2012

Anthony Grab

Technical Assignment III

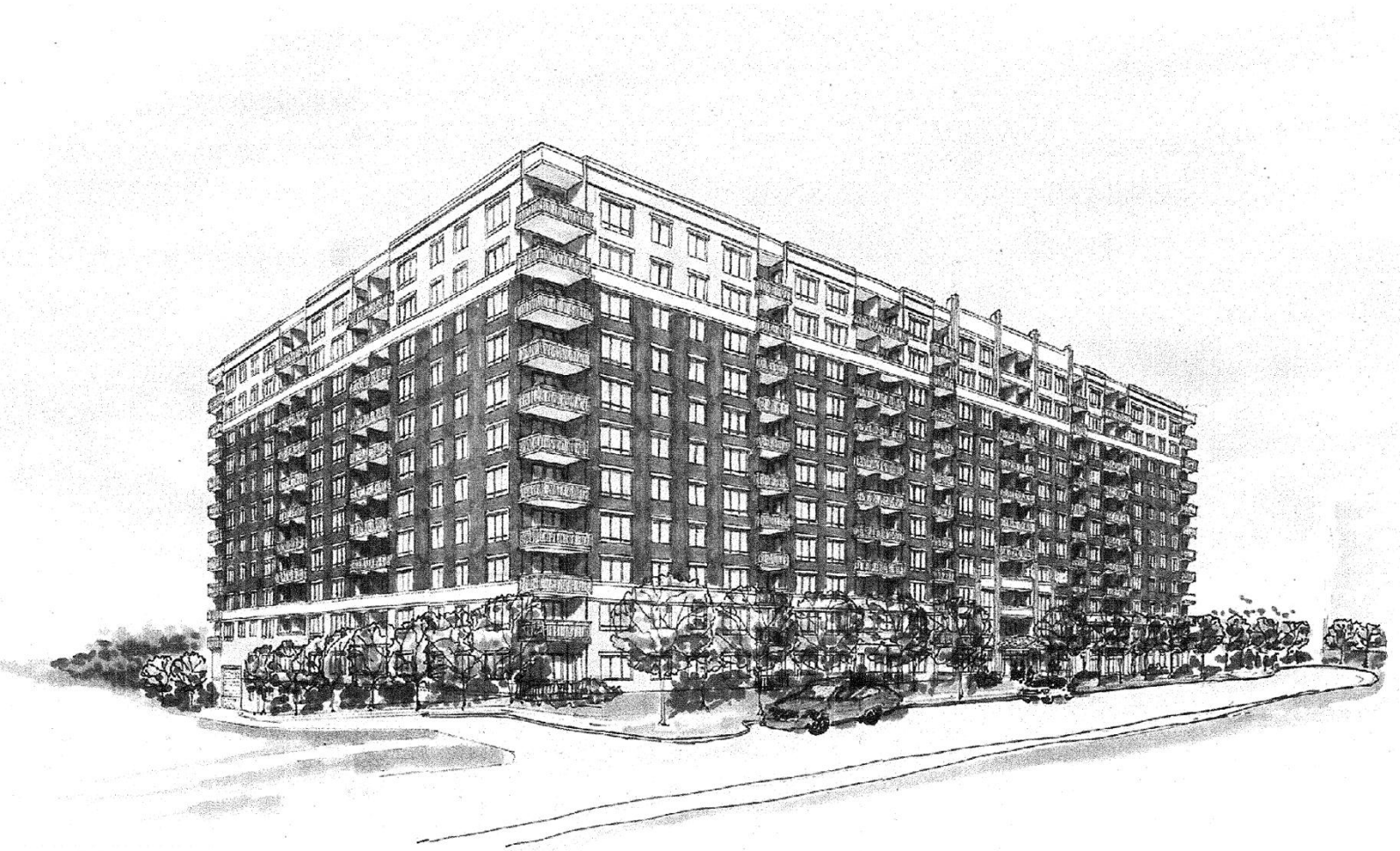

Figure 1: Sketch of Square 1400 – Courtesy of DPR

[SQUARE 1400 APARTMENTS]

Construction Management I Advisor: Raymond Sowers I Square 1400 Apartments I Fairfax, VA
11-12-2012 I Technical Assignment III

Executive Summary

Technical Assignment III is intended to analyze the key parameters and features that influence the execution of the Square 1400 Apartment Building located in Fairfax, VA. The building is a 327,431 SF apartment building with a neighboring three-story parking garage. One of the largest challenges of the project was the site logistics which include overhead power lines. The surrounding buildings were also of concern.

