Title	**Demonstrate knowledge of fire sprinkler systems and installation practices**		
Level	**3**	**Credits**	**10**

Purpose	This unit standard is for personnel employed in the fire protection industry and covers the knowledge of operating principles of fire sprinkler systems and installation practices. People credited with this unit standard are able to demonstrate knowledge of: • fire sprinkler systems; • system components used for fire sprinkler systems; • pipe-work installation procedures and requirements for fire sprinkler systems.

Classification	Mechanical Engineering > Fixed Fire Protection 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,
Building (Forms) Regulations 2004,
Ministry of Business, Innovation and Employment (MBIE) *Acceptable Solutions (AS) and Verification Methods (VM)*,
MBIE New Zealand Building Code Handbook,
NZS 4515:2009, *Fire sprinkler systems for residential occupancies*
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
Fire Protection Equipment Register refers to the sprinkler equipment register maintained by the Sprinkler System Certifier (SSC). Only equipment which the SSC considers satisfy the criteria, as set out in NZS 4541:2020, shall be listed.
Systems documentation refers to the documentation required to be maintained by NZS 4541:2020, including logbooks, test reports, equipment details and drawings, specifications, additions and alterations, contract agreement, fire reports, building consents, standards, codes of practice, 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. Use of standards listed in the references by candidates during assessment is encouraged.
   b. All activities must be done in accordance with applicable aspects of NZS 4541:2020, NZS 4515:2009, and applicable manufacturer's instructions, systems documentation, and workplace procedures.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of fire sprinkler systems.

Performance criteria

1.1 The principles of operation of fire sprinkler systems are explained.

Range wet pipe, dry pipe, anti-freeze system.

1.2 Commissioning procedures for a typical fire sprinkler system are outlined with reference to system documentation.

Range wet pipe, dry pipe, anti-freeze system.

1.3 The New Zealand building legislation and compliance system relevant to fire sprinkler system installations are outlined.

1.4 Certification procedures applicable to fire sprinkler systems are identified.

Outcome 2

Demonstrate knowledge of system components used for fire sprinkler systems.

Performance criteria

2.1 Components of a fire sprinkler system are identified, and their uses and limitations are explained.

Range may include – pressure, temperature, atmospheric and environmental factors.

2.2 Types of sprinkler heads and sprayers are described in terms of their means of operation, spray pattern, and selection criteria.

2.3 Storage, handling, and installation precautions for sprinkler heads are described.

2.4 Storage, handling, and installation precautions for other components are described.

Range may include but is not limited to – valves, signal generating devices, pressure switches, flow switches, dry drops, flexible droppers, pressure gauges, flange and coupling types.

2.5 Location criteria and installation practices for sprinkler heads are identified and described in terms of systems documentation.

2.6 Valves and their associated fittings are identified and described in terms of the types of systems in which they are used and systems documentation.

Range may include but is not limited to – butterfly valves, pressure relief valves, pressure reducing valves, back flow prevention devices, gate valves, float control valves, deluge valves, pre-action valves.

2.7 Alarm devices used in fire sprinkler systems are identified, and are explained in terms of their principles of operation.

Range type x and type y pressure switches, flow switches, enhanced safety valve sets, residential valve sets, water motor alarms.

2.8 Approval and listing requirements for fire sprinkler components are identified and described with reference to the Fire Protection Equipment Register maintained by the SSC.

Outcome 3

Demonstrate knowledge of pipe-work installation procedures and requirements for fire sprinkler systems.

Performance criteria

3.1 Pipe selection and jointing options applicable to various sprinkler systems are described.

Range jointing options for steel pipes include but are not limited to – threaded (including wet and dry jointing compounds), rolled groove, flange, slip-on joints, mechanical jointing, clamp-on fittings; jointing options for plastic pipes include but are not limited to – glue, fusion weld, slip-on joints.

3.2 Fittings, fixtures, and supports matching the size and type of pipes used for systems are identified and their use in terms of their placement within the systems is explained.

Range pipe fittings include but are not limited to – threaded, rolled groove, flange, glue, fusion weld, slip-on joints;
pipe supports include but are not limited to – hanging, bracing (2-way and 4-way), fixing, fasteners, clips, structures, spacing, flexible droppers, wall brackets.

3.3 Plant and equipment used for pipe jointing are described in terms of use, care, set-up requirements, and procedures for use.

Range includes but is not limited to – threading machine, roll-grooving machine, drop saw, cut-off wheels, hole saws, pipe reamers.

3.4 Proprietary jointing systems are described.

Range includes but is not limited to – roll groove couplings, slip joints, fusion welding, solvent based jointing.

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	31 December 2000	31 December 2017
Revision	2	17 May 2001	31 December 2017
Review	3	26 March 2007	31 December 2017
Revision	4	23 April 2008	31 December 2017
Review	5	15 October 2015	31 December 2026
Review	6	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.