

# ROBERT LLOYD SHEET METAL INC.

## CUSTOMER PROFILE

### CORVALLIS BENTON COUNTY LIBRARY

The Corvallis Library is located in Corvallis, Oregon and was founded by nine female members of a coffee club in 1899 with the purchase of two books. The city of Corvallis assumed control of the library in 1920 and has since expanded the library twice, making it the central hub of the district serving all surrounding areas. In 1996, Corvallis Benton County Library issued 13,000 Library cards growing its active patrons to 53,000 and a monthly circulation of over 70,000 items.

At the end of 2006, the library began looking into replacing its existing Honeywell pneumatic system which was installed in 1991. After receiving the contract for the HVAC renovation, Robert Lloyd Sheet Metal began an occupied remodel of the building in July of 2007. The scope of the work included:

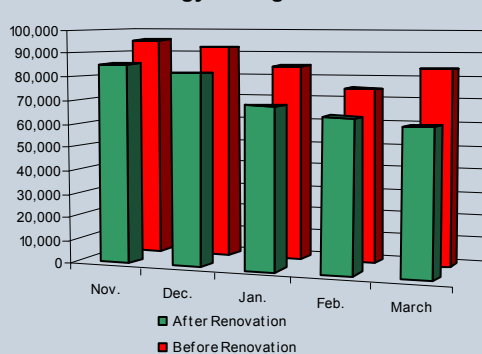
- Replacing all pneumatic controls with electronic controls, actuators and sensors
- Adding a heat pump to service the new atrium
- Replacing and adding variable speed control to the chilled water pumps
- Adding CO<sub>2</sub> Sensors and VFD control to all units with economizers
- Hot water reset to the boiler

In addition to the above scope, RLSM provides the following features as a standard part of every project:

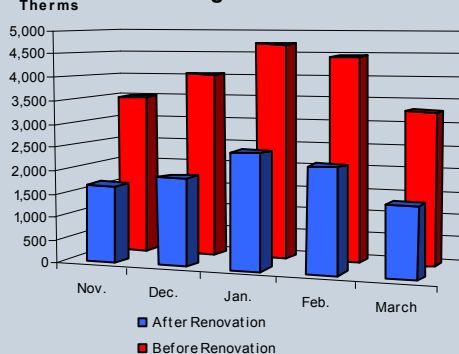
- E-mail alarming to notify you of equipment failures
- Building and zone scheduling which allows the building to run in occupied and unoccupied modes
- Discharge air temperature sensors for every unit
- Remote access for advanced troubleshooting
- Outstanding customer service.

After installation was complete in October of 2007, the Corvallis Benton County Library has seen increased savings in energy costs. Their energy usage over 5 months has decreased by an average of 13,500 KWh of electricity and 2,000 therms of natural gas per month which is an estimated \$3,600 in energy savings per month.

Corvallis Benton County Library Electrical Energy Savings



Corvallis Benton County Library Natural Gas Savings



### ROBERT LLOYD SHEET METAL INC

Robert Lloyd Sheet Metal Inc.  
4485 Independence Hwy  
Independence, OR 97351

Phone: (503) 838-3863  
Fax: (503) 838-3964

Email: [webinquiry@rlsm.net](mailto:webinquiry@rlsm.net)



Corvallis Benton County Library  
645 NW Monroe Ave  
Corvallis OR 97330

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#### Problems Addressed By The Renovation

##### Problems

**Single Stage Pumps and Fans**

**No Co2 sensors on units With Economizers**

**No Building Schedule**

**No Alarming or equipment monitoring**

##### Benefits of Correcting

By adding variable speed control to pumps and fans in the building, instantaneous energy spikes are eliminated and the units are able to use only the amount of energy needed. This saves on the total KWh used and lowers the demand charge.

By adding Co2 sensors to the units with economizer dampers, the units only let in enough outside air to maintain the Co2 set point. In situations where the economizer damper is either open or closed the building has to work harder to heat or cool air from the outside. When Co2 sensors are available, the economizer damper is allowed to modulate to a desired position and allow the air in the room that the building has already heated or cooled to recirculate, lowering the work done by the building to keep the rooms at their desired temperature.

By adding a master building schedule the building is able to operate in occupied mode and unoccupied mode. The unoccupied mode is a state where the system is off, but it has the ability to turn on if necessary to stop the building from falling too far away from its heating or cooling set points. This saves energy because the building does not have to work as hard to recover from a night of being off. Zone Scheduling has the benefits of being able to schedule specific areas or rooms, saving the energy to heat or cool those spaces if no one is going to be using them.

Building equipment can go some time before it is noticed that it is not functioning properly. By adding equipment monitoring, the building is able to keep an eye on all controlled building equipment and generate e-mail alarms to notify you when something is not functioning properly.



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