The information regarding the LEED of the new construction of the apartment building and parking structure can be found within the LEED Evaluation section of the report, which illustrates the major contributions that lead to a LEED Rating of Silver. Square 1400 was evaluated base on the 2009 system which evaluates the build in a number of different categories including sustainable site, water efficiency, energy and atmosphere, and material resources. HITT Contracting and Sustainable Building Partners LLC (SB Partners) joined together to develop a whole building energy simulation for the proposed apartment building.

A schedule of acceleration analysis was performed on the new apartment building to gain a better understanding of the critical path. Once evaluated, a few key areas were discovered that had potential for acceleration. For example, the delay to relocate overhead power lines caused countless hours to be lost. To read more about schedule delays and risks, please see the schedule acceleration scenarios section of the report. The project had a limited number of value engineering items. That being said, key areas of values engineering that were implemented are outlined in the section titles Value Engineering Topics. Few areas that were valued engineered are as follows: finishes (door, hardware, and cabinets), windows, and the cast-in-place structure. A summary of the 2012 PACE Roundtable breakout session focused on Operation and Maintenance: Energy and BIM as well as Delivery of Services: Measuring Effective Collaboration can be found on page 18 of the report.

A section outlining several problematic features of Square 1400 that could be pursued through detailed analysis of technical building systems and construction methods concludes the report. Areas of focus include Construction of Cast-In-Place Slabs, Exterior Glazing + LEED, SIPS + BIM, and Prefabricated Brick Façade Panels.

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LEED Evaluation

See Appendix A for the LEED Project Scorecard

Overview

Figure 2- LEED Logo – Courtesy of USGBC

The Square 1400 Apartments is currently pursing LEED Silver under the 2009 LEED-NC report rating. The 2009 system evaluates the build in a number of different categories including sustainable site, water efficiency, energy and atmosphere, and material resources. The United States Green Building Council (USGBC) set the LEED standards for all types of construction. Square 1400 falls under New Construction. HITT Contracting is working with SB Partner to develop a whole building energy simulation for the proposed apartment building. SB Partners utilizes a 3D model as a design tool specifically for the purpose of enhancing the energy performances of the facility. In doing so, this increased the LEED Energy and Atmosphere by one credit. These efforts along with HITT's in-house LEED team and the project team will ultimately save money and create a more stainable building.

