QUALIFICATION HANDBOOK

Diploma in Bricklaying at SCQF Level 6 (6805-33)

February 2016 Version 2

City & Guilds

Qualification at a glance

Subject area	Construction
City & Guilds number	6805
Age group approved	16-18, 19+
Entry requirements	None
Assessment	Multiple choice/assignment
Support materials	Centre handbook Assessor guidance Task Manual
Registration and certification	Consult the Walled Garden/Online Catalogue for last dates

Title and level	**City & Guilds number**
Diploma in Bricklaying at SCQF Level 6	6805-33

Version and date	**Change detail**	**Section**
V2 February 2016	Unit 201 amended	Units
	City & Guilds group statement amended	Useful contacts
	Phone numbers deleted	Useful contacts

Contents

1 Introduction

This document tells you what you need to do to deliver the qualification:

Area	Description
Who is the qualification for?	It is for candidates who work or want to work as a Bricklayer in the construction sector.
What does the qualification cover?	It allows candidates to learn, develop and practise the skills required for employment and/or career progression in Bricklaying. It covers the following skills: • Interpreting working drawings to set out masonry structures • Producing thin joint masonry and masonry cladding • Building solid walling, isolated and attached piers • Construct cavity walling forming masonry structures
Is the qualification part of a framework or initiative?	The qualification forms the technical certificate for the Construction Building Apprenticeship Framework.
What opportunities for progression are there?	It allows candidates to progress into employment or to the following City & Guilds qualifications: • Diploma in Bricklaying at SCQF Level 6

Structure

To achieve the **Diploma in Bricklaying at SCQF Level 6 (6705-33)**, learners must achieve **57** credits from the mandatory units below.

City & Guilds unit number	Unit title	Credit value
Unit 301	Principles of organising, planning and pricing construction work	7
Unit 302	Repair and maintain masonry structures	5
Unit 303	Constructing radial and battered brickwork	16
Unit 304	Carrying out decorative and reinforced brickwork	12
Unit 305	Constructing fireplaces and chimneys	10
Unit 201	Health, safety and welfare in construction	7

2 Centre requirements

Approval

The approval process for Construction qualifications is available at our website. Please visit **www.cityandguilds.com/construction** for further information.

Resource requirements

Physical resources and site agreements

Centres will have well equipped workshops with a comprehensive range of hand and portable power tools that meet current industry standards. All powered equipment should be well maintained and PAT certified. Centres will have special designated areas within their Bricklaying workshop (cubicles or project areas) allowing candidates to practise the requirements of the units and carry out the Practical Assignments.

Centre staffing

All staff who assess (tutor/deliver) these qualifications must:

- have recent relevant experience in the specific area they will be teaching;
- be technically competent in the area for which they are delivering training and/or have experience of providing training;
- have a CV available demonstrating relevant experience and any qualifications held.

All staff who quality assure these qualifications must:

- have a good working knowledge and experience within the construction industry;
- have an established strategy and documentary audit trail of internal quality assurance;
- have a good working knowledge of quality assurance procedures;
- have a CV available demonstrating relevant experience and any qualifications held.

While the Assessor/Verifier (A/V) units/TAQA are valued as qualifications for centre staff, they are not currently a requirement for these SCQF qualifications. However, we encourage trainers and assessors to qualify to the current TAQA standard.

Continuing professional development (CPD)

Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.

Candidate entry requirements

Whilst there are no formal entry requirements for this qualification, learners are advised to take the SCQF Level 4 and SCQF Level 5 Diplomas in order to ensure they have the right skills and knowledge for SCQF Level 6. Alternatively, the learner should provide evidence of significant industry experience, at the centres discretion.

Age restrictions

City & Guilds cannot accept any registrations for candidates under 16 as this qualification is not approved for under 16s.

3 Delivering the qualification

Initial assessment and induction

An initial assessment of each learner should be made before the start of their programme to identify:

- if the learner has any specific training needs,
- support and guidance they may need when working towards their qualification
- any units they have already completed, or credit they have accumulated which is relevant to the qualification
- the appropriate type and level of qualification.

We recommend that centres provide an induction programme so the learner fully understands the requirements of the qualification, their responsibilities as a learner, and the responsibilities of the centre. This information can be recorded on a learning contract.

