THESIS PROPOSAL

February 6th, 2014

SOUTH HALLS RENOVATION: EWING-CROSS

UNIVERSITY PARK, PA

Quaid Spearing

Construction Option

Advisor: Dr. Anumba

SOUTH HALLS RENOVATION: EWING-CROSS

EXECUTIVE SUMMARY

Ewing – Cross is part of the South Halls Renovation and New Construction project, which is located in University Park of the Pennsylvania State University. There are four identical dormitory buildings that are currently being consecutively renovated. This creates an opportunity to explore alternative solutions for Ewing – Cross that could be implemented on the remaining phases. With Ewing – Cross's construction schedule at only seven months, there are critical areas on the schedule that could hinder timely completion. As such, the focus of this thesis will be to explore alternative methods of construction that can accelerate the schedule while maintaining quality.

The first analysis will look at implementing modularization. Due to the fact that the bathroom slabs and portions of the façade are removed, there is a unique opportunity to modularize the bathroom units. The analysis would focus on investigating the different levels of modularization and how it could be implemented in a renovation project. Building the bathrooms offsite will reduce the concern of the finish schedule for the bathrooms being accelerated at the cost of quality.

The second analysis will look at implementing Short Interval Production Scheduling (SIPS) for the student rooms. The layouts of the rooms are repetitive on floors one through four, allowing for the opportunity to increase the workflow and productivity of the rough-ins and finishes for the student rooms. The SIPS schedule that is generated will be compared to the original to determine what potential savings are achievable.

The third analysis will focus on value engineering the limestone façade by implementing full thickness limestone panels. The costly limestone veneer panels can be eliminated and prefabricating the limestone walls offsite will be analyzed in an attempt to further save time on the schedule. Changing the façade material will create an architectural breadth in looking at the different patterns of limestone available. The prefabricated design will then be evaluated for cost reduction and schedule savings.

The final analysis will focus on resequencing the renovation phases in an attempt to turn the buildings over to Penn State more quickly. Penn State Housing almost entirely relies on the revenue generated from student housing; getting the project completed one semester sooner could produce a lot of revenue for the owner. The analysis will focus on investigating how the project team would renovate two buildings at once, and the logistical challenges that accompany this. The other three analyses that focus on offsite construction will lend themselves to this analysis by helping to alleviate jobsite congestion as well as reducing the construction schedule.

Through these four analyses, the expected outcomes are to provide potential cost and schedule saving solutions to the current issues faced on the project. The overall goal is to accelerate the project schedule while maintaining or improving the quality of the final delivered product.

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PROJECT INTRODUCTION

Ewing – Cross is part of the South Halls Renovation and New Construction project, which is located in University Park of the Pennsylvania State University. Ewing – Cross is a 71,000 gross square foot four-story plus basement dormitory building that will house approximately 250 students. Also included in the South Halls Renovation is the addition of a new dormitory building, Chace Hall, as well as the renovation of three other dormitory buildings and the renovation and addition to Redifer Commons. Figure 1 below depicts the current sequencing of the renovation phases at South Halls.

Figure 1: South Halls Phasing Schedule | Image courtesy of Bing Maps

The project is delivered using a Design – Build delivery method. Barton Malow Company is serving as the construction manager for the project, along with Clark Nexsen fulfilling the role of the architect and MEP engineer. Barton Malow is contracted with Penn State on a $94.1M Guaranteed Maximum Price (GMP) contract, and Clark Nexsen is contracted with Barton Malow on a Lump Sum basis. The total cost for the Ewing – Cross renovation is approximately $15.2M; this equates to $214.15/SF.

The total project duration for the South Halls renovation is approximately 33 months, with the design phase beginning at the end of May in 2011. The notice to proceed was given on May 1st, 2012, with construction beginning on Chace and Haller-Lyons. Construction on Ewing-Cross began with the demolition and abatement of the interiors in May of 2013, and is expected to reach substantial completion in at the end of December 2013 in anticipation of student move-in for the 2014 spring semester. In total, the construction of Ewing-Cross is on an aggressive seven month duration, with a unique phasing of the interior work.

