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 consist 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 11th**, **2013** and will reach substantial completion on **February 19th**, **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 11th, 2013 and will reach substantial completion on February 19th, 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 10th and final floor is set for February 19th, 2015. The complete detailed CPM construction schedule can be found in Appendix 1.

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 th Floor)	-	2/19/15	-

Table 1: Detailed Schedule Overview

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 RSMeans 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.

ltem	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
Total including tax, overhead and profit	\$6,161,674
Cost per SF	\$40.78

Table 2: Detailed Structural Estimate Summary

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, 2nd through 5th, 6th through 8th, 9th-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.

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

Table 3: Mechanical Assembly Summary

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.

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

Table 4: Electrical Assembly Summary

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.

PLUMBING ASSEMBLY ESTIMATE

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

Table 5: Plumbing Assembly Estimate Summary

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

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 RSMeans 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.

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
Total	\$2,109,776	\$87,907

Table 6: General Conditions Summary

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.





ESTIMATE SUMMARY

In Technical Assignment Two, a square foot estimate was conducted using RSMeans 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%. This this case, the square foot estimate was within 10% of the actual GMP contract (\$32,752,717).

	Est	imate Sumr	ma	ry		
		Te	ch	1	Te	ch 2
CSI Division	Description	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
		Subtotal	\$:	26,830,250.00		\$29,157,326.78
	Winter We	ater Allowance	\$	100,000.00		\$ 100,000.00
	Subcontractor Bon	ding Allowance	\$	299,426.00		\$ 299,426.00
		Contingency	\$	968,521.00		\$ 968,521.00
		GL Insurance	\$	266,140.00		\$ 266,140.00
		Fee (3.25%)	\$	871,983.13		\$ 947,613.12
	I	Precon Services	\$	75,000.00		\$ 75,000.00
		Total	\$:	29,411,320.13		\$ 31,814,026.90

Table 7: Estimate Summary

A direct comparision 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 estiamte. One of the reasons the structural cost increased is because post tensioning was excluded in the square foot estiamte. 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





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.





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 paces 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 pursing 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 pursing 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.

/ ID	Activity Name	Original St	tart	Finish	Predecessors	013	Qtr 2, 20	013	Qtr 3, 20)13	Q	tr 4, 20	13	Qtr 1	1, 2014		Qtr 2, 2	014	Qtr	3, 2014		Qtr 4,	2014	Qtr
		Duration				Mar Ap	or May	Jun Ju	ul Aug	Sep	Oct	Nov	Dec	Jan F	eb N	/lar Api	r May	Jun	Jul	Aug S	Зер (Oct N	ov Dec	; Jan
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A.1 Apartment B	uilding	530 02	2-11-13	02-19-15								1					i	i.						
A.1.1 CONSTRUCT	TON	530 02	2-11-13	02-19-15			1		1		1	1	 		1		1	1				<u> </u>		
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SITE 1010	INSTALL SITE FENCE	5 02	2-13-13*	02-19-13		INSTALL SITE F	ENCE																	
	INSTALL SEDIMENT/EROSION CONTROLS	5 02	2-13-13*	02-19-13	SITE 1010	INSTALL SEDI	MEINT/ERO:		OLS								-							
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	EXCAVATION / LAGGING MOBILIZATION 2	20 09	9-17-13*	10-15-13	SITE1200						; EX	; XCAVAT	ION / LA	GGING M	10BILIZA	TION 2		i.						
SIТЕ1220	REMOVE DIRT NEEDED FOR TOWER CRANE ERECTION	10 10)-31-13*	11-13-13	CONC1000						Γ-	RE	MOVE D			OWER CRA	NE							
SITE1230	INSTALL FINAL PHASE OF RAKERS	20 11	-14-13*	12-12-13	SITE1220									TALL FINAL		OF RAKER	s	ł						
SITE1240	EXCAVATION / LAGGING MOBILIZATION 3	15 11	-29-13	12-19-13	SITE 1230									XCAVATIO		GING MO	BILIZATIO							
	OVEMENTS	68 07		10-30-14							÷												0-30-14 A	112 SI
A.1.1.2.1 SITE		68 07	-28-14	10-30-14													-		-				0-30-14, A	.1.1.2.1
Ξ SITE1250	INSTALL PLANTERS	15 07	/-28-14*	08-15-14								1								INST/	ALL PLA	NTERS		
SITE 1260	INSTALL PLANTERS/PAVERS/HARDSCAPE	20 08	8-07-14*	10-02-14													-		Ē			INSTALL F	LANTERS/F	PAVERS/
SITE1270	GUNITE POOL	10 08	8-11-14*	08-22-14	SITE 1250							1						Ì	ļ [- Gr	JNITE PC	OL		
SITE 1280	INSTALL TRELLIS	10 08	8-18-14*	08-29-14	SITE 1250														+		NS ALL	IRELLI\$		
SITE 1290	INSTALL / SET DECK AND AREA DRAINS	10 08	8-25-14*	09-08-14	SITE1270							1						i.			INSTA	LL / SET D		AREA DR
SITE1300	LANDSCAPING	20 10)-03-14*	10-30-14	SITE 1260												1					— <i>и</i>		ING
		324 04	-15-13	08-06-14			1		1			1	1 1	i.	1	i I	1	1		▼ 08-06- ⁻	14. A.1		ES	
UTIL1030	SEWER - RUN SERVICE	30 09	9-11-13*	03-31-14							-					SEV	, Ver - Run		E I					
UTIL1050	GAS - RUN LINE/ TURN ON SER VICE	5 10)-31-13*	11-26-13							+		GAS - F			I SER VIC E			+	·		····· !		
UTIL1110	STORM - RUN SERVICE	5 04	I-01-14*	04-07-14												s 🗖	to'RM - R	UN SERVI	CE					
UTIL1120	WATER - RUN SERVICE	5 04	-08-14*	04-21-14	UTIL1110									-				RUN SE	RVICE					
UTIL1140	COMCAST - RUN/PULL/TERMINATIONS	10 06	5-11-14*	07-09-14								1 1 1								ICAST - RI	UN/PUIL	./TERMINA		
UTIL1150	VERIZON - RUN/PULL/TERMINATIONS	10 07	7-10-14*	08-06-14	UTIL1140															VERIZO	ON - RU	I/PULL/TEF		NS
A 1131 TEMP	POWER	25 04	-15-13	05-20-13				05-20-13 A	1.1.3.1 TEM	POWER	i										····]			·
UTI1000	INSTALL CONDUIT	5 04	-15-13*	04-19-13				CONDUIT										-						
UTI1010	INSTALL TEMP ELECTRIC SHED AND CABINET/METER	10 04	-15-13*	05-17-13	UTI1000			INSTALL TEMP	ELECTRIC S	HED AND		: Et/Mete	Ŕ					ł						
			-		<u> </u>	L					I		<u> </u>	i			1	1		i				

