



**Peter Pan Peanut Butter**  
**Sylvester, Georgia Processing Plant**



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## **Executive Summary**

This assignment is intended to consider possible topics that could eventually lead to research topics. Outlined in my assignment are critical industry issues that were addressed in the P.A.C.E. Roundtable meeting including topics such as prefabrication, building information modeling (BIM), and workforce development issues. During the Roundtable these issues were discussed by students as well as industry professionals from many different companies, giving a wide range of useful information. Outlined next in the assignment is how I plan to take my topic, workforce development and research it. I plan to do this by researching different programs in high schools and in companies, as outlined in the following pages.

In review of my thesis building, ConAgra Foods Project Stallone, I came across some things that I think require research and changes. Systems that I felt that could have been done differently to save money or schedule time included the structural and mechanical systems. Finally I provided a chart that shows how I will be splitting up my focus to get the results that I need on my final project, with the two biggest focuses in research spending 35 percent of my time and construction review spending 30 percent of my time.

## **Critical Industry Issues**

The P.A.C.E. Roundtable is an annual event held here at Penn State University for industry members to gather and elaborate on developing issues in the construction world today. This year's event took place on October 24<sup>th</sup> and brought up critical issues pertaining to areas of prefabrication, Building information modeling (BIM), and workforce development. While at the event we were encouraged to find ways to implement the issues into research that we could use on our senior thesis projects, which I found some issues could tie in while others could not. The event was both a great opportunity to meet with industry professionals and learn of the critical issues that are affecting our industry every day.

### **Prefabrication**

The first critical industry issue that was discussed dealt with prefabrication. Prefabrication is a construction method that involves the assembly of buildings or their components at a location other than the building site. The method controls construction costs by economizing on time, costs, and materials.

When referring to ConAgra Foods Project Stallone, looking back there were not very many opportunities where prefabrication would have proved beneficial to the project. This is mostly due to the fact that the project was on such a tight schedule, usually an opportunity to where prefabrication excels. The only problem was that there was also no lead time on this project, which is a definite must have with preconstruction. Prefabrication is definitely an issue that can be very beneficial to a project but at the same time is not for every project as shown with Project Stallone. In review and talking to industry professionals about my project, we came to the conclusion that if there were a longer lead time or I was not working on a renovation project some preconstruction techniques would have helped relieve our extremely tight schedule.

### **Building Information Modeling (BIM)**

Building information modeling is a hot up and coming topic in the construction industry today. It ties together all of the important necessary elements of a project such as the scheduling, estimating, construction drawings, specifications, and 4D models. This process allows information to flow from the owner to the architect to the contractor seamlessly to help with coordination of trades and reducing change orders.

Tying BIM into my project would have proved to be a total loss. BIM, like prefabrication, requires lead time, something that was not available on Project Stallone. This lead time is need due to the fact that development of the BIM requires building of the model itself, and coordination and cooperation of trades involved. Even given the lead time I am still not convinced that a BIM would have been beneficial because the extreme unknown conditions involved with a renovation project.

### **Workforce Development**

Looking at the construction industry over the next ten years, workforce development is causing some concern. The trend lately has increased a movement of workers away from physically demanding, not so glamorous construction jobs such as carpenters, masons, and general laborers. As brought up in the P.A.C.E. Roundtable, this issue is crucial to our industry's survival. It is necessary that something be done to promote and encourage young people to enter the industry.

An issue that is extremely important to me was brought to attention at the meeting. There is currently a rise in Latin American workers. The only problems with this are their citizenship status, their skill levels, and their ability to speak the English language. These issues are great cause for concern. For instance, take an individual that cannot speak English how do you convey the necessary safety requirements could be the difference between life or death.

Dealing with this issue throughout the duration of my project, proved to be quite difficult. There was an abundance of Latin American workers on Project Stallone, approximately 50 percent. Many of which did not speak English. Knowing both Spanish and English I as well as a few others were able to help the situation to an extent where everything got accomplished safely. In review, there should have been a better approach to the situation, knowing that approximately 30 percent of the workforce was unable to speak English. Further research in this area is an opportunity that will be discussed later in the report.

Reviewing the P.A.C.E. Roundtable, I was able to meet with industry professionals that offered advice on my thesis and learn of important issues that are affecting the industry today. Contacts made included Matt Gulden with The Haskell Company , Mike Arnold with Foreman Program and Construction Managers, and Charles Tomasco with Truland Systems. All of which were willing to discuss any issues that I had with my project.

