AE 481W

[Submitted: 12/01/2009]

Matthew Dabrowski
Construction Management
Consultant: Dr. Chris Magent

[Rydal Park Medical Center Addition]
[Rydal, Pennsylvania]

[TECHNICAL ASSIGNMENT 3]

[The following report presents a technical overview of the Rydal Park Medical Center Addition. Located within this assignment an alternate methods analysis of the addition which has been addressed through a project manager interview. The interview focused on constructability challenges, schedule acceleration scenarios and value engineering topics. The report will conclude with a discussion of personal observations regarding problematic features of the building and exploring several technical analysis methods.]

Rydal Park Medical Center Addition

Project Information:

Function : Institutional Care
Building Cost : $26.590,000
Size : 142,862 Square Feet
Dates of Construction : Sept 09' - March 11'
Delivery Method : CM @ Risk, Design-Bid-Build w/ Negociated GMP

Project Team:

Owner : Presby's Inspired Life
Developers : Greenbrier Developers, Inc.
Architect : Stewart-Conners PLLC
Construction Manager : The Whiting-Turner Contracting Co.
Structural Engineer : WK Dickson & Co.
MEP Engineer : Moore Engineering

Architecture:

- Aesthetics intended to invoke sense of residential community living at a location where seniors may receive skilled elderly nursing care.
- 5 story structure will include:
  - two floors of parking garage space
  - two floors of skilled nursing care
  - one floor of critical memory support
- Façade will implement a stone veneer system and spray applied stucco as well as curtain window wall & Pella windows to match the existing medical facility

Structural:

Foundation :
- Helical geo-pier stone column foundation system will provide support under spread footers

Superstructure :
- Post-tension two-way concrete system
- Reinforced concrete columns
- Reinforced masonry mass shear Walls (gravity system), located mainly at stairtowers, utilized as the lateral system

Roof Sturcutre :
- Non-composite roof deck mainly supported by K-series joists and severl intermediate wide flange beams between columns

MEP Systems:

- Four pipe air/water HVAC system:
  - three fan coil units (400 - 1200 CFM)
  - Eight AHU's (630 - 3770 CFM)
  - Four energy recovery units (first floor)
- Building power supplied by PECO:
  - 15 KW Switchgear to stepdown power
  - 208/120V 3 Phase 4 wire wire System
  - 350 KW Emergency Generator (first floor)
- Combination dry and wet pipe fire supression system

Conceptual Sketch

Matthew James Dabrowski
Architectural Engineering | Construction Management
http://www.engr.psu.edu/ae/thesis/portfolios/2010/mjd5060

Table of Contents

Thesis Abstract 2
Table of Contents 3
Executive Summary 4
Constructability Challenges 5
Challenge #1: Site Constraints 5
Challenge #2: Site Utilities 6
Challenge #3: Connecting the Addition to Existing Facility 6
Schedule Acceleration Scenarios 7
Critical Path 7
Procurement 7
Site Preparation, Underground Utilities, and Substructure 8
Post-Tension Concrete Structure 8
Building Enclosure and Façade 8
Interior Finishes and MEP 8
Value Engineering Topics 9
V.E.'s Impact on the Owner 11
Observations: Problematic Features 12
Technical Analysis Methods 13
Analysis #1: Integrated Project Delivery Execution Plan 13
Analysis #2: MEP Coordination with Interior Finishes – SIP Schedule 13
Analysis #3: LEED Analysis – Life Cycle Cost 14
Analysis #4: Alternate Mechanical System / Energy Analysis 14
Weight Matrix 15
Appendix A 16

Executive Summary

Presby's Inspired Life develops and manages continuing care communities that provide an opportunity for senior citizens to live their lives within a relaxing residential surrounding while retaining peace of mind that if any health emergency were to arise, assistance would be immediately available. This location, Rydal Park, is a continuing care retirement community where seniors begin living at homes that are cozy cottages and as their conditions progress (if any exist), they will eventually move into the medical facility at the center of the campus. This medical addition has finishes that closely resemble would be found within a luxury hotel, but with the added necessity of being equipped for medical emergencies.

Technical Assignment 3 investigates constructability challenges, schedule acceleration methods and value engineering items through a project manager interview. This interview is a crucial component of thesis research given its ability to provide further insight to the student through the project team's perspective. The three major constructability challenges discussed include dealing with a wetland site, relocating the underground utilities and managing the connection of the addition to the existing facility. The schedule acceleration section summarizes the critical path and explains potential scenarios that could be attempted during each phase of the critical path. Finally, the project manager portion wraps up by addressing value engineering methods implemented on this project.

