



Australian Government

RIICWD532D Prepare detailed design of tunnels

Release: 2

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Modification History

Release	Comment
1	This unit replaces RIICWD532A Prepare detailed design of tunnels
2	Required frequency and volume of evidence amended in Performance evidence. Substantial amendments made in Assessment Conditions field, including: references to Industry Sectors, assessor and subject matter expert experience requirements, how assessment should be conducted and what it should confirm.

Application

This unit describes a participant's skills and knowledge required to prepare detailed design of tunnels in Civil construction.

This unit is appropriate for those working in management or technical specialist roles.

No licensing or certification requirements apply to this unit at the time of publication.

Unit Sector

Civil construction

Elements and Performance Criteria

1. Plan and prepare for the detailed design of tunnels	1.1 Access, interpret and apply detailed design of tunnels documentation and ensure the work activity is compliant 1.2 Obtain, read, interpret, clarify and confirm work requirements 1.3 Identify and confirm the tunnels project requirements and information 1.4 Prepare a design plan which makes best use of the available resources
2. Undertake the detailed design of tunnels	2.1 Interpret and analyse data and identify viable options 2.2 Interpret and analyse data and recommend the preferred option 2.3 Complete the detailed design 2.4 Prepare a cost estimate for execution of the design 2.5 Participate in the review of design with peers and stakeholders

	2.6 Complete required documentation 2.7 Monitor and coordinate the progress of other team members involved in the design process 2.8 Gain design approval
3. Finalise design processes of tunnels	3.1 Ensure filing of design records is completed 3.2 Complete and submit design cost and other reporting 3.3 Participate in performance review of the design process 3.4 Seek client feedback and contribute to the verification of the design 3.5 Close out all systems
4. Support and review the application of the design of tunnels	4.1 Provide clarification and advice to those applying the design 4.2 Review the application of the design and recommend changes for continuous improvement 4.3 Contribute to the validation of the design

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit. Further information is available in the Resources and Infrastructure Industry Training Package Companion Volume.

Unit Mapping Information

RIICWD532A Prepare detailed design of tunnels

Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIICWD532D Prepare detailed design of tunnels

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Performance Evidence

Evidence is required to be collected that demonstrates a candidate's competency in this unit. Evidence must be relevant to the roles within this sector's work operations and satisfy all of the requirements of the performance criteria of this unit and include evidence that the candidate:

- locates and applies relevant legislation, documentation, policies and procedures
- implements the requirements, procedures and techniques for the safe, effective and efficient detailed design of tunnels including:
 - accessing and interpreting plans, drawings, specifications and design briefs
 - accessing and interpreting engineering survey and geotechnical information
 - accessing and interpreting hydrological, meteorological, cultural and heritage data
 - applying computer aided drafting design (CADD) and drafting technology
 - applying Industry or government standard design software
 - applying engineering graphical presentation techniques
- works effectively with others to undertake and complete the detailed design and documentation detailed design of tunnels that meets all of the required outcomes including:
 - using a range of communication techniques and equipment to convey information to others
 - maintaining written and verbal reporting requirements
 - organising work activities to meet all task requirements
 - communicating clearly and concisely with others to receive and clarify work instructions
- demonstrates completion of detailed designs of tunnels that safely, effectively and efficiently meets all of the required outcomes on more than one (1) occasion including:
 - calculate areas, volumes, densities, mass, percentages and grades

- maintain design cost records
- interpret and apply engineering survey information
- interpret and analyse tunnels construction materials test results
- carry out risk assessments
- select tunnels option data
- determine tunnels loadings and capacity requirements
- select tunnels options
- size tunnels components
- select appropriate construction techniques
- develop and apply design plans
- preparation and planning for the detailed design,
- undertaking of the detailed design including:
 - analyse and interpret relevant data and identify viable options
 - calculations including:
 - earthworks volumes
 - construction materials and services quantities
 - construction cost estimates
 - finalisation of the detailed design processes
 - supporting the application of the detailed design
 - reviewing application of design and recommending improvements

Knowledge Evidence

The candidate must demonstrate knowledge of detailed design of tunnels through:

- applying legislative, organisation and site requirements and procedures for:
 - risk assessment and management
 - statutory compliance
 - work health and safety
 - applying equipment safety requirements
 - complying with emergency issues
 - complying environmental issues
 - quality management
 - verbal and written communication
 - Australian and other relevant standards
 - Industry and organisational design procedures and practice
 - tunnels geometric requirements
 - potential hazards, constraints and conditions
 - trench and pit shoring
 - design review
 - design approval

- documentation and reporting
- record keeping
- performance review
- systems close out
- current Industry best practice
- identifying, assessing and selecting tunnels options
- selecting and applying techniques for choosing preferred options
- applying team leadership techniques
- selecting and applying operational techniques required for the execution of tunnels construction tasks
- identifying and selecting tunnels construction plant and equipment capabilities
- applying cost estimation techniques
- applying principles of road user behaviour

Assessment Conditions

- An assessor of this unit must satisfy the requirements of the NVR/AQTF or their successors; and Industry regulations for certification and licensing; and,
- this unit is best assessed in the context of this sector's work environment; and,
- outcomes of this unit that occur in an office-based setting may be assessed in a simulated 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; and,
- this unit must be assessed in compliance with relevant legislation/regulation and using policies, procedures, processes and operational manuals directly related to the industry sector for which it is being assessed; and,
- assessment may be conducted in conjunction with the assessment of other Units of Competency; and,
- assessment must confirm consistent performance can be applied in a range of relevant workplace circumstances; and,
- assessors must demonstrate the performance evidence, and knowledge evidence as outlined in this Unit of Competency, and through the minimum years of current* work experience specified below in an Industry sector relevant to the outcomes of the unit; or,
- where the assessor does not meet experience requirements a co-assessment or partnership arrangement must exist between the qualified assessor and an Industry subject matter expert. The Industry subject matter expert should hold the unit being assessed (or an equivalent unit) and/or demonstrate equivalence of skills and knowledge at the unit level. An Industry technical expert must also demonstrate skills and knowledge from the minimum years of current work experience specified below in the Industry sector, including time spent in roles related to the unit being assessed; and,
- assessor and Industry subject matter expert requirements differ depending on the Australian Qualifications Framework Level (AQF) of the qualification being assessed and/or Industry Sector as follows:

Industry sector	AQF** Level	Required assessor or Industry
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		subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Construction	1	1 Year
	2	2 Years
Drilling, Coal Mining and Extractive (Quarrying)	3-6	3 Years
Metalliferous Mining and Civil Construction	3-6	5 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.	

*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 frequent site assessments across various locations.

**Where a unit is being delivered outside of a Qualification the first numeric character in the Unit code should be considered to indicate the AQF level

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