AE 481W

Technical Assignment 1: Construction Project Management

Jonathan Revtai

Construction Management

Consultant: Dr. Riley

Bakery Square – Building 1

9/29/2008

BkSq

Jonathan Revtai

Construction Management

Project Size
378,000 SF

Project Cost
$24 Million

Start Date
03.17.2008

End Date
05.21.2009

Delivery Method
CM at Risk

Building 1 at Bakery Square

Pittsburgh, PA

Project Team

Owner/ Developer
Bakery Square Holdings, L.P.

Architect
Astorino

CM at Risk
P.J. Dick Inc.

Building 1 is part of the bakery Square Project built around the renovation of the 1918 Nabisco Factory. This facility includes retail spaces, a fitness center, restaraunts, and a parking garage. The parking garage structure is built around all of the other spaces including a cast-in-place swimming pool on level two. Facade finishes will be provided during fit out, and have not been finalized.

www.engr.psu.edu/ae/thesis/portfolios/2009/jar5015

MEP

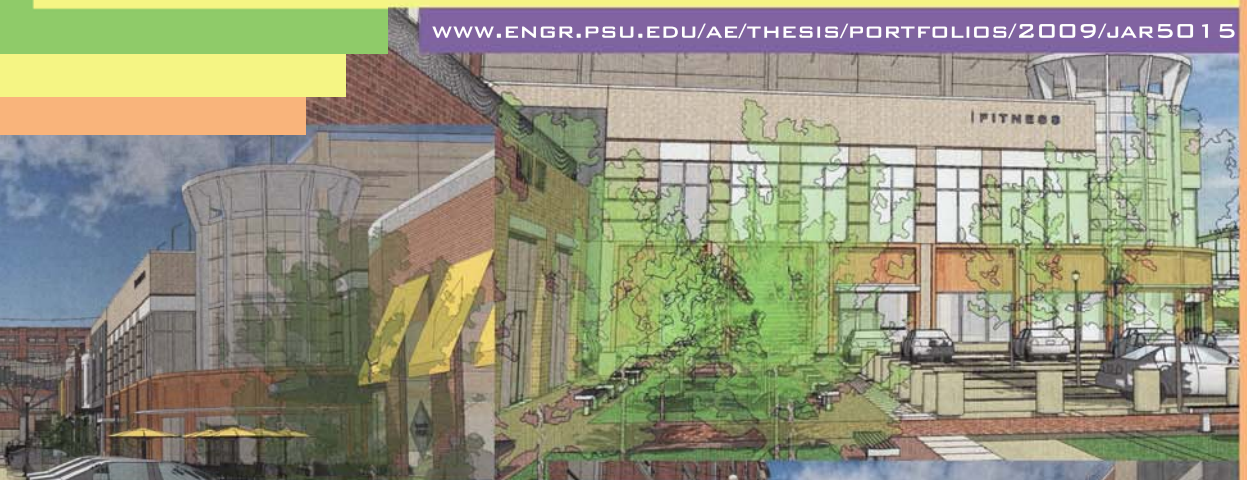
Roof top units are used to condition the retail fitness spaces, while wall units are used in the parking garage section. Plumbing is limited to bathrooms

Electrical

The fitness center is fed by a separate switch board from the rest of the building. The feed to each switchboard is a 3 phase, 480 v connection.

Structural

Precast concrete is used for most of the superstructure. structural steel is used for an outside bridge, and a hanging mezzanine in the fitness center.the foundations are built with Auguer cast piles.



EXECUTIVE SUMMARY

Building 1 at Bakery Square cannot be considered as a typical project. The building is just one of five facilities that are being built on site, and therefore the general conditions differ from most jobs because the construction manager is already in place for other buildings. The functionality of the spaces in the building makes it difficult to estimate on a basic level.

Background information for this project is listed below. Completion of the project is scheduled for May 21, 2009. Erection of the structure will occur in a west to east fashion and building enclosure will be achieved by February 3, 2009.

A building systems summary has been included in this report. A few major areas of interest include a hanging steel mezzanine level inside the fitness center, a cast-in-place pool located on the second floor, and a building integration of retail space, fitness center, and parking garage.

Project cost estimations were performed using D4Cost2002 software and R.S. Means. Results from these investigations yielded a building cost of $24,038,430 and $22,946,120 respectively. Cost information was not available due to owner's request.

Local and site condition investigations did not reveal any major concerns. The largest amount of risk involved with the site is the existence of railroad tracks in unknown subsurface locations. With four other Bakery Square facilities being built on site, special planning may be required once all projects are under construction. Since a number of large scale projects have recently begun in the Pittsburgh area, subcontractors must plan carefully to ensure their labor forces are sufficient to meet schedule demands.

After research of Walnut Capital's interests, a few conclusions about their organization have been made. It is a priority of Walnut Capital to aid in the development of the surrounding community evident from the close proximity of their office and the project. Quality, cost, and scheduling goals must be accomplished in order for Building 1 to be labeled a successful project.

P.J. Dick is delivery the building as a construction manager at risk with a GMP. Subcontractors were selected based upon lump sum bids. Both project and staffing organizational charts have been included in this report and clearly show the chain of command.

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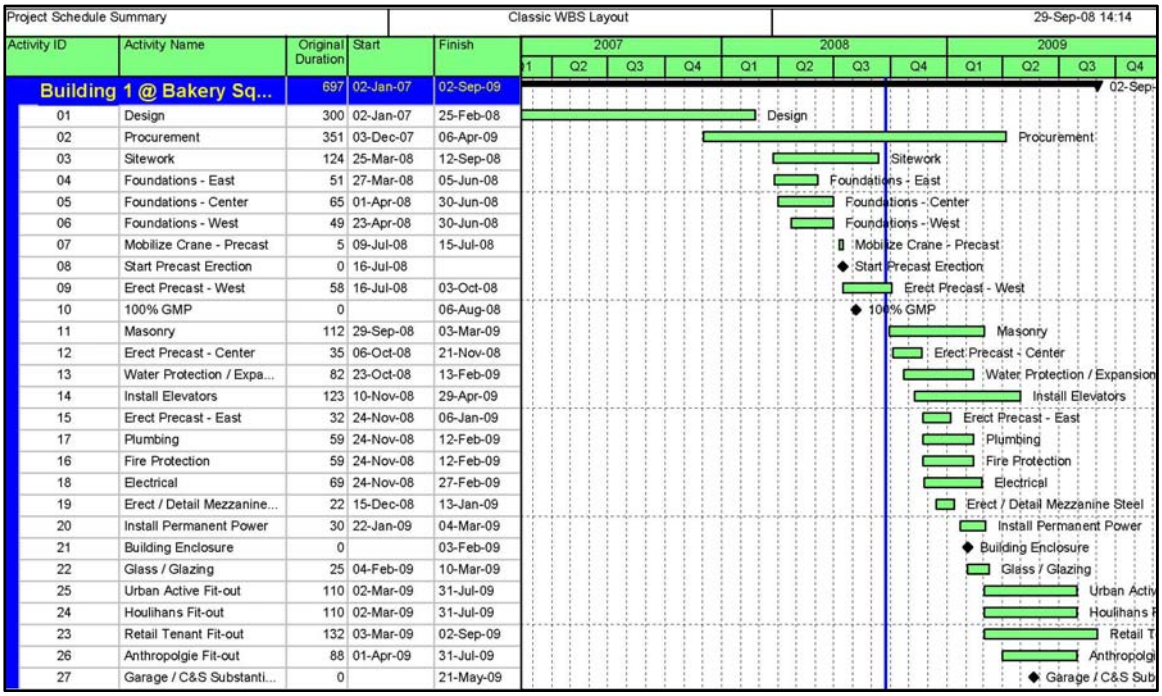
PROJECT SCHEDULE SUMMARY

Construction for Building 1 at Bakery Square starts with the installation of auger cast piles from East to West. Foundation wall and pile cap placement follows while site rough grading is finished. Foundation construction is scheduled to take a little longer than three months. Precast erection quickly follows the foundation sequence and is scheduled to progress one bay at a time from West to East. Steel erection will occur about five months after the precast sequence starts. Finishes are very limited because the contract is for the parking garage and core and shell only. Building enclosure is scheduled for February 3, 2009, and makes it possible for fit-out of the unfinished spaces to begin.



