

Walter Nichols  
Hawthorn Building  
Altoona, PA



## **Executive Summary**

The Hawthorn Building at Penn State presented many design challenges when attempting to provide a decent building system while meeting codes and design criteria. Each building system was designed to solve the problems of the space in a tasteful way while meeting the requirements of the codes and criteria. The lighting redesign of the Hawthorn Building includes the following spaces: the Main Corridor, the Pechter Family Music Room, the Lecture Hall classroom, and the Computer Classroom.

This report includes an in-depth analysis of the design criteria, design concerns and goals, schematic design, and finally the lighting calculation values for the lighting systems. Energy efficient lamps, appropriate power density calculations, and control systems were also included in the lighting design of the spaces.

The electrical depth of my report focuses on the checking the sizing of the new lighting system, making sure the panel boards can safely handle the new loading, sizing the panel boards, and doing the same for the emergency electrical system. This depth study is different than what was originally purposed. After speaking with my contact at Penn State Altoona as well as Dr. Mistrick, I felt that this depth study was more appropriate than the one originally purposed.

For my first breadth study, I wanted to elaborate more on the idea of energy saving lamps and how much could be saved if a construction management cost analysis was done. After designing my lighting systems for the building, I went back and checked different possibilities for lamps that could be used. A detailed spreadsheet with energy savings, kilowatt usage, and rate charges was created to see how much money per year using energy efficient lamps could save.

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My second breadth study was an acoustical design in the Pechter Family Music Room. Since I would be changing the existing lighting system, which in turn would change the existing acoustical system, I decided that I should design an appropriate acoustical system for the room with the new lighting system. Different types of wall panels, ceiling pyramids, and architectural materials were analyzed to create an appropriate acoustical system for the room.

In conclusion, the systems chosen for the different spaces show how all of the different architectural systems work together with each other. It also shows how making changes to certain parts of a system will affect the other systems. All of these things come together to form the complete building system.