	Activity Name	Original	Start	Finish	Predecessors	013		tr 2, 201	13	Qtr 3, 2013	5	Qtr	4, 2013	Q	tr 1, 2014		Qtr 2, 2	014	Qt	r 3, 201	14	Qt	r 4, 2014	4	Qt
		Duration				Mar	Apr	May	Jun	Jul Aug	Sep	Oct	Nov Dec	Jan	Feb I	Var Ap	or May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jar
UTI1020	TEMP POWER ON	0	05-20-13*		UTI1010		1	└→ 11	TEMP POV	NER ON, 05-20-1	*									1					
4.1.1.3.2 PERM P	OWER	85	03-27-14	07-28-14			¦ ⊥									-				07-28-	14, A.1.1.	.3.2 PER		۲	
UTI1030	INSTALL DUCT BANK AND CONDUIT	5	03-27-14*	05-21-14														INSTALL	DUCT BA	NK AND	CONDU	JT			
UTI1040	RELEASE AND PULL CONDUCTORS	0	05-22-14*	07-25-14	UTI1030	1	1 1 1						1				_ └ ►∎			RELEAS	E AND PU	JL CON	DUCTORS	5	
🔲 UTI1050	TURN ON PERMANENT POWER	0	07-28-14*		UTI1040								1	-					L=>	TURN C	¢N PERΜ∕	ANENT F	OWER, 07	7-28-14*	*
A.1.1.4 FOUNDATIO	DNS	63	10-16-13	01-15-14		i I I								0	1-15-14¦ A	1.1.4 FOL	INDATION	S		;					
CONC1000	INSTALL FOOTING AND TOWER CRANE	11	10-16-13*	10-30-13	SITE1210						ب	-	INSTALL FOO	DTING AN	D TOWER C	RANE									
CONC1010	INSTALL MUD MAT / WATERPROOFING	20	11-04-13*	12-02-13	CONC1000						i i	الجا	INS	TALL MUD	MAT / WA	TERPROOF	FINĠ			;					
CONC1020	IN MAT PLUMB/ ELEC	25	11-11-13*	12-16-13	CONC1010									IN MAT P	LUMB/ELEC	>									
CONC1030	INSTALL MAT SLAB	25	11-26-13*	12-31-13	CONC1020						i i	i				AВ				;					
CONC1040	FOUNDATION WALLS, PITS, ETC	20	12-17-13*	01-15-14	CONC1030									F	OUNDATIC	N WALLS,	PITS, ETC			:					
A.1.1.5 SUPPORTED	D SLABS THRU GROUND FL	38	12-24-13	03-17-14												03-17	-14, A.1.1.	5 SUPPO	RTED SLA	BS THRU	GROUN	C FL			
CONC1050	G1 SLAB - FORM/ RESTEEL/ PLACE	5	12-24-13*	01-17-14				[[G1 SLAB - F	ORM/ RES	TEEL/ PLAC	CĘ							
CONC1060	GROUND FLOOR SLAB - FORM / RESTEEL / PLACE	5	02-12-14*	03-17-14	CONC1050											GROU	IND FLOO	r slab - I	FORM/RE	esteel/ f	IACE				
A.1.1.6 SUPPORTED	D SLABS ABOVE GROUND FL	55	03-18-14	06-12-14									1	1			1	0	6-12-14,	A.1.1.6 \$	SUPPORTE		SABOVE	GROUN	ID F
CONC1070	2ND FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	03-18-14*	03-26-14			, 1 1									2 NI	D FLOOR S	LÁB - FO	RM/ REST	EEL/ PLA	CE				
CONC1080	3RD FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	03-27-14*	04-03-14	CONC1070											► <u></u> 3	RD FLOOR	SLAB - F	ORM/ RE	steel/ Pi	ACE				
CONC1090	4TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	04-04-14*	04-11-14	CONC1080		+ 		·								4TH FLOC	R SLAB -	FORM/ R	ESTEEL/	PLACE	· · · · · ·			
CONC1100	5TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	04-14-14*	04-21-14	CONC1090		1										; 5TH FL		B - FORM	/ RESTEE	L/ PLACE	E ,			
CONC1110	6TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	04-22-14*	04-28-14	CONC1100											L L			AB - FOR	M/ REST	EEL/ PLA	C E			
CONC1120	7TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	04-29-14*	05-05-14	CONC1110						Ì	Ì						i I FLOOR	SLAB - FO	RM/ RE	STEEL/ PL	ACE			
CONC1130	8TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	05-06-14*	05-12-14	CONC1120									-			⊢ 8		R SLAB - I	FORM/ F	RESTEEL/I	PLACE			
CONC1140	9TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	05-13-14*	05-19-14	CONC1130						·	·						9TH FLO	OR SLAB	- FORM/	RESTEEL				
CONC1150	10TH FLOOR SLAB - FORM/ RESTEEL/ PLACE	5	05-20-14*	05-27-14	CONC1140														LOOR SL	AB - FOI	RM/ REST	EEL/PL	CE		
CONC1160	ROOF SLAB - FORM/ RESTEFT / PLACE	5	05-28-14*	06-12-14	CONC1150						i i		1							B - FORN	A/ RESTEE		F		
		53	03-27-14	09-02-14									1								₩ 09-02	14 Δ 1	1 7 SKIN		
	INSTALL INTERIOR CMU	5	03-27-14*	04-16-14	CONC1070						i i	i i					INSTALL		ксми	÷		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
SKIN1010	ROOF - SUPPORTS/ CURBS/ WATERPROOFING	5	03-27-14*	08-22-14			+						·						+	!	ROOF - 5	SIPPOR		/WATFI	RPF
		5	04-22-14*	08-06-14	SKIN1000	_												1			ME/ SHE/		/FK		
SKIN1020		5	04-22-14	00-00-14	CONC1150																				
		122	04 02 14	10 10 14	CONCTISU												-	-	I I	, 				11000	
	E (INCLUDES MAIN ELECTRIC ROOM AND G	60	04-03-14	06-26-14													1	-	06-26-	14 A 1 1	81 64	RAGE (FIF
RGH1000	MEP ROUGH-IN	40	04-03-14*	05-29-14							·	·	·					MEP	ROUGH-II	N					
	POUR MECH PADS	5	05-22-14*	05-29-14	RGH1000								1						MECH	PADS					
RGH1030		20	05-30-14*	06-26-14	RGH1020														SET FOI						
		57	05-21-14	08-12-14	KOIIIO20	-			1		-	-	1							08	12-14	11182	GROUNT		D II
RGH1010	PLUMBING STACKS/ HVAC RISERS	5	05-21-14*	05-28-14	RGH1050		1 1 1												BING STA	CKS/H		.FS			. 01
RGH1130	LAYOUT FLOOR	5	07-04-14*	07-11-14			+											1	 LA	YOUT FI	OOR			+	
RGH1180		5	07-14-14*	07-18-14	RGH1130		1 1 1																NG WAII	SANDS	SHA
RGH1210	DUCIWORK ROUGH-IN	5	07-21-14*	07-25-14	RGH1130		1									1									
			07-24-14	07-20-14	PGH1200		1 1 1																		
		5 F	07-29-14*	02 01 14	DCH1210											1									
	rravie IVIEIAL 31003	5	07 24 44	00-01-14							· · · · ·		·												
		5	07 24 44*	08-06-14	KGH1330		1									1				set a			owers		
КСН1330		5	07-31-14^	08-06-14	KGH1300		1 1 1						1									UGH-I			
RGH1370	ELECTRICAL ROUGH-IN	5	08-05-14*	08-11-14	KGH1330		- - - -						1								CTRICAL	.ROUGH	I-IN		
RGH1420		0	08-12-14*		RGH1370																UNTY INS	SPECTIC	DNS, 08-12	2-14*	
A.1.1.8.3 GROUN		49	07-14-14	09-22-14	DOUMERS		; +					·					····					J9-22-1	4, A.1.1.8.	3 GROL	UN
🔲 RGH1190		8	07-14-14*	07-23-14	KGH1130		1													LAYOUT	FLOOR			-	
				00 0/ 14	DCU1100 DCU1010					1 1						1					1	- OKOK		L'DC	

