

# Technical Assignment 2

The Apartment Building  
East Coast, USA

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Source: JMAV

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## EXECUTIVE SUMMARY

The Apartment Building is a high-end apartment building located on the East Coast. It consists of ten stories above grade, amounting to 151,158 SF. The building also has a two-story, 62,250 SF underground parking garage.

Technical Assignment Two analyzes key features that affect project execution and construction. This analysis involves a more detailed schedule and more detailed estimates of major building systems. In addition, an analysis of site utilization based on the detailed schedule and a LEED analysis is included.

The detailed construction CPM schedule, comprised of roughly 275 activities, was created using Primavera P6. The schedule is broken down into eight main categories based on construction phases. The Apartment Building received the notice to proceed on **February 11<sup>th</sup>, 2013** and will reach substantial completion on **February 19<sup>th</sup>, 2015** resulting in a total duration of 24 months. The detailed construction schedule can be found in Appendix 1.

A more detailed cost analysis was performed to improve upon the square foot estimate that was performed in Technical Assignment One. In this assignment, a detailed structural estimate, MEP assemblies estimate, and a general conditions estimate was performed. The detailed structural estimate, which was primarily concrete, was calculated to be **\$6,161,674**. The cost of the MEP systems through an assembly estimate was found to be **\$2,631,759** for the mechanical system, **\$3,098,242** for the electrical system and **\$2,871,375** for the plumbing system. The general conditions estimate, which is dictated by the schedule, was **\$2,109,776**. Upon updating the square foot estimate with these more detailed estimates, the total estimate for the building increased to \$31,814,026, which is within 3% of the actual project estimate.

Site utilization plans were created based on the schedule and was broken up into three main phases of construction: excavation and site work, structure, and enclosure and finishes.

Lastly, a LEED evaluation was performed to analyze the current LEED plan and suggest improvements to the plan. The Apartment Building is currently pursuing 47 points, placing it in the LEED Certified category. Through the addition of three points, the project can be upgraded to a LEED Silver rating. A possible option is to pursue Green Power (2 points) and Construction IAQ Management before occupancy (1 point). These points will have a slight cost impact, however will not affect the design and construction schedule.

## DETAILED PROJECT SCHEDULE

A detailed schedule of roughly 275 tasks was produced for the construction of the Apartment Building. This schedule is strictly a construction schedule and does not include the design and preconstruction phase. The schedule is broken down into eight main phases, as seen in Table 1. The Apartment Building received the notice to proceed on February 11<sup>th</sup>, 2013 and will reach substantial completion on February 19<sup>th</sup>, 2015 resulting in a total duration of 24 months. Due to the repetitive nature of residential high-rise construction, the above grade floors were grouped into groups of two to reduce the number of schedule activities.

Although the schedule may suggest that two floors are being turned over at a time, this is not necessarily the case. Turnover is being done in phases to allow early revenue for the owner. The first phase of turnover included the garage through second floor. From the second floor and up, a floor will be turned over every week. Since the building is being turned over in phases, some of the durations in Table 1 are longer than what would be expected if the entire building was turned over at once. For example, the final punchlist would typically take a few week at the end of the project. Due to the phased turnover, a punchlist must be completed after each floor is completed, resulting in a longer punchlist duration of 69 days. The final certificate of occupancy for the 10<sup>th</sup> and final floor is set for February 19<sup>th</sup>, 2015. The complete detailed CPM construction schedule can be found in Appendix 1.

**Table 1: Detailed Schedule Overview**

Phase	Start	Finish	Duration
Notice To Proceed	2/11/13	-	-
Site Prep/ Excavation	2/11/13	7/31/13	120
Site Improvements	7/28/14	10/30/14	68
Utilities	4/15/13	8/6/14	324
Structure	10/16/13	6/12/14	156
Enclosure	3/27/14	9/2/14	53
MEP Rough-In and Framing	4/3/14	10/10/14	133
Finishes	5/30/14	1/5/15	155
Punchlist	9/12/14	1/19/15	69
Certificate of Occupancy (10 <sup>th</sup> Floor)	-	2/19/15	-

## UPDATED ESTIMATE

### DETAILED STRUCTURAL SYSTEM ESTIMATE

The structural system primarily consists of cast-in-place concrete. The foundation is comprised a concrete mat slab and foundation walls, creating a bathtub effect. Beginning on the second floor and up through the roof, post-tensioning is used in the slabs which allow for a thinner slab thickness.

A detailed estimate was completed for the cast-in-place concrete system using pricing from RSMean Online and subcontractor data. This detailed estimate only include concrete used in the building, and excludes site concrete and concrete for the courtyard swimming pool.

**Table 2: Detailed Structural Estimate Summary**

Item	Cost
Mat Slab	\$959,796
Foundation Walls	\$211,406
Elevated Slabs	\$3,381,568
Columns	\$437,147
Beams	\$154,105
Shear Walls	\$66,008
Stairs	\$45,582
Post Tensioning	178095
<b>Total including tax, overhead and profit</b>	<b>\$6,161,674</b>
Cost per SF	\$40.78

In order to simplify the concrete quantity takeoff process, the structure was broken down into components: mat slab, foundation wall, elevated slabs, columns, beams, shear walls, stairs, and post tensioning. All components were taken off in cubic yards of concrete except stairs and post tensioning. Stairs were taken off in linear feet of nosing and post tension by square feet.

Exact dimensions were used to calculate the volume of concrete needed for mat slabs, columns, beams, and shear walls. The building footprint decreased every couple of floors in a step like fashion, as seen in Figure 1. Due to this repetitive nature, the elevated slabs for the above grade floors were grouped into groups with similar footprints. Within these groups, only one floor needed to be taken off then multiplied by the number of floors that had the same footprint. The groupings were as follows: upper parking through ground, 2<sup>nd</sup> through 5<sup>th</sup>, 6<sup>th</sup> through 8<sup>th</sup>, 9<sup>th</sup>-roof. Columns

were taken off in a similar manner as the elevated slabs because of the repetition of floors. Since the cost data for the elevated slabs from RSMeans online did not include post tensioning, a separate post tensioning takeoff was completed. In order to price post tensioning, subcontractor pricing was used. The general cost for post tensioning is about \$1.25 per SF of post tensioned slab according to the concrete subcontractor on the project. The detailed structural estimate, including tax, overhead and fee, came out to **\$6,161,674** or **\$40.78 per SF**. The complete structural takeoff and estimate can be found in Appendix 2.

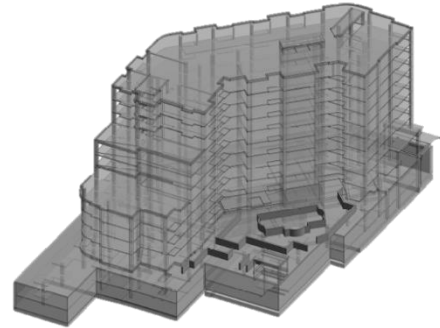


Figure 1: Concrete Structure

## MEP ASSEMBLY ESTIMATE

An assembly estimate for the mechanical, electrical and plumbing systems was completed. The procedure for creating an assembly estimate for each system was similar. First major system assemblies were identified, quantified, and then assigned cost data from RSMeans Online. Subcontractor markups were then applied to the assembly estimates. (6% tax on materials, 7% overhead, 4% profit). The total cost of the MEP systems was calculated to be

## MECHANICAL ASSEMBLY ESTIMATE

Two primary types of mechanical systems are used to service the various spaces within the building. Two roof top units, 5580 and 6150 CFM, serve the main corridors of the building. The individual apartment units, and common areas are conditioned by split system heat pumps. The sizes of these split system heat pumps range from 300 CFM to 3000 CFM.

Table 3: Mechanical Assembly Summary

Item	Cost
Rooftop Units	\$89,373
Split System Heat Pumps	\$1,024,960
Fans	\$796,056
<b>Total including tax, overhead and profit</b>	<b>\$2,631,759</b>
Cost per SF	\$17.42

The main assemblies of the mechanical system include, rooftop units, split system heat pumps and fans. Table 3 shows a summary of the mechanical assembly estimate. The majority of the cost of the estimate is from the split system heat pumps that serve the individual apartment units as well as the common areas. The total cost of the mechanical system assembly estimate, including tax, overhead and profit came to **\$2,631,759** or **\$17.42 per SF**. The complete mechanical takeoffs and assembly estimate can be found in Appendix 3.

#### ELECTRICAL ASSEMBLY ESTIMATE

The Apartment Building runs on 208/120V which is typical for residential buildings. Four 1000A switchgears supply the 16 to 20 load centers located on each floor.

**Table 4: Electrical Assembly Summary**

Item	Cost
Switchgear	\$119,576
Load Centers	\$1,065,148
Generators	\$133,938
Receptacles	\$798,525
Fixtures	\$553,711
<b>Total including tax, overhead and profit</b>	<b>\$3,098,243</b>
Cost per SF	\$20.50

The main assemblies for the electrical system are switchgears, load centers, generators, receptacles and lighting fixtures. Table 4 shows a summary of the electrical assembly estimate. It is clear that the load centers that are located in each apartment unit and common spaces account for the bulk of the total. The total cost of the electrical including tax, overhead and profit came to **\$3,098,242** or **\$20.50 per SF**. The complete mechanical takeoffs and assembly estimate can be found in Appendix 4.

