

C/VM2 update

Some new fire ratings, the introduction of optional deemed-to-comply surface finishes and design clarifications are among recent changes to the Verification Method for fire safety design.

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THE VERIFICATION METHOD C/VM2 Framework for fire safety design provides engineers with a pathway for demonstrating compliance with the New Zealand Building Code clauses C1 to C6 *Protection from fire* based on engineering analysis.

Method provides structured approach

C/VM2 was published in April 2012. For the first time, it provided a structured approach for fire engineers to demonstrate compliance by describing a set of fire scenarios to be addressed and specifying various engineering input parameters and assumptions for the fire and evacuation process.

These included design values for fire size, amount of fuel present, amount of smoke and carbon monoxide generated and assumed occupant characteristics affecting evacuation times. The design is assessed against acceptance criteria specified in the Code clauses.

Problems when no method

Before April 2012, fire engineers independently proposed design input parameters and the acceptance criteria. This sometimes resulted in inconsistent assumptions by different engineers for very similar designs and buildings.

There were also occasional delays in the consenting process due to required reworking from disagreement about the design's compliance with the Code.

Bold step

Publication of C/VM2 represented a bold step with few international precedents. It required the then Department of Building and Housing - now Ministry of Business, Innovation and Employment (MBIE) - to design a framework with engineering parameters, for the most part from first principles, but relying on a range of supporting standards and practices where appropriate.

Since 2012, C/VM2 has been under constant review and improvement by MBIE as industry experience with the new framework increased.

Current version changes

Feedback from industry led to the current version (Amendment 4) of the Verification Method being published, following a consultation period, effective from 1 July 2014.

It includes changes for surface finishes, fire ratings, the design process and clarifications.

Surface finishes

A range of optional deemed-to-comply surface finish solutions has been introduced so that, for many common linings and finishes - for example, painted plasterboard and timber floors - it is no longer

necessary to provide fire-testing evidence to demonstrate compliance with the specified Group Number or critical flux.

A concession previously given to surface finish requirements for HVAC ducts was confirmed allowing compliance with AS 4254-2002 *Ductwork for air-handling systems in buildings* as an alternative to the existing Group Number testing regime.

These surface finish changes and solutions also apply to the Acceptable Solutions for clause C *Protection from fire*.

Fire ratings

An upper limit for any fire resistance rating of 3 hours with sprinklers, or 4 hours unsprinklered, has been introduced. Previously, some buildings with high fire loads and low ventilation may have required in excess of 4 hours calculated using the fire severity formula given in C/VM2. This mainly affects buildings used for storage.

When determining fire resistance ratings for construction that is only required to perform for specified periods of time - for example, to protect escape routes until evacuation is complete - a quick estimate based on three times the required safe egress time is permitted as an alternative to a more detailed calculation based on either demonstrating equivalent time of exposure or designing for burnout.

Design process and clarifications

Commentary is provided clarifying situations in which it is acceptable to use parts of the C/AS1-7 Acceptable Solutions within a C/VM2 design, rather than requiring a complete C/VM2 analysis for all parts of a building.

The Building Code waives certain acceptance criteria where it is not possible to expose more than 1,000 occupants to the effects of the fire.

Guidance around how to assess whether someone is considered exposed or not is provided. Appropriate use of smoke separations can be used to reduce the number of occupants exposed and allow a wider range of engineered solutions.

Other changes

- A maximum length of 50 m - or 40 m if occupants are not expected to be familiar with the building - for a single direction of escape has been introduced under the blocked-exit scenario.
- C/VM2 was previously silent on providing for lower roof exposures and parapets to control horizontal fire spread. These are now included, ensuring consistency with the Acceptable Solutions.
- C/VM2 provides limited opportunities for relying on manual rather than automatic fire alarms in low-occupancy buildings with high ceilings and alert occupants, such as warehouses, where the likelihood of manual detection is higher. This has now been extended to also allow the manual alarm to cover small, attached office and ancillary spaces. ◀

For more ▶ MBIE responds to frequently asked questions about the Acceptable Solutions and the Verification Method for *Protection from fire* (C/AS1-7 and C/VM2) at www.dbh.govt.nz/changes-to-c1-c6-faq with an 'Ask us a question' form.