

40143 Describe structural component manufacturing processes and on-site construction methods

Kaupae Level	4
Whiwhinga Credit	5
Whāinga Purpose	<p>This skill standard recognises knowledge of structural component manufacturing processes and on-site construction methods.</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 manufacturing processes for structural components.	a. Described manufacturing processes meet accepted industry practice and standards.
	b. Described manufacturing considerations include guidelines for procurement of materials and quality control of component manufacturing.
2. Explain handling, transportation, and storage considerations for structural components.	a. Explanation of handling, transportation and storage considerations aligns with accepted industry practice and standards.
3. Describe on-site construction methods for structural components.	a. Description of on-site construction methods aligns with accepted industry practice and standards.

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

Assessment specifications:

Manufacturing processes for light steel, heavy steel, and reinforcement steel and precast concrete structural components are required for assessment.

On-site construction methods for light steel, heavy steel, reinforcement steel in-situ and precast concrete structural components are required for assessment.

Handling, transportation and storage considerations for light steel, heavy steel, reinforcement steel and precast concrete structural components are required for assessment.

Accepted industry practice refers to documented workplace processes and procedures for manufacturing and agreed practices for on-site construction that meet relevant industry standards and guidelines.

Ngā momo whiwhinga | Grades available

Achieved.

Ihirangi waitohu | Indicative content

Fabrication methodology

- Pre-fabrication considerations – procurement, quality assurance.
- Component fabrication processes:
 - Steel - hot rolled, cold formed
 - Cutting, folding, bending
 - Computer Numerically Controlled (CNC)
 - Welding, drilling, fixings.
- Precast concrete and its components.
- Concrete casting, formwork & falsework.

Steel fabrication

- Cutting, forming, joining and surface treatment.

Precast concrete manufacturing

- Formwork, installing and fixing steel reinforcement, placement, finishing and curing.

Quality control

- Inspection and Test Plan (ITP) – material certifications, concrete testing (onsite and offsite), welding.
- Third party testing and review.
- Shop drawing review processes.
- Workshop certification and audits.
- Coordination between structure and other disciplines.

Construction methods

- On-site methods
- Advantages and limitations of off-site and onsite precast manufacture.
- Applied tolerances.
- In-situ – tilt panels, trusses, frames.
- Temporary works – propping.
- Safe on-site construction practice.
- Temporary state vs permanent state, construction loads and their effect.
- Stud welding.

Component handling and logistics

- Lifting, rigging and crane requirements.
- Storage.
- Transport.
- Loading & unloading.
- Paint protection.
- Centre of gravity calculation.
- Hazards and safety practices.

Rauemi | Resources

Refer to the Structural Detailing Programme Guidance document available from qualifications@waihangaararau.nz

Pārongo Whakaū Kouna | 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	26 September 2024	N/A
Kōrero whakakapinga Replacement information	N/A		
Rā arotake Planned review date	31 December 2029		

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.