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 PLUMBING ASSEMBLY ESTIMATE
 

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Table 5: Plumbing Assembly Estimate Summary

Item	Cost
Water Closets	\$445,647
Sinks	\$561,247
Bathtub	\$830,624
Water Fountain	\$4,008
Pumps	\$93,376
Water Heaters	\$578,478
<b>Total including tax, overhead and profit</b>	<b>\$2,871,375</b>
Cost per SF	\$19.00

The main assemblies for the plumbing system are water closets, sinks, bathtubs, water fountains, pumps and water heaters. Table 5 shows a summary of the electrical assembly estimate. Plumbing fixtures that are used in the individual apartment units account for the majority of the cost because of the high number of apartment units. The total cost of the electrical including tax, overhead and profit came to **\$2,871,375** or **\$19,000 per SF**. The complete plumbing takeoffs and assembly estimate can be found in Appendix 5.

 GENERAL CONDITIONS ESTIMATE
 

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A detailed general conditions estimate was performed with respect to the detailed construction schedule. This general conditions estimate includes project staffing, temporary facilities, utilities, insurance, permitting, inspections, safety and personal protection, clean up and IT and software. Contractor pricing as well as RSM means pricing was used to calculate costs. The total general conditions for the 24 month project came to **\$2,109,776** or roughly **\$87,907 per month**. This monthly cost is not entirely accurate since general conditions costs will follow a bell curve. Costs will be lower at the beginning phases of the project, then peak towards the middle, and ramp down at the end.



Table 6: General Conditions Summary

Item	Cost	Monthly Cost
Project Staff	\$1,159,673	\$48,320
Temp Facilities and Utilities	\$280,204	\$11,675
Safety and Personnel Protection	\$183,579	\$7,649
Clean Up	\$189,264	\$7,886
Insurance	\$140,000	\$5,833
Permitting	\$75,400	\$3,142
Professional Services	\$28,468	\$1,186
IT	\$25,546	\$1,064
LEED Certification	\$10,600	\$442
Inspections	\$10,000	\$417
Office Supplies	\$7,041	\$293
<b>Total</b>	<b>\$2,109,776</b>	<b>\$87,907</b>

Table 6 shows a summary of the general conditions estimate. At 55 percent, the project staff accounts for the majority of the general conditions cost. The project staff is comprised of project management, field, administrative and safety personnel. Temporary facilities and utilities was the second most costly item accounting for 13 percent of the total. Figure 2 shows the complete breakdown of the general conditions estimate. Refer to Appendix 6 for a more detailed general conditions estimate.

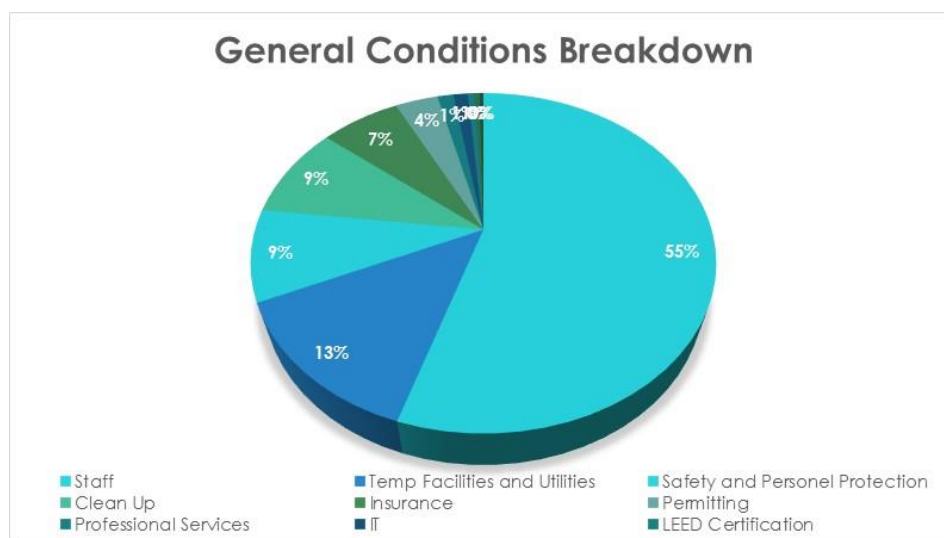


Figure 2: General Conditions Breakdown

## ESTIMATE SUMMARY

In Technical Assignment Two, a square foot estimate was conducted using RSMMeans for an 8-24 story apartment building with face brick with concrete block backup and reinforced concrete frame. The total square foot estimate, including markups and allowances, was \$29,411,320. The accepted accuracy of a square foot estimate is within 15%. In this case, the square foot estimate was within 10% of the actual GMP contract (\$32,752,717).

Table 7: Estimate Summary

Estimate Summary					
CSI Division	Description	Tech 1		Tech 2	
		Estimate Type	Total	Estimate Type	Total
1	General Requirements	SF	\$ 1,755,250.00	Detailed	\$ 2,109,776.33
3	Concrete	SF	\$ 5,685,000.00	Detailed	\$ 6,161,673.51
4	Masonry	SF	\$ 1,737,000.00	SF	\$ 1,737,000.00
6	Wood, Plastics, and Composites	SF	\$ 1,436,000.00	SF	\$ 1,436,000.00
7	Thermal and Moisture Protection	SF	\$ 91,000.00	SF	\$ 91,000.00
8	Openings	SF	\$ 1,560,000.00	SF	\$ 1,560,000.00
9	Finishes	SF	\$ 1,696,500.00	SF	\$ 1,696,500.00
11	Equipment	SF	\$ 723,500.00	SF	\$ 723,500.00
12	Furnishings	SF	\$ 606,500.00	SF	\$ 606,500.00
14	Conveying Equipment	SF	\$ 3,313,500.00	SF	\$ 3,313,500.00
21	Fire Suppression	SF	\$ 643,500.00	SF	\$ 643,500.00
22	Plumbing	SF	\$ 3,109,500.00	Assembly	\$ 2,871,375.15
23	HVAC	SF	\$ 2,539,000.00	Assembly	\$ 2,631,758.79
26	Electrical	SF	\$ 1,457,000.00	Assembly	\$ 3,098,243.00
27	Communication	SF	\$ 477,000.00	SF	\$ 477,000.00
<b>Subtotal</b>			\$ 26,830,250.00		\$ 29,157,326.78
<b>Winter Weater Allowance</b>			\$ 100,000.00		\$ 100,000.00
<b>Subcontractor Bonding Allowance</b>			\$ 299,426.00		\$ 299,426.00
<b>Contingency</b>			\$ 968,521.00		\$ 968,521.00
<b>GL Insurance</b>			\$ 266,140.00		\$ 266,140.00
<b>Fee (3.25%)</b>			\$ 871,983.13		\$ 947,613.12
<b>Precon Services</b>			\$ 75,000.00		\$ 75,000.00
<b>Total</b>			\$ 29,411,320.13		\$ 31,814,026.90

A direct comparison of the estimate performed in technical assignment one and two can be found in the above table. The detailed estimates for general conditions and the structural system were higher than what was calculated in the square foot estimate. One of the reasons the structural cost increased is because post tensioning was excluded in the square foot estimate. At \$1.25 per SF, post tensioning is a significant cost. The MEP assembly estimates were relatively close to the squarefoot approximation except for the electrical estimate which nearly doubled. A

reason for this increase is that the building uses twice as many switch gears and a more complex distribution system and high end light fixtures than what was specified in the square foot estimate.

In theory, as the estimate becomes more developed, the accuracy should improve and the cost should reach the actual cost of construction. In this technical assignment, assembly estimates for the MEP systems was performed as well as a detailed estimate for the structural system and general conditions

The accepted accuracy of an assembly estimate is within 10% of the actual cost and 5% for a detailed estimate. Using a combination of square foot, assembly and detailed estimates from technical assignment one and two, a new summary estimate was created. The accuracy of this estimate should be within 5% and 15%. The updated total cost of the building is \$31,814,026, which is within 3% of the actual cost. Therefore, this estimate is more accurate than the 5% to 15% that was expected.

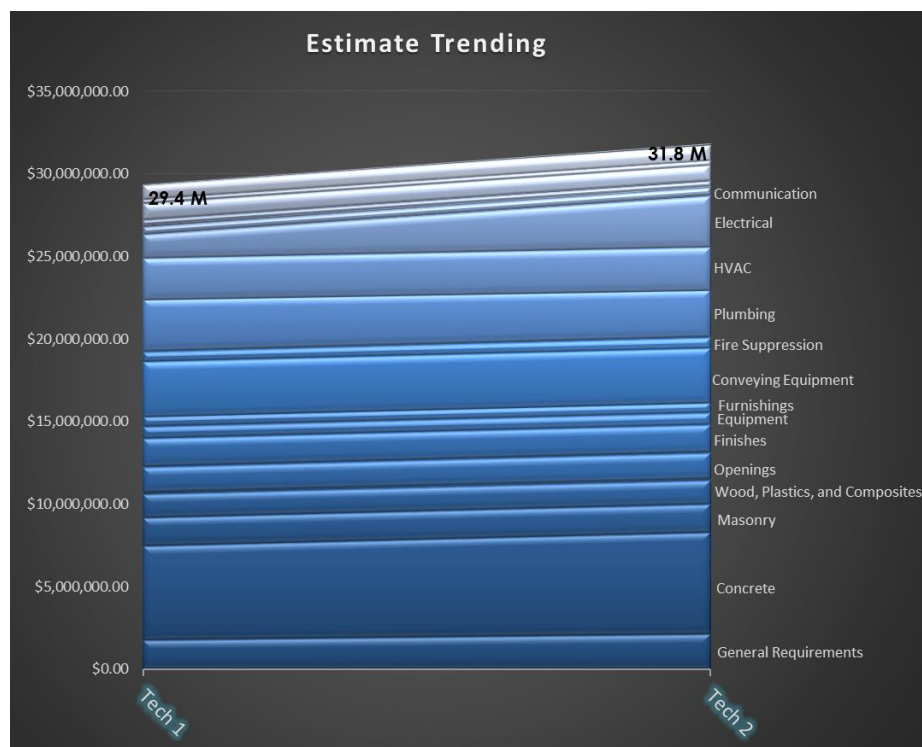


Figure 3: Estimate Trending

A useful tool to track the development of an estimate as it progresses is the concept of estimate trending. Figure 3 shows the development of the estimate from the square foot estimate performed in Technical Assignment One to the updated estimate from this technical assignment.

