Technical Assignent 1

The Apartment Building East Coast, USA

B. Kerem Demirci | Construction Option | Advisor: Dr. Messner | 9.19.14



Source: JMAV

EXECUTIVE SUMMARY

The Apartment Building is a high-end apartment building located on the East Coast. It consist of ten stories above grade, amounting to 151,158 SF. The building also has a two story, 62,250 SF underground parking garage. Ten of the units are designated affordable housing for 40 years which allows the maximum zoning height restriction to increase from 77 feet to 99 feet. The ground floor houses amenities such as a lounge, business center, and fitness room. An additional club room is located on the fifth floor. Accessible terraces are



Figure 1: Rendering
(Source JMAV)

located on the fifth and eighth floor and include gas grills, gas fire pits, and water/gas features. The average rental price for the apartment units is roughly \$2,100 per month.

This report includes a background on the project, owner, project team, project delivery method, existing conditions, building systems, schedule, and cost. This project will be LEED certified based on LEED 2009 for new construction.

CONTENTS

Executive Summaryi
The Client1
Project Team1
Project Delivery Method1
Existing Conditions1
Building Systems Summary
Structural system3
Support of Excavation
Building Enclosure4
Mechanical System4
Electrical System
Schedule5
Cost Evaluation
Appendix 1: Presentation Slides (9/15/14)6
Slide 1: Introduction
Slide 2: Client Information7
Slide 3: Project Delivery
Slide 4: Project Team9
Slide 5: Existing Conditions
Slide 6: Building Systems11
Slide 7: Building Systems Continued12
Slide 8: Dchedule Summary13
Slide 9: Project Cost
Appendix 2: Enlarged Site logistics plan15
Appendix 3: Summary Estimate16
Appendix 4: Summary Schedule
Appendix 5: Presentation Comments and Response21

THE CLIENT

The client for The Apartment Building is BMPI. BMPI is a partnership between three main investors of which one is the owner of the general contractor of this project, John Moriarty & Associates (JMA). The other two partners are a developer out of Boston and a local developer. The goal of BMPI is to promote the growth of an up and coming metro accessible area. According to an economic impact study, conducted by Delta Associates, The Apartment Building will increase the value of nearby single family houses by 2.9% per year. The main priority of the client is to create this building will cost in mind, while keeping the schedule in mind in order for a quick return on investment.

PROJECT TEAM

John Moriarty & Associates Virginia (JMAV) office staffed this project in a traditional structure. A regional director oversees all JMAV projects. Under the regional director is the field operations manager and senior project manager. The field operations manager oversees the field operations on multiple projects. On this project the field staff is comprised of a head superintendent, three assistant superintendent and a field intern who are all onsite daily. The senior project manager oversees the project management staff of multiple projects. On this project the project the project management staff is comprised of a nead superintendent staff is comprised of a project management staff of multiple projects. On this project the project management staff is comprised of a project manager and an assistant project manager who are onsite daily.

PROJECT DELIVERY METHOD

The delivery method on this project is a CM at Risk. The advantages of this delivery method is that only one party is responsible for construction and it allows the contractor to be involved early on in the design phase. Since this is a private project and one of the owners is also the owner of JMAV, the contract is a sole source negotiated contract. The contract type between the owner and the general contractor is a negotiated GMP, which includes open book accounting. This project also included two design-build subcontractors. Power Design Inc. and Mechanical Design Group, the electrical and mechanical/ plumbing respectively. The these two design build subcontractors hold contracts with the general contractor but have key communication paths with the architect, Rust Orling Architecture. See slide 3 of Appendix 1 for the complete project organizational chart.

EXISTING CONDITIONS

This building is being built on what used to be an old middle school which closed in 1979. Since the closing of the middle school, multiple office buildings and residential buildings have been built nearby. Currently, the site is surrounded by two four story office buildings, townhomes and an eight story condominium. Above grade, the existing buildings appear to be a modest distance away from The Apartment Building. However, many of the existing buildings have underground parking levels that extend further than their above grade footprints. This makes the construction site much more congested than it appears. Since there are already existing buildings nearby. Utility lines are in close proximity to the new building, refer to Appendix 2. The majority of the utility lines run up Main Street. Some utilities, such as sanitary, storm, and water lines branch off Main Street and wrap around the west side of the construction site and down 2nd Street and tie into other existing buildings. Traffic in the area is not extremely heavy since it is primarily a residential area with office buildings. Due to requests by neighboring buildings, construction parking will not be available onsite and street parking is prohibited. All construction personnel must park in a designated off-site parking lot then be bussed to the job site.

BUILDING SYSTEMS SUMMARY

STRUCTURAL SYSTEM

The structural design criteria for this building is based off the 2009 International Building Code and the 2009 Virginia Construction Code. The design loads are listed in Table 1.

Area	Load
Private rooms and corridors	40 PSF
Public rooms and corridors	100 PSF
Stairs and exit ways	100 PSF
Yards and terraces, pedestrian	100 PSF
Garages, passenger vehicles	40 PSF, 3000LB Concentrated
Vehicular driveways, loading	250 PSF, 3000LB Concentrated
Fire truck loading	350 PSF, 3000LB Concentrated
Roof	30 PSF

Table 1: Residential, Multi Family Design Loads

The structural system supporting these loads is primarily cast-in-place concrete. The foundation is comprised a 36-40" mat slab an foundation walls. Beginning on the second floor and up through the roof, post-tensioning is used in the slabs which allow for a thinner slab thickness, eight inches on average. The post-tension tendons are low-relaxation strands that are comprised of seven wires and have a minimum ultimate strength of 270 KSI.

SUPPORT OF EXCAVATION

The surrounding existing buildings contain underground parking levels that extend past the above ground footprint. This congestion makes excavation for The Apartment Building very tight. Since the adjacent underground levels are so close to the building site, excavation had to be supported within the footprint of the new building. This was done so using a raker system with soldier beams and lagging.

BUILDING ENCLOSURE

The Apartment Building uses a multitude of different materials for the façade. The primary materials are brick, architectural concrete masonry units (ACMU), and metal cladding. Each elevation of the building utilizes these three primary façade materials. Although the materials are the same for each elevation, various colors, patterns, and mortar types create different visual appearances throughout the façade of the building.

From the ground level to the third floor, the façade is primarily comprised of Type 1 ACMU and Type 2 brick. Type 1 brick is used from the third floor through eighth floor. From the eighth floor up a combination of metal cladding, Type 2 brick, and Type 1 brick are used. In addition to the three main façade materials, cast stone is used in horizontal bands that encompass the building as well as window sills. Additional features of the building enclosure include aluminum windows, metal railings, prefinished aluminum trellis and projected metal sunscreens (5th, 8th and 10th floor). The majority of the façade is supported by anchoring to 3-5/8" metal studs that are supported by the post-tensioned concrete structure. A typical exterior wall assembly, from outside to inside, is made up of the façade material, air space, rigid insulation, air barrier, gypsum sheathing, metal studs with batt insulations, then interior gypsum board. The thicknesses of each component vary based on the façade material being supported and the intended fire rating. Punch windows are used throughout the exterior of the building. In addition, four story curved segmented aluminum window assemblies are located at each of the main entrances. Both glazing systems are prefinished aluminum.

MECHANICAL SYSTEM

The primary mechanical room is located in a central location on the ground floor, see slide 7 of Appendix 2 for the exact location. 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. In addition electric unit heaters are used in stair cases, the trash room, pump room and storage rooms.

ELECTRICAL SYSTEM

The electrical connection point is located in the northeast corner of the building. The main transformer vault and electrical room are located at the G2 level, see slide 7 of Appendix 1. 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.

SCHEDULE

The Apartment Building received the notice to proceed on February 11^{th,} 2013 and will reach substantial completion on February 13, 2015, resulting in a duration of roughly 24 months. The post-tensioned concrete structure was completed in June, 2014, roughly 16 months after notice to proceed. Turnover of this building will be done in phases, allowing early revenue for the owner. The first phase of turnover is planned for December 10^{th,} 2014 and includes the garage through the 2nd floor. From this point on the schedule dictates a turnover rate of a floor per week. A summary schedule of construction (design phases excluded) can be found in Appendix 4.

