



HVAC SYSTEM

GEOHERMAL HEAT PUMP

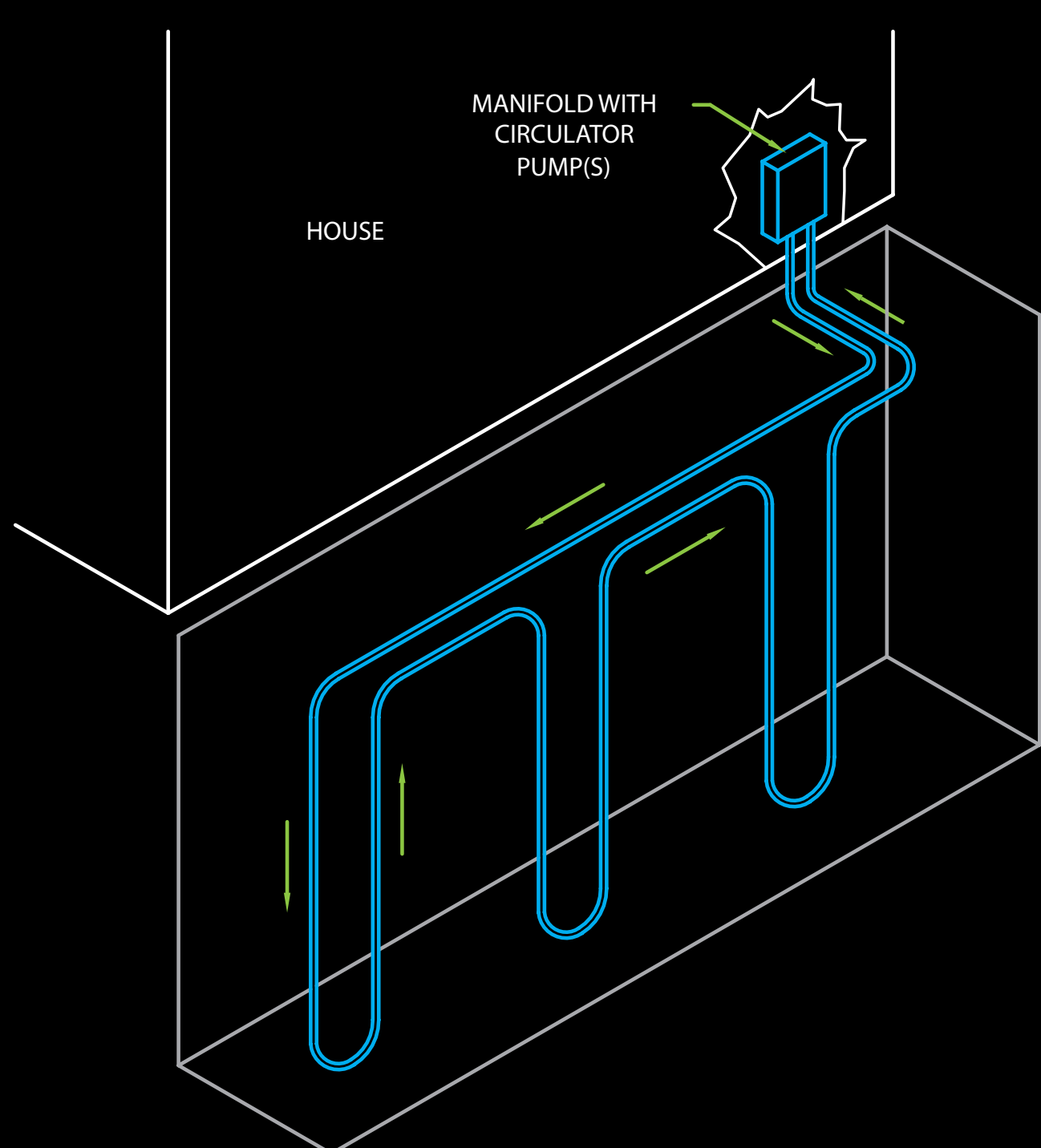
To provide high-efficiency heating and cooling in a cold climate, a geothermal heat pump was selected. A geothermal heat pump is more efficient than an air-source heat pump, and supplies higher temperature heating air, because it takes advantage of the relatively constant and mild ground temperature—rather than the more extreme air temperature—as an energy source.

For any HVAC system, it is important to carefully size the system according to industry standard procedures. Improper sizing can lead to callbacks, poor system efficiency, and discomfort. Proper sizing is absolutely critical with a geothermal system, which costs substantially more per ton than conventional systems.

ACCA Manual J was used to size the HVAC system for this home, using specifications unique to the home such as window type and location, R-values, and estimates of air tightness.

The geothermal heat pump in this home is a closed-loop system, which consists of an underground heat exchange loop and indoor heat pump equipment. When operating, a pump circulates a heat exchange fluid (glycol solution) through the durable ground loop piping, which runs inside a 450-foot well and carries a 50-year warranty. In the indoor unit, this fluid is circulated through a heat exchanger to heat (or cool) the environmentally-friendly refrigerant that circulates through the heat pump. Using electricity, the heat pump operates like a reversible refrigerator to raise (or lower) the refrigerant temperature before it travels through the indoor coil to heat (or cool) air. The operation is very quiet and extremely efficient.

You may also notice with this system there is no noisy outdoor unit!



10 pts. Under **Section 3.3.1i** of the **NAHB Model Green Home Building Guidelines**, this home receives 10 points for a geothermal system with an Energy Efficiency Ratio (EER) of 27, which is nearly twice the 14.1 minimum EER required for equipment bearing the ENERGY STAR® label.