

# NATIONAL CERTIFICATE IN BOATBUILDING STEEL (Level 4)

302 CREDITS Version 5

An apprentice completing this NZQA accredited qualification will gain the knowledge and skills required to be Marine Industry recognized and qualified as a competent **Steel Boatbuilder**.

In this qualification, apprentices gain a comprehensive and detailed understanding of all aspects of steel construction.

This qualification covers boat drawing, lofting techniques, pattern making, building boats of all sizes, and how to complete accurate calculations.

Construction of the frames through to completion of the hull and superstructure are all covered in detail as are welding, cutting, shaping/fabricating fitting of interior/exterior components, and the correct use of all boatbuilding tools.

Steel has great strength compared to other boatbuilding mediums and can be worked easily and fitted to a wide range of applications. For these reasons smaller commercial boats (ferries, fishing boats) are often built from steel as are larger vessels and superyachts.

This qualification takes, on average 4.5 to 5.5 years to complete.



Aaron Malfait

Aaron Malfait decided to become a boatbuilder after he and his parents had talked to one of the NZ Marine ITO field officers at a boatshow. He started off studying composite boatbuilding, but changed over to the National Certificate in Boatbuilding (Steel) after his company McMullen and Wing, received orders for two steel boats.

He enjoys learning and using the different welding techniques and the feeling of accomplishment on seeing a large piece of steel that he has worked on fitted into place.

In future Aaron wants to do the 'Alloy' qualification and after that the Level 5 Diploma.

*'You are only as hard as the material you work with'*  
– Aaron Malfait

## NATIONAL CERTIFICATE IN BOATBUILDING (STEEL) Level 4 (Version 5)

### Unit Standard Content

| Unit Number | Unit Title   | Level | Credit Value |
|-------------|--|-------|--------------|
| 414         | Demonstrate knowledge of the distribution environment  | 2     | 4            |
| 2671        | Weld steel structures in the downhand positions using the manual metal arc welding process                             | 3     | 6            |
| 2672        | Weld steel in the downhand positions to a general purpose industry standard using the gas metal arc welding process    | 3     | 6            |
| 2673        | Weld steel structures in the downhand positions using the gas metal arc and flux cored arc welding processes           | 3     | 6            |
| 2682        | Weld steel in the downhand positions to a general purpose industry standard using the manual metal arc welding process | 3     | 6            |
| 2683        | Cut metals using manual thermal processes  | 3     | 4            |
| 2684        | Weld steel structures in all positions using the gas metal arc or flux cored arc welding processes                     | 4     | 10           |
| 2685        | Weld steel structures in all positions using the manual metal arc welding process                                      | 4     | 10           |
| 5433        | Demonstrate knowledge of electrical and electronic applications for marine use   | 4     | 8            |
| 9913        | Demonstrate a knowledge of the New Zealand marine industry   | 2     | 3            |
| 9917        | Demonstrate knowledge of boatbuilding methods  | 2     | 4            |
| 9922        | Produce templates and patterns used in boatbuilding  | 3     | 4            |
| 9923        | Install internal and external boat hardware fittings   | 4     | 4            |
| 9933        | Install exterior boat joinery, modules and components  | 4     | 10           |
| 9946        | Assemble multiple and complex metal boat components for joining  | 4     | 10           |
| 9949        | Identify the characteristics of steels relevant to boatbuilding  | 2     | 2            |
| 10836       | Produce scale drawings of boat surfaces from corrected offsets   | 2     | 6            |
| 11789       | Prepare steel substrates for marine surface coatings   | 4     | 5            |
| 18158       | Select, use and care for hand tools used in boatbuilding   | 2     | 5            |
| 18159       | Select, use and care for portable power tools used in boatbuilding   | 2     | 5            |
| 18160       | Operate mechanical plant used in boatbuilding  | 2     | 12           |
| 18161       | Perform measurements and calculations used in boatbuilding   | 2     | 5            |
| 18162       | Calculate quantities and costs for boatbuilding projects   | 3     | 4            |
| 18163       | Demonstrate a knowledge of boatbuilding construction drawings and produce related freehand sketches                    | 3     | 2            |
| 18164       | Demonstrate knowledge of insulation and install insulation in boats  | 3     | 2            |
| 18165       | Demonstrate knowledge of computer technology used in the boating industry  | 3     | 6            |
| 18166       | Participate in a project team in the boating industry  | 2     | 4            |
| 18170       | Contribute to a project team in the boating industry   | 3     | 3            |
| 21907       | Demonstrate and apply knowledge of safe welding procedures under supervision   | 2     | 3            |
| 23035       | Describe and install boat tankage systems  | 3     | 6            |
| 23241       | Loft a boat hull   | 4     | 10           |
| 23242       | Loft full sized decks and superstructures  | 4     | 6            |
| 23243       | Identify and explain the causes and prevention of material deterioration in the marine environment                     | 4     | 8            |
| 23244       | Identify and apply health and safety procedures for the boatbuilding industry  | 3     | 4            |
| 25075       | Perform basic fabrication operations under supervision   | 2     | 12           |
| 25113       | Describe filling and fairing technology used in boatbuilding   | 3     | 4            |
| 25115       | Describe, install and test plumbing systems in boats   | 3     | 6            |
| 25116       | Lift, support and move boats and components  | 3     | 8            |
| 25157       | Build metal boat framework under supervision   | 3     | 20           |
| 25343       | Identify boat fittings and fastenings  | 2     | 4            |
| 25344       | Demonstrate knowledge of marine trades and expectations of employees   | 2     | 3            |
| 25345       | Demonstrate knowledge of terminology used in the marine industry   | 2     | 6            |
| 25874       | Lay out and mark off light fabrication shapes  | 4     | 15           |
| 26542       | Demonstrate basic knowledge of the operation of recreational craft by day  | 2     | 6            |