Support materials

The following resources are available for this qualification:

Description	How to access
Assessor guidance	**www.cityandguilds.com**
Task manual	**www.cityandguilds.com**
Qualification approval form	**www.cityandguilds.com/construction**
SmartScreen	**www.smartscreen.co.uk**

4 Assessment

Unit	Title	Assessment method	Where to obtain assessment materials
301	Principles of organising, planning and pricing construction work	City & Guilds e-volve multiple choice test. The test covers all of the knowledge in the unit.	Examinations provided on e-volve.
302	Repair and maintain masonry structures	Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes. Both assessments are set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure they are properly carried out.	**www.cityandguilds.com**
303	Constructing radial and battered brickwork	Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes. Both assessments are set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure they are properly carried out.	**www.cityandguilds.com**

Unit	Title	Assessment method	Where to obtain assessment materials
304	Carrying out decorative and reinforced brickwork	Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes. Both assessments are set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure they are properly carried out.	**www.cityandguilds.com**
305	Constructing fireplaces and chimneys	Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes. Both assessments are set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure they are properly carried out.	**www.cityandguilds.com**
201	Health, safety and welfare in construction	City & Guilds e-volve multiple choice test. The test covers all of the knowledge in the unit.	Examinations provided on e-volve.

Test specifications

The way the knowledge is covered by each test is laid out in the tables below:

Test 1: Unit 301 Principles of organising, planning and pricing construction work
Duration: 60 minutes

Unit	Outcome	Number of questions	%
301	1 Understand different types of drawn information in construction	7	17.5
	2 Understand energy efficiency and sustainable materials for construction	8	20
	3 Understand how to estimate quantities and price work for construction	10	25
	4 Understand how to plan work activities for construction	6	15
	5 Understand how to communicate effectively in the workplace	9	22.5
	Total	**40**	**100**

Test 2: Unit 302 Repair and maintain masonry structures
Duration: 45 minutes

Unit	Outcome	Number of questions	%
302	1 Understand the materials used to repair masonry structures	16	53
	2 Understand methods for repairing and renewing masonry structures	14	47
	Total	**30**	**100**

Test 3: Unit 303 Constructing radial and battered brickwork
Duration: 40 minutes

Unit	Outcome	Number of questions	%
303	1 Understand how to set out and build arches	16	80
	3 Understand how to set out and build brickwork curved on plan	2	10
	5 Understand how to set out and build concave and convex brickwork	1	5
	7 Understand how to set out and build battered brickwork	1	5
	Total	**20**	**100**

Test 4: Unit 304 Carrying out decorative and reinforced brickwork
Duration: 40 minutes

Unit	Outcome	Number of questions	%
304	1 Understand how to set out and build decorative brickwork features	7	35
	3 Understand how to set out and build obtuse and acute angle quoins	6	30
	5 Understand how to set out and build reinforced brickwork	7	35
	Total	**20**	**100**

Test 5: Unit 305 Constructing fireplaces and chimneys
Duration: 40 minutes

Unit	Outcome	Number of questions	%
305	1 Understand how to select resources for fireplace and chimney construction	12	60
	3 Understand how to set out and build fireplaces and chimneys	8	40
	Total	**20**	**100**

Test 6: Unit 201 Health, safety and welfare in construction
Duration: 1 hour

Unit	Outcome	Number of questions	%
201	1 Know the health and safety regulations, roles and responsibilities	7	17.5
	2 Know accident and emergency reporting procedures and documentation	5	12.5
	3 Know how to identify hazards in the workplace	7	17.5
	4 Know about health and welfare in the workplace	3	7.5
	5 Know how to handle materials and equipment safely	2	5
	6 Know about access equipment and working at heights	3	7.5
	7 Know how to work with electrical equipment in the workplace	4	10
	8 Know how to use personal protective equipment (PPE)	5	12.5
	9 Know the cause of fire and fire emergency procedures	4	10
	Total	**40**	**100**

5 Units

Structure of units

These units each have the following:

- City & Guilds reference number
- title
- level
- credit value
- unit aim
- learning outcomes which are comprised of a number of assessment criteria

Range explained:

Range gives further scope on what areas within an assessment criteria must be covered. The range in a unit **must** be taught to learners and parts of the range will be assessed.

Glossary of terms

The following key words and terms are used in the units.