Following this interview discussion, personal observations regarding problematic features will be addressed. These features include both building design challenges as well as issues associated with the project team or resident living at the community. Beyond that, four construction management analysis activities have been identified which explore potential research for the spring 2010 semester.

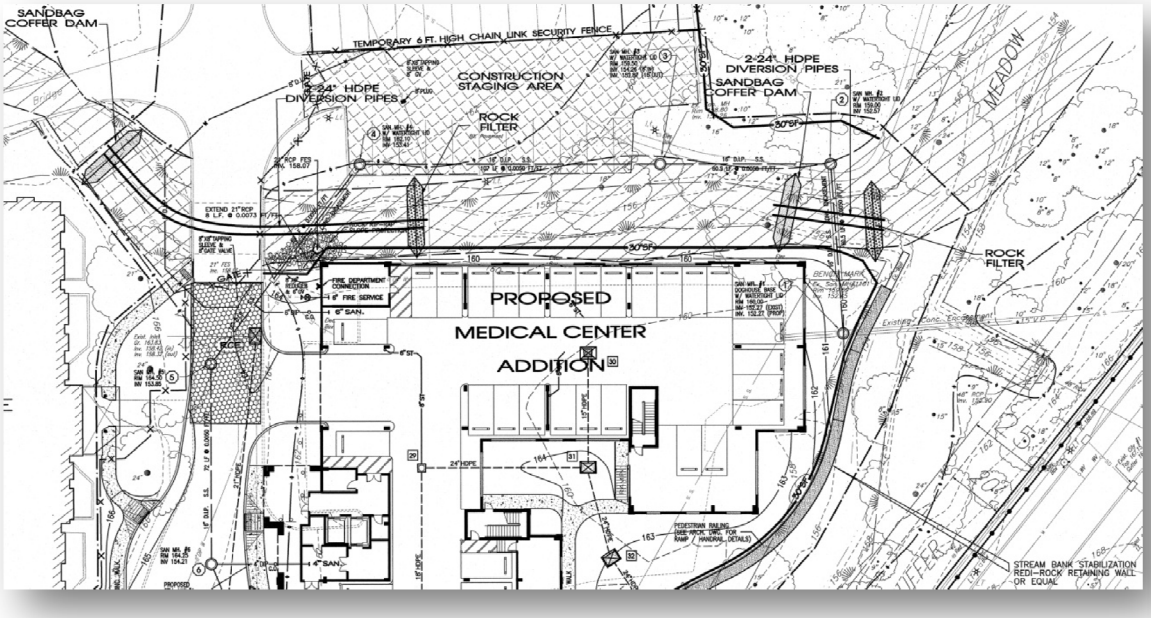
Constructability Challenges

Considering the official mobilization occurred on November 16th 2009, it is difficult to pinpoint many challenges as they have yet to occur. During the project manager interview, Chip Cinamella, was able identify several key regions that may potentially present challenges to the construction team. The three major challenges facing Whiting-Turner are working within the constraints of an extremely tight site, relocating the site utilities while maintaining locking dock operability, and the final connection of this addition to the existing medical facility.

Challenge #1: Site Constraints

Along the eastern and northern sides of the building are regions designated as floodplains and wetlands as well as a stream that runs along the building. Each of these components must remain undamaged and intact during the entire duration of construction. Typical sediment and erosion controls will not be sufficient for this project. In order to protect the floodplain and wetland regions, coffer dams and diversion pipes will temporarily redirect the flow of water permitting crane and equipment access. Large rocks will be utilized to filter the water in order to prevent construction debris and waste from damaging the local ecosystem.

The stream bank will require stabilization through the use of a retaining wall. This will allow vehicles and equipment to travel around the site while maintaining the integrity of the stream bank. It will also provide a barrier between wildlife and construction in an attempt to keep animals from entering the construction site.



