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## EXECUTIVE SUMMARY

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The purpose of this report is to perform a detailed energy analysis of the new student housing project soon to be built at the Mount St. Mary's University. Several methods of evaluation will be considered, such as a LEED-NC analysis, a detailed study for compliance with ASHRAE Standard 90.1-2004, analysis of mechanical systems first cost and lost rentable space due to mechanical systems, and building loads, energy usage, and cost estimates.

Although a LEED™ rating was not pursued by the university, the building was designed to be environmentally friendly and energy efficient. Energy recovery and the use of geothermal heat pumps contributed to 26 attainable LEED™ Credits, which would have allowed the building to be Certified.

ASHRAE Standard 90.1-2004 compliance was determined for building envelope, HVAC systems, service water heating, lighting, and motor efficiency. For all intents and purposes, the building was found to be fully compliant with the Standard, only fenestration posing a few questions. First cost of the mechanical systems was approximately \$2.3 million or \$41.66 per square foot, and they accounted for a mere 1.94% of the available building space.

Carrier's Hourly Analysis Program (HAP) was utilized to estimate building cooling and heating loads, as well as supply and ventilation air flow rates. The calculated results were found to be comparable to the design loads and flow rates. HAP was also used to evaluate building energy consumption and operating costs in order to describe the actual impact various building systems would have on overall energy usage. It was found that heating would account for 6.1% of overall annual costs, cooling would account for 13.2%, and lighting loads would account for 22.3%.

This report illustrates a comprehensive study of building energy usage, showing environmentally conscious techniques, building energy efficiencies, compliance to applicable energy requirements, and estimated actual consumption and costs. Based on the results of this study, when complete, this new student housing project will provide the Mount St. Mary's University with a well designed and energy efficient dormitory.