ANALYSIS 1 – MODULARIZATION OF BATHROOM UNITS

PROBLEM IDENTIFICATION

There have been numerous quality concerns with the bathrooms, especially with the finishes, such as the tile work. While the rest of Ewing – Cross follows a top-down construction method, all four floors of restrooms are working simultaneously. This makes it more difficult to track quality and ensure that all finish work, such as waterproofing the showers, is done properly and according to specification. Without proper coordination of all finish crews, it can become difficult to deliver a finished product that meets Penn State's standards, without the need for rework. In addition, Cooper – Hoyt and Hibbs – Stephens are essentially identical to Ewing – Cross, so any solutions identified could be implemented in those buildings as well.

BACKGROUND RESEARCH

The removal of the bathroom slabs in Ewing – Cross in turn required that the brick façade be removed in front of the bathrooms. While the rest of the brick façade on the building will remain, opening the façade at the bathrooms creates a unique opportunity to use modularization in the bathrooms. The bathroom units could be built offsite, in a factory, and then shipped to the jobsite. By removing the construction of the bathrooms from the jobsite and placing them in a factory setting, there is potential improve the quality of the finishes. The units could be built at a reasonable pace, and the construction manager can then better track quality of the finish work. Modularization of the bathrooms would allow for a finalized unit to be installed, which would help to alleviate some of the rush to finish the bathrooms. Removing portions of the construction off of the jobsite would reduce congestion on the jobsite, which would be beneficial for Analysis 4.

Modularization of the bathrooms would also alleviate some of the burden of field installing the intricate MEP systems in the bathrooms. Modularization allows for the construction of the bathrooms to occur at essentially any point in the project, even during non-normal construction hours. The units could be built ahead of time and waiting to be installed as soon as the new bathroom slabs are in place. The modular design of the units would need to take into account how they will be connected to the structural system; further research would need to be performed to determine if modular units would have an integral structural system or be slid into place and rest on a traditional concrete slab system. Another concern would be the productivity rates and schedule savings achievable; this will be supported by research performed using knowledge gained from AE 570: Production Management in Construction. Modularization was a key focus of the course, and information obtained from this course will help garner a strategy for modular implementation at South Halls.

POTENTIAL SOLUTIONS

With respect to the implementation of modularization of the bathrooms at Ewing – Cross, the results of the analysis will produce the following potential solutions:

- Recommend implementing modularization in an effort to reduce the bathroom schedule duration, improve the quality of the finish work, and decrease site congestion.
- Consider modularization as an alternative to traditional stick-built construction, but the calculated schedule/cost savings do not differ from the original method.
- Do not recommend implementing modularization because it does not produce schedule savings or the cost increases are too great to do so.

ANALYSIS STEPS

- Research different levels of modularization.
- Investigate if any of the project team members have experience with modularization.
- Determine transportation and module size limitations.
- Develop preliminary bathroom modular design.
  - Redesign bathroom layout to reduce number of bathroom designs.
  - Analyze ADA code to ensure that new layout is acceptable.
- Analyze modular units for production efficiency and potential cost/labor savings.
- Evaluate possible schedule savings.
- Determine installation process and site logistics for modular units
- Implement modularization to decrease site congestion and accelerate schedule
- Compare modularization duration results to the original bathroom schedule.

RESOURCES

- AE 570 (Production Management in Construction)
  - Modularization Technical Report
- Barton Malow Project Team
- Industry Professionals familiar with modularization
- AE Faculty Members
- Project Documents and Specifications

EXPECTED OUTCOMES

It is believed that the implementation of modularization will accelerate the schedule for the bathroom, while producing higher quality work. While quality and cost are very important to Penn State, the schedule is crucial because most of Housing's revenue comes from on-campus student housing. Modularization of the bathrooms has the potential to help in reducing the overall project schedule for quicker turnover to the owner.

Please See Appendix A for Architectural Breadth requirements.

CRITICAL INDUSTRY RESEARCH

Modularization has been a key topic of discussion throughout various AE courses at Penn State. A lot of projects incorporate prefabrication, but very few fully utilize modular units, whether it is the entire building, or even just the bathrooms. The goal of my research will be to explore the effectiveness of modularization as well as the limitations. It is easier to implement modularization in new construction because there are few preexisting limitations placed on the project team. However, as Ewing – Cross is a renovation, it will be important to fully research and understand how the existing structure could impact the use of modularization. I will conduct interviews with project team members as well as industry professionals who have been on a project where modularization was used. I will also research past case studies of projects involving modularization. The results of the research will benefit the project team as well as provide an understanding of how modularization can be implemented in renovation projects in the future.