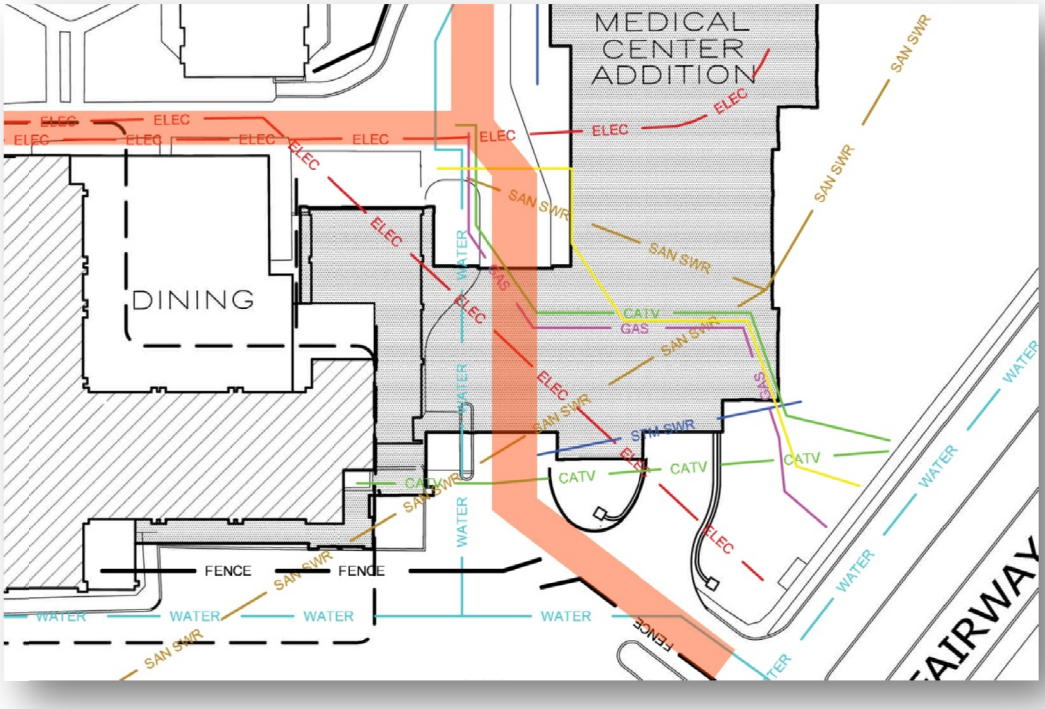
[*Figure 1 – Sediment and Erosion Control Plan*]

All of these precautions must be managed properly to maintain the integrity of the community's environmental surrounding and atmosphere which is what the campus was established upon. This peaceful environment must be maintained as it is one the main marketing elements for the community to continually obtain new senior residents.

Challenge #2: Site Utilities

The second challenge facing the team, at this stage of the project, is the relocation of the existing utilizes. Since this site was originally a parking lot, the utilities were placed in the quickest run from the municipal or city connection point to where it needed to be on the campus. When the utilities were placed, no planning took place to anticipate that a building would be placed in this region in the future. Viewing the underground utilities from an overlay map shows a tangled mess of conduit and pipes. To add to this challenge, the loading dock is directly next to the campus' main utility bank. This loading dock is the primary hub for all of the medical supply and food deliveries for the retirement community and must remain open at all times. As soon as a delivery truck requires access, any open utility trenches must be covered with steel plates providing access to the loading dock.

Whiting-Turner has developed a sequence plan outlining the order in which each utility will be capped off, dug out, relocated and re-activated. This will present a timeline to each subcontractor showing when they need to be ready to perform their relocations in order to maintain the overall schedule. Each utility must be relocated within the highlighted corridor indicated by the orange region below. This region has been located below a new road which will provide quick access for maintenance personnel. By doing this, all of the conduits and pipes will become centrally located improving the owner's ability to monitor these utilities.



[*Figure 2 – Existing Underground Utility Overlay Plan*]

Challenge #3: Connecting the Addition to Existing Facility

The last major challenge currently facing Whiting-Turner is managing the connection of the addition to the current existing facility. This connection will involve a seven inch expansion joint which creates challenges with any MEP runs that cross this connection plane as well as finishes located within this region. Any conduit or pipes that cross this connection plane will require addition fittings that allow for flexibility if settlement

were to occur. The façade connection will be another challenging element of this challenge. The owner has stressed that this connection must appear seamless from the exterior view. This façade connection will require close monitoring as well as implementing several quality control checkpoints.

