

Outline Mechanical Specifications for Webster Residence, Haliburton

SYSTEMS OVERVIEW

The Webster residence is an autonomous house with renewable energy supply, well water supply and composting human waste treatment.

Space and Domestic Water Heating

Space heating is supplied mainly via radiant output from a ~~8 kW~~ ^{10 kW} contraflow masonry heater. The west bedroom will receive heat via convective register above the heater into the floor plenum. The masonry heater contains an embedded potable water heat exchanger which can deliver some space heating to the east bedrooms. There is a separate heat exchanger for domestic hot water in the fire box of the masonry heater, as well as solar collectors, convecting to the domestic hot water storage tank located at the upper level.

Ventilation

Air from the house is centrally exhausted through the toilet opening via the composter, then through a heat pipe heat recovery ventilator to the outside. Supply air is preheated via two crawl spaces prior to entering the heat recovery ventilator. The supply air is then introduced into the floor plenum for distribution to various rooms through floor and ceiling registers, essentially without ductwork.

Water Supply and Grey Water Treatment

Potable water is made available from a conventional pressurized well system consisting of a submersible well pump and a pressure tank. The greywater from sanitary drains is collected in a sump and dosed to an indoor growing bed for treatment and conducted to a subsurface drywell.

Composting Toilets

Two toilets, one in the upper level and one on the main level, are connected to a single composting unit located in the basement. The toilets are the exhaust ports for the house.

Electrical Supply

The electrical system consists of 2000 W of PV panels and a 1500 W wind generator on top of a guyed 90 ft tower. The generated power is stored in 16 batteries and converted to 110V by an inverter.