Term	Definition
Abutment	The brickwork on either side of an arch opening which supports the haunches.
Apron	A slightly projecting panel under a window opening, or the metal or lead cover below a chimney stack
Axed Arch	An arch formed of bricks cut to appropriate wedge shape
Batter	A backward Slope
Batter-Board	A template used in setting out the batter of a wall. Often referred to as a “profile” or a “template”.
Bevel	Adjustable tool for marking various angles. Splayed or chamfered edge
Bird’s Mouth	An oblique cut in brickwork
Bullseye	A circular opening in brickwork formed with a complete ring of voussoirs, also known as a wheel arch.
Camber	A very flat upward curve
Camber-Arch	An arch with slight upward curvature.
Cant	A special shaped brick with a splayed surface joining two adjacent faces
Chimney Back	The back of the fireplace.
Chimney Breast	A projecting portion of an internal wall face which contains the fireplace and the flue.
Chimney Stack	The portion of the chimney containing the tops of the flues which passes through and projects above the roof

Chimney Throating	The portion of the flue just above the gathering over the fireplace.
Collar joint	The joint between the concentric rings of brickwork of a double ring arch.
Concave	Curved like a segment of the interior of a circle or hollow sphere;
Convex	Having a surface that is curved or rounded outward
Corbel	A support projecting from the face of a wall (usually of brick or stone.
Corbelling	Building out from the face of a wall in successive projecting courses.
Dentil Course	Arrangement of bricks with indented and or protruding bricks
Dog Leg	A special brick serving the same purpose as the squint.
Dog Toothing	Arrangement of decorative bricks where the heading face is laid at a 45^0 angle to the wall leaving the arris on the face
Drip Groove	Small chase cut on the underside of the edge of a projection to throw off rain water.
Easing	The lowering of an arch centre for removal
Extrados	The outside edge of the arch.
Fender Wall	A dwarf wall to carry the hearth of a groundfloor fireplace.
Flashing	Dressed lead or zinc over a joint in construction arranged
Flat Arch	An arch having a very small camber
Flue	A pipe or tube formed for conveying smoke or air
Flue Linings	Pre-cast hollow fireclay blocks which are built in position during chimney construction to form a complete flue
Folding Wedges	Wedges placed against each other with their thinner edges facing in opposite directions.
Gathering	The reduction of the brickwork opening over the mouth of a fireplace to the required size of the fire Bringing together all the flues to the base of the stack
Gauged Arch	A arch built of purpose-made or carefully cut bricks laid with very thin joints.
Gauged Work	Built of purpose-made or carefully cut bricks with very thin joints, built to a specified number of courses.
Haunches	Brickwork on either side of an arch between the springing points and the crown.
Hearth	The slab projecting in front or the fireplace opening and jambs.
Intrados	The inside edge of the arch.
Key or Key Brick	A brick or keystone is the centre voussoir in an arch.
Lime stain	Also known as bleed or bloom. White insoluble calcareous deposits on the face of brickwork derived from Portland cement mortars that have been subject to severe weathering during the setting process
Polychromatic brickwork	Decorative brickwork featuring different colours

Thermal values	Often referred to as the U value which is an efficiency of a building and is used to calculate the heat loss, it is found by dividing the materials thickness by its conductivity or K value which in turn gives a resistance which can be used to calculate the heat loss from a building.
Rise	The vertical height of the arch from the springing line
Rise of an Arch	The vertical height between the springing line and the intrados of an arch.
Rough Arch	An arch formed with bricks not cut to shape
Rubbers	Soft bricks specially made for cutting or rubbing to any shape required.
Shoring	Operation of temporarily supporting the wall of an excavation or a structure.
Shuttering	Temporary framework erected to receive wet cement, the framework remaining until the concrete is set.
Skewback	The inclined surface of brickwork from which a segmental arch springs.
Soffit	The under surface of the arch
Span	The horizontal width of the opening that the arch will span.
Springer	The first voussoir of the arch.
Springing line	The horizontal line from which the arch springs
Squint	A special brick for the construction of non-right angled quoins
Striking Point	Point from which the arc on an arch radiates, it is also used to form the angle of skew back and to mark out voussoirs
Trammel	A lath or batten used to mark outa circular curve by being pivoted at one end.
Travel in a Flue	The horizontal distance which a flue is moved from one position to another.
Turning Piece	A centre cut from one piece of timber.
Voussoirs	Are bricks that are tapered or shaped units that form the arch.
Thermal values	Often referred to as the U value which is an efficiency of a building and is used to calculate the heat loss, it is found by dividing the materials thickness by its conductivity or K value which in turn gives a resistance which can be used to calculate the heat loss from a building.