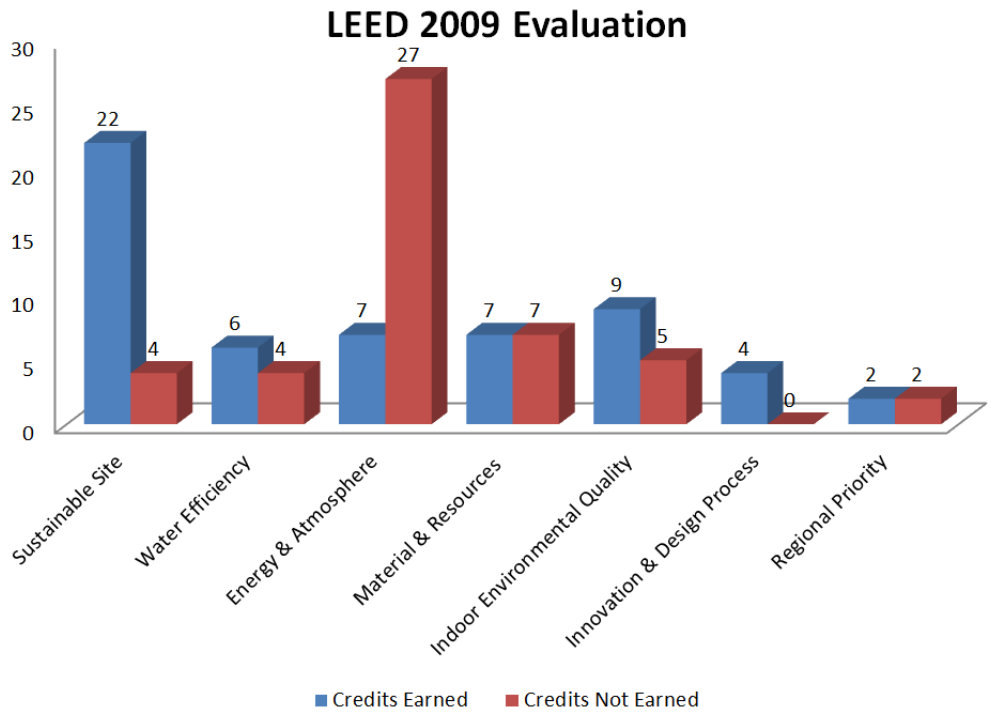

Figure 3- Square 1400 LEED Evaluation – Developed by Anthony Grab

Sustainable Site

Within the LEED 2009 scoring system, the Square 1400 project scored 22 out of 26 possible credits. Such a high score in this category is more than satisfactory considering the location in Fairfax, VA. The main intent of this category includes site selection and features, development density, public transportation, and parking/bike access. With a lot of these credits able to be

controlled, a number of them can be achieved by simply choosing a favorable site location. One of the main sub-categories is Alternative Transportation, Public Transportation Access. The project obtained all possible credits in this sub-category. This is due to the fact that the site is closely located near the orange line of the Washington, D.C. Metro. A layer of 2B stone was added throughout the construction site to help control mud and prevent it from being tracked on neighboring roads by dump trucks and other construction equipment.

Water Efficiency

The credits achieved in the Water Efficiency category were 6 out of 10 possible points. This is a typical score for most projects with larger sites. The main reason for Water Efficiency is the management of water and the reduction of water supply during construction as well as throughout the life cycle of the building. Low flow fixtures were used throughout the building to decrease the amount of water per flush, resulting in a 40 percent reduction in water use.

Energy and Atmosphere

One of the lowest scoring categories was in the Energy and Atmosphere section, which achieved a score of 7 out of 35 possible points. Unlike other categories, Energy and Atmosphere required the project to achieve 4 out of the 10 sub-categories, which includes Fundamental Commissioning of the Buildings Energy Systems, Minimum Energy Performance, and Fundamental Refrigerant Management. As part of the project process, it must demonstrate compliance with ASHRAE 90.1-2007. It also must result in a minimum of 10 percent annual energy cost savings approved by the Green Building Certification Institute to be eligible for LEED Certification. The energy model utilized by SB Partners to perform the analysis can be seen below in Figure 4.

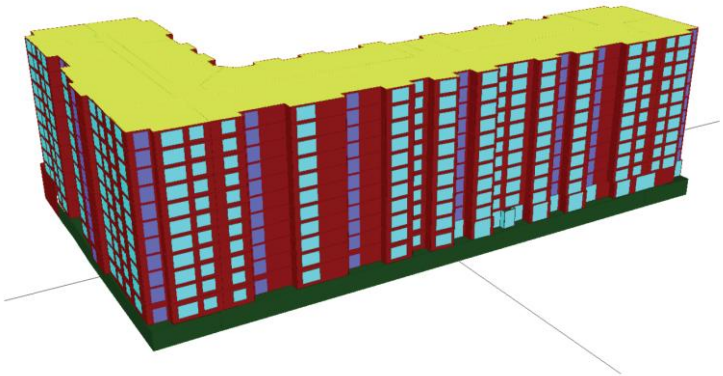

Figure 4- Square 1400 Energy Model – Courtesy of SB Partners

Material Resources

Within the Materials and Resources group, the Square 1400 project performed satisfactory, scoring 7 out of 14 possible credits. The intent of this category is to choose materials and resources that will decrease waste through the means of choosing environmentally friendly products. The USGBC set a requirement that states that the sum of the use of salvaged, refurbished, or reused materials constitutes at least 5 percent of the total value of materials on the project. The project team is currently working to comply with this requirement.

Indoor Environmental Quality

Another category within the LEED evaluation system is the Indoor Environmental Quality; here, Square 1400 earned 9 out of 15 credits. With Square 1400 being an apartment building where occupants will sleep, it is critical that this category is evaluated with great detail. The USGBC set two required subsections. The first subsection states the building must establish minimum indoor air quality (IAQ) performance to enhance indoor air quality in buildings, thus contributing to the comfort and well-being of the occupants. This can be achieved by two methods such as mechanically ventilating spaces or naturally ventilating spaces. Square 1400 incorporated both these methods. The second requirement says that precautions must be taken to prevent or minimize exposure of building occupants, indoor surfaces and ventilation, and air distribution systems to environmental tobacco smoke (ETS).