Activity ID	Activity Name	Original Duration	Start	Finish
Building 1 @ Bakery Sq...		697	02-Jan-07	02-Sep-09
01	Design	300	02-Jan-07	25-Feb-08
02	Procurement	351	03-Dec-07	06-Apr-09
03	Sitework	124	25-Mar-08	12-Sep-08
04	Foundations - East	51	27-Mar-08	05-Jun-08
05	Foundations - Center	65	01-Apr-08	30-Jun-08
06	Foundations - West	49	23-Apr-08	30-Jun-08
07	Mobilize Crane - Precast	5	09-Jul-08	15-Jul-08
08	Start Precast Erection	0	16-Jul-08	
09	Erect Precast - West	58	16-Jul-08	03-Oct-08
10	100% GMP	0		06-Aug-08
11	Masonry	112	29-Sep-08	03-Mar-09
12	Erect Precast - Center	35	06-Oct-08	21-Nov-08
13	Water Protection / Expa...	82	23-Oct-08	13-Feb-09
14	Install Elevators	123	10-Nov-08	29-Apr-09
15	Erect Precast - East	32	24-Nov-08	06-Jan-09
17	Plumbing	59	24-Nov-08	12-Feb-09
16	Fire Protection	59	24-Nov-08	12-Feb-09
18	Electrical	69	24-Nov-08	27-Feb-09
19	Erect / Detail Mezzanine...	22	15-Dec-08	13-Jan-09
20	Install Permanent Power	30	22-Jan-09	04-Mar-09
21	Building Enclosure	0		03-Feb-09
22	Glass / Glazing	25	04-Feb-09	10-Mar-09
25	Urban Active Fit-out	110	02-Mar-09	31-Jul-09
24	Houlihans Fit-out	110	02-Mar-09	31-Jul-09
23	Retail Tenant Fit-out	132	03-Mar-09	02-Sep-09
26	Anthropolgie Fit-out	88	01-Apr-09	31-Jul-09
27	Garage / C&S Substanti...	0		21-May-09

- Figure 1 - Project Schedule Summary

Note: See Appendix A for full a full page version of the Project Schedule Summary.

BUILDING SYSTEMS SUMMARY

Demolition Required	Demolition for Building 1 at Bakery Square was limited to the removal of an existing parking lot and storm sewer system. Hazardous materials were not encountered during demolition. However, buried rail lines were discovered during excavation and needed to be removed in certain locations in order to construct the foundations.
Structural Steel Frame	The design for Building 1 specifies structural steel to be used in three places. Structural steel is used inside the fitness center for the mezzanine level, along the south façade as the main support for the apron, and for a pedestrian bridge located on the 4th floor that connects Building 1 to the existing Building 3. Wide flanged members will be used in all three of these areas, and metal tube is required for the bridge and the apron. A hand winch material lift will be used to hoist most of the steel. Larger members, such as the W33x354, will be erected with the Manitowoc 999 crane that is being used for the precast concrete erection. Hanging columns, attached to steel supports located under the 4th floor's precast tees, will be used to support the mezzanine level. A 5-½" composite slab is specified for the mezzanine level.
Cast In Place Concrete (CIP)	Construction of the foundations, slabs-on-grade, and the swimming pool were accomplished using CIP methods. Placement was performed by direct chute or pumping. MevaLite, a lightweight clamp system, was used for forming purposes.
Precast Concrete	Sidley Precast Group was awarded the precast concrete package for Building 1. The firm is located in Thompson, Ohio, approximately 130 miles from the job site.

Precast Concrete (Continued)	Connections for the precast pieces include the following methods: • **Columns** o Tube steel splice connections are used to aid with initial alignment between the columns. o For final adjustment, plate welding is performed to secure the columns in place. • **Structural Tees** o Tees are shimmed and grouted to the spandrels. o JVI vector connectors are used for tee-to-tee connections. • **Spandrels** o Dywidag bars, a type of post-tensioning system, connect the spandrels to the columns in order to achieve proper shear strength. A Maintowoc 999 crawler crane is being used to erect the precast concrete portion of Building 1. Erection has started at the west end of the building with the crane located inside the building footprint. The structure will be erected one bay at a time, and the crane will move across the building footprint from West to East.
Mechanical System	There are multiple mechanical systems in place in this building due to the varying functionalities of the spaces. In the Garage portion of the building, electrical wall heaters, cabinet unit heaters, electric duct coils, and packaged terminal AC (PTAC) units are placed in the lobbies and garage office areas. The restaurant, retail spaces, and the fitness center each have their own separate forced air roof top units for heating and cooling purposes, but are not included in this contract. These units will be located on the low roofs located directly above level 1 and level 3. Inside the parking garage, manual dry standpipes in the stairwells are designated for fire protection. All other areas will fulfill fire suppression requirements through the use of sprinklers.

<table>
<tr><td>Electrical System</td><td>A main switchboard is dedicated to the fitness center, while the retail space and garage share another separate switchboard. Both switchboards have the following size and capacity attributes:

Retail & Garage
- 480/277 V
- 3 Phase
- 4 W 2000 A
- 80 KAIC

Fitness Center
- 480/277 V
- 3 Phase
- 4W 2500A
- 80 KAIC

A backup generator provides temporary power to the elevators, emergency lighting, and emergency systems located in the building should the power supply be disrupted. Temporary power is produced using a diesel generator with the following properties:
• 100 KW
• 480/277 V
• 3 Phase
• 4 Wire</td></tr>
<tr><td>Masonry</td><td>Non-load bearing masonry walls are used for stairwells, elevator lobbies, and to partition interior rooms. The masonry walls are used to achieve fire ratings where necessary and are covered with metal joists and gypsum wallboards. Scaffolding will be required for the walls but will only be needed to span one story at a time.</td></tr>
<tr><td>Curtain Wall</td><td>There is a curtain wall system for the building but the design has not yet been finalized. TRACO window systems are to be installed in the punched openings throughout the rest of Building 1, and it is believed by the construction manager that a TRACO system will be used for the curtain wall.</td></tr>
<tr><td>Support of Excavation</td><td>None has been necessary during construction of Building 1. Sufficient room on the site enabled excavators to use layback methods. However, trench shoring will be required during placement of the storm water line.

Temporary dewatering was achieved with a 2” sump pump. Elevator pits will house permanent sump pumps in order to achieve dewatering after construction.</td></tr>
</table>

PROJECT COST EVALUATION

Parametric estimating with ***D4Cost2002*** yielded a result of $24,038,430. Results were based on a 6 story parking garage structure. Since the building is either a parking garage structure or an unfinished core and shell building, the closest building in the database would be a similar parking garage structure. The estimate is based off of a three similar parking garage structures that were close to the same square foot and story height. Results are less than $40,000 or .2% of the building cost.

Multiple building types were used to perform a square foot estimate with ***R.S. Means*** because of the varying functions in the structure. A 5 story parking garage was used to estimate the garage portion of the building, and a 1 story retail store with a 14' height was used for the retail, restaurant, and fitness portion. The square foot estimate for the parking garage came to be $11,881,688 with a square foot cost of $42.95. The square foot estimate for the retail portion equaled $11,064,432 with a square foot cost of $105.9. The total square foot cost of Building 1 equaled $60.68/SF totaling $22,946,120.

The multiuse nature of the building made it very difficult to make an estimate with standard parametric and square foot estimating methods. The total cost of construction for Building 1 is set with a GMP of $24 Million. Even with the level of inaccuracy both estimates were very close to the actual number.

Overall Building Costs are $24,000,000.