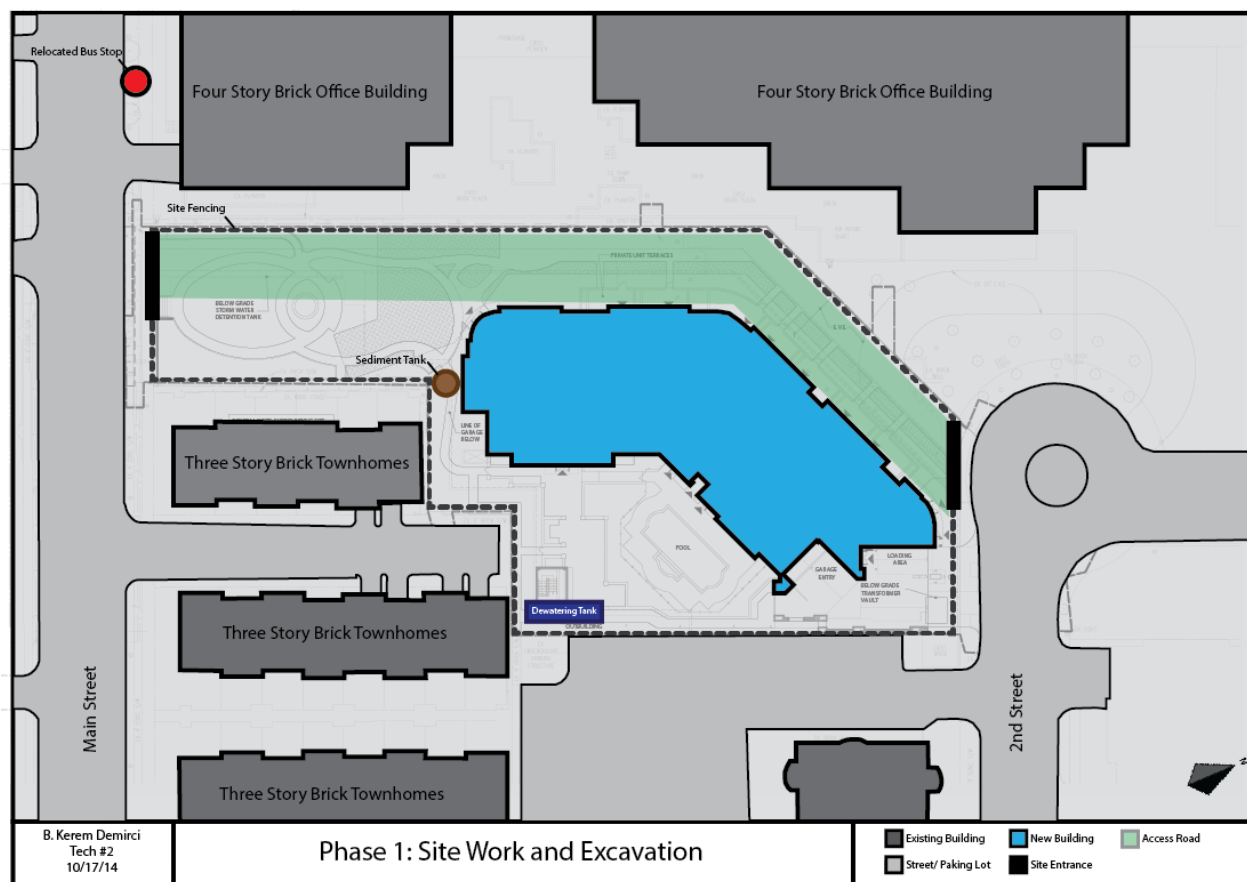
Visually it is evident that the increase in the estimate is primarily due to the electrical, concrete and general conditions estimate.

## SITE UTILIZATION PLANNING

Based on the construction schedule for The Apartment Building, the construction site will be used differently depending on the phase of the building. The site utilization plan is broken down into three main phases:

1. Excavation and Site work
2. Structure
3. Enclosure and Finishes

### PHASE 1: EXCAVATION AND SITE WORK



The first major phase of construction is preparing the site and excavating the building footprint. For this phase, the site utilization plan is simple since no new work is being put in place. Prior to construction, a site fence is needed to isolate the site from its surrounding. The main construction entrance is located on the north end with the construction exit located on Main Street. This will be

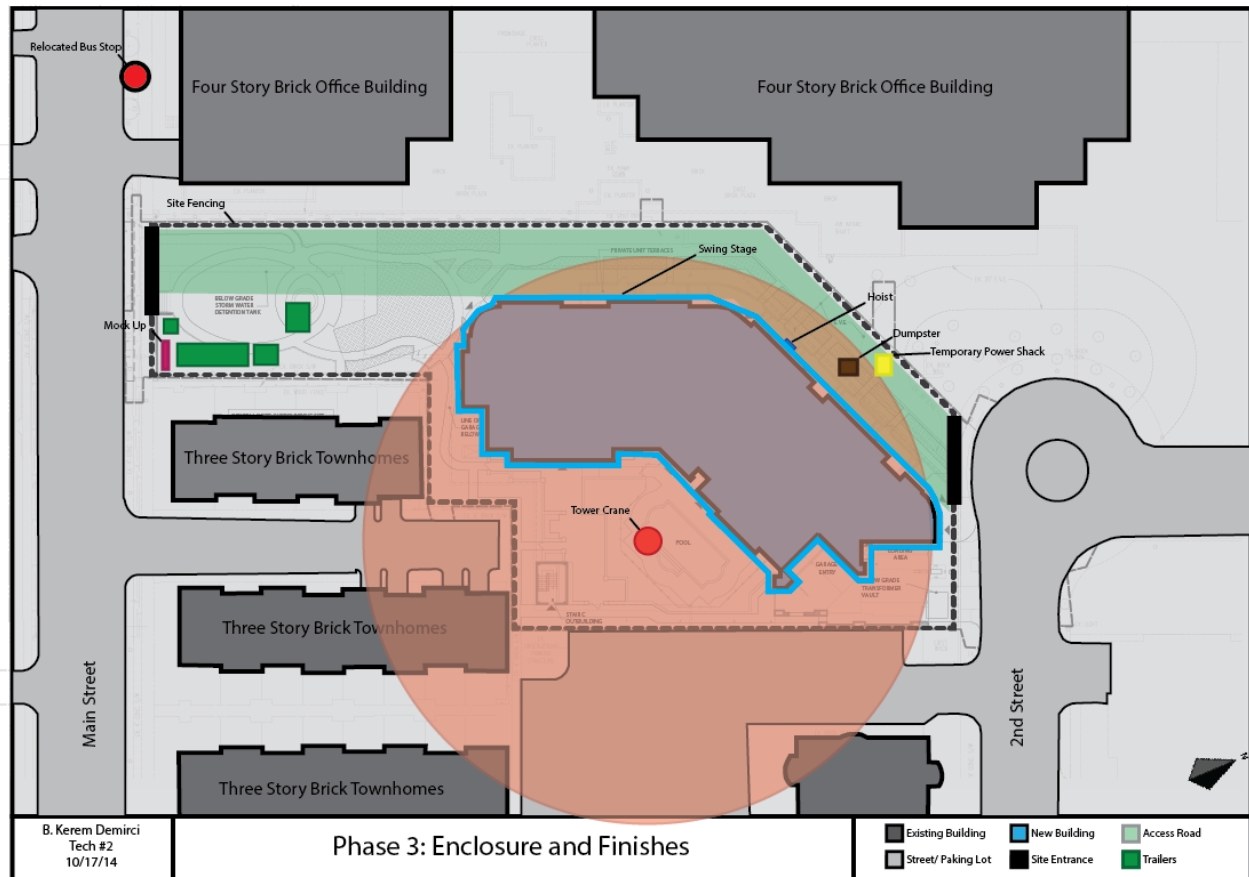
the main access path that trucks will use to haul soils off site. A dewatering tank and storm water tank is needed to keep water levels down as excavation progresses. An existing bus stop was previously located in close proximity to the Main Street entrance to the site, thus it needed to be moved up the street. An enlarged site utilization plan can be found in Appendix 7.

