



Australian Government

RIICTC303E Excavate tunnel by machine

Release: 2

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Modification History

Release	Comments
Release 2	This version was released with RII Resources and Infrastructure Industry Training Package Version 7.1. This release made editorial corrections to Knowledge Evidence.
Release 1	This version first released with RII Resources and Infrastructure Industry Training Package Version 6.0.

Application

This unit describes the skills and knowledge required to excavate tunnel by machine in civil construction, including incorporating dust suppression methods, removing excess water and controlling mucking.

It applies to those working in operational roles. They generally work under minimal supervision to undertake a broad range of tasks in varied work contexts, using some discretion and judgement in selecting equipment, services or contingency measures.

Licensing, legislative and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Users must check requirements with relevant body before applying the unit.

Unit Sector

Civil construction

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Plan and prepare to excavate tunnel by machine	1.1 Obtain, interpret, clarify and confirm work instructions 1.2 Access, interpret and apply documentation required to excavate tunnels by machine and confirm work activity is compliant 1.3 Confirm and identify requirements for complying with environmental protection, safety and traffic management signage requirements

ELEMENT	PERFORMANCE CRITERIA
	1.4 Select equipment and tools required for work activities and check for faults 1.5 Select and wear personal protective equipment according to site requirements 1.6 Identify and address potential risks, hazards and environmental issues, and implement control measures within scope of own role 1.7 Obtain and interpret emergency procedures and identify steps required to respond to emergencies
2. Set up for machine operation	2.1 Devise and follow production schedules consistent with job requirements 2.2 Locate and set up machine and equipment according to job requirements 2.3 Carry out pre-start, start-up, park up, shutdown and secure equipment procedures 2.4 Adjust machine and attachments for terrain, rock and ground conditions 2.5 Drive, operate machine and use controls according to job requirements 2.6 Complete operator maintenance and servicing of machine and equipment to schedule according to manufacturer specifications and site requirements
3. Excavate tunnel and control dust and water	3.1 Excavate tunnel to shape required by specification according to line levels and measurements 3.2 Incorporate dust suppression methods with machine cutting operations to control dust 3.3 Operate and maintain dust extraction systems during excavation 3.4 Remove excess water by operating pumping or drainage system to maintain minimal surface water levels
4. Control mucking	4.1 Set up and align mucking system to spoil system according to job requirements 4.2 Operate mucking attachments according to job requirements 4.3 Maintain dust extraction system in operation along conveyor or mucking system 4.4 Remove spoil according to planned operating procedures 4.5 Direct trucks safely to and from mucking area according to job requirements
5. Conduct clean-up activities	5.1 Clear work area and dispose of or recycle materials according to site requirements 5.2 Clean, check, perform maintenance on and store plant, tools and equipment according to manufacturer specifications and site requirements

ELEMENT	PERFORMANCE CRITERIA
	5.3 Carry out housekeeping activities according to site requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

Skill	Description
Numeracy	Calculates basic measurements including mass and dimensions
Self-management	Monitors and minimises own exposure to worksite risks and hazards during work activities
Writing	Completes documentation using sector specific vocabulary, grammatical structures and conventions

Unit Mapping Information

Supersedes and is equivalent to RIICTC303D Excavate tunnel by machine.

Links

Companion Volume Implementation Guides are available from VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIICTC303E Excavate tunnel by machine

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- excavate tunnel by machine on at least two occasions, including completing at least a twenty lineal metre section of tunnel.

During the above, the candidate must:

- locate and apply required documentation, policies and procedures
- implement the requirements, procedures and techniques for the completion of excavate tunnel by machine, including:
 - applying equipment and manual handling techniques
 - selecting and using required tools and equipment
 - interpreting engineering drawings
- work with others to undertake and complete the tunnel excavation by machine that meets all required outcomes, including:
 - organising work activities to meet all task requirements
 - communicating with others to receive and clarify work instructions
 - using communication techniques and systems to advise others of work activity and exclusion zone.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- policies, procedures and documentation required to excavate tunnel by machine, including those relating to:
 - work health and safety
 - environmental protection
 - waste management
 - using safety data sheets (SDS) and materials handling methods
 - project quality requirements
 - emergency response
 - manufacturer specifications for required plant and equipment
 - site isolation and traffic control responsibilities and authorities
 - communication techniques and equipment
 - job plans and specifications
 - site requirements
 - production schedules
 - machine operations
 - housekeeping activities, including:
 - cleaning up work area
 - cleaning, maintaining and storing equipment and tools
 - waste management
 - processing records
- principles and techniques required to excavate tunnel by machine, including those related to:
 - dust suppression
 - machine cutting operations ground conditions
 - excavation processes, including the use of:
 - shields
 - earth pressure bearing shields
 - pipe jacking
 - tunnel services, including:
 - rail
 - road
 - communication
 - water
 - power
- civil construction terminology relevant to excavating tunnel by machine
- types, characteristics, technical capabilities and limitations of plant and equipment required to excavate tunnel by machine, including:
 - road header machines
 - tunnelling boring machines (TBM)
 - shields

- pipe jacking equipment.

Assessment Conditions

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

- include access to:
 - personal protective equipment
 - equipment required to excavate tunnel by machine
- be conducted in a safe environment; and,
- be assessed in the context of this sector's work environment; and,
- be assessed in compliance with relevant legislation/regulation and using policies, procedures and processes directly related to the industry sector for which it is being assessed; and,
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

Assessor requirements

Assessors must be able to clearly demonstrate current and relevant industry knowledge and experience to satisfy the mandatory regulatory standards as set out in the Standards for Registered Training Organisations 2015/Australian Quality Training Framework mandatory requirements for assessors current at the time of assessment and any relevant licensing and certification requirements. This includes:

- vocational competencies at least to the level being delivered and assessed
- current industry skills directly relevant to the training and assessment being provided
- current knowledge and skills in vocational training and learning that informs their training and assessment
- formal relevant qualifications in training and assessment
- having knowledge of and/or experience using the latest techniques and processes
- possessing the required level of RII training product knowledge
- having an understanding and knowledge of legislation and regulations relevant to the industry and to employment and workplaces
- demonstrating the performance evidence, and knowledge evidence outlined in this unit of competency, and
- the minimum years of current** work experience after competency has been obtained as specified below in an industry sector relevant to the outcomes of the unit.

It is also acceptable for the appropriately qualified assessor to work with an industry expert to conduct assessment together and for the industry expert to be involved in the assessment judgement. The industry expert must have current industry skills directly relevant to the training and assessment being provided. This means the industry subject matter expert must demonstrate skills and knowledge from the minimum years of current work experience after competency has been obtained as specified below, including time spent in roles related to the unit being assessed:

Industry sector	AQF indicator level***	Required assessor or industry subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Infrastructure	1	1 year
	2	2 years
Drilling, Coal Mining, Extractive (Quarrying), Metalliferous Mining and Civil Infrastructure	3-6	3 years
Other sectors	Where this unit is being assessed outside of the resources and infrastructure sectors assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and where no industry standard is specified should comply with any relevant regulation.	

*Guidance on simulated environments has been stipulated in the RII implementation guide located on VETNet.

**Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting a minimum number of site assessments as determined by the relevant industry sector, across various locations.

*** While a unit of competency does not have an AQF level, where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered as the AQF indicator level for assessment purposes.

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