	Activity Name	Duratian	Start	Finish	Predecessors	013	6	atr 2, 2	2013		Qtr 3, 2	2013		Qtr 4, 2	013		Qtr 1, 2	014		Qtr 2	2014			, 2014		Qtr 4, 2	014	Qtr 1, 2
		Duration				Mar	Apr	May	y Jun	Jul	I Aug	g Sep	Oct	t Nov	Dec	Jai	n Feb	Mar	r Ap	r M	ay Ju	un J	Jul A	ug Se	ep (Oct Nov	Dec	Jan F
RGH1290	FRAME CORRIDOR DEMISING WALLS AND SHAFT WALLS	10	07-24-14*	08-06-14	RGH1190																			FRAME	CORRIE	OR DEMISI	NG WALLS	S AND SHAF
RGH1340	DUCTWORK ROUGH-IN	10	07-31-14*	08-13-14	RGH1190																			DUCTV	VORK	OUGH-IN		
RGH1430	SPRINKLER ROUGH-IN	10	08-12-14*	08-25-14	RGH1450																		_	SPR		ROUGH-IN		
RGH1450	FRAME METAL STUDS	10	08-14-14*	08-27-14	RGH1340							-							-				┞╼┦	FR/	ame <mark>m</mark>	ETAL STUDS		
RGH1520	PLUMBING ROUGH-IN	10	08-26-14*	09-09-14	RGH1450													i.	i.						PLUN	BING ROUG	H-IN	
RGH1580	ELECTRICAL ROUGH-IN	10	09-08-14*	09-19-14	RGH1520							-		-										╘┝┏	Ė LE	CTRICAL RC	UGH-IN	
💼 RGH1640	COUNTY INSPECTIONS	0	09-22-14*		RGH1580																			i la	🔶 İda	JUNTY INSP	ECTIONS,	, 09-22-14*
A.1.1.8.4 2ND FL	OOR	32	06-05-14	07-22-14																	-		 p7-:	22-14, A .	1.1.8.4	2ND FLOO	R	
RGH1040	LAYOUT FLOOR	7	06-05-14*	06-13-14																	, in	LAYO		R				
RGH1050	PLUMBING STACKS/ HVAC RISERS	7	06-05-14*	06-13-14	RGH1040	1																PLUM	BING ST/	ACKS/HV	AC RI	SERS		
🔲 RGH1060	FRAME CORRIDOR DEMISING WALLS AND SHAFT WALLS	7	06-16-14*	06-24-14	RGH1050																	FR	AMECO	RRIDOR	DEMISI	NG WALLS /	ND SHAF	FT W ALLS
RGH1080	DUCTWORK ROUGH-IN	7	06-23-14*	07-01-14	RGH1040							-										- 🗖 T	очтоис	RK ROUC	SH-IN			
RGH1100	SPRINKLER ROUGH-IN	7	06-30-14*	07-09-14	RGH1110																		SPRINK		GH-IN			
RGH1110	FRAME METAL STUDS	7	07-02-14*	07-11-14	RGH1080	 					!					!	!		!	!		╎┞═╁╧	FRAME	METAL	STUDS			
RGH1150	SET AND CONNECT TUBS/SHOWERS	7	07-09-14*	07-17-14	RGH1160	_																	🖪 SET A		INEÇT 1	IUBS/\$HOW	ERS	
RGH1160	PLUMBING ROUGH-IN	7	07-09-14*	07-17-14	RGH1110			1				:		-		}	-	}	1			, 🛏		IBING RC	UGH-I	N		
RGH1170	ELECTRICAL ROUGH-IN	7	07-11-14*	07-21-14	RGH1160							-							-						ROUGI	H-IN		
RGH1240	COUNTY INSPECTIONS	0	07-22-14*		RGH1170																	i 🕴 🕻			PECTIC	ONS. 07-22-	14*	
A 1 1 8 5 3RD/4T	TH FLOOR	65	06-16-14	09-17-14																		<u>i li li li li</u>			09.1	17-14¦Δ11	85 3RD/	
RGH1070	PLUMBING STACKS/ HV AC RISERS	7	06-16-14*	07-03-14	RGH1050	_								i.					i.				PLUMBIN		(S/ HV	AC RISERS		
RGH1090		7	06-25-14*	07-15-14	RGH1060									-									- FRAM					SHAFT WA
		7	07-02-14*	07-22-14	PCH1080	_																			POLICI			
		7	07-02-14	07-22-14	RG11060			1		1		:				:		ł	1					SDDINIKI				
BCU1250		7	07-21-14	00-07-14	RGH1230, RGH1100																	· <mark></mark>						
RGH1250		7	07-23-14	00-11-14	RGH1120, RGH1110	_ {																						
RGH1400	SET AND CONNECT IUBS/SHOWERS	/	08-07-14"	08-27-14	RGH1410, RGH1150														-				F.				JR2/2HO/	WERS
RGH1410	PLUMBING ROUGH-IN	7	08-07-14*	08-27-14	RGH1250, RGH1160	_																			JMBING	3 ROUGH-IN	N	
RGH1510	ELECTRICAL ROUGH-IN	7	08-21-14*	09-16-14	RGH1410, RGH1170													-					4		ELEC	TRICAL ROI	JGH-IN	
RGH1630	COUNTY INSPECTIONS	0	09-17-14*		RGH1510																				🕨 Ç <mark>o</mark> l	JNTY INSPEC	CTIONS, 0)9-17-14*
A.1.1.8.7 5TH/6T	HFLOOR	48	07-04-14	09-12-14				1				1				-			1						09-12	2-14, A .1.1.8	.7 5TH/61	TH FLOOR
BGH1140	PLUMBING STACKS/ HV AC RISERS	5	07-04-14*	07-18-14		_																- 17		IBING ST		HVAC RISE	RS	
RGH1200	FRAME CORRIDOR DEMISING WALLS AND SHAFT WALLS	5	07-16-14*	07-29-14																			FR	AME OC	DRRIDD	R DEMISINC	WALLS A	AND SHAFT
RGH1260		5	07-23-14*	08-05-14																				DUCTWC		UGH-IN		
RGH1350		5	08-04-14^	08-15-14	RGH1380								.									·		SPRIN		JUGH-IN		-++-
RGH1380	FRAME METAL STUDS	5	08-06-14*	08-19-14	RGH1260	_						-							-						/IE MILT.	ALSTUDS		
RGH1460	SET AND CONNECT TUBS/SHOWERS	5	08-18-14*	08-29-14	RGH1470	_								Ì										- SE		CONNECT T	UBS/SHO	WERS
RGH1470	PLUMBING ROUGH-IN	5	08-18-14*	08-29-14	RGH1380							-							-						UMBIN	G ROUGH-I	N	
RGH1530	ELECTRICAL ROUGH-IN	5	08-28-14*	09-11-14	RGH1470																			-	ELÉCI	RICALROU	GH-IN	
RGH1590	COUNTY INSPECTIONS	0	09-12-14		RGH1530) CO	NTY INSPECT	10NS, 09)-12-14
A.1.1.8.9 7TH/8T	H FLOOR	48	07-21-14	09-26-14																					 P	}-26-14, A.1	.1.8.9 7TI	H/8TH FLOC
RGH1230	PLUMBING STACKS/ HVAC RISERS	5	07-21-14*	08-01-14																			P	LUMBINC	g stac	KS/HVAC F	RSERS	
RGH1310	FRAME CORRIDOR DEMISING WALLS AND SHAFT WALLS	5	07-30-14*	08-12-14																			· 🗖	FRAME	CORR	IDOR DEMIS	ING WAL	LIS AND SH
RGH1390	DUCTWORK ROUGH-IN	5	08-06-14*	08-19-14		1		1		1		1				ł			1				📮	rpuç	twoʻf k	. ROUGH-IN	1	
BGH1480	SPRINKLER ROUGH-IN	5	08-18-14*	08-29-14	RGH1490							-							-				┥╽┢╸	• — \$P	RINKLE	R ROUGH-I	Ν	
🚃 RGH1490	FRAME METAL STUDS	5	08-20-14*	09-03-14	RGH1390																		╶╴╴╴╴╴╴╴	- F	RAM	METAL STUD	'S	
RGH1540	SET AND CONNECT TUBS/SHOWERS	5	09-02-14*	09-15-14	RGH1550																				SĘT /	AND CONN	ECT TUBS/	/SHOWER'S
RGH1550	PLUMBING ROUGH-IN	5	09-02-14*	09-15-14	RGH1490							-	-											┕╤╋╈	PLUN	/IBING ROU	GH-IN	
RGH1600	ELECTRICAL ROUGH-IN	5	09-12-14*	09-25-14	RGH1550							1		-												LECTRICAL	NOUGH-IN	N
RGH1650	COUNTY INSPECTIONS	0	09-26-14*		RGH1600							-												זן	⊷ :		PECTIONS	s, 09-26-14*
		40	08-04-14	10-10-14							!						!			i				<u>-</u>			Δ 1191	11 отµ/1dті

