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| Title | Calibrate and maintain test equipment in a civil engineering laboratory | | |
| Level | 4 | Credits | 8 |

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| Purpose | People credited with this unit standard are able to, in a civil engineering laboratory: describe the procedures to operate test equipment; prepare test equipment for calibration; calibrate test equipment; report and document calibration results; and maintain test equipment. |
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| Classification | Infrastructure Civil Engineering > Infrastructure Laboratory |
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| Available grade | Achieved |
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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 the: 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 4402:1986 *Methods of testing soils for civil engineering purposes - Preliminary and general*, available from <https://www.standards.govt.nz/>; NZS 4407:2015 *Methods of sampling and testing road aggregates*, available from <https://standards.govt.nz>.
- 3 Evidence is required for test equipment in three categories from the following – equipment to measure mass, temperature, length, volume, pressure, force; and temperature-controlled cabinets, used in a civil engineering laboratory.
- 4 Definitions
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.
Reference standards refer to standardised objects or substances which are used as a measurement base for similar objects or substances.

Outcomes and performance criteria

Outcome 1

Describe the procedures to operate test equipment in a civil engineering laboratory.

Performance criteria

- 1.1 The calibration procedure is described.
- 1.2 The maintenance procedure is described.
- 1.3 The quality control checks are identified, and the type and cause of typical errors are described.

Outcome 2

Prepare test equipment for calibration in a civil engineering laboratory.

Performance criteria

- 2.1 The calibration procedure is selected.
- 2.2 Hazards are identified and personal protective equipment, safety equipment and procedures are used.
- 2.3 All measuring equipment is confirmed to meet the laboratory's specification requirements, and the calibration procedure is fully complied with.
- 2.4 Reference standards and measuring equipment are assembled, and test equipment is set up and adjusted as necessary.
- 2.5 Potential sources of measurement error are identified and minimised.

Outcome 3

Calibrate test equipment in a civil engineering laboratory.

Performance criteria

- 3.1 Individual tests are performed within acceptable variance to ensure repeatability of measurement.
- 3.2 Readings are confirmed as a result of a valid measurement and data is recorded.
- 3.3 Resulting test data is analysed.
 - Range includes but is not limited to – uncertainty of measurement, trends, inconsistencies, accuracy, precision, validity.

Outcome 4

Report and document calibration results in a civil engineering laboratory.

Performance criteria

- 4.1 Results of each calibration are recorded.
- 4.2 Calibration labels, equipment stickers, quality control tags and seals are attached where required.
- 4.3 Compliance or non-compliance with requirements of test specifications is reported and documented, and the next course of action is discussed with supervisor, manager or colleagues.

Outcome 5

Maintain test equipment in a civil engineering laboratory.

Performance criteria

- 5.1 Maintenance procedures and appropriate records are identified.
- 5.2 Equipment, facilities, reference standards and stocks of consumables are maintained.
- 5.3 Maintenance is planned and evaluated.
- 5.4 Equipment requiring maintenance is identified, documented and reported.

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| Planned review date | 31 December 2025 |
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Status information and last date for assessment for superseded versions

| Process | Version | Date | Last Date for Assessment |
|-----------------------|---------|-----------------|--------------------------|
| Registration | 1 | 21 January 2011 | 31 December 2021 |
| Review | 2 | 23 January 2020 | N/A |
| Rollover and Revision | 3 | 24 October 2024 | N/A |

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| 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>.

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.