Heat Shifters

AIM

The aim of this technical solution is to inform practitioners about the requirements for installation of heat shifters.

PLUMBING REGULATIONS 2008

The *Plumbing Code of Australia* (PCA) is adopted by and forms part of the *Plumbing Regulations 2008*. Part E1 of the PCA specifies the objectives and performance requirements related to the installation of heating, ventilation and air-conditioning systems. ***AS 4254: Ductwork for air handling systems in buildings***, is a "deemed to satisfy" document listed in Part E1 of the PCA and contains a section on "Duct construction and installation". ***AS 4508:Thermal resistance of insulation for ductwork used in building air-conditioning***, is also a "deemed to satisfy" document listed in Part E1 of the PCA and contains a section on "Requirements for bulk insulation thermal resistance".

HEAT SHIFTERS

Ducting fitted with a fan can be used to transfer warm air from a heated room to unheated parts of a house. This system is termed a "heat shifter".

Heat shifters are most effective at providing back-up heating for rooms that do not normally require constant heating, such as bedrooms.

By connecting a heated living area with a bedroom, a heat shifter enables residual heat from the heated room to be passed to the bedroom when the heater has been turned off. Alternatively, excess heat from one room can be shifted to another whilst the heater is still in operation. A heat shifter can improve the warm air circulation throughout a home.

Heat shifters can satisfactorily transfer heat to a distance of up to 12 metres.
A typical heat shifter would consist of:

- 150 mm axial fan;
- 150 mm insulated aluminium ducting;
- two 150 mm 90° duct elbows;
- low resistance ceiling discharge grille with low spread.

Heat shifters are available in kit form from a number of companies.

Before buying equipment, inspect the roof space to ensure sufficient clearance exists between roofing and ceiling lining, especially at the point where the fan and discharge grilles are to be installed.

A minimum clearance of 400 mm is normally required to enable the 90° duct elbows to be installed.

The fan may be located in any section of the heat shifter. An alternative to fitting the fan in the ceiling is to install it in the ductwork, or purchase ducting incorporating a suitable fan. This has the advantage of reducing fan noise. The discharge register if installed in the ceiling (which may be your only option), should be placed as far from the room doorway as possible and near the wall to avoid the effects of draughts. It is always preferable to install the

discharge register at or near floor level but in many cases, this will not be achievable.
It is important to ensure that the duct material is fire rated and installed to comply with the requirements of *AS 4254*. The duct must be insulated if it is installed in a ceiling space or unconditioned space within a building, to a rating of at least R 0.9 as required by Table 2.1 of *AS 4508*.

All electrical work for the fan must be carried out by a licensed electrician.

They are useful in transferring heat from one end of the house to another (as in Figure 1).

And from one room to an adjacent room (as in Figures 2 and 3). In Figure 3 only a fan is needed.

Where warm air from a downstairs heated area collects upstairs, a heat shifter can be used to help bring the warm air back downstairs (as in Figure 4).

Note: When a heat shifter is used in conjunction with a space heater, an opening must be provided to allow air to flow back to the heater. For example, if there is not already a larger, permanent opening, provide a return-air grille of size 600 mm x 150 mm minimum between the two rooms.

FIGURE 1 - EXAMPLE OF HEAT SHIFTING FROM LIVING ROOM TO BEDROOM

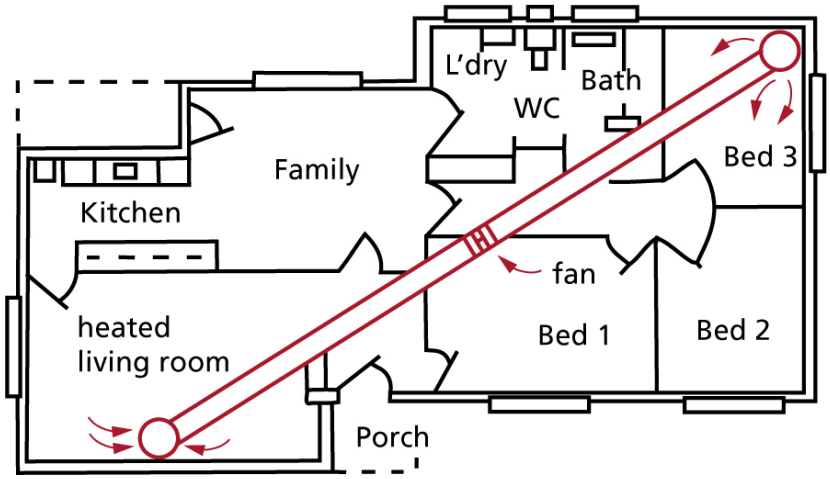

FIGURE 2 - EXAMPLE OF HEAT SHIFTING FROM HEATED ROOM TO NON HEATED ROOM

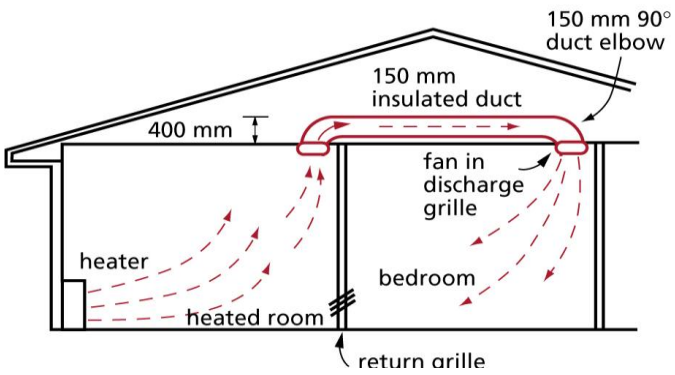

FIGURE 3 - EXAMPLE OF HEAT SHIFTING FROM AN ADJACENT ROOM

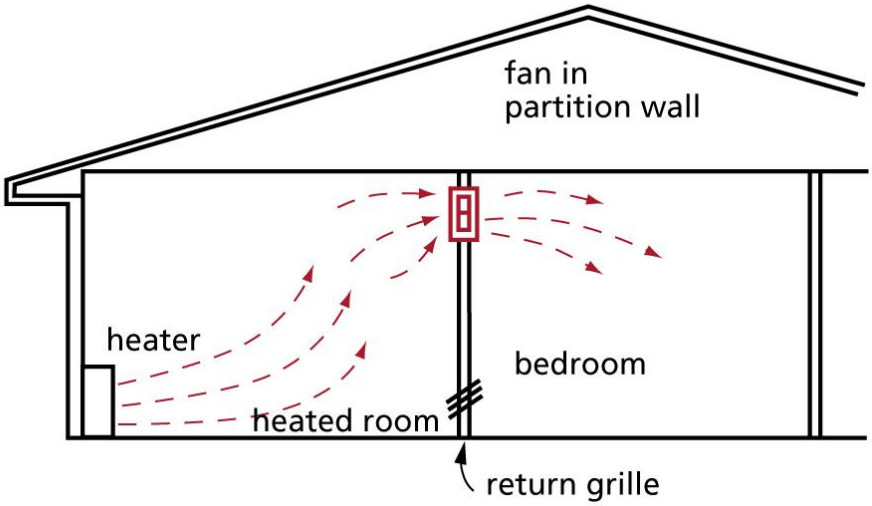

FIGURE 4 - EXAMPLE OF HEAT SHIFTING FROM UPPER FLOOR TO LOWER FLOOR