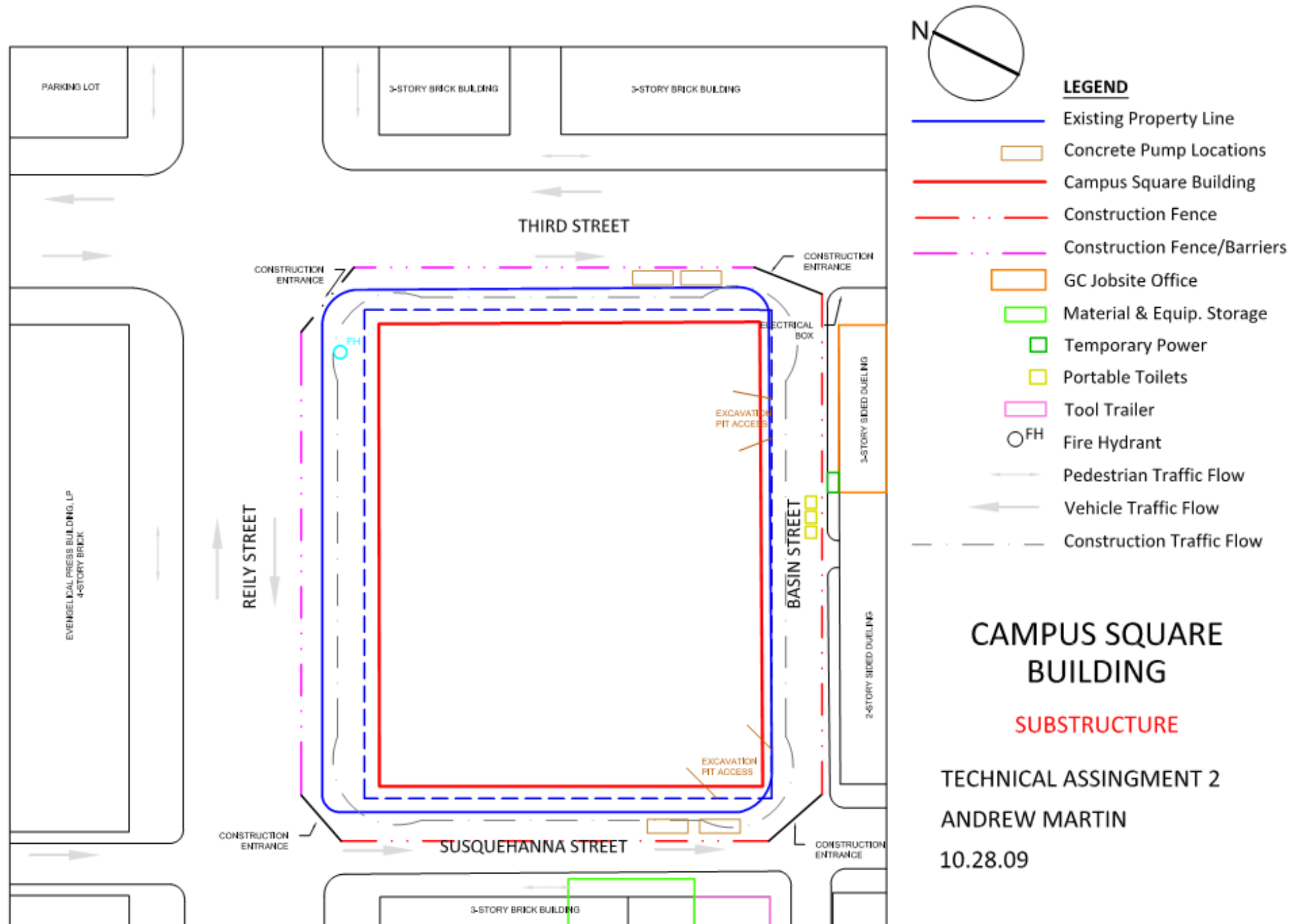
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