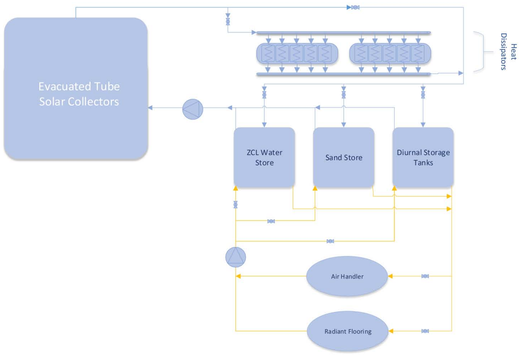
URBANDALE CENTRE FOR HOME ENERGY RESEARCH

Thermal COLLECTION

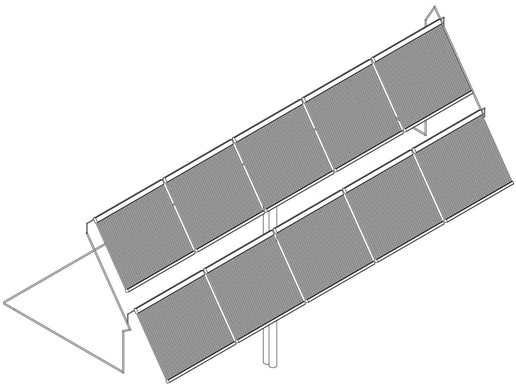


Solar Loop

Connecting Solar Collection to Thermal Storage

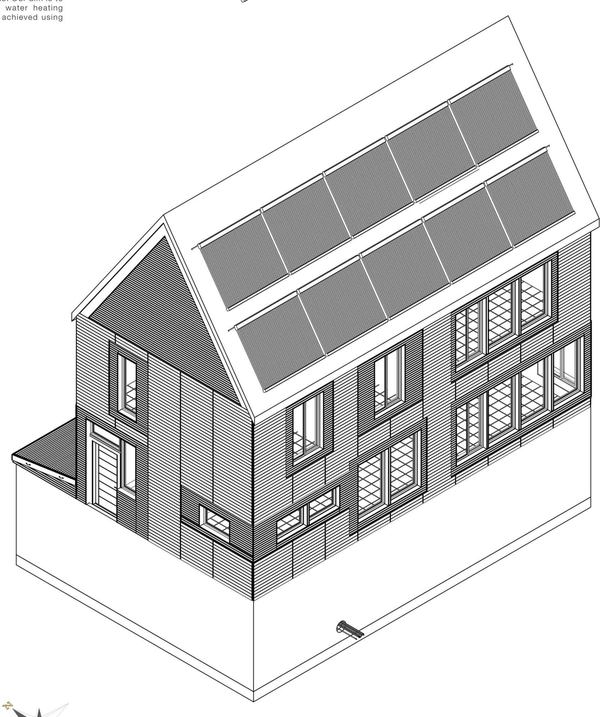
We use an antifreeze fluid in the solar collectors to protect from winter freezing, and the heated fluid is pumped down to the basement where the energy gets transferred to the storage systems through heat exchangers. All the pumps and valves to operate the system, including distribution and temperature are controlled by a central data acquisition and control system.

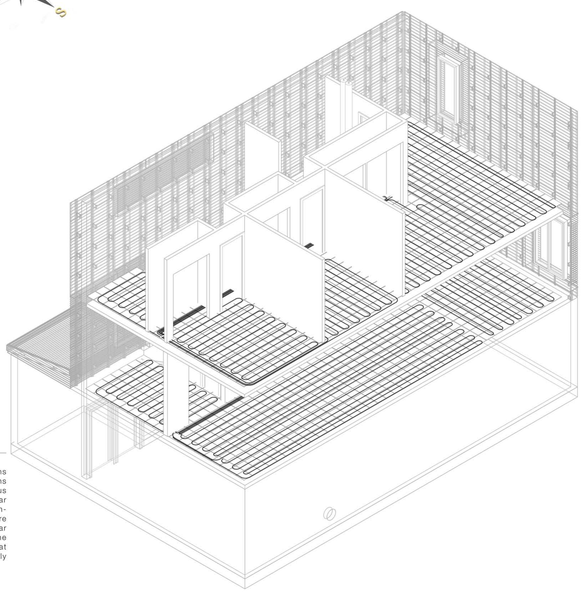
Heat is distributed to the house from the thermals storage systems through the heat exchangers to forced air, radiant floors or domestic hot water.



EcoGen Rooftop Collection

An array of ten Apricus evacuated tube solar collectors sits on a racking atop the roof. The collectors are tilted at 60 degrees for optimum solar collection during the winter and snow shedding. The steep pitch of the roof was designed to facilitate this. The gross rooftop collector area is 44 m2 that is proportional to the size of the house and its thermal energy needs. Our aim is to achieve 90% of the house space and water heating needs over the year, which can only be achieved using the seasonal storage systems.





Roth Radiant Floor System

Typically radiant floor heating systems distribute heat to a house. This project turns the house into a solar collector, allowing us to capture and use excess passive solar gains from the tile floor. The south facing windows extend low to the floor to allow more sun to hit the tiles, increasing the solar energy collected. Heat is pulled out of the floors and dumped into the Three Tanks that can then provide heating at night or supply domestic hot water needs.