## PHASE 2: STRUCTURE



The next major phase of construction is the concrete structure. All the elements from Phase 1 will remain on site and additional items such as a tower crane, dumpster, temporary power shack and construction trailers will be added to the site. A tower crane is vital during this phase because it will be heavily used for concrete pours at the upper levels of the building. Since the site has been graded and prepped in phase 1, the project team can now move on-site, requiring construction trailers to be installed. Trailers are located at the South end of the site with direct access from Main Street. The dumpster is located on the main construction access path for easy removal. In order to prepare for the next phase of construction, a mockup will be built on site right next to the Main Street entrance. This mockup will provide quality control for the building façade that will begin in the next phase. An enlarged site utilization plan can be found in Appendix 7.

### PHASE 3: ENCLOSURE AND FINISHES



Once the structure is topped out, the enclosure can begin followed by interior finishes. In order to properly install the enclosure and interior finishes, a hoist is needed. The hoist will be located on the East elevation of the building, easily accessible from the main construction access path. The hoist will be used to transport materials and workers to the upper levels of the structure. In addition swing stages will be installed around the perimeter of the building. The swing stages will be used as work platforms when the enclosure is being constructed. Later on during this phase, the crane will also be removed. An enlarged site utilization plan can be found in Appendix 7.



Figure 4: Site Photo of Swing Stage

## LEADING INDUSTRY PRACTICE EVALUATION: LEED ANALYSIS

### CURRENT LEED STATUS

BMPI is aiming for a LEED Certified status for The Apartment Building under LEED 2009 for New Construction. From the LEED scorecard, provided by JMAV, the project is pursuing a total of 47 points, out of the possible 110, which puts the project in the LEED Certified category. Figure 5 shows a breakdown of LEED points that are currently being pursued on the project. Points from the Sustainable Sites category account for the majority of the points with the least amount of emphasis on Regional Priority. A complete detailed breakdown of currently pursued LEED points can be found in the LEED scorecard in Appendix 8.

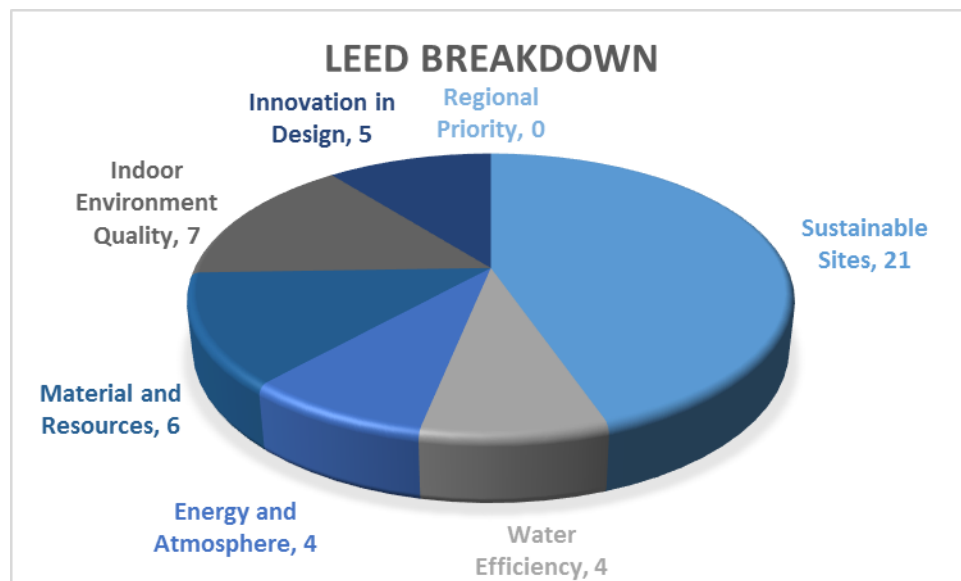


Figure 5: Current LEED Breakdown

The goal of the Sustainable Sites category is to promote the relationship between the building and its existing environment and surrounding. In the Sustainable Sites category, the bulk of the points earned are due to the fact this building be being developed on a previously developed site, an old high school, and is located within walking distance to a metro station. Additional Sustainable Site points are achieved by providing reserved spaces for low emitting and fuel efficient vehicles (LEFEV) and creating a ride share support system that will increase carpooling. In addition, light colored roofing will be used for over 75% of the total roof area.

The Water Efficiency category aims to reduce potable water consumption and the more efficient use of water. The Apartment Building will be able to achieve four points in this category by

reducing potable water consumption for irrigation by 50% and utilizing low flow fixtures such as water closets, urinals, showerheads, and sinks that will use 30% less water than the baseline usage.

Energy and Atmosphere account for four points for The Apartment Building. This category rewards the project for implementing energy-efficient and renewable design strategies. Through design, The Apartment Building will be to reduce energy usage by 14%. In addition, a third party commissioning authority was brought on board.

The Materials and Resources category aims to promote efficiency in resources and takes in to account a life-cycle approach. The design team and construction team work together to achieve six points in this category. JMAV implemented a construction waste management plan that involves sorting and recycling construction waste. In addition regional materials and recycled content are specified in the design.

The category that contains the second highest amount of points pursued is Indoor Environmental Quality. This category deals with the indoor environmental factors such as air quality, lighting and thermal conditions that effect the health and productivity of the building occupants. The Apartment Building plans to achieve seven points in this category by implementing an IAQ management plan during construction, using low emitting materials and allowing controllability of the building systems.

The innovation category is an open category that promotes exceptional performance. The Apartment Building plans on doubling the public transportation access, covering 100% of parking, implementing a signage program on the lobby television that educated the occupants about green building, and having a LEED Accredited Professional on the design team.

The last category in LEED 2009 for New Construction is Regional Priority. The Apartment Building is not currently planning on pursuing any points in this category. This is a new category to LEED 2009. The credits are bonus credits that local USGBC chapters determined were important for that geographic region.

## PROPOSED LEED IMPROVEMENTS

According to the LEED breakdown, The Apartment Building is currently pursuing 47 LEED points, placing the project at the upper limits of LEED Certified. The project can easily be upgraded to a LEED Silver by pursuing three additional points.





Figure 6: LEED Ratings

Since this project is currently only LEED Certified, this leaves many opportunities to achieve these three additional points. However, these additional points must take into consideration that design is complete and the building is currently in the latter phase of construction. These additional points should not cause any design changes because the building is far along in construction, which would be a costly change. A possible option is to pursue Green Power (2 points) and Construction IAQ Management before occupancy (1 point). The addition of these points would bring the point total to 50, improving the buildings rating to LEED Silver.

Green Power is credit 6 of the Energy and Atmosphere category and is worth two points. According to LEED 2009 for New Construction, the intent of Green Power is to, "encourage the development and use of grid-source, renewable energy technologies on a net zero pollution basis". These points can be earned by simply purchasing a two-year contract for green power for at least 35% of the building's electricity needs. Green Power includes solar, wind, geothermal, biomass or low-impact hydro sources. This can be purchased directly from the local electricity provider who buys certified renewable energy from local facilities. Although this option is more expensive than traditional electricity, it is an easy solution that has no impact on the design and construction of the building.

Credit 3.2 of Indoor Environmental Quality is implementing a construction IAQ management plan before occupancy. This credit can be achieved by flushing the building with 14,000 cu.ft/SF of outdoor air upon substantial completion. Since this can be done right before occupancy, this credit will have no impact on design and construction.

For a slight cost increase, these three additional credits can improve The Apartment Building's rating from Certified to Silver. There are many other possible combinations of points that could be pursued, however, the ones suggested will required a minimal amount of additional work and will not interfere with work that has already been put in place.