*Please refer to Appendix B for sample interview questions.

ANALYSIS 2 – SIPS IMPLEMENTATION FOR STUDENT ROOMS

PROBLEM IDENTIFICATION

Ewing – Cross is comprised of four floors of student housing, and a ground floor that primarily consists of the mechanical rooms. The top four floors are typical; however, the current schedule only divides the rough-in and finishes by floor. In addition, most of the activities per floor do not have typical durations; for example, Electrical Rough-In takes 5 days, while Hanging and Finishing Drywall takes 19 days. If activity durations can be made more consistent, then the overall construction will have a better flow. The punchlist for student rooms and turnover to the owner was critical at Ewing-Cross because the owner was receiving the building right when students were ready to return for the spring semester. This resulted in phasing the turnover of floors so that Penn State could start on owner FF&E. If the duration of construction for student rooms can be shortened, then the turnover of the building should happen earlier, allowing the owner more time to prepare for student arrival.

BACKGROUND RESEARCH

The repetitive layout of student rooms creates the opportunity to implement Short Interval Production Scheduling (SIPS). Utilizing SIPS will give a better understanding of the crews performing each construction activity. By understanding this information, the crew sizes can be optimized to eliminate the need for crews to overlap. The quality of work should also increase because SIPS will create a linear flow to the construction activities, where each crew has a designated work area that belongs to them for a given period of time. Better matching each construction activity to have similar durations would allow the project team to quickly identify if one particular activity is holding up other trades.

Currently, the construction is zoned by floor, making it difficult to understand how the work flows on each floor. It will be important to investigate if rezoning the construction will create a better flow for the activities. Dormitory buildings lend themselves well to the implementation of SIPS, and with there being four identical buildings in the South Halls renovation, any schedule savings achieved at Ewing – Cross could be applied to the other buildings. Implementing SIPS may not decrease the overall project schedule, but would allow for the turnover of critical spaces earlier, which would ease the burden of move-in on both the project team and the owner.

POTENTIAL SOLUTIONS

The results of the analysis will produce the following potential solutions with respect to the implementation of a precast concrete structural system:

- Recommend implementing SIPS as tool that produces schedule acceleration, improved productivity, cost savings, and a linear work flow.
- Consider SIPS as an alternative, but no schedule savings are perceived over the existing schedule.

- Do not recommend implementing SIPS because it does not product any savings or adds additional time or costs to the project.

ANALYSIS STEPS

- Research the implementation of SIPS on other projects and any relevant case studies.
- Consult with South Halls project team and gather information on final schedule with actual durations and crews sizes for each activity.
    - Examine current activities and crew sizes, and make adjustments to create consistent activity durations.
- Determine the optimal zoning of construction to allow for a linear work flow.
- Develop new schedule, utilizing SIPS for the student rooms.
- Evaluate the feasibility of SIPS by comparing the new schedule to the current schedule and provide recommendation.

RESOURCES

- AE 473 (SIPS Project)
- AE 570 (Production Management)
- Barton Malow Project Team
- Industry Professionals familiar with SIPS implementation
- AE Faculty Members
- Project Documents and Schedule

EXPECTED OUTCOMES

The expected result is that implementing SIPS will produce a better work flow and increase the productivity of the crews. One of the top priorities for Penn State is turnover of the student rooms, to allow for FF&E in preparation of student arrival. Using SIPS will create a schedule with more predictable completion dates. This will create schedule savings that can then be directly translated in cost savings.

ANALYSIS 3 – PREFABRICATION OF LIMESTONE FACADE

PROBLEM IDENTIFICATION

As previously mentioned, maintaining the project schedule is of particular concern. In addition, the site at Ewing – Cross is very tight, by State College standards. Often construction activities overlap and any minor delay can offset several different activities from being completed on time. During the enclosure of Ewing – Cross, there was a delay in material acquisition; the limestone panels were delayed by two weeks, and the façade completion was delayed because of this. The delays caused by the limestone panels required Barton Malow to shift several other exterior activities around to maintain the schedule. Because eight of the twelve limestone bumpouts are attached to the existing brick veneer, there is an opportunity to utilize prefabrication.