COST EVALUATION

The total contract value of the negotiated GMP contract is \$32,752,717, or \$216.75 per SF. A square foot estimate was performed using RSMeans. The closest category in RSMeans that The Apartment Building fell in was an 8-24 story apartment building with face brick with concrete block backup and reinforced concrete frame. The final estimated cost came to \$27,598,000 which comes to \$182.64 per SF. This estimate is just about 15% lower than the actual cost which is an acceptable for a square foot estimate. A summary of the square foot estimate can be found in Appendix 3.

There are many factors that explain the lower estimated cost. The square foot estimate does not include an outdoor swimming pool and post-tensioned concrete. Also due to the nature of the estimate, only a single below grade level can be able, so the second garage level is excluded from the estimate. The finishes in the apartments units are also much higher quality, thus more expensive, than what was specified in the square foot estimate. The electrical estimate was roughly half the actual cost. The building actually uses twice as many switch gears than the estimate specifies as well as a more complex distribution system

APPENDIX 1: PRESENTATION SLIDES (9/15/14)

SLIDE 1: INTRODUCTION



Apartment Building

Technical Assignment 1: Construction Project Management

B. Kerem Demirci Construction Option Advisor: Dr. Messner September 15, 2014

SLIDE 2: CLIENT INFORMATION



SLIDE 3: PROJECT DELIVERY

Project Delivery Legend Lump Sum Negotiated GMP Key Communication BMPI Owner John Moriarty & Rust Orling Associates of Virginia Architecture General Contractor Architect H.D. Power Design Inc. Smith Electrical Windows Engineer Mechanical Design Group Structura CCE Specialties Urban LTD Mechanical/ Plumbing Structural Metal Framing **Civil Engineer** Engineer Engineer J.D. Long Schuster Others Masonry Concrete Others

SLIDE 4: PROJECT TEAM



SLIDE 5: EXISTING CONDITIONS



SLIDE 6: BUILDING SYSTEMS



SLIDE 7: BUILDING SYSTEMS CONTINUED

Building Systems

Mechanical



- Mechanical Room located on ground floor (2) Roof Top Units
 - 5580- 6150 CFM
- Split System Heat Pumps serve apartment units, common areas, and service room • 300 - 3000 CFM

Electrical



- Main Electrical Room located on G2 level .
- Transformer located on G2 level
- 120/208V Service (4) 1000A Switchboards
- 6 20 Unit load centers located on each floor