# Appendix 1: Detailed Construction Schedule

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Activity ID	Activity Name	Original Duration	Start	Finish	Predecessors	2013												2014			2015								
						Qtr 2, 2013			Qtr 3, 2013			Qtr 4, 2013			Qtr 1, 2014			Qtr 2, 2014			Qtr 3, 2014			Qtr 4, 2014		Qtr 1, 2015			
						Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
<b>A</b>	<b>Apartment Building</b>	530	02-11-13	02-19-15		[Summary bar]																							
<b>A.1</b>	<b>Apartment Building</b>	530	02-11-13	02-19-15		[Summary bar]																							
<b>A.1.1</b>	<b>CONSTRUCTION</b>	530	02-11-13	02-19-15		[Summary bar]																							
<b>A.1.1.1</b>	<b>SITE PREP / PRE - EXCAVATION</b>	218	02-11-13	12-19-13		[Summary bar]																							
<b>A.1.1.1.1</b>	<b>SITE PREP</b>	120	02-11-13	07-31-13		[Summary bar]																							
SITE1000	NTP	0	02-11-13*			[Gantt bar]																							
SITE1010	INSTALL SITE FENCE	5	02-13-13*	02-19-13		[Gantt bar]																							
SITE1020	INSTALL SEDIMENT/EROSION CONTROLS	5	02-13-13*	02-19-13	SITE1010	[Gantt bar]																							
SITE1040	CLEAR / ROUGH GRADE SITE	13	02-22-13*	03-12-13	SITE1020	[Gantt bar]																							
SITE1050	INSTALL SOLDIER PILES PHASE 1	3	03-12-13*	03-15-13	SITE1040	[Gantt bar]																							
SITE1060	APPROVE NEWDESIGN FOR STORM VAULT	8	03-15-13*	03-27-13	SITE1050	[Gantt bar]																							
SITE1070	INSTALL SOLDIER PILES PH 2	3	03-27-13*	04-01-13	SITE1060	[Gantt bar]																							
SITE1080	EXCAVATE / LAG TO SUBGRADE	5	04-01-13*	04-08-13	SITE1070, SITE1060	[Gantt bar]																							
SITE1090	OWNER RELOCATE EX. GAS SERVICE	35	04-08-13*	05-24-13		[Gantt bar]																							
SITE1100	INSTALL NEW BMP SYSTEM	35	04-08-13*	05-28-13	SITE1050, SITE1080	[Gantt bar]																							
SITE1110	INSTALL NEW STORM PIPE / STRUCTURES PHASE 1	20	04-08-13*	05-06-13	SITE1100	[Gantt bar]																							
SITE1120	CITY APPROVE SITE PLAN REVISION TO STORM WORK	0	05-17-13*		SITE1110	[Gantt bar]																							
SITE1130	PREP AND INSTALL BMP SYSTEM SEALER AT BOTTOM	3	05-28-13*	05-31-13	SITE1100	[Gantt bar]																							
SITE1140	INSTALL NEW STORM PIPE / STRUCTURES PHASE 2	25	05-28-13*	07-02-13	SITE1120, SITE1100, S	[Gantt bar]																							
SITE1150	REMOVE EX. BMP SYSTEM AND FOUNTAIN	15	07-02-13*	07-24-13	SITE1140	[Gantt bar]																							
SITE1160	INSTALL SOLDIER PILES PH 3	15	07-10-13*	07-31-13	SITE1150	[Gantt bar]																							
<b>A.1.1.1.2</b>	<b>EXCAVATION</b>	104	07-24-13	12-19-13		[Summary bar]																							
SITE1170	EXCAVATION / LAGGING MOBILIZATION 1	15	07-24-13*	08-14-13	SITE1160	[Gantt bar]																							
SITE1180	INSTALL BRACKET PILES EAST SIDE	10	08-14-13*	08-28-13	SITE1170	[Gantt bar]																							
SITE1190	INSTALL OFF SET WALER AND HEEL BLOCKS	20	08-14-13*	09-12-13	SITE1170	[Gantt bar]																							
SITE1200	INSTALL RAKERS	15	09-03-13*	09-23-13	SITE1190	[Gantt bar]																							
SITE1210	EXCAVATION / LAGGING MOBILIZATION 2	20	09-17-13*	10-15-13	SITE1200	[Gantt bar]																							
SITE1220	REMOVE DIRT NEEDED FOR TOWER CRANE ERECTION	10	10-31-13*	11-13-13	CONC1000	[Gantt bar]																							
SITE1230	INSTALL FINAL PHASE OF RAKERS	20	11-14-13*	12-12-13	SITE1220	[Gantt bar]																							
SITE1240	EXCAVATION / LAGGING MOBILIZATION 3	15	11-29-13	12-19-13	SITE1230	[Gantt bar]																							
<b>A.1.1.2</b>	<b>SITE IMPROVEMENTS</b>	68	07-28-14	10-30-14		[Summary bar]																							
<b>A.1.1.2.1</b>	<b>SITE</b>	68	07-28-14	10-30-14		[Summary bar]																							
SITE1250	INSTALL PLANTERS	15	07-28-14*	08-15-14		[Gantt bar]																							
SITE1260	INSTALL PLANTERS/PAVERS/HARDSCAPE	20	08-07-14*	10-02-14		[Gantt bar]																							
SITE1270	GUNITE POOL	10	08-11-14*	08-22-14	SITE1250	[Gantt bar]																							
SITE1280	INSTALL TRELLIS	10	08-18-14*	08-29-14	SITE1250	[Gantt bar]																							
SITE1290	INSTALL / SET DECK AND AREA DRAINS	10	08-25-14*	09-08-14	SITE1270	[Gantt bar]																							
SITE1300	LANDSCAPING	20	10-03-14*	10-30-14	SITE1260	[Gantt bar]																							
<b>A.1.1.3</b>	<b>UTILITIES</b>	324	04-15-13	08-06-14		[Summary bar]																							
UTIL1030	SEWER - RUN SERVICE	30	09-11-13*	03-31-14		[Gantt bar]																							
UTIL1050	GAS - RUN LINE/ TURN ON SERVICE	5	10-31-13*	11-26-13		[Gantt bar]																							
UTIL1110	STORM - RUN SERVICE	5	04-01-14*	04-07-14		[Gantt bar]																							
UTIL1120	WATER - RUN SERVICE	5	04-08-14*	04-21-14	UTIL1110	[Gantt bar]																							
UTIL1140	COMCAST - RUN/PULL/TERMINATIONS	10	06-11-14*	07-09-14		[Gantt bar]																							
UTIL1150	VERIZON - RUN/PULL/TERMINATIONS	10	07-10-14*	08-06-14	UTIL1140	[Gantt bar]																							
<b>A.1.1.3.1</b>	<b>TEMP POWER</b>	25	04-15-13	05-20-13		[Summary bar]																							
UTI1000	INSTALL CONDUIT	5	04-15-13*	04-19-13		[Gantt bar]																							
UTI1010	INSTALL TEMP ELECTRIC SHED AND CABINET/METER	10	04-15-13*	05-17-13	UTI1000	[Gantt bar]																							

█ Actual Level of Effort   
 █ Remaining Work   
 █ Critical Remaining Work   
 ◆ Milestone   
 ── summary















## APPENDIX 2: STRUCTURAL SYSTEM TAKEOFFS AND ESTIMATE

Structural Take Offs							
Mat Slab							
Description	Floor	Quantity	Area (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
32"	Lower Parking	1.00	5638.00	2.67	15053.46	557.54	557.54
40"	Lower Parking	1.00	24626.00	3.33	82004.58	3037.21	3037.21
Foundation Wall							
Description	Floor	Quantity	Area per floor (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
12" Wall	Lower Parking	1.00	660.60	10.00	6606.00	244.67	244.67
	Upper Parking	1.00	660.60	10.00	6606.00	244.67	244.67
24" Wall	Lower Parking	1.00	106.17	12.00	1274.00	47.19	47.19
	Upper Parking	1.00	106.17	12.00	1274.00	47.19	47.19
8" Wall	Lower Parking	1.00	152.56	9.00	1373.00	50.85	50.85
	Upper Parking	1.00	152.56	9.00	1373.00	50.85	50.85
18" Transfer Girder	Ground through 2		414.00		621.00	23.00	23.00
Elevated Slabs							
Description	Floor	Quantity	Area per floor (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
12"	Upper Parking	1.00	30264.00	1.00	30264.00	1120.89	1120.89
	Ground	1.00	30264.00	1.00	30264.00	1120.89	1120.89
8"	2 through 5	4.00	15426.00	0.67	10284.00	380.89	1523.56
	6 through 8	3.00	14084.00	0.67	9389.33	347.75	1043.26
	9 through 10	2.00	12840.00	0.67	12840.00	475.56	951.11
	Roof	1.00	12840.00	0.67	12840.00	475.56	475.56
Columns							
Description	Floor	Quantity	Cross Area (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
18" x 32"	Lower Parking	54.00	4.00	10.00	40.00	1.48	80.00
	Upper Parking	54.00	4.00	10.00	40.00	1.48	80.00
	Ground	54.00	4.00	10.00	40.00	1.48	80.00
	2 through 5	160.00	4.00	9.00	36.00	1.33	213.33
	6 through 8	120.00	4.00	9.00	36.00	1.33	160.00
	9 through 10	72.00	4.00	9.00	36.00	1.33	96.00
Beams							
Description	Size		Cross Area (SF)	Length (LF)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
1FBO1	12x32		2.67	13.00	34.71	1.29	1.29
1FBO2	8x32		1.78	17.00	30.26	1.12	1.12
1FBO3	12x24		2.00	17.00	34.00	1.26	1.26
1FBO4	18x24		3.00	30.00	90.00	3.33	3.33
1FBO5	24x24		4.00	10.00	40.00	1.48	1.48
1FBO6	60x48		20.00	36.00	720.00	26.67	26.67
1FBO7	36x32		8.00	21.00	168.00	6.22	6.22
2FBO1	54x40		15.00	28.00	420.00	15.56	15.56
2FBO2	64x40		17.78	33.00	586.74	21.73	21.73
2FBO3	12x24		2.00	77.00	154.00	5.70	5.70
2FBO4	14x20		1.94	9.00	17.46	0.65	0.65
3FBO1	60x44		18.33	26.00	476.58	17.65	17.65
5FBO1	10x18		1.25	33.00	41.25	1.53	1.53
5FBO2	10x18		1.25	33.00	41.25	1.53	1.53
8FBO1	10x18		1.25	29.00	36.25	1.34	1.34