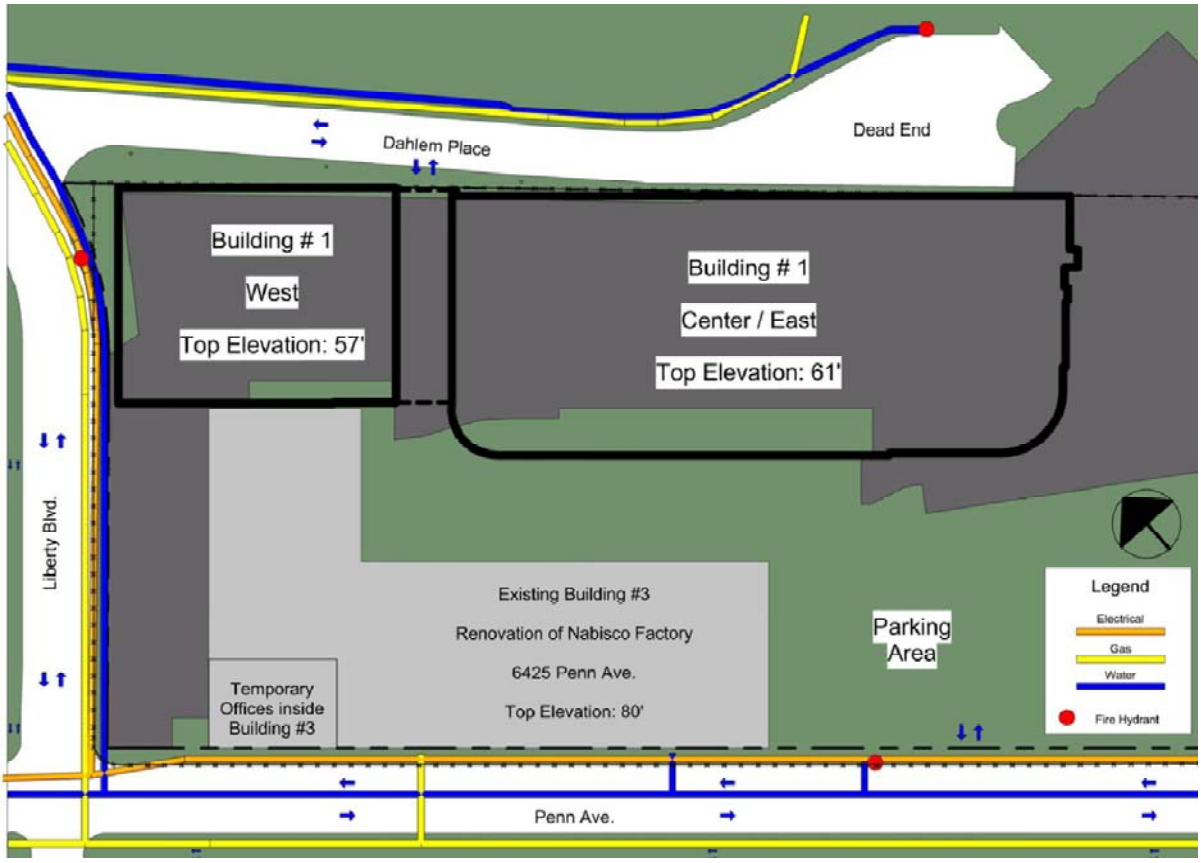
Square Foot Building Costs are $63.47/SF.

Other information of cost was not available by owner request.

Note: See Appendix B for cost evaluation information.

SITE PLAN OF EXISTING CONDITIONS

Building #1 at Bakery Square is located on an old parking lot situated behind an existing building. The existing building, which is also owned by Walnut Capital, is currently under renovation. The foundations for Building #1 will come in close contact with existing caissons for Building #3.



- Figure 2 - Existing Site Conditions

The gas, electrical, and water lines are not a concern for excavation because they are all located outside of the building footprint. Fire hydrants are located at the west and south ends of the site, but they do not pose any major concerns. Subsurface concerns may include an existing storm water system and railroad tracks that are both located in unknown locations.

Traffic located around the site will not be affected by the work progressing at Bakery Square. Sidewalks along Liberty Blvd. and Penn Ave. are closed, but there are sidewalks available for pedestrians directly across the street.

See Appendix C for full Site Plan.

LOCAL CONDITIONS

Labor Unions are an important aspect of construction in the Pittsburgh region, and this project in particular requires 100% union participation. A Cast-In-Place concrete system is the preferred method of construction for most buildings in the area. However, precast concrete systems have made an immergence in recent years due to schedule and cost constraints. This trend is especially true for parking garages.

Construction has recently begun on a number of large scale projects in the Pittsburgh area, causing the labor pool to diminish. Mechanical, electrical, and plumbing subcontractors must plan their work carefully to ensure that the unions are able to supply them with enough workers to complete the work on schedule.

Concurrent construction and renovation work on four other Bakery Square Development buildings will make this site very congested. Onsite parking privileges are granted to the construction management team, subcontractor superintendants, and one foreman per company. All other personnel must park offsite. Workers take advantage of side street free parking located within one block from the site. Recycling and tipping fees in the area are priced around $400 for a two week rental on a 30 CY dumpster.

A subsurface investigation report was performed in April of 2007. Twenty-three test bores were drilled across the Bakery Square site; twelve were within the footprint of Building 1. Through subsurface investigation it was revealed that the soil was of a silty/sandy composition and heavily saturated with ground water. Due to the nature of the soil and the moderate to high load of Building 1, the subsurface investigation report recommended the use of deep foundations.

Note: See Appendix D for boring locations and a sample test bore log.

CLIENT INFORMATION

Bakery Square Holdings is a limited partnership comprised of Pittsburgh real-estate developer Walnut Capital and The Feil Organization, a New York based investor. Walnut Capital prides itself as a leading developer and property manager of real estate in the Pittsburgh region.

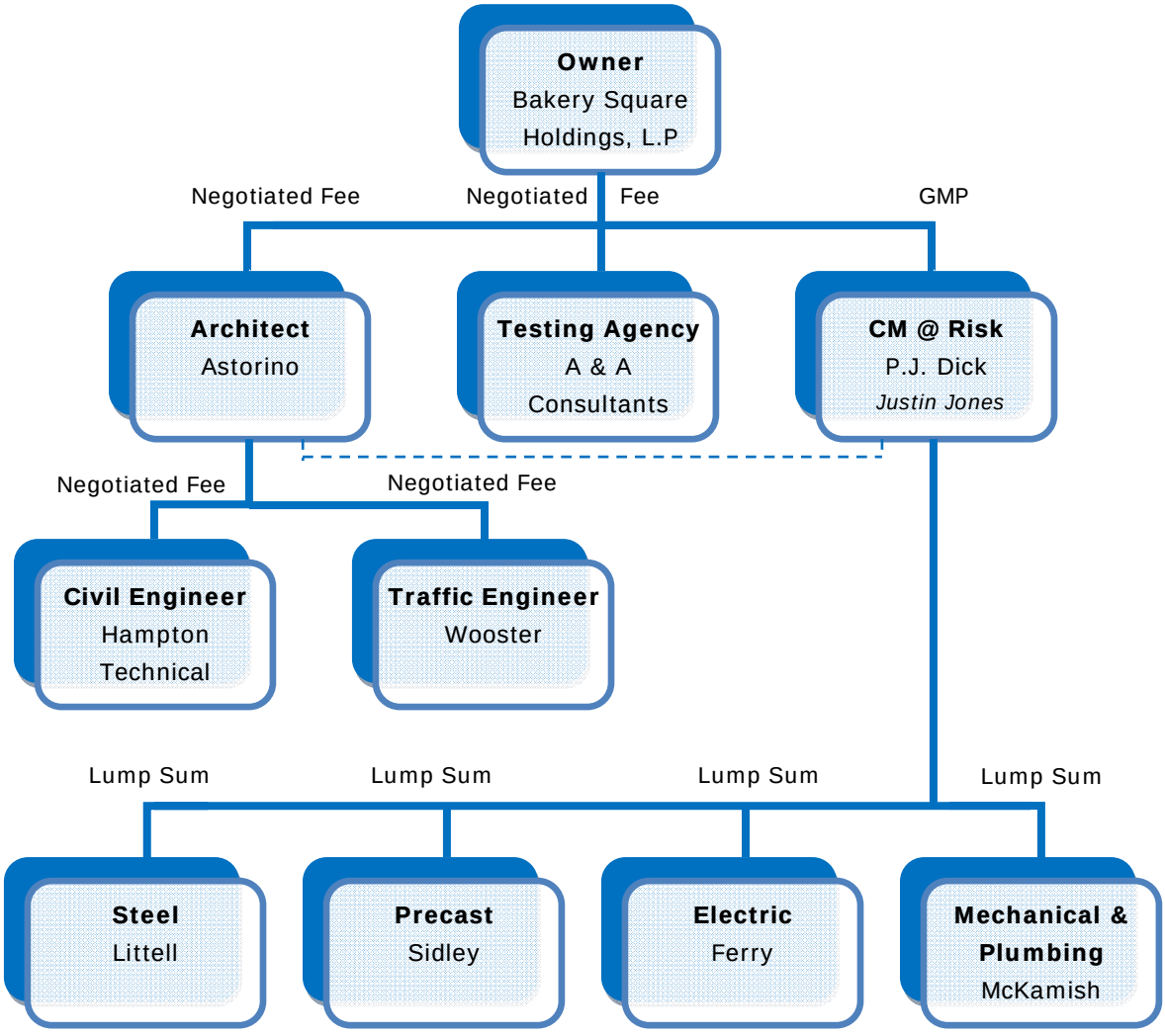
It has been a priority of Walnut Capital to help develop the surrounding community, and Bakery Square Development is a prime example of that effort. When the management team discovered this real estate not even a mile from their office, they immediately took a special interest in it. Walnut Capital's dedication to this project is evident with their hands on approach and weekly meetings with the contractor. Another reason for constructing Bakery Square Development is to make a profit. Walnut Capital is an entrepreneurial business and invests in real estate to make a profit.

