

Title	Describe water supply mains materials and fittings, and causes and prevention of pipe failure		
Level	3	Credits	6

Purpose	People credited with this unit standard are able to describe: the materials and features of standard classes of water supply pipes, joints and flanges; the selection criteria, use, and manufacturer's specifications of fittings, for a water main; and causes of failure, and methods of prevention of failure, of water supply pipes.
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Classification	Water Industry > Water Reticulation
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Available grade	Achieved
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Guidance Information

- Legislation and references relevant to this unit standard include: Health and Safety at Work Act 2015, and subsequent amendments;
WSAA 109-2011 Industry Standard for Flange Gaskets and O-rings Appendix D – Flange jointing procedure, available from Water Services Association of Australia: <https://www.wsaa.asn.au/shop/product/7371>;
Technical Note PP 811-TN PE Flange Connections, available from <http://www.performancepipe.com/en-us/Documents/PP811-TN%20PE%20Flange%20Adapters.PDF>.
- Definitions
Organisational procedures – instructions to staff, and procedures which are documented in memo or manual format and are available in the workplace. These requirements include but are not limited to – site specific requirements, manufacturers' specifications, product quality specifications, and legislative or regulatory requirements.
Water supply pipe factors include pipe material, pipe type, or pipe condition.

Outcomes and performance criteria

Outcome 1

Describe the materials and features of standard classes of water supply pipes, joints and flanges.

Performance criteria

- 1.1 Standard classes of water supply pipes are described in terms of their materials and pipeline features.
- Range materials – cast and ductile iron, steel, asbestos cement, polyethylene, PVC;
pipeline features – pressure class, materials, outside diameters, internal diameters, wall thickness.
- 1.2 Jointing is described in terms of the techniques for cutting and chamfering of specified types.
- Range non-restrained and restrained compression joints, rubber ring joints, electrofusion joints and butt welds (polyethylene), welded joints (steel), solvent cement (PVC) joints.
- 1.3 Flanges are described in terms of their pressure ratings, sizes, and classes.
- 1.4 The reasons for, requirements, and techniques for pressure testing are described in accordance with manufacturer's specifications.

Outcome 2

Describe the selection criteria, use, and manufacturer's specifications of fittings for water mains.

Range isolation valves, tees, bends, fire hydrants, special purpose valves, pressure reducing valves, air valves.

Performance criteria

- 2.1 Fittings are described in terms of their selection criteria for differing pipe types, diameters, and pressure ratings.
- 2.2 Fittings are described in terms of their use and manufacturer's specifications.
- Range specifications include but are not limited to – materials of construction, type and class, pressure rating, installation, anchor block requirements.

Outcome 3

Describe causes of failure, and methods of prevention of failure, of water supply pipes.

Performance criteria

- 3.1 The causes of water supply pipe failure are described in terms of their potential impact on pipelines.
- Range internal factors; external factors; water supply pipe factors.

3.2 Methods of prevention of failure of water supply pipes are described for external factors, internal factors, and water supply pipe factors.

Range quality of workmanship, corrosion prevention, material selection, compatibility of materials, loading.

Replacement information	This unit standard, unit standard 19209, unit standard 22097, unit standard 22100, unit standard 24922, and unit standard 27330 were replaced by unit standard 31449.
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This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 May 2002	31 December 2018
Review	2	26 April 2005	31 December 2018
Review	3	19 September 2008	31 December 2018
Review	4	16 March 2017	31 December 2021
Review	5	27 September 2018	31 December 2021

Consent and Moderation Requirements (CMR) reference	0101
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.