

Title	Design water services for sanitary plumbing systems and explain less common systems		
Level	5	Credits	20

Purpose	People credited with this unit standard will be able to: <ul style="list-style-type: none"> – design water services for sanitary plumbing systems; and – explain less common water services for sanitary plumbing systems.
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Classification	Plumbing, Gasfitting and Drainlaying > Plumbing
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Available grade	Achieved
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Guidance Information

- 1 This unit standard builds upon the pre-existing knowledge and skills held by a tradesman plumber. It reflects part of the increased knowledge and skill set that is required to become recognised as a certifying plumber. The competencies expected of a tradesman plumber have already been demonstrated and reassessment is not required.

- 2 References
 Building Act 2004;
 New Zealand Building Code;
 Construction Contracts Act 2002;
 Health Act 1956;
 Health and Safety at Work Act 2015;
 Plumbers, Gasfitters, and Drainlayers Act 2006;
 Plumbers, Gasfitters and Drainlayers Board (Plumbing Registration and Licensing) Notice 2016;
 Resource Management Act 1991;
 The following standards, which are available at <http://www.standards.govt.nz>:
 AS/NZS 3500.1:2018 *Plumbing and drainage – Part 1: Water services*;
 AS/NZS 3500.2:2018 *Plumbing and drainage – Part 2: Sanitary plumbing and drainage*;
 AS/NZS 3500.4:2018 *Plumbing and drainage – Part 4: Heated water services*;
 NZS 3604:2011 *Timber-framed buildings*;
 NZS 4219:2009 *Seismic performance of engineering systems in buildings*;
 The following guides, which are available at <http://www.worksafe.govt.nz>:
Health and Safety by Design: 2018;
 and all subsequent amendments and replacements.

- 3 Definition
Drawings – plans and schematics. Plans must be to scale, be drawn on the relevant architectural background, and include a legend and all pipe types (hot water, cold

water, gas, etc.). It is expected that drawing instruments, Computer Aided Design (CAD), or Building Information Modelling (BIM) software are used for drawing.

4 Assessment

Assessments requiring application or demonstration of skills and knowledge may be performed using workplace evidence or evidence derived from simulation or scenario-based activities.

Includes application of trade calculations and science. Trade calculations and science may be demonstrated through the use of graphs, tables, software tools, or online or other electronic resources.

5 All tasks must be carried out in accordance with:

Building Act 2004;

Health and Safety at Work Act 2015;

New Zealand Building Code; and

any other relevant legislation, regulations, codes, or standards as applicable to plumbing.

Outcomes and performance criteria

Outcome 1

Design water services for sanitary plumbing systems.

Range systems include but are not limited to – hot water reticulation system, cold water reticulation system, water storage system, hot water heating system; one system must be for a multilevel building; one system must include a pump which is an integral part of the system; includes a minimum of two pipe materials across the systems.

Performance criteria

1.1 Calculate pipe sizes for the systems with consideration of pressures, flow rates and loading units.

1.2 Determine the type, number, and position of backflow prevention measures for the systems.

Range backflow prevention devices may include but are not limited to – atmospheric vacuum break (AVB), pressure vacuum breaker (PVB), spill proof vacuum breaker (SPVB), registered air gap, double detector check, double check valve (Dual check), hose connection vacuum breaker, reduced pressure zone device, vacuum break, vented dual check.

1.3 Determine the layout of the pipework for the systems.

1.4 Specify the materials for the systems.

1.5 Analyse potential adverse effects of the designs on structure and adjust designs to mitigate these effects.

Range may include but is not limited to – structural integrity, weather tightness, seismic, fire rating, internal water damage, positioning of system in relation to other services.

1.6 Assess the potential for risks resulting from the designs in the installation stage.

Range risks may include but are not limited to – risks to installers, risks to other on-site personnel, and risks to the public.

1.7 Prepare the drawings and specifications to document designs.

Outcome 2

Explain less common water services for sanitary plumbing systems.

Range may include – rainwater harvesting system, solar water heating system, domestic fire sprinkler system, alternative water supplies; evidence of one is required.

Performance criteria

2.1 Explain less common water services for sanitary plumbing systems in terms of their design considerations.

Planned review date	31 December 2024
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 March 2020	N/A

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 The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.