

## Fixing reinforcement steel in-situ to complex designs

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### Overview

This standard is about fixing reinforcement steel in-situ to complex designs, which would include densely populated structures (less than 100mm centres, less than 100mm spacing and a minimum of 4 layers of reinforcement steel), circular, elliptical or conical structures, stairs and cast-in embedments; bracing and preparing complex prefabricated sections for lifting into place for fixing in-situ; interpreting information, adopting safe, healthy and environmentally responsible work practices, selecting and using materials, components, tools and equipment.

This standard is for people working in the occupational area of steelfixing and can be used by lead operatives, supervisors and managers

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### Performance criteria

#### You must be able to:

1. interpret the given information relating to the work and resources to confirm its relevance
2. comply with the given, relevant legislation and official guidance to carry out your work and maintain safe and healthy work practices
3. select the required quantity and quality of resources for the methods of work
4. comply with organisational procedures to minimise the risk of damage to the work and surrounding area
5. comply with the given contract information to carry out the work efficiently to the required specification
6. complete the work within the allocated time, in accordance with the programme of work

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## Knowledge and understanding

You need to know and understand:

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**Performance Criteria 1****Interpretation of information**

K1 the organisational procedures developed to report and rectify inappropriate **information** and unsuitable **resources**, and how they are implemented

K2 the types of **information**, their source and how they are interpreted

K3 the organisational procedures to solve **problems** with the **information** and why it is important they are followed

**Performance Criteria 2****Safe work practices**

K4 the level of understanding operatives must have of **information** for relevant, current **legislation and official guidance** and how it is applied

K5 how **emergencies** should be responded to and who should respond

K6 the organisational **security procedures** for tools, equipment and personal belongings

K7 what the accident reporting procedures are and who is responsible for making the report

K8 why, when and how **health and safety control equipment** should be used

K9 how to comply with environmentally responsible work practices to meet **\*current \*legislation and official guidance**

**Performance Criteria 3**

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**Selection of resources**

K10 the characteristics, quality, uses, sustainability, limitations and defects associated with the **resources** and how defects should be rectified

K11 how the **resources** should be used and how any **problems** associated with the **resources** are reported

K12 the organisational procedures to select **resources**, why they have been developed and how they are used

K13 the **hazards** associated with the **resources** and **methods of work** and how they are overcome

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**Performance Criteria 4****Minimise the risk of damage**

K14 how to **protect work** from damage and the purpose of protection

K15 why **disposal of waste** should be carried out safely and how it is achieved

**Performance Criteria 5****Meet the contract specification**

K16 how **methods of work**, to meet the specification, are carried out and **problems** reported

K17 how **maintenance** of tools and equipment is carried out

**Performance Criteria 6****Allocated time**

K18 what the **programme** is for the work to be carried out in the estimated, allocated time and why deadlines should be kept

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### Scope/range related to performance criteria

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**Performance Criteria 11** interpretation of complex drawings, specifications, schedules, method statements, risk assessments and manufacturers' information related to the work to be carried out

**Performance Criteria 22** avoidance of risk by complying with the given information relating to the following

- methods of work
- safe use of health and safety control equipment
- safe use of access equipment
- safe use, storage and handling of materials,
- safe use of tools and equipment
- specific risks to health

**Performance Criteria 33** selection of resources associated with own work

- materials, components and fixings
- tools, plant and equipment
- labour

**Performance Criteria 44** protect the work and its surrounding area from damage<sup>5</sup>  
 maintain a clear and tidy work space<sup>6</sup> dispose of waste in accordance with current legislation

**Performance Criteria 57** demonstrate work skills to plan, sequence, prepare, coordinate, measure, mark out, fit, fix, embed, position. brace, secure and check<sup>8</sup> select, use and maintain tools and equipment<sup>9</sup> coordinate and install in situ reinforcement steel to complex designs to given working instructions for the following 9.1 construct high density reinforcement steel structures (with steel bars spaced at less than 100mm centres) across all horizontal, vertical or inclined planes with a minimum of 3 layers of reinforcement steel bars (with less than 100mm spacing between layers)

1. construct bases, slabs or walls of reinforcement steel with at least one non-90 degree angle junction or at least one of the following complex shapes: circular, elliptical, conical, or helical
2. Install cast-in embedments which require interpretation of information from multiple sources and in conjunction with other trades to meet the agreed specification