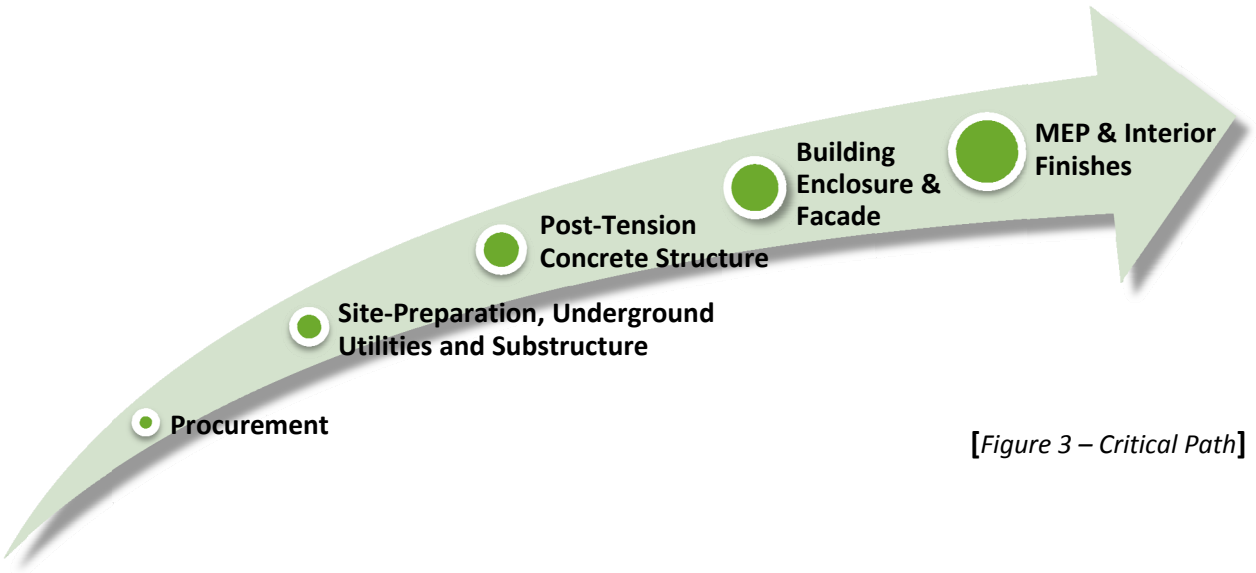
Along with the technical element of this challenge is the phased occupancy problem. The owner would like to regain control of the resident rooms, in the existing facility, affected by the construction as soon as possible. In order to provide quick delivery of this region affecting the existing facility, subcontractors that have interior work may be scheduled to complete their work while the concrete structure is still being completed.

Located within ***Appendix A*** are the building sections of this complex region.

Schedule Acceleration Scenarios

On top of this $26 million medical center addition is an additional $12 million worth of renovation work within the rest of the retirement community. This renovation work has created extremely critical deadlines for the phased occupancy schedule. Considering this issue, the schedule is one of the most crucial elements to this construction project. Subcontractors who have agreed to the developed schedule must adhere to it while maintaining their quality craftsmanship. Besides utilizing weekends and extra crews, several acceleration scenarios have been developed in the event they will be required and are explained within the following section.

Critical Path



[*Figure 3 – Critical Path*]

The critical path for this project follows a standard flow of work considering the relatively low complexity of the building type. The project schedule provides 25 days to complete the GeoPier foundation system, 105 days to complete the concrete structure, 165 days for the building envelope and ranging from 190 to 260 days for interior finishes depending on the complexity of that floor.

Procurement

It is critical to complete procurement for the work that gets the building started, i.e. site work, foundations, underground MEP, etc. or naturally the entire project will begin late. This portion of work mainly involves

project management and purchasing which means that these entities must properly coordinate their work to prevent late starts. There is potential to accelerate the schedule if work is purchased early and subcontractors can plan accordingly for early arrival to the site. It is also extremely critical to complete procurement with subcontractors that require extensive time to fabricate construction elements such as storefront glazing or prefabricated structural components. Trades that involve off site fabrication will only begin working on these components after they are signed and agreed to a contract.

Site Preparation, Underground Utilities, and Substructure

During this phase of the schedule, the site work, GeoPeir, concrete and MEP contracts must be purchased and all construction permits acquired. These trades must be ready to send workers to the site immediately after Whiting-Turner has mobilized. This project has roughly 120 days to complete the major site work. With proper coordination, this 120 day duration could be accelerated if work occurs simultaneously. As soon as the underground stone columns are placed, underground utilities and concrete footers could be placed immediately following. Currently Whiting-Turner has this work planned back to back with no simultaneous work. Overlapping site work allows for an accelerated schedule with minimal cost impacts.

Post-Tension Concrete Structure

This phase of construction does not indicate many opportunities for schedule accelerations. Considering that a good portion of the interior work requires a watertight building, the concrete structure and building enclosure must be complete prior to starting finishes and MEP.

Building Enclosure and Façade

Given that the building envelope can begin prior to the watertight milestone, this phase of the critical path begins to indicate excellent opportunities for schedule acceleration. Currently Whiting-Turner has planned to begin the building envelope only after the structural steel for the roof has been set. With this type of sequencing, the lower floors are sitting empty when work could be commencing. Instead of waiting until the structure is 100% complete, the stone veneer and EFIS can begin to be applied to the structure around the time that the third floor of superstructure is starting. If a unique method of setting the façade is developed and properly implemented, the building enclosure could wrap up shortly thereafter the concrete structure finishes.