Since Walnut Capital and P.J. Dick have worked together on previous projects, both companies are on the same page when it comes to project expectations. A GMP has been set to ensure the cost of the building meets both the expectations of the developers and the requirements set forth by the investors. Bakery Square has been marketed as a high-end urban center, and therefore is expected to be built with quality in mind. Since leases have been signed for Building 1, it is also important that the building be constructed on time. Both P.J. Dick and Walnut Capital expect the construction at Bakery Square to be performed in a safe manner. A Safety Manager has been assigned to the job and routine inspections are performed to ensure compliance with the safety plan.

PROJECT DELIVERY SYSTEM

P.J. Dick is delivering Building 1 as a construction manager at risk with a GMP. This type of contract was chosen because of the previous relationships that Walnut Capital has had with P.J. Dick. Factors taken into consideration when evaluating the organizational structure include time, owner experience, team experience, quality, cost. Time, cost, and quality are important to this project, and both have experience. A construction manager at risk structure is well suited for all of these qualities.

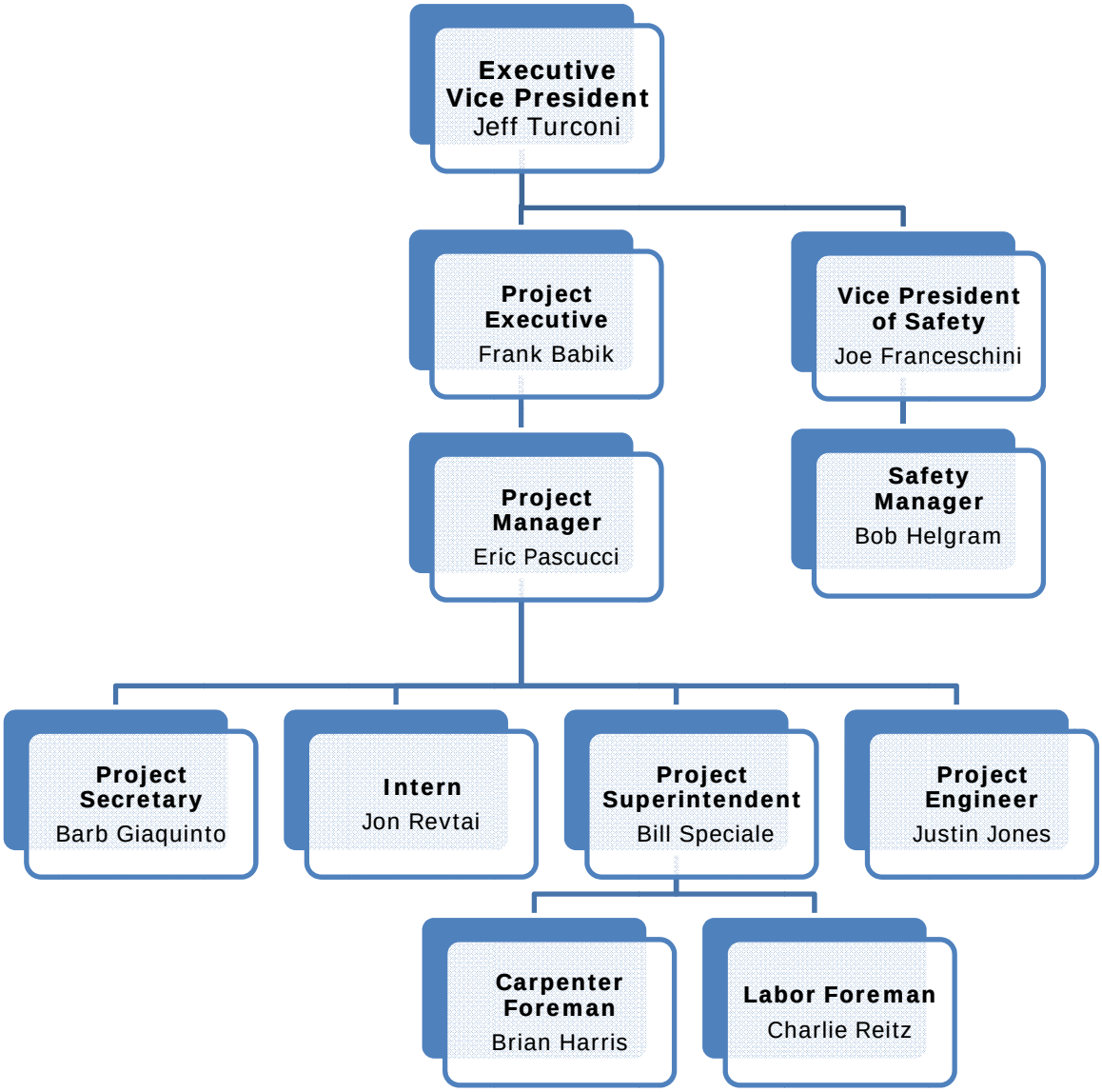
Subcontractors were chosen based on a lump sum evaluation. Scopes were reviewed and prices were adjusted before the low bidder was given a contract to sign. Insurance was not included in any pricing because the project has an Owner Controlled Insurance Policy (OCIP), but bonds were required if any subcontract amount exceeded $500,000.



- Figure 3 - Project Organizational Chart

STAFFING PLAN

P.J. Dick is the construction manager for the entire project of Bakery Square Development. This includes Building 1 and four other multiuse structures that are either being renovated or being newly constructed. The organizational chart shown in figure 2 is for Building 1. A Project Executives oversees all operations in the Pittsburgh area, including the Bakery Square Project. The Project Manager is responsible for all of the buildings on site, while other responsibilities are split among the rest of the staff. A Project Engineer is dedicated to Building 1, while the Safety Manager, Project Secretary, Intern, and Project Superintendent divide their time among multiple buildings.