Unit 201 Health, safety and welfare in construction

Level:	5
Credit value:	7
Aim:	The aim of this unit is to provide the learner with the knowledge to carry out safe working practices in construction, in relation to sourcing relevant safety information and using the relevant safety procedures at work

Learning outcome
The learner will: 1. know the health and safety regulations, roles and responsibilities
Assessment criteria
The learner can: 1.1 identify **health and safety legislation** relevant to and used in the construction environment 1.2 state **employer and employee responsibilitie**s under the Health and Safety at Work Act (HASWA) 1.3 state **roles and responsibilities** of the Health and Safety Executive (HSE) 1.4 identify **organisations** providing relevant health and safety information 1.5 state the importance of holding on-site safety inductions and toolbox talks.

Range
Health and safety legislation Health and Safety at Work Act, Reporting Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Control of Substances Hazardous to Health (COSHH), Construction, Design and Management (CDM) regulations , Provision and Use of Work Equipment Regulations (PUWER), manual handling operations Regulations, Personal Protective Equipment (PPE) at Work Regulations, Work at Height Regulations, Control of Noise at Work Regulations, Control of Vibration at Work Regulations , Electricity at Work Regulations, Lifting operations and Lifting Equipment Regulations (LOLER) **Employer responsibilities** Safe working environment, adequate staff training, health and safety information, site inductions, toolbox talks, risk assessment, supervision, PPE, reporting hazards, accidents and near misses, sections 2 to 9 of Health and Safety at Work Act, CDM reg's,

construction phase plans, welfare, display public liability Insurance and health and safety law poster.

Employee responsibilities
Working safely, working in partnership with the employer, reporting hazards, accidents and near misses, following organisational procedures as per Sections 2 to 9 of Health and Safety at Work Act.

Roles and responsibilities:
Enforcement (including fees for intervention), legislation and advice, inspection, investigation eg site investigations.

Organisations
Health and Safety Executive (HSE) website, Institute of Occupational Safety and Health, British Safety Council, 'manufacturer', ROSPA.

Learning outcome
The learner will: 2. know accident and emergency reporting procedures and documentation
Assessment criteria
The learner can: 2.1 state legislation used for reporting accidents 2.2 state major **types of emergencies** that could occur in the workplace 2.3 identify reportable injuries, diseases and dangerous occurrences as per RIDDOR 2.4 state main types of **records** used in the event of an accident, emergency and near miss and reasons for reporting them 2.5 identify **authorised personnel** involved in dealing with accident and emergency situations 2.6 state **actions** to take when discovering an accident.

Range
Types of emergencies Fires, security incidents, gas leaks. **Records**: Accident book, first aid records, organisational records and documentation. **Authorised personnel** First aiders, supervisors/managers, health and safety executive, emergency services, safety officer. **Actions** Area made safe, call for help, emergency services.

Learning outcome
The learner will:

3. know how to identify hazards in the workplace
Assessment criteria
The learner can: 3.1 state the importance of **good housekeeping** 3.2 state reasons for risk assessments and method statements 3.3 identify **types of hazards** in the workplace 3.4 state the importance of the correct storage of combustibles and chemicals on site 3.5 identify different **signs and safety notices** used in the workplace.

Range
Good housekeeping: Cleanliness, tidiness, use of skips and chutes, segregation of materials, clear access to fire escapes, clear access to fire extinguishers. **Types of hazards:** Fires, slips, trips and falls, hazardous substances (relating to inhalation, absorption, exposure, ingestion, cross-contamination), electrical, asbestos, manual handling, plant and vehicle movement, adverse weather. **Signs and safety notices:** Prohibition, mandatory, warning, safe condition, supplementary.

Learning outcome
The learner will: 4. know about health and welfare in the workplace
Assessment criteria
The learner can: 4.1 identify requirements for welfare facilities in the workplace as per Construction Design Management (CDM) 4.2 state health effects of noise and **precautions** that can be taken 4.3 state **risks** associated with drugs, alcohol and medication which could affect performance in the workplace.