Innovation & Design Process

The Innovation and Design Process was evaluated on the project to give the design team the opportunity to achieve additional credits by implementing exceptional performance systems above which is set by the LEED rating system. The project earned 4 of the 6 possible credits. The points were achieved by exemplary performance in transportation, Green Power for residents, and LEED Accredited Professionals working on the project.

Regional Priority

The final category, Regional Priority, was evaluated with the intent to provide an incentive for the achievement of credits that address geographically specific environmental priorities. A total of 2 credits out of the 4 possible were achieved.

The following is a list of the energy efficiency measures that are to be implemented in the building.

- Residential: 13 SEER split system heat pumps (baseline is 9.105 EER PTHP)
- Corridors: High Efficiency Aaon units with VFD fans and Economizer
- Common Areas: High Efficiency VRF system
- High efficiency garage lighting at 0.15 W/sf max (baseline is 0.20 W/sf for covered parking and 0.15 W/sf for open parking lots an drives)
- High Efficiency Windows (apartment sliders, residential IGUs, and curtain walls)
- 1.5 gpm shower heads and faucets (assumed – no actual selections provided)
- ENERGY STAR Qualified Refrigerator (20% improvement)
- ENERGY STAR Qualified Clothes Washer (35% Improvement)
- ENERGY STAR Qualified Dish Washer (25% Improvement)
- Fixed building shading, self-shading, overhangs and porches

Schedule Acceleration Scenarios

The Square 1400 Apartment is currently under a construction schedule that is expected to be completed on August 19, 2013. HITT Contracting did all scheduling in house using Primavera P6 Software. The schedule was maintained throughout the construction of the project. Every week the schedule had to be adjusted to meet the correct stage of construction. A three week look ahead was also created by the site superintendent. This ability to keep the schedule updated has allowed HITT Contracting to remain on schedule and avoid missing its completion date in mid-August.

Critical Path

The critical path schedule linked with Square 1400 Apartments shadowed a fairly traditional construction process with a variation of a few unique features. This can be observed in Figure 5. The site work phase consisted of mobilization, site establishment, and underground utilities. Within site establishment, many items were located such as site trailers, site fencing, material laydown, mortar mix station, and delivery routes. The next phase of construction was foundations. Within this phase, excavation as well as reinforcing, pouring spread footings, and pouring slab-on-grade were included. The timing with weather was critical during this phase as later mentioned. The Superstructure phase of construction came next in the critical path method schedule. Level 1 columns were formed, and then the post-tension-slab was formed and poured. This process was repeated up through the building. Upon completion of the buildings superstructure came the installation of the building exterior. Starting with the setting of the light gage metal framing, the enclosure was composed of masonry brick and precast panels. The windows and doors were installed after the completion of the masonry. The roof was also installed during this phase. As soon as the building was enclosed, fit-out could start for the MEP systems and interior partitions. The next phase was interior finishes. Drywall, paint, hardware, and carpet were to be installed. The final phase of the CPM schedule was the closeout phase, where HITT Contracting developed punch list items, inspections, and finally the turnover walk took place.

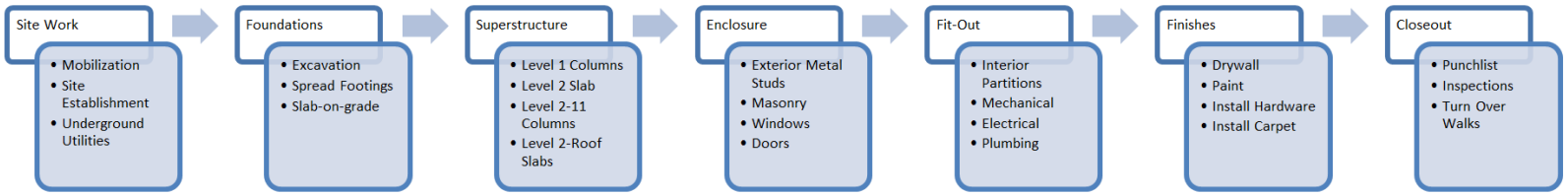

Figure 5- Square 1400 CPM – Developed By Anthony Grab

Acceleration Techniques

After discussing with the project management team, a few key scheduling techniques were revealed that could aid in meeting the substantial completion date of August 13, 2013. The first area that caused delay in the project schedule was the existing overhead powers. This issue was recognized early in the site work phase. However, the change to run them underground was not made until the superstructure was being constructed. This was because of the slow turnaround time on the owner side. Had this issue been address earlier, countless hours of maneuvering around the power lines with the crane and other construction equipment would have been saved.

