

GILPIN COUNTY ROAD AND BRIDGE FACILITY FACT SHEET

Gilpin County Road and Bridge Building

- The building is 21,625 square feet, located east & south of the old R&B building.
- Total Cost of the facility excluding the land: \$ 4.89 million.
- The County paid cash for the land in 2006 using gaming tax revenues and paid cash for the building, also using gaming tax revenues (there was no mill levy or increase in property taxes to pay for the land or the facility)

Project Timeline (2006)

- May 25 - Contract signed with Neenan Archistruction for the design phase of the project.
- September 12 - Schematic Design was completed.
- November 21 - Design drawings were completed and construction documents started.
- January 23 - Contract signed with Neenan Archistruction for construction.
- January 31 - Construction documents and drawings were completed and issued.
- March 15 - Building pad layout begun.
- March 28 - Form/pour foundation footings & pads
- April 10 - Set pre-cast concrete wall panels
- April 18 - Steel erection
- May 4 - Roof installation
- August 31 - Substantial Completion

Energy strategies for the building

- The building uses a variety of renewable energy methods including clerestory lighting and heating with a combination of used motor oil, solar ventilation pre-heating, and biomass.
- Other energy technologies that are Included are radiant floor heating, snowmelt aprons, air-to-air heat recovery unit, programmable controls for radiant heaters, skylights in the roof, and lighting controls.
- These technologies will save money and energy over the life of the building.
- Alternative energy strategies that were rejected due to exceptionally long payback periods were photovoltaic and wind power.

Cost of installing the biomass system

- Cost of biomass (including biomass boiler, chip delivery system, required additional building area, dust wall, project fees and contingency): \$647,752
- Cost of putting in a natural gas boiler in lieu of biomass (including required additional building area, project fees and contingency): approximately \$423,800.
- Either a natural gas boiler or biomass would require a back-up gas boiler, radiant heaters, pumps, piping and hydronics: \$262,909
- There was an approximate \$224,000 difference in up front costs to the county for putting in a biomass boiler vs. a natural gas boiler.

Cost of heating with biomass:

- The building currently needs approximately 400-500 green tons of chips per year (requires thinning between 20-40 acres per year, or clear-cutting 3-7 acres of dead forest)
- Current costs for green chips: \$37/ton.
- Total cost to heat the new Road and Bridge building with chips for one year: <\$10,000 (original chip supply estimated at \$15,600-\$25,000).
- Estimated savings VS natural gas: >\$30,000.

Operation of the biomass facility

- It requires one person working ¼ time to operate the biomass system. This includes a two week annual shutdown for maintenance/cleaning.
- During periods of low heating load, the biomass boiler continues to operate at a very low capacity, just as a gas boiler would. The automated chip delivery system supplies chips to the boiler at a rate to meet the heating load.
- The natural gas backup boiler will come on automatically anytime the boiler system can't meet the heating load. This might occur due to extreme cold weather, a chip supply disruption or mechanical fault in the system.
- The system is rated to be 70-75% efficient, depending on the moisture content of the wood.

Environment and air quality

- Forest health can be improved by thinning.
- Chipping beetle killed trees or even beetle-infested trees will not promote the spread of pine beetles.
- Emissions from biomass create far less air pollution than wild fires, controlled burns, and pile burning (pile burns are often used to clean up after forest thinning efforts – the biomass system would burn this same wood in a controlled environment).
- The biomass system does not burn quite as clean as natural gas however; the *net emissions* of a wood-fired boiler, compared to a natural gas boiler plus controlled burn (or other disposal method), are significantly reduced.
- Biomass does not contribute to greenhouse gases and global warming in the same way fossil fuels do. Burning biomass releases about the same amount of carbon dioxide as burning fossil fuels; fossil fuels release carbon dioxide captured by photosynthesis millions of years ago—an essentially "new" greenhouse gas which adds to the carbon dioxide in the atmosphere. Burning biomass, on the other hand, releases carbon dioxide that is from the current carbon cycle, so there is no net increase. The carbon dioxide that is released will be absorbed by new trees as the forest re-grows.
- During normal operation there are very little or no visible emissions.