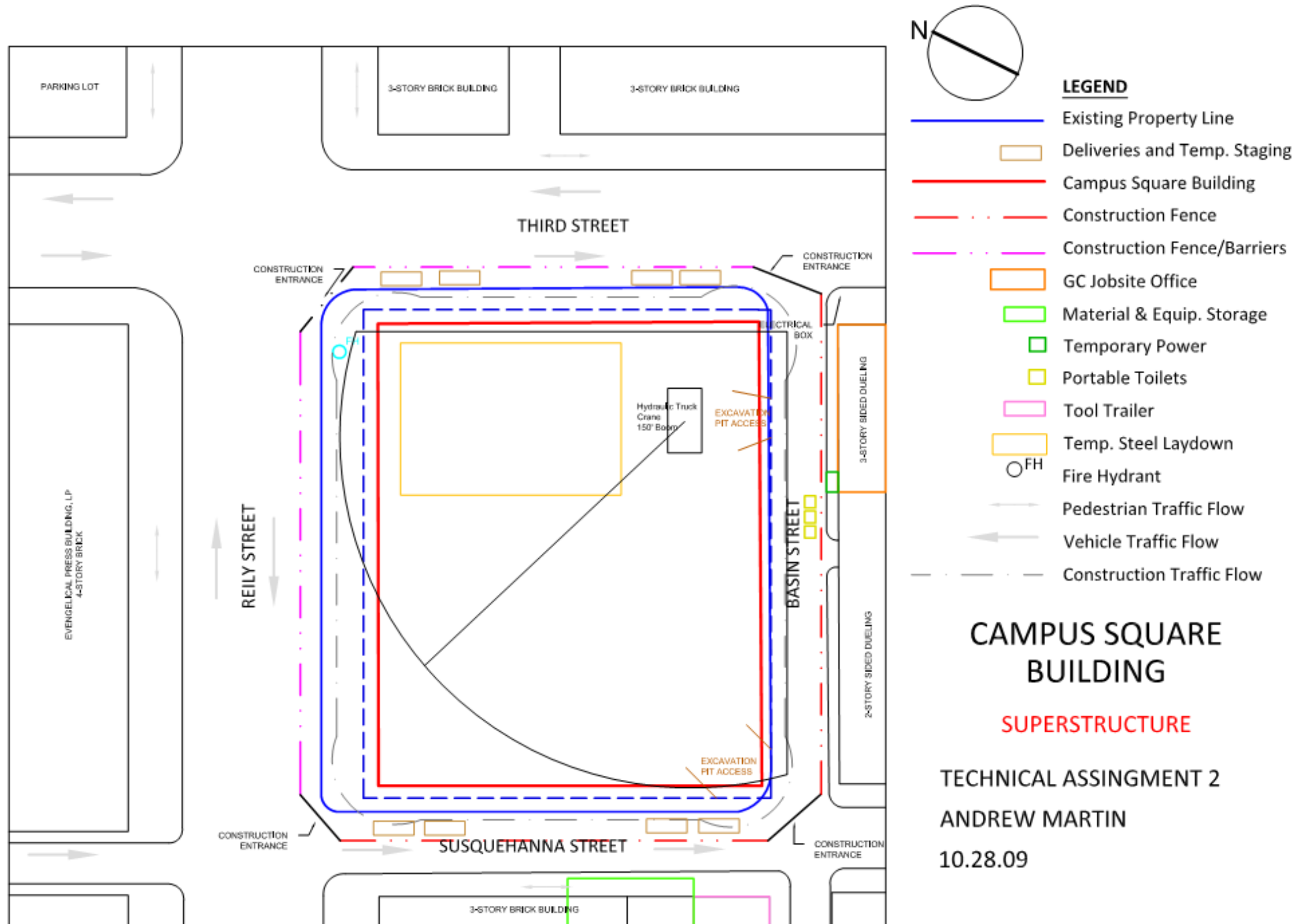
LEGEND