	Activity Name	Original	Start	Finish	Predecessors	013	Q	tr 2, 20	13	Q	tr 3, 20	13	Q	tr 4, 20	13	Q	tr 1, 20	J14
		Duration				Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Ν
e RGH1360	PLUMBING STACKS/ HVAC RISERS	5	08-04-14*	08-15-14				1										
e RGH1440	FRAME CORRIDOR DEMISING WALLS AND SHAFT WALLS	5	08-13-14*	08-26-14			1 1 1	1			1						1	
🔲 RGH1500	DUCTWORK ROUGH-IN	5	08-20-14*	09-03-14				1										Ì
🔲 RGH1560	SPRINKLER ROUGH-IN	5	09-02-14*	09-15-14	RGH1570		' ' '	 				 			 	 	1	
e RGH1570	FRAME METAL STUDS	5	09-04-14*	09-17-14	RGH1500		+ 	 				 						
e RGH1610	SET AND CONNECT TUBS/SHOWERS	5	09-16-14*	09-29-14	RGH1620			1			1	1			1	1		1
🔲 RGH1620	PLUMBING ROUGH-IN	5	09-16-14*	09-29-14	RGH1570		1 1 1					-						į.
🔲 RGH1660	ELECTRICAL ROUGH-IN	5	09-26-14*	10-09-14	RGH1620		1 1 1					:			:	:		ł
BGH1670	COUNTY INSPECTIONS	0	10-10-14*		RGH1660		1 1 1					-						
A.1.1.9 FINISHE	S	155	05-30-14	01-05-15			+	 !										1
A.1.1.9.1 GA	RAGE	80	05-30-14	09-22-14			1 1 1	1				-		1	- - -		1	-
FNSH1000	DOORS/FRAMES/HARDWARE	20	05-30-14	06-26-14	RGH1000		1	1			1	1		1				
FNSH1010	PAINT	15	06-27-14	07-18-14	FNSH1000		, , ,					- - -			-			}
FNSH1020	MEPS FINISHES	20	07-21-14	08-15-14	FNSH1010			1										Ì
FNSH1120	FLOORING	15	08-18-14	09-08-14	FNSH1020		±	L	L		 	 !	+ !	L	· I			- I !
FNSH1320	STRIPING/SIGNAGE	10	09-09-14	09-22-14	FNSH1120												1	i.
A.1.1.9.2 GR	OUND FLOOR UNITS	43	08-12-14	10-10-14								-			1			1
FNSH1100	INSULATION, GYP & TAPE	13	08-12-14	08-28-14	RGH1370													ł
FNSH1140	DR S, FRMS, HRWR	5	08-21-14	08-28-14	FNSH1100		1 1 1	-					1		-	1	1	ł
FNSH1170	CERAMIC TILE	5	08-28-14	09-05-14	FNSH1100		+						+ !					
FNSH1180	PAINT PRIME	5	08-28-14	09-05-14	FNSH1100			1										Ì.
ENSH1190	KITCH CABS	5	08-28-14	09-05-14	FNSH1180	-	1					1			1	-		1
ENSH1200	COUNTERS	5	08-28-14	09-05-14	FNSH1190	_	, , , ,					-			ļ			
		5	08-28-14	09-05-14		-		1			1	-			1			
		5	08-28-14	09-05-14	ENSH1210		, +	- 										
			00-20-14	10 10 14		_	1 1 1					:			:	:		ł
FINSH1230		30	08-28-14	10-10-14	FNSHTTUU	_	1 1 1	1				-			-		1	-
FINSH1280	APPLIANCES	5	09-05-14	09-12-14	FNSH1210	_	1	1				1	1	1			1	
FNSH1290	FLOORS	5	09-05-14	09-12-14	FNSH1210		1 1 1								-			-
A.1.1.9.3 GR		75	09-22-14	01-02-15			¦ ¦	¦ 	¦				¦	¦				
FNSH1370	INSULATION, GYP & IAPE	18	09-22-14	10-15-14	FNSH1100, RGH1640		1 1 1					-						-
FNSH1500	DR S, FRMS, HRWR	8	10-08-14	10-17-14	FNSH1370	_	1	1				1		1			1	-
FNSH1590	CERAMIC TILE	8	10-15-14	10-24-14	FNSH1370		1 1 1					1 1 1			- - -	1		1
FNSH1600	PAINT , PRIME	8	10-15-14	10-24-14	FNSH1370												1	-
FNSH1630	MILLWORK PH 1	15	10-20-14	11-07-14	FNSH1600		 					¦ 	¦			¦	 	<u> </u>
FNSH1780	COUNTER TOPS	10	11-03-14	11-14-14	FNSH1630		1 1 1	, , ,			1	 	1	1		- - -	1	
FNSH1860	FINISH PAINT	10	11-10-14	11-21-14	FNSH1780		1				1							1
FNSH1930	FINISH MEP	8	11-17-14	11-26-14	FNSH1860							-					1	
FNSH1970	TILE FLOORS	15	11-24-14	12-12-14	FNSH1860		1				1	-			1			1
FNSH1980	COMMON AREA FINISHES	30	11-24-14	01-02-15	FNSH1860							-					1	
FNSH2060	HARD WOOD FLOORS	15	12-08-14	12-26-14	FNSH1970	1	 !	 !										1
A.1.1.9.4 2NE	FLOOR	81	07-22-14	11-12-14			1 1 1				1 1 1	-						-
FNSH1030	MEPS/FRAMING INSPECTION	2	07-22-14	07-23-14	RGH1240		1 1 1				1	-	-		1		1	
FNSH1040	INSULATION	2	07-24-14	07-25-14	FNSH1030		1 1 1	1			1	-						-
FNSH1050	INSULATION/CLOSE IN INSPECTION	2	07-28-14	07-29-14	FNSH1040		1 1	1			 	1 1 1	1 1 1	1			1	Ì
FNSH1060	BOARD / TAPE / SAND	15	07-30-14	08-19-14	FNSH1050	1	+ !	L	L		 !	J		L !	 			- 1
FNSH1130	TEX TURED CEILINGS	5	08-20-14	08-26-14	FNSH1060							-						
	PRIME PAINT / FINISH COAT MECH. RMS	8	08-27-14	09-08-14	FNSH1130		1					-						ł
FNSH1300	PRE-HUNGS AND BASE	8	09-08-14	09-17-14	FNSH1160							-						
= FNSH1310	KITCH CABS	8	09-08-14	09-17-14	FNSH1160			1				1	1	1	1 1		1	i.
		0	0, 00-14	5, 1,-14		1	1				1	1	1		1	1	1	<u>:</u>



