



EXECUTIVE SUMMARY

The Food Science Building will serve as the new home for the College of Agriculture's department of Food Sciences. Additionally, it will be the new home for the well-known PSU Creamery's Production Facility and Retail Area. The current design of the building places the location of the partial basement mechanical room on the west side of the building. The majority of my senior thesis analysis is associated with the proposed relocation of the basement to the east side of the building under the Production Area. The results found are listed below:

Analysis 1: Basement Relocation and Structural Redesign

- Relocating the basement to the east side of the building under the Production Area and changing the structure to all cast in place concrete through to the second floor utilizing a wide module concrete joist slab.
 - 3 month schedule savings for Production Area
 - \$190,000 cost savings
 - More aesthetically pleasing exposed concrete ceiling in Production Area
 - Increased ceiling height of 17" in Production Area

Analysis 2: MEP & Utility Relocation with Regards to Basement Relocation

- First Floor Production Area is now a cast in place structure vs. slab on grade.
 - Easier and more precise layout for critical penetrations in Production Area
 - Availability to run lines under slab and penetrate at any time
 - Maintenance and future relocation are not issues- lines always accessible.
- Interior mechanical pipe savings- Relocation places basement closer to mech. shaft
 - \$48,000 cost savings
 - Decrease runs – decrease chances for future problems (leaks, maintenance)
- Exterior utility relocations to the east side of building
 - \$3,000 cost savings
 - Removes utility lines from running directly under civic hardscape area

Analysis 3: Stainless Steel Bollard Detail

- Redesign to a simplified less complex installation detail
 - Value engineering idea that will aid in constructability
 - Will allow for more precise placement with surroundings

Research: Sustainable Designs for Production Areas

- Utilize a compressed ammonia refrigeration system for cooling
- Use a steam system when heating water for cleaning and equipment purposes
- Facilitate GMP's into design (Good Manufacturing Practices)
 - Use high speed quick rolling doors at coolers and freezers
 - Use HCFC-free insulated composite metal panels