BACKGROUND RESEARCH

The use of a prefabricated limestone façade would be analyzed for several reasons; (1) removing construction from the jobsite would reduce jobsite congestion, (2) there is a potential to accelerate the enclosure schedule. Similar to Analysis 1, construction would be moved offsite, meaning that the limestone walls could be built ahead of time and waiting to be installed. Moving construction offsite would also have the potential to reduce the cost of construction because prevailing wage rates may not be required if the construction is not performed on the Penn State campus.

The use of the limestone veneer panels was dictated solely by the schedule; the limestone panels have a higher cost when compared to a traditional thicker limestone panel. Since the façade would be constructed offsite, there is an opportunity to utilize full thickness limestone panels, in an effort to save costs on material.

Furthermore, much like Analysis 1, there are two main concerns with using a prefabricated wall system; the structural system necessary to connect the limestone façade to the brick veneer, and the productivity rates and schedule savings that are attainable. The modular design of the limestone façade would need to factor in the tie-in to the existing façade.

While the smaller projection stone panels are installed over top of existing brick veneer, the larger projection stone panels serve as the primary exterior wall. The large projections also house the mechanical chases (see Figure 4). For this reason, any changes in the wall composition of the large projection stone panels will need to be analyzed to ensure that condensation does accumulate within the mechanical chase.

