4 Measure Apply measurement conventions to structural detailing

Kaupae | Level	4
Whiwhinga | Credit	5
Whāinga | Purpose	This skill standard recognises the knowledge required to apply measurement conventions to structural detailing in the construction industry. This skill standard may contribute to the New Zealand Diploma in Detailing (Structural) (Level 5) with strands in Light steel, Structural steel, Precast concrete, and Reinforcing steel [Ref:4515].

Hua o te ako me Paearu aromatawai \| Learning outcomes and assessment criteria

Hua o te ako | Learning outcomes	**Paearu aromatawai** | Assessment criteria
Demonstrate applied knowledge of units of measurement used in structural detailing.	a. Identification of relevant units of measure and explanation of how they are used in structural detailing.
	b. Calculation method and relationships for angles, area, volume, density, force, pressure and moments are accurate.
Explain the types and application of tools of measurement.	a. Explanation includes principles of use, accuracy, limitations and appropriate applications for each too of measurement.
Explain the types and application of tolerances in structural detailing.	a. Impact of tolerances on structural integrity, functionality, and compliance.
Demonstrate knowledge of coordinate systems and datums for structural detailing	a. Coordinate and datum systems are applied accurately in the production of drawings and layouts.
	b. Translation between datum and coordinate systems maintains accuracy and consistency of position and measurement.

Pārongo aromatawai me te taumata paearu \| Assessment information and grade criteria

Assessment specifications:

Calculations of angles, area, volume, density, force, pressure and moments.

Tools of measurement include those commonly applied in a structural detailing context.

Tolerances refer to fabrication, construction and measurement tolerances.

Co-ordinate systems and datums knowledge in relation to production of drawings and layouts for structural detailing.

Ngā momo whiwhinga | Grades available

Achieved

Ihirangi waitohu | Indicative content

International System of Units (SI Units)
- Concepts, relationships and application
- Coordinate systems and datums
- Conversion from metric to imperial

Angles
- Decimal
- Degrees/minutes/seconds

Tools of measurement
- Types, application and limitations
- Linear
- 3D
- Angular

Geometric concepts
- Points, lines and planes, concentricity, eccentricity
- Dimensions and measurement
- Geometric shapes
- Scaling
- Symmetry and asymmetry

Trigonometric Concepts
- Trigonometric ratios
- Angle measurements
- Triangular relationships
- Vector components

Tolerances

Types and application
- Design
- Fabrication
- Construction

Accuracy in measurement application

Impact of compounding tolerances

Rauemi | Resources

Programme guidance available from qualifications@waihangaararau.nz

https://www.building.govt.nz/assets/Uploads/projects-and-consents/guide-to-tolerances/guide-to-tolerances.pdf

Pārongo Whakaū Kounga | Quality assurance information

Ngā rōpū whakatau-paerewa | Standard Setting Body	Waihanga Ara Rau Construction and Infrastructure Workforce Development Council.

Whakaritenga Rārangi Paetae Aromatawai | DASS classification	Planning and Construction > Construction
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga | CMR	0048

Hātepe | Process	**Putanga** | Version	**Rā whakaputa** | Review Date	**Rā whakamutunga mō te aromatawai** | Last date for assessment
Rēhitatanga | Registration	<type here>	[dd mm yyyy]	[dd mm yyyy]
Arotakenga | Review	<type here>	[dd mm yyyy]	[dd mm yyyy]
Kōrero whakakapinga | Replacement information	<type here>		
Rā arotake | Planned review date	[dd mm yyyy]		

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@waihangaararau.nz to suggest changes to the content of this skill standard.