Interior Finishes and MEP

This final phase of the critical path provide an excellent chance to implement a short interval production schedule or SIPS. Considering that this facility will house 115 typical resident rooms, a properly implemented SIP schedule could possibly allow for the completion of four or five rooms per one week interval. Also, if an aggressive building envelope schedule is perused, interior finishes and MEP work would have the possibility of beginning shortly after the concrete structure completes.

Value Engineering Topics

Presby's Inspired Life along with Stewart-Conners Architects began working towards a design during the first quarter of 2008. Since then this project has been placed on hold several times and has undergone serious considerations of what the owner would like in the delivery of this product. Whiting-Turner has been involved in two extensive value engineering sessions totaling roughly $2 million worth of redesigns and scope reduction. The following items are just a few of the many V.E. items that the Presby's Inspired Life has accepted and considered.

Toilet Accessories
Approximate Savings: $61,000 – Accepted

The architect specified a very expensive name brand for toilet accessories and shower grab bars. The price for the specified brand was almost purely for just the name. Utilizing an alternate brand provided the same style and quality, desired by the owner, but at a fraction of the cost. After the owner went to a showroom to look at the alternate brand, he immediately called WT and confirmed the VE approval.

Plumbing Fixtures
Approximate Savings: $40,000 – Accepted

All of the toilets within the facility were specified to be the color 'almond'. After some research and estimating work, this saving amount was found if the color was specified as just 'white'. The colored porcelain and plastic components of the specified plumbing fixtures were found be at a premium.

Window Sills
Approximate Savings: $22,775 – Accepted

Marble window sills were specified throughout the entire building. It was suggested by the millwork and casework bidders to replace the marble sills with painted maple wood window sills. Since the quality of the marble countertops was presenting problems during this discussion, the owner instantly approved this item. This selection will be a better match to the existing facility which was originally built with painted maple wood sills and not marble.

Wall Type
Approximate Savings: $18,600 – Accepted

Wall type W4 and W7 are identical to wall type W2 in every way besides an extra layer of insulation. The rough framing bidder indicated that utilizing a more standard wall type throughout the building makes it easier and faster to frame since there are less alternating wall types. On top of the reduced cost it was discovered that W2 provided an extra half hour toward the fire wall rating.

Piping for Sanitary Drain, Condensate Lines, Domestic Water, and Storm Water Line
Approximate Savings: $80,125 – Accepted

Instead of using metal piping, Moore Engineering proposed to use PVC for sanitary drain, condensate, and storm water lines. CPVC (Chlorinated PVC) would be used for the domestic water. The CPVC has many benefits over copper including lower price, lightweight, self-insulating, less subject to jobsite theft and is

resistant to corrosion. This element was extremely critical during the GMP wrap up considering the impact $80,000 has the selection of a plumbing package.

Architectural Soffit
Approximate Savings: $11,500 - Accepted

Originally a radiused soffit was designed for the foyer entrance of each resident room which requires a significant amount of labor. It was decided to use a straight soffit alternative in lieu of the radiused. The saving seen is mainly associated with the amount of labor required to curve wood in order to create the curve.

Lighting Fixtures (Aggressive Alternatives)
Approximate Savings: $70,000 – Rejected

Whiting-Turner suggested utilizing more standard exterior lighting fixtures which could be easily purchased and delivered. This V.E. also recommended reducing the variety of site luminaries from 20 different styles to five which reduces the overall layout complexity and increases repetitive installation. This was rejected due to the owner's wish of having an 'exciting' nighttime atmosphere for the senior residents.

Stone Veneer Sealer
Approximate Savings: $30,757 – Rejected

The stone veneer manufacturer, Quality Stone Veneer, explained that the warranty does not require a sealer to meet the specifications but does assist maintenance crews during cleaning in the spring time. Quality Stone also said that without the sealer, over a 25 year period, the owner may see some discoloration. After the owner considered these downsides, Presby's Inspired Life decided to reject the deletion of the sealer from the GMP.

Ground Floor Parking Slab
Approximate Savings: $25,000 – Rejected

The ground floor of the building is going to be a parking garage designed with a slab on grade concrete floor. WT proposed the idea of utilizing asphalt for the first floor given that it will be on grade. This issue remained on the table for several weeks until the owner decided that it would compromise the over look of the campus which has been mainly constructed out of concrete.

Domestic Hot and Cold Water Piping Insulation
Approximate Savings: $70,000 – Rejected

Considering one of the benefits of CPVC (previously accepted V.E. item) is self-insulating, the MEP engineer suggested deleting all of the specified insulation on the domestic hot and cold water piping. This was another item that was on the table for several weeks until the owner decided against it. Given that CPVC is relatively new to the construction industry that are still many unknowns since it has minimal documentation over time. Presby's Inspired Life finally decided that the insulation should be purchased and therefore declined this proposed V.E. item.

