Project Title: Energy Audit: R.E. Lee Memorial Episcopal Church

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ABSTRACT

The Robert E. Lee Memorial Episcopal Church requested an energy audit to assess their current energy consumption and learn about possible ways to reduce energy cost and become better stewards of the environment. An energy audit consists of utilizing utility bills, research, observation, and analysis to make recommendations in changing the energy usage of an existing structure. The building consists of the church building and the Parish House for a total of 17,180ft^2. After surveying the building of its heating and cooling equipment, utilities, and occupancy use, it was determined that water, natural gas, and electricity bills could be reduced by various long and short term measures to eliminate excess energy use. During the course of the energy audit different alternatives were examined in order to reduce energy consumption. This consisted of using an hourly analysis program to observe changes in heating and cooling loads with various added insulation, considering church policy changes, receiving cost estimates from local companies for various modifications, and performing a cost analysis for the viable possible recommendations. Through these adaptations, not only would the congregation save money by reducing their energy consumption, they would also become better stewards of the earth.

EXECUTIVE SUMMARY OF OPTIONS

The following is a summary of the final options to decrease energy costs and become better stewards of the environment based off cost analysts and research as describe in the previous sections.

Summary of Options: Costs, Savings, and Payback

Options	**Capital Cost**	**Yearly Savings**	**Payback Period**
Attic Ins. Only	$2,400.00	$2,270.02	1yr, 1 months
Wall Ins. Only	$5,200.00	$1,926.47	2 yrs, 10 months
Interior Windows	$11,559.40	$554.44	32 years
Compact Fluorescents (100 bulb replacement)	$165.00	$1,061.17	Less than 1 Year
Undercroft Interior Storm Windows	$2,268.07	$437.00	5 yrs, 3 months
Knight Boiler Replacement	$31,700	$1,771	23 yrs, 5 months
Toilet Bricks / Bottles	$1.36	$35.92	Less than 1Month
Geothermal Heat Pump	$275,000	$6,245.84	79 years, 6 months

Along with these recommendations implementing the minor changes to include the following:

- Weather-stripping large wooden doors (front doors of sanctuary, Parish House bottom floor exit door, etc.)
- Directional floor registers in sanctuary
- Using ceiling fans during both cooling and heating months
- Increasing/decreasing thermostat in cooling/heating months respectively
- Consolidating offices to one floor
- Creating permanent signs to “Turn Lights Off After Use” in bathrooms, closets, etc.