


## ConAgra Foods

Peter Pan Peanut Butter  
Project Stallone



Food Processing Plant  
Sylvester, Georgia

Johnathan Garlow Construction Management    2008 PSU AE Thesis

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## Presentation Outline

- Project Overview
- Structural Redesign
- Mechanical
- Workforce Development Issues
- Summary & Conclusions
- Questions

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## Project Overview

Project Overview

Structural Redesign

Mechanical

Workforce Development Issues

Summary & Conclusions

Questions

**Project Type:**  
Renovation

**Total Cost:**  
\$13.5 Million

**Project Size:**  
200,100 SF

**Project Duration:**  
May 4 – August 27 of 2007  
3 months and 3 weeks

**Function:**  
Food Processing and Distribution

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## Project Overview

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Mechanical

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**Building**

- Pre-Engineered Metal Building built in early 70's
- Originally not used for Food Processing
- Food production stopped in mid-February because of possible salmonella contamination.

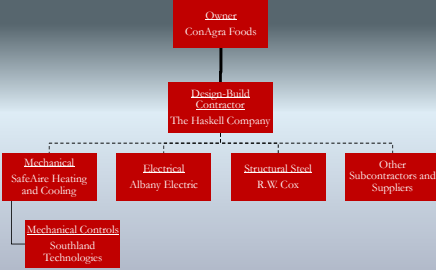
**Project Team**

<u>Owner:</u>	<u>Design-Build Contractor:</u>
ConAgra Foods	The Haskell Company




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## GMP Contract



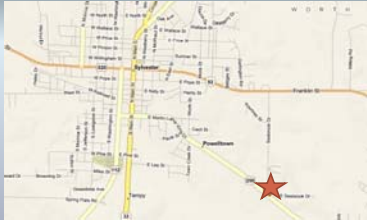
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graph TD
    Owner[Owner  
ConAgra Foods] --> DB[Design-Build Contractor  
The Haskell Company]
    DB -.-> Mech[Mechanical  
SafeAire Heating and Cooling]
    DB -.-> Elec[Electrical  
Albany Electric]
    DB -.-> Steel[Structural Steel  
R.W. Cox]
    DB -.-> Other[Other Subcontractors and Suppliers]
    Mech --- MechCont[Mechanical Controls  
Southland Technologies]
    
