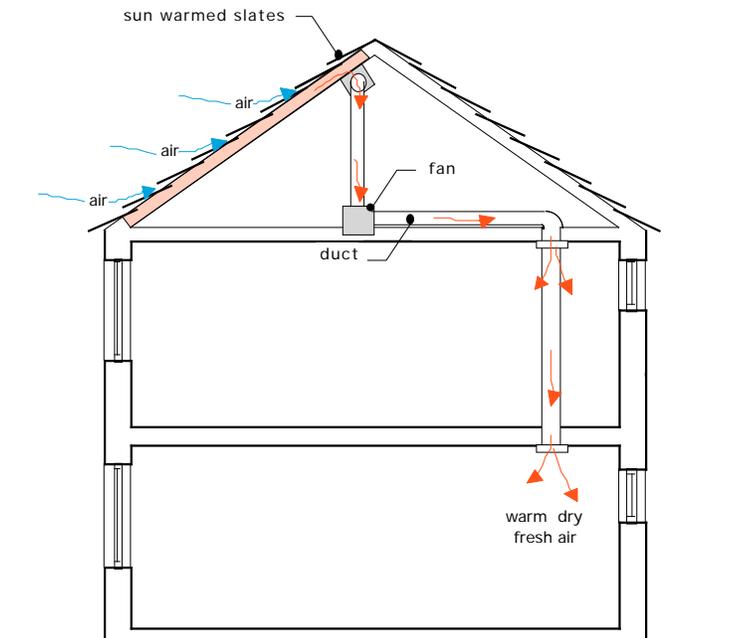


passive solar ventilation
 simple retrofitting
 improved air quality



1996



aim

Solar pre-heating of ventilation to tackle dampness & condensation.

strategy

The temperature of a roof surface is usually higher than that of the external ambient air during daylight hours, even in overcast weather. There is an opportunity here to use the solar heat collected by the roof to pre-heat the ventilation air needed by the building below. The most conventional roofs can quite easily be turned into remarkably efficient solar air heating collectors.

The technique is to use a fan to suck external cold fresh air through the slots & gaps between slates/tiles on the roof. The air picks up the solar heat & the resulting warm dry fresh air is then delivered to the building below. A simple time clock will turn of the fan at night. The arrangement of ducts and manifolds can be varied to suit individual roofs.

This technique has been pioneered, developed and tested at Napier University. A field trial of the system on occupied houses in Edinburgh's Burdiehouse area was set up, with the special aim of assessing its effectiveness in alleviating coldness, dampness & condensation.

10 houses with dampness problems were identified & divided into 3 groups:

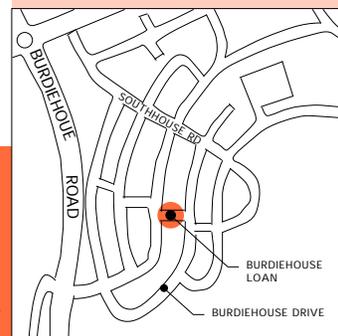
1. unchanged ventilation,
2. ordinary ventilation system (simple positive ventilation system with fans drawing air from the attic space into the hall),
3. solar ventilation (similar positive ventilation system, but with the air intake through special manifold integrated into the south facing slope.

assessment of performance

The houses were monitored over a year with the following results:

- both ventilation groups enjoyed significantly reduced levels of dampness,
- the solar group houses were warmer than the other 2 groups,
- 2 of the 4 solar households reported health improvements,
- noise and running costs were not perceived as problems,
- the ventilation systems were quick and easily fitted. The additional solar pre-heat components took about a day to fit in each house.

Most conventional roofs can quite easily be turned into remarkably efficient solar air heating collectors.



further information

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