SLIDE 8: SCHEDULE SUMMARY

Schedule Summary

Journary Schedule Note Add Solution Note Add Solution Solution Solution 2 Conceptual Design and Estimate Solution Solution Solution Solution 2 Design Development Design and Estimate Solution Solution Solution Solution 3 Intell Conceptual Design and Estimate Solution Solution Solution Solution 4 Solution Solution Solution Solution Solution Solution Solution Solution 6 Table Rep Development Design and Estimate Solution Solution Solution Solution Solution Solution 8 Table Rep Development Design and Estimate Solution Solution Solution Solution Solution Solution Solution Solution 10 Rep Solution So	ID	Task Name	Duration	Start	Jan	11	Apr '11 Jul '11	Oct '11	Jan '12	Apr'12	Jul '12	Oct '12	Jan '	'13 Apr	'13 Jul '1	3 Oct '1	13 Jan '1	14 Apr	14 J	al '14	Oct '14 Ja	n'15	Apr '15
1 Conceptual Design and Estimate 370 days Im 2//11 3 Cesign begins and Estimate 6 days Mor 2/11/3 4 The Frago Design begins and Estimate 6 days 10 Intral Remarked Power 8 days Mor 2/11/3 10 Intral Remarked Power 8 days Mor 2/11/3 11 Remarked Power 8 days Mor 2/11/3 11 Remarked Power 8 days Mor 2/13 11 Remarked Power 0 days Mor 2/13 11 Remarked Power On 0 days Mor 2/13 11 Remarked Power On 0 days Mor 2/13 12 Remarked Power On 0 days Mor 2/13 13 Rook Arti Bob 2 days Ne 10/2/13 14 Rook Agond Round Power 9 days Mor 2/11 13 Rook Agond Round Power 9 days Mor 2/11 14 Rook Agond Round Power 9 days Mor 2/11/3 14 Rook Agond Round Power 9 days Mor 2/11/3	0	Summary Schedule	1058 days	Tue 2/1/11																		7	summary s
2 Design Development Design and Estimate 162 days Nn 7/1/13 4 Disk Prep Disk Of Mon 21/1/13 4 Disk Prep Disk Of Mon 21/1/13 4 Disk Prep Disk Of Mon 21/1/13 6 Time Tower Disk Of Mon 22/1/13 7 Time Tower On Disk Mon 22/1/13 8 Time Tower On Disk Mon 22/1/13 10 Permanent Power On Disk Mon 22/1/13 11 Permanent Power On Disk Mon 22/1/13 12 Time Tower On Disk Mon 22/1/13 13 Permanent Power On Disk Mon 22/1/13 14 Powner On Disk Mon 22/1/13 15 Permanent Power On Disk Mon 22/1/13 16 Permanent Power On Disk Mon 22/1/13 17 Permanent Power On Disk Mon 22/1/13 18 Power Don Piez Supported Sub Mon 22/1/13 19 Design Development Dask Mon 22/1/14 Piez Supported Sub Mon 22/1/14 19 Development Dask Mon 22/1/14 Piez Supported Sub Mon 22/1/14 19	1	Conceptual Design and Estimate	370 days	Tue 2/1/11							Conce	ptual De	isign i	and Estir	nate								
3 INP Dags Mon 2/11/13 4 Sile Prep Sile Arego Sile Prep 10 Install Remoment Power Sile Arego Mon 2/11/13 10 Install Remoment Power Sile Arego Mon 2/11/13 10 Install Remoment Power Diagi Mon 2/11/13 11 Remoment Power Diagi Mon 2/11/13 12 Install Remoment Power On Diagi Mon 2/11/13 13 Remoment Power On Diagi Mon 2/11/13 13 Ponce Mon Sile Pret Sile Arego Pret Mat Sile 14 None Alfort Sile Diagi None Alfort Sile Diagi 14 None Alfort Sile Diagi None Alfort Sile Diagi None Alfort 15 Resconserved Sile Diagi None Alfort Sile Diagi	2	Design Development Design and Estimate	162 days	Sun 7/1/12										Design	n Develop	ment Des	ign and l	Estimati	e				
4 Site Prep 123 dorg Mond 3/11/13 5 Indial Remoter Flower 24 dorg Mond 3/27/13 8 Indial Remp Power 24 dorg Mond 3/27/13 9 Temp Rower On 0 dorg Mond 3/27/13 11 Permover Rower On 0 dorg Mond 3/27/13 25 Bolgrafin 10 dorg Mond 7/27/13 3 Rome Rower On 0 dorg Mond 7/27/13 12 Inoil Pooting and Tower Crane 1 dorg Wee 10/30/13 13 Rome Rower On 2 dorg Ne 12/17/13 14 Rome Rower On 2 dorg Ne 12/17/13 15 Rome Supported States Through Ground Floor K dorg Ne 12/17/13 16 Rome Supported States Through Ground Floor K dorg Ne 12/17/13 17 Roose Supported States Through Ground Floor K dorg Ne 12/17/13 18 Remitopered States Above Ground Floor K dorg Ne 12/17/13 18 Remitopered States Above Ground Floor K dorg Ne 12/17/13 19	3	NTP	0 days	Mon 2/11/13										NTP									
10 Initial Fermioner Power 34 dogs Wed 3/2713 3 Initial Temp Power Desk Desk <thdesk< th=""> <thdesk< th=""> Desk</thdesk<></thdesk<>	4	Site Prep	123 days	Mon 2/11/13												Site Prep	•						
B Initial Temp Power Bear Control Copy Mon 4/29/13 11 Permonent Power On Copy Mon 4/29/13 12 Permonent Power On Copy Mon 4/29/13 13 Permonent Power On Copy Mon 4/29/13 14 Permonent Power On Copy Mon 4/29/13 12 Install Temp Power On Permonent Power On Permonent Power On 12 Install Temp Power On Permonent Power On Permonent Power On 12 Install Temp Power On Permonent Power On Permonent Power On 12 Install Temp Power On Copy Mon 4/11/13 13 Form Appointed State Through Corourd Too Staty Through Foreigh Gorourd Too 13 Form Appointed State Through Corourd Too Stady Through Foreigh Gorourd Too 14 Poole Supponted State Above Gorourd Too Stady Through Kabove Gorourd Too 14 Poole Supponted State Above Gorourd Too Stady Through Kabove Gorourd Too 15 Poole Supponted State Above Gorourd Too Stady Through Kabove Gorourd Too <td>10</td> <td>Install Permanent Power</td> <td>348 days</td> <td>Wed 3/27/13</td> <td></td> <td>Instal</td> <td>Permane</td> <td>nt Po</td> <td>ower</td>	10	Install Permanent Power	348 days	Wed 3/27/13																Instal	Permane	nt Po	ower
9 Temp Power On 0 days Mon 4/213 11 Permonent Power On 0 days Mu 2/1/3 2 Incall Fooding and Tower Cone 1 day West 00/013 Excavation 13 Permonent Power On 0 days Mu 2/1/3 Excavation Excavation 13 Pape Mor Sab 2 days Use 11/2/1/3 Excavation Image Power On Excavation 14 Foundation Maile, Pits etc. Excavation Image Power On Excavation 15 Form Supported Stats Trough Ground Foor 57 days Mi 2/2/1/3 16 Reinforce Supported Stats Trough Ground Foor 54 days Mi 2/2/1/3 17 Pioce Supported Stats Trough Ground Foor 54 days Mi 2/2/1/3 18 Form Supported Stats Power Ground Floor 56 days Mi 2/2/1/4 19 Reinforce Supported Stats Trough Ground Floor 57 days Mi A/2/1/4 19 Reinforce Supported Stats Power Ground Floor 57 days Mi A/2/1/4 10 Reinforce Supported Stats Power Ground Floor 57 days Mi A/2/1/4 <	8	Install Temp Power	26 days	Mon 4/29/13	1										Insta	ll Temp P	ower						
11 Permanent Power On 0 days Pur/13 2 Permanent Power On 0 days Pur/13 12 Invail Footing and Tower Crane 1 day Vest 10/2013 13 Proce Number Stab 2 days Vest 10/2013 14 Foundation Walls, Pils et C 2 days Vest 10/2013 15 Form Supported Stabs Through Ground Floor 2 days Vest 10/2013 16 Reinforce Supported Stabs Through Ground Floor 2 days Vest 10/2014 17 Papes Supported Stabs Through Ground Floor 2 days Ne 12/2/13 18 Form Supported Stabs Above Ground Floor 2 days Nu 12/2/14 18 Form Supported Stabs Above Ground Floor 2 days Nu 12/2/14 19 Papes Supported Stabs Above Ground Floor 2 days Nu 12/2/14 19 Papes Supported Stabs Above Ground Floor 2 days Nu 12/2/14 19 Papes Supported Stabs Above Ground Floor 2 days Nu 12/2/14 19 Papes Supported Stabs Above Ground Floor 10 days Nu 12/2/14 19 <td< td=""><td>9</td><td>Temp Power On</td><td>0 days</td><td>Mon 6/3/13</td><td>1 </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>🔶 Temp</td><td>Power C</td><td>)n</td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	9	Temp Power On	0 days	Mon 6/3/13	1										🔶 Temp	Power C)n						
S Beacardin 107 day The B/1/3 12 Ireal Fooding and Nover Crine 1 day Med 1000/13 13 Pace Mat Stab 2 days The 11/24/13 14 Foundation Walts, Hite to 22 days The 11/24/13 15 Form Supported Stats Through Ground Floor S7 day The 12/24/13 16 Reinforce Supported Stats Through Ground Floor S7 days The 12/24/13 17 Pooce Supported Stats Through Ground Floor S7 days The 12/24/13 18 Reinforce Supported Stats Through Ground Floor S7 days The 12/27/13 19 Reinforce Supported Stats Above Ground Floor S7 days The 37/14 20 Pooce Supported Stats Above Ground Floor S7 days The 37/14 21 Indit Srick S6 days Thu 3/20/14 Reinforce Supported Stats Above Ground Floor 22 Indit Srick S6 days Thu 3/20/14 Reinforce Supported Stats Above Ground Floor S7 days 23 Indit Srick S6 days Thu 3/20/14 Reinforce Supported Stats Above Ground Floor So days	11	Permanent Power On	0 days	Thu 7/25/13	1										٠	Permane	nt Power	On					
12 Insuit Fooling and Tower Cone Id all 13 Place Mark Tabo 26 days Ive 11/26/13 14 Foundation Walk, Pit eto 22 days Tue 12/17/13 15 Form Supported Stabs Through Ground Roor 57 days Form Supported Stabs Through Ground Roor 16 Reinforce Supported Stabs Through Ground Roor 54 days Flue 1/28/13 16 Reinforce Supported Stabs Through Ground Roor 54 days Flue 3/18/14 17 Place Supported Stabs Through Ground Roor 54 days Flue 3/18/14 18 Form Supported Stabs Through Ground Roor 56 days Flue 3/18/14 19 Reinforce Supported Stabs Through Ground Roor 56 days Flue 3/18/14 19 Reinforce Supported Stabs Through Ground Roor 56 days Flue 3/18/14 19 Reinforce Supported Stabs Through Ground Roor 56 days Flue 3/18/14 19 Reinforce Supported Stabs Through Ground Roor 56 days Flue 3/18/14 10 Place Supported Stabs Above Ground Roor 56 days Flue 3/18/14 12 Broin Instal Fluick 7 days Tue 4/12/14 Instal Flinick 12 <	5	Excavation	107 days	Thu 8/1/13	1												Exc	cavatior	1				
