

Title	Design fire detection and alarm systems		
Level	5	Credits	20

Purpose	<p>This unit standard is for the training of fire alarm technicians and covers the design of fire detection and alarm systems, using both conventional and addressable devices.</p> <p>People credited with this unit standard are able to: prepare to design fire detection and alarm systems; design fire detection and alarm systems; and prepare drawings and project design for the installation of fire detection and alarm systems.</p>
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Classification	Mechanical Engineering > Fire Detection and Alarm Systems
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Available grade	Achieved
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Guidance Information

- Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the:

Building Act 2004,
 Ministry of Business, Innovation and Employment (MBIE) *Acceptable Solutions (AS) and Verification Methods (VM)*,
 New Zealand Building Code,
 AS/NZS 3000:2018, *Electrical Installations* (known as the Australian/New Zealand Wiring Rules),
 NZS 4512:2021, *Fire Detection and Alarm Systems in Buildings*.
 Available at <https://www.standards.govt.nz/>
 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.
- Definitions

Ancillary services refer to ventilating systems, emergency lighting, lift control, or other building services.

Design brief refers to notes and/or sketches that record the requirements of the system including the owner's functional requirements.

Environment may include but is not limited to weather, temperature, manufacturing processes, toxic/flammable atmosphere, and places of restraint, hospitals, and rest homes.

Equipment specifications refer to manufacturer's specifications for installation, operation, and performance of their equipment.

Fire detection and alarm system refers to an installation of apparatus, which performs specified fire related functions in response to the operation of a detector, manual call point, or other input. It includes – manual call points, detectors, control and indication equipment, alerting devices, interconnections, fittings, labels, energy sources, and remote signalling devices and may include emergency warning and intercommunication systems (EWIS) where applicable.

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

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. Evidence of compliance certification for the designed installations in accordance with NZS 4512:2021, section 107.1(e) is an acceptable method of assessment against this unit standard.
- b. All activities must be done in accordance with applicable standards, project documentation, and workplace procedures.

4 Range

For assessment purposes, competence must be demonstrated on at least three systems of which at least one uses addressable devices and one each of type 2, 3, and 4 systems as specified in NZS 4512:2021.

5 Recommended skills and knowledge

Unit 23266, *Demonstrate knowledge of fire detection and alarm system design*, or demonstrate equivalent knowledge and skills.

Outcomes and performance criteria

Outcome 1

Prepare to design fire detection and alarm systems.

Performance criteria

- 1.1 Design project scopes are established from project documentation.
- 1.2 Applicable standards and codes are identified from project documentation.
- 1.3 Environment for fire detection and alarm systems is established from project documentation.

Outcome 2

Design fire detection and alarm systems.

Range design is to be in accordance with NZS 4512:2021, AS/NZS 3000:2018, the AS and VM documents, the project documentation.

Performance criteria

- 2.1 Zones and sectors are determined.
- 2.2 Types, locations, positions, spacing, coverage, and quantity of call points and detectors are determined.
- 2.3 Types, locations, positions, and quantity of indicators, alerting devices (audible and/or Visual), and remote signalling equipment are determined.
- 2.4 Ancillary services interface requirements are determined.
- 2.5 Types and locations of control and indicating equipment are determined.
- 2.6 Ratings for power supplies and batteries and chargers are calculated and suitable equipment is selected.
- 2.7 Cabling systems are designed and cables are selected.
- 2.8 Zone indexes are designed using standard symbols.
- 2.9 Amplifier ratings are calculated.

Outcome 3

Prepare drawings and project design for the installation of fire detection and alarm systems.

Performance criteria

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

Replacement information	This unit standard and unit standard 23266 replaced unit standard 9398, unit standard 10924, and unit standard 17724.
Planned review date	31 December 2029

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 October 2006	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

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.