Bridger View Neighborhood at Story Mill
Bozeman, Montana
Farmhouse 3 Case Study

1,448 SF, 3-bedrooms
704 SF insulated, unconditioned basement


Credit: Susan Bilo

Bridger View homes are designed and built to be more comfortable, durable, healthy, efficient, and affordable than homes built to code.

The *critical first step* is to construct a **high-performance building envelope** with super-insulation and air-tight construction. This allows a building to hold-in heated and cooled air longer increasing comfort and reducing operating costs.

Certifications include:

ENVELOPE


Credit: Bridger View

- ► Roof: raised-heel trusses accommodate R-60 blown-in cellulose insulation
- ► Walls: R-33 (R-21 cellulose + R-12 EPS); Foundation Walls: R-14; Slab: R-8
- ► Windows: Alpen triple pane. Fixed pane: R-7; Casement: R-5; SHGC: 0.38
- ► Air-tightness: 0.8 ACH_{50} achieved with taped ZIP sheathing as primary wall air barrier; Intello Plus fabric ceiling air barrier; all penetrations sealed

VENTILATION

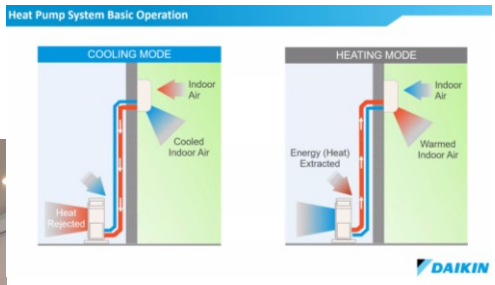
Air-tight envelopes conserve energy in all seasons. Fresh outdoor air is provided at 100 CFM by an Aldes **Energy Recovery Ventilator** (ERV). In winter, as much as 75% of the home's heat energy is transferred to incoming outdoor air and gets distributed to the bedrooms and open-concept kitchen + dining + living space. A HEPA filter can be used to block wildfire smoke. The ERV rids the home of stale air, odors, excess moisture, and poor indoor air quality.



Credit: https://www.aldes-na.com/wp-content/uploads/2022/06/Residential-HEVERV_aim-V2_brochure_2022.pdf



Credit: Susan Bilo




Indoor heat pump unit with radiant heater above.


Credits: Susan Bilo
Outdoor heat pump unit.

HEATING & COOLING

A 15,000 BTU, cold-climate Daiken Aurora **air-to-air source heat pump supplies both space heating and cooling** by simply moving heat energy into or out of the home. Provides heat when temperatures are down to -13°F outside and cools when up to 115°F outside.

Heating efficiency: 12.5 HSPF; 2.3 (at 5°F) to 4 COP (for every 1 kW of electricity used to power the heat pump, 2 to 4 kWs of heat energy are produced). Cove radiant heaters provide back-up heat if needed.
Cooling efficiency: 20 SEER.

FIXTURES & APPLIANCES

After the building envelope and HVAC system goals are met, the next step is to install energy- and water-efficient fixtures and appliances.

The refrigerator, dishwasher, clothes washer and dryer, induction stove, ceiling fans, and all lighting fixtures and bulbs are **Energy Star** labeled. The Daiken heat pump and Aldes ERV are also Energy Star-labeled. The label means they are 3rd-party certified to deliver efficiency and savings.



Credit: Susan Bilo

Bridger View homes have two modern appliances not found in most homes!

The induction stove heats food faster and is more energy efficient than electric resistance and natural gas stoves. The heat pump clothes dryer uses almost 30% less energy than a conventional clothes dryer.

The Bridger View neighborhood has water-wise landscaping and also uses water wisely indoors. Toilets, faucets, and showerheads are all **WaterSense** labeled. This means they are certified to use at least 20% less water, save energy, and perform as well as or better than regular models.



Credits: Susan



Credit: Susan Bilo

Heat pump water heater.

HOT WATER

Installing Energy Star and WaterSense fixtures and appliances reduces the amount of energy and water (hot or cold) needed. Using heated water more efficiently allows for a smaller and more affordable hot water heater. A Grundfos recirculating pump conserves water at all fixtures. A 50-gallon Lochinvar Heat Pump Water Heater (HPWH) transfers existing heat energy from the basement air to the tank's water. Energy Star certified; Uniform Energy Factor (UEF): 3.4

ENERGY USE & SOLAR ELECTRIC SYSTEM

Bridger View homes only use electricity (no combustible fossil fuels) that can be provided on-site by a solar electric (photovoltaic=PV) system. Homes are designed "solar ready" with enough roof space for unshaded, south-facing PV modules and pre-installed electric components.

- ► Estimated electricity use: 12,991 kWh/year at a cost of $1,784/year (0.13 kWh). This is a savings of $1,870/year over a 2006 IECC reference home. Home Energy Rating Score: 49
- ► Energy Use Intensity (EUI): 31 (kBtu/square foot/year)
- ► A 10-kilowatt PV system will provide 100% of the home's energy