• Figure 4 - Staff Chart for P.J. Dick

APPENDIX A:

Project Schedule Summary

Project Schedule Summary	Classic WBS Layout	29-Sep-08 14:14

Activity ID	Activity Name	Original Duration	Start	Finish
Building 1 @ Bakery Sq...		697	02-Jan-07	02-Sep-09
01	Design	300	02-Jan-07	25-Feb-08
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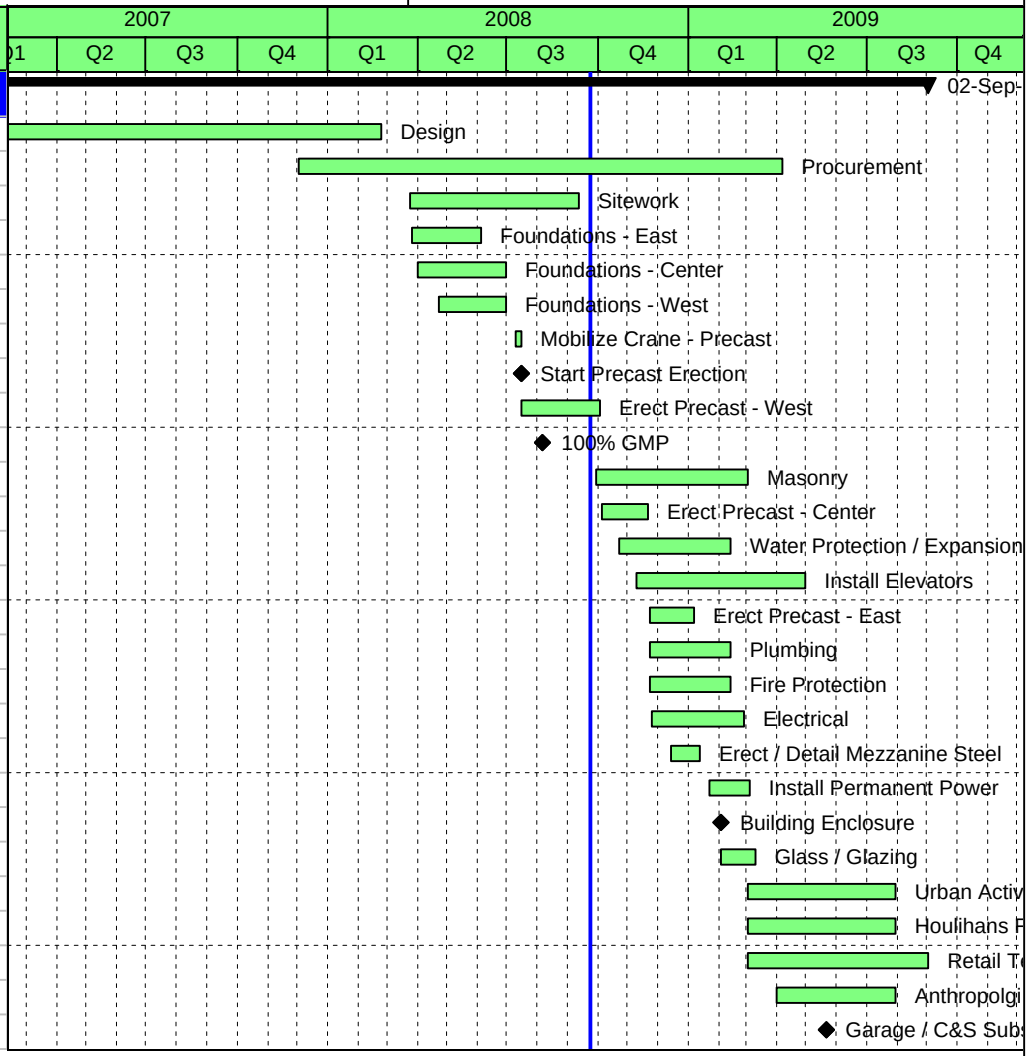


Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

Jonathan Revtai

APPENDIX B:
Cost Information

R.S. Means adjustments

Parking Structure
Added 10’ vertically to outside of building.

Retail Store
Added 10’ vertically to outside of building
Removed all interiors
Removed all HVAC
Removed all Plumbing

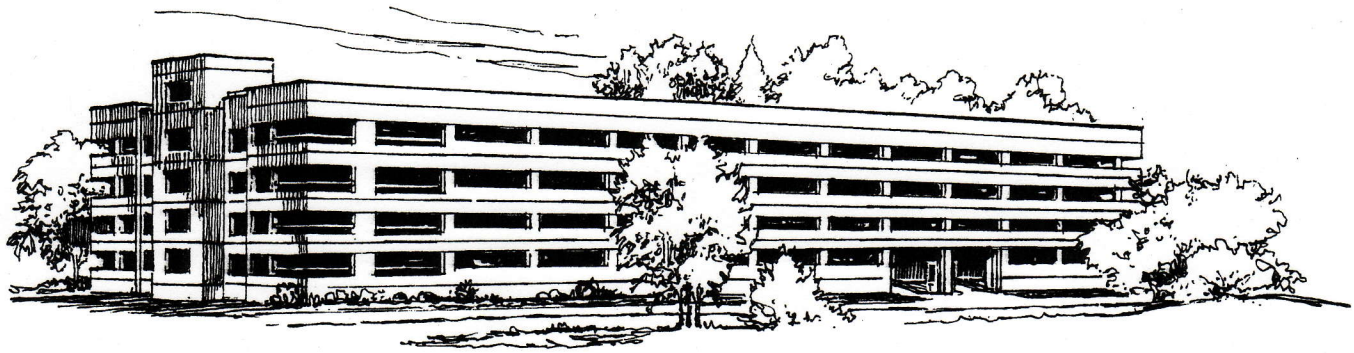
D4 Estimate for Bakery Square - Building 1

Building 1 - Bakery Square - Oct 2007 - PA - Pittsburgh

Prepared By:	**Jonathan Revtai** **PSU** **,** **Fax:**	Prepared For:	**Dr. Riley** **,** **Fax:**
Building Sq. Size:	**378120**	Site Sq. Size:	**59700**
Bid Date:		Building use:	**Commercial**
No. of floors:	**6**	Foundation:	**PIL**
No. of buildings:		Exterior Walls:	**PRE**
Project Height:		Interior Walls:	
1st Floor Height:		Roof Type:	
1st Floor Size:		Floor Type:	**PRE**
		Project Type:	**NEW**

Division		Percent	Sq. Cost	Amount
00	**Bidding Requirements**	**4.70**	**2.99**	**1,130,548**
	Bidding Requirements	4.70	2.99	1,130,548
01	**General Requirements**	**6.27**	**3.98**	**1,506,268**
	General Requirements	6.27	3.98	1,506,268
02	**Site Work**	**4.70**	**2.99**	**1,129,785**
	Site Work	4.70	2.99	1,129,785
03	**Concrete**	**31.63**	**20.11**	**7,603,626**
	Concrete	31.63	20.11	7,603,626
04	**Masonry**	**1.24**	**0.79**	**297,099**
	Masonry	1.24	0.79	297,099
05	**Metals**	**3.56**	**2.27**	**856,551**
	Metals	3.56	2.27	856,551
06	**Wood, Plastics, and Composites**	**0.18**	**0.11**	**42,699**
	Wood, Plastics, and Composites	0.18	0.11	42,699
07	**Thermal & Moisture Protection**	**1.25**	**0.79**	**299,898**
	Thermal & Moisture Protection	1.25	0.79	299,898
08	**Doors & Windows**	**4.26**	**2.71**	**1,025,045**
	Doors & Windows	4.26	2.71	1,025,045
09	**Finishes**	**1.58**	**1.00**	**379,036**
	Finishes	1.58	1.00	379,036
10	**Specialties**	**0.26**	**0.17**	**63,301**
	Specialties	0.26	0.17	63,301
11	**Equipment**	**0.55**	**0.35**	**132,820**
	Equipment	0.55	0.35	132,820
12	**Furnishings**	**3.10**	**1.97**	**745,205**
	Furnishings	3.10	1.97	745,205
14	**Conveying Systems**	**2.03**	**1.29**	**488,399**
	Conveying Systems	2.03	1.29	488,399
15	**Mechanical**	**3.26**	**2.07**	**783,053**
	Mechanical	3.26	2.07	783,053
16	**Electrical**	**3.94**	**2.51**	**947,633**
	Electrical	3.94	2.51	947,633
21	**Fire Suppression**	**0.46**	**0.29**	**110,201**
	Fire Suppression	0.46	0.29	110,201
22	**Plumbing**	**1.69**	**1.08**	**406,883**
	Plumbing	1.69	1.08	406,883

23	**HVAC**	**7.11**	**4.52**	**1,708,097**
	HVAC	7.11	4.52	1,708,097
26	**Electrical**	**10.60**	**6.74**	**2,547,644**
	Electrical	10.60	6.74	2,547,644
27	**Communications**	**0.28**	**0.18**	**66,225**
	Communications	0.28	0.18	66,225
31	**Earthwork**	**6.62**	**4.21**	**1,591,732**
	Earthwork	6.62	4.21	1,591,732
32	**Exterior Improvements**	**0.73**	**0.47**	**176,682**
	Exterior Improvements	0.73	0.47	176,682
Total Building Costs		**100.00**	**63.57**	**24,038,430**
Total Non-Building Costs		**100.00**	**0.00**	**0**
Total Project Costs		**--**	**--**	**24,038,430**



