Title	**Make calculations in rigging work and use graphic techniques to calculate measurements applicable to rigging**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to: calculate areas and volumes, weights, and forces, in rigging work; and use graphic techniques in the calculation of measurements applicable to rigging.

Classification	Lifting Equipment > Core Rigging

Available grade	Achieved

Guidance Information

1 All tasks must be carried out in accordance with the industry good practice based on:
- a quality management systems (of the employer);
- b designer's requirements and manufacturers' operating instructions; and government and local government legislation, regulations, bylaws, Health and Safety at Work Act 2015, and New Zealand Standards;
- c the most up to date version of the *Approved Code of Practice for Load-lifting Rigging* is available online from: https://worksafe.govt.nz/topic-and-industry/load-lifting-and-rigging/, and all subsequent amendments and replacements.

2 Evidence should be gathered in a rigging context and cover common rigging arrangements. It is intended that calculations will be made using common mathematical formulae.

3 Definitions
Rigging – as defined in the *Approved Code of Practice for Load-Lifting Rigging*.
Rigging arrangements are slings, spreader bars, chains, turfers or other pieces of equipment rigged or set up to lift or move a load.

4 Range
Rigging may include but is not limited to - the use of mechanical load-shifting equipment and associated gear to move, place, and secure loads including plant, equipment, or structural members, and includes the setting up and dismantling of cranes, hoists, and other lifting appliances.

Outcomes and performance criteria

Outcome 1

Calculate areas and volumes applicable to rigging.

Performance criteria

1.1 The areas of two-dimensional objects evident in rigging work are calculated.

Range rectangle, triangle, parallelogram, circle, sector.

1.2 The volumes of three-dimensional objects evident in rigging work are calculated.

Range cube, regular prism, cylinder, pyramid, sphere.

Outcome 2

Calculate the weights of three-dimensional objects applicable to rigging.

Performance criteria

2.1 Weights are calculated by applying values of mass of various materials.

Range objects include but are not limited to – rectangular solid shape, solid cylinder, heavy-walled hollow cylinder, rolled steel joist, complex shape made up of primary shaped objects;
the mass of materials to be applied include but is not limited to – concrete, timber, steel, liquid filled.

Outcome 3

Calculate forces acting on rigging arrangements.

Performance criteria

3.1 Forces are calculated where the pivot point is between two acting forces, and where one value for forces and distances to the pivot are known.

3.2 Forces are calculated where the pivot point is not between two acting forces, and where one value for forces and distances to the pivot are known.

Outcome 4

Use graphic techniques in the calculation of measurements applicable to rigging.

Performance criteria

4.1 Static rigging arrangements are drawn showing lengths, angles, and forces.

4.2 Measurements for rigging work are calculated and confirmed using graphic techniques.

Range may include but is not limited to – use of ratio and scale to determine lengths, angles, and forces in rigging arrangements.

Replacement information	This unit standard was replaced by skill standard 40492.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	22 October 2010	31 December 2020
Review	2	13 December 2018	31 December 2027
Review	3	27 March 2025	31 December 2027

Consent and Moderation Requirements (CMR) reference	0183

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