- Existing Property Line
- Concrete Pump Locations
- Campus Square Building
- Construction Fence
- Construction Fence/Barriers
- GC Jobsite Office
- Material & Equip. Storage
- Temporary Power
- Portable Toilets
- Tool Trailer
- FH Fire Hydrant
- Pedestrian Traffic Flow
- Vehicle Traffic Flow
- Construction Traffic Flow

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SUBSTRUCTURE

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- LEGEND**
- Existing Property Line
 - Deliveries and Temp. Staging
 - Campus Square Building
 - Construction Fence
 - Construction Fence/Barriers
 - GC Jobsite Office
 - Material & Equip. Storage
 - Temporary Power
 - Portable Toilets
 - Tool Trailer
 - Temp. Steel Laydown
 - FH Fire Hydrant
 - Pedestrian Traffic Flow
 - Vehicle Traffic Flow
 - Construction Traffic Flow

**CAMPUS SQUARE
BUILDING**

SUPERSTRUCTURE

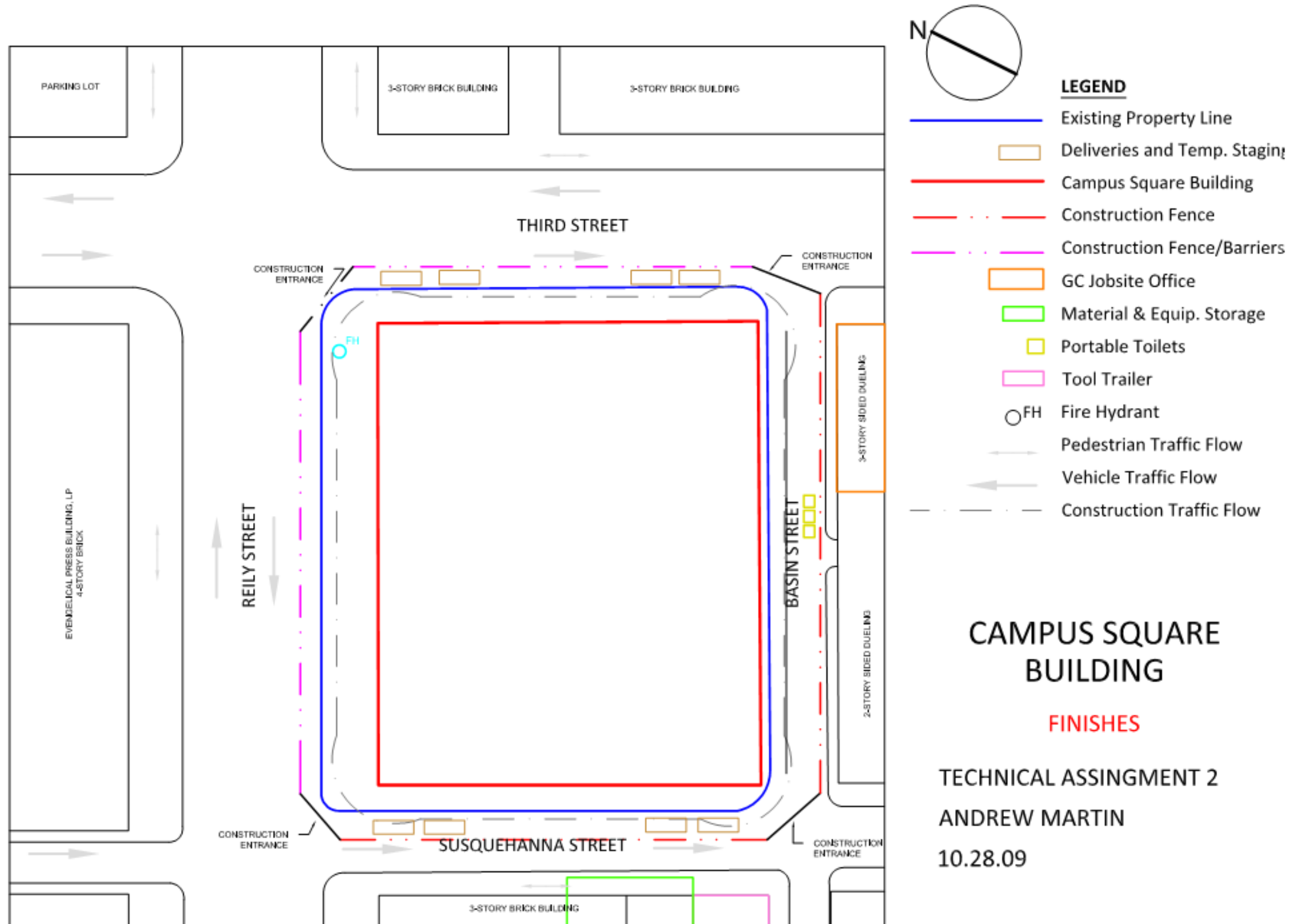
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C. Detailed Structural Systems Estimate

A detailed structural estimate was performed for the Campus Square building. The results are summarized in the tables shown below. Complete takeoff notes can be found in **Appendix B** of this technical report.

RS Means was utilized in determining material, labor, and equipment costs for the estimate. Costs were also adjusted for the project location and timeframe of the project. When performing the structural estimate for steel, specific bays were chosen which reflected typical spaces throughout the building. Four bays were chosen, which are described in **Appendix B**. Once the structural system was estimated for the highlighted bays, the associated costs for each bay were extrapolated throughout the typical spaces. Concrete was estimated by analyzing the entire structure for structural assemblies, rather than an extrapolated figure.

Steel Costs

Material	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
Structural Steel	\$ 1,313,929.47	\$ 69,982.80	\$ 37,284.87	\$ 1,421,196.99
Metal Deck	\$ 203,148.00	\$ 47,196.00	\$ 2,736.00	\$ 253,080.00
WWF	\$ 25,348.68	\$ 27,139.14	\$ -	\$ 52,487.82
TOTAL	\$ 1,542,426.15	\$ 144,317.94	\$ 40,020.87	\$ 1,726,764.81

Concrete Costs

Material	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
Piers	\$ 37,334.85	\$ 25,855.97	\$ 2,467.90	\$ 65,658.72
Spread Footings	\$ 49,674.23	\$ 16,757.37	\$ 104.81	\$ 66,536.41
Slab on Grade	\$ 30,609.39	\$ 5,353.72	\$ 1,993.38	\$ 37,956.49
Elevated Deck	\$ 120,555.00	\$ 95,931.00	\$ 36,936.00	\$ 253,422.00
Foundation Walls	\$ 37,698.11	\$ 5,380.77	\$ 1,997.36	\$ 45,076.24
TOTAL	\$ 275,871.58	\$ 149,278.83	\$ 43,499.45	\$ 468,649.86

The detailed structural estimate was determined to be \$2,195,414.67 (\$29.27/SF); somewhat higher than the actual cost. This may be in-part due to Wohlsen self-performing concrete work, as well as other value engineering and cost saving methods. Furthermore, the assumed overhead and profit may have been higher than the actual percentage.

Total Cost

Material	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
Steel	\$ 1,542,426.15	\$ 144,317.94	\$ 40,020.87	\$ 1,726,764.81
Concrete	\$ 275,871.58	\$ 149,278.83	\$ 43,499.45	\$ 468,649.86
Totals	\$1,818,297.73	\$293,596.77	\$83,520.32	\$2,195,414.67

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D. General Conditions Estimate

A general conditions estimate was prepared for the Campus Square building. The estimate includes any applicable items that were implemented directly by the project team and construction crew, but does not include Wohlsen's home office overhead costs. This general conditions estimate is based on the 10-month construction schedule utilized for the project. If alterations are made to the original construction schedule, the estimate can easily accommodate adjustments.