Costs per square foot of floor area

Exterior Wall	S.F. Area	85000	115000	145000	175000	205000	235000	265000	295000	325000
	L.F. Perimeter	529	638	723	823	923	951	1037	1057	1132
Face Brick with Concrete Block Back-up	Steel Frame	57.80	56.45	55.45	54.95	54.50	53.90	53.60	53.15	53.00
	R/Conc. Frame	44.10	42.75	41.70	41.15	40.80	40.10	39.90	39.45	39.25
Precast Concrete	Steel Frame	60.65	59.10	57.90	57.20	56.75	55.95	55.65	55.10	54.85
	R/Conc. Frame	46.25	44.65	43.50	42.80	42.40	41.60	41.25	40.65	40.45
Reinforced Concrete	Steel Frame	57.10	55.95	55.10	54.65	54.25	53.75	53.55	53.15	53.00
	R/Conc. Frame	42.40	41.20	40.40	39.90	39.60	39.05	38.85	38.45	38.35
Perimeter Adj., Add or Deduct	Per 100 L.F.	1.40	1.05	0.85	0.65	0.60	0.50	0.45	0.40	0.30
Story Hgt. Adj., Add or Deduct	Per 1 Ft.	0.45	0.45	0.40	0.30	0.40	0.30	0.30	0.30	0.25
Basement—Not Applicable										

The above costs were calculated using the basic specifications shown on the facing page. These costs should be adjusted where necessary for design alternatives and owner's requirements. Reported completed project costs, for this type of structure, range from $29.50 to $114.10 per S.F.

Common additives

Description	Unit	$ Cost
Elevators, Electric passenger, 5 stops		
2000# capacity	Each	127,300
3500# capacity	Each	134,300
5000# capacity	Each	139,800
Barrier gate w/programmable controller	Each	3950
Booth for attendant, average	Each	12,300
Fee computer	Each	14,900
Ticket spitter with time/date stamp	Each	7450
Mag strip encoding	Each	20,900
Collection station, pay on foot	Each	126,000
Parking control software	Each	25,200 - 103,000
Painting, Parking stalls	Stall	9.75
Parking Barriers		
Timber with saddles, 4" x 4"	L.F.	6.70
Precast concrete, 6" x 10" x 6'	Each	69.50
Traffic Signs, directional, 12" x 18", high density	Each	79.50

Model costs calculated for a 5 story building with 10′ story height and 145,000 square feet of floor area

Garage, Parking

				Unit	Unit Cost	Cost Per S.F.	% Of Sub-Total
A. SUBSTRUCTURE							
1010	Standard Foundations	Poured concrete; strip and spread footings		S.F. Ground	6.40	1.28	
1020	Special Foundations	N/A		–	–	–	
1030	Slab on Grade	6" reinforced concrete with vapor barrier and granular base		S.F. Slab	6.06	1.22	11.9%
2010	Basement Excavation	Site preparation for slab and trench for foundation wall and footing		S.F. Ground	.15	.03	
2020	Basement Walls	4′ foundation wall		L.F. Wall	61	1.22	
B. SHELL							
B10 Superstructure							
1010	Floor Construction	Double tee precast concrete slab, precast concrete columns		S.F. Floor	19.61	15.69	49.8%
1020	Roof Construction	N/A		–	–	–	
B20 Exterior Enclosure							
2010	Exterior Walls	Face brick with concrete block backup	*40% of story height*	S.F. Wall	29.48	2.94	
2020	Exterior Windows	N/A		–	–	–	9.3%
2030	Exterior Doors	N/A		–	–	–	
B30 Roofing							
3010	Roof Coverings	N/A		–	–	–	
3020	Roof Openings	N/A		–	–	–	0.0 %
C. INTERIORS							
1010	Partitions	Concrete block		S.F. Partition	28.08	1.08	
1020	Interior Doors	Hollow metal		Each	16,840	.12	
1030	Fittings	N/A		–	–	–	
2010	Stair Construction	Concrete		Flight	3625	.25	5.0%
3010	Wall Finishes	Paint		S.F. Surface	1.43	.11	
3020	Floor Finishes	N/A		–	–	–	
3030	Ceiling Finishes	N/A		–	–	–	
D. SERVICES							
D10 Conveying							
1010	Elevators & Lifts	Two hydraulic passenger elevators		Each	133,400	1.84	5.8%
1020	Escalators & Moving Walks	N/A		–	–	–	
D20 Plumbing							
2010	Plumbing Fixtures	Toilet and service fixtures, supply and drainage	*1 Fixture/18,125 S.F. Floor*	Each	2719	.15	
2020	Domestic Water Distribution	Electric water heater		S.F. Floor	.07	.07	4.7%
2040	Rain Water Drainage	Roof drains		S.F. Roof	6.35	1.27	
D30 HVAC							
3010	Energy Supply	N/A		–	–	–	
3020	Heat Generating Systems	N/A		–	–	–	
3030	Cooling Generating Systems	N/A		–	–	–	
3050	Terminal & Package Units	N/A		–	–	–	0.0 %
3090	Other HVAC Sys. & Equipment	N/A		–	–	–	
D40 Fire Protection							
4010	Sprinklers	N/A		–	–	–	
4020	Standpipes	Standpipes and hose systems		S.F. Floor	.07	.07	0.2 %
D50 Electrical							
5010	Electrical Service/Distribution	400 ampere service, panel board and feeders		S.F. Floor	.23	.23	
5020	Lighting & Branch Wiring	Fluorescent fixtures, receptacles, switches and misc. power		S.F. Floor	2.65	2.65	
5030	Communications & Security	Alarm systems and emergency lighting		S.F. Floor	.11	.11	9.7%
5090	Other Electrical Systems	Emergency generator, 7.5 kW		S.F. Floor	.05	.05	
E. EQUIPMENT & FURNISHINGS							
1010	Commercial Equipment	N/A		–	–	–	
1020	Institutional Equipment	N/A		–	–	–	
1030	Vehicular Equipment	Ticket dispensers, booths, automatic gates		S.F. Floor	1.11	1.11	3.5 %
1090	Other Equipment	N/A		–	–	–	
F. SPECIAL CONSTRUCTION							
1020	Integrated Construction	N/A		–	–	–	
1040	Special Facilities	N/A		–	–	–	0.0 %
G. BUILDING SITEWORK		**N/A**					
				Sub-Total	31.49	**100%**	
	CONTRACTOR FEES (General Requirements: 10%, Overhead: 5%, Profit: 10%)			25%	7.85		
	ARCHITECT FEES			6%	2.36		
				Total Building Cost	**41.70**		

Costs per square foot of floor area

Exterior Wall	S.F. Area	4000	6000	8000	10000	12000	15000	18000	20000	22000
	L.F. Perimeter	260	340	360	410	440	490	540	565	594
Split Face Concrete Block	Steel Joists	122.95	111.40	101.35	97.05	93.15	89.60	87.20	85.70	84.60
Stucco on Concrete Block	Steel Joists	120.05	108.90	99.40	95.20	91.55	88.15	85.85	84.40	83.35
Painted Concrete Block	Steel Joists	114.40	103.55	94.45	90.50	87.00	83.75	81.55	80.20	79.20
Face Brick on Concrete Block	Steel Joists	139.65	126.00	112.95	107.60	102.60	98.00	94.90	92.95	91.50
Painted Reinforced Concrete	Steel Joists	129.90	117.50	106.20	101.50	97.10	93.05	90.40	88.70	87.50
Tilt-up Concrete Panels	Steel Joists	120.25	109.05	99.50	95.40	91.65	88.25	85.95	84.50	83.50
Perimeter Adj., Add or Deduct	Per 100 L.F.	14.20	9.50	7.15	5.70	4.75	3.70	3.10	2.80	2.60
Story Hgt. Adj., Add or Deduct	Per 1 Ft.	1.75	1.60	1.25	1.15	1.00	0.90	0.85	0.75	0.70
For Basement, add $30.70 per square foot of basement area										

The above costs were calculated using the basic specifications shown on the facing page. These costs should be adjusted where necessary for design alternatives and owner's requirements. Reported completed project costs, for this type of structure, range from $51.50 to $179.05 per S.F.