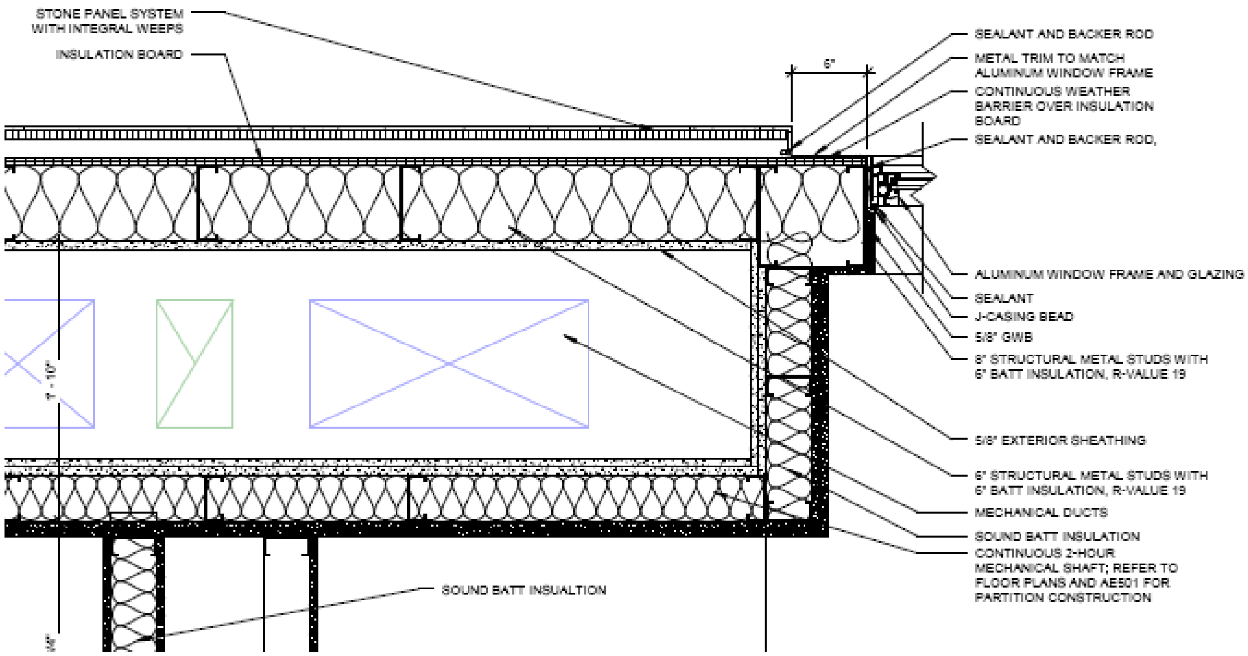

Figure 4: Limestone Façade at Mechanical Shaft | AE512

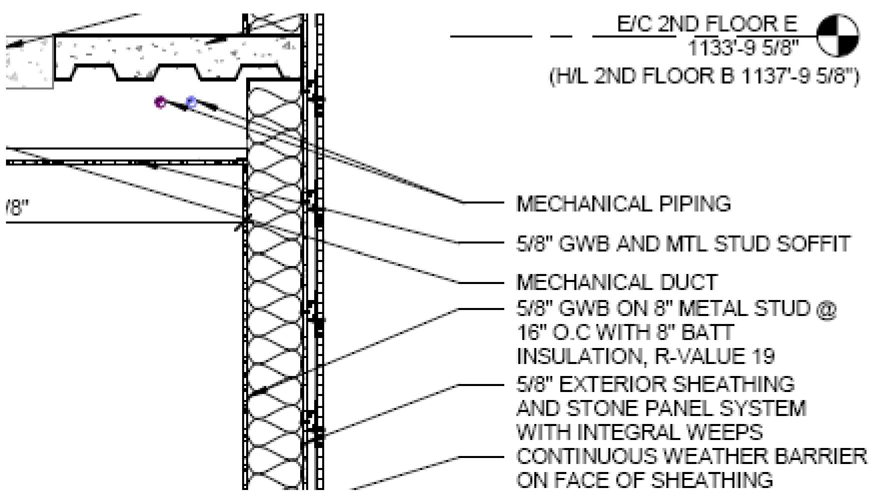

Figure 5: Wall Section at Large Projection Stone Panels | AE322

POTENTIAL SOLUTIONS

The results of the analysis will produce the following potential solutions with respect to the implementation of a prefabricated limestone façade wall

- Recommend implementing a prefabricated limestone facade to reduce jobsite congestion, while reducing cost and accelerating the enclosure schedule.
- Consider a prefabricated limestone façade as an alternative to a built in place façade system, but no significant cost or schedule savings are achieved.
- Do not recommend using a prefabricated limestone façade because the cost to do so outweighs the benefit of accelerating the schedule.

ANALYSIS STEPS

- Develop prefabricated limestone façade design and determine optimal limestone thickness for cost savings.
    - Design and analyze structural system for heavier wall system.
- Gather information on possible connection types for tie-in to existing brick veneer.
- Evaluate connections and load requirements.
- Analyze the prefabricated system for cost savings.
- Determine transportation and size limitations.
- Determine installation process and site logistics for the prefabricated limestone façade.
- Compare the cost and schedule of the prefabricated system to the stick-built system.

RESOURCES

- AE 404 & AE 308 (Structural courses)
- Barton Malow Project Team
- Industry Professionals familiar with prefabricated and limestone facades
- AE Faculty Members
- Project Documents and Specifications

EXPECTED OUTCOMES

By removing the construction of the limestone façade offsite, the prefabricated walls can be installed on a just-in-time basis. This will reduce congestion on the jobsite and allow for a reduction in the schedule. Productivity should be improved, resulting in a lower cost for labor. It is believed that offsite prefabrication will reduce the schedule and help in making resequencing of the construction phasing (Analysis 4) possible.

*See Appendix A for Structural Breadth requirements.

ANALYSIS 4 – RESEQUENCE RENOVATION PHASES

PROBLEM IDENTIFICATION

The current phasing of the South Halls project sees the first renovation, Haller-Lyons, taking twelve months to complete, with the remaining three buildings taking seven months each to complete. This puts the total construction duration at approximately 33 months, from May 2012 to January 2015. Each of the renovated dormitories will house approximately 248 students. As such, the sooner that Penn State can have each dormitory back online, the more revenue they stand to generate. Having the project completed even one semester quicker would allow them to start their payback period that much sooner.

BACKGROUND RESEARCH

This analysis will focus on the phasing of the South Halls renovation to determine how multiple buildings could be renovated at once to accelerate the schedule and turn the project over to Penn State quicker. The goal will be to renovate Cooper – Hoyt and Hibbs – Stephens at the same time, allowing the project to finish seven months ahead of schedule, or a semester earlier. Renovating the final two buildings simultaneously is initially thought to be ideal because there is an inherent learning curve from having already renovated Haller – Lyons and Ewing – Cross.

Attempting to deliver a project seven months sooner raises several concerns; it would create an aggressive schedule as well as increase the jobsite congestion. This ties into the other three analyses, which focus on prefabrication and moving construction offsite. If several areas of the project can be effectively constructed offsite and then quickly installed onsite, renovating multiple buildings at once becomes more feasible.

