



The research topics included in this analysis deals with the construction of the new Upper Dublin High School. This construction of this project was approved through public referendum. For this reason, the school district needed to support of the public and thus held a variety of town meetings to view their opinions. Two of the main requests were that this building was energy efficient and can be used as a teaching tool for the students. For this reason, the Upper Dublin School District decided to pursue LEED certification. Their initial goal was a LEED Silver rating, but they are currently on track to achieve LEED Gold.

This thesis starts with a fairly thorough description of the project. This takes a look at the owner, the project schedule and site layouts. It also includes information on the phasing sequence of this project and a description of the main building systems.

This leads into my main thesis analysis. For my first analysis I have studied the impact implementing LEED on a project actually has. This takes a look at this topic through independent research and through conversation with members of the project team. This includes conversation with the owner, construction manager, and the LEED consultant.

This moves into my second analysis, an evaluation of the geothermal well system. This takes a look at this system through the expected energy reduction in comparison to traditional heating and cooling systems, as well as the costs and constructability. From here, I move into my first breadth topic. For this breadth I try to supplement the energy used by the geothermal well system with solar electric panels.

For my third analysis I take a look at implementing a small rain water collection system. Although the original intention was to supplement the water use in the building, it was found through my research that there is not the space or available money to complete this successfully. Instead, this system will be implemented with the sole purpose of educating the students. This rainwater collection system must also be relatable and cost friendly for the students to implement a similar system in their own home.

My final analysis topic deals with the evaluation of the lighting system. This analysis takes a look at the components that make up the lighting system and how they compare to other traditional lighting systems. This leads into my second breadth topic. This breadth topic deals with the replacement of the current high-output T5 fluorescent lighting with T5 fluorescent tubes.

Following all of my analysis topics are my conclusions. This includes conclusions on each of my analysis topics and the thesis in general. Following this is the summary of the main thesis investigation areas. This includes the requirement for the MAE program of the graduate classes that were used to help throughout this thesis.