Range
Precautions Reducing noise at source, PPE, isolation, exposure time. **Risks** Reduced risk perception, loss of concentration, balance problems, absenteeism and reduced productivity.

Learning outcome
The learner will: 5. know how to handle materials and equipment safely
Assessment criteria
The learner can: 5.1 identify legislation relating to safe handling of materials and equipment 5.2 state procedures for safe lifting and manual handling activities in accordance with guidance and legislation 5.3 state the importance of using **lifting aids** when handling materials and equipment.

Range
Lifting aids Wheelbarrow, sack barrow, mechanical lifting aids, pallet truck.

Learning outcome
The learner will: 6. know about access equipment and working at heights
Assessment criteria
The learner can: 6.1 identify legislation relating to working at heights 6.2 identify types of **access equipment** 6.3 state **safe methods** of use for **access equipment** 6.4 identify **dangers** of working at height.

Range
Access equipment: Stepladders, ladders (pole, extension), trestles, hop-ups, proprietary scaffolding, podium, stilts **Safe methods** Regular inspection, check for broken, damaged or missing components, responsible use, consideration of adverse weather conditions, good housekeeping **Dangers** Falling tools, falling equipment, falling materials, persons falling from height (injuries to themselves and others).

Learning outcome
The learner will: 7. know how to work with electrical equipment in the workplace
Assessment criteria
The learner can: 7.1 state **precautions** to take to avoid risks to self and others when working with electrical equipment 7.2 state **dangers** of using electrical equipment 7.3 identify **voltages** and voltage colour coding that are used in the workplace 7.4 state **methods** of storing electrical equipment.

Range
Precautions Check leads, check plugs, use of cable hangers, check tools and equipment, current valid PAT certificate **Dangers**: Burns, electrocution, fire. **Voltages** Battery powered, 110/115 volts, 230/240 volts and 415 volts. **Methods** Components present, equipment cleaned, checked for damage, stored in a clean and secure location.

Learning outcome
The learner will: 8. know how to use Personal Protective Equipment (PPE)
Assessment criteria
The learner can: 8.1 state the legislation governing use of Personal Protective Equipment (PPE) 8.2 state **types of PPE** used in the workplace 8.3 state the importance of PPE 8.4 state why it is important to store, maintain and use PPE correctly 8.5 state the importance of checking and reporting damaged PPE.

Range
PPE: Head protection, eye protection, ear protection, face/dust masks, breathing apparatus, high visibility clothing, safety footwear, gloves, sun protection, barrier cream, water proofs, knee pads, overalls/disposable clothing

Learning outcome
The learner will: 9. know the cause of fire and fire emergency procedures
Assessment criteria
The learner can: 9.1 state **elements** essential to creating a fire 9.2 identify methods of fire prevention 9.3 state actions to be taken on discovering a fire 9.4 state **types of fire extinguishers** and their uses.

Range
Elements Oxygen, fuel, heat. **Types of fire extinguishers:** Water, foam, CO2, dry powder.

Unit 301 Principles of organising, planning and pricing construction work

Level:	6
Credit value:	7
Aim:	The aim of this unit is to provide the learner with the knowledge of building methods and construction technology in relation to: • understanding a range of building materials used within the construction industry and their suitability to the construction of modern buildings. • organise the building process and communicate the design to work colleagues and others.

Learning outcome
The learner will: 1. understand different types of drawn information in construction
Assessment criteria
The learner can: 1.1 compare advantages and disadvantages of computer-aided design (CAD) programs to traditional drawing methods 1.2 explain **information** required to produce orthographic projection drawings 1.3 explain the process and purpose of producing a schedule from a drawing 1.4 explain the **benefits** of isometric projection drawings 1.5 explain **information** required to produce isometric projection drawings.

Range
Information (AC1.2) Room dimensions, heights, width, sizes, heights and positions of walls, doors and window specifications, building regulations **Benefits** Pictorial view of an object, assembly or design. Helps the client, customer, supplier or non-technical person understand how the finished product will look or what is required. **Information (AC1.5)**

Isometric axis, positioning and required view of the object, lines or surfaces relative to isometric axis. Object dimensions and scale.

