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| Title | Demonstrate knowledge of installing, supporting, and maintaining water supply pipework in buildings | | |
| Level | 4 | Credits | 7 |

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| Purpose | <p>This unit standard is for people who work in the plumbing industry.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – describe factors and methods for determining water supply requirements in buildings; – demonstrate knowledge of installing and supporting water supply pipework in buildings; – demonstrate knowledge of the maintenance and repair of water supply pipework in buildings; and – demonstrate knowledge of regulatory requirements, selection of methods and materials, and underpinning concepts and principles, as applied to the installation, supporting, and maintenance of water supply pipework in buildings. |
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| Classification | Plumbing, Gasfitting and Drainlaying > Plumbing |
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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;
 - Health and Safety at Work Act 2015;
 - Plumbers, Gasfitters, and Drainlayers Act 2006;
 - Plumbers, Gasfitters, and Drainlayers Regulations 2010;
 - Resource Management Act 1991;
 - Water Services Act 2021.

The following standards, which are available at <http://www.standards.govt.nz>:

- AS/NZS 3500.1:2021 *Plumbing and drainage, Part 1: Water services*,
- AS/NZS 3500.4:2021 *Plumbing and drainage, Part 4: Heated water services*,
- NZS 3604:2011 *Timber-framed buildings*.

The following guides, which are available at <http://www.worksafe.govt.nz>:

- Excavation Safety – Good practice Guidelines*,
- Underground services – Guide for safety with underground services*.

The following Building Code clauses, and any related Acceptable Solution and Verification Method documents, which are available at <https://www.building.govt.nz/>:
New Zealand Building Code Clause B1 Structure,
New Zealand Building Code Clause B2 Durability,
New Zealand Building Code Clause C Protection From Fire,
New Zealand Building Code Clause E2 External Moisture,
New Zealand Building Code Clause G10 Piped Services,
New Zealand Building Code Clause G12 Water Supplies,
New Zealand Building Code Clause H1 Energy Efficiency.

Any new, amended or replacement referenced standards, codes of practice, guidelines, Building Code Acceptable Solutions and Verification Methods, or authority requirements affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

2 Definitions

Job requirements refer to specific requirements of the job at hand not covered by job specifications.

Job specifications refer to instructions (oral, written, graphic) and may include any of the following – manufacturer instructions; design drawing detail specifications; specifications from a specialist source such as an architect, designer, engineer, or a supervisor; and site or work specific requirements.

Maintenance may refer to all or any of – repair, upgrade, alteration, removal.

Water supply pipework refers to pipe, fittings and associated valves and components used or intended to be used for the reticulation of water to sanitary fixtures, sanitary appliances and fittings within a building.

3 Candidates must hold a current limited certificate trainee authorisation or exemption under supervision as issued under the Plumbers, Gasfitters, and Drainlayers Act 2006.

4 Assessment information

For assessment, where skills are the same across different materials, it is not necessary to demonstrate knowledge of the skill in respect of each of those different materials.

5 This unit standard applies to the installation of water supply pipework above and below the ground but does not apply to the installation of water mains under control of a network utility operator.

Outcomes and performance criteria

Outcome 1

Describe factors and methods for determining water supply requirements in buildings.

Performance criteria

- 1.1 Describe the factors that need to be considered when determining pipe size requirements.
- Range factors may include but are not limited to– quality of water, material selection (including internal diameter and friction loss), loading units, minimum pressure, minimum flow rates, probable simultaneous flow rates.
- 1.2 Describe a method of sizing domestic water supply pipework.
- Range may include but is not limited to – method outlined in AS/NZS 3500.1 Appendix D.

Outcome 2

Demonstrate knowledge of installing and supporting water supply pipework in buildings.

Performance criteria

- 2.1 Describe methods of determining materials required for water supply pipework installations in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.
- Range methods may include but are not limited to – take offs from plans and specifications, schedule of quantities.
- 2.2 Describe methods and fittings used for jointing water supply pipework including pipes of different materials in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.
- Range materials may include but are not limited to – copper, brass, polybutylene, polyethylene, cross-linked polyethylene, uPVC, stainless steel;
evidence is required for three different materials;
jointing methods may include but are not limited to – brazing/capillary, compression, crimp, crox, flange, fusion weld, solvent weld, press fit, push fit, screwed thread, sliding sleeve;
evidence is required for a minimum of three different methods.
- 2.3 Describe soundness tests appropriate to water supply pipework installations in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.

- 2.4 Describe requirements and methods of protecting water supply pipework against physical damage in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.
- Range protection is for – corrosion and erosion, ultra-violet light, expansion, contraction, vibration and impact, seismic activity, freezing, heating, abrasion resistance, environmental factors.
- 2.5 Describe requirements and methods for protecting the building structure from damage when installing pipework in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.
- Range protection from – condensation on pipework, penetrations through structural elements, insulation of pipework.
- 2.6 Explain requirements and methods to identify pipework by label and/or colour in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.
- 2.7 Explain requirements and methods to support and thermally insulate water supply pipework in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.
- 2.8 Describe post installation commissioning processes in accordance with job specifications, relevant codes and standards, and the requirements of the Building Act 2004.

Outcome 3

Demonstrate knowledge of the maintenance and repair of water supply pipework in buildings.

Performance criteria

- 3.1 Explain methods and processes for ongoing maintenance of water supply pipework systems in accordance with maintenance requirements, job specifications, and relevant standards and codes.
- 3.2 Explain methods and processes to assess installed water supply pipework to identify the causes of faults in accordance with maintenance requirements, job specifications, and relevant standards and codes.
- 3.3 Explain methods and processes to rectify faults in accordance with maintenance requirements, job specifications, and relevant standards and codes.
- 3.4 Describe post maintenance commissioning processes in accordance with maintenance requirements, job specifications, and relevant standards and codes.

Outcome 4

Demonstrate knowledge of regulatory requirements, selection of methods and materials, and underpinning concepts and principles, as applied to the installation, supporting, and maintenance of water supply pipework in buildings.

Performance criteria

4.1 Describe the application of relevant sections of legislation, standards, and codes to the installation, supporting, and maintenance of water supply pipework in buildings.

4.2 Justify the selection of methods and materials.

Range job specifications, operation of the installed system and components, suitability and durability of materials, location of pipework.

4.3 Explain the application of underpinning concepts and principles to the installation, supporting, and maintenance of water supply pipework in buildings.

Range includes but is not limited to – capillary attraction, corrosion, electrical earthing and bonding, expansion and contraction, freezing, friction, hydrostatics and hydraulics, pH, properties of metals, relative density, siphon, water hardness and softness, condensation, thermal insulation.

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| Replacement information | This unit standard and unit standard 30606 replaced unit standard 2143. |
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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 | 26 October 2017 | 31 December 2028 |
| Review | 2 | 30 May 2024 | N/A |

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| Consent and Moderation Requirements (CMR) reference | 0003 |
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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 Waihangā Ara Rau Construction and Infrastructure Workforce Development Council qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.