Waive Whiting-Turner's Payment and Performance Bond
Approximate Savings: $365,000 – Rejected

Whiting-Turner does not normally include a Payment and Performance bond within their GMP's since they require all of their bidders to include one within the price of their work. Also Whiting-Turner does not self perform any work, so this bond would be secondary cover over the subcontractors protection already. The owner gave the initial approval for this issue but the bank that was lending money to the owner made would not approve. Within the bank's contract with Presby's Inspired Life it was established that the Construction Manager at Risk must include a P & P or the contract would be void.

The V.E.'s Impact on the Owner

Throughout this final value engineering session, the owner became extremely focused on finish items, or items that are visible. Presby's Inspired Life keep insisting that they wanted the best carpets, tiles, wood finishes, cabinets, pull handles, and faucets but their budget did not permit the allowance of the specified name brands. This caused the major delays as Whiting-Turner had to continuously call each bidder and ask for updated bids. Every time WT contacted these bidders, some became more agitated and eventually several key bidders lost interest and just stopped sending updated information since they were too busy dealing with other projects and bid opportunities. Searching for less expensive finish items actually caused more damage after some of the more competitive bidders became exhausted with Presby's indecisiveness.

When owners become hung up on visible elements it distracts the entire project team from other areas of the project that could provide a better project delivery. More time could have been spent on developing an improved mechanical system or improving the building envelope therefore delivering an energy efficient product. Instead the developer, architect, owner, interior designer and construction manager all became hung up on why a certain brand of tile cost $1.25 per SF versus $2.75. After considering that the initial 50% design development estimate took place in March 2008 and the GMP was to be submitted in September 2009, it is clear why the price increased.

It is felt that what the owner called a value engineering session really developed into a "scope reduction" or "quality reduction" session chasing items that aren't directly visible to the occupants. This session directly resulted in lowering the quality of the building which could have been an aesthetically pleasing medical facility given its surroundings.

Observations: Problematic Features

Throughout the development of the GMP during the bid period, several problematic features were personally observed within the design of the building and how the entire project team interacted. Many of these issues bring differing levels of complexities but each would require a considerable amount of research to completely understand. Developing alternate solutions to these issues will provide excellent insight for future problem solving within the construction industry. The following topics are features of this building that have a high potential to create problems if further consideration is not explored:

- Site utilization and layout near a floodplain & wetland region as well as a stream
- Partial demolition of the existing medical facility which must remain operational
- Coordinating the relocation of the underground utilities
- Installation of the GeoPier Stone Column Foundation close to the underground utilities
- Construction of post-tensioned concrete structure – sequencing and shoring
    - Lack of space around the site for crane placement and movement
    - Application of prefabricated or precast structural elements
- Shear Walls / Stair Wells construction
- Curved curtain wall and its connection to the curved standing metal seam roof
- Connection of the addition of the existing medical facility and concealing the exterior existence of the connection
- Setting large mechanical equipment within the building (no equipment will be placed on the roof)
- MEP installation and coordination with Interior Finishes (SIP Schedule?)
- Alternate mechanical system, improved efficiency
- Lack of LEED Consideration (Life Cycle Cost)
- Resident occupancy phasing sequence throughout the campus during construction
- Safety of the campus pedestrians
- Maintaining proper air quality, noise levels, and vibration due to close proximity to a medical facility
- Project Team Goal Alignment and difficulty of maintaining a proper team while spread out in multiple geographic locations – Architect (North Carolina), Developer (Texas), Interiors (Illinois), Owner and Construction Manager (Pennsylvania)

After considering this list, it is apparent that some topics will be more feasible to research than others. This list of features must be carefully analyzed since they will eventually be the basis of research for the spring 2010 semester. Personal observation of the project team during the GMP development has gathered interest for a main construction management topic of Integrated Project Delivery, or at least improved project goal alignment.

Technical Analysis Methods

The following four items have been selected from the prior problematic features list and will be potential topics for research during the spring 2010 semester. Through the development of this section, one of the primary themes for these analysis concerns efficiency both within the project team's effort to design the building but also within the construction of the facility itself.

Analysis #1: Integrated Project Delivery Execution Plan

During the summer of 2009, the development of this project was personally observed revealing the lack of team integration. Although team discontinuity existed, a good portion of this problem was a result of how Presby's Inspired Life managed each entity of the project team. One of the main management issues was that the owner would ask one of the project entities to check on something that was the main responsibility of a different entity. Once this commenced, it was as if each member had to work in complete secrecy which immediately halted forward progress. When meetings were held it was as if each project member was afraid to present information because another member would explain that the information was incorrect.

