

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: prepare to design fixed fire protection systems; design fixed fire protection systems; prepare drawings, plans, and specifications for fixed fire protection systems.</p>
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Classification	Mechanical Engineering > Fixed Fire Protection Systems
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Available grade	Achieved
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Guidance Information

- 1 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the:
 Building Act 2004,
 Building (Forms) Regulations 2004,
 Ministry of Business, Innovation and Employment (MBIE) *Acceptable Solutions (AS) and Verification Methods (VM)*,
 MBIE New Zealand Building Code Handbook,
 AS 4587:2020, *Water mist fire protection systems - System design, installation, and commissioning*,
 AS ISO 14520.1-2023, *Gaseous fire-extinguishing systems - Physical properties and system design Part 1:General requirements*
 AS ISO 14520.10-2019, *Gaseous fire-extinguishing systems - Physical properties and system design - HFC 23 extinguishant*
 AS ISO 14520.14-2015, *Gaseous fire-extinguishing systems - Physical properties and system design - IG-55 extinguishant*
 AS ISO 14520.15-2015, *Gaseous fire-extinguishing systems - Physical properties and system design - IG-541 extinguishant*
 AS ISO 14520.2-2006, *Gaseous fire-extinguishing systems - Physical properties and system design - CF3I extinguishant*
 AS ISO 14520.6-2006, *Gaseous fire-extinguishing systems - Physical properties and system design - HCFC Blend A extinguishant*
 AS ISO 14520.9-2019, *Gaseous fire-extinguishing systems - Physical properties and system design - HFC 227ea extinguishant*
 National Fire Protection Association, NFPA 15:2022, *Water spray fixed systems for fire protection*,
 NFPA 16:2019, *Installation of foam-water sprinkler and foam-water spray systems*,
 NFPA 17:2024, *Dry chemical extinguishing systems*,

NFPA 17A:2021, *Wet chemical extinguishing systems*,
NFPA 750:2023, *Water mist fire protection systems*,
NFPA 2001:2022, *Clean agent fire extinguishing systems*,
NZS 4517:2010, *Fire sprinkler systems for houses*
NZS 4541:2020, *Automatic fire sprinkler systems*

Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

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.

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

Special hazards fixed fire protection system refers to systems designed and installed to AS 4214:2018, AS 4587:2020, NFPA 15:2022, NFPA 16:2019, NFPA 17:2024, NFPA 17A:2021, NFPA 750:2023, or NFPA 2001:2022 standards. They may include but are not limited to: 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 4541:2020 and/or other relevant standards listed in the references including logbook, 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.

Workplace 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.

3 Assessment information

- a. All activities must comply with relevant legislative and/or regulatory requirements and recognised codes of practice.
- b. All activities must demonstrate safe working practices.
- c. All activities must be completed and reported within agreed timeframes.
- d. All activities must be done in accordance with applicable systems documentation, plans and workplace procedures.
- e. Design is to be in accordance with appropriate Standards, the AS and VM documents, the project documentation, and job specifications.

4 Range

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

Outcomes and performance criteria**Outcome 1**

Prepare to design fixed fire protection systems.

Performance criteria

- 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 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 sprinkler protection, 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.

Performance criteria

- 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.

Performance criteria

- 3.1 Drawings and project design for the installation of systems are prepared.
- 3.2 Assumptions and decisions are recorded in specifications.

Replacement information	This unit standard replaced unit standard 9381 and unit standard 9382.
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Planned review date	31 December 2029
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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	31 December 2026
Review	3	27 June 2024	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>.

Comments on this unit standard

Please contact the Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.