Learning outcome
The learner will: 2. understand energy efficiency and sustainable materials for construction
Assessment criteria
The learner can: 2.1 evaluate the uses of thermally insulated **materials** 2.2 describe **construction methods** used to insulate against heat loss and gain 2.3 compare thermal values of **wall construction** 2.4 explain the purpose of an Energy Performance Certificate (EPC) 2.5 describe **sustainable materials** and their use in construction.

Range
Materials Polyisocyanurate (PIR), expanded polystyrene (EP) fibre glass, sheep wool, mineral wool, double glazed units, multi-foil insulation. **construction methods** location of insulation, selection of materials, compliance with Building Regulations **Wall construction** Cavity, solid and timber frame **Sustainable materials** Locally sourced, managed timber (FSC), recycled materials.

Learning outcome
The learner will: 3. understand how to estimate quantities and price work for construction
Assessment criteria
The learner can: 3.1 describe how to estimate quantities of construction materials 3.2 describe **information required** to prepare a materials list using a schedule 3.3 explain the purpose of preferred suppliers lists when ordering materials 3.4 explain the purpose of the Bill of quantities 3.5 explain the purpose of the tendering process 3.6 explain the difference between quoting and estimating 3.7 calculate waste percentages for a construction task 3.8 describe the **information required** to prepare a quote.

Range
information required (AC3.2) Quantity, quality, colour, dimensions, location, installation details **Information required (AC3.8)** Labour Operational costs VAT Material cost

Learning outcome
The learner will: 4. understand how to plan work activities for construction
Assessment criteria
The learner can: 4.1 outline the benefits of **planning** the sequence of material and labour requirements 4.2 outline advantages and disadvantages of purchasing or hiring plant and equipment 4.3 identify **planning methods** 4.4 identify information required to produce a GANTT chart for a building project.

Range
Planning Programmes of work, stock systems, critical path analysis, lead times, schedules, Gantt chart. **Planning methods** GANTT chart, critical path analysis.

Learning outcome
The learner will: 5. understand how to communicate effectively in the workplace
Assessment criteria
The learner can: 5.1 explain the purpose of **site documentation** 5.2 identify information to create an agenda for a meeting 5.3 explain information required to prepare a toolbox talk and site induction 5.4 explain the purpose of a site survey and the information required to prepare a **defects** list 5.5 describe information required to prepare written communications to resolve **problems**.

Range
Site documentation Organisation chart, method statement, risk assessment, manufacturers' technical information, delivery notes, variation orders, permits to work, diaries, minutes, memos. **Defects** Poor standard of work, poor quality of materials, damaged materials, human error **Problems:** Delivery, materials, quality, human resources.

Unit 302 Repair and maintain masonry structures

Level:	6
Credit value:	5
Aim:	The aim of this unit is to provide the learner with the knowledge and skills to enable them to carry out repairs and to maintain masonry structures.

Learning outcome
The learner will: 1. understand the materials used to repair masonry structures.
Assessment criteria
The learner can: 1.1 describe the application of common **materials** used in **masonry maintenance** 1.2 analyse typical **defects** associated with **materials** used in masonry structures 1.3 investigate how **hazards** associated with using materials and equipment can be minimised 1.4 explain the importance of the **relationships** between building materials 1.5 **calculate** materials required for masonry repairs.

Range
Materials (AC1.1) Bricks, mortar, blocks, stone, concrete, timber, copings, pier caps, specials, flashings, DPC and trays, insulation, cavity ties, render, lintels. **Masonry maintenance** Repair, replace, rebuild. **Defects** Bulging, spalling, cracking, subsidence, mortar failure, damp, staining, stone erosion, metal corrosion, sulphate attack, permanent/heavy efflorescence. **Materials (AC1.2)** Bricks, mortar, blocks, stone, concrete, copings, pier caps, specials, flashings, DPC and trays, insulation, cavity ties, render, lintels.

Hazards

Harmful substances, falling objects, manual handling, adverse weather, inhalation of particulates, services (electric, gas, water), fires, slips, trips and falls, plant and vehicle movement.

Relationships affected by:

Movement (expansion & shrinkage), strength, appearance, size (imperial/metric/modular), air-tightness, thermal values, sound transfer.