	Activity Name	Duration	Start	Finish	Fredecessors	013		u 2,20	13	Q	u 3, 20	13	Q Q	1 4, 20	13		. 1, 20	J1 T
		Duration				Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	4
FNSH1	340 CERAMIC TILE	8	09-18-14	09-29-14	FNSH1310		1				1	-					-	
FNSH1	350 COUNTERS	8	09-18-14	09-29-14	FNSH1310													÷
FNSH1	420 FINISH PAINT	8	09-29-14	10-08-14	FNSH1350		1			1	1	-					-	
FNSH1	510 FINISH MEP	8	10-09-14	10-20-14	FNSH1420		1			1 		-					-	
FNSH1	520 MIRRORS / SHELVING	8	10-09-14	10-20-14	FNSH1420]	!		[]		}	¦	!	l	{			ł
ENSH1	530 APPLIANCES PH 1	3	10-09-14	10-13-14	FNSH1420		1	1		1	- - -	-						
FNSH1	640 FLOORS	8	10-20-14	10-29-14	FNSH1510							1					-	ł
FNSH1	740 APPLIANCES PH 2	3	10-30-14	11-03-14	FNSH1640						-	-					1	
FNSH1	750 UNIT ENTRY DOORS/HW	5	10-30-14	11-05-14	FNSH1640							į						ł
FNSH1	760 CORRIDOR/COMMON AREA FINISHES	10	10-30-14	11-12-14	FNSH1640		1				1	-					-	
🖶 A.1.1.9.5	5 3RD/4TH FLOOR	84	07-31-14	11-26-14			+ 				 	 	+				{ }	÷
FNSH1	070 MEPS/FRAMING INSPECTION	2	07-31-14*	08-18-14					: :	1	1	1	}	-			1	
FNSH1	080 INSULATION	3	08-04-14*	08-21-14	FNSH1070													-
FNSH1	090 INSULATION/CLOSE IN INSPECTION	2	08-07-14*	08-25-14	FNSH1080		1	1									-	
FNSH1	110 BOARD / TAPE / SAND	15	08-13-14*	09-10-14	FNSH1090, FNSH1060							1					-	111,
FNSH1	260 TEXTURED CEILINGS	5	09-04-14*	09-17-14	FNSH1110					 				L				
FNSH1	330 PRIME PAINT / FINISH COAT MECH. RMS	8	09-11-14*	09-24-14	FNSH1260						1	1	1				-	
ENSH1	380 PRE-HUNGS AND BASE	8	09-22-14*	10-01-14	FNSH1330						-							
	390 KITCHCARS	8	09-22-14*	10-01-14	FNSH1330				:		:	:	1	}			1	
		2 2	10-02-14*	10-08-14	ENSH1300		1	1			- - -	-						
		0	10-02-14	10-00-14	FNSU1200													-ŀ-
		0	10-02-14	10-06-14	FINSH1390						-						-	
FINSH1	570 FINISH PAINT	8	10-13-14*	10-15-14	FNSH1450													
E FNSH1	670 FINISH MEP	8	10-23-14^	11-03-14	FNSH1570						1	-					-	
FNSH1	680 MIRRORS / SHELVING	8	10-23-14*	11-03-14	FNSH1570						-	-						
FNSH1	690 APPLIANCES PH 1	3	10-23-14*	10-27-14	FNSH1570							ļ	¦	¦	ļ		ļ	
FNSH1	790 FLOORS	8	11-03-14*	11-12-14	FNSH1670		1			1 1 1		-					-	
FNSH1	900 APPLIANCES PH 2	3	11-13-14*	11-17-14	FNSH1790				-			-					1	
FNSH1	910 UNIT ENTRY DOORS/HW	5	11-13-14*	11-19-14	FNSH1790		1			1								
FNSH1	920 CORRIDOR/COMMON AREA FINISHES	10	11-13-14*	11-26-14	FNSH1790				: :		1	:	}	-			1	
💾 А.1.1.9.7	7 5TH/6TH FLOOR	63	08-22-14	11-26-14			; ; ;	, , ,				¦ 	; ;					
FNSH1	150 MEPS/FRAMING INSPECTION	2	08-22-14*	09-02-14					: :		1	1	}	-			1	
FNSH1	240 INSULATION/CLOSE IN INSPECTION	2	08-29-14*	09-09-14	FNSH1250		1											
FNSH1	250 INSULATION	3	09-03-14*	09-12-14	FNSH1150				-	1 1 1	1	1	-	-			1	ł
ENSH1	270 BOARD / TAPE / SAND	10	09-04-14*	09-24-14	FNSH1240		1					-						ł
FNSH1	360 TEXTURED CEILINGS	5	09-18-14*	10-01-14	FNSH1270						1							Ì
FNSH1	400 PRIME PAINT / FINISH COAT MECH. RMS	5	09-25-14*	10-08-14	FNSH1360													1
FNSH1	460 PRE-HUNGS AND BASE	5	10-02-14*	10-15-14	FNSH1400						1	1	1				-	
FNSH1	470 KITCH CABS	5	10-02-14*	10-15-14	FNSH1400	1											-	
FNSH1	540 CERAMIC TILE	5	10-09-14*	10-22-14	FNSH1470		1	1		1		1		1				
FNSH1	550 COUNTERS	5	10-09-14*	10-22-14	FNSH1470						-						-	
FNSH1	610 FINISH PAINT	5	10-16-14*	10-29-14	FNSH1550	1	;				-i 	 	÷					Ť
FNSH1	700 FINISH MEP	5	10-23-14*	11-05-14	FNSH1610		1			1	1	1		1			-	
FNSH1	710 MIRRORS / SHELVING	5	10-23-14*	11-05-14	FNSH1610					 	1 1						1	
FNSH1	720 APPLIANCES PH 1	3	10-23-14*	11-03-14	FNSH1610							1	1				-	
FNSH1	770 FLOORS	5	10-30-14*	11-12-14	FNSH1700	1				1 1							-	
FNSH1	830 APPLIANCES PH 2	3	11-06-14*	11-17-14	FNSH1770	1		L					!	L				- -
FNSH1	840 UNIT ENTRY DOORS/HW	5	11-06-14*	11-19-14	FNSH1770							1 1 1					-	
FNSH1	850 CORRIDOR/COMMON AREA FINISHES	10	11-06-14*	11-26-14	FNSH1770		-		1		1						}	
	7TH/8TH FLOOR	62	09-26-14	12-22-14								1					-	
		02	1			Li					i	i	i	i	<u>.</u>	<u> </u>	<u> </u>	<u> </u>



	Activity Name	Original	Start	Finish	Predecessors	013	Q	tr 2, 20	13	Q	tr 3, 20	13	C	tr 4, 20	013	Q	tr 1, 20	14
		Duration				Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Ma
🛑 FNSH1410	MEPS/FRAMING INSPECTION	2	09-26-14	09-29-14	RGH1650			1 										
FNSH1430	INSULATION	3	09-30-14	10-02-14	FNSH1410		-				 				1	-		
FNSH1480	INSULATION/CLOSE IN INSPECTION	2	10-03-14	10-06-14	FNSH1430											-		
FNSH1490	BOARD / TAPE / SAND	10	10-07-14	10-20-14	FNSH1480													
FNSH1650	TEXTURED CEILINGS	5	10-21-14	10-27-14	FNSH1490			-			1					-		
FNSH1730	PRIME PAINT / FINISH COAT MECH. RMS	5	10-28-14	11-03-14	FNSH1650										- - - -	-		
FNSH1800	PRE-HUNGS AND BASE	5	11-04-14	11-10-14	FNSH1730		-+	L				J ! !		. .	-			
	КІТСН САВЅ	5	11-04-14	11-10-14	FNSH1730							1			-	-		
FNSH1870	CERAMIC TILE	5	11-11-14	11-17-14	FNSH1810						1					-	1	
FNSH1880	COUNTERS	5	11-11-14	11-17-14	FNSH1810	—					- - -				1	-		
ENSH1940	FINISH PAINT	5	11-18-14	11-24-14	FNSH1880													
	FINISH MED	5	11-25-14	12-01-14	FNSH1940								<u>.</u>		 	 		
		5	11 25 14	12-01-14							-							
		5	11-23-14	12-01-14	FNSH1940			:			:	1 1 1	1	1	1	:	1	
FINSH2010		3	11-25-14	11-27-14	FINSH1940						-				- - -	-		
FNSH2040	FLOORS	5	12-02-14	12-08-14	FNSH1990			1										
FNSH2070	APPLIANCES PH 2	3	12-09-14	12-11-14	FNSH2040				L				¦					
FNSH2080	UNIT ENTRY DOORS/HW	5	12-09-14	12-15-14	FNSH2040			-								-		
FNSH2090	CORRIDOR/COMMON AREA FINISHES	10	12-09-14	12-22-14	FNSH2040						1					1		}
A.1.1.9.11 9TH/1	0TH FLOOR	62	10-10-14	01-05-15				i.								i.		
FNSH1560	MEPS/FRAMING INSPECTION	2	10-10-14	10-13-14	RGH1670			-								-		
FNSH1580	INSULATION	3	10-14-14	10-16-14	FNSH1560								¦					
FNSH1620	INSULATION/CLOSE IN INSPECTION	2	10-17-14	10-20-14	FNSH1580						1							
FNSH1660	BOARD / TAPE / SAND	10	10-21-14	11-03-14	FNSH1620													
FNSH1820	TEXTURED CEILINGS	5	11-04-14	11-10-14	FNSH1660			1			1	1	1	-	1	-	1	1
FNSH1890	PRIME PAINT / FINISH COAT MECH. RMS	5	11-11-14	11-17-14	FNSH1820						- - -					-		
FNSH1950	PRE-HUNGS AND BASE	5	11-18-14	11-24-14	FNSH1890													
FNSH1960	KITCH CABS	5	11-18-14	11-24-14	FNSH1890													
FNSH2020	CERAMIC TILE	5	11-25-14	12-01-14	FNSH1960			ļ			ļ				Ì	ļ		
FNSH2030	COUNTERS	5	11-25-14	12-01-14	FNSH1960			-			1	1				-		
FNSH2050	FINISH PAINT	5	12-02-14	12-08-14	FNSH2030			-										
FNSH2100	FINISH MEP	5	12-09-14	12-15-14	FNSH2050						1	1				-		
FNSH2110	MIRRORS / SHELVING	5	12-09-14	12-15-14	FNSH2050							 	÷					
FNSH2120	APPLIANCES PH 1	3	12-09-14	12-11-14	FNSH2050			-			1					1		
FNSH2130	FLOORS	5	12-16-14	12-22-14	FNSH2100						-							
FNSH2140	APPLIANCES PH 2	3	12-23-14	12-25-14	FNSH2130			-			1					-		
FNSH2150	UNIT ENTRY DOORS/HW	5	12-23-14	12-29-14	FNSH2130						-							
ENSH2160	CORRIDOR/COMMON AREA FINISHES	10	12-23-14	01-05-15	FNSH2130								<u>.</u>					
A 1 1 10 WORK TO		69	09-12-14	01-19-15	1													
PNCH1000	GROUND FLOOR PUNCHLIST	5	09-12-14*	10-22-14				-			1					-		
PNCH1010	2ND FLOOR PUNCHLIST	5	10-30-14*	12-08-14														
PNCH1020	4TH FLOOR PUNCHUST	5	10-30-14*	12-08-14				}			:				1	}		
PNCH1030	5TH FLOOR PUNCHUST	5	11-06-14*	12-15-14														
		5	11_12_14*	12_22_14							: : :	1	1		1	:	1	
DNCU1050		5	11 12 14*	12-22-14							-					-		
PNCHI050		5	11-13-14	12-22-14				-			ļ				ļ	ļ		
PNCH1060		5	11-20-14*	12-29-14		_		-			1	1				1		
PNCH1070	8TH FLOOR PUNCHLIST	5	11-27-14*	01-05-15				¦ 				¦ 	¦ 	¦	¦ 			¦
PNCH1080	9TH FLOOR PUNCHLIST	5	12-04-14*	01-12-15				1				1						
PNCH1090	10TH FLOOR PUNCHLIST	5	12-11-14*	01-19-15				-			1	1				1	1	
A.1.1.11 ELEVATO	RS	437	02-27-13	11-17-14			1	1			1	1	i	1	1	i 1	1	i



