

April 4th, 2012

Final Report –
Executive Summary



Unionville High School
Additions and Renovations

Michael Beam | Construction Option | Advisor: Dr. Messner

Executive Summary

This comprehensive Senior Thesis Final Report has been compiled to present information obtained through research concerning four analysis depth topics and two depth topics in regards to the Unionville High school Building Project. With an overall size of 319,000 square feet and three stories above grade, the UHS building project has four main phases with both additions and renovations.

Analysis 1: Delivery Method Study highlights UHS' use of a Single Prime delivery method and compares this method to the PA mandated Multiple Prime delivery method. Based on past experience, the school district was able to receive a waiver to use a Single Prime. Ultimately, *the district benefited* from this arrangement due to better communication, fewer delays, and even cost savings.

Analysis 2: 4D Safety and Phase Plan discusses the implementation of BIM on the project. With no BIM used as part of the original project design, the possibility of added value existed by introducing BIM in some capacity. Ultimately, a phase by phase safety plan using a 3D model will be developed for use by the School district. Increased information regarding the project leads to a safer project and based on the proposed application, it is believed that the owner would *benefit greatly from implementing BIM*.

Analysis 3: On Site Renewable Energy aimed to add an on-site energy source to the project, which strived for LEED certification but lacked renewable energy. After comparing the two, Photovoltaic Cells were chosen over Wind energy. Following system design and implementation, it was determined that based on use of Purchase Power Agreement, UCFSD stands to *save over \$400,000* over the life of the contract, providing significant benefit to the owner.

Analysis 4: Façade Redesign aimed to improve upon the stick-built façade of the original design. Using Phase 1 as a microcosm of the building, a precast façade panel design was chosen and implementation was studied. Despite a savings in installation duration, added cost, a change in aesthetics, and reduced thermal properties show that *the original façade is a better option for the UHS project*.