Along with this issue, the development team was constantly seeking out elements that could reduce the cost of the project. Eventually the owner declared that the project was hanging on items that were worth 0.0006% of the overall project budget (approximately $26 million). If a project is at this point, the reason for commencing the project and utilizing all of the hired professionals should be reexamined.

For this analysis I would like develop a guide for owners and project teams that will help each member of the project team align their goals towards the smooth delivery of a product to an owner. It is clear that this owner wanted a purchase a product twice the size of what their budget permitted. This issue must become more transparent within construction industry of today. As more codes and regulations become established, the cost of delivering a project will only increase. I would like to take a deeper analysis into what occurred to put this project on hold in the past and figure out how it could have been prevented. Mobilization occurred less than a month ago, but this project has utilized more man hours than it would take to design and estimate two or three projects. Considering the plethora of technologies available, this design and procurement process should be more efficient and streamlined than its current state.

During the 2010 PACE Roundtable event, this topic generated the most interest due to its excellent applicability to this project team. Also, considering that this topic is relatively young, I think it would be an extremely timely topic to explore.

Analysis #2: MEP Coordination with Interior Finishes – SIP Schedule

As previously mentioned, this facility will have 115 almost identical resident rooms. In order to promote a smooth and quick delivery, I would like to develop a short interval production schedule (SIPS) for the resident rooms within this building which would outline how much time each trade has in a specific area or region. This analysis could be an extremely useful resource to the project team given the current early phase of construction. MEP and interior finishes will not begin until around September 2010 indicating that any research performed for this analysis could be implemented.

I would like to potentially approach this analysis with both a traditional schedule format as well as from a 4D method. Unfortunately this project is not utilizing BIM, therefore I would develop a basic model with enough

detail enabling me to highlight regions or components. When highlighted a note or schedule would indicate the date and which trade is working within the region. Development of a basic model would be useful for other breadth research such as a lighting redesign or display the appearance of an alternate architectural facade. I would need to compile a detailed list of the scope of work involved within each resident room and the time associated with each construction element. The mechanical and electrical systems would require extensive investigation in order to comprehend the complexities associated with tying-in and final connections in each room.

Analysis #3: LEED Analysis – Life Cycle Cost

During my meeting with the project manager, Chip Cinamella, I explained my opinion that the best form of thesis research is the type of research that has the potential to be implemented in the future. Since Presby's Inspired Life choose not to peruse LEED certification I would like see what the building would achieve currently. I would also like to investigate which methods could be implemented to achieve certification or higher. Further discussion, of the previous topic with Mr. Cinamella, lead to the concept of developing an extensive and in-depth life cycle cost-analysis. This research generated could be implemented into the owner's budget and yearly maintenance updates. This life cycle analysis would take into consideration daily maintenance to re-carpeting, painting, window replacements, roof replacement and energy costs. Anything and everything that could possibly occur to the building over a fifty year period would be applied to this analysis in an effort to improve the owner's ability to calculate and adhere to a budget.

For the LEED portion of this analysis I would be able to obtain construction waste management plans and how waste is being recycled or diverted. My current relationship with the project team is extremely strong which will allow for quick updates throughout the spring semester.

This is also another opportunity to become proactive on a project that is not currently using LEED. With the time available to me next semester, I should be able to develop a well articulated proposal indicating the many benefits of LEED and sustainable construction to Presby's Inspired Life.

Analysis #4: Alternate Mechanical System / Energy Analysis

After considering issues from the PACE conference, along with the sustainable building methods course, and general global energy concerns, my interest in energy usage has become extremely elevated. This research could be combined in some method with the previous analysis with LEED. I would like to focus on how the current mechanical system will be heating and cooling the building and select a more efficient alternative. Along with this alternative system, I would like to calculate the savings, or lack of, associated with the newly selected system. To perform this analysis, I would use an energy modeling program, such as Energy 10, to develop a basis for a reselection of the mechanical system. This energy modeling would also open opportunities for me to change the amount of lighting and discover how renewable energies could aid with on-site energy production.

My contact at Whiting-Turner, Bogdan Minda, is extremely knowledgeable with mechanical systems. He would be able to explain the benefits and drawbacks to alternate systems. At the same time he would be able to explain which mechanical system work best with what types of buildings. This research also has the potential to tie into the life cycle cost-analysis. A system with a higher upfront cost could be compared to the current system over a 50 year period. This analysis may reveal that the currently designed mechanical system may end up costing Presby's Inspired Life twice as much over 50 years.