The second major potential acceleration technique came during the construction of the buildings enclosure. A Fraco Scaffolding System was to be used on all sides of the building. The plan was to have the masons start on one corner of the building and work there up and around in a quark screw sequence. This would stream line the production of the masons. However, with the exterior occupied by the masons Fraco lift, there was no longer a means for other trades to perform work on the building envelope or get materials into the building. This slowed down the production of a number of trades. To help with this growing problem, HITT installed its own man/material lift. With a cost to keep the scaffold on site, it proved effective in ensuring all trades could move materials in and out of the building smoothly.

Project Risks

There is always risk when constructing a new building. With the excavation for the apartments foundation set to take place on January 1, there was a fear of snow and ice. This would greatly impact the speed at which the exaction could be performed. Common to most projects, getting the building water tight on time was of concern. A delay meant all interior finishes would be set back.

Value Engineering Topics

On January 6, 2012 HITT Contracting was award the lump sum package to build Square 1400 Apartments. Accompanied with their bid package was a list of value engineering suggestions. The following outlines the major topics that were implemented on the project.

Design Build Finishes

During the early stages of the design phase Brett Hitt said that he wanted to build a building that will last him a number of years. With that in mind, the design team decided the structure of the new apartment building would be durable cast-in-place concrete. With only a 6-inch thickness for the post tension slab, the project team decided it would be beneficial to add extra reinforcing and stiffen up the structure. The thin slab also caused a potential problem with the balcony railings. It would be challenging to drill quick bolts deep into the slab as specified by the proposed steel railings. To reduce the depth, the railing was change to aluminum. The design team also realized the structure is not the only item that needs to withstand the test of time. The windows that were original specified were change to a receptor style which is thick and more durable. The finishes, such as floors, frames, and cabinets, were all changed to more durable materials.

When considering value engineering on a project, cost always comes to mind. For Square 1400, the project team evaluated what was originally specified by the architects and engineers and then made recommendation for improvements in different areas. A budget was then put together and given to Brett Hitt. He would than assess whether he wanted to make the changes. HITT contracting was able to buy enough contingency to make the changes.

Two areas of value engineering that were considered but not implemented were the lighting package and the level of finish in the apartment units. A balance had to be considered between the number of upgrades and the payback on the upgrades. Every change that was made would be multiplied by 372, which is the number of keys. Brett had to decide if the upgrades will generate more rent for him or if it is just something nice to have in the building.

Critical Industry Issues

The 21th Annual Partnership for Achieving Construction Excellence (PACE) roundtable was held at the Nittany Lion Inn on November 6, 2012. The theme of this year's round table was Improving Efficiency through Innovation. Attendees were permitted to choose from six breakout sessions, which related to a verity of critical industry issues.

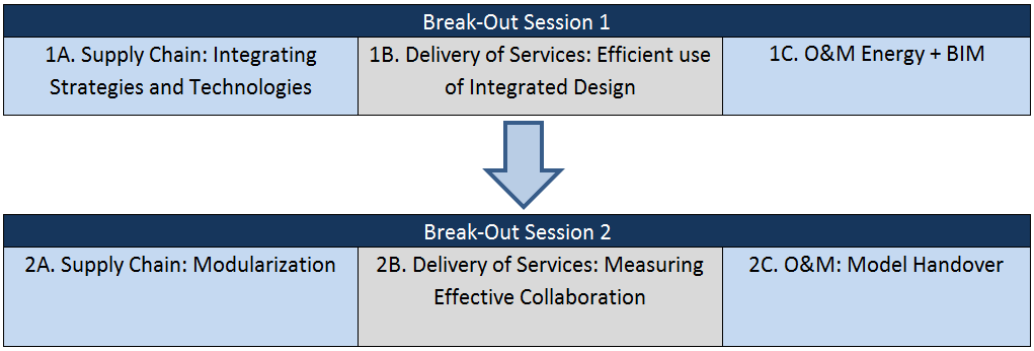

Figure 6 - PACE Roundtable Sessions – Developed By Anthony Grab

Session 1C. O&M Energy + BIM

Building information modeling (BIM) is a popular topic in the construction industry, most of which has highest focuses during the design and construction phase of the project. Lead by Dr. Messner, the first information session outlined the importance of operation and maintain of a building with the integration of BIM along with using BIM for energy analysis.