Common additives

Description	Unit	$ Cost
Emergency Lighting, 25 watt, battery operated		
Lead battery	Each	278
Nickel cadmium	Each	800
Safe, Office type, 4 hour rating		
30" x 18" x 18"	Each	4075
62" x 33" x 20"	Each	8850
Smoke Detectors		
Ceiling type	Each	174
Duct type	Each	445
Sound System		
Amplifier, 250 watts	Each	2225
Speaker, ceiling or wall	Each	181
Trumpet	Each	345

Important: See the Reference Section for Location Factors

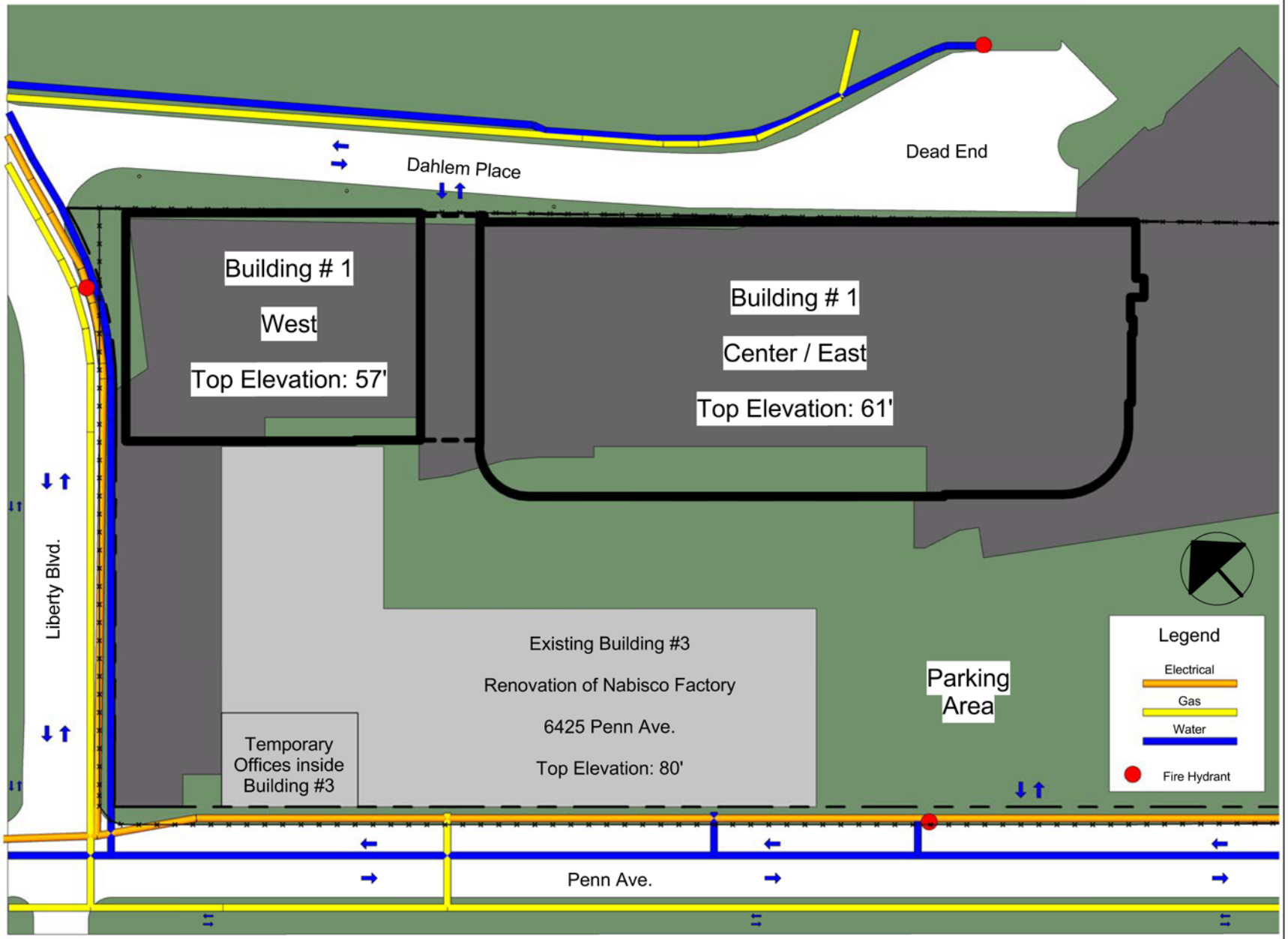
Model costs calculated for a 1 story building with 14′ story height and 8,000 square feet of floor area

Store, Retai

				Unit	Unit Cost	Cost Per S.F.	% Of Sub-Tot
A. SUBSTRUCTURE							
1010	Standard Foundations	Poured concrete; strip and spread footings		S.F. Ground	1.70	1.70	
1020	Special Foundations	N/A		—	—	—	
1030	Slab on Grade	4" reinforced concrete with vapor barrier and granular base		S.F. Slab	4.63	4.63	12.9%
2010	Basement Excavation	Site preparation for slab and trench for foundation wall and footing		S.F. Ground	.25	.25	
2020	Basement Walls	4′ foundation wall		L.F. Wall	70	3.13	
B. SHELL							
	B10 Superstructure						
1010	Floor Construction	N/A		—	—	—	
1020	Roof Construction	Metal deck, open web steel joists, beams, interior columns		S.F. Roof	6.40	6.40	8.5 %
	B20 Exterior Enclosure						
2010	Exterior Walls	Decorative concrete block	*90% of wall*	S.F. Wall	15.54	8.81	
2020	Exterior Windows	Storefront windows	*10% of wall*	Each	39.95	2.52	15.7%
2030	Exterior Doors	Sliding entrance door and hollow metal service doors		Each	1802	.45	
	B30 Roofing						
3010	Roof Coverings	Built-up tar and gravel with flashing; perlite/EPS composite insulation		S.F. Roof	5.41	5.41	7.4%
3020	Roof Openings	Roof hatches		S.F. Roof	.12	.12	
C. INTERIORS							
1010	Partitions	Gypsum board on metal studs	*60 S.F. Floor/L.F. Partition*	S.F. Partition	5.22	.87	
1020	Interior Doors	Single leaf hollow metal	*600 S.F. Floor/Door*	Each	842	1.40	
1030	Fittings	N/A		—	—	—	
2010	Stair Construction	N/A		—	—	—	15.8%
3010	Wall Finishes	Paint		S.F. Surface	5.37	1.79	
3020	Floor Finishes	Vinyl tile		S.F. Floor	3.05	3.05	
3030	Ceiling Finishes	Mineral fiber tile on concealed zee bars		S.F. Ceiling	4.74	4.74	
D. SERVICES							
	D10 Conveying						
1010	Elevators & Lifts	N/A		—	—	—	
1020	Escalators & Moving Walks	N/A		—	—	—	0.0 %
	D20 Plumbing						
2010	Plumbing Fixtures	Toilet and service fixtures, supply and drainage	*1 Fixture/890 S.F. Floor*	Each	2243	2.52	
2020	Domestic Water Distribution	Gas fired water heater		S.F. Floor	3.74	3.74	9.8%
2040	Rain Water Drainage	Roof drains		S.F. Roof	1.08	1.08	
	D30 HVAC						
3010	Energy Supply	N/A		—	—	—	
3020	Heat Generating Systems	Included in D3050		—	—	—	
3030	Cooling Generating Systems	N/A		—	—	—	9.2 %
3050	Terminal & Package Units	Single zone unit, gas heating, electric cooling		S.F. Floor	6.93	6.93	
3090	Other HVAC Sys. & Equipment	N/A		—	—	—	
	D40 Fire Protection						
4010	Sprinklers	Wet pipe sprinkler system		S.F. Floor	3.43	3.43	4.6%
4020	Standpipes	N/A		—	—	—	
	D50 Electrical						
5010	Electrical Service/Distribution	400 ampere service, panel board and feeders		S.F. Floor	2.39	2.39	
5020	Lighting & Branch Wiring	Fluorescent fixtures, receptacles, switches, A.C. and misc. power		S.F. Floor	9.16	9.16	
5030	Communications & Security	Alarm systems and emergency lighting		S.F. Floor	.37	.37	16.1%
5090	Other Electrical Systems	Emergency generator, 15 kW		S.F. Floor	.19	.19	
E. EQUIPMENT & FURNISHINGS							
1010	Commercial Equipment	N/A		—	—	—	
1020	Institutional Equipment	N/A		—	—	—	
1030	Vehicular Equipment	N/A		—	—	—	0.0 %
1090	Other Equipment	N/A		—	—	—	
F. SPECIAL CONSTRUCTION							
1020	Integrated Construction	N/A		—	—	—	
1040	Special Facilities	N/A		—	—	—	0.0 %
G. BUILDING SITEWORK		**N/A**					
					Sub-Total	75.08	**100%**
	CONTRACTOR FEES (General Requirements: 10%, Overhead: 5%, Profit: 10%)				*25%*	18.76	
	ARCHITECT FEES				*8%*	7.51	
					Total Building Cost	**101.35**	