Continued on next page

**Elective Unit Standard Content** Plus at least **25** credits from the following list:

| Unit Number | Unit Title  | Level | Credit Value |
|-------------|---|-------|--------------|
| 2674        | Weld stainless steel plate in the downhand positions using the gas metal arc and flux cored arc welding processes | 3     | 6            |
| 2676        | Weld stainless steel sheet using the gas tungsten arc welding process   | 3     | 6            |
| 2677        | Weld aluminium in the downhand positions using the gas tungsten arc welding process                               | 3     | 6            |
| 2687        | Weld stainless steel sheet and plate in all positions using the gas metal arc or flux cored arc welding process   | 4     | 10           |
| 2688        | Weld stainless steel tube using the gas tungsten arc welding process  | 4     | 12           |
| 2689        | Weld aluminium in all positions using the gas tungsten arc welding process  | 4     | 10           |
| 5231        | Use constructions and make drawings for geometrical situations  | 1     | 2            |
| 9931        | Overlay boat deck with teak   | 4     | 15           |
| 9937        | Install interior and exterior boat systems  | 4     | 10           |
| 10841       | Produce a half model of a small craft to scale  | 4     | 10           |
| 10843       | Mark out full sized boat components from loftings and computer generated mylars                                   | 3     | 2            |
| 11777       | Install production inboard engine packages in boats   | 3     | 6            |
| 11778       | Install and test custom power plants and power trains   | 4     | 20           |
| 18171       | Demonstrate knowledge of spars and rigging  | 3     | 5            |
| 23038       | Form and shape compound aluminium plate for boats   | 4     | 10           |
| 25152       | Apply 2D CAC/CAM in boatbuilding  | 4     | 5            |
| 25153       | Describe computerized manufacturing processes used in boatbuilding  | 4     | 3            |
| 25698       | Form and shape light fabrication materials  | 4     | 20           |
| 25700       | Assemble and join light fabrication materials   | 4     | 20           |