Today's buildings are becoming more complex and difficult to operate. With that in mind, there is a high demand for information rich models that will assist with the upkeep of the different building systems. However, there are a number of challenges that come along with achieving this goal. The first question that comes to mind is it really worth the extra time and money to develop dynamic models of the building or is it easy and cheaper just to wait until the element fails and then the fix the problem? Another hurdle to overcome is the fact that many owners are not pushing BIM on their projects.

BIM models are becoming more popular for energy analysis study of the building. It is important to develop the model early in the design phase of the project. This will ensure all the major energy scenarios have been evaluated and will not have a high cost impact if the change is made early. However, it is also important to keep the model up to date as the project progresses. This will make it easier down the road to check if the building is performing the way it was intended to, typically a year later.

A lot of the existing buildings in the country are becoming outdated and are in need of updates. In the city of Philadelphia, the energy hub has set a high goal of lowering all existing buildings' energy by 2020. A good way to evaluate the energy usage of buildings is to simply look at the energy bill for the past several years. This will give a good indication as to what type of upgrades would be suitable for the building.

The thing that surprised me the most about the information session was the fact that there was not any software on the market that is able to take the BIM model created by the architect and link it to the major MEP systems in the building. In order to make this possible, manufactures are going to have to start creating models of the systems that can be then loaded into the model for accurate data. For Square 1400 Apartments, it would be worth looking into placing vibration sensors on the mechanical equipment. When a change in vibration is indicated, an alarm would go off notifying maintenance personnel which area is in need of work. Penn State is already using similar variation sensors throughout the campus.

Session 2B. Delivery of Services: Measuring Effective Collaboration

The main topic of the session was how the industry views collaboration and how we can measure collaboration in a group meeting. When placing a project team in a room, are they really collaborating or are they just building silos?

Ray Sowers kicked off the session with how the industry looks at collaboration; it has to be cheaper, faster, better. You need to look at whether collaboration will give you the competitive edge to get the project. It is important that the project team defines what the collaborative structure looks like so we can see the problems. People need to feel that they have a sense of interaction during the meetings.

Bryan Franz, referring to the South Halls project and a number of other projects on Penn State campus, said how they have brought in a number of IPD principles such as mutual respect, trust, and other collaborative elements. Penn state is trying to use the principles on project that may not be IPD. To achieve this, Penn State sat down with the Office of Physical Plant and the project team to develop a collaboration charter that would hopefully motivate the project team to use collaborative measures. The team broke the charter into several different matrices such as cost or scheduling. These were than use to judge how effective the collaboration was. One example was a RFI turnaround time of about of three days.

Another major part of the collaboration process is having subcontractors on the project that have the ability to handle the collaboration process. Nick Umosella of Barton Malow used an example on the South Halls project of how he has six really good subcontractors and one that was a pain to work with from the start of the project. This is sometime hard to avoid because the contract type typically dictates the quality of the subcontractor. For example a lump sum

contract typically awards the sub with the lowest bid and not necessarily the most qualified to perform the work.

The final major topic brought up in the info session was how do we measure trust? A lot of time this goes back to the trades. What was there number at the start of the project? It one thing to forget something in the bid package, however there are some subs that low ball their bid to guarantee the job. In some cases, previous experience can be looked at to see which subcontractors worked well.

The thing that surprised me the most about the info session was the fact that collaboration was such a big issues it the construction industry. Over the years in the classroom environment, we always talked about the best case scenario for collaboration and never what to do when a subcontractor does not perform correctly.

For the Square 1400 project, the collaboration process is somewhat different from a traditional construction project. This is due to the fact that the owner of the project is also the construction manager. Because of this, there has been excellent communication between the two. On the other hand, the collaboration between the subcontractors and the CM is very important. It would be beneficial to adopt some of the strategies outlined in the info session on the Square 1400 project. For example, a turnaround time of three days would be an excellent way to gauge the level of collaboration on the project.

