

Table 1.1 Improvement Measures

Improvement Measures	Douglas County Courthouse	Douglas County Extension Center	Douglas County Fairgrounds Arena	Douglas County Fairgrounds Building 21	Douglas County Fairgrounds Storage Building	Douglas County Jail	Douglas County Law Enforcement Center	Public Works Offices	Public Works Shop	United Way Building	Youth Services Building
Lighting Systems Upgrades	◆	◆	◆	◆	▲	◆	◆	◆	◆	▲	◆
Exterior Pole and Interior Can LEDs	◆						◆				
Water Conservation Measures	◆	◆	◆	◆		◆	◆	◆	◆		◆
Water Controls						◆					◆
Rain/Condensate Capture						▲	▲				
Irrigation/Cooling Tower Submetering						◆					
Solar Water Heaters						▲					▲
HVAC System Replacement/Upgrade	◆			◆			◆				
Ground Source Heat Pump	▲						▲				
Radiant Heat									▲		
Waste Oil Storage Expansion									▲		
Cell Ventilation Daytime Shutdown						▲					◆
Energy Management System Installation and Expansion	◆		▲				◆	▲			▲
Boiler and Chiller Controls	◆										
Programmable Thermostats		◆	◆	◆					◆	▲	
LEED Certification	▲					▲	▲				▲

◆ = Recommended improvement measures
 ▲ = Evaluated but not recommended improvement measures

1.2 Overall Summary

The report includes facility descriptions, utility analysis, descriptions of all measures reviewed, financial analysis, implementation plan, measurement and verification, and appendices that provide technical details. The information is designed to provide insight about the proposed measures, the technical data to support the projections, an effective plan for implementing the project, and a clear methodology for verifying that the savings are achieved.

This report will be the basis for our final project configuration. This configuration will be agreed upon and incorporated into the schedules and appendices of the energy performance contract. The associated fees have been agreed upon in the State of Kansas Standard Agreement, RFP #02458.

As a next step, we can move ahead based on this report and select the final detailed scope of work that will be included in the energy performance contract.

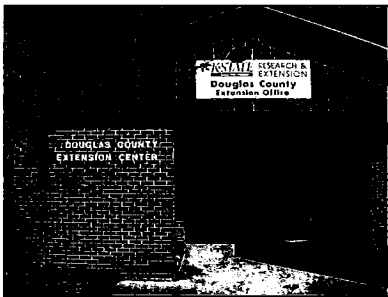
Our commitment is to work with you to develop and facilitate your project, and help bring about tangible energy savings and facility improvements that will enhance your ability to fulfill your primary mission. We truly value the opportunity to work with Douglas County and are excited to become "Your energy partner for the future through delivery of superior value today."

In the winter, a gas-fired boiler located in the basement provides hot water to baseboard natural convection radiators. There is no individual control at each radiator, but the building is divided into four zones. The existing boiler is original to the building renovation, and dates to the late 1970s. As a result, it is nearing the end of its expected life and replacement is recommended. The air handler circulates air within the building to maintain an even temperature throughout. As stated above, an adequate measure of fresh air is not being introduced by the air handler currently.

Observations

- ▶ The lighting system is relatively modern, but newer technology exists that would result in energy savings.
- ▶ Water fixtures are high-flow and the county would benefit from their replacement.
- ▶ Both the chiller and boiler could use replacement, resulting in energy savings and other benefits.
- ▶ The energy management system and components are in working order, but implementation of new technology could result in energy savings, and other benefits.

2.2 Douglas County Extension Center



Douglas County Extension Center

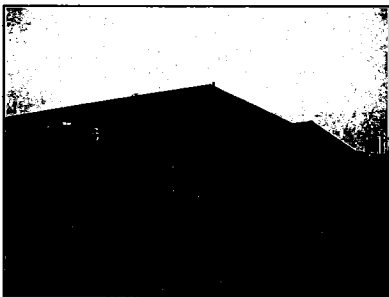
The Douglas County Extension Center is a 6,000 square foot facility made up entirely of offices. It is located at the Douglas County Fairgrounds. The roof is a sloped composite shingle type. Lighting in the facility is provided by T12 lamps and fixtures. The water fixtures are the high-flow type Domestic hot water is provided by a gas water heater.

The HVAC system consists of three small units with direct expansion cooling and gas heating utilizing indoor furnaces and outdoor condensing units. While components of several of these systems are older, there would be little benefit from replacement since newer units are not significantly more efficient. Currently, the HVAC units are controlled by manual thermostats. During the audit, it was logged that no setback of these systems occurs and that energy savings could result through the implementation of programmable thermostats.

Observations

- ▶ The current lighting system is aged, and newer technology exists that would result in energy savings.
- ▶ Water fixtures are high-flow and the county would benefit from their replacement.
- ▶ Manual thermostats are used and energy savings would result through replacement with programmable thermostats.

2.3 Douglas County Fairgrounds Arena



Douglas County Fairgrounds Arena

The Douglas County Fairgrounds Arena is a 41,565 square foot facility that was built in 2000. The majority of the facility contains a dirt floor arena used for various events. In addition, the facility houses a small kitchen, a few bathrooms, and offices. Large bay doors along the exterior of the building are used for setup and teardown of the various events. The roof is composed of sloped corrugated metal. It is original to the building and shows no signs of leaks or other issues. Lighting is provided by metal-halide fixtures with additional 32-watt T8 fixtures serving the kitchen, offices, and bathrooms. Water fixtures, located in

both the kitchen and bathrooms, are of the high-flow type. The kitchen appliances are all electric as is the domestic water heater serving the building.

