

<b>Title</b>	<b>Demonstrate and apply knowledge of excavation, backfill and compaction for a gas network</b>		
<b>Level</b>	<b>3</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	People credited with this unit standard are able to: demonstrate knowledge of excavation, backfill and compaction for a gas network; prepare for excavation operations for a gas network; excavate for a gas network; backfill and compact for a gas network; and carry out final preparation prior to surface reinstatement.
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<b>Classification</b>	Gas Industry > Gas Network Construction
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 This unit standard is intended for, but is not limited to, workplace assessment. The range statements relate to enterprise specific equipment, procedures, and processes.
- 2 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable manufacturer's specifications, company procedures and legislative requirements. This includes the knowledge and use of suitable tools and equipment.
- 3 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the current version of:
  - Health and Safety at Work Act 2015;
  - Resource Management Act 1991;
  - AS/NZS 4645.1:2018 *Gas distribution networks – Network management*;
  - AS/NZS 4645.2:2018 *Gas distribution networks – Steel pipe systems*;
  - AS/NZS 4645.3:2018 *Gas distribution networks – Plastic pipe systems*;
  - AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and construction*;
  - AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
  - Excavation Safety good practice guidelines ISBN 978-0-908336-49-4 (online)*;
  - Road Controlling Authority (RCA) specifications;
  - Good Practice Guidelines for Excavation Safety* available at <https://worksafe.govt.nz/topic-and-industry/excavation/excavation-safety-gpg/>;
  - and any subsequent amendments and replacements.
- 4 References
  - Australian standards (AS) may be found at [www.standards.org.au](http://www.standards.org.au);
  - Australian/New Zealand standards (AS/NZS) may be found at [www.standards.govt.nz](http://www.standards.govt.nz).

- 5 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.
- 6 **Definitions**  
*Company procedures* mean the documented methods for performing work activities, and include health and safety, operational, environmental, and quality management requirements. They may refer to legislation, regulations, guidelines, standard operating procedures, manuals, codes of practice, or policy statements.  
*Contract specifications* refer to plans, diagrams, and special technical conditions. They do not include special administrative conditions.  
*Immediate environment* refers to the environment in which the work is taking place such as inner city, suburban, or rural, and may include the presence of nearby structures such as power poles and foundations.  
*Road Controlling Authority (RCA)* refers to New Zealand Transport Agency network, local authority requirements and service providers.
- 7 **Range**  
*Excavation* may include – by hand, hydrovac machines, or mechanical excavators. This unit does not include thrusting (by soil displacement hammer) or directional drilling.

## Outcomes and performance criteria

### Outcome 1

Demonstrate knowledge of excavation, backfill and compaction for a gas network.

### Performance criteria

- 1.1 Requirements and specifications for excavation, backfill and compaction are described.
- Range RCA requirements, network drawings, utility plans, permits, consents, approvals, easements, compaction rates and layers, specified materials, bedding material, pipeline protection, separation.
- 1.2 Methods of excavation and compaction are described.
- Range excavation – by hand, hydrovac machines, mechanical excavators; compaction – by hand, tamper, plate compactor.
- 1.3 Hazards associated with excavation, backfill and compaction are described.
- Range hazards may include – live gas, other utilities, noise, working in excavations, deep excavations, confined spaces, groundwater, plant and equipment, excavation machinery, ground conditions, weather, vehicles, general public, vibration; evidence of six hazards is required.

**Outcome 2**

Prepare for excavation operations for a gas network.

**Performance criteria**

- 2.1 Job instructions are sourced and confirmed.
- Range may include – RCA requirements, network drawings, utility plans, permits, consents, approvals, easements.
- 2.2 Overhead and underground utilities are identified, located and marked.
- 2.3 Potential environmental and safety hazards are identified and controlled.
- Range hazards may include – live gas, other utilities, noise, working in excavations, deep excavations, confined spaces, groundwater, plant and equipment, excavation machinery, ground conditions, weather, vehicles, general public; evidence of six hazards is required; controls may include – gas detection underground services location and protection, touch mitigation, personal protective equipment, signage, barriers, exclusion zones, safe access and egress, shoring, de-watering, temporary traffic control, communication with operator; evidence of six different controls is required.

**Outcome 3**

Excavate for a gas network.

**Performance criteria**

- 3.1 Excavation is carried out taking into account ground conditions and immediate environment, and the excavation is shored or otherwise stabilised.
- 3.2 Groundwater is controlled without destabilising the excavation.
- 3.3 Overhead and underground utilities are adequately protected.

**Outcome 4**

Backfill and compact for a gas network.

**Performance criteria**

- 4.1 A check is made to ensure backfill material meets contract specifications or RCA requirements as required, and any discrepancies are reported.
- 4.2 Backfill material is placed and compacted in accordance with RCA requirements or contract specifications as required.

**Outcome 5**

Carry out final preparation prior to surface reinstatement.

**Performance criteria**

5.1 Surface reinstatement and final preparation requirements are confirmed.

5.2 Final preparation prior to surface reinstatement is carried out.

Range may include – RCA requirements, contract specifications, landowner, easement conditions.

<b>Planned review date</b>	31 December 2024
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	27 February 2020	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0014
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**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.