G1FB01	16x16			1.78	30.00	53.40	1.98	1.98
G1FB02	24x16			2.67	19.00	50.73	1.88	1.88
G1FB03	8x16			0.89	13.00	11.57	0.43	0.43
G1FB04	12x16			1.33	14.00	18.62	0.69	0.69
G1FB05	16x20			2.22	17.00	37.74	1.40	1.40
RB01	10x14			0.97	55.00	53.35	1.98	1.98
RB02	10x14			0.97	48.00	46.56	1.72	1.72
TFB01	8x18			1.00	389.00	389.00	14.41	14.41
TFB02	8x18			1.00	81.00	81.00	3.00	3.00
TFB03	8x18			1.00	288.00	288.00	10.67	10.67
TFB04	32x11			2.44	189.00	461.16	17.08	17.08
TFB05	8x18			1.00	324.00	324.00	12.00	12.00
TFB06	24x11			1.83	195.00	356.85	13.22	13.22
<b>Shear Walls</b>								
Description	Floor	Quantity	Surface Area (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)	
12" Shear Wall 1		1.00	1169.00	136.00	1169.00	43.30	43.30	
12" Shear Wall 2		1.00	3916.00	136.00	3916.00	145.04	145.04	
12" Shear Wall 3		1.00	1173.00	136.00	1173.00	43.44	43.44	
<b>Stairs</b>								
Description	Floor	# of Treads	Nosing Length (LF)				Total Length (LF)	
Stair A	Lower Parking - Roof	200.00	4.00				800.00	
Stair B	Ground - Roof	164.00	4.00				656.00	
Stair C	Upper Parking - Ground	44.00	4.00				176.00	
<b>Post Tensioning</b>								
Description	Floor	Quantity	Area per floor (SF)				Total Area (SF)	
PT	2 through 5	4.00	15426.00				61704.00	
	6 through 8	3.00	14084.00				42252.00	
	9 through 10	2.00	12840.00				25680.00	
	Roof	1.00	12840.00				12840.00	

<b>Structural Estimate</b>					
<b>Mat Slab</b>					
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
033053404050	CY	194.02	72.38	0.60	148861.99
033053404050	CY	194.02	72.38	0.60	810934.18
				Subtotal	<b>959796.17</b>
<b>Foundation Wall</b>					
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
033053404260	CY	154.78	118.14	11.87	69678.62
033053404260	CY	154.78	118.14	11.87	69678.62
033053404350	CY	149.33	148.10	14.91	14737.82
033053404350	CY	149.33	148.10	14.91	14737.82
033053404200	CY	165.68	165.57	16.71	17694.41
033053404200	CY	165.68	165.57	16.71	17694.41
033053404350	CY	149.33	148.10	14.91	7183.82
				Subtotal	<b>211405.52</b>
<b>Elevated Slabs</b>					
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
033053402100	CY	255.06	262.08	25.19	607891.67
033053402100	CY	255.06	262.08	25.19	607891.67
033053402100	CY	255.06	262.08	25.19	826269.88
033053402100	CY	255.06	262.08	25.19	565790.79
033053402100	CY	255.06	262.08	25.19	515816.09
033053402100	CY	255.06	262.08	25.19	257908.04
				Subtotal	<b>3381568.15</b>
<b>Columns</b>					
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
033053400900	CY	259.42	324.48	32.38	49302.40
033053400900	CY	259.42	324.48	32.38	49302.40
033053400900	CY	259.42	324.48	32.38	49302.40
033053400900	CY	259.42	324.48	32.38	131473.07
033053400900	CY	259.42	324.48	32.38	98604.80
033053400900	CY	259.42	324.48	32.38	59162.88
				Subtotal	<b>437147.95</b>
<b>Beams</b>					
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
033053400350	CY	365.15	411.84	41.84	1052.65
033053400300	CY	343.35	490.88	48.83	989.68
033053400300	CY	343.35	490.88	48.83	1112.00
033053400300	CY	343.35	490.88	48.83	2943.53
033053400300	CY	343.35	490.88	48.83	1308.24
033053400350	CY	365.15	411.84	41.84	21835.47

033053400350	CY	365.15	411.84	41.84	5094.94
033053400350	CY	365.15	411.84	41.84	12737.36
033053400350	CY	365.15	411.84	41.84	17794.09
033053400350	CY	365.15	411.84	41.84	4670.36
033053400300	CY	343.35	490.88	48.83	571.05
033053400350	CY	365.15	411.84	41.84	14453.26
033053400350	CY	365.15	411.84	41.84	1250.99
033053400350	CY	365.15	411.84	41.84	1250.99
033053400350	CY	365.15	411.84	41.84	1099.36
033053400350	CY	365.15	411.84	41.84	1619.46
033053400350	CY	365.15	411.84	41.84	1538.49
033053400300	CY	343.35	490.88	48.83	378.41
033053400300	CY	343.35	490.88	48.83	608.98
033053400350	CY	365.15	411.84	41.84	1144.54
033053400350	CY	365.15	411.84	41.84	1617.95
033053400350	CY	365.15	411.84	41.84	1412.03
033053400350	CY	365.15	411.84	41.84	11797.22
033053400350	CY	365.15	411.84	41.84	2456.49
033053400350	CY	365.15	411.84	41.84	8734.19
033053400350	CY	365.15	411.84	41.84	13985.62
033053400350	CY	365.15	411.84	41.84	9825.96
033053400350	CY	365.15	411.84	41.84	10822.20
				Subtotal	<b>154105.50</b>
<b>Shear Walls</b>					
<b>Cost Code</b>	<b>Unit</b>	<b>Unit Material</b>	<b>Unit Labor</b>	<b>Unit Equipment</b>	<b>Extended Total</b>
033053404260	CY	154.78	118.14	11.87	12330.35
033053404260	CY	154.78	118.14	11.87	41305.10
033053404260	CY	154.78	118.14	11.87	12372.54
				Subtotal	<b>66007.99</b>
<b>Stairs</b>					
<b>Cost Code</b>	<b>Unit</b>	<b>Unit Material</b>	<b>Unit Labor</b>	<b>Unit Equipment</b>	<b>Extended Total</b>
033053406800	LF Nosing	5.89	21.63	0.41	22344.00
033053406800	LF Nosing	5.89	21.63	0.41	18322.08
033053406800	LF Nosing	5.89	21.63	0.41	4915.68
				Subtotal	<b>45581.76</b>
<b>Post Tensioning</b>					
<b>Cost Code</b>	<b>Unit</b>	<b>Unit Cost</b>			<b>Extended Total</b>
Custom	SF	1.25			77130.00
Custom	SF	1.25			52815.00
Custom	SF	1.25			32100.00
Custom	SF	1.25			16050.00
				Subtotal	<b>178095.00</b>
				Subtotal	5433708.05
				Tax (6%)	184594.66
				Overhead (7%)	380359.56
				Profit(3%)	163011.24
				<b>Total</b>	<b>6161673.51</b>

## APPENDIX 3: MECHANICAL SYSTEM ASSEMBLY TAKE-OFFS AND ESTIMATE

Mechanical Take Offs					Mechanical Estimate						
Item	Designation	Quantity	CFM	SF	Total	Cost Code	Unit	Unit Material	Unit Labor	Extended Total	
Rooftop Unit	RTU 1	1	5580			D30401141020	ea	\$ 37,656.50	\$ 7,015.20	\$ 44,671.70	
Rooftop Unit	RTU2	1	6150			D30401141020	ea	\$ 37,656.50	\$ 7,015.20	\$ 44,671.70	
Apartment Heat Pumps	HP	165		800	132000	D30501703520	SF	\$ 3.58	\$ 3.92	\$ 990,000.00	
Common Area Heat Pumps	HP	8		1000	8000	D30501701320	SF	\$ 2.05	\$ 2.32	\$ 34,960.00	
Fan	EF-1	165	80		165	-	ea	\$ 77.47	\$ 80.00	\$ 25,982.55	
	TR#1	1	1305		1	D30402201020	ea	\$ 3,222.63	\$ 5,594.40	\$ 8,817.03	
	GEF #1	1	10500		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	GEF #2	1	10500		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	GEF #3	1	10500		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	GEF #4	1	10500		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	GSF #1	2	10500		2	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 119,909.00	
	GSF #2	1	10500		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	VF #1	1	1400		1	D30402201020	ea	\$ 3,222.63	\$ 5,594.40	\$ 8,817.03	
	VF #2	1	1400		1	D30402201020	ea	\$ 3,222.63	\$ 5,594.40	\$ 8,817.03	
	SP #A	1	17000		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	SP #B	1	15000		1	D30402201080	ea	\$ 12,890.50	\$ 47,064.00	\$ 59,954.50	
	CQ	1	2940		1	D30402201040	ea	\$ 5,531.75	\$ 19,713.60	\$ 25,245.35	
	EF #2	1	1100		1	D30402201020	ea	\$ 3,222.63	\$ 5,594.40	\$ 8,817.03	
	EF #3	1	650		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	EF #4	1	750		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	EF #5	1	2650		1	D30402201040	ea	\$ 5,531.75	\$ 19,713.60	\$ 25,245.35	
	EF #6	1	250		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	SF#VA	1	5000		1	D30402201060	ea	\$ 9,185.75	\$ 39,338.40	\$ 48,524.15	
	EF#VA	1	5000		1	D30402201060	ea	\$ 9,185.75	\$ 39,338.40	\$ 48,524.15	
	EF-LD	1	600		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	EF-M	1	225		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	EF-W	1	225		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	EF-JA	1	50		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
	EF-PE	1	450		1	D30402201010	ea	\$ 2,740.50	\$ 3,219.00	\$ 5,959.50	
										<b>Subtotal</b>	\$ 1,910,359.57
										<b>Tax (6%)</b>	\$ 14,566.18
										<b>Overhead (7%)</b>	\$ 133,725.17
										<b>Profit(3%)</b>	\$ 573,107.87
										<b>Total</b>	\$ 2,631,758.79