13 Puce Mat Sab 26 doys The 11/20/13 14 Foundation Walk, Pile et 20 Pula 12/17/13 Foundation Walk, Pile et 20 15 Form Supported Stabs Through Ground Floor 57 doys The 12/17/13 16 Reinforce Supported Stabs Through Ground Floor 57 doys The 12/17/13 17 Puce Supported Stabs Through Ground Floor 54 doys The 12/17/13 17 Puce Supported Stabs Above Ground Floor 54 doys The 12/17/14 18 Form Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 19 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 19 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 10 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 10 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 12 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 12 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14 12 Reinforce Supported Stabs Above Ground Floor 57 doys Thu 3/20/14	12	Insal Footing and Tower Crane	1 day	Wed 10/30/13	1											1.1	Insall Fo	oting a	nd Tow	er Crane			
14 Foundation Walls, Pits etc Poundation Walls, Pits etc Poundation Walls, Pits etc 15 Form Supported Situs Through Ground Floor 54 days Fit 12/27/13 16 Reinforce Supported Situs Through Ground Floor 54 days Fit 12/27/13 17 Pace Supported Situs Through Ground Floor 54 days Fit 12/27/13 18 Form Supported Situs Through Ground Floor 54 days The 12/27/13 18 Form Supported Situs Through Ground Floor 54 days The 32/18/14 19 Reinforce Supported Situs Through Ground Floor 54 days The 32/18/14 19 Reinforce Supported Situs Through Ground Floor 54 days The 32/18/14 19 Reinforce Supported Situs Through Ground Floor 54 days The 32/18/14 20 Pace Supported Situs Through Ground Floor 59 days Mon 3/2/14 23 Install Biok 75 days Thu 4/3/14 24 Install Kinke 75 days Thu 4/3/14 25 Brough-In Mach/Elev/ TD 12 days Mon 7/28/14 26 Findinge-Elevint 16 days Mon 7/28/14 27 Courtyard Improvements <td< td=""><td>13</td><td>Place Mat Slab</td><td>26 days</td><td>Tue 11/26/13</td><td>1 </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Pla</td><td>ace Mat</td><td>Slab</td><td></td><td></td><td></td><td></td></td<>	13	Place Mat Slab	26 days	Tue 11/26/13	1												Pla	ace Mat	Slab				
15 Form Supported Status Triough Ground Floor 57 adys The 12/2/13 16 Reinforce Supported Status Triough Ground Floor 54 adys Fit 12/2/13 17 Place Supported Status Triough Ground Floor 54 adys Fit 12/2/13 18 Form Supported Status Triough Ground Floor 54 adys The 12/2/14 19 Reinforce Supported Status Above Ground Floor 56 adys The 3/18/14 20 Place Supported Status Above Ground Floor 66 dys Thu 3/27/14 21 Initial Brick 78 dys Thu 3/27/14 22 Place Supported Status Above Ground Floor 78 dys Thu 3/27/14 23 Initial Brick 78 dys Thu 3/27/14 24 Initial Brick 78 dys Thu 4/2/14 25 Rough-In Mech/Eleor TD 127 adys Thu 4/2/14 24 Initial Windows 55 dys 56 dys Mod 3/2/14 25 Frainer 156 dys Mod 3/2/14 Frainer Frainer Frainer 25 Frainer 156 dys Mod 3/2/14 Frainer Frainer Frainer Frainer Frainer Frain	14	Foundation Walls, Pits etc	22 days	Tue 12/17/13	1												- F	oundat	ion Wa	lls, Pits e	tc		
16 Peinforce Supported Slabs Through Ground Poor 44 doys Fit 12/27/13 17 Ploce Supported Slabs Through Ground Poor 44 doys Tue 2/31/13 18 Form Supported Slabs Above Ground Poor 44 doys Tue 2/31/13 18 Form Supported Slabs Above Ground Poor 45 doys Tue 3/31/14 20 Place Supported Slabs Above Ground Poor 57 doys Tue 3/32/14 23 Instal Brick F5 doys Tue 3/22/14 28 Place Supported Slabs Above Ground Poor 57 doys Tue 3/32/14 28 Form MeenPileev/TD 127 doys Tue 4/32/14 28 Former/ Sheath/ Tyvek 77 doys Tue 4/32/14 29 Frame/ Sheath/ Tyvek Frame/ Sheath/ Tyvek Frishtes 21 Structure Top out Odoys Tue 3/2/14 Frishtes 22 Structure Top out Odoys Tue 3/2/14 Frishtes 23 Structure Top out Odoys Tue 3/2/14 Frishtes 24 Instal Windows 64 doys Mon 7/2/14 Frishtes 25 Structure Top out Odoys Tue 3/2/14 F	15	Form Supported Slabs Through Ground Floor	57 days	Tue 12/24/13														For	m Supp	oorted S	abs Throu	igh Gi	iround Floo
17 Place Supported Slabs Through Ground Floor 54 days Tou 12/3/14 18 Form Supported Slabs Above Ground Floor 54 days Thu 3/2/14 19 Reinforce Supported Slabs Above Ground Floor 54 days Mon 3/2/14 20 Place Supported Slabs Above Ground Floor 54 days Mon 3/2/14 23 Instal Brick #5 days Mon 3/2/14 28 Rough In MechTleor J 12 days Mon 3/2/14 28 Rough In MechTleor J 12 days Mon 3/2/14 28 Rough In MechTleor J 12 days Mon 3/2/14 28 Rough In MechTleor J 12 days Mon 3/2/14 29 Rough In MechTleor J 12 days Mon 3/2/14 20 Final Brick 15 days Mit 3/3/14 20 Final MechTleor J 12 days Mon 3/2/14 21 Structure Top out 0 days Mit 3/2/14 22 Form / Sheath / Tyvek Mon 3/2/14 Mon 3/2/14 23 Structure Top out 0 days Mit 3/2/14 Mon 3/2/14 24 Install Windows 6 days Mon 7/2/14	16	Reinforce Supported Stabs Through Ground Floor	54 days	Fri 12/27/13														Rei	inforce	Support	ed Slabs T	hroug	gh Ground I
IB Porm Supported Stabs Above Ground Floor 99 day Tue 3/8/14 19 Reinforce Supported Stabs Above Ground Floor 60 days hu 3/20/14 20 Place Supported Stabs Above Ground Floor 97 days hu 3/20/14 23 Install Brick 96 days hu 3/2/14 23 Install Brick 95 days hu 3/2/14 23 Rough-In Mech/Elev/TD 127 days hu 3/2/14 24 Frame/Sheath/Tyvek 77 days hu 4/2/14 25 Rough-In Mech/Elev/TD 127 days frame/Sheath/Tyvek 26 Finithes 156 days Finithes/Sist/Alve Finithes/Sist/Alve 26 Finithe 166 days Keed Alv14 Country and Improvements 64 days 27 Punchist/ Owner Mais 92 days Finithes/Sist/Alve Sister/Sist/Owner 4th Floor Finithes/Sister/Si	17	Place Supported Slabs Through Ground Floor	54 days	Tue 12/31/13														Pla	ice Sup	ported S	labs Throu	Jgh G	iround Floo
19 Reinforce Supported Stats Above Ground Roor 60 days Turs/01/4 20 Place Supported Stats Above Ground Roor 60 days Mon 3/24/14 21 Install trick 67 days Mon 3/24/14 22 Place Supported Stats Above Ground Roor 78 days Mon 3/24/14 23 Install trick 78 days Thu 3/21/14 24 Install trick 78 days Thu 4/21/4 25 Rough-In Mech/Elev/TD 127 days The 4/22/14 26 Finines 15 days Finishes 27 Prome/Sheat/Tyvek 77 days Thu 4/21/14 7 Courtyard Improvements 44 days Mon 7/20/14 28 Final inspections 144 days Mon 8/4/14 29 Turnover famour Gardge - Second Roor 0 days Final Inspections 31 Turnover dampe - Second Roor 0 days Final Inspections 15 date mprovements 32 Turnover dampe - Second Roor 0 days Wed 12/0/14 Final Inspections 32 Turnover dampe - Second Roor	18	Form Supported Slabs Above Ground Floor	59 days	Tue 3/18/14	1														Fo	orm Supp	orted Sla	bs Ab	oove Groun
20 Place Supported Status Above Ground Rior SP days Mon 3/24/14 23 Install Brick SP days Mon 3/24/14 23 Install Brick SP days Mu 3/24/14 23 Rough-In Mech/Eleo / TD 127 days Thu 4/3/14 22 Rough-In Mech/Eleo / TD 127 days Thu 4/3/14 23 Rough-In Mech/Eleo / TD 127 days Thu 4/2/14 24 Install Windows 45 days Wed 6/4/14 24 Install Windows 45 days Wed 6/4/14 25 Structure Top out 0 days Mon 7/28/14 26 Finines 61 days Mon 7/28/14 27 Structure Top out 6 days Mon 7/28/14 28 Final Inspections 14 days Mon 7/21/4 29 Tumover dangae - Second Rioor 0 days Wed 12/10/14 29 Tumover dan Fioor 0 days Wed 12/1/14 31 Tumover dan Fioor 0 days Wed 12/1/14 32 Tumover sth Fioor 0 days W	19	Reinforce Supported Slabs Above Ground Floor	60 days	Thu 3/20/14															R	einforce	Supporte	d Slat	bs Above G
23 Install Sink P5 days Tu 3/27/14 25 Rough Mech/Elev/TD 12 days Tu 4/22/14 26 Finithes 156 days Tite 4/22/14 26 Finithes 156 days Tite 4/22/14 27 Prome/Sheath/Tyvek 77 days Tue 4/22/14 28 Finithes 156 days Tite 4/22/14 29 Finithes 156 days Tite 4/22/14 21 Structure Top out 0 days Wed 6/4/14 22 Structure Top out 0 days Mon 7/22/14 28 Final Improvements 64 days Mon 7/22/14 29 Tumover dampoorements 61 days Tum 9/7/14 29 Tumover dampoorements 61 days Tum 9/7/14 29 Tumover dampoorements 61 days Tum 9/7/14 29 Tumover dampoorements 61 days Wei 12/10/14 29 Tumover dampoor 0 days Wei 12/10/14 30 Tumover dampoor 0 days Wei 12/17/14 31 Tumover dam Roor 0 days Wei 12/10/14 3	20	Place Supported Slabs Above Ground Floor	59 days	Mon 3/24/14															P	lace Sup	ported Sla	bs Al	bove Groun
Iss Bought Meenplieu/to Is // 40/14 28 Rought Meenplieu/to Tadays Tue // 42/14 28 Rought Meenplieu/to Tadays Nue 4/2/14 28 Rought Meenplieu/to Frame// Sheath/Tyrek Frame// Sheath/Tyrek 24 Instal Windows 65 days Mie 6/4/14 Frame// Sheath/Tyrek 24 Instal Windows 65 days Mie 6/4/14 Courtyret Instal Windows 25 Structure Top out 0 days Mon 6/4/14 Courtyret Instal Windows 25 Final Impections 14 days Mon 6/4/14 Structure Top out Courtyret Timprovements 26 She improvements 61 days Thu 0/7/14 Punchilt/ Owner Waits Paus Structure Timprovements 27 Punchilt/ Owner Waits Paus Meenplant Meenplant Meenplant Structure Yes Funchilt Owner Structure Yes 30 Tumover Sth Roor O days Weel 12/3/14 Yes Funchilt Owner Sth Roor Tumover Sth Roor Tumover Sth Roor Tumover Sth Roor 33 Tumover Sth Roor O days Weel 1/2/1/15 Tumover Sth	23	Install Brick	95 days	Thu 3/27/14																Inst	Brick		
