

Title	Demonstrate knowledge of the supervision of structural steel welding in accordance with AS 2214		
Level	5	Credits	25

Purpose	<p>This unit standard is for use in the training of supervisors of structural steel welding operations. The knowledge and skills represented by this unit standard align with the examination requirements specified in Australian Standard AS 2214, Certification of welding supervisors – Structural steel welding.</p> <p>People credited with this unit standard are able to demonstrate knowledge of: the general responsibilities and duties of a welding supervisor; welding and related processes, welding production, welding inspection and testing, and metallurgy for welding supervisors; and the application of AS/NZS 1554 in the welded fabrication of structural steel.</p>
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Classification	Mechanical Engineering>Welding
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Available grade	Achieved
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Explanatory notes

- 1 Information regarding examinations and certification of welding supervisors under AS 2214 is available from HERA, PO Box 76134, Manukau City, Manukau 2241, available at: www.hera.org.nz.
- 2 In accordance with AS 2114, candidates presenting for assessment against this standard should have achieved one of the following:
 - (a) Three years approved practical experience in the fabrication engineering industry, and successful completion of an approved course that includes welding process technology, welding metallurgy, weld testing and inspection; and standards and specifications relating to steel structures.
 - (b) Three years approved experience in the supervision or inspection of welding.
 - (c) A qualification in either engineering, metallurgy or welding, and three years approved experience related to the practical application of welding.

In addition, a candidate shall have verbal and written communication skills and be able to write reports.
- 3 References

AS 1101.3:2005, *Graphical symbols for general engineering – Welding and non-destructive examination*.

AS 2214:2004, *Certification of welding supervisors – Structural steel welding*.

AS 2812:2005, *Welding, brazing and cutting of metals – Glossary of terms*.

AS/NZS 1554 Parts 1 – 7, *Structural steel welding*.

WTIA Technical Note 07 (TN07.) – *Health and safety in welding*. Australia: Welding Technology Institute of Australia, 2004. Available from HERA, PO Box 76134, Manukau, Auckland City 2241.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of the general responsibilities and duties of a welding supervisor.

Evidence requirement

- 1.1 The supervisor's role in relation to communication, supervision and quality control is described in accordance with AS 2214.
- 1.2 The use of effective communication related to welding processes is practically demonstrated in accordance with AS/NZS 1554.
- 1.3 Welding terminology and interpretation of welding symbols are explained in accordance with industry practice.
- Range AS 2812, AS 1101.3.
- 1.4 The supervisor's role in relation to welding safety policy is explained in accordance with WTIA TN07.
- Range environmental dangers, safe storage and reticulation of industrial gases, acts and regulations.

Outcome 2

Demonstrate knowledge of welding and related processes for welding supervisors.

Evidence requirement

- 2.1 Welding and cutting processes are described in terms of their advantages and limitations for structural steel welding.
- Range processes may include – brazing, electroslag, electrogas welding, flux-cored arc welding, gas metal-arc welding, gas tungsten-arc welding, gas welding, manual metal-arc welding, stud and resistance welding, submerged arc welding, thermal cutting and gouging.
Evidence is required of five different processes.
- 2.2 Welding power sources and associated equipment are described in accordance with current technology used in structural steel fabrication.

2.3 Aspects of structural steel welding practice are described with reference to processes and welding quality.

Range aspects may include but are not limited to – control of residual stress and distortion, influence of arc welding parameters, polarity and magnetic effects, classification, handling and storage of consumables, jigs and fixtures.

Outcome 3

Demonstrate knowledge of welding production for welding supervisors.

Evidence requirement

3.1 Production procedures for the welding of structural steel are explained.

Range procedures may include – planning and control, layout of materials, materials handling, welding procedures, supervision of welders, qualification of welders.
Evidence is required of four procedures.

3.2 Methods of maintaining the identification of structural steel during the fabrication process are described.

Range evidence is required of two methods.

3.3 Structural steel weld joint geometry is detailed for given material grade and thickness, in accordance with AS/NZS 1554.

3.4 The supervisor's specific responsibilities for welding production are explained in accordance with AS 2214.

3.5 The supervisor's specific responsibilities for qualification of welders and welding procedures are explained in accordance with AS/NZS 1554.

3.6 The inspection requirements for welded construction are explained in accordance with AS/NZS 1554.

Outcome 4

Demonstrate knowledge of welding inspection and testing for welding supervisors.

Evidence requirement

4.1 Fabrication and welding quality control plans to assure weld quality are described in accordance with AS/NZS 1554.

4.2 Visual examination requirements of AS/NZS 1554 to assure compliance of weld quality are described.

4.3 The supervisor's responsibility for coordination of destructive testing and non-destructive examination (NDE) is explained in accordance with AS 2214.

4.4 Welding documentation requirements are described in accordance with AS/NZS 1554.

Range documentation requirements include but are not limited to – procedure qualification records, welding procedure specifications.

Outcome 5

Demonstrate knowledge of metallurgy for welding supervisors.

Evidence requirement

5.1 The changes that occur in carbon steel during the welding and cooling cycles are explained.

Range changes include – metallurgical, mechanical properties.

5.2 The factors that influence heat input on the deposited metal and heat-affected zone are explained in accordance with AS/NZS 1554.

5.3 Preheating, maintenance of interpass temperature, and post-weld heat treatment are explained in accordance with AS/NZS 1554.

5.4 Specifications and grades of structural steel are stated from given data.

Range evidence is required for a minimum of two different specifications and grades.

5.5 The tests and specimens required to establish mechanical properties of welded joints are determined in accordance with AS/NZS 1554.

5.6 Failure mechanisms of weld and parent metal are explained with reference to causes.

Range causes may include but are not limited to – overload, fatigue, weld decay or carbide precipitation, stress corrosion, galvanic corrosion, lamellar tearing.
Evidence is required for a minimum of three different causes.

Outcome 6

Demonstrate knowledge of the application of AS/NZS 1554 in the welded fabrication of structural steel.

Evidence requirement

6.1 Given scenarios of welded construction are analysed to determine compliance with AS/NZS 1554.

6.2 The welding supervisor's role relating to the fabrication, welding, and inspection of steel construction is described in accordance with AS/NZS 1554.

Planned review date	31 December 2021
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 May 2010	31 December 2018
Review	2	18 February 2016	N/A

Consent and Moderation Requirements (CMR) reference	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMRs). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz at qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.