Title	**Demonstrate knowledge of fire detection and alarm system components and installation practices**		
Level	**3**	**Credits**	**9**

Purpose	This unit standard is for the training of fire alarm technicians and covers the knowledge of fire detection and alarm system components, their principles of operation, installation practices, wiring and cabling principles, ducting and cable securing/supports, electrostatic discharge (ESD) and precautions. People credited with this unit standard are able to demonstrate knowledge of: • principle of operation of major components of fire detection and alarm systems; • component symbols and fire detection and alarm system drawings; • cabling systems used in fire detection and alarm system installation practices; • fasteners commonly used in the installation of fire detection and alarm system components; • fire alarm and detection system component and cable installation practices; • electrostatic discharge (ESD).

Classification	Mechanical Engineering > Fire Detection and Alarm Systems

Available grade	Achieved

Guidance Information

1 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),
AS/NZS 3013:2005, *Electrical Installations – classification of the fire and mechanical performance of wiring system elements,*
NZS 4512:2021, *Fire Detection and Alarm Systems in Buildings,*
SAA HB 20:1996, *Graphical symbols for fire protection drawings.*
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.

2 Definitions

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.

Industry practice refers to the safe and sound trade practice generally accepted by competent persons within the fire protection industry.

Standards refer to NZS 4512:2021 and AS/NZS 3000:2018.

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. Knowledge of all systems defined by NZS 4512:2021 must be demonstrated.
b. All activities must be done in accordance with applicable standards, equipment specifications, systems documentation, industry practice, and workplace procedures.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of principle of operation of major components of fire detection and alarm systems.

Range may include but is not limited to – manual call points, alerting devices, detection devices, delay timers, isolation switches, control units, power supplies, remote signalling devices, input devices.

Performance criteria

1.1 The purpose of each major component is described.

1.2 The principles of operation of the major components of fire detection and alarm systems are described.

1.3 The locations and positions of detectors are described.

Range may include but is not limited to – heat, point-type smoke, beam-type, line-type, aspirating, fire alarm panel.

1.4 The locations and positions of fire alarm panels are described.

1.5 The purpose of marking and labelling components, sub-assemblies, terminals, and controls is described.

Outcome 2

Demonstrate knowledge of component symbols and fire detection and alarm system drawings.

Range may include but is not limited to – manual call points, alerting devices, detection devices, delay timers, isolation switches, control units, power supplies, remote signalling devices, input devices, fire alarm panels.

Performance criteria

2.1 The drawing symbols of major components are identified.

2.2 Layout of fire detection and alarm systems, schematic diagrams, and interconnection drawings are interpreted.

Outcome 3

Demonstrate knowledge of cabling systems used in fire detection and alarm system installation practices.

Performance criteria

3.1 Types of cables used in the fire detection and alarm systems and associated interfaces are described in terms of their type and uses in accordance with the standard and equipment specifications.

3.2 Types of cable support systems used in fire detection and alarm system installations and associated interfaces are described in accordance with equipment specifications and industry practice.

Range typical support systems may include but are not limited to – trunking, conduit, catenary wires, cable trays.

3.4 Cable termination methods are described in accordance with equipment specifications, industry practice and standards.

Outcome 4

Demonstrate knowledge of fasteners commonly used in the installation of fire detection and alarm system components.

Range fasteners may include but are not limited to – screws and bolts including various types of heads and self-tapping screws; different types of nuts including locking nuts; plain, spring, and serrated washers; various types of pins including cotter pins; circlips; masonry anchors; adhesives.

Performance criteria

4.1 Fasteners are visually identified from given physical samples or pictorial representations.

4.2 Uses of fasteners are outlined with reference to fire detection and alarm system installation, applications and equipment specifications.

4.3 The principles of bolted joints are outlined with reference to forces and locking mechanisms.

Outcome 5

Demonstrate knowledge of fire alarm and detection system component and cable installation practices.

Performance criteria

5.1 Installation practices for fire detection and alarm system components, cable support systems, and interfaces are described.

Range components may include but are not limited to – control equipment including power supplies, detectors, manual call points, alerting devices, zone control and indicating units;
cable support systems may include but are not limited to – trunking, conduit, catenary wires, cable trays.

Outcome 6

Demonstrate knowledge of electrostatic discharge (ESD).

Performance criteria

6.1 ESD and causes of ESD are described.

6.2 The effects of ESD on electronic circuits and fire alarm control equipment are explained.

6.3 The precautions required and methods of prevention of ESD damage to fire alarm control equipment are described.

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	15 October 2015	31 December 2026
Review	2	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.