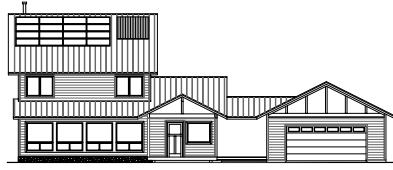
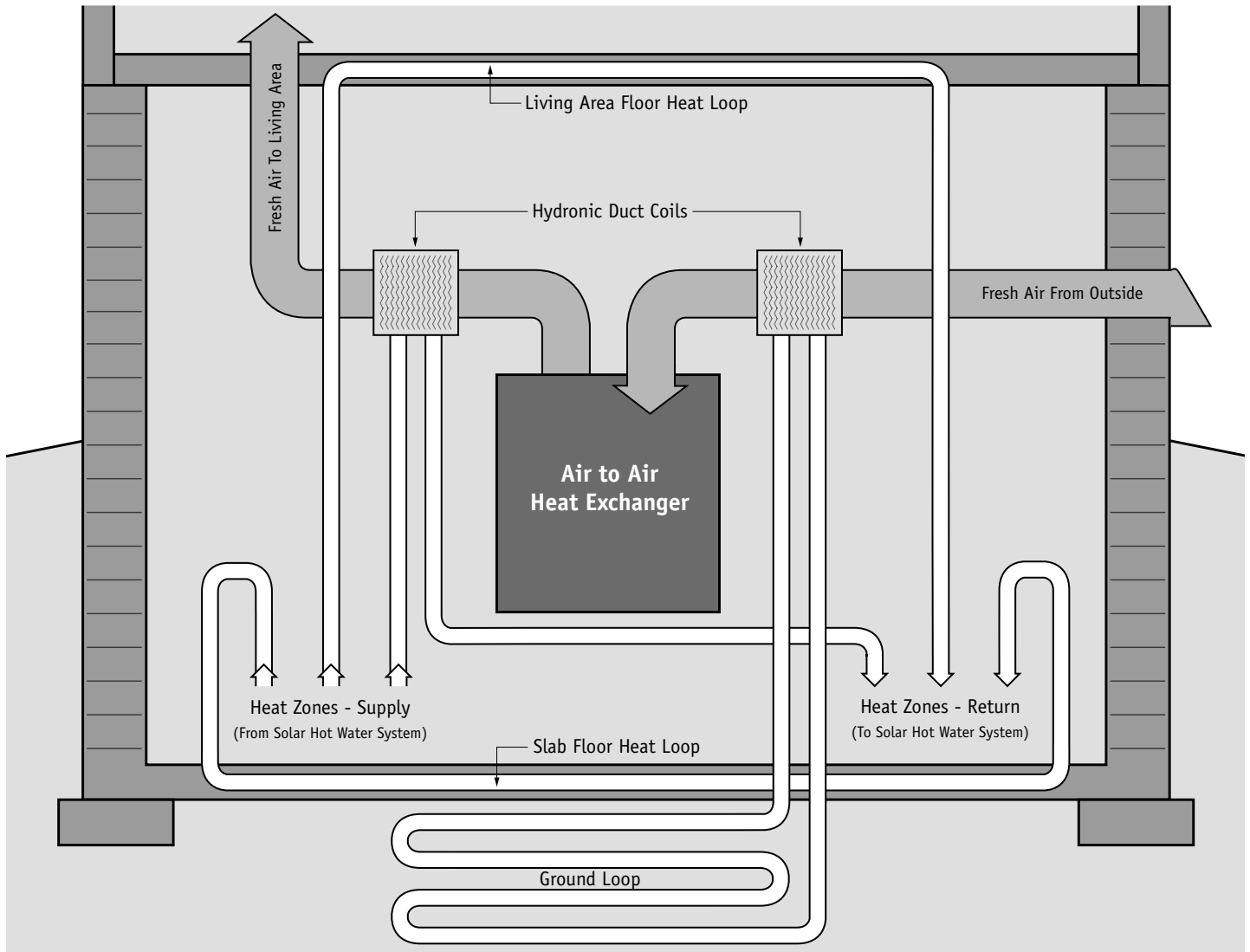


Eco-Home at Hawk Ridge

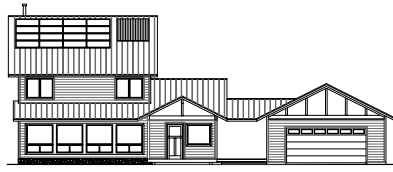


A solar model demonstrating energy efficiency, renewable energy and green building

Schematic Diagram : Mechanical Ventilation Air Tempering



Eco-Home at Hawk Ridge



A solar model demonstrating energy efficiency, renewable energy and green building

Heat Recovery Ventilation

The Eco-Home is equipped with a high performance heat recovery ventilator. With higher than average heat recovery performance, and fitted with properly sized and distributed ducting, this system provides efficient and effective whole house ventilation. Beyond just ventilation, this system also incorporates experimental ground loop outside air tempering as well as a fresh air heating system that delivers heat to the upstairs bedrooms.

Basic Design Plus Innovations

The basic ventilation design removes stale air from the bathrooms and kitchen while delivering fresh outside air to bedrooms and living areas. This portion of the design represents a high performance fully ducted whole house system with close to 90% transfer of heat energy from the exhaust air to the fresh air in the winter. High speed override controls in the kitchen and baths eliminate the need for bath fans which, having no heat recovery, represent a significant energy loss by exhausting heated air directly to the outdoors.

Thanks to the high performance design of the home the heating loads are very small. This smaller demand opens the door to innovative approaches in heating and ventilation. The Eco-Home's ventilation system has a couple of added features.

The fresh air drawn into the house by the ventilation system passes through a washable filter and a finned coil before it enters the heat recover ventilator. The coil is connected to 250 feet of polyethylene pipe that is buried in the sand fill beneath 4" of foam insulation under the home's slab. This closed loop system is filled and pressurized

with a water and antifreeze solution. A small pump circulates this heat transfer fluid through the loop and duct coil whenever the ventilator is running. The design is intended to provide a measure of tempering of the fresh air coming in from outside. This should help warm the air in the winter and provide a bit of cooling and dehumidification in the summer months. This ground tempering system is experimental and we hope to learn what potential there is in this approach by monitoring its performance and behavior during the years the home is open as a demonstration project.

The hybrid heating system provides heat to the radiant floor zones and also heats the ventilation air that is delivered to the upstairs. Different from a forced air system in that it usually uses all outside air, this low flow system will be no noisier than a normal ventilation system. To avoid over drying the house during very cold weather the system can switch to re-circulation mode for periods of time if needed. When heat is needed in the upstairs bedrooms a small circulator moves hot water through a second duct coil in the duct that delivers fresh air upstairs. Controlled by a thermostat this system will automatically deliver heated fresh air to the upper level.