Title	**Demonstrate knowledge of drainage for infrastructure works**		
Level	**4**	**Credits**	**15**

Purpose	People credited with this unit standard are able to demonstrate knowledge of subsoil drainage systems and piped culvert drainage systems.

Classification	Infrastructure Works > Generic Infrastructure Works

Available grade	Achieved

Guidance Information

1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with relevant legislative and industry requirements.

2 Legislation and references relevant to this unit standard include:
- Health and Safety at Work Act 2015;
- AS/NZS 1254:2010 *PVC-U pipes and fittings for stormwater and surface water applications;*
- AS/NZS 1260:2009 *PVC-U pipes and fittings for drain, waste and vent application*;
- AS/NZS 1462: series *Methods of test for plastics pipes and fittings*;
- AS/NZS 2033:2008 *Installation of polyethylene pipe systems;*
- AS/NZS 3725:2007 *Design for installation of buried concrete pipes*;
- AS/NZS 4058:2007 *Precast concrete pipes (pressure and non-pressure);*
- NZS 4406:1986 *Helical lock-seam corrugated steel pipes – Design and installation*; available from www.standards.co.nz;
  and all subsequent amendments and replacements.

3 Definition
Industry requirements refer to relevant policies, processes, methodologies, industry codes of practice, site specific health and safety plans, standard operating procedures, site safety plans, quality plans, work plans, traffic management plans, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer's requirements, contract specifications, manuals, procedural documents.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of subsoil drainage systems.

Performance criteria

1.1 Causes of excessive subgrade moisture are identified.

1.2 Means of minimising load on pipes are identified.

1.3 Types and sizes of subsoil drain are identified and matched to applications.

Range applications include – control of ground water-table level, intercept seepage between clay and rock layers, intercept seepage from other layers.

1.4 Location, frequency, and grade of subsoil drain outlets are identified, and means of preventing outlets from becoming submerged are described.

1.5 Types of subsoil drainage pipes are identified by the materials they are made of, and their perforation requirements are explained in accordance with the appropriate NZ Standard.

1.6 Subsoil drainage system components are identified and their applications for different soil types are specified.

1.7 Advantages of filter aggregates in subsoil drainage systems are identified.

Range evidence of at least two advantages is required.

1.8 Use of geotextiles in subsoil drainage systems is explained in accordance with technical instructions.

Outcome 2

Demonstrate knowledge of piped culvert drainage systems.

Performance criteria

2.1 Functions of culvert drainage systems are described.

Range systems include – stream culvert, water-table culvert.

2.2 Types of culvert systems are described and their application explained.

Range systems include – box, pipe, steel pipe, plastic ribbed;
evidence of two culvert systems is required.

2.3 Drainage system components are described and their functions explained.

Range components include – inlets and outlets, angled inlets and outlets, head walls, wing walls, drop structures, stilling basins, debris controls;
evidence of three drainage system components is required.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 March 2011	31 December 2023
Review	2	19 February 2015	31 December 2023
Review	3	30 September 2021	N/A

Consent and Moderation Requirements (CMR) reference	0101

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Connexis - Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.