Activi	rity ID	Activity Name	Original	Start	Finish	Predecessors	013		Qtr 2, 20	013	Q	tr 3, 20 ⁻	13	Q	tr 4, 20	013		Qtr 1, 2	2014		Qtr 2, 2	014	Q	tr 3, 20	14	Q	tr 4, 20	14	Qtr 1,	2015
			Duration				Mar	Ар	r May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	n Feb	o Ma	r Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb 3
	😑 ELEV 1000	PURCHASE ELEVATORS	4	02-27-13*	03-04-13		PUR	RĊHAS		DRS	-		⊧	-	-	1	+	-	-		-	-	-	F		П				
	😑 ELEV 1010	SHOPDRAWINGS	20	03-05-13*	04-01-13	ELEV 1000		📕 SH	OPDRAW	INGS	1 1 1	 	1 1 1	1	1		-							1 1 1		11				
	ELEV 1020	ENGINEERING / FABRICATION	70	03-13-14*	06-19-14	ELEV 1030																	ENGINE	RING /	ABRICA	T ON				
	ELEV 1030	INSTALL FREIGHT / CONSTRUCTION ELEVATOR	55	06-20-14*	09-08-14												÷								INS	t. <mark>n</mark> .l fri	e <mark>ight / c</mark>	ONSTRUC	CTION E	LEVATO
	😑 ELEV 1040	INSTALL PASSENGER ELEVATORS	70	08-11-14*	11-17-14	ELEV 1030						 	1														i i	NSTALL PA	ASSENG	ER ELEV/
	📑 A.1.1.12 FINAL I	NSPECTIONS	498	08-04-14	02-19-15	1							1				-										÷ F			b
	INSP1000	FINAL PLUMBING	5	08-04-14*	11-13-14						1 1 1	 	, , ,		1		-										EI FI	nal plum	BING	
	INSP1010	FINAL MECHANICAL	5	08-11-14*	11-17-14		1						 !												r		F	INAL MEC	HANIC/	AL
	INSP1020	FINAL ELECTRICAL	5	08-13-14*	09-12-14												ļ								FIN	I. <mark>N</mark> . ELE(TRICAL			
	INSP1030	FINAL BUILDING	5	09-23-14*	09-23-14								1				-								1	FINAL E	SULDING	2		
	INSP1040	RING OUT LIFE SAFETY SYSTEM	15	10-02-14*	10-22-14	INSP1060					 	 	1		1		1							 	-	tin the second sec	R NG O	UT LIFE SA	FETY SY	STEM
	INSP1050	FINAL SITE	2	10-17-14*	10-20-14	SITE1300					1 1 1	 	 	1	1		-							 		4∎	FINAL SI	ſΕ		
	INSP1060	FINAL LIFE SAFETY	10	10-23-14*	11-05-14	FNSH1610	1				 	 												r		-	FINA	IL LIFE SAI	FETY	
	INSP1070	FINAL ELEVATOR	3	11-18-14*	11-20-14	ELEV 1040, INSP1040					1	1 	, , ,											1 1 1			┕╸	FINAL ELE	VATOR	
	🔲 INSP1080	FINAL CERTIFICATE OF COMPLETION	0		02-19-15	PNCH1090					1 	1 	1 1 1											1 						
	EC00515 City Ce	enter Office Building Addition	694	11-01-10 A	07-23-13							07-23-1	3, EC00	15 City	Center	Office I	Building	g Ådditi	ο'n											

