

5 Materials Evaluate the properties, application and limitations of steel and concrete used in structural systems

Kaupae Level	4
Whiwhinga Credit	5
Whāinga Purpose	<p>This skill standard recognises knowledge of the properties, application and limitations of structural materials used in construction.</p> <p>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].</p>

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

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
1. Describe properties of common engineering materials used for structural systems.	a. Properties for light, heavy and reinforcement steel, concrete, and composite align with accepted materials science knowledge.
2. Evaluate the application, and limitations of common engineering materials used in structural systems.	a. Application and limitations align with accepted engineering practice, standards and building regulatory frameworks.

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

Assessment specifications:

Knowledge of the properties for light, heavy and reinforcement steel, concrete, and composite.

Properties must include form, durability, aesthetic, behaviour under load and performance.

Limitations and application of steel, concrete and composite materials.

Ngā momo whiwhinga | Grades available

Achieved

Ihirangi waitohu | Indicative content

Structural material types

- Steel - light, heavy and reinforcement
- Concrete – precast and in-situ
- Composite

Material properties

- Fundamental property differences in supply
- Form/profiles
- Mechanical
- Thermal

Structural materials application**Steel**

- Structural steel
- Dimensions of structural steel members
- Reinforcement in concrete
- Light Steel

Concrete

- Precast
- In-situ
- Prestressed
- Post-tensioned

Composite

- Prestressed and in-situ concrete
- Steel/concrete
- Carbon fibres
- Sustainable products

Material protection and finishes

- Introduction to corrosion and coatings
- Steel - corrosion protection, fire protection.
- Concrete – finishings classifications

Rauemi | Resources

Programme guidance available from qualifications@waihangaararau.nz

New Zealand Building Code

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

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