In the table below, the main categories of the general conditions estimate have been outlined. Please see **Appendix C** for the complete detailed general conditions estimate.

Description	Cost
Staffing	\$590,440
Administrative Facilities and Supplies	\$39,650
Safety	\$4,000
Cleanup	\$125,655
Jobsite Work Requirements	\$129,500
Permitting	\$66,686
Bonds and Insurance	\$105,488
Total General Conditions Cost	\$1,061,419

Staffing costs account for the majority of the general conditions costs, which can be attributed to key project team personnel assigned full time to this specific job. Durations and costs associated with the entire project team are detailed in the GC estimate. An adjacent building was provided by the owner to act as the jobsite office at no cost to Wohlsen. Due to the limited sight conditions, a material shakeout space was prepared adjacent to the site. Two row homes were demolished and cleared in order to provide the shakeout space. Furthermore, an off-site parking lot was also needed in order to accommodate subcontractor parking and storage. The owner also assumed the builder's risk for this particular job. These aforementioned items were included into the general conditions estimate. All durations and quantities used in the estimate are accurate; approximate cost figures were provided by Wohlsen Construction Company.

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Critical Industry Issues

The breakout session I chose to attend at the Annual PACE Roundtable, was “Energy and the Building Industry”. This session focused on the new standards for energy performance, and new priorities for energy in buildings which are being set by clients, as well as how increased attention to energy will change contracting, design method, and profitability. I chose to attend this session because of the dramatic rise in public awareness about our current environmental impacts, and the methodology and practices being implemented to prevent further environmental downturn.

The session opened with concerns about why energy consumption and efficiency is so important, not only to the construction industry, but as a global population. Energy consumption impacts nearly every global market, from fuel and electricity costs, to ever rising food and product costs. Soon, Pennsylvania will face deregulation in electricity costs which will inevitably result in higher utility costs for the consumer. It is important to observe how the increase in energy will, in-turn, result in higher costs of other goods in order to compensate for increased production costs.

Recently, a dramatic “Go-Green” trend has emerged as the status-quo when considering new construction. Owners are now beginning to have a great interest in reducing building life-cycle costs, as well as increasing energy efficiency. Energy and environmentally conscience buildings not only save the owner money on energy costs, but also help better the environment. Unfortunately, a trend is emerging amongst owners to obtain “green” buildings in order to use them as marketing tools for higher tenant fees, and “green-washing” barely sustainable ideas and products. Fortunately, efforts are being implemented through government and private agencies to monitor the status of sustainable buildings. The United States Green Board Council (USGBC) will soon be establishing programs requiring previously LEED certified buildings to be audited for performance standards according to the rating initially awarded. If a building is no longer performing to standard, the certification may be stripped from the owner. Energy labeling was another program discussed in which every building will be labeled according to energy consumption, similar to Energy Star ratings on appliances and electronics. These efforts will help maintain the legitimacy of sustainable efforts.

Current economic conditions and the impact on the construction industry was also an issue brought up in the Industry Panel discussion. Construction companies are trying to find new methods and strategies in order to decrease costs so lower bids can be made. In-turn, this has resulted in General Contractors and Construction Managers hiring low-bid subcontractors, which may not be qualified to perform the work, resulting in increased risk for the project’s

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success. The current economic downturn has also resulted in an increase in joint ventures between companies (sometimes competitors) in an attempt to secure work, many times, at a lower profit margin.

I was surprised how positive the industry members were about the economic situation, and the overall downturn in business. It seemed as though they truly believed their companies had the right strategy to get through this tough period. Many explained how this current market is not one that has not been seen before, and the general cyclical nature to construction.

Diversification among project types and markets was said by many of the industry members as the key to success in this recession.

When considering my specific thesis building, a few topics discussed during the conference could be applied to my project. For instance, the owner of the Campus Square Building: GreenWorks Development, puts a strong emphasis in sustainability. Therefore, one idea could be establishing or researching their means of maintaining sustainability once tenants occupy the structure. Another topic could be a study into the implementation of Solyndra's cylindrical PV panels over the conventional array installed on the building. Lifecycle costs could be calculated in determining which system would better suite Campus Square.

The contacts listed below, whom I met at the conference, may be able to assist me with the above listed ideas:

Mr. Daniel P. Kerr, P.E.