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APPENDIX 2: STRUCTURAL SYSTEM TAKEOFFS AND ESTIMATE

		Structural Take	e Offs			
		Mat Slab				
Floor	Quantity	Area (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
ower Parking	1.00	5638.00	2.67	15053.46	557.54	557.54
ower Parking	1.00	24626.00	3.33	82004.58	3037.21	3037.21
Floor	Quantity	Foundation Wa	All Hoight (ft)	Volume (Cu. Et)	Volume (CV)	Total Volume (CV)
ower Parking	1 00	660 60	10.00	6606.00	244.67	244 67
Innor Parking	1.00	660.60	10.00	6606.00	244.07	244.07
owor Darking	1.00	106.17	12.00	1274.00	244.07	244.07
Inner Parking	1.00	106.17	12.00	1274.00	47.15	47.15
owor Darking	1.00	152.56	12.00	1274.00	50.95	50.95
Innor Parking	1.00	152.50	9.00	1272.00	50.85	50.85
round through 2	1.00	132.30	5.00	1373.00 621.00	22.00	22.00
		414.00		021.00	25.00	25.00
		Elevated Slab	S			
Floor	Quantity	Area per floor (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
Ipper Parking	1.00	30264.00	1.00	30264.00	1120.89	1120.89
Fround	1.00	30264.00	1.00	30264.00	1120.89	1120.89
through 5	4.00	15426.00	0.67	10284.00	380.89	1523.56
through 8	3.00	14084.00	0.67	9389.33	347.75	1043.26
through 10	2.00	12840.00	0.67	12840.00	475.56	951.11
loof	1.00	12840.00	0.67	12840.00	475.56	475.56
		Columns				
Floor	Quantity	Cross Area (SF)	Height (ft)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
ower Parking	54.00	4.00	10.00	40.00	1.48	80.00
Ipper Parking	54.00	4.00	10.00	40.00	1.48	80.00
iround	54.00	4.00	10.00	40.00	1.48	80.00
through 5	160.00	4.00	9.00	36.00	1.33	213.33
through 8	120.00	4.00	9.00	36.00	1.33	160.00
through 10	72.00	4.00	9.00	36.00	1.33	96.00
		Poams				
Size		Cross Area (SE)	Length (LE)	Volume (Cu. Ft)	Volume (CY)	Total Volume (CY)
2x32		2 67	13.00	34 71	1 29	1 29
x32		1.78	17.00	30.26	1.12	1.12
2x24		2.00	17.00	34.00	1.26	1.26
8x24		3.00	30.00	90.00	3.33	3.33
4x24		4.00	10.00	40.00	1.48	1.48
0x48		20.00	36.00	720.00	26.67	26.67
6x32		8.00	21.00	168.00	6.22	6.22
4x40		15.00	28.00	420.00	15.56	15.56
4x40		17.78	33.00	586.74	21.73	21.73
2x24		2.00	77.00	154.00	5.70	5.70
4x20		1.94	9.00	17.46	0.65	0.65
0x44		18.33	26.00	476.58	17.65	17.65
0x18		1.25	33.00	41.25	1.53	1 53
0x18		1.25	33.00	41.25	1.53	1.53
		1.25	29.00	26.25	1.33	1.00
	Floorower Parkingower Parkingower Parkingower Parkingoper Parkingower Parkingoper Parkingower ParkingoofFloorower Parkingower Parkingower Parkingower Parkingthrough 10oofSize2x32x322x32x322x248x244x240x486x324x402x244x200x440x180x18	FloorQuantitypwer Parking1.00pwer Parking1.00Parking1.00pper Parking1.00pper Parking1.00pper Parking1.00pper Parking1.00pper Parking1.00pper Parking1.00pper Parking1.00iround through 2	Mat Slab Floor Quantity Area (SF) ower Parking 1.00 5638.00 ower Parking 1.00 24626.00 Foundation Ware Foundation Ware Floor Quantity Area per floor (SF) ower Parking 1.00 660.60 oper Parking 1.00 106.17 oper Parking 1.00 152.56 oper Parking 1.00 152.56 oper Parking 1.00 152.56 oper Parking 1.00 152.56 oper Parking 1.00 30264.00 round 1.00 30264.00 round 1.00 30264.00 round 1.00 12840.00 of 1.00 4.00 <td>Harring Area (SF) Height (ft) ower Parking 1.00 5638.00 2.67 ower Parking 1.00 24626.00 3.33 Eoundation Wall Floor Quantity Area per floor (SF) Height (ft) ower Parking 1.00 660.60 10.00 oper Parking 1.00 106.17 12.00 ower Parking 1.00 152.56 9.00 ower Parking 1.00 152.56 9.00 ower Parking 1.00 152.56 9.00 round through 2 414.00 100 100 round through 1 Area per floor (SF) Height (ft) pper Parking 1.00 30264.00 1.00 round 1.00 30264.00 0.67 through 5 4.00 15426.00 0.67 through 5 4.00 12840.00 0.67 of 1.00 12840.00 0.67 through 5 160.00 4.00 10.00 ipper Par</td> <td>Hat Slab Height (ft) Volume (Cu. Ft) wer Parking 1.00 5638.00 2.67 15053.46 ower Parking 1.00 24626.00 3.33 82004.58 Ver Parking 1.00 6606.00 10.00 6606.00 pper Parking 1.00 660.60 10.00 6606.00 ower Parking 1.00 106.17 12.00 1274.00 pper Parking 1.00 105.256 9.00 1373.00 ower Parking 1.00 152.56 9.00 1373.00 ower Parking 1.00 30264.00 1.00 30264.00 ower Parking 1.00 30264.00 1.00 30264.00 roound through 2 Elevated Slabs Elevated Slabs Elevated Slabs Elevated Slab 2.00 1.00 30264.00 1.00 30264.00 1.00 30264.00 1.00 30264.00 1.00 30264.00 1.00</td> <td>Hor Quantity Area (SF) Height (ft) Volume (Cu. Ft) Volume (CY) wer Parking 1.00 5638.00 2.67 15033.46 557.54 wer Parking 1.00 2462.00 33 82004.58 3037.21 Foundation Wall Foundation Wall Foundation Wall Volume (Cu. Ft) Volume (CV) Swer Parking 1.00 660.60 10.00 6606.60 244.67 Ower Parking 1.00 106.17 12.00 1274.00 47.19 Ower Parking 1.00 105.25 9.00 1373.00 50.85 round through 2 414.00 621.00 23.00 1120.89 Floor Quantity Area per floor (SF) Height (ft) Volume (Cu. Ft) Volume (CV) prer Parking 1.00 30264.00 1.00 30264.00 1120.89 round 1.00 30264.00 1.00 30264.00 1120.89 through 8 3.00 14084.00 0.67 128840.00 4775.56</td>	Harring Area (SF) Height (ft) ower Parking 1.00 5638.00 2.67 ower Parking 1.00 24626.00 3.33 Eoundation Wall Floor Quantity Area per floor (SF) Height (ft) ower Parking 1.00 660.60 10.00 oper Parking 1.00 106.17 12.00 ower Parking 1.00 152.56 9.00 ower Parking 1.00 152.56 9.00 ower Parking 1.00 152.56 9.00 round through 2 414.00 100 100 round through 1 Area per floor (SF) Height (ft) pper Parking 1.00 30264.00 1.00 round 1.00 30264.00 0.67 through 5 4.00 15426.00 0.67 through 5 4.00 12840.00 0.67 of 1.00 12840.00 0.67 through 5 160.00 4.00 10.00 ipper Par	Hat Slab Height (ft) Volume (Cu. Ft) wer Parking 1.00 5638.00 2.67 15053.46 ower Parking 1.00 24626.00 3.33 82004.58 Ver Parking 1.00 6606.00 10.00 6606.00 pper Parking 1.00 660.60 10.00 6606.00 ower Parking 1.00 106.17 12.00 1274.00 pper Parking 1.00 105.256 9.00 1373.00 ower Parking 1.00 152.56 9.00 1373.00 ower Parking 1.00 30264.00 1.00 30264.00 ower Parking 1.00 30264.00 1.00 30264.00 roound through 2 Elevated Slabs Elevated Slabs Elevated Slabs Elevated Slab 2.00 1.00 30264.00 1.00 30264.00 1.00 30264.00 1.00 30264.00 1.00 30264.00 1.00	Hor Quantity Area (SF) Height (ft) Volume (Cu. Ft) Volume (CY) wer Parking 1.00 5638.00 2.67 15033.46 557.54 wer Parking 1.00 2462.00 33 82004.58 3037.21 Foundation Wall Foundation Wall Foundation Wall Volume (Cu. Ft) Volume (CV) Swer Parking 1.00 660.60 10.00 6606.60 244.67 Ower Parking 1.00 106.17 12.00 1274.00 47.19 Ower Parking 1.00 105.25 9.00 1373.00 50.85 round through 2 414.00 621.00 23.00 1120.89 Floor Quantity Area per floor (SF) Height (ft) Volume (Cu. Ft) Volume (CV) prer Parking 1.00 30264.00 1.00 30264.00 1120.89 round 1.00 30264.00 1.00 30264.00 1120.89 through 8 3.00 14084.00 0.67 128840.00 4775.56

TFB06	24x11	1.83	195.00	356.85	13.22	13.22
TFB05	8x18	1.00	324.00	324.00	12.00	12.00
TFB04	32x11	2.44	189.00	461.16	17.08	17.08
TFB03	8x18	1.00	288.00	288.00	10.67	10.67
TFB02	8x18	1.00	81.00	81.00	3.00	3.00
TFB01	8x18	1.00	389.00	389.00	14.41	14.41
RB02	10x14	0.97	48.00	46.56	1.72	1.72
RB01	10x14	0.97	55.00	53.35	1.98	1.98
G1FB05	16x20	2.22	17.00	37.74	1.40	1.40
G1FB04	12x16	1.33	14.00	18.62	0.69	0.69
G1FB03	8x16	0.89	13.00	11.57	0.43	0.43
G1FB02	24x16	2.67	19.00	50.73	1.88	1.88
G1FB01	16x16	1.78	30.00	53.40	1.98	1.98

			Shear Walls				
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

			Stairs			
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
			Post Tensioni	ng		
Description	Floor	Quantity	Area per floor (SF)			Total Area (SF)
РТ	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

