
Sustainable Building Features and Fire Safety

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When designing buildings to be more energy efficient and environmentally friendly, it is a challenge to achieve these objectives, but other objectives of good building design cannot be forgotten in the process, and one of these is fire safety. The impact of these features on fire safety can have positive, neutral or negative implications. A list of common features of such buildings has been developed and their implications for fire safety investigated with the aid of an expert group. The most positive feature is distributed heating and cooling, which unlike central systems does not require the movement of large volumes of air and hence potentially smoke around a building in the event of a fire. Use of natural ventilation, commonly with atria and double skin facades allows for relatively unimpeded smoke transport in the event of a fire. Fire engineering design and fire safety mitigation measures such as natural draught and mechanical extract systems, for atria is well developed and understood. This is not the case for double skin facades. Computational Fluid Dynamics modelling of prototype buildings with a double skin façade has been carried out. Provided the vents to the double skin facade close in a fire, smoke spread via the double skin facade is prevented. The New Zealand Building Code, Framework for Fire Safety Design, C/VM2, and normal good practice, requires a robustness check, that is allowing for failure of one system such as that closing of vents to the inside of the building. In the event of such a failure the Fire Engineering design of a double skin facade, is unlikely to be successful unless a building is sprinklered. Other sustainable building features with less significant effects are also discussed.

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