122 Prome/ Sheathy Typek 77 days Tue 4/20/14 26 Finihes 154 days Ff 5/30/14 26 Instail Windows 45 days Wed 6/4/14 21 Structure Top out 0 days Twe 4/20/14 22 Structure Top out 0 days Med 7/20/14 28 Final Inspections 144 days Mon 7/20/14 29 Transvertions 61 days Mon 7/20/14 29 Tumover darage - Second Floor 0 days Wed 12/1/14 20 Tumover dan Floor 0 days Wed 12/1/14 21 Tumover flh Floor 0 days Wed 12/1/14 28 Final Inspectific Towner Walts 9 days Med 7/1/4 29 Tumover darage - Second Floor 0 days Wed 12/1/14 20 Tumover darage - Second Floor 0 days Wed 12/1/14 21 Tumover flh Floor 0 days Wed 12/2/14 22 Tumover flh Floor 0 days Wed 12/2/14 23 Tumover flh Floor 0 days <td< td=""><td>25</td><td>Rough-In Mech/Elec/ TD</td><td>127 days</td><td>Thu 4/3/14</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>Rough-In</td><td>Mec</td><td>h/Elec/ TD</td></td<>	25	Rough-In Mech/Elec/ TD	127 days	Thu 4/3/14																1	Rough-In	Mec	h/Elec/ TD
28 Finishes 156 days Filishes Filishes 24 Install Windows 65 days Weed 6/4/14 21 Structure Top out 0 days Tru 0/12/14 Install Windows 7 Counyard Improvements 64 days Mon 8/4/14 Counyard Improvements 64 days 8 Find Impedions 14 days Mon 8/4/14 Counyard Improvements 61 days 6 Site Improvements 61 days Thu 9/7/14 Find Improvements 61 days 7 Dunolist/ Owner Walks P2 days Find //12/14 Find Improvements 61 days 9 Tumover Star Roor 0 days Weed 12/17/14 Find Improvements 61 days 30 Tumover Star Roor 0 days Weed 12/17/14 Find Improvements 7 umover Star Roor 7 umover Star Roor <t< td=""><td>22</td><td>Frame/ Sheath/ Tyvek</td><td>77 days</td><td>Tue 4/22/14</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Fran</td><td>ne/ Sheath</td><td>√ Tyv</td><td>vek</td></t<>	22	Frame/ Sheath/ Tyvek	77 days	Tue 4/22/14																Fran	ne/ Sheath	√ Tyv	vek
24 Introl Windows 65 days Wed 6/4/14 21 Structure Top out 0 days Med 6/2/14 22 Structure Top out 0 days Med 6/2/14 28 Final Inspections 144 days Mon 7/28/14 28 Final Inspections 144 days Mon 8/4/14 29 Tumover dampae - Second Ricor 0 days Wed 12/10/14 29 Tumover dampae - Second Ricor 0 days Wed 12/10/14 30 Tumover dampae - Second Ricor 0 days Wed 12/10/14 31 Tumover dampae - Second Ricor 0 days Wed 12/10/14 32 Tumover dampae - Second Ricor 0 days Wed 12/10/14 33 Tumover dam Ricor 0 days Wed 12/10/14 34 Tumover dam Ricor 0 days Wed 12/10/14 35 Tumover dam Ricor 0 days Wed 12/10/14 34 Tumover dam Ricor 0 days Wed 12/10/14 33 Tumover dam Ricor 0 days Wed 12/10/14 34 Tumover dam Ricor 0 days Wed 12/10/14 35 Tumover dam Ricor	26	Finishes	156 days	Fri 5/30/14																		Finis	hes
21. Structure Top out 0 days Thu 4/12/14 \$ Structure Top out Courty and importance 7 Courty and importance 64 days Mon 7/20/14 Courty and importance Final Importance 8 Final Importance 14 days Mon 8/4/14 Final Importance Final Importance 6 She improvements 61 days Thu 8/7/14 Final Importance Final Importance 7 Punchity Comer Wals 92 days File 9/12/14 File 9/12/14 File 9/12/14 9 Tumover Garage - Second Pioor 0 days Wed 12/17/14 File 9/12/14 File 9/12/14 30 Tumover dan Filo or 0 days Wed 12/17/14 File 9/12/14 File 9/12/14 31 Tumover dan Filo or 0 days Wed 12/17/14 File 9/12/14 File 9/12/14 33 Tumover dan Filo or 0 days Wed 12/17/14 File 9/12/14 File 9/12/14 33 Tumover file Filo or 0 days Wed 12/17/14 File 9/12/14 File 9/12/14 34 Tumover file Filo or 0 days Wed 12/11/15 File 9/12/14 File 9/12/14 35	24	Install Windows	65 days	Wed 6/4/14																Ir	stall Wind	Jows	
7 Countyard Improvements 64 days Mon 7/20/14 28 Find Impediants 14 days Mon 8//14 28 Find Impediants 14 days Mon 8//14 6 Site Improvements 61 days Tru 8//14 77 Punchit/ Owner Walks 12 days Find Impediants 78 Find Impediants 12 days Find Impediants 79 Punchit/ Owner Walks 12 days Find Impediants 70 Tumover Start Roor 0 days Wed 12//14 70 Tumover Start Roor 0 days Wed 12//14 71 <tumover roor<="" start="" td=""> 0 days Wed 12//14 72 Tumover Start Roor 0 days Wed 12//14 70 Tumover Start Roor 0 days Wed 1//14/15 70 Tumover Start Roor 0 days Wed 1//21/15</tumover>	21	Structure Top out	0 days	Thu 6/12/14															🔶 S	tructure	Top out		
28 Final Inspections 144 days Mon R/4/14 6 Site Improvements 61 days Final Inspect 7 Punchist/ Owner Walks 92 days Fit 9/12/14 7 Punchist/ Owner Walks 92 days Fit 9/12/14 70 Tumover Garage - Second Ricor 0 days Wed 12/10/14 70 Tumover Garage - Second Ricor 0 days Wed 12/10/14 71 Tumover Sth Ricor 0 days Wed 12/2/14 72 Tumover Sth Ricor 0 days Wed 12/3/14 73 Tumover Sth Ricor 0 days Wed 12/3/14 74 Tumover Sth Ricor 0 days Wed 1/2/15 74 Tumover Sth Ricor 0 days Wed 1/2/15 74 Tumover Sth Ricor 0 days Wed 1/2/15 75 Tumover Sth Ricor 0 days Wed 1/2/15 76 Tumover Sth Ricor 0 days Wed 1/2/15 76 Tumover Sth Ricor 0 days Wed 1/2/15 76 Tumover Sth Ricor 0 days Wed 1/2/	7	Courtyard Improvements	64 days	Mon 7/28/14																	Courty	ard Ir	mprovemer
6 She Improvements 61 days Thu 07/14 27 Punchity Owner Wats 92 days F6 9/12/14 28 Tumover Gange - Second Roor 0 days Wed 12/10/14 30 Tumover dange - Second Roor 0 days Wed 12/17/14 30 Tumover dange - Second Roor 0 days Wed 12/17/14 31 Tumover dange - Second Roor 0 days Wed 12/17/14 32 Tumover dan Roor 0 days Wed 12/17/14 33 Tumover dan Roor 0 days Wed 12/31/14 34 Tumover dan Roor 0 days Wed 12/1/14 35 Tumover dan Roor 0 days Wed 12/1/14 36 Tumover dan Roor 0 days Wed 1/2/1/15 36 Tumover dan Roor 0 days Wed 1/2/1/15 36 Tumover dan Roor 0 days Wed 1/2/1/14 37 Tumover dan Roor 0 days Wed 1/2/1/14	28	Final Inspections	144 days	Mon 8/4/14																		- 1	Final Inspec
ZZ Punchit/ Owner Walks P2 days First/1/4 29 Tumover Garage - Second Roor 0 days Weid 12/10/14 29 Tumover Garage - Second Roor 0 days Weid 12/10/14 30 Tumover Sid Roor 0 days Weid 12/24/14 31 Tumover Sin Roor 0 days Weid 12/24/14 32 Tumover Sin Roor 0 days Weid 12/24/14 33 Tumover Sin Roor 0 days Weid 12/24/14 34 Tumover Sin Roor 0 days Weid 12/24/14 35 Tumover Sin Roor 0 days Weid 12/24/14 36 Tumover Sin Roor 0 days Weid 12/24/14 37 Tumover Sin Roor 0 days Weid 12/21/15 36 Tumover Sin Roor 0 days Weid 12/21/15 37 Tumover Sin Roor 0 days Weid 12/21/15 36 Tumover Sin Roor 0 days Weid 12/21/15 37 Tumover Sin Roor 0 days Weid 12/21/15	6	Site Improvements	61 days	Thu 8/7/14																	Site Ir	лргоч	vements
29 Tumover Ganga - Second Ricor 0 days Wei 12/10/14 30 Tumover Ganga - Second Ricor 0 days Wei 12/10/14 30 Tumover Ait Ricor 0 days Wei 12/24/14 31 Tumover Sth Ricor 0 days Wei 12/31/14 32 Tumover Sth Ricor 0 days Wei 12/31/14 33 Tumover Sth Ricor 0 days Wei 12/31/14 34 Tumover Sth Ricor 0 days Wei 12/31/14 35 Tumover Sth Ricor 0 days Wei 12/31/14 36 Tumover Sth Ricor 0 days Wei 1/21/15 36 Tumover Sth Ricor 0 days Wei 1/21/15 37 Tumover Sth Ricor 0 days Wei 2/24/14	27	Punchlist/ Owner Walks	92 days	Fri 9/12/14																		Fur	nchlist/ Ow
30 Turnover 3rd Roor 0 days Wed 12/17/14 31 Turnover 4rd Roor 0 days Wed 12/17/14 32 Turnover 4rd Roor 0 days Wed 12/17/14 33 Turnover 4rd Roor 0 days Wed 12/17/14 33 Turnover 4rd Roor 0 days Wed 12/17/14 34 Turnover 4rd Roor 0 days Wed 12/17/14 35 Turnover 4rd Roor 0 days Wed 12/17/15 36 Turnover 7rd Roor 0 days Wed 1/2/15 36 Turnover 9rd Roor 0 days Wed 1/2/1/5 37 Turnover 10r Roor 0 days Wed 2/2/1/3	29	Turnover Garage - Second Floor	0 days	Wed 12/10/14																	TI	rnþv	er Garage -
31 Turnover 4th Rioor 0 days Wed 12/24/14 32 Turnover 5th Rioor 0 days Wed 12/31/14 33 Turnover 5th Rioor 0 days Wed 12/31/14 34 Turnover 5th Rioor 0 days Wed 12/31/14 34 Turnover 7th Rioor 0 days Wed 1/14/15 35 Turnover 5th Rioor 0 days Wed 1/21/15 36 Turnover 5th Rioor 0 days Wed 1/21/15 37 Turnover 5th Rioor 0 days Wed 1/21/15 37 Turnover 5th Rioor 0 days Wed 2/24/15	30	Tumover 3rd Floor	0 days	Wed 12/17/14																	• T	urrov	ver 3rd Floo
32 Turnover 5th Floor 0 days Wed 1/3/1/4 Turnover 5th Floor Turnover 5th Floor Turnover 6th Floor 33 Turnover 7th Floor 0 days Wed 1/1/15 Turnover 7th Floor	31	Turnover 4th Floor	0 days	Wed 12/24/14																	• 1	íurno	over 4th Flo
33 Turnover dth Rioor 0 days Wed 1/7/15 34 Turnover 3th Rioor 0 days Wed 1/14/15 35 Turnover 3th Rioor 0 days Wed 1/21/15 36 Turnover 9th Rioor 0 days Wed 1/21/15 37 Turnover 10th Rioor 0 days Wed 1/21/15	32	Turnover 5th Floor	0 days	Wed 12/31/14																	•	Turne	over 5th Flo
34 Turnover 7th Floor 0 days Wed 1/14/15 35 Turnover 8th Floor 0 days Wed 1/21/15 36 Turnover 9th Floor 0 days Wed 1/21/15 37 Turnover 10th Floor 0 days Wed 2/4/15	33	Turnover 6th Floor	0 days	Wed 1/7/15																	•	Turn	over 6th Fl
35 Turnover 8th Roor 0 days Wed 1/21/15 36 Turnover 9th Roor 0 days Wed 1/28/15 37 Turnover 10th Roor 0 days Wed 2/4/15	34	Turnover 7th Floor	0 days	Wed 1/14/15																	•	Turr	nover 7th F
36 Turnover 9th Ricor 0 days Wed 1/28/15 Turnover 9th 37 Turnover 10th Ricor 0 days Wed 2/4/15 Turnover 10th	35	Turnover 8th Floor	0 days	Wed 1/21/15																	•	🖡 Tur	rnover 8th F
37 Turnover 10th Rioor 0 days Wed 2/4/15	36	Turnover 9th Floor	0 days	Wed 1/28/15	1																	🔹 Tu	rnover 9th
	37	Turnover 10th Floor	0 days	Wed 2/4/15																		Tu	urnover 10t

