

<b>Title</b>	<b>Demonstrate knowledge of structural fire behaviour</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>4</b>

<b>Purpose</b>	<p>This unit standard is primarily for fire officers.</p> <p>People credited with this unit standard are able to identify the behaviour of structural and cladding materials under fire conditions, and predict the likelihood of fire spread.</p>
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<b>Classification</b>	Fire and Rescue Services > Fire and Rescue Services - Structural and Industrial
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Compliance with the fire and rescue service provider's Health and Safety policy and procedures is mandatory.
- 2 Assessment against this unit standard may take place under real or practical simulated conditions.
- 3 The primary references for this unit standard are: Edgerley, P.G., and Robinson, P.G., *Handbook for Fire Engineers* (Leicester: Institution of Fire Engineers, 1989); and Buchanan, A.H. (ed), *Fire Engineering Design Guide* (Christchurch: Centre for Advanced Engineering, 2001).
- 4 Performance of the outcomes and performance criteria during assessment against this unit standard must be in accordance with the primary references.

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### Outcomes and performance criteria

#### Outcome 1

Identify the behaviour of structural and cladding materials under fire conditions.

Range must include but is not limited to – timber, concrete, brick, steel, glass, aluminium.

#### Performance criteria

- 1.1 Properties of structural and cladding materials under fire conditions are identified in terms of their combustibility and co-efficient of linear expansion.

- 1.2 Thermal properties of materials at elevated temperatures are identified.
- Range thermal conductivity, thermal capacity, thermal diffusivity.
- 1.3 Strength and deformation characteristics of materials at elevated temperatures are identified.
- Range proportional limit, yield strength, ultimate strength, modulus of elasticity, co-efficient of linear expansion, creep.

## Outcome 2

Predict the likelihood of fire spread.

### Performance criteria

- 2.1 Radiated heat intensities and radiation distance required for ignition are identified.
- Range neighbour's combustible wall (plastic and cellulosic), the neighbour's non-combustible wall not fitted with fire resistant glazing, the neighbour's non-combustible wall fitted with fire resistant glazing.
- 2.2 The likelihood of fire spread within a building structure and between structures is identified.
- Range fire spread by radiation, spontaneous ignition, pilot ignition, surface ignition.
- 2.3 The likelihood of vertical fire spread, both internally and externally, is estimated for a given building's structure.

**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 June 1995	31 December 2025
Revision	2	21 May 1998	31 December 2025
Revision	3	2 August 1999	31 December 2025
Review	4	25 March 2004	31 December 2025
Review	5	20 November 2009	31 December 2025
Review	6	30 September 2021	31 December 2025

<b>Consent and Moderation Requirements (CMR) reference</b>	0039
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.