

Title	Demonstrate knowledge of installation, commissioning, and maintenance of on-site wastewater treatment systems		
Level	4	Credits	12

Purpose	<p>This unit standard is for people who work, or intend to work, in the drainlaying industry.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – demonstrate knowledge of concepts and principles underpinning the installation and maintenance of wastewater treatment systems; – demonstrate knowledge of installing and commissioning wastewater system components; – describe selection and installation of effluent disposal fields; – describe preventative and ongoing maintenance of wastewater treatment systems; and – describe maintenance of wastewater system components.
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Classification	Plumbing, Gasfitting and Drainlaying > Drainlaying
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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:
 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.

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 1547:2012 *On-site domestic wastewater management*;
 AS/NZS 3500.2:2021 *Plumbing and drainage, Part 2: Sanitary plumbing and drainage*.

The following guides, which are available at <http://www.worksafe.govt.nz/worksafe>:
Good practice guidelines – Excavation safety, Wellington: WorkSafe New Zealand, 2016;
Guide for Safety with Underground Services, Wellington: Department of Labour, 2002.

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 E1 Surface Water;
New Zealand Building Code Clause G13 Foul Water.

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 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 refers to all or any of – repair, upgrade, alteration, removal.

Wastewater treatment system refers to single stage septic tanks and proprietary multi-stage septic tanks; distribution chambers; pumps, filters, and controls; effluent disposal fields.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of concepts and principles underpinning the installation and maintenance of wastewater treatment systems.

Performance criteria

- 1.1 Describe relevant sections of legislation, standards, and codes in terms of their application to the installation of on-site wastewater treatment systems.
- 1.2 Describe particular health and safety requirements when installing and maintaining wastewater treatment and disposal systems, and appropriate management strategies.
 - Range may include – confined spaces, gaseous environments, infectious substances, onsite installation, lifting/handling.
- 1.3 Explain underpinning concepts and principles in terms of their application to the installation and maintenance of septic tanks.
 - Range sedimentation, bacterial action.
- 1.4 Explain key principles relating to positioning and protection of septic tanks.
 - Range security/integrity of structure, soil characteristics, ground water table.
- 1.5 Describe safe processes for lifting septic tanks to avoid damage to tank and equipment and injury to people.

- 1.6 Explain underpinning differences in the operation, maintenance, and commissioning of propriety multi-stage septic tank systems compared to single stage systems.

Range may include but is not limited to – secondary treatment, pump maintenance, blower maintenance, filters, alarms, connection fittings.

- 1.7 Explain underpinning concepts and principles in terms of their application to the installation and maintenance of pumps and controls for non-potable water supply and disposal systems.

Range atmospheric pressure, corrosion, expansion and contraction, friction, hydraulics and hydrostatics, siphon, water valves.

- 1.8 Explain underpinning concepts and principles in terms of their application to the installation and maintenance of effluent disposal fields.

Range evaporation, soakage, soil properties, transpiration, dose loading methods.

Outcome 2

Demonstrate knowledge of installing and commissioning wastewater system components.

Performance criteria

- 2.1 Explain the importance of establishing correct line level and gradient to ensure correct operation of wastewater system.

- 2.2 Explain the purpose, operation, and location of septic tank related components.

Range access point, invert levels, benching, risers, cascades, lid and adjustment ring, filters, fresh air inlet.

- 2.3 Describe actions to prevent tank flotation in accordance with manufacturer's instructions and job specifications.

- 2.4 Describe the commissioning process of septic tank and/or wastewater treatment system and components in accordance with manufacturer's instructions and job specifications.

- 2.5 Describe how to identify appropriate pumps, filters, and controls for supply and disposal systems in accordance with job specifications.

Range pumps may include but are not limited to – reciprocating, rotary (centrifugal, gear).

- 2.6 Describe how to determine appropriate other fittings and components required for proper operation of pump systems.

- 2.7 Describe how to install pumps, filters, and controls for supply and disposal systems in accordance with job specifications.
- 2.8 Describe how to carry out installation and commission tests on pumps filters and controls in accordance with manufacturer's instructions and job specifications.

Outcome 3

Describe selection and installation of effluent disposal fields.

Range may include but is not limited to – drip lines, evapotranspiration bed, soakage trench, soakage pit, other approved systems.

Performance criteria

- 3.1 Describe how appropriateness of effluent disposal field is confirmed in accordance with job specifications.
- 3.2 Describe how to position an effluent disposal field in accordance with job specifications.
- 3.3 Describe how to install an effluent disposal field in accordance with job specifications.
- 3.4 Describe control methods for protection of an effluent disposal field.
- Range includes surface water run-off, stock control, vehicle access, fencing.
- 3.5 Describe how a distribution chamber is installed in accordance with job specifications.
- 3.6 Describe the content and importance of hand-over briefing to customer on completion of installation.
- Range may include but is not limited to – impact of inappropriate discharges to tank, operation of mechanical components, operational requirements.

Outcome 4

Describe preventative and ongoing maintenance of wastewater treatment systems.

Performance criteria

- 4.1 Describe preventative and ongoing maintenance requirements and processes for single stage septic tank systems.
- 4.2 Describe preventative and ongoing maintenance requirements and processes for propriety multi stage septic tank systems.

- 4.3 Describe preventative and ongoing maintenance requirements and processes for pumps.
- 4.4 Describe preventative and ongoing maintenance requirements and processes for disposal fields.

Outcome 5

Describe maintenance of wastewater system components.

Performance criteria

- 5.1 Describe how to identify faults in terms of causes and means of rectification.
- 5.2 Describe how to rectify faults in accordance with maintenance requirements and job specifications.

Replacement information	This unit standard and unit standard 30539 replaced unit standard 1112, unit standard 21904, unit standard 21946, unit standard 23846, and unit standard 27335.
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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	28 September 2017	31 December 2028
Review	2	30 May 2024	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 Waihangara Ara Rau Construction and Infrastructure Workforce Development Council qualifications@waihangaararau.nz if you wish to suggest changes to the content of this unit standard.