

EXECUTIVE SUMMARY

The Longwood at Oakmont Healthcare Center is a 45,000 square foot senior care facility located in Verona, Pennsylvania. After examining the building's existing mechanical systems it has been determined that the facility is designed in a very practical and energy efficient manner. However, there are a few aspects within the mechanical system that could be improved upon.

The main objective of this redesign is to increase the building's energy consumption and in turn minimize the building's life cycle costs. All of the existing design criteria established by Reese Engineering are to be upheld at the same time, including minimizing the amount of rooftop equipment, fulfill the needs and budget requirements of the client, and adhere to all applicable codes and requirements.

The main redesign consideration for this project is to utilize a geothermal or ground source heat pump system. This would step in for the duties otherwise performed by the building's cooling tower and gas-fired boilers. The system uses the Earth's constant underground temperatures as a heat source in the winter and a heat sink in the summer. These systems can be very efficient and depending on energy prices, very cost effective. In order to determine if this system is beneficial to the building and its owner a number of aspects will have to be analyzed, including; initial costs, construction time and costs, energy savings, geological characteristics of the site, maintenance, and indoor environmental quality.

The system will also impact other aspects of the building in addition to the mechanical system. Breadth topics will be analyzed to assess what changes will be made. The construction of a geothermal well site can be costly and time consuming and can sometimes inflate the projects budget and schedule. This will be examined to ensure the system is advantageous. With the system's elimination of certain equipment, electrical consumption will be reduced. The impact of minimizing electrical usage will also be looked into and the resizing of electrical equipment will be examined.

Hopefully after intense examination of the new system's characteristics it will prove to be a smart, cost effective, and energy conscious decision.