Title	**Demonstrate knowledge of civil infrastructure construction materials and testing devices**		
Level	**4**	**Credits**	**4**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of origins and applications of civil infrastructure construction materials; demonstrate knowledge of soil mechanics with regards to compaction; and describe civil infrastructure construction material testing devices.

Classification	Infrastructure Works > Infrastructure Civil 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 relevant to this unit standard include:
- Health and Safety at Work Act 2015;
- Resource Management Act 1999;
- TNZ B/02: 2005, *Specification for Construction of Unbound Granular Pavement Layers*;
- TNZ M/04: 2006, *Specification for Basecourse Aggregate*;
- TNZ F/01 *Specification for earthworks construction*;
- TNZ T/01 *Benkelman beam deflection measurements*; available from http://www.nzta.govt.nz/
- NZS 4402.1:1986 - *Methods of testing soils for civil engineering purposes - Preliminary and general*; available from http://www.standards.govt.nz/;
- and all subsequent amendments and replacements.

3 Definitions
CBR refers to California Bearing Ratio.
Construction materials refer to natural or manufactured clays, silts, sands gravels and exclude concrete.
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 and Waka Kotahi New Zealand Transport Agency specifications and guidelines.
MDD refers to maximum dry density.

OWC refers to optimum water content.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of origins and applications of civil infrastructure construction materials.

Performance criteria

1.1 Civil infrastructure construction materials are identified in terms of origin, and the use of local materials is explained in terms of criteria for suitability for civil construction projects.

1.2 Civil infrastructure construction materials are described in terms of differences in particle size, construction properties, and applications.

1.3 Particle size distribution is described in terms of the differences and applications of well graded, poorly graded, and gap graded construction materials.

Outcome 2

Demonstrate knowledge of soil mechanics with regards to compaction.

Performance criteria

2.1 Water content and dry density are explained in terms of how they relate to each other.

Range OWC, MDD, NZ standard compaction, NZ heavy compaction, NZ vibrating hammer compaction.

2.2 Density is explained in terms of the importance in civil infrastructure construction.

Range wet density, dry density, % compaction, total voids, specific gravity.

2.3 Field tests used to measure density in civil infrastructure construction are described in terms of underlying concepts.

Range nuclear density meters, plateau testing.

2.4 CBR is described in terms of methods to determine the strength of civil infrastructure construction materials.

Range inferred CBR – scala penetrometer, clegg hammer.

Outcome 3

Describe civil infrastructure construction material testing devices.

Performance criteria

3.1 Civil infrastructure construction material testing devices are described in terms of suitable materials for testing, methods of use, likely results, and the consequences of non-compliant results.

Range scala penetrometer, clegg hammer, Benkelman beam.

Replacement information	This unit standard replaced unit standard 25833.

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	27 September 2018	31 December 2023
Review	2	29 July 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.