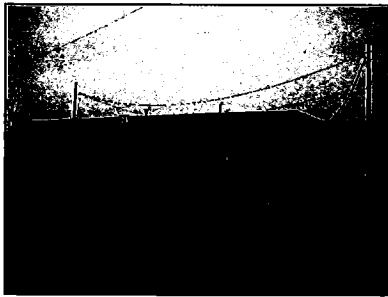
Inside the main arena, the HVAC system consists of gas unit heaters with no cooling capabilities that are controlled by manual thermostats. It was observed during walkthroughs that these units are kept at a constant temperature set point during the winter and are left on. In addition, these heating units are typically left on when the bay doors are opened. Three residential-style split systems serve the kitchen, bathrooms, and offices with both heating and cooling. These systems are controlled through the use of manual thermostats. Logged data indicates that the spaces are kept at occupied set points even during unoccupied times.

Observations

- ▶ The metal-halide fixtures located in the main arena are less efficient than newer technologies. In addition, newer fixture types would avoid the warm up time required with the current fixtures.
- ▶ Water fixtures are high-flow and the county would benefit from their replacement.

- ▶ Manual thermostats are used throughout the building and energy savings would result through replacement with programmable thermostats.
- ▶ The installation of a sensor to shutoff the arena HVAC units when an adjacent bay door is open would result in energy savings.

2.4 Douglas County Fairgrounds Building 21



Douglas County Fairgrounds Building 21

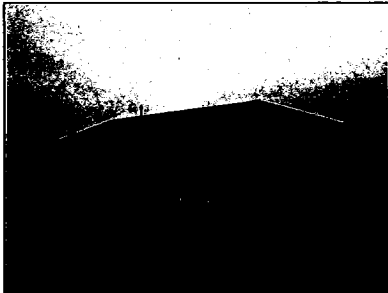
Douglas County Fairgrounds Building 21 is a 10,000 square foot facility that was built in 1983. The building is utilized primarily for events, and there are extensive periods of time when there is no usage. The roof utilizes sloped corrugated metal as its covering material. Water fixtures are of the high-flow type. Lighting in the building is provided by T12 fixtures. Hot water is supplied by a 40-gallon gas water heater. There is also a kitchen that utilizes three residential-style electric stoves and two refrigerators.

The HVAC system consists of several gas-fired heating, direct expansion cooling units located outdoors. All components of the units are contained within a single housing. Two of these units have been replaced recently due to failure. The remaining units are reaching the end of their useful lives and show signs of wear and hail damage. During the audit, airflow and efficiency measurements were taken that indicate that the performance of the units have degraded due to their age. In addition, these units are controlled by manual thermostats. Logger data collected during the audit indicates that while the building is occupied sparingly, the temperature is kept at an occupied set point throughout the year.

Observations

- ▶ Lighting in the facility is done using older technology. Upgrading the fixtures would yield energy savings.
- ▶ Water fixtures are high-flow and the county would benefit from their replacement.
- ▶ Based on the age and condition of the existing HVAC units, replacement would be beneficial.
- ▶ Currently manual thermostats are used throughout the building and energy savings would result through replacement with programmable thermostats.

2.5 Douglas County Fairgrounds Storage Building



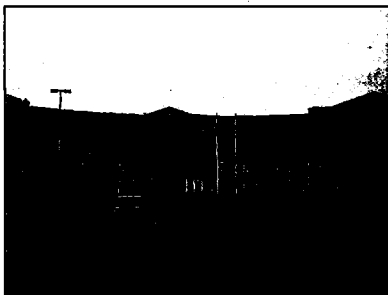
Douglas County Fairgrounds Storage Building

The Douglas County Fairgrounds Storage Building is a 9,765 square foot facility that was built in 2005. The building is used for storage and is used minimally. The roof utilizes sloped corrugated metal as its covering material. Lighting in the building consists of 32-watt T8 fixtures. The HVAC system utilizes gas-fired residential style heaters as well as gas-fired unit heaters near the bay doors. Also housed within the facility is a halon gas suppression system. There are no water fixtures within this building. While no programmable thermostats are used, there is a timer system that performs a similar function

Observations

- ▶ Because of the limited use and age of the building, no energy conservation measures are recommended for this building.

2.6 Douglas County Jail



Douglas County Jail

The Douglas County Jail is a 107,000 square foot facility that was built in 1997. It is used as a correctional facility to house inmates for the county. It contains 28 maximum, 56 medium, and 28 minimum security cells along with 14 women's cells. The roof surface is composed of a flat rolled roof as well as a pitched metal roof above the penthouses. Lighting in the facility is provided through a mixture of 32-watt T8 lamps, metal-halide lamps, and 7-watt cell night lighting. Water fixtures in the building are of the high-flow type. During walkthroughs, staff explained that considerable flooding issues arise because of the

inmates. Seven 250-gallon gas water heaters provide domestic hot water. Because of the nature of the facility, both a kitchen and laundry room are located in the building. The kitchen uses gas for its appliances, which includes a booster heater used for the dishwasher. The laundry room also utilizes gas for the driers.

The space is conditioned through the use of a 4-pipe water loop serving 12 air handling units. During the winter, two gas boilers are used for heating; while in the summer two chillers and a cooling tower provide cooling. Currently, a separate meter is installed on the water line serving the cooling tower; however, it is not read by the water department because of compatibility issues. All motors have variable frequency drives used for controlling speed. The entire HVAC system is controlled by an Automated Logic energy management system utilized in several of the