Weight Matrix

Analysis Description	Research	Value Engr.	Constr. Review	Sched. Reduc.	Total
Integrated Project Delivery	15%	0%	0%	20%	**35%**
SIP Schedule	0%	10%	10%	10%	**25%**
LEED / Life Cycle Analysis	3%	0%	7%	0%	**15%**
Energy Analysis / Alternate Mechanical System	10%	10%	5%	0%	**25%**
Total	**28%**	**20%**	**22%**	**30%**	**100%**

Appendix A

Building Sections of the Connection

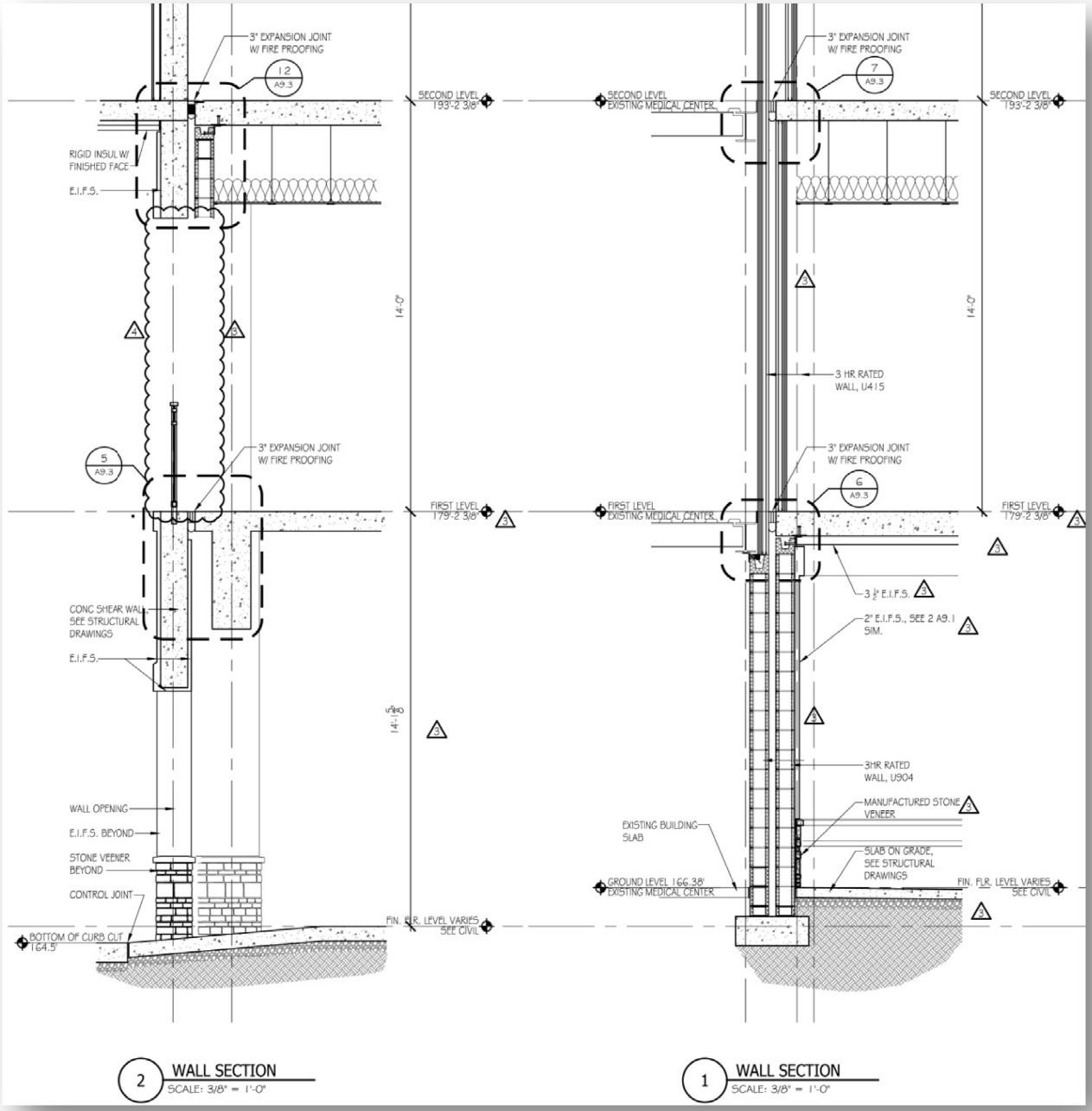
of the

Existing Medcial Facility

to the

Medical Center Addition

Bottom Half of the Building Section



Top half of the Building Section