Project Cost

Actual Project Costs

	Cost	Cost per SF
Structural System	\$6,221,434	\$41.17
Plumbing/Mechanical System	\$3,030,500	\$20.06
Electrical System	\$3,169,500	\$20.98
Construction Cost	\$29,942,641	\$198.16
Total Project Cost	\$32,752,717	\$216.75



Square Foot Estimate

	Cost	Cost per SF
Structural System	\$5,438,000	\$35.92
Plumbing/Mechanical System	\$3,324,500	\$22.17
Electrical System	\$1,457,000	\$9.65
Construction Cost	\$24,009,500	\$158.89
Total Project Cost	\$27,598,000	\$182.64

Apartment, 8-24 Story with Face Brick with Concrete Block Back-up and Reinforced Concrete Frame



APPENDIX 2: ENLARGED SITE LOGISTICS PLAN

APPENDIX 3: SUMMARY ESTIMATE



Square Foot Cost Estimate Report

Cost Estimate Report RSMeansOnline

Estimate Name:

Apartment Building

Building Type: Location: Stories Count (L.F.): Stories Height Floor Area (S.F.): LaborType Basement Included: Data Release: Cost Per Square Foot Total Building Cost Apartment, 8-24 Story with Face Brick with Concrete Block Back-up / R/Conc. Frame

ALEXANDRIA, VA 11.00 10.00 151,105.00 STD Yes Year 2014 Quarter 3 \$182,64 \$27,598,000.00



