

Waynesburg Central High School



Thesis Proposal (Breathths Only)

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Executive Summary

Construction projects consistently become more and more complicated to manage and deliver; adding LEED certification to a project only makes it more complex. LEED certification requires that certain items be tracked to ensure the proper percentages are met for certification. Tracking these items means that there needs to be a paper trail and results in more work for the project manager. Central Greene School district did not choose to construct a LEED certified project but this analysis will analyze some of the steps that would have been taken to achieve certification and provide other school districts in western Pennsylvania with a guide for achieving certification. A series of four analyses will be done all to further understand the complications that come with LEED certification.

Analysis 1: Construction Scheduling

Scheduling is challenging enough when there is only one thing that needs to be addressed but in the case of Waynesburg Central High School there are twelve phases. This analysis will look at the schedule changes as a result of pursuing LEED certification with the hope of ultimately shortening the construction time by a more structured approach to construction. Site layout plans to include changes incurred by LEED will also be developed.

Analysis 2: LEED Certification

LEED is a topic that is common in the industry it has now been around for several years but owners are still not sure if it is worth pursuing a LEED certified project. This analysis will result in a guide that will be useful to school districts in western Pennsylvania to help them determine the challenges that may be faced if choosing to pursue or should the site be more conducive the ease at which LEED certification can be achieved.

Analysis 3: Recycling and Waste Management (Breadth #1)

Waynesburg Central High School does not currently have a recycling plan. This analysis will analyze the feasibility of implementing a recycling plan. It will look at the constructability challenges that are related to the implementation of a recycling plan and also tie into the scheduling challenges and be shown on the revised site layout plans from analysis 1.

Analysis 4: Energy Savings Analysis (Breadth #2)

Energy savings for any building will result in a cost benefit for the owner. This analysis will analyze the lighting system that is being installed in Waynesburg Central High School and do a cost comparison to several other lighting alternatives to determine if a more efficient and cost effective system could be implemented.

Analysis 3: Recycling and Waste Management

(Constructability Breadth)

A. Problem: Construction projects produce large quantities of waste.

Construction projects today produce large quantities of waste that could be mitigated with the proper precautionary steps. Waynesburg Central High School currently has no recycling plan in place, and as a result all waste is placed in the same dumpster and removed from the site. LEED projects often implement a multiple dumpster system where debris of the same nature is placed in the corresponding dumpster. Waynesburg Central High School is a rural location in south western Pennsylvania which may cause for recycling to be more challenging to do than other locations where the practice is more common. In this region recycling companies may not be readily available as in most regions.

B. Goal: Implement a waste management plan that promotes recycling resulting in waste reduction.

C. Research Steps:

Step 1: Analyze LEED requirements to achieve the points associated with recycling and waste management.

Step 2: Research the availability of recycling in the western Pennsylvania area as well as the associated costs.

Step 3: Comprise a plan to attain LEED points for recycling and waste management.

D. Expected Outcome: I expect the cost of recycling will be high due in part to the lack of recycling in the area. I expect that while contacting and finding local recycling plants there will be a minimal cost variation between companies, should there even be multiple companies. In the plan there will have to be some sort of incentive program to encourage the subcontractors to participate in the program, otherwise recycling will not be a success.

Analysis 4: Energy Savings Analysis

(Lighting/Electrical Breadth)

A. Problem: Energy consumption in a building is a large cost.

LEED certification focuses on a few main areas of a building in order to achieve certification; one of the emphasized areas is energy consumption. With energy consumption being emphasized as an area of focus in the LEED certification process this is an area that needs to be further looked at on most projects. Though manufacturers are becoming more consistent and there is less deviation in the performance of products, some products still perform better than others do in terms of energy consumption. Lighting systems is not the only system that should be analyzed on a construction project for energy efficiency; mechanical systems are often the largest single consumer of energy in a building. This analysis will analyze the lighting system chosen at Waynesburg Central High School because this system is more visible and can be used more easily as an educational tool.

B. Goal: Choose a luminaire that will result in an energy reduction from the previously chosen one if possible, and then create a spreadsheet to calculate the energy savings.

C. Research Steps:

Step 1: Research luminaires and find the most cost effective.

Step 2: Compare possible luminaire options to the specified.

Step 3: Determine Energy savings with new luminaire.

D. Expected Outcome: I expect to find a florescent lighting fixture that will save about 5 percent in energy compared to the specified luminaire. The type will stay a florescent to ensure that the entire lighting system does not have to change as well as the service that is feeding them. At the end of this analysis I should have a spreadsheet with 3 possible lighting fixture alternatives and the originally specified fixture, along with the performance energy specifications, annual energy consumption, annual energy cost, and the initial cost for each luminaire type.