

SEMFWE3-43 – SQA Unit Code HE9A 04

Erecting structural steelwork



Overview

This standard identifies the competencies you need to erect and assemble pre-fabricated structural steelwork such as support structures, building frames and roofs, mezzanine platforms, rigs, access staging and platforms to specification and in accordance with approved procedures. You will be required to determine, from the drawings and specifications, what has to be done and how best it can be achieved safely, within the time frames allowed and appropriate to the environment and site conditions.

Your responsibilities will require you to comply with organisational policy and procedures for the safe erection of the structure and the associated assembly activities to be undertaken and to report any problems with the component parts, equipment or construction 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 applying structural assembly and erection procedures. You will understand the principles and processes associated with the erection and assembly of the structures, and their application. You will know about the ways of handling structural steelwork, the means of fixing them in position as well as the care and use of the tools and equipment in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring the finished structure is produced to the required specification. You will understand the safety precautions required when working at height and 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.

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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 determine what has to be done and how this will be achieved
 - P3 select the appropriate construction elements and check that they are in a usable condition
 - P4 position and secure the construction elements in line with the specification
 - P5 securely fix any necessary temporary support facilities
 - P6 take appropriate measures to protect the finished construction
 - P7 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 steel construction/erection environment and when erecting structural components (general site safety, appropriate personal protective equipment (PPE), accident procedure; working at height and statutory regulations relating to it, risk assessment procedures and COSHH regulations)
- K2 the personal protective clothing and equipment that needs to be worn when carrying out the erection activities (such as leather gloves, eye protection, safety helmets, ear protection, safety harness)
- K3 safe working practices and procedures needed for erecting structural components
- K4 the correct methods of moving or lifting heavy structural sections
- K5 the hazards associated with erecting structural components and how they can be minimised (such as using dangerous or badly maintained tools and equipment, lifting and handling long and heavy components, working at height, slips trips and falls)
- K6 how to obtain the necessary construction and site drawings and joining specifications
- 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 how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
- K9 the preparations that need to be carried out on the components prior to erecting and assembling them
- K10 equipment and temporary installations that may be required to support the structure during the erection activities
- K11 the various methods of securing the assembled components (the range of nuts and bolts used including close tolerance location bolts; temporary tack welding methods and techniques)
- K12 how to set-up and align the various components and the tools and equipment that is used
- K13 the use and care of tools and equipment, and control procedures
- K14 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
- K15 the problems that can occur when erecting structural components/assemblies, and how these can be avoided
- K16 inspection techniques that can be applied to check the construction is to

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- specification and within acceptable limits
- K17 the extent of your own responsibility and whom you should report to if you have problems that you cannot solve
- K18 reporting lines and procedures, line supervision and technical experts

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Additional Information

Scope/range related to performance criteria

- You must be able to:*
1. carry out **all** of the following during the structural assembly operations:
 - 1.1 comply with health and safety and site regulations at all times
 - 1.2 use the correct construction drawings and interpret them correctly
 - 1.3 correctly prepare the components and faces to be erected and assembled
 - 1.4 use the correct datum faces
 - 1.5 erect and assemble the structural components in the correct order or manner
 - 1.6 correctly align the components and faces to be joined
 - 1.7 use the specified or appropriate fixing method and ensure all bolts are tightened to the required torque
 - 1.8 produce an assembly which meets the required specification
 2. erect structural steelwork for **one** of the following:
 - 2.1 building frames and roofs
 - 2.2 mezzanine platforms
 - 2.3 access staging and platforms
 - 2.4 support structures
 - 2.5 rigs
 3. use **four** of the following types of components in the assemblies produced:
 - 3.1 columns
 - 3.2 bed plates
 - 3.3 fish plates
 - 3.4 beams
 - 3.5 staircases
 - 3.6 brackets
 - 3.7 roof trusses
 - 3.8 bulkheads
 - 3.9 support plates
 - 3.10 frames
 - 3.11 roof sheeting/cladding
 - 3.12 guards and hand rails
 - 3.13 safety cages
 - 3.14 platforms and ladders
 4. use **all** of the following during the erection and assembly activities:
 - 4.1 hand tools and equipment (podger, crow bar, spanners, torque wrenches)
 - 4.2 assembly and alignment techniques and procedures (levels,

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- plumb lines, laser equipment)
- 4.3 mechanical fastening techniques and procedures (bolted, riveted)
- 4.4 slinging and lifting techniques (ropes, chains, cranes)
- 4.5 temporary staging or mobile platforms
- 5. erect structural steelwork on **either** of the following sites:
 - 5.1 new construction site
 - 5.2 existing construction
- 6. produce constructions which meet **all** of the following quality and accuracy standards:
 - 6.1 all components are correctly assembled 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 completed assemblies meet specification

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