



Conclusions

This last year of the AE curriculum has required students into proving to their professors that they did pay attention in class and the past 5 years have not been in vein. The mere fact that the Architectural Engineering curriculum has an extra year than most majors is telling the public something.

Studying for a thesis topic is some heavy stuff and quite frankly scares most people. But the process was not as bad as it seemed. With the bulking up of information and the structured schedule of gathering that information made a strong foundation to build a thesis on top of. The CM opportunity to sit in on the discussions at the PACE seminar held this past October help a majority of the students within CM get a thesis topic way before the other options considered one. From there the technical reports were valuable resources for the second semester to find the answers that students need to prove their points.

4D modeling as the basis of this thesis proved to have a plethora of information from the taboo in the industry to the cases and research already written about what it is and how to use it. Talking with the industry professional was the biggest input to this thesis. Drawing on the opinions and facts from the people that know and use, or don't use, the technology every day could not have made the research any easier. Granted not as many people responded to take the survey, but that's the nature of the beast. There are enough cases out in the real world now that people should be more open minded about using new technologies in the construction industry. It's like trying to argues it's still



winter outside when it's blatantly the end of spring. The evidence is there, just accept it and use it to one's advantage.

Also the requirement of using a building that is under construction is an interesting idea. Using a building that is still under construction helps the student find major issues with the building. Also the issues with the building mostly occur during construction and not after construction. The issues at stake are fresh in the minds of the people working on the building give the student something to consider for research or how the student feels they could have fixed the problem. The issues found in the airport may have been trivial, but upon further research became a bigger issue.

Solving problems is going to be a big part of every AE graduate and the ability to solve those problems will be invaluable. Developing a schedule for a quicker way of erecting the building proved to be quite the challenge and a big learning experience. Not all buildings can have SIPS schedules applied to them, but reviewing the SIPS schedule with the 4D modeler proved to be a great way to cross check the logic of the developed schedule. Overall using the 4D modeling proved the point made in this thesis that it is needed to review the logic of schedules as well a develop a better way to build a building.

Analyzing the beam for the structural integrity became a big deal because it would not have worked at the point that would have been easy, and extending the duct along the beam to punch through the beam at a more safe point proved to be more expensive. When looking for a better option the analysis of the HVAC system came into play and load analysis and efficiency issues came into play. Moving the loads from one



roof top unit to another rooftop was a considerable solution and proved to be quite cost effective.

Overall the process of writing this thesis made the student draw upon topics and subjects that they learned from years back. Granted many students would prefer to avoid some of these topics, but that is not the real world. Analyzing topics outside of their degree are going to come up every day in their lives. This is why the Penn State degree is so highly regarded in the building industry. The graduates of this program know how to solve problems to some extent out of their own focus. This knowledge makes Penn Staters have that extra edge in the real world, and having that edge makes life all the better.