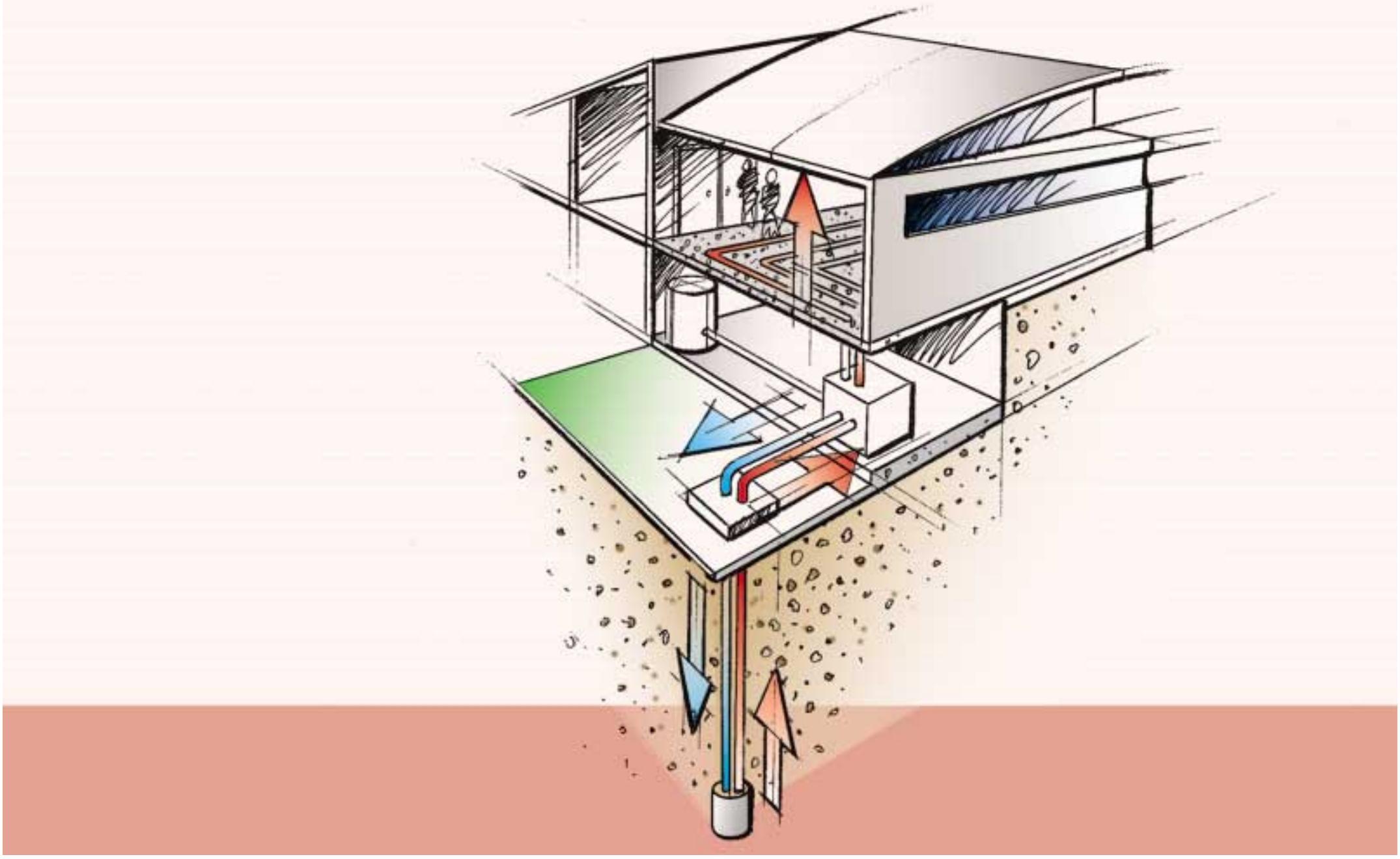
07 THERMAL STORAGE

> Heat pumps

cooling heating



HOW IT WORKS

- Heat pumps work like a domestic refrigerator in reverse. Rather than removing heat from a small space (fridge), heat pumps absorb heat (from the ground, air or a body of water) and store it in a small space (e.g. a water tank).
- Solar energy is stored as heat in natural heat sinks such as:
  - the ground—closed loop system where fluid is circulated through loops bored horizontally or vertically into the ground (known as geo-exchange systems).
  - water or air—open loop systems which use a large body of water such as a lake, river or the water table, or air.
- The constant temperature fluid from the heat sink flows to the heat pump where refrigerant is used to transfer heat from the heat sink to air or water for use in ventilation systems, hydronic or sub-floor heating systems, pool heating or hot water heating systems etc. within the building.
- The process can be reversed to enable cooling in summer months.

HOW IT SAVES ENERGY

- Provides heating and cooling to complement conventional climate control systems.

HOW IT IS INNOVATIVE

- Not widely used in Victoria.

APPLICATION

- Areas without a natural gas supply.
- Buildings with efficient heating/cooling requirements.
- Geo-exchange systems require external space to install geothermal loops which may disrupt existing landscaping.

WHERE DEMONSTRATED

- Australian Geological Survey Office, Canberra, Australian Capital Territory
- Monash Science Centre, Clayton, Victoria