Title	Demonstrate knowledge of pumps used in water reticulation			
Level	4	Credits	5	

Purpose	People credited with this unit standard are, for water reticulation, able to: describe pumps; describe the use of pumps and the effects of pump delivery rates; identify and describe pump arrangements; and demonstrate knowledge of the control of pumps.

Classification	Water Industry > Water Reticulation	
Available grade	Achieved	

#### **Guidance Information**

- 1 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable legislative and industry requirements.
- 2 Legislation relevant to this unit standard includes: Health and Safety at Work Act 2015, Water Services Act 2021, and subsequent amendments.
- 3 Definitions

*Industry requirements* may refer to but are not limited to relevant policies, processes, methodologies, industry codes of practice, site specific health and safety plans, standard operating procedures, site safety plans, quality plans, work plans, traffic management plans, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer's requirements, contract specifications, manuals, procedural documents, Waka Kotahi New Zealand Transport Agency specifications and guidelines.

*Water reticulation* – in this context refers to all pipe systems, pumping systems, and components that contribute to the distribution of water, and collection and disposal of wastewater and stormwater.

# **Outcomes and performance criteria**

#### Outcome 1

Describe pumps used in water reticulation.

## Performance criteria

1.1 Pumps are described in terms of their mechanical components, and planned maintenance requirements.

Range impellor and body materials, pump mounting, motor and control systems, alternative power supply.

### Outcome 2

Describe the use of pumps and the effects of pump delivery rates in water reticulation.

#### Performance criteria

- 2.1 The use of pumps to recover hydraulic fall is described in terms of energy and ground level.
- 2.2 The effects of pump delivery rates are described in terms of fixed and dynamic heads.
  - Range includes but is not limited to pump head-discharge curves, system head curves, control valve, well levels, suction pressure requirement.

## Outcome 3

Identify and describe pump arrangements for water reticulation.

#### Performance criteria

- 3.1 The options for pump and motor siting are identified and described in terms of wet and/or dry well arrangements, and in-line configuration.
  - Range may include but is not limited to suction and delivery head issues, flooding, settling or suspension of solids, flooding of stations, pipework options, station visibility, pipe station and reservoir siting options; evidence is required for three options.
- 3.2 The options for the number of pump sets are identified and described in terms of flow rates and space requirements.
  - Range includes but is not limited to inflow and outflow variability, standby requirements.
- 3.3 Ancillary equipment required is identified and described in terms of function and siting.
  - Range includes but is not limited to washdown hoses, electrical supply, valve siting, control equipment, air venting.

# Outcome 4

Demonstrate knowledge of the control of pumps used in water reticulation.

## Performance criteria

- 4.1 Normal duty pump control and control systems are described in terms of operating levels and duty or standby setting.
- 4.2 Pump station and reservoir size effects on pump operations are identified and described in terms of start frequency.

Planned review date	31 December 2026

#### Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 October 2005	31 December 2016
Rollover and Revision	2	20 February 2009	31 December 2016
Rollover	3	21 July 2011	31 December 2018
Review	4	16 March 2017	31 December 2023
Review	5	24 March 2022	N/A

Consent and Moderation Requirements (CMR) reference0101This CMR can be accessed at <a href="http://www.nzga.govt.nz/framework/search/index.do">http://www.nzga.govt.nz/framework/search/index.do</a>.

## Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at <u>qualifications@waihanga.nz</u> if you wish to suggest changes to the content of this unit standard.