Title	**Demonstrate and apply knowledge of tidal and depth measurement theory**		
Level	**4**	**Credits**	**15**

Purpose	People credited with this unit standard are able to: – demonstrate knowledge of tidal fundamentals, tidal measurement and datums; – explain the principles, capabilities, and limitations of depth measurement equipment; – install, configure, and calibrate a digital tide gauge; and – analyse and report tidal information.

Classification	Surveying > Hydrography

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 relevant legislative and industry requirements.

2 Legislation and references relevant to this unit standard include:
- Health and Safety at Work Act 2015;
- HYSPEC Contract Specification for Hydrographic Surveys Version 2.0, Land Information New Zealand (LINZ), available at https:www.linz.govt.nz;
- Standards of Competence For Category “B” Hydrographic Surveyors S-5B, available at https://iho.int/.

3 Definition
Industry requirements may refer 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, contract work programmes, job safety analysis, safe work method statements, job instructions, manufacturer’s requirements, contract specifications, manuals, procedural documents, and guidelines.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of tidal fundamentals.

Performance criteria

1.1 Tide generating forces are explained.

1.2 Causes of temporal and spatial effects on water level are explained.

Range atmospheric pressure, wind, seiches, precipitation, shape of coast, estuarine, inland waterway topography.

1.3 Modifying influences that affect the tide are explained.

1.4 Different types of tide are identified and explained.

1.5 Different tidal levels are defined.

Range Chart Datum (CD), Sounding Datum (SD), Lowest Astronomical Tide (LAT), Highest Astronomical Tide (HAT), Mean High Water Springs (MHWS), Mean Low Water Springs (MLWS), Mean High Water Neaps (MHWN), Mean Low Water Neaps (MLWN), Mean Sea Level (MSL).

1.6 Global Navigation Satellite System (GNSS) tide theory is explained.

1.7 Transfers of sounding datum and harmonic analysis are explained.

1.8 Tide stream, currents and two current measurement techniques are explained.

Outcome 2

Demonstrate knowledge of tidal measurement and datums.

Performance criteria

2.1 Methods of tidal measurement and their recording are described.

Range two methods of tidal measurement.

2.2 Installation, collection, and calibration of tidal data using digital or GNSS tide methodology is explained.

2.3 Tidal streams and currents are explained in terms of the methodology used in data collection.

2.4 Tidal datums, and how to reference tidal datums to a land benchmark, are described.

2.5 Accuracies for each component part of the tidal measurement are described.

Outcome 3

Explain the principles, capabilities, and limitations of depth measurement equipment.

Performance criteria

3.1 Principles, capabilities, and limitations of depth measurement equipment are explained.

Range Single Beam Echo Sounder (SBES), Multi Beam Echo Sounder (MBES), Light Detection and Ranging (LiDAR), remote sensing, satellite remote sensing.

Outcome 4

Install, configure, and calibrate a digital tide gauge.

Performance criteria

4.1 Digital tide gauge is configured.

4.2 Digital tide gauge is installed.

4.3 Digital tide gauge is calibrated.

Outcome 5

Analyse and report tidal information.

Performance criteria

5.1 Water levels at a main and secondary port are predicted using tide tables.

5.2 Water levels are analysed and reported.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 November 2015	31 December 2022
Review	2	27 May 2021	N/A

Consent and Moderation Requirements (CMR) reference	0101

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Connexis - Infrastructure Industry Training Organisation qualifications@connexis.org.nz if you wish to suggest changes to the content of this unit standard.