Below is a list of key contacts that might be able to advise my areas of interest:

- Randy Barrett (HITT Contracting) – any general questions about Square 1400
- Ray Sowers (OPP) – questions about infinity systems
- Tom Grab (HITT Contracting) – General industry question
- Michael Barnhart (Forrester Construction) – General industry question
- Penn State AE Professors – for help with structural and MEP calculations

Problem Identification and Technical Analysis Options

Construction of Cast-In-Place Slabs (Structure)

The current structure for the Square 1400 Apartment Building is a six-inch cast-in-place structure with post-tension reinforcing. At eleven stories, the building is 105 feet tall with about 8.5 feet per floor. Cast-in-place concrete is the preferred structure in Washington, D.C. because it allows the end user to maximize the number of floors within local height restrictions. However, located in Fairfax, VA, Square 1400 does not fall within the height restricted area.

In order to satisfy costs, it would be beneficial to investigate other building structure systems such as wood or infinity structures. The new building structures would allow for the original layout to remain relatively the same. The life of the structures would be compared to allow the owner to determine whether it fits with in their needs. Additional analysis would be performed to ensure the capacities of the structure are met.

Exterior Glazing + LEED (Mechanical)

The exterior glazing is always an important aspect of the building, whether it's an architectural feature or an energy saving feature. It would be of great value to investigate different types of exterior window glass to improve the aesthetics and energy efficiency of the building. Analysis would be performed on the energy load with the upgraded window against the ones specified for the building. There would be a potential gain in LEED credits for the new measures.

SIPS + BIM (Construction Management)

The use of the Short Interval Production Schedule (SIPS) method helps to break construction activities into detailed repeatable activities. This actually differs from the conventional way of project scheduling as it usually break projects into operations instead. The implementation of the SIPS is still a current method in the construction industry, yet it does appear to bring benefits for coordination and scheduling standpoint.

SIPS provides a faster learning curve for the crew and has a much productive work sequence. It helps to eliminate the non-productive, time-related delays in construction. Using SIPS would allow the resources and materials to be ready on site. Moreover, with close supervision of the time schedule, it instills both workers and supervisors immediate sense of urgency to get the job done as it creates a psychological feeling of the sense of accomplishment for every task completed at every stage. With Square 1400 being an apartment building with repetitive levels, it would be beneficial to look into using SIPS with the integration of BIM to better understand sequencing.

Prefabricated Brick Façade Panels (Construction Management)

With the exterior façade of the Apartment building constructed of brick, it would be of value to look into prefabricated brick panels similar to the ones used on the Millennium Science Building on Penn State's Campus. There are a number of advantages to using prefabricated panels such as decreased schedule duration, increased quality control, and earlier dry-in of the building. The analysis for the prefab panels would include sustainability, cost, and R-value. Different materials would be explored but would still preserve the look specified by the architect.

Appendix A

Detailed Project Schedule

LEED-NC 2009 Project Scorecard

Square 1400

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Project Points
57
Silver

Targeted Rating is Silver

0-39	= No certification
40-49	= Certified
50-59	= Silver
60-79	= Gold
80-110	= Platinum

Y	?	N	Sustainable Sites		
			Prereq 1	Construction Activity Pollution Prevention	Required
1			Credit 1	Site Selection	1
5			Credit 2	Development Density & Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation, Public Transportation Access	6
1			Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	1
3			Credit 4.3	Alternative Transportation, Low-Emitting Fuel Efficient Vehicles	3
2			Credit 4.4	Alternative Transportation, Parking Availability	2
		1	Credit 5.1	Site Development - Protect or Restore Habitat	1
1			Credit 5.2	Site Development - Maximize Open Space	1
1			Credit 6.1	Storm Water Management - Quantity	1
		1	Credit 6.2	Storm Water Management - Quality	1
1			Credit 7.1	Heat Island Reduction, Non-Roof Heat Island Reduction, Non-Roof	1
1			Credit 7.2	Heat-Island Reduction, Roof Heat-Island Reduction, Roof	1
		1	Credit 8	Light Pollution Reduction	1
22		4	Sustainable Sites	Possible Points	26