## APPENDIX 4: ELECTRICAL SYSTEM ASSEMBLY TAKE-OFFS AND ESTIMATE

Electrical Take Offs					Electrical Estimate					
<b>Switch Gear</b>					<b>Switch Gear</b>					
Item	Voltage	Amps	Quantity		Cost Code	Unit	Unit Material	Unit Labor	Extended Total	
MC-A/C	120/208	1000	2		D50102400300	ea	\$ 15,988.50	\$ 4,087.20	\$ 40,151.40	
MC-B	120/208	1200	1		D50102400320	ea	\$ 16,763.70	\$ 4,611.20	\$ 21,374.90	
MC-C	120/208	1000	1		D50102400320	ea	\$ 16,763.70	\$ 4,611.20	\$ 21,374.90	
SWBD H	120/208	2000	1		D50102400400	ea	\$ 30,911.10	\$ 5,764.00	\$ 36,675.10	
<b>Load Center</b>					<b>Load Center</b>					
Item	Voltage	Amps	Quantity		Cost Code	Unit	Unit Material	Unit Labor	Extended Total	
Unit	120/208	125	165		D50102501040	ea	\$ 2,398.28	\$ 3,222.60	\$ 927,445.20	
LG2	120/208	400	1		D50102502060	ea	\$ 3,439.95	\$ 2,777.20	\$ 6,217.15	
L1	120/208	800	1		D50102503060	ea	\$ 8,478.75	\$ 6,261.80	\$ 14,740.55	
L2	120/208	250	1		D50102502000	ea	\$ 3,512.63	\$ 2,969.60	\$ 6,482.23	
L6	120/208	250	1		D50102502020	ea	\$ 5,838.23	\$ 5,135.20	\$ 10,973.43	
L10	120/208	300	1		D50102502040	ea	\$ 8,551.43	\$ 7,650.40	\$ 16,201.83	
EDP	120/208	400	1		D50102503020	ea	\$ 17,248.20	\$ 15,824.80	\$ 33,073.00	
EL1	120/208	200	1		D50102502000	ea	\$ 3,512.63	\$ 2,969.60	\$ 6,482.23	
EL2	120/208	150	1		D50102501080	ea	\$ 2,325.60	\$ 1,860.20	\$ 4,185.80	
EDPB	120/208	250	1		D50102502040	ea	\$ 8,551.43	\$ 7,650.40	\$ 16,201.83	
EL10	120/208	100	1		D50102501060	ea	\$ 3,294.60	\$ 4,637.40	\$ 7,932.00	
L1A	120/208	150	1		D50102501020	ea	\$ 1,623.08	\$ 2,017.40	\$ 3,640.48	
EL6	120/208	150	1		D50102501060	ea	\$ 3,294.60	\$ 4,637.40	\$ 7,932.00	
L1P	120/208	60	1		D50102501020	ea	\$ 1,623.08	\$ 2,017.40	\$ 3,640.48	
<b>Generator</b>					<b>Generator</b>					
Item	kW		Quantity		Cost Code	Unit	Unit Material	Unit Labor	Extended Total	
#1	150		1		D50902100480	kW	\$ 406.98	\$ 39.48	\$ 66,969.00	
#2	150		1		D50902100480	kW	\$ 406.98	\$ 39.48	\$ 66,969.00	
<b>Receptacles</b>					<b>Receptacles</b>					
Item	kW		Quantity	Total SF	Cost Code	Unit	Unit Material	Unit Labor	Extended Total	
Apartment Units			2805	118305	D50201250560	ea	\$ 43.61	\$ 228.46	\$ 763,156.35	
Garage			25		D50201250560	ea	\$ 43.61	\$ 228.46	\$ 6,801.75	
Public Areas			105		D50201250560	ea	\$ 43.61	\$ 228.46	\$ 28,567.35	
<b>Fixtures</b>					<b>Fixtures</b>					
Item	Designation	Type	Quantity	Total SF	Cost Code	Unit	Unit Material	Unit Labor	Extended Total	
Garage Light				67591	D50202100200		\$ 0.71	\$ 1.96	\$ 180,467.97	
Apartment Lights				146370	D50202100200		\$ 0.97	\$ 1.58	\$ 373,243.50	
									<b>Subtotal</b>	\$ 2,670,899.43
									<b>Tax (6%)</b>	\$ 160,253.97
									<b>Overhead (7%)</b>	\$ 186,962.96
									<b>Profit(3%)</b>	\$ 80,126.98
									<b>Total</b>	\$ 3,098,243.34

## APPENDIX 5: PLUMBING SYSTEM ASSEMBLY TAKE-OFFS AND ESTIMATE

Plumbing Take Offs		Plumbing Estimate				
<b>Apartment Units</b>		<b>Apartment Units</b>				
Item	Quantity	Cost Code	Unit	Unit Material	Unit Labor	Extended Total
Water Closets	189	D20101101960	ea	\$ 1,624.00	\$ 697.08	\$ 438,684.12
Bathroom Sink	189	D20103101600	ea	\$ 659.75	\$ 657.12	\$ 248,888.43
Bathtub	189	D20105102000	ea	\$ 3,577.88	\$ 816.96	\$ 830,624.76
Kitchen Sink	165	D20104101760	ea	\$ 1,141.88	\$ 719.28	\$ 307,091.40
<b>Men's/ Women's Restrooms</b>		<b>Men's/ Women's Restrooms</b>				
Item	Quantity	Cost Code	Unit	Unit Material	Unit Labor	Extended Total
Water Closets	3	D20101101960	ea	\$ 1,624.00	\$ 697.08	\$ 6,963.24
Sinks	4	D20103101600	ea	\$ 659.75	\$ 657.12	\$ 5,267.48
Water Fountain	2	D20108101920	ea	\$ 1,573.25	\$ 430.68	\$ 4,007.86
<b>Water Heater</b>		<b>Water Heater</b>				
Item	Quantity	Cost Code	Unit	Unit Material	Unit Labor	Extended Total
1 Bathroom Units	141	D20202101900	ea	\$ 2,207.63	\$ 1,154.40	\$ 474,046.23
2 Bathroom Units	24	D20202101940	ea	\$ 2,334.50	\$ 1,154.40	\$ 83,733.60
Common Areas	3	D20202102060	ea	\$ 5,278.00	\$ 1,620.60	\$ 20,695.80
<b>Pumps</b>		<b>Pumps</b>				
Item	Quantity	Cost Code	Unit	Unit Material	Unit Labor	Extended Total
Domestic Water	1	221123132030	ea	\$ 56,217.50	\$ 2,271.15	\$ 58,488.65
Sump Pump	1	221429132050	ea	\$ 4,104.38	\$ 732.00	\$ 4,836.38
Fire Pump	1	213113503450	ea	\$ 27,270.60	\$ 2,779.98	\$ 30,050.58
						<b>Subtotal</b>
						\$ 2,513,378.53
						<b>Tax (6%)</b>
						\$ 106,658.76
						<b>Overhead (7%)</b>
						\$ 175,936.50
						<b>Profit(3%)</b>
						\$ 75,401.36
						<b>Total</b>
						\$ 2,871,375.15

## APPENDIX 6: GENERAL CONDITIONS ESTIMATE

General Conditions Estimate				
Cost Code	Description	Material Cost	Labor Cost	Extended Total
01-01	Supervision	\$ 45,230.00	\$488,485.20	\$ 533,715.20
01-02	Executive Supervision	\$ 2,770.00	\$ 12,015.60	\$ 14,785.60
01-03	Project Management	\$ 40,184.00	\$433,246.80	\$ 473,430.80
01-04	Project Executive	\$ 5,061.60	\$ 45,552.00	\$ 50,613.60
01-05	Admin Assistant		\$ 14,688.00	\$ 14,688.00
01-06	Purchasing/ Estimating	\$ 2,000.00	\$ 21,600.00	\$ 23,600.00
01-07	Accounting		\$ 17,340.00	\$ 17,340.00
01-08	Safety Supervision	\$ 3,150.00	\$ 28,350.00	\$ 31,500.00
01-09	Temporary Fencing	\$ 8,056.00		\$ 8,056.00
01-10	Temporary Signage	\$ 1,702.00	\$ 234.00	\$ 1,936.00
01-11	Field Trailer	\$ 38,341.20	\$ 5,817.00	\$ 44,158.20
01-12	Temporary Services	\$ 185,000.00		\$ 185,000.00
01-13	Telephone	\$ 15,663.00		\$ 15,663.00
01-14	Toilets	\$ 23,308.00		\$ 23,308.00
01-15	Water and Ice	\$ 2,083.00		\$ 2,083.00
01-16	IT	\$ 10,262.35	\$ 5,604.00	\$ 15,866.35
01-17	Project Software	\$ 9,680.00		\$ 9,680.00
01-18	Dumpster	\$ 59,550.00		\$ 59,550.00
01-19	Clean Up - Daily	\$ 3,859.00	\$ 30,730.00	\$ 34,589.00
01-20	Clean Up - End of Project	\$ 5,125.00	\$ 90,000.00	\$ 95,125.00
01-21	Safety and Personal Protection	\$ 161,018.00	\$ 22,561.00	\$ 183,579.00
01-22	Insurance	\$ 140,000.00		\$ 140,000.00
01-23	Permits	\$ 75,400.00		\$ 75,400.00
01-24	Professional Fees	\$ 442.58		\$ 442.58
01-25	Additional plan printing	\$ 3,826.00		\$ 3,826.00
01-26	Courier Service	\$ 3,215.00		\$ 3,215.00
01-27	3rd Party Inspections	\$ 10,000.00		\$ 10,000.00
01-28	LEED Certification	\$ 10,600.00		\$ 10,600.00
01-29	Scheduling	\$ 2,803.00	\$ 25,223.00	\$ 28,026.00
			<b>Subtotal</b>	<b>\$ 2,109,776.33</b>



