



Australian Government

RIICTC306 Conduct tunnel boring machine operations

Release: 1

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Modification History

Release	Comments
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 assist the operation of tunnel boring machines (TBM) in civil construction, including conducting TBM pre-operational checks and monitoring, operating and adjusting TBM controls.

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. Prepare to conduct TBM operations	1.1 Obtain, interpret and confirm work instructions 1.2 Access, interpret and apply documentation required to conduct TBM operations and confirm work activity is compliant 1.3 Identify environmental issues and potential hazards and implement control measures within scope of own role 1.4 Select and wear personal protective equipment according to site requirements 1.5 Confirm and comply with environmental protection, safety and traffic management signage requirements 1.6 Select plant, tools and equipment required for tasks, check for

	faults and report or rectify as required 1.7 Obtain and interpret emergency procedures and identify steps required to respond to emergencies
2. Conduct TBM pre-operational checks	2.1 Confirm TBM parameters and conditions against permit to bore and design limitations for tunnel and TBM 2.2 Confirm required works that prevent tunnelling are completed before tunnelling commences 2.3 Confirm required materials and services are available to permit tunnelling to commence 2.4 Confirm required keys on operating dashboard are functioning according to manufacturer specifications 2.5 Report technical faults to required personnel as required
3. Operate TBM	3.1 Operate TBM according to manufacturer specifications and job and site requirements 3.2 Adjust operations according to job requirements 3.3 Communicate with required personnel and report problems as required 3.4 Carry out operator maintenance according to manufacturer specifications and site requirements 3.5 Carry out troubleshooting to operation as required 3.6 Monitor operating parameters when TBM is at docking mode 3.7 Assist with required tasks on TBM as required
4. Conduct housekeeping activities	4.1 Clear work area and recycle or dispose of materials according to site requirements 4.2 Clean, check, perform maintenance on and store plant, tools and equipment according to manufacturer specifications and site requirements 4.3 Complete records according to site procedures

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	Identifies and interprets information from site requirements and documentation
Oral communication	Uses communication techniques and systems to communicate with others
Self-management	Monitors and minimises own exposure to worksite risks and hazards

	during activities
Writing	• Completes records using sector-specific vocabulary, grammatical structures and conventions

Unit Mapping Information

New unit

Links

Companion Volume Implementation Guide is found on VETNet -

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

Assessment Requirements for RIICTC306 Conduct tunnel boring machine operations

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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:

- conduct tunnel boring machine (TBM) operations on at least three occasions, including:
 - completing at least 250 metres of the tunnelling phase
 - completing at least 250 metres of ring building
 - completing at least 250 metres of excavation
 - completing and monitoring at least two cutterhead intervention sessions.

During the above, the candidate must:

- locate and apply required documentation, policies and procedures and confirm work activity is compliant
- implement the requirements, procedures and techniques to conduct TBM operations, including:
 - monitoring, interpreting and controlling TBM control panels
 - interpreting required documentation, including:
 - engineering drawings
 - permits to bore approved by a tunnel manager
 - on screen tunnelling parameters
 - identifying soil and geological characteristics
- work with others to conduct TBM operations in a way that meets required outcomes, including:
 - organising work activities to meet task requirements
 - communicating with others to receive and clarify work instructions, including with:
 - TBM persons in charge
 - shift superintendents
 - tunnel managers
 - using techniques and systems to advise others of work activity and exclusion zones

- monitoring hazards and identifying and communicating changes to work environment.

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 conduct TBM operations, including those relating to:
 - environmental protection, including atmospheric monitoring
 - work instructions
 - hazard and risk management
 - environmental protection
 - incident and emergency response
 - job safety analyses (JSAs)/job safety environmental analyses (JSEAs)/safe work method statements (SWMS)
 - project quality requirements
 - permits to bore
 - design limitations
 - manufacturer specifications for required plant and equipment
 - site requirements
 - communication techniques and equipment
 - workplace recording and reporting
 - safety data sheet (SDS) and materials handling methods
 - waste management
 - work health and safety
- types, operational phases, characteristics and limitations of TBM and equipment required to operate TBM
- principles and techniques for effective TBM operations, including:
 - TBM operational roles and responsibilities
 - techniques for creating and monitoring safe and stable tunnelling environments
 - techniques for interpreting and applying:
 - TBM controls
 - permits to bore
 - engineering drawings
- types and characteristics of tunnels required for TBM operations, including:
 - soil and rock types and characteristics
 - implications of soil and rock types for TBM operations
- civil construction terminology required for conducting tunnel construction.

Assessment Conditions

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

- include access to:
 - personal protective equipment
 - TBM
 - equipment required to conduct TBM operations
- 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 assessor's 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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