

## EXECUTIVE SUMMARY

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The Mount St. Mary's University began the design of this new student housing project with a fixed budget and certain goals. One of those goals was for the building to utilize sustainable systems in order to promote environmental consciousness while at the same time assuring a comfortable and functional building for the students who would reside there.

The following pages outline my proposal for an investigation into optimizing possible "green" design approaches that could have been implemented at this new dormitory. At the same time, I will attempt to maximize life cycle costs while simultaneously minimizing first costs and operational costs, and based on the results of each system, I will attempt to determine the best possible sustainable building approach in terms of cost efficiency.

My depth work will entail a detailed analysis of the current geothermal system as well as a comparison to other conventional means of design for thermal comfort. Breadth work will encompass two forms of solar design, solar collectors for heating of the domestic hot water and photovoltaic panels for energy storage, as well as an analysis of how each system will affect constructional decisions and costs. After completing all analyses, I will attempt to create a model in EES or another similar program that will be capable of optimizing the building with respect to first costs and life cycle savings.

As I have stated in my previous technical assignments, I feel that the designed system for this new student housing project is probably one of the best possible based on the realistic budget of the project and the desires of the university. This investigation is to be preformed as an exercise in optimization, the goal of which being an attempt to determine a best possible sustainable system based on initial, operational, and life cycle costs.