

Unit 12: Developing Advanced Skills in Structural Masonry Operations

Unit code: M/503/5765

QCF Level: 3

Credit value: 20

Guided learning hours: 200

Unit aim

This unit enables learners to understand the tools, equipment and working techniques used to perform bricklaying operations to complex designs and structural brickwork. It gives learners the opportunity to develop skills used in producing structural brickwork where a high degree of accuracy and quality is required.

Learning outcomes and assessment criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria determine the standard required to achieve the unit.

Learning outcomes	Assessment criteria
1. Understand the preparation required to construct structural brickwork	1.1 describe the setting out procedure for a structural brickwork retaining wall given the project plans and specification 1.2 describe the construction details for a mass retaining wall with one expansion joint, based on sketched details that specify its length and height 1.3 calculate the quantity of resources required to build a reinforced brick retaining wall given the project drawings 1.4 explain how to set out a chevron pattern earth retaining wall given the plans and specification 1.5 describe the method of constructing a land drain at the base of a retaining wall, complying with site protocol

	<p>1.6 prepare the method statement for constructing a rebated expansion joint in a reinforced structural wall given the design details</p> <p>1.7 explain the site quality control procedure for building a vertical reinforced hollow block structural wall</p> <p>1.8 describe the product quality control procedure for building a precast artificial concrete coping stone based on Eurocodes</p>
<p>2 Be able to construct structural brickwork safely</p>	<p>2.1 set out a 1-brick retaining wall with 1 obtuse quoin in special bricks to a specified accuracy from given project information</p> <p>2.2 construct a 1-brick wall to a specified plan, containing 1 intermediate acute angle quoin, to a given detail, complying with current legislation</p> <p>2.3 construct a brick wall that is 1-brick thick in English bond with an attached pier 1-brick thick and 2-bricks wide, 3 course high, flush joint, complying with current legislation</p> <p>2.4 construct a brick on edge coping for a 1-brick retaining wall incorporating a projecting tile creasing course from project details, complying with current legislation</p>
<p>3 Be able to construct reinforced brickwork safely</p>	<p>3.1 set out a 1-brick thick Flemish bond wall with buttress return to a specified accuracy and a given layout drawing</p> <p>3.2 specify the resources required to construct a staggered diaphragm factory wall from given project details</p> <p>3.3 construct a 330mm thick brick wall with two returns and an intermediate attached pier 100mm x300mm, built in English Garden wall bond based on project details to specified quality and accuracy, complying with current legislation</p> <p>3.4 construct a brick isolated pier that is capped with a padstone to carry a steel beam using a suitable bond, of size 450mm x450mm, given project details</p>

	and complying with current legislation
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1 Understand the preparation required to construct structural brickwork

Structural brickwork: solid walls (brick up to 2 bricks thick, composite walls up to 450mm thick); load bearing structures (cross wall, cellular, staggered diaphragm, chevron); reinforced brickwork (horizontal, vertical, piers, hollow units, grouted cavity, pocket type wall); bands; plinths; panels; projections; sills; lintels; quoins; drainage systems (surface water, ground water, land drains)

Setting out: location; shape; size; curved; staggered; chevron; graphical (scaled drawings, plans, elevations, detailed sections, sketches); template; temporary support

Construction details: project drawings (plans, elevations, sections, architect's specification); sketches; scaled drawings; contract documents (drawings, layout, assembly, component, co-ordinated project information, bill of quantities, specifications); product information

Quantity of resources: masonry materials (bricks, blocks, natural stone, local materials, dense block (solid, hollow)); wall extension profiles; lintels (steel, insitu concrete, precast concretes); brick reinforcement (mesh, bar); mortars (cement, premixed, gauged); concrete (structural mixes, plain, reinforced); copings (stone, precast concrete, brick, creasing course); damp proof course (sheet, brick); drainage (geotextiles, drainage products); tools (hand, portable power); access equipment (ladders, hop-ups, stepladders, lightweight tower scaffolds, trestles and staging); material handling (manual, mechanical); portable power tools (cutting, forming, shaping, site electrical, portable); dewatering (sump, land drains); personal protective clothing; safety barriers; guards

Site protocol: safety signs (advisory, prohibitive, mandatory, warning); first aid (emergency, trained first aider, first aid box requirements, medical hazards, drugs, alcohol); risk control mechanism; work methods; site logistics; hazardous materials; material movement; storage; mechanical plant and equipment (lifting, transporting, fixing, forming, cutting and fixing); scaffold; power access equipment; welfare facilities; component protection (site storage, in place protection); traffic routes; walkways; site personnel; waste; (licences, consent); temporary site utilities (water, electricity, drainage, telecommunications)

Quality control: contract documents (drawings, specification, bill of quantities); architect; clerk of works; resident engineer; building control; British Standard Specifications; Code of Practice; Eurocodes

2 Be able to construct structural brickwork safely

Project information: drawings (layout, assembly, component); structural engineers details (steel layout drawings, bending schedules); architect (working drawings, sketches, oral instructions, variations, amendments); specification, contracts; Bill of Quantities

Legislation: housekeeping; hazards; risk assessment; welfare facilities requirements; noise (health effects, thresholds, monitoring of noise, control mechanisms); Control of Substances Hazardous to Health (COSHH); Manual Handling Regulations; electricity (site installation, precautions, dangers, different voltages, colour coded wiring, correct colour coding for different voltages, storing electrical equipment); PPE (enforcement, site, Health and Safety Executive (HSE))

3 Be able to construct reinforced brickwork safely

Layout drawing: working drawings (architect, structural engineer, consulting engineer); scaled working; sketches; British Standards design codes (brick structures, foundations); Eurocode (design codes and standards); Brick Development Association (BDA) guides (material specifications, construction, drainage)

Project details: site; drawings (scaled details, outline, sketches); structural engineer's details (structural stability, material specification); site instructions (architect's working drawings, sketches, oral instructions, variations, amendments); specification; contract bill of quantities

Legislation: PPE (glove, footwear, visibility, goggles, masks); fire (spread, fire evacuation, alarms, fire prevention, fire extinguishers); Building Regulations (notices, inspections, Part A Structural, Part B Fire safety)