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

		% of Total	Cost Per SF	Cost
A Substructure	-	9.6%	\$15.28	\$2,309,500
A1010	Standard Foundations		\$0.58	\$87,500
	Pile caps,6 piles,8'-6" x 5'-6" x 37", 40 ton capacity, 14" column size, 458 K column			
	Pile caps, 12 piles, 11' - 6" x 8' - 6" x 49", 40 ton capacity, 19" column size, 900 K column			
A1020	Special Foundations		\$12.80	\$1,934,500
	Steel H piles, 100' long, 400K load, end bearing, 6 pile cluster			
	Steel H piles, 100' long, 800K load, end bearing, 12 pile cluster			
	Grade beam, 30' span, 52" deep, 14" wide, 12 KLF load			
A1030	Slab on Grade		\$0.44	\$66,000
	Slab on grade, 4" thick, non industrial, reinforced			
A2010	Basement Excavation		\$0.29	\$44,000
	Excavate and fill, 10,000 SF,8' deep, sand, gravel, or common earth, on site storage			
A2020	Basement Walls		\$1.17	\$177,500
	Foundation wall, CIP, 12' wall height, pumped, .591 CY/LF, 28.79 PLF, 16" thick			
B Shell		23.9%	\$38.00	\$5,742,500
B1010	Floor Construction		\$20.93	\$3,162,500
	Cast-in-place concrete column, 16" square, tied, 300 K load, 14' story height, 253 lbs/LF, 4000 PS	31		
	Cast-in-place concrete column, 24" square, tied, 900K load, 12' story height, 567 lbs/LF, 4000PS	31		
	Cast-in-place concrete beam and slab , 6" slab , one way , 12" column , 25'x25' bay , 40 PSF super	imposed load, 129	F	
	Cast-in-place concrete beam and slab , 6" slab , one way , 18" column , 25%25' bay , 125 PSF supe	rimposed load, 22	7	
	Flat slab, concrete, with drop panels, 6" slab/2.5" panel, 12" column, 15'x15' bay, 75 PSF superi	mposed load, 153	P:	
B1020	Roof Construction		\$1.41	\$213,000
	Roof, concrete, beam and slab, 25'x25' bay, 40 PSF superimposed load, 12" deep beam, 6" slab	, 129 PSF total lo	ad	
B2010	Exterior Walls		\$11.50	\$1,737,000
	Brick wall, composite double wythe, standard face/CMU back-up, 8" thick, perlite core fill			
B2020	Exterior Windows		\$3.40	\$514,500
	@2014 1-800-334-3509 softwaresupport@rsmeans.com			1

			% of Total	Cost Per SF	Cost
	Windows aluminum sliding	standard glass 5' x 3'			
B2030	Exterior Doors			\$0.16	\$24,500
	Door, aluminum & glass, with	out transom, wide stile, hardware, 3'-0" x 7'-0" opening			+;
	Door, aluminum & glass, with	out transom, non-standard, double door, hardware, 6'-0" x 7'-0" c	pening		
B3010	Roof Coverings			\$0.60	\$91,000
	Roofing, asphalt flood coat, g	ravel, base sheet, 3 plies 15# asphalt felt, mopped			
	Insulation, rigid, roof deck, co	mposite with 2" EPS, 1" perlite			
	Roof edges, aluminum, duran	odic, .050" thick, 6" face			
	Flashing, aluminum, no backi	ng sides, .019"			
	Gravel stop, aluminum, extruc	led, 4", mill finish, .050" thick			
C Interiors			20.6%	\$32.79	\$4,954,500
C1010	Partitions			\$9.50	\$1,436,000
	Concrete block (CMU) partitio	n, light weight, hollow, 6" thick, no finish			
	Metal partition, 5/8"fire rated g	gypsum board face, 1/4" sound deadening gypsum board, 2-1/2"	@ 24", same opposi	ite	
	Furring 1 side only, steel char	inels, 3/4", 16" OC			
	Gypsum board, 1 face only, e	xterior sheathing, fire resistant, 1/2"			
	Add for the following: taping a	nd finishing			
	1/2" fire rated gypsum board,	taped & finished, painted on metal furring			
C1020	Interior Doors			\$6.76	\$1,021,000
	Door, single leaf, wood frame	, 3'-0" x 7'-0" x 1-3/8", birch, solid core			
	Door, single leaf, wood frame	, 3'-0" x 7'-0" x 1-3/8", birch, hollow core			
C1030	Fittings			\$4.01	\$606,500
	Cabinets, residential, wall, two	o doors x 48" wide			
C2010	Stair Construction			\$1.29	\$194,500
	Stairs, steel, cement filled me	tal pan & picket rail, 12 risers, with landing			
C3010	Wall Finishes			\$2.50	\$378,000
	Painting, interior on plaster ar	d drywall, walls & ceilings, roller work, primer & 2 coats			
	Vinyl wall covering, fabric bac	k, medium weight			
	Ceramic tile, thin set, 4-1/4" x	4-1/4"			
C3020	Floor Finishes			\$5.37	\$811,000
	Carpet tile, nylon, fusion bond	led, 18" x 18" or 24" x 24", 24 oz			
	Carpet tile, nylon, fusion bond	led, 18" x 18" or 24" x 24", 35 oz			
	Carpet, padding, add to abov	e, minimum			
	Carpet, padding, add to abov	e, maximum			
	Vinyl, composition tile, minimu	ım			
	Vinyl, composition tile, maxim	um			
	Tile, ceramic natural clay				
C3030	Ceiling Finishes			\$3.36	\$507,500
	Gypsum board ceilings, 1/2" f	ire rated gypsum board, painted and textured finish, 7/8"resilient	channel furring, 24"	0	
D Services			48.0%	\$76.32	\$11,532,000
D1010	Elevators and Lifts			\$21.93	\$3,313,500
	3.00-Traction gearless elevate	ors, passenger, 3000 lb, 10 floors, 200 FPM			
	Traction, geared passenger, 3	3500 lb,15 floors, 10' story height, 2 car group, 350 FPM			
D2010	Plumbing Fixtures			\$15.21	\$2,299,000
	Kitchen sink w/trim, counterto	p, PE on Cl, 24" x 21", single bowl			
	Laundry sink w/trim, PE on C	, black iron frame, 24" x 20", single compt			
	Service sink w/trim, PE on CI	comer floor, 28" x 28", w/rim guard			
	Bathroom, lavatory & water cl	oset, 2 wall plumbing, stand alone			
	Bathroom, three fixture, 2 wal	l plumbing, lavatory, water closet & bathtub, stand alone			
D2020	Domestic Water Distribution			\$5.20	\$785,500
	Gas fired water heater, reside	ntial, 100< F rise, 30 gal tank, 32 GPH			
	® 2014	1-800-334-3509 softwaresupport@rsmeans.com			2