APPENDIX C:

Existing Conditions Site Plan



Existing Conditions

Project number	Tech Report I
Date	9/29/08
Drawn by	Revtai
Checked by	Revtai
Scale	1" = 80'-0"

C101

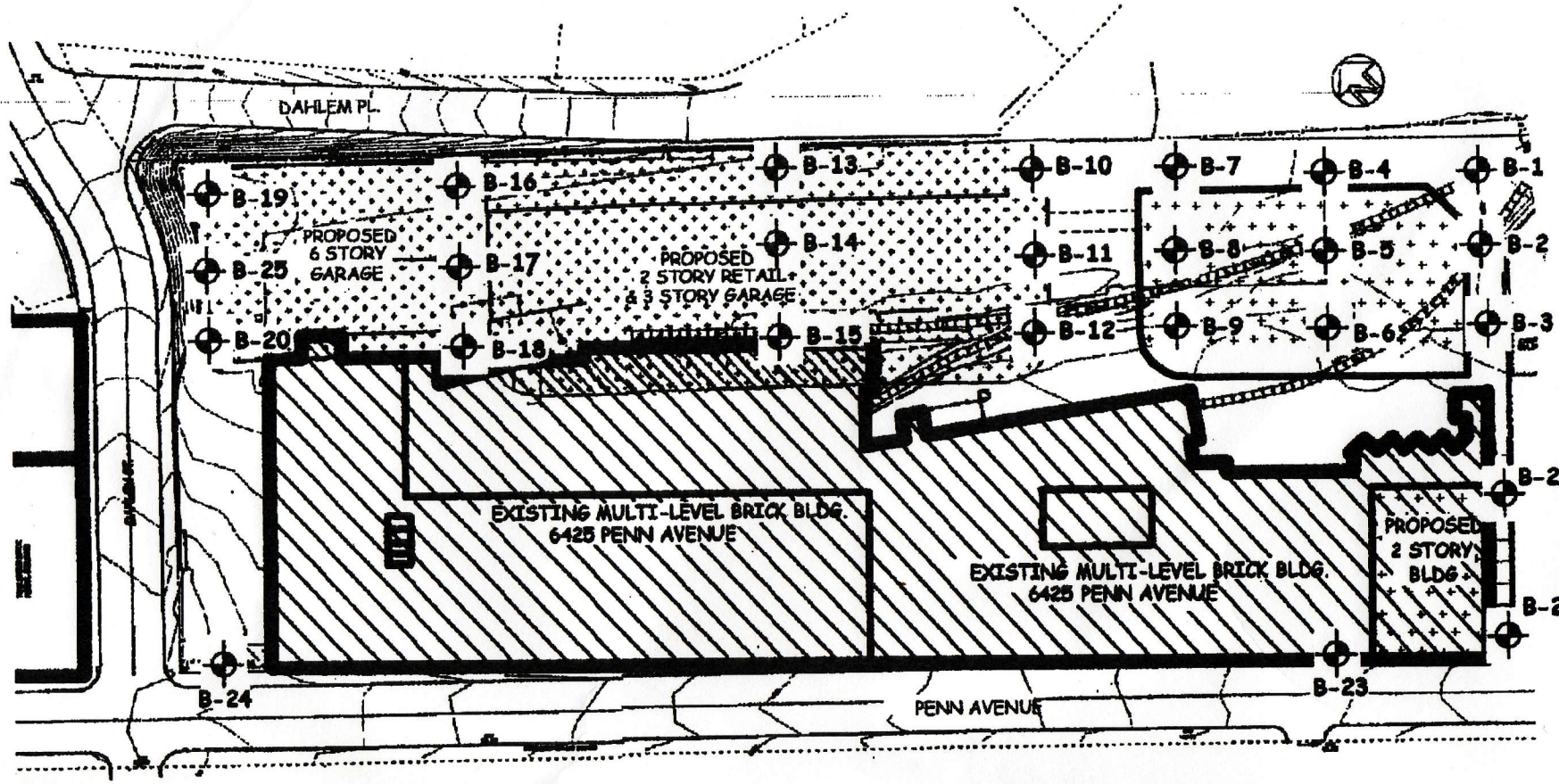
Jonathan Revtai Building #1

Autodesk® Revit®

www.autodesk.com/revit

APPENDIX D:

Site Test Bore Information



NABISCO PROPERTY

CONSTRUCTION ENGINEERING CONSULTANTS, INC.
2018 Waverly Street
Pittsburgh, PA 15218
(412) 351-6465

TEST BORING LOG

BORING NO.: B-14

PROJECT: NABISCO PROPERTY
LOCATION: PITTSBURGH, PA
DATE STARTED: 4/13/07
DRILLER: T. ZILKA
SURFACE ELEVATION: 930.0'
WATER LEVELS:
AT COMPLETION: 0
AT 24 HOURS: 15.2

CLIENT: WALNUT CAPITAL
PROJECT NO.: J-09140
DATE COMPLETED: 4/13/07
LOGGED BY: HSR
LOG TYPE: ENGINEER'S
SPOON SIZE: 2 INCHES
HLW. STEM AGR.: 3.25 I.D.

ELEVATION	DEPTH	LEGEND	SYMBOL	DESCRIPTION OF MATERIAL	RECOVERY (%)	SAMPLE NO.	SPOON BLOWS/6in.	THICKNESS OF SAMPLES	RQD, %	REMARKS
930.0'	0.0'			ASPHALT						
929.8'	0.2'			FILL: Slag, cinders, trace of brown clay and organic material, dense, dry to wet	100%	1	28-40-47	1.5'-3.0'		
926.7'	3.3'	7	CL	CLAY: Brown to gray, mottled, soft to medium stiff, damp	27%	2	5-6-6	3.0'-4.5'		
					100%	3	3-5-6	6.0'-7.5'		
921.3'	8.7'			SAND: Reddish brown to brown, with trace of brown silt, very loose to loose, damp	100%	4	3-3-6	9.0'-10.5'		
		14			100%	5	3-3-3	12.0'-13.5'		
					100%	6	3-3-3	15.0'-16.5'		
911.3'	18.7'		GM	SILT: Reddish brown, with trace of weathered rock fragments, soft to medium stiff, dry to moist	100%	7	2-5-5	18.0'-19.5'		
		21								
908.2'	21.8'		ML	SILT: Gray, with trace of sand, very soft to medium stiff, moist	100%	8	5-4-5	21.0'-22.5'		
					100%	9	3-5-5	24.0'-25.5'		
		28			100%	10	2-3-3	27.0'-28.5'		
					100%	11	3-2-5	30.0'-31.5'		
897.5'	32.5'			SAND: Gray, with trace of silt, very loose to loose, wet	100%	12	2-2-5	33.0'-34.5'		
		35								
894.3'	35.7'			SILTY SHALE: Bluish gray, with trace of sand, hard, dry	100%	13	37-41-50/0.4	36.0'-37.4'		
890.7'	39.3'			SILTSTONE: Bluish gray, with trace of sand and shale, very broken to blocky, soft to medium hard, damp	100%	14	50/0.3	39.0'-39.3'		BEGIN CORING @ 39.3'
		42			90%	R1		39.3'-44.3'	57%	
885.7'	44.3'									Bottom of Boring @ 44.3'