10 install steel reinforcement with reinforcement couplers and fix subsequent reinforcement<sup>11</sup> plan, sequence, prepare and coordinate the incorporation of the following into prefabricated steel sections

1. temporary construction bars
2. permanent support bars or riders
3. lifting support points
4. bracing bars or rakers

**Performance Criteria 612** completion of own and teams work within the estimated, allocated

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time to meet the needs of other occupations and/or client

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### Scope/range related to knowledge and understanding

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**Disposal of waste**<sup>1</sup> environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance

**Emergencies**<sup>2</sup> operative's response to situations in accordance with organisational authorisation and personal skills when involved with

- fires, spillages, injuries
- emergencies relating to occupational activities

**Hazards**<sup>3</sup> those identified by risk assessment, methods of work, manufacturers' technical information, statutory regulations and official guidance

**Health and safety control equipment**<sup>4</sup> identified by the principles of prevention for occupational use, types and purpose of each type, work situations and general work environment

- collective protective measures
- local exhaust ventilation (LEV)
- personal protective equipment (PPE)
- respiratory protective equipment (RPE)

**Information**<sup>5</sup> complex drawings including accessing drawings from Building Information Modelling (BIM) systems, site instructions, specifications, schedules, method statements, risk assessments, manufacturers' information, current regulations and organisational guidance associated with fixing reinforcement steel in situ to complex designs

**Legislation and official guidance**<sup>6</sup> this relates to the operative's responsibilities regarding potential accidents, health hazards and the environment whilst working in the workplace, below ground level, in confined spaces, at height, with tools and equipment, with materials and substances, with movement and storage of materials by manual handling and mechanical lifting

**Maintenance**<sup>7</sup> operative care of hand tools, portable power tools and ancillary equipment  
**Methods of work**<sup>8</sup> how to apply of knowledge of safe and healthy work practices, procedures and skills relating to the method and area of work and materials used to

- coordinate and lead on fixing reinforcement steel in situ to complex designs\*
- extract details from steel fixing drawings and schedules (hardcopy or digital systems) and conveying the information to others  
\*
- identify, communicate and follow the installation quality requirements  
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- plan and sequence steel fixing and embedment works for complex designs  
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- prepare steel bar and resources for in situ installation  
\*
- fix steel in situ for the following complex designs:
  1. high density reinforcement steel structures (with steel bars spaced at less than

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100mm centres) across all horizontal, vertical or inclined planes with a minimum of three layers of reinforcement steel bars (with less than 100mm spacing between layers)

2. slabs, bases or walls of reinforcement steel with at least one non-90 degree angle junction and the following complex shapes: circular, elliptical, conical, and helical

\*

- Install cast-in embedments which require interpretation of information from multiple sources and in conjunction with other trades to meet the agreed specification

\*

- determine appropriate bracing for complex reinforcement steel sections, fix and secure for section movement:

1. temporary construction bars
2. permanent support bars or riders
3. lifting support points,
4. bracing bars or rakers

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- incorporate reinforcement coupler and continuity systems

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- provide information for digital systems

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- recognise and determine when specialist skills and knowledge are required and report accordingly

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- work with, around and in close proximity to plant and machinery

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- use hand tools, portable power tools and equipment

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- work at height

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- use access equipment

9 team coordination, team work and communication10 needs of other occupations associated with in situ reinforcement steel and prefabricated reinforcement steel sections**Problems**11 those arising from information, resources and methods of work

- own authority to rectify
- organisational reporting procedures

**Programme**12 types of progress charts, timetables and estimated times13 organisational procedures for reporting circumstances which will affect the work programme**Protect work**14 protect work against damage from general workplace activities, other occupations and adverse weather conditions**Resources**15 materials, components and equipment relating to types, quantity, quality, sizes and the sustainability of standard and/or specialist

- reinforcement steel including pre-cut and pre-bent
- tie wire, spacers, embedments, fittings and fixings
- hand tools, portable power tools and equipment

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16 confirm resources and materials conform with the specification  
17 methods of calculating quantity, length, area and wastage associated with the method and procedure to fix reinforcement steel in situ to complex designs  
**Security procedures**  
18 site, workplace, company and operative

## Fixing reinforcement steel in-situ to complex designs

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