



# CHEMISTRY BUILDING

April 7, 2011

## EXECUTIVE SUMMARY

**Senior Thesis** is meant to present the results that were found after conducting the four areas of research and analysis that were completed on the Chemistry Building throughout the spring semester. These four areas came forth through the series of technical reports completed and meeting with Dr. Riley. These practical areas were chosen, based upon the idea that they could be modified based upon critical industry issues, value engineering, constructability, and schedule reduction/acceleration.

### **Analysis #1: Bringing BIM into the Field (Critical Industry Issue)**

After working on the Chemistry Building for two summers and being a part of the PACE roundtable discussion, it was clear that this project is a prime example of “bringing BIM into the field.” The purpose of this analysis is to investigate additional ways BIM could have been used on the Chemistry Building besides MEP coordination.

### **Analysis #2: Lab Penthouse AHU Commissioning (Mechanical Breadth)**

During the balancing and commissioning process of the lab penthouse AHU’s of the Chemistry Building, it was realized these five AHU’s were performing inefficiently. It was determined the cause was poor layout of duct work. The goal of this analysis is to use the BIM model to layout the duct work differently to eliminate the additional two inches of static pressure between the AHU and exhaust duct.

### **Analysis #3: Alternative Curtain Wall Systems**

The Chemistry Building is designed to have a forty million dollar curtain wall system that is manufactured in Italy and contracted with Permasteelisa. The goal of this analysis is to determine two things. The first is to determine if breaking the contract up between multiple players can shorten lead-time and reduce the schedule. The second is to investigate other high-efficiency glazing systems to determine if a US manufacturer can produce a similar system. Glazing with PV capability will also be explored to see if it will be realistic to incorporate on the Chemistry Building.

### **Analysis #3: Feasibility of PV Curtain Wall System (Electrical Breadth)**

Analysis #4 will be incorporated with analysis #3. Because the curtain wall is extremely expensive, a financial analysis will be conducted to determine if a PV capable glazing systems can be substituted. The goal is to find a system that can help with the energy consumption of the building with a short payback period.