Title	**Determine, evaluate, and report on precision and bias in proficiency data in a civil engineering laboratory**		
Level	**5**	**Credits**	**6**

Purpose	People credited with this unit standard are able to determine, evaluate, and report on precision and bias in proficiency data in a civil engineering laboratory.

Classification	Infrastructure Civil Engineering > Infrastructure Laboratory

Available grade	Achieved

Guidance Information

1 Applicable rules, standards, and codes include but are not limited to: ISO/IEC 17025:2018 *General requirements for the competence of testing and* calibration *laboratories*, ISO 5725-2:2019 *Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*, ISO 13528:2015 *Statistical methods for use in proficiency testing by interlaboratory comparison* available at https://www.iso.org/store.html; ASTM C802-14 *Standard practice for conducting an interlaboratory test program to determine the precision of test methods for construction materials*, ASTM D7372-17 *Standard guide for analysis and interpretation of proficiency test program results* ASTM E691-19 *Standard practice for conducting an interlaboratory study to determine the precision of a test method,* available at https://www.astm.org/.

2 Assessment against this unit standard must be based on evidence from workplace proficiency data.

3 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; customer/organisation developed methods; standard operating procedures; specifications; manuals; and manufacturer's information.
Proficiency data includes own laboratory's proficiency data in relation to other laboratories.

Outcomes and performance criteria

Outcome 1

Determine, evaluate, and report on precision and bias in proficiency data in a civil engineering laboratory.

Performance criteria

1.1 Analysis is carried out to determine precision and bias in accordance with organisational requirements.

Range may include but is not limited to – repeatability, reproducibility, assigned value, reference value, grand mean, mean.

1.2 Precision and bias is evaluated in terms of the accepted true value.

1.3 Own laboratory's performance is evaluated in relation to the outcomes of the proficiency data in accordance with organisational requirements.

Range includes but is not limited to – z-scores.

1.4 Own laboratory's performance is reported in accordance with organisational requirements.

Planned review date	31 December 2024

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 February 2015	31 December 2021
Review	2	23 January 2020	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 Connexis - Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.