```

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## Project Location

- Sylvester, GA
- Peanut Capital of the World
- Town population: approx. 6,000
- Geographically: north of Tallahassee, FL and south of Atlanta, GA.



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## Scope of Project

**Re-Roof:**  
Addition of a single-ply membrane with insulation over existing metal roof.

**Structural Repairs:**  
Repairs and additions.

**Mechanical System:**  
Addition of a mechanical system for building pressurization.

**Interior work:**  
There were numerous interior changes made.

Project Overview  
Structural Redesign  
Mechanical  
Workforce  
Development Issues  
Summary & Conclusions  
Questions

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## Structural Redesign

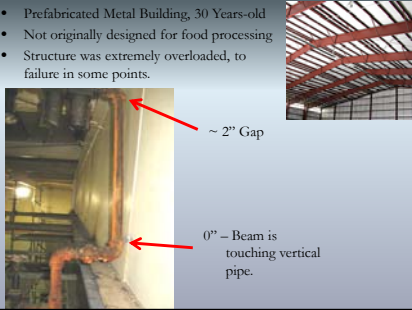
Redesign of the Current Structural System for Simplification and Added Value the Owner

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## Structural System

**Original Problem:**

- Prefabricated Metal Building, 30 Years-old
- Not originally designed for food processing
- Structure was extremely overloaded, to failure in some points.



~ 2" Gap



0" - Beam is touching vertical pipe.

Project Overview  
Structural Redesign  
Mechanical  
Workforce  
Development Issues  
Summary & Conclusions  
Questions

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## Structural System

**Current Fix:**


Frame Repairs                      Stands

Project Overview  
Structural Redesign  
Mechanical  
Workforce  
Development Issues  
Summary & Conclusions  
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## Problem With Fix

Overloading Fixed, but Created Accessibility Problems

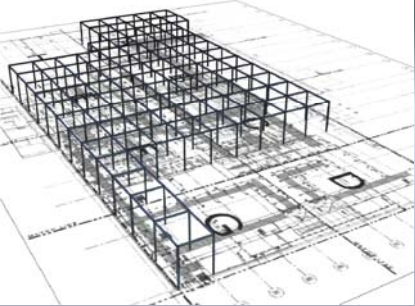


Project Overview  
Structural Redesign  
Mechanical  
Workforce  
Development Issues  
Summary & Conclusions  
Questions

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## Solution

Replace the stands with a structural system on a grid.



Project Overview  
Structural Redesign  
Mechanical  
Workforce  
Development Issues  
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## Analysis

Step 1. Calculate loads of equipment hanging

Material	Unit Weights (plf)
1" ø Chilled Water	9
1 1/2" ø Chilled Water	15
2" ø Chilled Water	20
2" ø Compressed Air	2
4" ø Compressed Air	4
1" ø Electrical Conduit	2
2" ø Electrical Conduit	5
3" ø Electrical Conduit	8
4" ø Electrical Conduit	11
6" ø Electrical Conduit	14
2" ø Pipe	9
3" ø Pipe	24
4" ø Hot Water	15
6" ø Hot Water	20
1" ø Natural Gas	2
1 1/2" ø Natural Gas	4
2" ø Natural Gas	8
3" ø Nitrogen	2
1" ø Nitrogen	5

Step 2. Design Beams

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## Analysis

Step 2. Design Beams

Using LRFD and design criteria of 1/360

$$\frac{l}{360} = \Delta = \frac{5wl^4}{384EI}$$

The internal moment of inertia,  $I = 555in^4$   
 Beam Selection: W18x40

Step 3. Design Columns

Using the same principals of tributary area, the appropriate column came to be W12x58.

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## Analysis

Step 4. Schedule Impacts

Steel Lead Time:  
 Factory shut-down in mid-February  
 Project Start was May 4  
 ~ 11 weeks

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## Analysis

Step 5. Cost Impacts

Original cost for stands:	\$1,548,080
Estimated cost:	\$ 826,730
Savings to the Owner	\$ 721,350

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## Conclusion

The structural analysis done for Project Stallone proved to be more cost efficient and of much higher value to ConAgra Foods.

The only concerns being the lead time for the steel. ConAgra would have had to act much more urgently in the selection of a contractor.

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## Mechanical System Analysis

Analysis of Fuel Costs

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## Problem

Mechanical System

- Fuel Costs (Propane vs. Natural Gas)

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Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Solution

Propane:

- Pros
  - Burns hotter than natural gas (2,500 btu/cf)
- Cons
  - Has to be delivered
  - Needs to be stored onsite.

Natural Gas:

- Pros
  - Cheaper than propane
  - Comes from a line, does not have to be stored
- Cons
  - Does not burn as hot as propane (1,030 btu/cf)

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Recommendations

For fuel costs in general:

Natural gas is recommended over propane because of its lower operating costs.

Energy Input	Fuel	Monthly Cost*	Cost Comparison
30,000 Btu/hr	Natural Gas**	\$201	
	Propane*	\$599	+\$399 (199% more expensive)
	Electricity <sup>3</sup>	\$613	+\$499 (248% more expensive)
60,000 Btu/hr	Natural Gas**	\$402	
	Propane*	\$1,199	+\$797 (199% more expensive)
	Electricity <sup>3</sup>	\$1,226	+\$824 (205% more expensive)
90,000 Btu/hr	Natural Gas**	\$602	
	Propane*	\$1,798	+\$1,196 (199% more expensive)
	Electricity <sup>3</sup>	\$1,838	+\$1,496 (248% more expensive)

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Recommendations

ConAgra had accessibility to natural gas onsite but chose to utilize propane because the system was there and they felt they would only use heating a portion of the year.

The addition of the gas line to where it had to be would have taken 5 days, or 1 week, longer to install.

The additional costs of adding the gas line would have cost ConAgra \$7,650 this cost would have been offset in the first year.

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Workforce Development

Assessment of the Current Construction Labor Market  
&  
Changes that Could Benefit the Future Market

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Problem

Currently the construction labor workforce is the strongest it has ever been.

Over the next ten years is where the problem is. In the construction industry 46.7% of the workforce will be over the age of 55 years old.

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Methodology

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Confirming Problem

- Posted online Surveys
- Conducted in-person interviews

Found majority of people felt that there was a problem. (80%)

Construction companies had no solution but to hire more

- This is a problem when there is no one to hire

Table 1. Civilian labor force, by age, sex, race, and ethnicity, 1996, 1996, 2006, and projected 2016

Group	Level				Change		Percent change		Annual growth rate		Percent distribution		
	1996	1996	2006	2016	1996-2006	2006-2016	96-2006	2006-16	96-2006	2006-16	1996	2006	2016
Total, 16 years and over	117,834	133,943	151,429	164,230	34,105	12,801	29.0	9.5	1.3	1.2	8.8	100.0	100.0
Age groups													
25 to 34	23,367	21,183	22,394	20,812	-2,184	-1,542	-9.3	-7.4	0.0	0.0	19.9	16.8	12.7
35 to 44	79,363	96,790	103,596	109,126	24,233	6,790	30.4	7.0	2.0	2.0	67.3	72.3	64.6
45 to 54	14,303	15,074	15,455	17,352	1,152	1,877	8.0	10.8	0.7	0.8	12.0	11.0	12.7

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Analysis

Finding Possible Solutions:

- Through interviews:
  - Trade Schools
  - Commonwealth Workforce Development Programs
- Through Research
  - Hispanic Workforce

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Evaluation

Trade Schools

- Recruit at high schools
- Recruit talented individuals
- Work with some unions
- Students get hands-on experience
- Employers know the talent they are getting

State Workforce Development Programs

- Do not recruit but lots of advertisement
- Offer money for training

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Evaluation

### Hispanic Labor Workforce

- In 2006 Hispanics accounted for 2/3 of the new construction jobs for the year
- Language barrier is a top concern
- Currently, Hispanics account for 80% of fatal construction injuries.

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Conclusion

- The Hispanic workforce seems to be picking up where the "baby boomers" are leaving off.
- Pairing technical schools, state funded workforce programs, and the Hispanic workforce is the answer to our problems.
- We must connect trade schools to contractors.
- Urgency is of top concern.

Project Overview  
Structural Redesign  
Mechanical  
Workforce Development Issues  
Summary & Conclusions  
Questions

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## Overall Conclusions

Project Overview

Structural Redesign

Mechanical

Workforce Development Issues

Summary & Conclusions

Questions

### Structural System

- Use a grid system to add value by giving back valuable floor space and allows for future expandability.
- The designed structural system saves money and keeps the same schedule by adding an extra crew.

### Mechanical System

- Use Natural gas over Propane due to the cheaper operating costs.
- The money saved from efficiency will outweigh the initial costs of fuel costs.

### Workforce Development

- The solution is to make companies aware of the upcoming problem.
- Hispanic workforce is already here, this is the answer, just need to adapt for it.
- Programs like Penn College of Technology will help companies hire skill positions, such as superintendents.

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## Questions

Project Overview

Structural Redesign

Mechanical

Workforce Development Issues

Summary & Conclusions

Questions