McClure Company

Mr. Jeremy Sibert

Hensel Phelps Construction Company

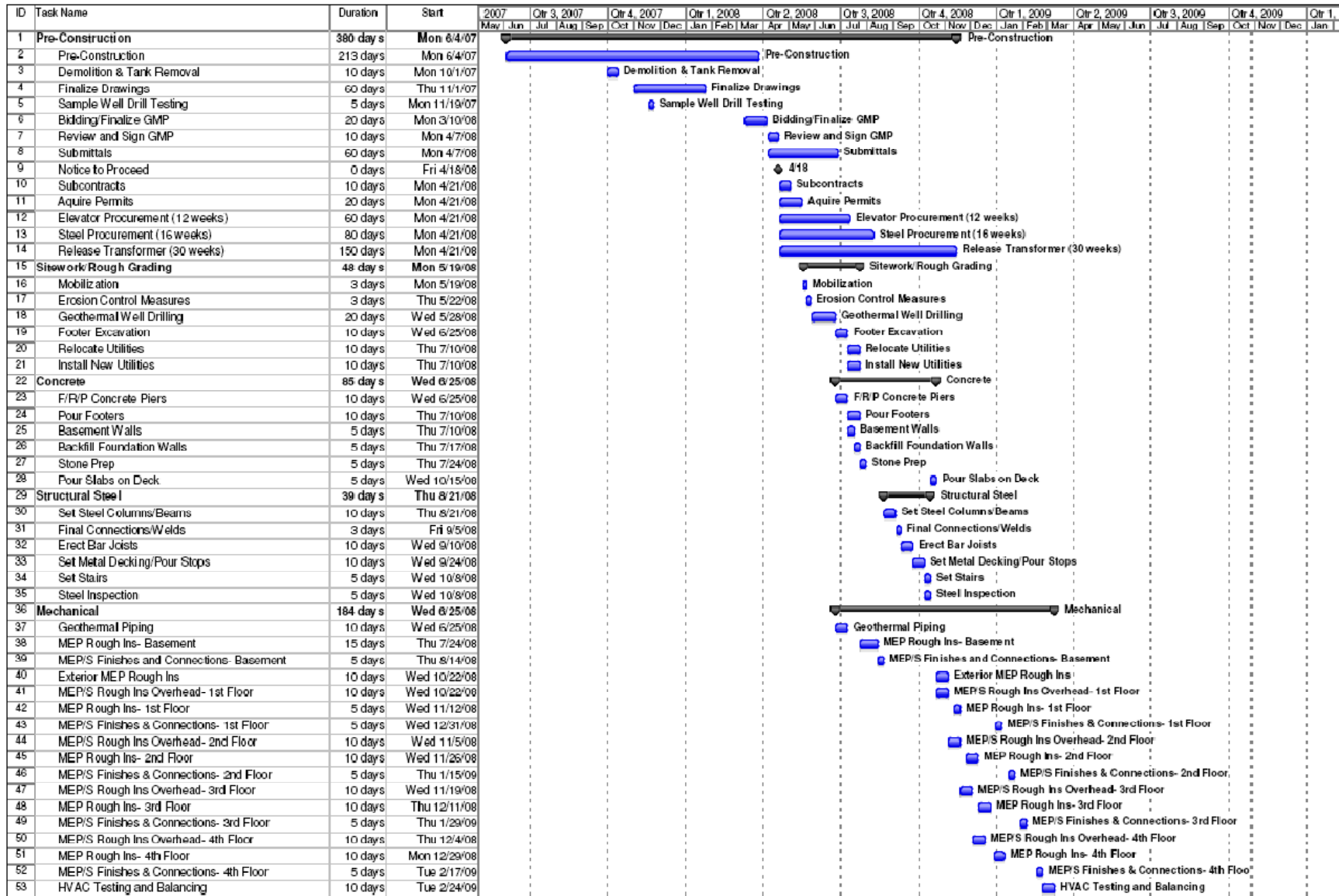
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Appendix A – Detailed Project Schedule



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Appendix B – Structural Systems Takeoff Calculation

Column Lines (5) and (6)							
Row Lines (F) and (E)							
Shape	Quantity	Wt./lf	Length (ft)	Weight (tons)	Total LF		
Second Floor Beams							LF
W14x22	2	22	7.8	0.17	15.60	W14x22/26	251.61
W14x26	2	26	28.7	0.75	57.40	W18x35	70.23
W18x35	1	35	23.4	0.41	23.42	W18x40	114.70
W18x40	1	40	28.7	0.57	28.67	W18x55	23.40
W27x178	1	178	23.4	2.08	23.42	W21x178	52.08
	1	178	28.7	2.55	28.67	W21x50	46.82
Third Floor Beams							W21x83
W14x22	2	22	28.7	0.63	57.33	W21x62	28.70
W14x26	2	26	7.8	0.20	15.61	W14x30	57.40
W18x35	1	35	23.4	0.41	23.42	22k7	86.10
W18x40	1	40	28.7	0.57	28.67		
W21x50	1	50	23.4	0.59	23.42		
W21x83	1	83	28.7	1.19	28.67		
Fourth Floor Beams							
W14x22	2	22	7.8	0.17	15.60		
W14x26	2	26	28.7	0.75	57.40		
W18x35	1	35	23.4	0.41	23.40		
W18x40	1	40	28.7	0.57	28.70		
W21x50	1	50	23.4	0.59	23.40		
W21x62	1	62	28.7	0.89	28.70		
Roof Beams							
22k7	3		28.7	0.00	86.10		
W14x22	1	22	28.7	0.32	28.67		
	1	22	4.0	0.04	4.00		
W14x30	2	30	28.7	0.86	57.40		
W18x40	1	40	28.7	0.57	28.67		
W18x55	1	55	23.4	0.64	23.40		
Second Floor Beams							LF
W14x26	2	26	28.7	0.75	57.40	W14x22/26	229.60
W16x31	1	31	28.7	0.44	28.70	W16x31	52.50
W18x40	1	40	23.8	0.48	23.75	W18x40	71.35
W27x178	1	178	23.8	2.12	23.80	W18x40	71.35
Third Floor Beams							W16x26
W14x26	3	26	28.7	1.12	86.10	W21x178	23.80

