

Project Overview



Industrial Placement Intern: Kurtis Palu

Major: Mechanical Engineering

School: University of Nebraska-Lincoln



Company Background

Madonna Rehabilitation Hospital, located in Lincoln, Nebraska is one of the largest rehabilitation hospitals in the United States. Madonna offers a wide range of rehabilitation care levels and specializes in spinal cord injuries, brain injuries, strokes, amputations and other neurological conditions for both adults and children. Madonna also operates various services across Lincoln, including ProActive, which is Lincoln's first medically based health and fitness center. ProActive is located in a 60,000 square foot building that offers medical, therapeutic, and educational fitness and wellness expertise.

Project Description

As Madonna has grown they have become very environmentally and energy conscious. They continually look for new ways to be more efficient and reduce their impact on the environment. Their interests include implementing solar and geothermal renewable energy sources as well as updating equipment and adopting new practices.

Pollution Prevention Benefits

Several recommendations offered were designed to minimize the energy consumption, solid waste and water use at Madonna. Benefits include reduced cost, maintenance, landfill service and utilities. General recommendations for Madonna's Green Team were also offered. Many of the opportunities offer short payback periods and large annual savings. These potential benefits are summarized in Table 1 below.

Table 1. Potential Savings from Implementing Suggestions

P2 Opportunity	Annual Savings	Annual Waste Reduction
Install Dyson Airblade Hand Dryers	\$54,000	27,700 lbs Solid Waste
Install Geothermal HVAC System	\$30,000	33,000 therms Natural Gas
Use Solar Pool Heating Systems	\$14,800	17,000 therms Natural Gas
Install Occupancy Sensors	\$4,200	61,000 kWh Electricity
Install Variable Frequency Drives	\$2,900	41,000 kWh Electricity
Use Waterless Urinals	\$1,300	438,000 gallons Water
Totals	\$107,200	438,000 gallons Water 102,000 kWh Electricity 50,000 therms Natural Gas 27,700 lbs Solid Waste

Using less energy and water, and reducing solid waste also reduces greenhouse gas emissions. Implementing the recommendations resulting from this project could result in the potential reduction of greenhouse gas emissions by nearly 400 metric tons of carbon dioxide equivalents per year.