		% of Total	Cost Per SF	Cost
D2040	Rain Water Drainage		\$0.17	\$25.000
	Roof drain, DWV PVC, 4" diam, diam, 10' high			+==,
	Roof drain, DWV PVC, 4" diam, for each additional foot add			
D3010			\$7.48	\$1,130,500
	Apartment building heating system, fin tube radiation, forced hot water, 30,000 SF area,300,00	0 CF vol		
D3030	Cooling Generating Systems		\$9.32	\$1,408,500
	Packaged chiller, air cooled, with fan coil unit, medical centers, 40,000 SF, 93,33 ton			
D4010	Sprinklers		\$2.63	\$397.500
	Wet pipe sprinkler systems, steel, light hazard, 1 floor, 10,000 SF			
	Wet pipe sprinkler systems, steel, light hazard, each additional floor, 10,000 SF			
	Standard High Rise Accessory Package 16 story			
D4020	Standpipes		\$1.58	\$238,500
	Wet standpipe risers, class III, steel, black, sch 40, 6" diam pipe, 1 floor			
	Fire pump, electric, with controller, 5" pump, 100 HP, 1000 GPM			
	Fire pump, electric, for jockey pump system, add			
D5010	Electrical Service/Distribution		\$1.63	\$246.000
	Overhead service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire,	120/208 V. 2000 A		
	Feeder installation 600 V. including RGS conduit and XHHW wire, 2000 A			
	Switchgear installation, incl switchboard, panels & circuit breaker, 120/208 V, 2000 A			
D5020	Lighting and Branch Wiring		\$7.83	\$1.183.000
	Receptacles incliplate, box, conduit, wire, 10 per 1000 SF, 1,2 Wiper SF, with transformer			
	Wall switches, 2.5 per 1000 SF			
	Miscellaneous power, 2 watts			
	Central air conditioning power. 3 watts			
	Motor installation, three phase, 460 V, 15 HP motor size			
	Motor feeder systems, three phase, feed to 200 V 5 HP, 230 V 7,5 HP, 460 V 15 HP, 575 V 20	HP		
	Incandescent fixtures recess mounted, type A, 1 watt per SF, 8 FC, 6 fixtures per 1000 SF			
D5030	Communications and Security		\$3.16	\$477.000
	Communication and alarm systems, fire detection, addressable, 100 detectors, includes outlets	, boxes, conduit an	d١	,
	Fire alarm command center, addressable with voice, excl, wire & conduit			
	Communication and alarm systems, includes outlets, boxes, conduit and wire, intercom system	s. 100 stations		
	Communication and alarm systems, includes outlets, boxes, conduit and wire, master TV anter	na svstems. 30 out	lei	
	Internet wiring, 2 data/voice outlets per 1000 S.F.	,,		
D5090	Other Electrical Systems		\$0.19	\$28.000
	Generator sets, w/battery, charger, muffler and transfer switch, gas/gasoline operated, 3 phase	. 4 wire. 277/480 V.	.8	+==,===
	Generator sets, w/battery, charger, muffler and transfer switch, diesel engine with fuel tank, 30	kW		
E Equipment & Furnish	inas	3.0%	\$4.79	\$723.500
E1090	Other Equipment	,0	\$4.79	\$723.500
	165.00-Laundry equipment, washer, residential, 4 cycle, average			··,
	165.00-Laundry equipment, dryers, gas-fired residential, 16 lb capacity, average			
	165.00-Refrigerator, residential appliances, no frost, 10 to 12 C.F., minimum			
	165.00-Range hood, residential appliances, vented, min, 2 speed, 30" wide, minimum			
	165.00-Garbage disposal, residential appliances, sink type, minimum			
	165.00-Dishwasher, residential appliances, built-in, 2 cycles, minimum			
	165.00-Cooking range, residential appliances, free standing, 1 oven, 30" wide, minimum			
F Special Construction		0.0%	\$0.00	\$0
G Building Sitework		0.0%	\$0.00	\$0

® 2014

1-800-334-3509 softwaresupport@rsmeans.com

3

	% of Total	Cost Per SF	Cost	
Sub Total	100%	\$158.89	\$24,009,500.00	
Contractor's Overhead & Profit	9.1 %	\$14.51	\$2,192,000.00	
Architectural Fees	0.0 %	\$0.00	\$0.00	
User Fees	5.3 %	\$9.24	\$1,396,500.00	
Total Building Cost	\$18	2.64	\$27,598,000.00	

1-800-334-3509 softwaresupport@rsmeans.com ® 2014

ID 0	Task Name Summary Schedule	Duration 1058 days	Start Tue 2/1/11	Jan '11	Apr '11 Jul '11	Oct '11 J	an '12 Apr '12	Jul '12	Oct '12 Jan '	13 Apr '13 Jul '1	.3 Oct '13 Jan '14	Apr '14 Jul '1	4 Oct '14 Jan '15 Apr '15 Summary S
1	Conceptual Design and Estimate	370 days	Tue 2/1/11					Conce	eptual Design a	and Estimate			
2	Design Development Design and Estimate	162 days	Sun 7/1/12							Design Develop	ment Design and E	stimate	
3	NTP	0 days	Mon 2/11/13							NTP			
4	Site Prep	123 days	Mon 2/11/13								Site Prep		
10	Install Permanent Power	348 days	Wed 3/27/13										Install Permanent Power
8	Install Temp Power	26 days	Mon 4/29/13							Insta	ll Temp Power		
9	Temp Power On	0 days	Mon 6/3/13							🔶 Tem	o Power On		
11	Permanent Power On	0 days	Thu 7/25/13							•	Permanent Power	On	
5	Excavation	107 days	Thu 8/1/13	-							Exca	avation	
12	Insall Footing and Tower Crane	1 day	Wed 10/30/13								Insall Foo	ting and Tower (Crane
13	Place Mat Slab	26 days	Tue 11/26/13								Plac	ce Mat Slab	
14	Foundation Walls, Pits etc	22 days	Tue 12/17/13								🔲 Fo	oundation Walls,	Pits etc
15	Form Supported Slabs Through Ground Floor	57 days	Tue 12/24/13									Form Suppor	ted Slabs Through Ground Floor
16	Reinforce Supported Slabs Through Ground Flo	or 54 days	Fri 12/27/13									Reinforce Su	pported Slabs Through Ground I
		F 4 - I - · · ·	T 10/01/10	-									ted Slobe Through Cround Flee
1/	Place Supported Slabs Inrough Ground Floor	54 days	Tue 12/31/13	-									ted Slabs I nrough Ground Floo
18	Form Supported Slabs Above Ground Floor	59 days	The 3/18/14	_								Porr	former Supported Slabs Above Ground
19	Reinforce supported slabs Above Ground Floo	r 60 days	inu 3/20/14									Rein	norce supported Slabs Above G
20	Place Supported Slabs Above Ground Floor	59 days	Mon 3/24/14									Plac	e Supported Slabs Above Groun
23	Install Brick	95 days	Thu 3/27/14										Install Brick
25	Rough-In Mech/Elec/ TD	127 days	Thu 4/3/14										Rough-In Mech/Elec/ TD
22	Frame/ Sheath/ Tyvek	77 days	Tue 4/22/14										Frame/ Sheath/ Tyvek
26	Finishes	156 days	Fri 5/30/14										Finishes
24	Install Windows	65 days	Wed 6/4/14										Install Windows
21	Structure Top out	0 days	Thu 6/12/14									💊 Stru	cture Top out
7	Courtyard Improvements	64 days	Mon 7/28/14										Courtyard Improvemer
28	Final Inspections	144 days	Mon 8/4/14										Final Inspec
6	Site Improvements	61 days	Thu 8/7/14										Site Improvements
27	Punchlist/ Owner Walks	92 days	Fri 9/12/14										Punchlist/ Ow
29	Turnover Garage - Second Floor	0 days	Wed 12/10/14										Turnover Garage -
30	Turnover 3rd Floor	0 days	Wed 12/17/14										🔶 Turnover 3rd Floo
31	Turnover 4th Floor	0 days	Wed 12/24/14										Turnover 4th Floe
32	Turnover 5th Floor	0 days	Wed 12/31/14										💊 Turnover 5th Flo
33	Turnover 6th Floor	0 days	Wed 1/7/15										🔹 Turnover 6th Fl
34	Turnover 7th Floor	0 days	Wed 1/14/15										🔹 Turnover 7th Fl
35	Turnover 8th Floor	0 days	Wed 1/21/15										🔶 Turnover 8th F
36	Turnover 9th Floor	0 days	Wed 1/28/15										Turnover 9th
37	Turnover 10th Floor	0 days	Wed 2/4/15										◆ Turnover 10t
	Task		Project Summary		l Man	ual Task		Sta	art-only	E	Deadline	+	
Proje	ect: Summary Schedule		Inactive Task		Dura	ation-only		Fir	nish-only	Э	Progress		_
Date	: Mon 10/20/14 Milestone	♦	Inactive Milestone		Man	ual Summarv Ro		Ex	ternal Tasks		- Manual Progress		
	Summarv		Inactive Summarv	I.	Man	ual Summarv		Ex	ternal Milestone	\diamond	5		
			, ,			Pa	ne 1						

APPENDIX 5: PRESENTATION COMMENTS AND RESPONSE

Comment	Response/Action
Validate design-build subcontractor contract. Cannot be with the GC and Architect.	Validated and updated the org chart such that the design-build subs are contracted only with the GC
Include design phase in summary schedule	Design phase added to summary schedule