

<b>Title</b>	<b>Demonstrate knowledge of tunnelling methods, <u>and selection of plant and equipment for tunnelling</u></b>		
<b>Level</b>	<b>5</b>	<b>Credits</b>	<b>15</b>

<b>Purpose</b>	People credited with this unit standard are able to: demonstrate knowledge of geological features in relation to tunnelling methods; describe support requirements and potential hazards in tunnels; and demonstrate knowledge of tunnelling methods <u>and selection of plant and equipment.</u>
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<b>Classification</b>	Extractive Industries > Underground Extraction
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<b>Available grade</b>	Achieved
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**Explanatory notes****Guidance Information**

1 Performance of the outcomes of this unit standard must comply with the following:  
Health and Safety at Work Act 2015 (HSW);  
Health and Safety at Work (General Risk and Workplace Management) Regulations 2016;  
Health and Safety at Work (Mining Operations and Quarrying Operations) Regulations 2016;  
Health and Safety at Work (Worker Engagement, Participation, and Representation) Regulations 2016;  
approved codes of practice issued pursuant to the HSW Act.

2 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

3 Definition  
TBM refers to a tunnel boring machine.

**Outcomes and evidence requirements****performance criteria**

**Outcome 1**

Demonstrate knowledge of geological features in relation to tunnelling methods.

**Evidence requirements****Performance criteria**

1.1 The effects of geological features are described in relation to the selected tunnelling method.

Range includes but is not limited to – structure, rock properties, sedimentary characteristics.

## Outcome 2

Describe support requirements and potential hazards in tunnels.

### Performance criteria~~Evidence requirements~~

2.1 Support requirements are described in terms of the stability of the tunnel.

Range includes but is not limited to – rock bolting methods, timber support, steel support, side support, mesh, grout, shotcrete, lining.

2.2 Potential hazards are described in terms of tunnelling safety.

Range includes but is not limited to – gas, dust, rock instability, water inundations, unconsolidated ground, water bearing strata, fracture planes, faulted ground.

## Outcome 3

Demonstrate knowledge of tunnelling methods and selection of plant and equipment.

### Performance criteria~~Evidence requirements~~

3.1 Tunnelling methods are described in relation to the host rock.

Range includes but is not limited to – hand mining, drill and blast, mechanical loading, roadheader, TBM.

~~3.2 The effectiveness of rock support is described in relation to given tunnelling methods.~~

~~3.3~~ The procedures to be adopted in development of shafts, connections, and facilities are described in relation to their intended use and safety.

Range includes but is not limited to – pump chambers, ventilation, escape routes, refuge chambers, special use chambers.

~~3.3 The design and attributes of plant and equipment are identified and evaluated in terms of the host rock and the profile of tunnelling sites.~~

~~Range plant and equipment includes – tunnelling plant and equipment, transportation plant and equipment; tunnelling plant and equipment includes but is not limited to – roadheader, TBM; transportation plant and equipment includes but is not limited to – conveyors, rail transport, rope haulage, diesel haulage, scraper drives, shaft hoisting.~~

3.4 Other factors that impact the selection of tunnelling methods, plant and equipment are explained.

Range may include but is not limited to – risk assessment, financial considerations, safety considerations and requirements (e.g. guarding), equipment compatibility, job requirements; plant and equipment includes – tunnelling plant and equipment, transportation plant and equipment.

<u>Planned review date</u>	<u>31 December 2022</u>
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**Status information and last date for assessment for superseded versions**

<u>Process</u>	<u>Version</u>	<u>Date</u>	<u>Last Date for Assessment</u>
<u>Registration</u>	<u>1</u>	<u>24 November 2005</u>	<u>31 December 2019</u>
<u>Revision</u>	<u>1</u>	<u>16 July 2010</u>	<u>31 December 2019</u>
<u>Review</u>	<u>1</u>		<u>N/A</u>

<b><u>Consent and Moderation Requirements (CMR) reference</u></b>	<u>0114</u>
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Status and review information**

<u>Registration date</u>	<u>24 November 2005</u>
<u>Date version published</u>	<u>16 July 2010</u>
<u>Planned review date</u>	<u>31 December 2022</u>

<b><u>Accreditation and Moderation Action Plan (AMAP) reference</u></b>	<u>0114</u>
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This AMAP can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Please note**

Providers must be granted consent to assess against standards (accredited) by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

~~Consent requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.~~

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**Comments on this unit standard**

~~Please contact MITO New Zealand Incorporated [info@mito.org.nz](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.~~

~~Please contact the NZ Motor Industry Training Organisation (Incorporated) (MITO) [info@mito.org.nz](mailto:info@mito.org.nz) if you wish to suggest changes to the content of this unit standard.~~