

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

<b>Purpose</b>	<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, <i>Certification of welding supervisors – Structural steel welding</i>.</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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<b>Classification</b>	Mechanical Engineering > Welding
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<b>Available grade</b>	Achieved
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### Guidance Information

- 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](http://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 City, Manukau 2241.

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## Outcomes and performance criteria

### Outcome 1

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

#### Performance criteria

- 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 communications related to welding processes are 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.

#### Performance criteria

- 2.1 Welding and cutting processes are described in terms of their advantages and limitations for structural steel welding.
- Range processes include – automation, 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, surface coatings and their effects on welding, thermal cutting and gouging.
- 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 discussed with reference to processes and welding quality.

Range aspects – 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.

#### Performance criteria

3.1 Solutions to production problems in the welding of structural steel are identified.

Range problems relating to – planning and control, layout of materials, materials handling, welding procedures, supervision of welders, qualification of welders.

3.2 The methods of marking structural steel to assure reliable identification of steel grade are described.

Range stamping, use of metal marking paint.

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.

#### Performance criteria

4.1 Fabrication and welding quality control plans are prepared for given scenarios to assure weld quality in accordance with AS/NZS 1554.

4.2 Compliance of quality of given welds with AS/NZS 1554 is determined by visual examination.

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 procedure qualification records, welding procedure specifications, relevant documentation such as manufacturer's data report (MDR).

### Outcome 5

Demonstrate knowledge of metallurgy for welding supervisors.

#### Performance criteria

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

Range changes include – temperature changes; the changes in structure in a cross-section of a welded joint; the solubility of gas in solid and liquid metal.

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 The range of steel grades covered by AS/NZS 1554 is identified.

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 include – fatigue, weld decay or carbide precipitation, stress corrosion, galvanic corrosion, lamellar tearing.

### Outcome 6

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

#### Performance criteria

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 regulatory approval of design, construction, testing, and installation of steel construction is described in accordance with AS/NZS 1554.

**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

**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	31 December 2025
Review	3	26 January 2023	31 December 2025

**Consent and Moderation Requirements (CMR) reference**

0013

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.