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Large isolated buildings (LIB) – not sprinkler protected

Objective

The objective of this Technical Note is to clarify the Department of Fire and Emergency Services (DFES) position in respect of the National Construction Codes (NCC) Building Code of Australia (BCA) Volume 1, C2.4(b)(ii) – vehicular access where the building is not sprinkler protected.

Background

DFES views these Alternative Solutions as a normal part of the design process. However, the deletion of the perimeter vehicular access prescribed by the Deemed to Satisfy (DTS) Provisions of the BCA, or reducing the extent to which the access is provided to the perimeter is not considered to be a feature appropriate for performance based solutions by fire engineers.

This access provides the Fire Brigade with the ability to move personnel and other necessary resources around the building to optimise the response to a fire situation and to allow appropriate levels of safety to firefighters working to contain and extinguish a potentially large fuel load.

Issue

DFES believes that a minimum distance of 10 metres should exist between the subject structure and the near side of the perimeter vehicular access (PVA) where the LIB is not sprinkler protected.

Rationale

1. AS2419.1 (as referenced by the BCA) Clause 3.2.2.1 paragraph 6 currently requires hydrant coverage to a building to be calculated assuming the fire appliance to be located no closer than 10 metres to the building. Thus through inference, AS2419.1 provides guidance to provide a minimum distance between a (PVA) and the structure it is serving.
2. A large isolated class 7 and 8 building is often clad in a manner that is not effectively attenuating radiant heat.

Where such buildings are substantially involved in fire, the resulting radiant heat (say 125 kW/m² received at 2.5 metres from a 50m x 6m wall) will prevent access of fire appliances to (typically) 3 sides of a four sided structure.

This is a significant defeat of the intended purpose of the BCA PVA requirements.

A radiation gap of 10 metres will not provide tenable conditions at the peak of a fully developed fire (would only reduce from approximately 125 kW/m² to 46 kW/m²) however it will;

- i. permit longer intervention during the early stages of a fire, and
 - ii. will permit earlier intervention during the decay stage of a fire
3. The risks associated with structural collapse of buildings subjected to elevated temperatures.

Whilst prefabricated (or tilt-up) buildings are designed to avoid outward collapse as complete panels, other construction types may not be.

4. A (PVA) provided in very close proximity to a structure restricts appliance manoeuvrability, in particular negotiating corners. This problem is especially exacerbated where longer aerial appliances are deployed.

Conclusion

Designers should ensure that wherever practicable, the inside edge of the (PVA) should be located not closer than 10 metres to the building.

This will significantly lessen the effects of radiant heat on emergency vehicles and responders, improve intervention times, provide some protection from outward falling building materials, and will, to some extent, help to achieve the intent of AS2419.1 Clause 3.2.2.1.

Further guidance on vehicular access and appliance specifications can be sourced at DFES Guideline 11.

Please note: This is a controlled document. DFES technical notes are available on the DFES Website: www.dfes.wa.gov.au under Regulation and Compliance, Building Plan Assessment then click on Publications/Guidelines.

Should the information provided in this guideline require further clarification, please contact DFES Built Environment Branch via email beadmin@dfes.wa.gov.au.

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