
**FIRE AND RESCUE SERVICES -
STRUCTURAL AND INDUSTRIAL**
**Apply knowledge of structural fire
behaviour**

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| level: | 3 |
| credit: | 3 |
| final date for comment: | March 2008 |
| expiry date: | December 2009 |
| sub-field: | Fire and Rescue Services |
| purpose: | <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> |
| entry information: | Recommended: Unit 4647, <i>Explain principles of fire science</i> , or demonstrate equivalent knowledge and skills. |
| accreditation option: | Evaluation of documentation and visit by NZQA and industry. |
| moderation option: | A national moderation system of moderation networks has been established by the Fire and Rescue Services Industry Training Organisation. |
| special notes: | <ol style="list-style-type: none">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 the <i>Manual of Firemanship Book</i> and <i>Building Construction and Structural Fire Protection</i>, London, HMSO, 1992; <i>Handbook for Fire Engineers</i>, Leicester, Institute of Fire Engineers, 1989; Lie, TT. <i>Fire in Buildings</i>, London, Applied Science Publishers, 1972, <i>Essential Readings from HM Fire Inspectorate</i>. These references are held at the NZFS Information Centre. |

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- 4 To gain credit for this unit standard conformance with the standards given in the references is an overarching requirement for all elements of the unit standard. The terms *identified* and *estimated* should be taken to include the phrase *in accordance with the reference*.

Elements and Performance Criteria

element 1

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

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

element 2

Predict the likelihood of fire spread.

performance criteria

- 2.1 Radiated heat intensities and radiation distance required for ignition are identified in terms of the neighbour's combustible wall (plastic and cellulosic), the neighbour's non-combustible wall not fitted with fire resistant glazing, and the neighbour's non-combustible wall fitted with fire resistant glazing in accordance with the primary references.

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- 2.2 The likelihood of fire spread within a building structure and between structures is identified in terms of fire spread by radiation, spontaneous ignition, pilot ignition, and surface ignition in accordance with the primary references.
- 2.3 The estimation of the likelihood of vertical fire spread, both internally and externally is in accordance with a given building's structure.

Comments on this unit standard

Please contact the Fire and Rescue Services Industry Training Organisation info@frsito.org.nz if you wish to suggest changes to the content of this unit standard.

Please Note

Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0039 which can be accessed at <http://www.nzqa.govt.nz/site/framework/search.html>.