

Title	Design fixed fire protection systems		
Level	5	Credits	40

Purpose	<p>This unit standard is for fixed fire protection systems technicians and covers the design of fixed fire protection systems.</p> <p>People credited with this unit standard are able to, for fixed fire protection systems: prepare to design, design, and prepare drawings, plans, and specifications.</p>
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Classification	Mechanical Engineering > Fixed Fire Protection Systems
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Available grade	Achieved
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Explanatory notes

- References
 - Building Act 2004
 - Ministry of Business, Innovation and Employment (MBIE) *Acceptable Solutions (AS) and Verification Methods (VM)*. Available at <http://www.dbh.govt.nz/AS/VM-documents>
 - New Zealand Building Code
 - AS 4587-1999, *Water mist fire protection systems - System design, installation and commissioning*
 - AS ISO 14520.1-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - General requirements*
 - AS ISO 14520.10-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - HFC 23 extinguishant*
 - AS ISO 14520.14-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - IG-55 extinguishant*
 - AS ISO 14520.15-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - IG-541 extinguishant*
 - AS ISO 14520.2-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - CF3I extinguishant*
 - AS ISO 14520.6-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - HCFC Blend A extinguishant*
 - AS ISO 14520.9-2009, *Gaseous fire-extinguishing systems - Physical properties and system design - HFC 227ea extinguishant*
 - NZS 4517:2010, *Fire sprinkler systems for houses*
 - NZS 4541:2013, *Automatic fire sprinkler systems*
 - NFPA 12:2011, *Carbon dioxide extinguishing systems*
 - NFPA 15:2012, *Water spray fixed systems for fire protection*
 - NFPA 16:2011, *Installation of foam-water sprinkler and foam-water spray systems*
 - NFPA 17:2013, *Dry chemical extinguishing systems*

NFPA 17A:2013, *Wet chemical extinguishing systems*
NFPA 750:2010, *Water mist fire protection systems*
NFPA 2001:2012, *Clean agent fire extinguishing systems*.

2 Definitions

Fixed fire protection system refers to engineered sets of components that work together to detect fires, alert occupants, and extinguish fires, and may include fixed or automatic systems, such as those described by the standards listed in the references, used for controlling or putting out fires.

Job specifications refer to instructions relevant to the safe completion of the specific task, such as technical specifications, assembly instructions, drawings, parts lists, standards, codes of practice, test and commissioning procedures, and verbal instructions.

Enterprise procedures refer to the documented procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, site safety procedures, equipment operating procedures, codes of practice, quality assurance procedures, housekeeping standards, charging of time and materials, management of drawings and documentation, procedures to comply with legislative and local body requirements.

Special hazards fixed fire protection system refers to systems designed and installed to AS 4214:2006, AS 4587:2002, NFPA 12:2011, NFPA 15:2012, NFPA 16:2011, NFPA 17:2013, NFPA 17A:2013, NFPA 750:2010, or NFPA 2001:2012 standards. They may include but are not limited to: carbon, inert gas; dry chemical; wet chemical; foam, foam-water, water mist; and explosion suppression types of systems.

Systems in this unit standard include – conventional sprinkler system types such as pressurised, floating pressure, pre-action, tail end anti-freeze, dry pipe, alternate wet and dry pipe and deluge systems; and special hazards fixed fire protection systems.

Systems documentation refers to the documentation required to be maintained by NZS 4541:2013 and/or other relevant standards listed in the references including log book, test reports, equipment details and drawings, specifications, contract agreement, additions and alterations, fire reports, building consents standards, codes of practice, installation instructions, test and commissioning procedures, and test and maintenance records.

Project documentation refers to all documentation required for designing and may include design brief, building plans, building drawings and specifications, and equipment specifications.

3 Range

All activities must comply with relevant legislative and/or regulatory requirements and recognised codes of practice.

4 Assessment

For assessment purposes, competence must be demonstrated on at least three systems.

Outcomes and evidence requirements

Outcome 1

Prepare to design fixed fire protection systems.

Evidence requirements

- 1.1 Design project scopes are established from project documentation and job specifications.
- 1.2 Applicable standards from the list in the references, codes, and bylaws are identified from project documentation.
- 1.3 Environment for fixed fire protection systems is established from project documentation.

Outcome 2

Design fixed fire protection systems.

Range design is to be in accordance with appropriate Standards, the AS/VM documents, the project documentation, job specifications, and may include but is not limited to – fire hazards or intended fire hazards for every area of the protected building, minimum required discharge and design flow to each area of the protected building, sizing water supplies, number of sprinklers and types, permitted exceptions from sprinklering, types of systems, hydraulic calculations, system components, control valve requirements and their placements, pipework and its installation requirements, installation requirements for pressure gauges and fire brigade gauges, alarm requirements and its installation requirements, requirement for hose reels.

Evidence requirements

- 2.1 System layout is established and component sizes are defined.
- 2.2 Equipment for system is selected.

Outcome 3

Prepare drawings, plans, and specifications for fixed fire protection systems.

Evidence requirements

- 3.1 Drawings and project design for the installation of systems are prepared in accordance with standards and project documentation.
- 3.2 Assumptions and decisions are recorded in accordance with enterprise procedures.

Replacement information	This unit standard replaced unit standard 9381 and unit standard 9382.
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Planned review date	31 December 2020
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 July 2011	31 December 2017
Review	2	15 October 2015	N/A

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz on qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.