

## 40141 Describe structural materials used in construction

<b>Kaupae   Level</b>	4
<b>Whiwhinga   Credit</b>	5
<b>Whāinga   Purpose</b>	<p>This skill standard recognises knowledge of the properties, application and limitations of structural materials used in construction.</p> <p>This skill standard aligns with the New Zealand Diploma in Detailing (Structural) (Level 5) with strands in Light Steel Frame, Reinforcing Steel, Structural Steel, and Precast Concrete [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 the properties of structural materials used in construction.	a. Properties are described using accepted materials science terminology.
	b. Descriptions of material properties include form, durability, aesthetic, behaviour under load, and performance.
2. Explain the application, and limitations of structural materials used in construction.	a. Application and limitations of structural materials explained align with accepted engineering practice and building standards.
	b. Applications and limitations of steel, concrete and composite materials are explained.

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

#### Assessment specifications:

Knowledge of properties for light, heavy and reinforcement steel, concrete, and composite materials is required for assessment.

Expected materials knowledge is relevant to structural detailing.

#### Ngā momo whiwhinga | Grades available

Achieved.

#### Ihirangi waitohu | Indicative content

Structural material types

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

**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 materials**

- 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**

Refer to the Structural Detailing Programme Guidance document available from [qualifications@waihangaararau.nz](mailto:qualifications@waihangaararau.nz).

[The New Zealand Building Code Handbook](#)

[Concrete Production Guide for New Zealand 2021](#)

[NZS 3404 Parts 1 and 2:1997 Steel Structures Standard](#)

**Pārongo Whakaū Kounga | Quality assurance information**

<b>Ngā rōpū whakatau-paerewa  </b> Standard Setting Body	Waihanga Ara Rau Construction and Infrastructure Workforce Development Council
<b>Whakaritenga Rārangi Paetae Aromatawai  </b> DASS classification	Planning and Construction > Construction > Core Planning and Construction
<b>Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga  </b> CMR	0048

<b>Hātepe   Process</b>	<b>Putanga   Version</b>	<b>Rā whakaputa   Date</b>	<b>Rā whakamutunga mō te aromatawai   Last date for assessment</b>
<b>Rēhitatanga   Registration</b>	1	26 September 2024	N/A
<b>Kōrero whakakapinga   Replacement information</b>	N/A		
<b>Rā arotake   Planned review date</b>	31 December 2029		

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