Title	**Evaluate and troubleshoot non-destructive testing of hardened concrete in a civil engineering laboratory**		
Level	**5**	**Credits**	**10**

Purpose	People credited with this unit standard are able to, in a civil engineering laboratory: evaluate results of non-destructive tests of hardened concrete; and troubleshoot abnormal results and scenarios for non-destructive tests of hardened concrete.

Classification	Infrastructure Civil Engineering > Infrastructure Laboratory

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 applicable organisational and legislative requirements.

2 Applicable legislation, regulations, rules, standards and codes include but are not limited to: Health and Safety at Work Act 2015, Hazardous Substances and New Organisms Act 1996, and their associated regulations and subsequent amendments; ISO/IEC 17025:2018 *General requirements for the competence of testing and calibration laboratories*, available from https://www.iso.org/store.html; NZS 3112.2:1986 *Methods of test for concrete - Tests relating to the determination of strength of concrete,* NZS 3112.3:1986 *Methods of test for concrete - Tests on hardened concrete other than for strength;* NZS 3112.4:1986 *Methods of test for concrete - Tests relating to grout,* available from https://www.standards.govt.nz/.

3 Evidence is required for two non-destructive tests used in a civil engineering laboratory, which may include but are not limited to – rebound hammer, ultrasonic pulse velocity, electromagnetic covermeter, gamma radiography, internal fracture test.

4 Definitions
Evaluate refers to interpreting test results in terms of the relevant test method, client processes and the project. The evaluation must identify options for corrective action and the scientific basis for these corrective actions. Components will vary between tests and include but are not limited to – the evaluation of task performance, compliance with organisational and test method requirements, from sample and equipment preparation to the calculation and reporting of results.

Organisational requirements refer to instructions to staff on policy and procedures which are formally documented or generally accepted at the worksite. This may include legislation; industry standards and methods; national and international standards and methods; standard operating procedures; specifications; manuals; and manufacturer's information.
Problem-solving techniques may include but are not limited to – cause and effect diagrams, hypothesis testing, appreciative enquiry, process flowchart analysis.
Scenario refers to an actual situation with contributing factors; these factors may include environment, conditions, materials, circumstances, location, relevance, site, context, status, workplace.
Troubleshoot refers to identifying problems in test scenarios and results, and to applying a problem-solving technique suitable to the problem in terms of the relevant test method, client processes and project to reach a realistic solution.

5 It is recommended people hold Unit 28721, *Perform concrete tests in a civil engineering laboratory*, or demonstrate equivalent knowledge and skills before being assessed against this unit standard.

Outcomes and performance criteria

Outcome 1

Evaluate results of non-destructive tests of hardened concrete in a civil engineering laboratory.

Performance criteria

1.1 Results are evaluated for conformance.

Range may include but is not limited to – checking for correctness and completeness, validity, comparison to uncertainty, compliance with specifications and test method.

Outcome 2

Troubleshoot abnormal results and scenarios for non-destructive tests of hardened concrete in a civil engineering laboratory.

Performance criteria

2.1 Abnormal test results are troubleshot to identify the nature of the problem.

2.2 Problem-solving techniques are applied to reach a valid solution.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 January 2011	31 December 2016
Review	2	19 February 2015	31 December 2021
Review	3	23 January 2020	N/A
Rollover and Revision	4	24 October 2024	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 Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@WaihangaAraRau.nz if you wish to suggest changes to the content of this unit standard.