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W18x40	1	40	23.8	0.48	23.80	W21x50	47.60
W21x50	1	50	23.8	0.60	23.80	W22x55	23.80
Fourth Floor Beams						W14x30	57.40
W14x26	3	26	28.7	1.12	86.10	22k7	57.40
W18x40	1	40	23.8	0.48	23.80		
W21x50	1	50	23.8	0.60	23.80		
Roof Beams							0.00
22k7	2		28.7	0.00	57.40		
W14x30	2	30	28.7	0.86	57.40		
W16x26	1	26	28.7	0.37	28.70		
W16x31	1	31	23.8	0.37	23.80		
W22x55	1	55	23.8	0.65	23.80		
Column Lines (5) and (6)							
Row Lines (E) and (D)							
Second Floor Beams							
W14x22	2	22	7.8	0.17	15.61	LF	
W14x26	2	26	29.0	0.75	58.00	W14x22/26	249.83
W21x44	1	44	29.0	0.64	29.00	W18x40	29.00
	1	44	23.4	0.52	23.42	W21x44	157.25
W27x178	1	178	29.0	2.58	29.00	W21x178	29.00
Third Floor Beams						W21x68	29.00
W14x22	2	22	7.8	0.17	15.61	W21x48	23.42
W14x26	2	26	29.0	0.75	58.00	22k6	145.00
W21x44	1	44	29.0	0.64	29.00		
	1	44	23.4	0.52	23.42		
W21x83	1	83	29.0	1.20	29.00		
Fourth Floor Beams							
W14x22	2	22	7.8	0.17	15.61		
W14x26	2	26	29.0	0.75	58.00		
W21x44	1	44	29.0	0.64	29.00		
	1	44	23.4	0.52	23.42		
W21x68	1	68	29.0	0.99	29.00		
Roof Beams							
22K6	5		29.0	0.00	145.00		
W14x22	1	22	29.0	0.32	29.00		
W18x40	1	40	29.0	0.58	29.00		
W21x48	1	48	23.4	0.56	23.42		
Column Lines (4) and (5)							
Row Lines (E) and (D)							

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Second Floor Beams						
W14x26	3	26	29.0	1.13	87.00	LF W14x22/26 290.00
W21x44	1	44	23.8	0.52	23.75	
Third Floor Beams						
W14x26	3	26	29.0	1.13	87.00	22k6 87.00
W21x44	1	44	23.8	0.52	23.75	W21x44 71.25
W24x55						W24x55 23.75
Fourth Floor Beams						
W14x26	3	26	29.0	1.13	87.00	
W21x44	1	44	23.8	0.52	23.75	
Roof Beams						
22k6	3		29.0	0.00	87.00	
W14x22	1	22	29.0	0.32	29.00	
W24x55	1	55	23.8	0.65	23.75	

Column Lines (5) and (6)

Row Lines (F) and (E)

	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
W14x22/26	\$ 10,703.06	\$ 893.18	\$ 543.46	\$ 12,139.70
W18x35	\$ 4,036.12	\$ 388.37	\$ 169.25	\$ 4,593.74
W18x40	\$ 7,525.47	\$ 634.29	\$ 276.43	\$ 8,436.19
W18x55	\$ 2,117.70	\$ 136.66	\$ 59.20	\$ 2,313.56
W21x178	\$ 13,762.66	\$ 240.61	\$ 104.68	\$ 14,107.95
W21x50	\$ 3,856.10	\$ 233.63	\$ 101.60	\$ 4,191.33
W21x83	\$ 3,918.04	\$ 152.24	\$ 66.23	\$ 4,136.51
W21x62	\$ 2,935.15	\$ 147.23	\$ 64.00	\$ 3,146.38
W14x30	\$ 2,830.97	\$ 224.43	\$ 137.19	\$ 3,192.59
22k7	\$ 831.73	\$ 235.05	\$ 106.76	\$ 1,173.54
Subtotals	\$ 52,517.00	\$ 3,285.69	\$ 1,628.80	\$ 57,431.49
Typical Bays	4			
Total	\$ 210,068.00	\$ 13,142.76	\$ 6,515.20	\$ 229,725.96

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Column Lines (4) and (5)

Row Lines (F) and (E)

	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
W14x22/26	\$ 9,767.18	\$ 815.08	\$ 495.94	\$ 11,078.20
W16x31	\$ 2,684.33	\$ 205.28	\$ 125.48	\$ 3,015.08
W18x40	\$ 4,681.27	\$ 394.57	\$ 171.95	\$ 5,247.79
W16x26	\$ 1,220.90	\$ 101.02	\$ 61.71	\$ 1,383.63
W21x178	\$ 6,289.39	\$ 109.96	\$ 47.84	\$ 6,447.18
W21x50	\$ 3,920.34	\$ 237.52	\$ 103.29	\$ 4,261.15
W22x55	\$ 2,153.90	\$ 113.76	\$ 49.74	\$ 2,317.41
W14x30	\$ 2,830.97	\$ 224.43	\$ 137.19	\$ 3,192.59
22k7	\$ 554.48	\$ 156.70	\$ 71.18	\$ 782.36
Subtotal	\$ 34,102.76	\$ 2,358.32	\$ 1,264.32	\$ 37,725.39
Typical Bays	6			
Total	\$ 204,616.56	\$ 14,149.92	\$ 7,585.92	\$ 226,352.34