**Appendix 7: Enlarged Site Utilization Plans**



B. Kerem Demirci  
 Tech #2  
 10/17/14

**Phase 1: Site Work and Excavation**

- Existing Building
- New Building
- Access Road
- Street/ Paking Lot
- Site Entrance

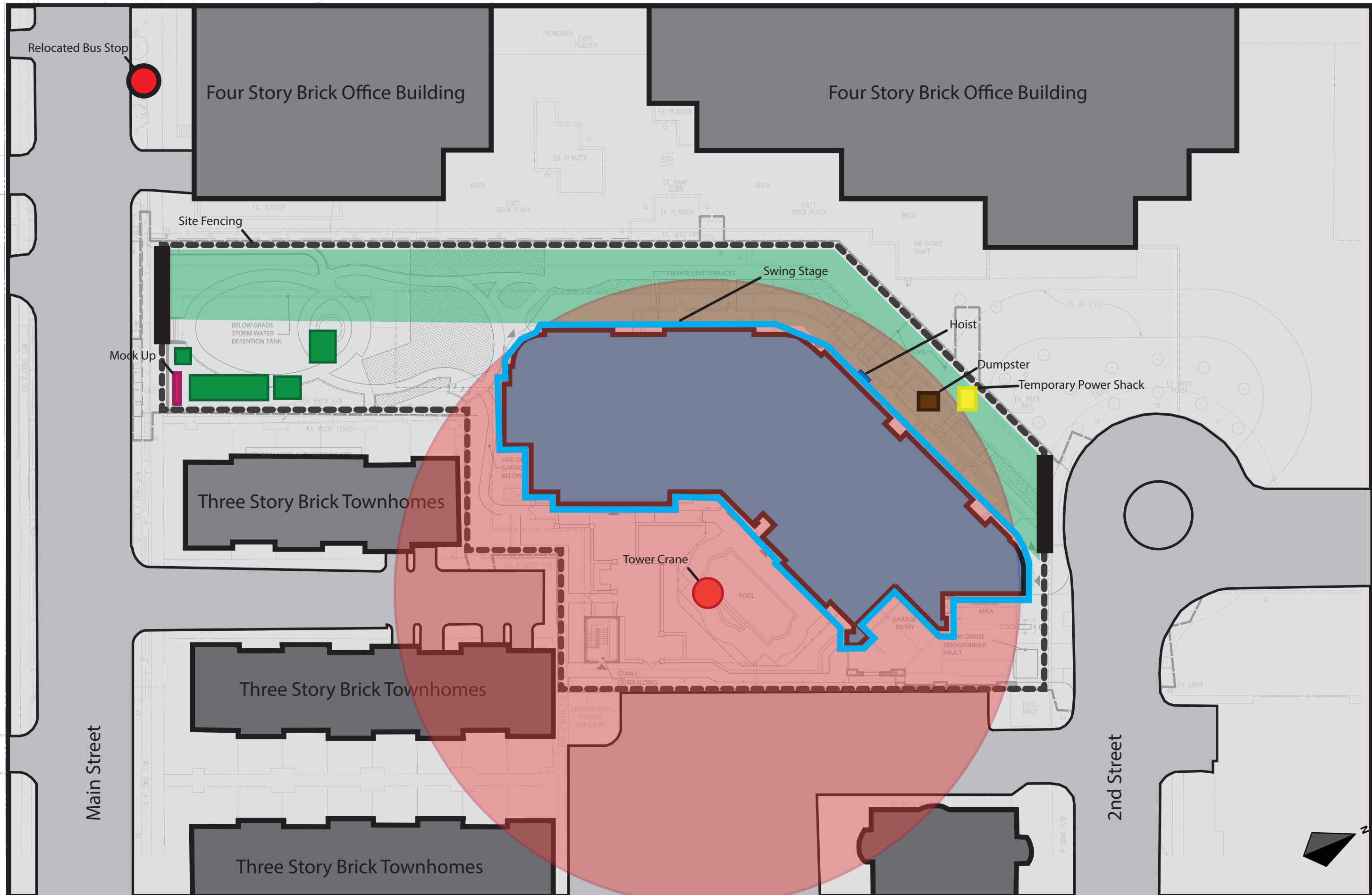




B. Kerem Demirci  
 Tech #2  
 10/17/14

### Phase 2: Structure

- Existing Building
- New Building
- Access Road
- Street/ Paking Lot
- Site Entrance
- Trailers



Relocated Bus Stop

Four Story Brick Office Building

Four Story Brick Office Building

Site Fencing

Swing Stage

Hoist

Dumpster

Temporary Power Shack

Mock Up

Three Story Brick Townhomes

Tower Crane

Three Story Brick Townhomes

Main Street

Three Story Brick Townhomes

2nd Street

B. Kerem Demirci  
Tech #2  
10/17/14

### Phase 3: Enclosure and Finishes

- Existing Building
- New Building
- Access Road
- Street/ Paking Lot
- Site Entrance
- Trailers



## APPENDIX 8: LEED SCORECARD

Category	Credit	Description	Possible Points	Currently Proposed	Additional Suggested
Sustainable Sites	Prereq 1	Construction Activity Pollution Prevention			
	1	Site Selection	1	1	
	2	Development Density & Community Connectivity	5	5	
	3	Brownfield Redevelopment	1		
	4.1	Alt. Transportation, Public Transportation Access	6	6	
	4.2	Alt. Transportation, Bicycle Storage & Changing Rooms	1	1	
	4.3	Alt. Transportation, Low Emitting & Fuel Efficient Vehicles	3	3	
	4.4	Alt Transportation, Parking Capacity	2	2	
	5.1	Site Development, Protect or Restore Habitat	1		
	5.2	Site Development, Maximize Open Space	1	1	
	6.1	Stormwater Design, Quantity Control	1		
	6.2	Stormwater Design, Quality Control	1		
	7.1	Heat Island Effect, Non-Roof	1	1	
	7.2	Heat Island Effect, Roof	1	1	
	8	Light Pollution Reduction	1		
Water Efficiency	Prereq 1	Water Use Reduction - 20% Reduction			
	1	Water Efficient Landscaping	2 to 4	2	
	2	Innovative Wastewater Technologies	2		
	3	Water Use Reduction - 30% Reduction	2 to 4	2	
Energy and Atmosphere	Prereq 1	Fundamental Commissioning of Building Energy Systems			
	Prereq 2	Minimum Energy Performance			
	Prereq 3	Fundamental Refrigerant Management			
	1	Optimize Energy Performance	1 to 19	2	
	2	On-site Renewable Energy	1 to 7		
	3	Enhanced Commissioning	2	2	
	4	Enhanced Refrigerant Management	2		
	5	Measurement and Verification	3		
Materials and Resources	Prereq 1	Storage and Collection of Recyclables			
	1.1	Building Reuse - Maintain Existing Walls, Floors and Roof	1 to 3		
	1.2	Building Resue - Maintain 50% of Non Structural Elements	1 to 3		
	2	Construction Waste Management	1 to 2	2	
	3.1	Material Reuse	1 to 2		
	4	Recycled Content	1 to 2	2	
	5	Regional Materials	1 to 2	2	
	6	Rapidly Renewable Materials	1		
7	Certified Wood	1			

Indoor Environmental Quality	Prereq 1	Minimum IAQ Performance			
	Prereq 2	Environmental Tobacco Smoke (ETS) Control			
	1	Outdoor Air Delivery Monitoring	1		
	2	Increased Ventilation	1		
	3.1	Construction IAQ Management Plan - During Construction	1	1	
	3.2	Construction IAQ Management Plan - Before Occupancy	1		1
	4.1	Low-Emitting Materials - Adhesives and Sealants	1	1	
	4.2	Low-Emitting Materials - Paints and Coatings	1	1	
	4.3	Low-Emitting Materials - Flooring Systems	1	1	
	4.4	Products	1		
	5	Indoor Chemical & Pollutant Source Control	1		
	6.1	Controllability of Systems - Lighting	1	1	
	6.2	Controllability of Systems - Thermal Comfort	1	1	
	7.1	Thermal Comfort - Design	1		
	7.2	Thermal Comfort - Verification	1		
	8.1	Daylight and Views - Daylight	1		
	8.2	Daylight and Views - Views	1	1	
	Innovation in Design	1.1	Innovation in Design: Exemplary Performance in SSc4.1 Public Transportation Access	1	1
1.2		Innovation in Design: Exemplary Performance in SSc7.1	1	1	
1.3		Innovation in Design: Education Program	1	1	
1.4		Green Power	1		
1.5		Innovation in Design: Energy Star Appliances	1	1	
2		LEED Accredited Professional	1	1	
Regional Priority	1.1	Regional Priority: EAc1	1		
	1.2	Regional Priority: SSc5.1 - Restore Habitat	1		
	1.3	Regional Priority: SSc6.1 SW Quantity	1		
	1.4	Regional Priority: MRc1.1, WEc2	1		
			<b>Total</b>	<b>47</b>	<b>3</b>
				<b>50 (Silver)</b>	