

Build_L4_1 Recognise material science in a construction trade

Kaupae Level	4
Whiwhinga Credit	5
Whāinga Purpose	This skill standard recognises knowledge of construction material chemistry, physics, and compatibility. This skill standard contributes to qualification pathways across the construction trades.

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

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
1. Explain the chemistry of common materials used in construction.	a. The material's chemistry is described in relation to its impact on common tasks in a construction trade.
2. Explain the physics of common materials used in construction.	a. Physical properties of materials, and mechanical behaviour under load, are described according to accepted building science.
3. Explain the compatibility of common materials used in construction.	a. Compatibility of materials is described in terms of maintaining structural integrity, durability and building performance.

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

Assessment specifications:

Candidates must be competent of consistently recognising material chemistry, physics, and compatibility in a construction trade.

Material chemistry includes composition, form, treatments, malleability, flammability, volatility of materials. It also includes the compatibility of different materials due to their chemical composition, the manner in which they are used, their susceptibility to deterioration over time, their effects on building performance, the environment, and people.

The level of building science knowledge required is that of a trade professional rather than that of an engineer, designer, or scientist.

Ngā momo whiwhinga | Grades available

Achieved.

Ihirangi waitohu | Indicative content

Timber

- Chemical composition of wood

- Chemicals/preservatives/treatments that impact the durability and properties of timber.
- Moisture content and its effect on structural integrity and behaviour of timber.
- Adhesives and coatings used in timber construction.

Concrete

- Chemical reactions involved in concrete formation.
- Concrete additives and their effects on concrete properties.
- Factors affecting concrete durability.
- Concrete testing methods

Metals

- Chemical composition of different metal types
- Metal production processes.
- Corrosion mechanisms in steel structures and methods to prevent corrosion.
- Compatibility.

Chemistry principles

- Material composition
- Form
- Treatments
- Malleability
- Flammability
- Volatility

Physics principles

- Physical properties.
- Mechanical behaviour.
- Principles of energy efficiency in buildings.
- Principles of sound transmission in buildings.

Material compatibility

- Chemical
- Thermal
- Moisture
- Mechanical
- Environmental.
- SDS's and E2AS.1.

Rauemi | Resources

Refer to the Core Construction Skills Guidance document which includes resources, definitions, and other information of relevance to this standard, available from qualifications@waihangaararau.nz.

The New Zealand Building Code, available from www.building.govt.nz.

NZS 3109:1997 Concrete construction

NZS 3404 Parts 1 and 2:1997 Steel structures

NZS 3631:1988 New Zealand timber grading rules, available from www.standards.govt.nz.

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 > Core Planning and Construction
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga CMR	0048

Hātepe Process	Putanga Version	Rā whakaputa Date	Rā whakamutunga mō te aromatawai Last date for assessment
Rēhitatanga Registration	1	dd mm 2024	N/A
Rā arotake Planned review date	dd June 2024		

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.