Column Lines (5) and (6)

Row Lines (E) and (D)

	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
W14x22/26	\$ 10,627.77	\$ 886.90	\$ 539.63	\$ 12,054.30
W18x40	\$ 1,902.69	\$ 160.37	\$ 69.89	\$ 2,132.95
W21x44	\$ 11,384.90	\$ 784.68	\$ 341.23	\$ 12,510.81
W21x178	\$ 7,663.54	\$ 133.98	\$ 58.29	\$ 7,855.81
W21x68	\$ 3,228.28	\$ 148.77	\$ 64.67	\$ 3,441.72
W21x48	\$ 1,928.87	\$ 116.87	\$ 50.82	\$ 2,096.56
22k6	\$ 1,400.70	\$ 395.85	\$ 179.80	\$ 1,976.35
Subtotal	\$ 38,136.75	\$ 2,627.42	\$ 1,304.33	\$ 42,068.50
Typical Bays	6			
Total	\$ 228,820.50	\$ 15,764.52	\$ 7,825.98	\$ 252,411.00

Column Lines (4) and (5)

Row Lines (E) and (D)

	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
W14x22/26	\$ 12,336.60	\$ 1,029.50	\$ 626.40	\$ 13,992.50
22k6	\$ 840.42	\$ 237.51	\$ 107.88	\$ 1,185.81
W21x44	\$ 5,158.50	\$ 355.54	\$ 154.61	\$ 5,668.65
W24x55	\$ 2,149.38	\$ 113.53	\$ 49.64	\$ 2,312.54
Subtotal	\$ 20,484.90	\$ 1,736.08	\$ 938.53	\$ 23,159.50
Typical Bays	9			
Total	\$ 184,364.10	\$ 15,624.72	\$ 8,446.77	\$ 208,435.50
TOTAL BEAM COSTS	\$ 827,869.16	\$ 58,681.92	\$ 30,373.87	\$ 916,924.80

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Assumed 12x50		LF	354.0		
Assumed 12x190		LF	155.7		
Columns 1st-3rd Floor Splice					
Name	Shape	Quantity	Wt./lf	Length (ft)	Weight (tons)
D-4	W12x58	1	40.0	34.5	0.69
D-5	W12x210	1	210.0	29.7	3.12
D-6	W12X50	1	50.0	31.5	0.79
E-4	W12x210	1	210.0	31.5	3.31
E-5	W12x210	1	210.0	31.5	3.31
E-6	W12x170	1	170.0	31.5	2.68
F-4	W12x53	1	53.0	31.5	0.83
F-5	W12X170	1	170.0	31.5	2.68
F-6	W12x40	1	40.0	31.5	0.63
Columns 3rd Floor Splice-Roof					
Name	Shape	Quantity	Wt./lf	Length (ft)	Weight (tons)
D-4	W12x40	1	40.0	25.0	0.50
D-5	W12x65	1	65.0	25.0	0.81
D-6	W12X40	1	40.0	25.0	0.50
E-4	W12x65	1	65.0	25.0	0.81
E-5	W12x65	1	65.0	25.0	0.81
E-6	W12x65	1	65.0	25.0	0.81
F-4	W12x40	1	40.0	25.0	0.50
F-5	W12x65	1	65.0	25.0	0.81
F-6	W12x40	1	40.0	25.0	0.50

COLUMNS

Assumed 12x50		354		
Assumed 12x190		155.7		
	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
W12x50	\$ 29,155.44	\$ 1,207.14	\$ 739.86	\$ 31,102.44
W12x190	\$ 48,614.21	\$ 601.00	\$ 365.90	\$ 49,581.11
Subtotal	\$ 77,769.65	\$ 1,808.14	\$ 1,105.76	\$ 80,683.55
Typical Bays (25 total, 4 calculated)			6.25	
TOTAL COLUMN COST	\$ 486,060.31	\$ 11,300.88	\$ 6,911.00	\$ 504,272.19
TOTAL STEEL COST	\$ 1,313,929.47	\$ 69,982.80	\$ 37,284.87	\$ 1,421,196.99

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Metal Deck					
Floor	Area (SF)	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
Floor 2-4 Approx.	51300	\$ 152,361.00	\$ 35,397.00	\$ 2,052.00	\$ 189,810.00
Roof Deck	17100	\$ 50,787.00	\$ 11,799.00	\$ 684.00	\$ 63,270.00
Total Area	68400	\$ 203,148.00	\$ 47,196.00	\$ 2,736.00	\$ 253,080.00

WWF					
Floor	Area (SF)	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
Total Area	85500	\$ 25,348.68	\$ 27,139.14	\$ -	\$ 52,487.82
Floor (2-4)	51300				
Roof Deck	17100				
Slab on Grade	17100				

Concrete Piers							
Size (SF)	Length (FT)	Quantity	Volume (CY)	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
4	10	25	37.0	\$ 37,334.85	\$ 25,855.97	\$ 2,467.90	\$ 65,658.72