Calculate

Linear measurements, areas (squares, triangles, circles), volumes, ratios of mortar/concrete, quantities.

Learning outcome

The learner will:

2. understand methods for repairing and renewing masonry structures.

Assessment criteria

The learner can:

2.1 identify safety checks for **access equipment**

2.2 explain methods of providing temporary **supports and bracings** while carrying out **maintenance and repairs**

2.3 describe **ways of removing** existing materials and components from masonry structures

2.4 describe **hand** and **power tools** required for repair to masonry structures

2.5 describe **preparation** and **mixing techniques** used when laying and fixing replacement materials and components

2.6 explain methods of fixing and securing doors and windows

2.7 investigate the **techniques** used to replace existing wall ties

2.8 explain reasons and **methods** of protecting completed work.

Range

Access equipment

Ladders, stepladders, extension ladders, trestles, independent scaffolding, cradle/stack scaffold, towers, hop ups, roof ladders, mobile elevated working platform (MEWP).

Supports and bracings

Dead shores:

- needles/pins
- adjustable steel props.

Maintenance and repairs to:

Substructure, superstructure.

Ways of removing

Hand, chute, machine.

Hand tools

Brick trowel, pointing trowel, lump hammer and bolster chisel, scutch hammer, line and pins, corner blocks, spirit level, boat/pocket level,

hawk, tape measure, builder's square, tingle plate, brick hammer, jointing iron, gauge lath/rod, profiles, storey rod.

Power tools
Disc cutter, mechanical bench saw, drill, cartridge gun, tile cutter, grinder, pneumatic breaker.

Preparation
Access, protection, material selection, cutting out.

Mixing techniques
Mortars, concrete, adhesives, grouts, resins.

Techniques
Removal and replacement of masonry, use of proprietary systems.

Methods
Protective coverings:

- plastic
- hessian
- timber
- insulation

signs and notices, site protection barriers, site security.

Learning outcome
The learner will: 3. be able to remove and renew masonry materials.
Assessment criteria
The learner can: 3.1 identify defective and damaged masonry materials 3.2 prepare **tools, equipment** and materials for removal and replacing defective masonry materials 3.3 remove and replace **defective masonry** 3.4 follow current **environmental and relevant health and safety legislation.**

Range
Tools Hand tools, portable power tools, materials, tool requisition sheet. **Equipment** Access equipment, PPE, mixers, masonry saws. **Defective masonry** Cut out joints and remove defective and damaged masonry, lay bricks and blocks to align bond with existing walling including cutting brick/blockwork to a required length, point new brickwork and blockwork to match existing walling. **Environmental and relevant health and safety legislation** Use and maintenance of PPE, risk assessment and method statements, COSHH guidance sheet, disposal of materials.

Learning outcome
The learner will: 4. be able to maintain a safe working environment.
Assessment criteria
The learner can: 4.1 maintain a clean, **safe and tidy work area** and protect the surrounding area immediately adjacent to the work 4.2 clean, check and store **tools, equipment** and materials after use 4.3 **dispose** waste materials safely 4.4 follow current environmental and relevant health and safety legislation

Range
Safe and tidy work area Consider public, workforce, visitors, site storage, transporting of material. **Tools and equipment** Mixer, wheelbarrow, bucket, hand tools, power tools. **Dispose** recycling, segregation of waste, conform to legislation.

Unit 303 Constructing radial and battered brickwork

Level:	6
Credit value:	16
Aim:	The aim of this unit is to provide the learner with the knowledge and skills to enable them to set out and build arches, brickwork curved on plan and concave and convex brickwork.

Learning outcome
The learner will: 1. understand how to set out and build arches.
Assessment criteria
The learner can: 1.1 describe different types of **arch terminology** 1.2 identify **components** required to set out arch construction 1.3 describe **methods** used to provide temporary support for arches 1.4 explain the correct procedures for **arch construction**.

Range
Arch terminology Soffit, rough ring, axed arch, gauged brickwork, arch centre, turning piece, folding wedges, easing and striking, temporary support, skewbacks, radius, striking point, springing line, bisecting line, springing point, voussoir, key brick, intrados, extrados, abutments, rise, dividers, haunches, span. **Components** Templates, arch centre, turning piece, props and bracing, folding wedges, proprietary arch formers, proprietary arch lintel. **Methods** Arch centres, props, folding wedges. **Arch construction** Semi-circular, segmental, gothic, tudor, bullseye, 3 centred arch.
Learning outcome
The learner will: 2. be able to set out and build arches and surrounding brickwork.