It would also need to be determined if Penn State has the capability to house twice as many students elsewhere on campus. After speaking with the project manager for the Office of Physical Plant, it was determined that taking multiple buildings offline is more feasible during the spring semester because student enrollment is typically lower during the spring, when compared to the fall semester. There are also renovations occurring in Redifer, as well as the east and west connectors from Redifer to Cooper – Hoyt and Hibbs – Stephens respectively. The Redifer work could pose a challenge to completing Cooper – Hoyt and Hibbs – Stephens together, so the entire sequencing of the South Halls project will be analyzed to determine the best sequence for the renovations.

POTENTIAL SOLUTIONS

The results of the analysis will produce the following potential solutions with respect to resequencing the renovation phasing at South Halls:

- Recommend resequencing the renovation phasing to allow owner turnover to occur one (1) semester sooner.
- Consider resequencing the renovation phasing as an alternative, but the cost to do so exceeds the revenue the owner would stand to generate.
- Do not recommend resequencing the renovation phasing because the cost to do so far exceeds the budget or the owner does not have the capacity to have multiple dormitory buildings down at the same time.

ANALYSIS STEPS

- Gather information concerning the total project schedule and sequencing of construction.
- Interview OPP project manager and owner's rep to determine feasibility of simultaneous renovations.
- Develop sequencing plan and analyze site logistics for simultaneous renovations.
  - Factor in any of the first 3 analyses that will successfully improve site logistics.
- Determine construction manager capabilities to implement plan.
- Perform cost analysis of GC and CM fees and determine feasibility of costs
- Compare the cost and schedule of the resequenced phasing to the original phasing

RESOURCES

- Penn State Housing
- OPP Project Management team
- Barton Malow Project Team
- AE Faculty Members
- AE 572 (Project Development and Delivery Planning)
- AE 570 (Production Management
- Previous South Halls feasibility studies

EXPECTED OUTCOMES

Through proper planning and the addition of offsite construction from the first three analyses, it is believed that it will be feasible to implement renovating multiple buildings at once in order to shorten the total project schedule. Doing so will require increasing the project management staff and their fees, but should be offset by the owner being able to generate revenue one semester sooner, ultimately saving Penn State money.

THESIS INVESTIGATION OBJECTIVES

Table 1 below shows a weight matrix that shows the breakdown of time allocated to each analysis. Also included is the distribution of the four core thesis investigations areas of: Critical Issue Research, Value Engineering Analysis, Constructability Review, and Schedule Reduction/Acceleration. The majority of time will be spent on schedule reduction and the constructability review of several systems within Ewing – Cross. This correlates with the theme of my thesis proposal in focusing on offsite construction to reduce the construction schedule.

Table 1: Weight Matrix

Critical Issue / **Analysis**	Critical Issue Research	Value Engineering Analysis	Constructability Review	Schedule Reduction/ Acceleration	**Total**
Bathroom Modularization	10%	5%	10%	10%	35%
SIPS for Student Rooms			10%	10%	20%
Prefabricated Limestone Façade	5%	10%	5%	5%	25%
Resequence Renovation Phases	5%		5%	10%	20%
Total	20%	15%	30%	35%	**100%**

CONCLUSIONS

Maintaining the high level of quality that Penn State expects while still meeting the project schedule has been the most critical aspect of the South Halls Renovation. Penn State Housing's budget almost entirely relies upon the revenue generated from on-campus student housing. As such, delivering South Halls even one semester sooner would allow Penn State to start generating a great amount of revenue. My four analyses focus around the theme of reducing the schedule through offsite fabrication, while also maintaining or exceeding the current level of quality.

APPENDIX A: BREADTH TOPICS AND MAE REQUIREMENTS

STRUCTURAL BREADTH: ANALYSIS 3

A structural breadth is also incorporated into the prefabricated limestone façade in Analysis 3. If the limestone façade is fabricated offsite, research will need to be performed to determine how the wall system will attach to the existing brick veneer. The current stick-built system sees 8" metal studs directly attached to the brick veneer; sheathing and Tyvek are then installed, with the limestone panels secured to the sheathing. With this entire assembly built offsite, the connections that secure the metal studs to the brick veneer will then need to be analyzed to ensure that they will hold the thicker limestone panels with a greater load, when compared to the limestone veneer panels. The structural system at the large projections will also need to be analyzed to determine how the wall load will be carried; this will involve performing an analysis of the loads and specifying a column size to carry these loads. The foundation will also need to be analyzed to determine if the current foundation will be capable of carrying the new loads. It is expected that the foundation will be able to handle the increased load, and that the new columns will tie into the existing structure.

