SEMFWE342

# Producing major structural components/sub-assemblies

## Overview

This standard identifies the competencies you need to produce major structural components/sub-assemblies such as beams, columns, portals, roof trusses, lattice braced framework, castellated beams using sections and fabricated components to specification and in accordance with approved procedures. You will be required lay out and secure parts of the structure for welding or fixing using mechanical fastenings in the correct order, and ensuring they are assembled in a manner that is fit for purpose.

Your responsibilities will require you to comply with organisational policy and procedures for the manufacture and assembly of the fabricated structures and the associated activities to be undertaken and to report any problems with the activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with minimum supervision, taking personal responsibility for your own actions and the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and provide an informed approach to producing structural components, their assembly and fixing procedures. You will understand the techniques used and the requirements of the manufacturing and assembling procedures and their application. You will know about the methods of producing structural components of the required strength, that are fit for purpose, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring the work output is produced to the required specification. You will understand the safety precautions required when working with structural components and their 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.

## 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 assemble the components in their correct positions
5. produce the structural components/sub-assemblies 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

## Knowledge and understanding

*You need to know and understand:*

1. the specific safety precautions to be taken when working in a fabrication environment and when producing structural components (general workshop and site safety, appropriate personal protective equipment (PPE), accident procedure; statutory regulations, risk assessment procedures and COSHH regulations)
2. the personal protective clothing and equipment that needs to be worn when carrying out the fabrication activities (such as leather gloves, eye protection, safety helmets, ear protection)
3. safe working practices and procedures needed for producing structural components
4. the workforce guards and safety protection equipment needed
5. the correct methods of moving or lifting heavy fabrications or rolled steel sections
6. the hazards associated with fabrication work and structural component operations and how they can be minimised (such using dangerous or badly maintained tools and equipment, lifting and handling log and heavy components, slips trips and falls)
7. how to obtain the necessary drawings and joining specifications
8. 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)
9. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
10. how to interpret marking out conventions (such as cutting lines, centre lines)
11. the preparations that need to be carried out on the components prior to assembling them
12. the various methods of securing the assembled components (the range of threaded fasteners used including close tolerance location bolts; tack welding methods and techniques; adhesive bonding of components)
13. how to set up and align the various components and the tools and equipment that is used
14. the material cutting characteristics and process considerations that need to be taken into account when producing structural components
15. the use and care of tools and equipment, and control procedures
16. 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

17. the problems that can occur when producing structural components/assemblies, and how these can be avoided
18. inspection techniques that can be applied to check shape (including straightness) and dimensional accuracy are to specification and within acceptable limits
19. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve
20. reporting lines and procedures, line supervision and technical experts

## Scope/range related to performance criteria

1.

Carry out **all** of the following during the structural assembly operations:

1.1 correctly prepare and set up the components and faces to be joined
1.2 use the correct datum faces
1.3 use the specified or appropriate fixing method
1.4 correctly align the components and faces to be joined
1.5 assemble/fabricate the structural components in the correct order or manner
1.6 produce an assembly which meets the required specification

2.

Produce **three** of the following structural assemblies:

2.1 beams
2.2 flanged components
2.3 columns
2.4 bulk heads
2.5 portals
2.6 staircases
2.7 roof trusses
2.8 safety cages
2.9 lattice braced frameworks
2.10 hand rails
2.11 castellated beams
2.12 seatings
2.13 other specific assembly

3.

Use **four** of the following types of components in the assemblies produced:

3.1 structural sections
3.2 support plates
3.3 fabricated beams
3.4 bed plates
3.5 fish plates
3.6 guards, hand rails
3.7 brackets
3.8 platforms and ladders
3.9 other specific components

4.

Assemble the components using **two** of the following methods:

4.1 bolted
4.2 temporary tack welded
4.3 riveted
4.4 adhesive bonding

4.5 other specific method

5.

Produce assemblies which meet **all** of the following quality and accuracy standards:

5.1 all components are correctly assembled and aligned in accordance with the specification
5.2 overall dimensions are within specification tolerances
5.3 assemblies meet appropriate geometric tolerances (square, straight, angles free from twists)
5.4 pitch of erection holes meets specification requirements, where appropriate
5.5 completed assemblies are secure, clean and free from burrs or flash

## Behaviours

# Additional Information

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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