

## Overview

This standard identifies the competences you need to site, level and align marine structural units, in accordance with instructions and approved procedures. You will be required to interpret specifications and drawings correctly, prepare the site in readiness for the assembly activities, identify the correct structural fabrications and follow the build strategy procedures to level and align the units. The units/structures to be sited and levelled will cover such items as double bottoms, deck panels and floors, hull unit structures, tube/pipe trusses, posts, pillars and columns, cantilevers, bulkheads and firewalls, girders/transverses, tanks/containers, platforms and seating and minor assemblies/sub-assemblies. You will be required site and make safe the various parts of the structure, using suitable supports and mechanical fastenings.

Your responsibilities will require you to comply with organisational policy and procedures for the marine structure sighting and levelling activities to be undertaken and to report any problems with the activities, tools, equipment or materials used that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will be sufficient to provide a good understanding of your work and will provide an informed approach to applying sighting and levelling techniques to marine structures. You will understand the sighting, levelling and alignment techniques used and the requirements of the build strategy, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that structures are sighted and levelled to the required specification.

You will understand the safety precautions required when lifting and handling marine structures and components and when using the associated tools and equipment. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

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## Performance criteria

### *You must be able to:*

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant instructions, assembly drawings and any other specifications
3. ensure that the specified components are available and that they are in a usable condition
4. use the appropriate methods and techniques to align and level the assembly components in their correct positions
5. secure the components using the specified connectors and securing devices
6. check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
7. deal promptly and effectively with problems within your control and report those that cannot be solved
8. complete relevant documentation in line with organisational procedures

## Knowledge and understanding

### *You need to know and understand:*

1. the specific safety precautions to be taken when working in a marine structural assembly environment and when producing marine major structural assemblies (such as general site safety, appropriate personal protective equipment, accident procedure; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)
2. the personal protective equipment (PPE) to be worn when carrying out the levelling and alignment activities (such as leather gloves, eye protection, safety helmets, ear protection)
3. safe working practices and procedures for producing marine structural assemblies
4. the correct methods of moving or lifting bulky and heavy components and fabrications
5. the hazards associated with levelling and aligning marine fabrications (such as using dangerous or badly maintained tools and lifting equipment; lifting and handling long and heavy components; cuts, slips trips and falls) and how they can be minimised
6. how to obtain the necessary drawings and build specifications
7. how to extract information from engineering drawings and related build specifications (to include symbols and conventions to appropriate BS or ISO standards) in relation to work undertaken
8. how to interpret marking out conventions (such as centre lines, datum lines, check marks, water lines, buttock lines and reference points)
9. how to carry out currency/issue checks of the specifications you are working with
10. the preparations to be carried out on the components prior to levelling and aligning them
11. the lifting and handling equipment to be used, and how to check that it is in a safe and usable condition
12. how to set up and align the various component, and the tools and equipment to be used (such as spirit levels, dumpy levels, laser alignment and levelling equipment, water levels, theodolite and clinometers)
13. methods of supporting the structures in the correct position and for temporarily holding the joints together to aid the assembly activities (such as jigs, clamps, rivet

clamps, jacks and wedges)

14. the use and care of tools and equipment and their control procedures
15. the importance of using tools or equipment only for the purpose intended; the care that is required when using the tools or equipment; the proper way of preserving tools or equipment between operations
16. the problems that can occur when carrying out the levelling and alignment activities and how these can be avoided
17. inspection techniques that can be applied to check that shape (including straightness) and dimensional accuracy are to specification and within acceptable limits
18. the extent of your own authority and whom you should report to if you have problems that you cannot resolve

## Scope/range related to performance criteria

1.

Carry out **all** of the following during the alignment and levelling operations:

- 1.1 correctly prepare the work area where the structures are to be erected
- 1.2 obtain and correctly set up the alignment and levelling instruments
- 1.3 identify and prepare the components and faces to be joined
- 1.4 work to the required quality specifications

2.

Align and/or level **three** of the following marine structural assemblies:

- 2.1 double bottom units
- 2.2 deck panels/floors
- 2.3 hull unit structure sections
- 2.4 tube/pipe trusses
- 2.5 posts/pillars/columns
- 2.6 cantilevers
- 2.7 bulkheads and firewalls
- 2.8 girders/transverses
- 2.9 tanks or containers
- 2.10 seating/platforms
- 2.11 minor assemblies/sub-assemblies

3.

Use **three** of the following reference points to correctly align and level the various fabrications:

- 3.1 centre lines
- 3.2 datum lines
- 3.3 check marks
- 3.4 water lines
- 3.5 buttock lines
- 3.6 reference points

4.

Carry out the alignment and levelling operations, using **two** of the following instruments:

- 4.1 dumpy level
- 4.2 laser level
- 4.3 spirit level
- 4.4 water line
- 4.5 theodolite
- 4.6 clinometers

5.

Use **three** of the following to position, align and hold structural components:

- 5.1 hydraulic jacks
- 5.2 mechanical jacks
- 5.3 bottle screws

- 5.4 crossbars
- 5.5 tack welding
- 5.6 mechanical fasteners
- 5.7 support frames
- 5.8 fairing aids
- 5.9 levers
- 5.10 stiffeners
- 5.11 screw props
- 5.12 clamps

6.

Produce marine structural assemblies which meet **all** of the following requirements:

- 6.1 all assemblies are correctly levelled and aligned in accordance with the specification
- 6.2 overall dimensions are within specification tolerances
- 6.3 assemblies meet appropriate geometric tolerances (square, straight, angles, free from twists)
- 6.4 where appropriate, pitches of erection holes meet specification requirements
- 6.5 completed assemblies are secure and safe

## Behaviours

### **Behaviours:**

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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Siting and levelling for the assembly of marine structures



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