

| | | | |
|--------------|--|----------------|-----------|
| Title | Demonstrate knowledge of measurement in surveying | | |
| Level | 4 | Credits | 14 |

| | |
|----------------|---|
| Purpose | People credited with this unit standard are able to demonstrate knowledge of: measurement systems in surveying; the xyz coordinate system in surveying; and types of vertical datum systems in surveying; explain the shape and curvature of the earth and its effect on survey measurement; and demonstrate knowledge of errors, tolerances and reductions in surveying. |
|----------------|---|

| | |
|-----------------------|-----------------------------|
| Classification | Surveying > Survey Practice |
|-----------------------|-----------------------------|

| | |
|------------------------|----------|
| 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 relevant legislative and industry requirements.
- 2 Legislation and references relevant to this unit standard include:
Health and Safety at Work Act 2015; and any subsequent amendments.
Surveyor-General's Rules published by Land Information New Zealand at <http://www.linz.govt.nz>;
Price, WF, and Uren, J, *Surveying for Engineers*, 5th ed. (UK: Red Globe Press, 2010), available at <http://www.fishpond.co.nz>.
- 3 Definitions
Industry requirements may refer to but are not limited to relevant company policies, processes, methodologies, industry codes of practice, standard operating procedures, site safety plans, quality plans, work plans, job instructions, and manufacturer's requirements.
SI refers to *Système international*, the International System of Units.
Xyz coordinate system (also known as Cartesian coordinate system in three dimensions) uses numbers to represent a point in three-dimensional space.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of measurement systems in surveying.

Performance criteria

- 1.1 Units of measurement used in surveying are converted in accordance with SI and imperial systems.

Range length, area, volume, angular.

Outcome 2

Demonstrate knowledge of the xyz coordinate system in surveying.

Performance criteria

- 2.1 Xyz coordinates are identified and their use in surveying is explained.

Outcome 3

Demonstrate knowledge of the types of vertical datum systems in surveying.

Performance criteria

- 3.1 Vertical datum systems are identified, their use in surveying is explained and correlated.

Range three vertical datums.

Outcome 4

Explain of the shape and curvature of the earth and its effect on survey measurement.

Performance criteria

- 4.1 Shape and curvature of the earth is explained.

Range geoid, spheroid, ellipsoid.

- 4.2 The effects of the shape and curvature of the earth on survey measurement is explained.

Outcome 5

Demonstrate knowledge of errors, tolerances and reductions in surveying.

Performance criteria

- 5.1 Types of errors are identified and explained.

Range random, systematic, gross.

- 5.2 Tolerances and their effects are explained in a range of surveying scenarios.
- Range surveying scenarios – turbine installation, hold-down bolts, urban cadastral, rural road, stockpile, one other.
- 5.3 Reductions are explained in relation to standard survey measurement corrections.
- Range distance reductions for instrument (prism), atmospheric (first velocity) and geometrical (slope, ellipsoid, projection), vertical angle reductions for curvature and refraction.
- 5.4 Reasons for rounding measurements and their implications for accuracy are explained.

| | |
|----------------------------|------------------|
| 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 April 2016 | 31 December 2022 |
| Review | 2 | 25 February 2021 | 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@infrastructureito.org.nz if you wish to suggest changes to the content of this unit standard.