Mechanical Exhaust / Ventilation Systems

AIM

The aim of this technical solution is to inform practitioners about mechanical exhaust / ventilation systems that exhaust odours and steam from wet area rooms, and some of the associated sizing and installation considerations.

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". Mechanical ventilation and air-conditioning systems for buildings are generally required to comply with the *Building Code of Australia* (BCA).

WHERE USED

There are proprietary mechanical ventilation systems available that exhaust odours and steam from wet area rooms and fixtures. These are best suited to multi-level residential and commercial buildings which contain typical wet area rooms where mechanical ventilation is required.

HOW THE SYSTEM WORKS

The system is wired into the light switch circuit which controls the dampers and exhaust fan. If all of the typical wet area rooms, such as those shown in Figure 1 are not occupied, all dampers are closed and the roof mounted fan is switched off. If only one light switch is turned on, the damper to that room opens to a pre-determined position and the fan starts to run at a corresponding low speed. As more rooms are occupied and light switches are turned on, dampers will open and the fan speed increases proportionally. As light switches are turned off, dampers close and the fan speed decreases and will stop when all light switches are turned off.

ADVANTAGES

- Dampers can be installed in either vertical or horizontal position
- A fan is not required in every unit or floor level
- Significant power savings of 50 - 60 per cent can be achieved, thus reducing greenhouse gas emissions
- Airflows may be reduced where permitted by BCA
- Smaller duct risers can be used where appropriate

SIZING AND INSTALLATION CONSIDERATIONS

- Ensure that the system can provide the minimum ventilation flow rates as required by the BCA, sufficient for the size of space and removal of steam produced showers / baths.
- Ensure adequate cross ventilation
- Allow for replenishment of exhaust air
- Ensure compliance with BCA with regard to exhaust air discharge
- Ensure compliance with BCA with regard to fire rating of any exhaust duct penetrations (where required).

FIGURE 1 - EXAMPLE OF MECHANICAL EXHAUST / VENTILATION SYSTEM