## **Critical Issues Research Method**

The P.A.C.E Roundtable proved to be very beneficial in addressing critical industry topics. One main topic as well as an important topic to me is workforce development. This issue if not dealt with soon will be cause for the crash of our industry. Without sufficient knowledgeable workers costs for construction could skyrocket causing a drop in the construction market.

I propose researching this upcoming problem to see if there is a viable solution. Potential topics that would include are the following:

- Researching to see exactly why there is such a decline in the workforce.
- Talking to different high schools to see what their trade programs are like as well as seeing if there are possible solutions to increases awareness of these programs.
- Looking deeper into the Latin American workforce by:
  - Potentially teaching superintendents/CMs Spanish.
  - Researching companies' policies on the issue.

Knowing that these topics are only a small step in the right direction on the subject matter is important. This is a very crucial issue and needs attention. Through my research, I hope to find an answer that can help the construction industry.

## **Problem Identification**

### **The Mechanical System**

The mechanical system on Project Stallone was put in place for the sole purpose of pressurizing the building. It was necessary to stop the migration of dust from finished product, which was the most positive pressure, to raw product, which was negative to the rest of the building and natural to outside pressure.

### *Value Engineering*

- Selection of the units to a more economical unit to reduce long term costs.
- Reuse of existing ducts that were already in place.
- Alternative solution to exterior units, which an extensive amount of money was spent to get them watertight.
- Changing fuel types from propane to natural gas

### *Constructability Review*

- Arranging the schedule so that structural modifications do not interfere with placement of duct.
- Analyze better ways to utilize site to accommodate storage of large ducts.

### *The Structural System*

The structural system on Project Stallone was a separate nightmare on its own. Upon start of the project the structure was extremely overloaded from years of hanging processing equipment from the existing frames of the engineered metal building. The solution that was chosen included three structural projects shoring, supporting existing hanging equipment, and structural repairs to existing frames.

#### *Value Engineering*

- Consider the use of one system. For example, start with shoring because it was necessary and then reinforce existing frames to the extent where they can carry the hanging loads.
- Consider prefabricated structural stands instead of field welding them in place.

#### *Constructability Review*

- Consider working only at nights when the building is empty to avoid clashes with other contractors.
- Analyze site layout to see if there is more efficient ways of moving steel into the building.

#### *Schedule Reduction*

- Working nights will allow welders to have access anywhere in the building without regards for other trades.
- Analyze changing the structural system to one system as opposed to two.

## **Technical Analysis Method**

### **Structural System: Analysis 1**

This analysis will include the changing of the structural system which designed was two separate systems. One structural system is to support all of the hanging process equipment that was attached to the structural frames over the years. The other was to repair the existing frames that were damaged from the excessive weight of the process equipment over the years. Before any of the structural work could take place a special shoring design was done to ensure that the structure would not fail during modifications. I propose to change the system to a single system, which would be the existing frames reinforced to the extent that they could carry the loads of the hanging equipment. This would still include the original shoring, for a safety factor, due to the fact that a failure would be catastrophic. I believe that this system will dramatically cut on schedule time and costs, of which will be under review.

### **Mechanical System: Analysis 2**

The mechanical system that was chosen on the criteria that it could get to site on time and simply pressurize the building. This analysis would be the redesign of the system to consider other more efficient alternative. The current system pressurizes the building form positive to negative, from finished to raw product respectively. The system is set up for propane heat when needed during the winter months. My analysis will consider other fuel types to help the owner save money. My only concerns with this analysis are the tight schedule. The units were chosen because of their availability and promptness to the site. I worry that with more specialized equipment the lead time will be longer throwing off the original, already extremely tight schedule.



**Life-cycle/Efficiency Analysis: Analysis 3**

Once the building is redesigned with the more efficient HVAC equipment along with the more efficient fuel, I plan to evaluate the benefits and the cost savings to the project. I feel that even if the equipment chosen for the redesign cannot meet the tight schedule conditions this is where the benefits will show up. The cost savings here will greatly outweigh the delaying of the schedule for a few days.



## Weight Matrix

The following weight matrix shows how I plan to spend reviewing critical issues in the construction industry as well as analyzing the topics that I have brought up with Project Stallone.

<b>Description</b>	<b>Research</b>	<b>Value Engineering</b>	<b>Construction Review</b>	<b>Schedule Reduction</b>	<b>Total</b>
<i>Workforce Development</i>	20%	-	5%	-	25%
<i>Structural System</i>	5%	15%	10%	10%	40%
<i>Mechanical System</i>	5%	-	10%	10%	25%
<i>Life-cycle/Efficiency</i>	5%	-	5%	-	10%
<b>Total</b>	35%	15%	30%	20%	100%