Slab on Grade						
Area (SF)	Thickness (FT)	Volume (CY)	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
2100	0.42	32.41				
500	0.50	9.26				
14500	0.42	223.77				
Total		265.43	\$ 30,609.39	\$ 5,353.72	\$ 1,993.38	\$ 37,956.49

Elevated Deck							
Floor	Area (SF)	Thickness (FT)	Volume (CY)	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
2nd-4th	51300	0.54	1029.17	\$ 120,555.00	\$ 95,931.00	\$ 36,936.00	\$ 253,422.00

Foundation Walls

Height (FT)	Thickness (FT)	Perimeter (FT)	Volume (CY)	Ext. Mat. O&P	Ext. Labor O&P	Ext. Equip. O&P	Ext. Total O&P
5	1.5	535	148.6	\$ 37,698.11	\$ 5,380.77	\$ 1,997.36	\$ 45,076.24

10% overhead and profit assumed in all estimates.

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Appendix C – General Conditions Estimate

Campus Square General Conditions Estimate				
Description	Quantity	Unit	Unit Price	Total
Supervision/Project Management				
Customer Captain/VP	20	HR	\$175	\$3,500
Project Executive	68	HR	\$175	\$11,900
Director of Field Operations	205	HR	\$150	\$30,750
Director of Safety	200	HR	\$50	\$10,000
Project Manager	2056	HR	\$100	\$205,600
Project Superintendent	2384	HR	\$100	\$238,400
Project Engineer	276	HR	\$75	\$20,700
Job Foreman	4	HR	\$75	\$300
Project Assistant	1060	HR	\$50	\$53,000
Project Accountant	216	HR	\$65	\$14,040
Contract Administrator	18	HR	\$125	\$2,250
			Subtotal	\$590,440
Administrative Facilities and Supplies				
Contractor's Office Set-Up	1	EA	\$2,500	\$2,500
Job Office Expenses	10	MTH	\$250	\$2,500
Furniture	1	EA	\$1,000	\$1,000
Copy Machine	10	MTH	\$100	\$1,000
Personal Computers	10	MTH	\$100	\$1,000
Local Area Network/Data	10	MTH	\$100	\$1,000
Telephone - Setup	1	EA	\$150	\$150
Monthly Telephone Bills	10	MTH	\$100	\$1,000
Cell Phone Bills	10	MTH	\$100	\$1,000
Jobsite Storage - Fence/Barriers	10	MTH	\$1,200	\$12,000
Drawings and Specifications	10	MTH	\$200	\$2,000
Photographs	10	MTH	\$50	\$500
Motor Vehicle Expenses (Gas/Maint.)	10	MTH	\$500	\$5,000
Postage and Shipping	10	MTH	\$250	\$2,500
Travel Expenses	10	MTH	\$500	\$5,000
As-Built Drawings	1	EA	\$1,000	\$1,000
Engineering Instruments/Supplies	10	MTH	\$50	\$500
			Subtotal	\$39,650
Safety				
Job Safety Expenses	10	MTH	\$200	\$2,000
Safety Materials	10	MTH	\$100	\$1,000

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Fire Protection (Extinguishers)	10	EA	\$100	\$1,000
			Subtotal	\$4,000
Clean-up				
Periodic Clean-up (Laborer)	2933	HR	\$35	\$102,655
Construction Cleaning	1	LS	\$11,000	\$11,000
Dumpster Service	10	MTH	\$1,000	\$10,000
Waste management Consultant	10	MTH	\$200	\$2,000
			Subtotal	\$125,655
Jobsite Work Requirements				
Fences/Barricades	10	MTH	\$500	\$5,000
Signage	1	LS	\$5,000	\$5,000
Misc. Tools & Equipment	10	MTH	\$3,000	\$30,000
Drinking Water	10	MTH	\$100	\$1,000
Protect Floors & Walls	1	LS	\$8,000	\$8,000
Patch FP	1	LS	\$5,000	\$5,000
Elevator Protection	1	LS	\$1,500	\$1,500
Temporary Heating/Cooling (for job office)	10	MTH	\$400	\$4,000
Monthly Electric Bill (for job office)	10	MTH	\$100	\$1,000
Fuel/Oil (misc.)	4	MTH	\$200	\$800
Temporary Toilets	10	MTH	\$500	\$5,000
Temporary Water / Electric (for construction activities)	10	MTH	\$250	\$2,500
Temporary Heat	4	MTH	\$200	\$800
Construction Site Access	1	LS	\$2,500	\$2,500
80' Pettibone	10	MTH	\$2,200	\$22,000
60' Man Lift	8	MTH	\$1,800	\$14,400
Contractor Parking Lot	1	LS	\$11,000	\$11,000
Laydown Space Preparation	1	LS	\$10,000	\$10,000
			Subtotal	\$129,500
Permitting	Cost			
Building Permit	\$65,256			
Street Cut Permit	\$1,430			
Subtotal	\$66,686			
Bonds and Insurance				
Liability Insurance	\$88,456			
Mercantile Tax	\$17,032			
Subtotal	\$105,488			
Total General Conditions Cost			\$1,061,419	