

|              |  |                |          |
|--------------|--|----------------|----------|
| <b>Title</b> | <b>Calibrate and maintain test equipment in a civil engineering laboratory</b> |                |          |
| <b>Level</b> | <b>4</b>   | <b>Credits</b> | <b>8</b> |

|                |   |
|----------------|---|
| <b>Purpose</b> | 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; report and document calibration results; and maintain test equipment. |
|----------------|---|

|                       |  |
|-----------------------|--|
| <b>Classification</b> | Infrastructure Civil Engineering > Infrastructure Laboratory |
|-----------------------|--|

|                        |          |
|------------------------|----------|
| <b>Available grade</b> | 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 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>.
- 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.

|                            |                  |
|----------------------------|------------------|
| <b>Planned review date</b> | 31 December 2024 |
|----------------------------|------------------|

**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                      |

|  |      |
|--|------|
| <b>Consent and Moderation Requirements (CMR) reference</b> | 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](mailto:qualifications@connexis.org.nz) if you wish to suggest changes to the content of this unit standard.