



Australian Government

TLIW0044A Weld rail on tram/light rail systems using submerged arc welding process

Release: 1

TLIW0044A Weld rail on tram/light rail systems using submerged arc welding process

Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit involves the skills and knowledge required to weld rail on tram/light rail systems using a submerged arc welding process.

It covers preparing materials, selecting and setting up welding equipment, carrying out submerged arc welding, inspecting for and correcting defects, and maintaining weld records. Licensing or certification requirements are not applicable to this unit.

Application of the Unit

Welds would mainly involve building up or pad welding on longer lengths of rail on tram/light rail systems. It covers welding both the rail head and the check rail. The weld quality is not measured against any Australian Standards.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

- | | |
|--|---|
| 1 Prepare materials for welding | 1.1 Weld requirements are identified from specifications and/or technical drawings |
| | 1.2 Material is correctly prepared using tools and techniques appropriate to the material and process |
| | 1.3 Materials are assembled/aligned to specifications, where required |
| | 1.4 Track is measured prior to commencement of welding |
| 2 Select welding machine settings and consumables | 2.1 Welding machine settings and consumables are identified from job requirements, welding procedures, specifications and/or technical drawings |
| 3 Assemble and set up welding equipment | 3.1 Welding equipment is assembled and set up safely and correctly to standard operating procedures |
| | 3.2 Any defective equipment is tagged and replaced in accordance with organisational and/or manufacturer specifications |
| 4 Weld rail using submerged arc process | 4.1 Pad, butt and fillet welds are deposited correctly in flat, and fillet welds in horizontal position, to specification |
| | 4.2 Joints are cleaned to specifications using techniques and tools appropriate to the defect, material and process |
| 5 Inspect welds and correct faults | 5.1 Weld joints are visually inspected against specifications |
| | 5.2 Track is measured to ensure welded track is within accepted tolerances |
| | 5.3 Weld defects are identified and remedial action is taken, where required |
| | 5.4 Defects are removed with minimum loss of sound metal using techniques and tools appropriate to the defect, material and process |
| 6 Maintain weld records as required | 6.1 Weld records are maintained in accordance with organisational procedures |

Required Skills and Knowledge

This section describes the knowledge and skills required for this unit.

Required knowledge:

- Acceptance standards for weld repairs on tram/light rail track
- Authorisation/approval processes and procedures
- Documentation and recordkeeping requirements
- Hazards that may exist when welding rail using submerged welding process, and ways of controlling the risks involved
- Problems that may occur when welding rail using submerged welding process, and action that can be taken to report or resolve problems
- Relevant communication systems and procedures
- Relevant safety, occupational health and safety (OH&S) and environmental procedures and regulations
- Track standards for rail condition and surface profile

Required skills:

- Apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities including traffic management
- Communicate effectively with others
- Interpret and follow operational instructions
- Modify activities depending on operational contingencies, risk situations and environments
- Select and use required personal protective equipment (PPE) conforming to industry and OH&S standards

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:
 - the required knowledge and skills
 - relevant legislation and workplace procedures
 - other relevant aspects of the range statement
- Assessment must include exercises which demonstrate competent performance of the following in a range of situations:
 - preparing and setting up traffic management plan
 - preparing items for welding according to workplace requirements
 - assembling and setting up welding equipment and preparing consumables
 - ensuring weld conforms to organisational requirements
 - completing documentation in accordance with organisational requirements

Context of and specific resources for assessment

- Performance is demonstrated in a suitable range of contexts
- Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
- In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Method of assessment

- As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
- Practical assessment must occur:
 - through activities in an appropriately simulated environment, and/or
 - in an appropriate range of situations in the workplace

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

- Work may involve exposure to:
- movement of equipment, materials and vehicles
- Basic track measurements may include:
- length, depth, width, diameter
 - track gauge
 - length of weld
- Measuring equipment may include:
- tape measures
 - track gauge
- Materials may include:
- flux core wire
 - welding electrodes
 - grinding discs
- Track layout may include:
- plain track
 - turnouts
 - special trackwork including catchpoints, expansion switches, diamond crossings and slips
- Communication equipment may include:
- two-way radios
 - telephones/mobile phones
 - agreed audible or hand signal
- Depending on work context, safety and personal protective equipment may include:
- high visibility clothing
 - long pants and shirts
 - hearing protection
 - long gloves
 - spats
 - sunscreen
 - sunglasses
 - welding helmet
 - safety glasses
 - insect repellent
 - safety headwear
 - safety footwear
 - portable radios/mobile phones
 - hand lamps
 - flags
 - safety devices
 - special PPE
- Information/documents may include:
- operational instructions, policies and workplace procedures
 - local authority regulations and procedures
 - work orders

Applicable regulations and legislation may include:

- information provided by other workplace personnel
- rail inspections and timekeeping records
- trackworker standard manual
- technical instructions
- manufacturer or workplace equipment operation manuals and specifications
- emergency procedure manuals
- two-way radio/mobile phone operation procedures
- legislated rail safety requirements including state acts and regulations together with any nationally approved compliance codes and/or guidelines
- local authority regulations
- relevant state/territory OH&S and environmental protection legislation

Unit Sector(s)

Not applicable.

Competency Field

W – Equipment and Systems Operations