ARCHITECTURAL BREADTH: ANALYSIS 1

With respect to Analysis 1, the implementation of modular bathrooms will require redesigning the bathrooms to better accommodate modularization. This will involve ensuring that the exterior wall to wall width is within the limitations for transportation to fit into a standard delivery truck (8 feet in width). Redesigning the bathrooms will also involve analyzing if the number of bathroom layouts can be reduced to increase productivity and drive down the design costs associated with each bathroom module. If the bathroom layout is changed, ADA code will need to be analyzed to ensure that the bathrooms still meet accessibility requirements. It is expected that that bathroom layout can be altered to improve the efficiency of the designs, while still maintaining ADA requirements.

MAE REQUIREMENTS

A majority of my analyses try to take advantage of knowledge gained from graduate level courses from the MAE curriculum. Information from AE 570 – Production Management in Construction will be used for Analyses 1 and 2. AE 570 dealt with increasing productivity and efficiency on jobsites. Analysis 1 deals with moving construction offsite; this will involve tracking how the production rates may increase or even decrease, when compared to onsite construction. Analysis 2 will look at implementing SIPS, which was discussed in detail during AE 570.

AE 572 – Project Development and Delivery Planning will also be used in Analysis 4 in looking at resequencing the renovation phases. AE 572 focused on improving the delivery method process to increase design and construction efficiency. Construction efficiency will be crucial for Analysis 4 because renovating multiple buildings at once will increase the site logistical challenges. The Design-Build GMP delivery method will not be altered; knowledge from AE 572 will be primarily used to better understand how jobsite efficiency can be improved for a Design-Build project.

APPENDIX B: SAMPLE INTERVIEW QUESTIONS

1. *Have you had experience on a project where modularization was implemented? If so, what was the project, and the reasoning for doing so?*

2. *What were the benefits of implementing modular system/units? Were there significant schedule savings compared to traditional construction?*

3. *What coordination or logistical challenges did you face because of implementing modularization?*

4. *Were there additional costs incurred through the use of modularization?*

5. *How would you implement modular bathroom units in a renovation project? What limitations would the existing structure place on implementing modularization?*

6. *Would you recommend implementing modular bathroom units?*

7. *Would you recommend integrating the structural system into the modules, or utilizing a separate precast concrete system?*

APPENDIX C: SPRING SEMESTER SCHEDULE

Date: 02/06/2014			Milestone 1 2/3/13		Milestone 2 2/17/13		Milestone 3 3/7/13				Milestone 4 3/31/13	Quaid Spearing Spring Schedule Faculty Advisor: Dr. Anumba			
Proposed Thesis Semester Schedule															
January 2014 - May 2014															
1/13/2013	1/20/2013	1/27/2013	2/3/2013	2/10/2013	2/17/2013	2/24/2013	3/3/2013	3/10/2013	3/17/2013	3/24/2013	3/31/2013	4/7/2013	4/14/2013	4/21/2013	4/28/2013
Research Modular Design								Spring Break				Final Report - April 9	Faculty Jury Presentation - 14-18		Senior Banquet - May 2
Revise Proposal or Update	Module Redesign (Arch Breadth)														
		Cost/Time Analysis													
			Installation /Sequencing												
				Research SIPS Case Studies											
					Obtain Schedule Data										
						Build SIPS schedule & Quantify Results	Build SIPS schedule & Quantify Results								
		Design Prefab System (Struct. Breadth)													
			Cost/Time Analysis												
				Develop Install Plan & Quantify Results											
								Research & Analyze Feasbility of New Sequence	Research & Analyze Feasbility of New Sequence	Research & Analyze Feasbility of New Sequence					
										Determine Cost and Schedule	Determine Cost and Schedule				
												Finalize Report			
													Jury Present	ABET Assessment	ABET Assessment
														Update CPEP & Report	Update CPEP & Report

	Milestone
1	Modular Analysis & Design Complete
2	Limestone Façade Prefab Design Complete
3	SIPS Analysis Complete
4	All Analyses Complete

Analyses & Breadths
Modularization of Bathroom Units
Prefabrication of Limestone Façade
SIPS Implementation for Student Rooms
Resequence Renovation Phases