Title	**Loft a boat hull**		
Level	**4**	**Credits**	**10**

Purpose	People credited with this unit standard are able to: lay out a lofting grid; prepare for drawing full sized hulls; produce full sized hull drawings; develop transoms and stems; and lift bevels from loftings and deduct planking thickness.

Classification	Boating Industries > Boatbuilding

Available grade	Achieved

Guidance Information

1 All work practices must meet recognised codes of practice and documented worksite health and safety procedures (where these exceed code) for personal, product, and worksite health and safety, and must meet the obligations required under the Health and Safety at Work Act 2015, Health and Safety in Employment Regulations 1995, and Resource Management Act 199, and any subsequent amendments.

2 Definitions
Corrected offsets refers to offsets that have been corrected during the lofting process so that they define a smooth and fair interpretation of a boats shape without abnormalities.
Datum lines refers to key reference lines used in boat lofting from which measurements are taken, typically consisting of Forward Perpendicular (FP), centreline and a reference waterline.
Design requirements refers to requirements determined by designer's plans and associated table of offsets.
Fair refers to smooth and without noticeable abnormalities.
Incorrect offsets refers to offsets that have been lifted from the lines plan prior to lofting but have not been corrected during the lofting process.
Grid lines refers to straight lines drawn out in the initial stages of the lofting, which form a grid along which the offsets are plotted or intersections checked.
Job specifications refers to the standard requirements of the job being undertaken.
Laying out refers to drawing out lines on the lofting.
Lift refers to taking an angle or lineal measurement from a part of the lofting.
Lines refers to the collection of curved lines that represent a vessel's shape in two dimension. These are drawn to a suitable scale and later drawn out or 'lofted'.
Lofting refers to a process of drawing out the lines of a vessel full size or near full size to enable information about the shape of the boat to be obtained so that the boat can be built the finished full size (or large scale) drawing of a vessel.
Table of offsets refers to a table of measurements that enable the shape of the vessel to be drawn. Offsets are measured by the designer from the lines plan using the same scale as the lines plan.

3 This unit standard assesses traditional non computerised lofting of boats, and drawing full sized boat components from offsets supplied by boat designers.

Outcomes and performance criteria

Outcome 1

Lay out a lofting grid.

Performance criteria

1.1 Materials, tools, space, and equipment are selected in accordance with job specifications.

Range includes – selection of straight edges, materials selected to achieve true floor lofting, tools used to layout lofting floor.

1.2 Floor is confirmed as being clean and true before proceeding to laying out.

1.3 Provided offsets are interpreted to establish the required grid dimensions and datum lines.

1.4 Layout is progressively checked in accordance with job specifications.

Range right angles, lengths, dimensions.

1.5 Grid is square, and dimensionally and proportionally accurate in accordance with job specifications.

Outcome 2

Prepare for drawing full sized hulls.

Performance criteria

2.1 Drawing materials, tools, space, and equipment are selected in accordance with job specifications.

Range includes but is not limited to – MDF sheets, tape, pencils, lofting floor, battens.

Outcome 3

Produce full sized hull drawings.

Range includes but is not limited to – buttocks, waterlines, sections, diagonals (for round bilge hull);
evidence is required for one hard chine hull and one round bilge hull.

Performance criteria

3.1 Lofted lines are consistent in line weight in accordance with job specifications and design requirements.

3.2 Faired lines cross grid lines in all three views at the correct corresponding points in accordance with job specifications.

3.3 Drawn lines correspond to supplied offsets as closely as possible while being fair.

3.4 Incorrect offsets are identified and corrected.

Outcome 4

Develop transoms and stems.

Range may include – flat transoms, curved transoms.

Performance criteria

4.1 Transoms are developed correctly in accordance with job specifications.

Range grid, and apparent shape on half breadth view.

4.2 Stem sections are developed correctly in accordance with job specifications.

Range in two locations, showing ghost line and stem face.

Outcome 5

Lift bevels from loftings and deduct planking thickness.

Performance criteria

5.1 Bevels are lifted from loftings in accordance with job specifications.

Range recording bevels from the lofting on board, recording multiple bevels from lofting (bevel board concept).

5.2 Planking thicknesses are determined from the drawings and deducted correctly.

5.3 Influence of variation in thickness of planking is described in terms of planking thickness deductions.

5.4 Influence of variation of angle of planking in relation to adjacent frames is described in terms of planking thickness deductions.

Replacement information	This unit standard replaced unit standard 10837, unit standard 10838, and unit standard 10842.

Planned review date	31 December 2027

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 October 2006	31 December 2017
Review	2	19 January 2017	31 December 2024
Review	3	25 August 2022	N/A

Consent and Moderation Requirements (CMR) reference	0136

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

Comments on this unit standard

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.