

Title	Design foul water drainage systems		
Level	5	Credits	8

Purpose	People credited with this unit standard will be able to design foul water drainage systems.
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Classification	Plumbing, Gasfitting and Drainlaying > Drainlaying
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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 drainlayer. It reflects part of the increased knowledge and skill set that is required to become recognised as a certifying drainlayer. The competencies expected of a tradesman drainlayer 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 (Drainlaying Registration and Licensing) Notice 2016;
 Resource Management Act 1991;
 The following standards, which are available at <http://www.standards.govt.nz>:
 AS/NZS 1546.1:2008 *On-site domestic wastewater treatment units – Septic tanks*;
 AS/NZS 1547:2000 *On-site domestic wastewater management*;
 AS/NZS 3500.2:2018 *Plumbing and drainage – Part 2: Sanitary plumbing and drainage*;
 The following guides, which are available at <http://www.worksafe.govt.nz>:
Excavation Safety: 2016;
Guide for Safety with Underground Services: 2002;
Health and Safety by Design: 2018;
 and all subsequent amendments and replacements.

- 3 Definitions
Drawings – plans and long sections. Plans must be to scale, be drawn on the relevant site plan, and include a legend. Drawings must include all necessary invert levels, access point levels, and depths. It is expected that drawing instruments, Computer Aided Design (CAD), or Building Information Modelling (BIM) software are used for drawing.

Foul water – any contaminated or non-potable water, as defined in AS/NZS 3500.0:2003 *Plumbing and Drainage – Part 0: Glossary of terms*.

Job requirements – position of building connection points, position of outfall connection points, invert levels, surface levels, depth of cover, and positioning of other services.

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 drainlaying.

6 Range

Includes a minimum of two systems;

includes one system of – trade waste system or on-site effluent disposal and wastewater treatment system;

one system must be for a single residential building;

one system must be for a multi-residential or commercial building;

one system must include a pump which is an integral part of the system.

Outcomes and performance criteria

Outcome 1

Design foul water drainage systems.

Performance criteria

1.1 Calculate pipe sizes and gradients for the systems with consideration of discharge units.

1.2 Determine the type, number, and position of system components with consideration of job requirements.

Range may include but is not limited to – access points, vents, gully traps, septic tanks.

1.3 Determine the layout of the pipework for the systems with consideration of job requirements.

1.4 Specify the materials for the systems.

1.5 Analyse potential adverse effects of the designs on structures and sites, and adjust designs to mitigate these effects.

Range may include but is not limited to – structural integrity, excavations, ground stability, soil types, site safety, 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.

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.