Y	?	N	Water Efficiency		
			Prereq 1	Water Use Reduction - 20% Reduction	Required
2		2	Credit 1	Water Efficient Landscaping; 50% potable use reduction	4
		2	Credit 2	Innovative Waste Water Technologies	2
4			Credit 3	Water Use Reduction; 30%, 35%, 40%	4
6		4	Water Efficiency	Possible Points	10

Y	?	N	Energy & Atmosphere		
			Prereq 1	Fundamental Commissioning of Building Energy Systems	Required
			Prereq 2	Minimum Energy Performance	Required
			Prereq 3	Fundamental Refrigerant Management	Required
			Prereq EA1	Achieve at least 2pts in EA Credit 1:	Required
3	1	15	Credit 1	Optimize Energy Performance (Currently 16%)	19
		7	Credit 2	Renewable Energy	7
2			Credit 2	Enhanced Commissioning	2
		2	Credit 3	Enhanced Refrigerant Management	2
		3	Credit 3	Measurement & Verification	3
2			Credit 4	Green Power	2
7	1	27	Energy & Atmosphere	Possible Points	35

Y	?	N	Materials & Resources		
			Prereq 1	Storage and Collection of Recyclables	Required
		3	Credit 1.1	Building Reuse, Maintain 55%, 75%, 95% existing walls, floors, roof	1
		1	Credit 1.2	Building Reuse, Maintain 50% Interior Non-Structural Elements	1
1			Credit 2.1	Construction Waste Management, Divert 50% From Landfill	1
1			Credit 2.2	Construction Waste Management, Divert 75% From Landfill	1
		1	Credit 3.1	Resource Reuse, 5%	1
		1	Credit 3.2	Resource Reuse, 10%	1
1			Credit 4.1	Recycled Content, 10% (post-consumer + 1/2 pre-consumer)	1
1			Credit 4.2	Recycled Content, 20% (post-consumer + 1/2 pre-consumer)	1
1			Credit 5.1	Regional Materials, 10% Extracted and Manufactured Regionally	1
1			Credit 5.2	Regional Materials, 20% Extracted and Manufactured Regionally	1
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1
7		7	Materials & Resources	Possible Points	14

HITT

LEED-NC 2009 Project Scorecard

Square 1400

5/27/2011 11:54

Project Points
57
Silver

Targeted Rating is Silver

0-39	= No certification
40-49	= Certified
50-59	= Silver
60-79	= Gold
80-110	= Platinum

Y	?	N	Indoor Environmental Quality		
			Prereq 1	Minimum IAQ Performance	Required
			Prereq 2	Environmental Tobacco Smoke (ETS) Control	Required
		1	Credit 1	Outside Air Delivery Monitoring	1
		1	Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan, During Construction	1
1			Credit 3.2	Construction IAQ Management Plan, Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials, Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials, Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials, Carpet Systems	1
	1		Credit 4.4	Low-Emitting Materials, Composite Wood and Laminate Adhesives	1
		1	Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems, Lighting	1
1			Credit 6.2	Controllability of Systems, Temperature and Ventilation	1
1			Credit 7.1	Thermal Comfort - Compliance	1
		1	Credit 7.2	Thermal Comfort - Monitoring	1
		1	Credit 8.1	Daylight & Views - Daylight 75% of Spaces	1
1			Credit 8.2	Daylight & Views - Views for 90% of Seated Spaces	1
9	1	5	Indoor Environmental Quality	Possible Points	15

Y	?	N	Innovation & Design Process		
1			Credit 1.1	Innovation in Design - Exemplary Performance SS 5.2	1
1			Credit 1.2	Innovation in Design - Exemplary Performance SS4.1 Transportation	1
	1		Credit 1.3	Innovation in Design - Green Housekeeping	1
	1		Credit 1.4	Innovation in Design - Green Building Education	1
1			Credit 1.5	Innovation in Design - Green Power for Residents	1
1			Credit 2	LEED™ Accredited Professional	1
4	2		Innovation & Design Process	Possible Points	6

Y	?	N	Regional Priority		
1			Credit 1.1	Regional Priority - SS6.1	1
		1	Credit 1.2	Regional Priority - WE2	1
1			Credit 1.3	Regional Priority - WE3, 40%	1
		1	Credit 1.4	Regional Priority - EA 2 On Site Renewable Energy	1
			Credit 1.5	Regional Priority	1
2		2	Regional Priority	Possible Points	4

Appendix B

PACE Roundtable Worksheet