

<b>Title</b>	<b>Demonstrate knowledge of curing methods for concrete construction</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	People credited with this unit standard are able to: identify the properties of hardened concrete; explain the curing process for concrete; and outline factors that affect the quality of concrete.
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<b>Classification</b>	Concrete > Concrete Technology
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<b>Available grade</b>	Achieved
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### Guidance Information

Legislation and publications relevant to this unit standard include:

Health and Safety in Employment Act 1992;

NZS 3109:1997 *Concrete construction*; NZS 3101 Parts 1 and 2:1995 *Concrete structures standard – The design of concrete structures*, available from Standards New Zealand

(<http://www.standards.co.nz>).

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### Outcomes and performance criteria

#### Outcome 1

Identify the properties of hardened concrete.

#### Performance criteria

1.1 The factors influencing the strength of concrete are identified in terms of water/cement ratio and degree of compaction.

Range factors include but are not limited to – age, curing.

1.2 The strength of concrete is described in terms of its different types.

Range types include but are not limited to – compressive strength, tensile strength, flexural strength, shear strength.

#### Outcome 2

Explain the curing process for concrete.

**Performance criteria**

- 2.1 The purpose of curing is explained in terms of the appropriate methods for particular conditions.
- Range conditions could include but are not limited to – moisture, temperature, differential shrinkage, frost expansion, temporary loads, design loads, differential expansion.
- 2.2 The requirements for the protection of concrete are explained in terms of hot and cold conditions.
- Range requirements include but are not limited to – retaining moisture, preventing excessive temperature differentials, reducing hardening time.
- 2.3 The factors which govern the striking times for formwork are explained in terms of concrete strength, treatment of the concrete surface and economics.
- 2.4 The purpose of accelerated curing is described in terms of established methods.
- Range established methods include but are not limited to – use of finer cement, chemical methods, thermal methods.
- 2.5 Requirements for avoiding cracking in large pours of concrete are identified in terms of high and low strength concrete.
- Range requirements include but are not limited to – concrete mix proportions, type of cementitious material, concrete placing temperature, ambient conditions, formwork and insulation.

**Outcome 3**

Outline factors that affect the quality of concrete.

**Performance criteria**

- 3.1 The terms modules of elasticity, creep, drying shrinkage, moisture movement and thermal movement are explained in terms of concrete production.
- 3.2 The factors affecting dimensional changes are explained in terms of their effects on quality.
- 3.3 The durability of concrete is explained in terms of the causes of deterioration.
- 3.4 Factors affecting the resistance of concrete to deterioration are identified in terms of abrasion, fire, frost, chemical attack, and carbonation.
- 3.5 The deleterious effects on concrete that can occur in sulphate-bearing ground and in a marine environment are described in terms of precautions taken to ensure good durability.

**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	23 May 2001	31 December 2023
Revision	2	16 July 2004	31 December 2023
Rollover and Revision	3	25 January 2008	31 December 2023
Rollover and Revision	4	17 November 2011	31 December 2023
Review	5	28 October 2021	31 December 2023

**Consent and Moderation Requirements (CMR) reference**

0048

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