

# COSVR621 – SQA Unit Code HG5F 04

## Repair, restore, conserve, replace or maintain forged heritage metalwork



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### Overview

This standard is about

- 1 interpreting information
- 2 adopting safe and healthy working practices
- 3 selecting materials, components, consumables and equipment
- 4 assessing, preparing, repairing, restoring, conserving, replacing or maintaining forged metalwork

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#### Performance criteria

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- You must be able to:*
- P1 interpret the given information relating to the work and resources to confirm its relevance
  - P2 comply with the given, relevant legislation and official guidance to carry out your work and maintain safe work practices
  - P3 select the required quantity and quality of resources for the methods of work
  - P4 comply with organisational procedures to minimise the risk of damage to the work and surrounding area
  - P5 comply with the given contract information to carry out the work efficiently to the required specification
  - P6 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:*

#### 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

*You need to know and understand:*

- K4 the level of understanding operatives must have of **information** for relevant, current **legislation and official guidance** and how it is applied
- K5 the types of **fire extinguishers** and how and when they are used
- K6 how **emergencies** should be responded to and who should respond
- K7 the organisational **security procedures** for tools, equipment and personal belongings
- K8 what the accident reporting procedures are and who is responsible for making the report
- K9 why, when and how **personal protective equipment (PPE)** should be used

#### Performance Criteria 3

##### Selection of resources

*You need to know and understand:*

- 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

#### Performance Criteria 4

##### Minimise the risk of damage

*You need to know and understand:*

- 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

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### Performance Criteria 5

#### Meet the contract specification

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*You need to know and understand:*

- 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

*You need to know and understand:*

- 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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## Additional Information

### Scope/range related to performance criteria

#### Performance Criteria 1

- 1 interpretation of plans, drawings, specifications, permits, schedules, method statements and manufacturers' information related to the work to be carried out

#### Performance Criteria 2

- 2 avoidance of risk by following the given information relating to at least four of the following
  - 2.1 methods of work
  - 2.2 safe use of personal protective equipment (PPE)
  - 2.3 safe use of access equipment
  - 2.4 safe use and storage of substances and materials
  - 2.5 safe use and storage of tools and equipment
  - 2.6 hot works

#### Performance Criteria 3

- 3 selection of resources associated with own work
  - 3.1 materials, components, consumables and fixings
  - 3.2 tools and equipment

#### Performance Criteria 4

- 4 protection of the work and its surrounding area from damage
- 5 minimise damage and maintain a clean work space
- 6 disposal of waste in accordance with legislation

#### Performance Criteria 5

- 7 demonstration of work skills to measure, mark out, disassemble, cut, shape, join, fit, position, assemble, secure and protect
- 8 use and maintain hand tools, portable power tools and blacksmiths equipment
- 9 repair, restore, conserve, replace or maintain forged heritage metalwork to given working instructions by applying the following techniques
  - 9.1 hot forge: drawdown, spread, upset, swage, fuller
  - 9.2 hot form: bend, twist, dish, raise
  - 9.3 hot cut: punch, split
  - 9.4 join: forge weld, fasten mechanically (fixed and moveable)
  - 9.5 fill
  - 9.6 cold form

#### Performance Criteria 6

- 10 completion of own work within the estimated, allocated time to meet the needs of other occupations and/or client

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### Scope/range related to knowledge and understanding

#### Disposal of waste

- 1 ~~environmental responsibilities, organisational procedures, manufacturers' information, statutory regulations and official guidance~~

#### Emergencies

- 2 operative's response to situations in accordance with organisational authorisation and personal skills when involved with
- 2.1 fires, spillages, injuries
  - 2.2 emergencies relating to occupational activities

#### Fire extinguishers

- 3 water, CO<sub>2</sub>, foam, powder and their uses

#### Hazards

- 4 those identified by risk assessment, method of work, manufacturers' technical information, statutory regulations and official guidance

#### Information

- 5 plans, drawings, specifications, permits, schedules, method statements, manufacturers' information, archaeological watching brief, historical conservation plans and charters, legislation and regulations governing buildings

#### Legislation and official guidance

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

#### Maintenance

- 7 operative care of hand tools and/or portable power tools and ancillary equipment

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### Methods of work

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- 8 application of knowledge for safe work practices, procedures and skills, relating to the method/area of work and materials used, to
    - 8.1 assess requirements for repair, restoration, conservation, replacement or maintenance of forged heritage metalwork
    - 8.2 validate appropriate ways in which the work should be carried out
    - 8.3 recognise sensitive areas
    - 8.4 maintain heritage and archaeological integrity
    - 8.5 maintain the principles of minimum intervention and reversible alterations
    - 8.6 survey, label and record components
    - 8.7 stop work at the point when conjecture begins and report findings
    - 8.8 identify types of deterioration
    - 8.9 relate equilibrium diagrams to metal types and properties
    - 8.10 identify metal properties
    - 8.11 heat treat
    - 8.12 make tools
    - 8.13 identify the effects of reduced loads, changed stress regimes, strengthening and reinforcement techniques to forged heritage metalwork
    - 8.14 fix and fit components
    - 8.15 hot forge: drawdown, spread, upset, swage, fuller
    - 8.16 hot form: bend, twist, dish, raise
    - 8.17 hot cut: punch, split
    - 8.18 join: forge weld, fasten mechanically (fixed and moveable)
    - 8.19 fill
    - 8.20 cold form
    - 8.21 clean and prepare metal
    - 8.22 record the work carried out (written, photographic or digital)
    - 8.23 recognise and/or report endangered/ protected flora and fauna
    - 8.24 pack and transport heritage metalwork
    - 8.25 use hand tools, power tools and blacksmiths equipment
    - 8.26 work at height
    - 8.27 use access equipment
  - 9 team work and communication
  - 10 needs of other occupations associated with the repair, restoration, conservation, replacement or maintenance of forged heritage metalwork

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### **Personal protective equipment (PPE)**

11 occupational use, types, purpose of each type and work situations

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### **Problems**

- 12 those arising from information, resources and methods of work
  - 12.1 own authority to rectify
  - 12.2 organisational reporting procedures

### **Programme**

- 13 types of progress charts, timetables and estimated times
- 14 organisational procedures for reporting circumstances which will affect the work programme

### **Protect work**

- 15 protect work against damage from general workplace activities, other occupations and adverse weather conditions

### **Resources**

- 16 materials, components and equipment relating to types, quantity, quality, sizes and sustainability of standard and/or specialist:
  - 16.1 metals
  - 16.2 components, fixings, consumables
  - 16.3 protective coatings
  - 16.4 hand and/or powered tools and blacksmiths equipment
- 17 methods of calculating quantity, length, area and wastage associated with the method/procedure to repair, restore, conserve, replace or maintain forged heritage metalwork

### **Security procedures**

- 18 site, workplace, company and operative



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**Relevant occupations** Smiths and Forge Workers

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**Suite** Heritage Skills (Construction)

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