

Marking off marine structural steelwork components

Overview

This standard identifies the competences you need to mark off plate and rolled sections, in accordance with approved procedures. You will be required to select the materials, the appropriate marking out tools and equipment, based on the information presented to you and the accuracy to be achieved. Marking out will be the preparation required for cutting, shaping and forming of plate and sections, as appropriate to the application and could include marking out workpiece datums, centre lines, angles, curved details, bending details including bending allowances and hole centring and outlining details.

Materials to be marked out may include ferrous, non-ferrous and non-metallic. Certain materials may require you to take the grain flow into account, to avoid later production process problems.

Your responsibilities will require you to comply with organisational policy and procedures for the marking-off activities undertaken and to report any problems with the materials, equipment or marking-off activities that you cannot resolve yourself, 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 produce.

Your underpinning knowledge will provide a good understanding of your work and will provide an informed approach to applying marking-off procedures in a marine fabrication environment. You will understand the marking-off process, and its application and will know about the materials as well as the care and use of tools, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety procedures required when using marking mediums and when carrying out the marking-off activities. You will be required to demonstrate safe working practices throughout and will understand the responsibilities you owe to yourself and others in the workplace.

Marking off marine structural steelwork components

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. obtain and use the correct information for marking out
3. obtain the appropriate marking out equipment and check that it is in a usable condition
4. prepare suitable datum's and marking out surfaces
5. mark off components using appropriate methods
6. check that the marking-off complies with the specification
7. deal promptly and effectively with problems within your control and report those that cannot be resolved
8. complete relevant documentation in line with organisational procedures

Marking off marine structural steelwork components

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken when carrying out marking-off activities in a marine fabrication environment and when using plate or rolled section materials, both on land and on board vessels (including general workshop and site safety, appropriate personal protective equipment, accident procedure; statutory regulations, risk assessment procedures and COSHH regulations)
2. the personal protective clothing and equipment (PPE) that needs to be worn when carrying out the marking-off activities
3. the correct methods of moving or lifting plate and rolled section materials
4. the hazards associated with marking off fabricated components (such as working in a marine fabrication environment, lifting and handling plate/fabricated components, slivers/burrs on plate materials, using marking-out mediums, using laser marking-out equipment) and how they can be minimised
5. the procedures to be adopted to obtain the necessary drawings and job instructions
6. how to extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards), in relation to work undertaken
7. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
8. how to carry out currency/issue checks of the specifications you are working with
9. how to produce a three dimensional shape from the two dimensional material
10. the preparations to be carried out on the material prior to marking out, to enhance clarity, accuracy and safety
11. principles of marking out; developing basic shapes (including flat, rectangular and cylindrical) from flat plate or rolled section materials
12. the various marking-out tools and equipment that can be used to mark off straight lines, angles, circles and profiles
13. use of marking-out conventions, datum edges/lines and centre lines
14. ways of laying out the shapes/patterns to maximise the use of plate or sheet material
15. methods of marking out large or long shapes
16. marking out and transferring information from templates
17. the calibration/care and control procedures for tools and equipment
18. the need for clear and dimensional accuracy in marking out to specifications/drawings
19. the problems that can occur in marking out the marine components and how these can be avoided
20. the extent of your own responsibility and whom you should report to

Marking off marine structural steelwork components

if you have problems that you cannot resolve

Marking off marine structural steelwork components

Scope/range related to performance criteria

1. Mark off marine components on **two** materials from the following:

1. carbon steel plate
2. carbon steel sections/bars
3. aluminium
4. stainless steel
5. non-metallic materials
6. other specific material

2. Mark off plate or sections for **four** of the following components:

1. deck plates
2. shell plates
3. transverses/longitudinal girders
4. frames/longitudinals/stiffeners
5. bulkheads
6. intercostals/wash plates
7. beam knees/brackets
8. web supports
9. hull/deck penetrations
10. walkways/platforms

3. Mark off plate or section, using **eight** of the following:

1. scribe
2. punch
3. rule and tape
4. straight edge
5. square
6. protractor
7. dividers or trammels
8. chalk line
9. templates
10. laser
11. combination/tri squares
12. bevel gauge
13. profile gauges
14. french chalk
15. marker pen
16. other specific marking off process

4. Mark off material to include **five** of the following features:

1. datum and centre lines

Marking off marine structural steelwork components

2. square/rectangular profiles
 3. irregular shapes
 4. circles
 5. curved profiles
 6. bend guide lines
 7. angles
 8. hole centring and outlining (linear)
 9. hole centring and outlining (circular)
5. Produce marked-off components which meet **all** of the following standards:
1. company/client standards
 2. dimensionally accurate (to drawing or specification)
 3. clearly defined for required processes
 4. use recognised marking out conventions

Marking off marine structural steelwork components

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

Marking off marine structural steelwork components

Developed by	Enginuity
Version Number	3
Date Approved	28 Feb 2019
Indicative Review Date	28 Feb 2021
Validity	Current
Status	Original
Originating Organisation	Semta
Original URN	SEMME3049
Relevant Occupations	Marine Engineering Trades
Suite	Marine Engineering Suite 3
Keywords	engineering; marine; marking off; structures; steelwork; components; datum; centre line; bend allowance; profiles