

Title	Demonstrate knowledge of civil construction material compaction, soil mechanics, and testing devices		
Level	4	Credits	5

Purpose	People credited with this unit standard are able to: describe compaction of civil construction materials and reason for compaction; demonstrate knowledge of origins and applications of civil construction materials; demonstrate knowledge of basic soil mechanics with regards to compaction; and describe civil construction material testing devices.
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Classification	Infrastructure Works > Infrastructure Civil Works
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Available grade	Achieved
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Guidance Information

- 1 Applicable specifications:
 TNZ B/02: 2005, *Construction of Unbound Granular Pavement Layers*,
 TNZ B/05: 2008, *Specification for In-situ Stabilisation of Modified Pavement Layers*,
 TNZ M/04: 2006, *Specification for Basecourse Aggregate*; available at
<http://www.transit.govt.nz/technical/specifications.jsp>.
- 2 For the purpose of this unit standard civil construction materials exclude concrete.
- 3 Definitions
CBR means California Bearing Ratio.
MDD means maximum dry density.
OWC means optimum water content.

Outcomes and performance criteria

Outcome 1

Describe compaction of civil construction materials and reason for compaction.

Performance criteria

- 1.1 Compaction is described in terms of its effect on various materials.
 Range cohesive, granular, modified road construction materials.

1.2 Reasons for compaction are described in terms of contractual obligations.

Range actual performance of compacted material compared with contract specifications, implications of poor compaction (contractor reputation, remediation cost).

Outcome 2

Demonstrate knowledge of origins and applications of civil construction materials.

Range clays, silts, sands, gravels.

Performance criteria

2.1 Civil construction materials are identified in terms of origin.

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

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

Outcome 3

Demonstrate knowledge of basic soil mechanics with regards to compaction.

Performance criteria

3.1 Water content and dry density are explained in terms of their relationships.

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

3.2 Density is explained in terms of its importance in civil construction.

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

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

Range replacement tests, tube sampling, nuclear density meters, plateau testing.

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

Range laboratory CBR – soaked, natural;
inferred CBR – scala penetrometer, impact soil tester.

Outcome 4

Describe civil construction material testing devices.

Performance criteria

4.1 Civil construction material testing devices are described in terms of suitable materials for testing and likely results.

Range scala penetrometer, impact soil tester, handheld shear vane, nuclear density meter.

Replacement information	This unit standard was replaced by unit standard 31473.
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This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 June 2009	31 December 2016
Review	2	19 February 2015	31 December 2021
Review	3	27 September 2018	31 December 2021

Consent and Moderation Requirements (CMR) reference	0101
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.