
Overview

This standard identifies the competencies you need to cut and shape plate or section materials to produce structural steel components such as fishplates, gussets, brackets, support pads and bed plates, in accordance with approved procedures. You will be required to interpret drawings, mark out simple shapes and hole positions, cut out and shape plate and sections, drill and prepare structural components ready for the assembly of major structural components.

Your responsibilities will require you to comply with organisational policy and procedures for the marking out, shaping and preparation activities undertaken, and to report any problems with the interpretation, equipment used, materials or manufacturing activities that you cannot personal resolve, or are outside your permitted authority, to the relevant person. You will be expected to work to instructions, 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 structural steel shaping and fabrication procedures. You will have an understanding of the fabrication processes, the equipment and its application, and will know about the materials and how to produce structural component parts, in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when working with fabrication tools and machinery. 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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Producing structural steel ancillary components

Performance criteria

- You must be able to:*
- P1 work safely at all times, complying with health and safety and other relevant regulations and guidelines
 - P2 follow relevant specifications for the component to be produced
 - P3 obtain the appropriate tools and equipment for the shaping operations and check they are in a safe and usable condition
 - P4 shape the materials using appropriate methods and techniques
 - P5 check that all the required shaping operations have been completed to the required specification
 - P6 deal promptly and effectively with problems within your control and report those that cannot be solved

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Knowledge and understanding

You need to know and understand:

- K1 the specific safety precautions to be taken when working in a fabrication environment and when cutting plate or rolled sections to shape (general workshop and site safety, appropriate personal protective equipment (PPE), accident procedure; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)
- K2 the personal protective clothing and equipment to be worn when carrying out the fabrication activities (such as leather gloves, eye/ear protection, safety helmets)
- K3 the correct methods of moving or lifting plate and rolled section materials
- K4 safe working practices and procedures to be observed when using manual and power-operated tools
- K5 the hazards associated with fabrication work (such as using dangerous or badly maintained tools and equipment; operating shearing machines; handling plate and fabricated components; using hot metal techniques), and how they can be minimised
- K6 the procedures for obtaining the necessary drawings and specifications, and how to check that they are the latest issue
- K7 how to use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate British, European or relevant International standards in relation to work undertaken)
- K8 the preparations to be carried out on the material prior to marking out, to enhance clarity, accuracy and safety
- K9 principles of marking out, and the tools and equipment that are used
- K10 use of marking out conventions (such as datums, cutting detail, centre lines)
- K11 ways of laying out the shapes/patterns to maximise the use of plate or sheet materials
- K12 marking out and transferring information from templates, and how to transfer information to the underside of the plate
- K13 the tools and techniques available for cutting and shaping plate and section materials (such as shearing machines, saws, burning equipment, drills)
- K14 the use and care of tools and equipment, including checks that need to be made to ensure that the tools are fit for purpose (cutting tools are sharp and undamaged; plugs and cables secure and free from damage; machine guards or safety devices operating correctly)
- K15 how to produce weld preparations, and the type of preparations required for different joints and material thicknesses
- K16 adjusting tools and equipment including the use of backstops on

guillotines

- K17 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
- K18 safety and control procedures for shaping plate and rolled steel sections
- K19 the problems that can occur with cutting and shaping plate and section materials, and how these can be avoided
- K20 the use of machine guards and safety protection equipment
- K21 inspection techniques that can be applied to check that shape and dimensional accuracy is to specification and within acceptable limits
- K22 the extent of your own authority and whom you should report to if you have problems that you cannot resolve
- K23 reporting lines and procedures, line supervision and technical experts

Additional Information

Scope/range related to performance criteria

- You must be able to:*
1. ensure that you carry out all of the following during the manufacturing activities:
 - 1.1 use the tools and equipment safely and correctly and only for its intended purpose
 - 1.2 mark out the components accurately using recognised conventions
 - 1.3 set up and hold the components firmly during the shaping operations
 - 1.4 use approved and safe cutting and shaping methods at all times
 - 1.5 produce the components to the correct size and shape
 - 1.6 ensure all holes are of the correct size and are at the correct centres for fixings
 2. cut and shape material to the marked-out shape, using three of the following methods:
 - 2.1 shearing/cropping
 - 2.2 sawing
 - 2.3 burning
 - 2.4 drilling
 - 2.5 bending
 3. produce structural steel components, to include three of the following:
 - 3.1 fishplates
 - 3.2 flanges
 - 3.3 gussets
 - 3.4 bed plates
 - 3.5 brackets
 - 3.6 tie bars
 - 3.7 support pads
 - 3.8 stiffening plates
 4. produce structural steel components from both of the following:
 - 4.1 steel plate (3mm or greater thickness)
 - 4.2 rolled steel section
 5. produce structural steel components which are cut and shaped to meet all the following quality and accuracy standards:
 - 5.1 company/customer standards requirements
 - 5.2 dimensionally accurate (to drawing or specifications)
 - 5.3 free from distortion
 - 5.4 free from sharp edges, slivers or burrs

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Developed by	SEMTA
Version number	2
Date approved	December 2011
Indicative review date	December 2016
Validity	Current
Status	Original
Originating organisation	SEMTA
Original URN	SEMFWE241
Relevant occupations	Engineering and manufacturing technologies; engineering; metal forming, welding and related trades
Suite	Fabrication and welding suite 2
Key words	engineering; welding; fabrication; manufacture; ancillary components; structures; shearing; cropping; brackets; stiffening plates