		Structur	al Estim	ate	
		М	at Slab		
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	959796.17
		Found	ation Wall		
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	211405.52
		Eleva	ited Slabs		
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	СҮ	255.06	262.08	25.19	565790.79
033053402100	СҮ	255.06	262.08	25.19	515816.09
033053402100	СҮ	255.06	262.08	25.19	257908.04
				Subtotal	3381568.15
		Co	olumns		
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
033053400900	СҮ	259.42	324.48	32.38	49302.40
033053400900	СҮ	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	СҮ	259.42	324.48	32.38	59162.88
				Subtotal	437147.95
		B	eams		
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	СҮ	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	СҮ	365.15	411.84	41.84	13985.62
033053400350	СҮ	365.15	411.84	41.84	9825.96
033053400350	СҮ	365.15	411.84	41.84	10822.20
				Subtotal	154105.50

		She	ar Walls		
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
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	66007.99

			Stairs		
Cost Code	Unit	Unit Material	Unit Labor	Unit Equipment	Extended Total
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	45581.76
		Post	rensioning		
Cost Code	Unit	Unit Cost			Extended Total
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	178095.00
				Subtotal	5433708.05
				Tax (6%)	184594.66
				Overhead (7%)	380359.56
				Profit(3%)	163011.24
				Total	6161673.51

APPENDIX 3: MECHANICAL SYSTEM ASSEMBLY TAKE-OFFS AND ESTIMATE

Mec	hanical Ta	ke Offs						Me	chanical	Est	timate		
Item	Designation	Quantity	CFM	SF	Total	Cost Code	Unit	Un	it Material	U	Init Labor	Ext	ended 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	НР	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
										Sub	ototal	\$1	,910,359.57
										Тах	(6%)	\$	14,566.18
										Ove	erhead (7%)	\$	133,725.17
										Pro	ofit(3%)	\$	573,107.87
										Tot	al	\$2	2,631,758.79

APPENDIX 4: ELECTRICAL	SYSTEM ASSEMBLY	TAKE-OFFS AND ESTIMATE

E	Electrical Take Offs E					Electrical Estimate						
Switch Gear					Switch Gear							
item	Voltage	Amps	Quantity		Cost Code	Unit	Ur	it Material		Unit Labor	Ex	tended 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
	Load Cen	nter						Load C	ent	er		
Item	Voltage	Amps	Quantity		Cost Code	Unit	Un	it Material		Unit Labor	Ex	tended 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
	Generat	tor						Gene	rato	r		
Item	kW		Quantity		Cost Code	Unit	Ur	nit Material		Unit Labor	Ex	tended 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
	Receptad	cles						Recept	tacle	es		
Item	kW		Quantity	Total SF	Cost Code	Unit	Ur	nit Material		Unit Labor	Ex	tended 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
	Fixture	25			Fixtures							
······ Item	Designation	Туре	Quantity	Total SF	Cost Code	Unit	Ur	it Material		Unit Labor	Ex	tended Total
Garage Light				67591	D50202100200		\$	0.71	\$	1.96	\$	180,467.97
Apartmet Lights				146370	D50202100200		\$	0.97	\$	1.58	\$	373,243.50
									Su	btotal	\$	2,670,899.43
									Та	x (6%)	\$	160,253.97
									Ov	verhead (7%)	\$	186,962.96
									Pre	ofit(3%)	\$	80,126.98
									Total		\$	3,098,243.34

APPENDIX 5: PLUMBING SYSTEM ASSEMBLY TAKE-OFFS AND ESTIMATE

Plumbing Ta	ke Offs	Plumbing Estimate							
Apartment	Units				Apartme	nt l	Jnits		
Item	Quantity	Cost Code	Unit	U	nit Material		Unit Labor	Ex	tended 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
Men's/ Women's	Restrooms			Μ	len's/ Womei	n's I	Restrooms		
Item	Quantity	Cost Code	Unit	U	nit Material		Unit Labor	Ex	tended 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
Water Hea	iter	Water Heater							
Item	Quantity	Cost Code	Unit	U	nit Material		Unit Labor	Ex	tended 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
Pumps					Pum	ips			
Item	Quantity	Cost Code	Unit	U	nit Material		Unit Labor	Ex	tended 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
						Subtotal \$		2,513,378.53	
						Tax (6%)		\$	106,658.76
						Overhead (7%)		\$	175,936.50
						Pr	ofit(3%)	\$	75,401.36
						То	otal	\$	2,871,375.15

APPENDIX 6: GENERAL CONDITIONS ESTIMATE

General Conditions Estimate										
Cost Code	Description	Μ	aterial Cost	Labor Cost	Ext	ended 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	П	\$	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 Personel 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				
				Subtotal	\$ 2	2,109,776.33				







APPENDIX 8: LEED SCORECARD

Category	Credit	Description	Possible Points	Currently Proposed	Additional Suggested
	Prereq 1	Construction Activity Pollution Prevention			
	1	Site Selection	1	1	
	2	Developent Density & Community Connectivity	5	5	
	3	Brownfield Redevelopment	1		
ŝ	4.1	Alt. Transportation, Public Transportation Access	6	6	
site	4.2	Alt. Transporation, Bicycle Storage & Changing Rooms	1	1	
<u>0</u>	4.3	Alt. Transporation, Low Emitting & Fuel Efficient Vehicles	3	3	
ę	4.4	Alt Transporation, Parking Capacity	2	2	
ai	5.1	Site Development, Protect or Restore Habitat	1		
nst.	5.2	Site Development, Maximize Open Space	1	1	
S	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		
⇒.	Prereq 1	Water Use Reduction - 20% Reduction			
end	1	Water Efficient Landscaping	2 to 4	2	
Na Îcie	2	Innovative Wasewater Technologies	2		
E	3	Water Use Reduction - 30% Reduction	2 to 4	2	
e	Prereq 1	Fundamental Commissioning of Building Energy Systems			
pe	Prereq 2	Minimum Energy Performance			
dso	Prereq 3	Fundamental Refrigerant Management			
Ĕ	1	Optimize Energy Performance	1 to 19	2	
. ₹	2	On-site Renewable Energy	1 to 7		
Ц	3	Enhanced Commissioning	2	2	
š	4	Enhanced Refrigerent Management	2		
e ^r o,	5	Measurement and Verification	3		
끒	6	Green Power	2		2
es S	Prereq 1	Storage and Collection of Recyclables			
ě	1.1	Building Reuse - Maintain Existing Walls, Floors and Roof	1 to 3		
SoL	1.2	Building Resue - Maintain 50% of Non Structural Elements	1 to 3		
ě Z	2	Construction Waste Management	1 to 2	2	
P	3.1	Material Reuse	1 to 2		
s	4	Recycled Content	1 to 2	2	
ia I	5	Regional Materials	1 to 2	2	
ate	6	Rapidly Renewable Materials	1		
ž	7	Certified Wood	1		

	Prereq 1	Minimum IAQ Performance			
	Prereq 2	Environmental Toacco Smoke (ETS) Control			
	1	Otdoor Air Delivery Monitoring	1		
	2	Increased Ventilation	1		
≥		Construction IAQ Management Plan - During			
g	3.1	Construction	1	1	
ð		Construction IAQ Management Plan - Before			
ō	3.2	Occupancy	1		1
eut	4.1	Low-Emitting Materials - Adhesives and Sealants	1	1	
Ē	4.2	Low-Emitting Materials - Paints and Coatings	1	1	
2	4.3	Low-Emitting Materials - Flooring Systems	1	1	
Ξ	4.4	Products	1		
ш 	5	Indoor Chemical & Pollutant Source Control	1		
õ	6.1	Contrallability of Systems - Lighting	1	1	
ŭ	6.2	Contrallability 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: Exemplary Performance in SSc4.1			
<u> </u>	1.1	Public Transportation Access	1	1	
55	1.2	Innovation in Design: Exemplary Performance in SSc7.1	1	1	
sig	1.3	Innovation in Design: Education Program	1	1	
<u>d</u>	1.4	Green Power	1		
<u>E</u>	1.5	Innovation in Design: Energy Star Appliances	1	1	
	2	LEED Accredited Professional	1	1	
	1.1	Regional Priority: EAc1	1		
Ë G	1.2	Regional Priority: SSc5.1 - Restore Habitat	1		
Pric	1.3	Regional Priority: SSc6.1 SW Quantity	1		
ě –	1.4	Regional Priority: MRc1.1, WEc2	1		
			Total	47	3
				50 (S	ilver)