Assessment criteria
The learner can: 2.1 interpret drawings to establish the location, **shape and size of arches to be erected** 2.2 produce work method statements to build arches 2.3 produce risk assessments for building arches 2.4 produce templates for building axed arches 2.5 provide temporary support for arches 2.6 cut voussoirs 2.7 build axed arches and surrounding brickwork 2.8 remove temporary support and make good. 2.9 follow current environmental and relevant health and safety legislation.

Range
Shape and size of arches to be erected Semi-circular and segmental arch construction.

Learning outcome
The learner will: 3. understand how to set out and build brickwork curved on plan.
Assessment criteria
The learner can: 3.1 describe **construction methods** used to build **brickwork curved on plan**.

Range
Construction methods Calculations for curved brickwork (circumference, radius, diameter, templates/trammels), plumbing and levelling brickwork. **Brickwork curved on plan** Serpentine walling, radial brickwork.

Learning outcome
The learner will: 4. be able to set out and build brickwork curved on plan.
Assessment criteria
The learner can: 4.1 interpret drawings to establish the location, and shape of brickwork curved on plan 4.2 produce work method statements to build brickwork curved on plan 4.3 produce risk assessments for building brickwork curved on plan 4.4 use templates to build brickwork curved on plan 4.5 use trammels to build brickwork curved on plan 4.6 cut components for brickwork curved on plan 4.7 build brickwork curved on plan.

4.8 follow current environmental and relevant health and safety legislation.

Learning outcome
The learner will: 5. understand how to set out and build concave and convex brickwork.
Assessment criteria
The learner can: 5.1 describe **construction methods** used to build concave and convex brickwork.

Range
Construction methods Trammel, template, specials.

Learning outcome
The learner will: 6. be able to set out and build concave and convex brickwork.
Assessment criteria
The learner can: 6.1 interpret drawings to establish the location, and shape of concave and convex brickwork 6.2 produce work method statements to build concave and convex brickwork 6.3 produce risk assessments for building concave and convex brickwork 6.4 use templates to build concave and convex brickwork 6.5 use trammels to build concave and convex brickwork 6.6 cut components for concave and convex brickwork 6.7 build concave and convex brickwork. 6.8 follow current environmental and relevant health and safety legislation.

Learning outcome
The learner will: 7. understand how to set out and build battered brickwork.
Assessment criteria
The learner can: 7.1 describe **construction methods** used to build battered brickwork.

Range
Construction methods Template, battered profile, string line.

Learning outcome
The learner will: 8. be able to set out and build battered brickwork.
Assessment criteria
The learner can: 8.1 interpret drawings to establish the location, and angle of battered brickwork 8.2 produce work method statements to build battered brickwork 8.3 produce risk assessments for building battered brickwork 8.4 use templates to build battered brickwork 8.5 cut components for battered brickwork 8.6 build battered brickwork. 8.7 follow current environmental and relevant health and safety legislation.

Unit 304 Carrying out decorative and reinforced brickwork

Level:	6
Credit value:	12
Aim:	The aim of this unit is to provide the learner with the knowledge and skills to enable them to set out and build decorative brickwork features, obtuse and acute angle quoins and reinforced brickwork.

Learning outcome
The learner will: 1. understand how to set out and build decorative brickwork **features**.
Assessment criteria
The learner can: 1.1 describe construction methods used to build brickwork incorporating **features**.

Range
Features Horizontal panels (basket weave and herringbone bonds), diagonal panels (basket weave and herringbone bonds), panel surrounds, over-sailing courses, dog-toothing, dentil courses, tumbling in, ramped work (circular and straight), plinth courses, cant brick, string courses.

Learning outcome
The learner will: 2. be able to set out and build decorative brickwork features.
Assessment criteria
The learner can: 2.1 interpret drawings to establish the location and shape to build decorative brickwork features 2.2 produce work method statements to build decorative brickwork features 2.3 produce risk assessments to build brickwork incorporating features 2.4 cut components to build brickwork incorporating features 2.5 build brickwork incorporating **features** 2.6 follow current environmental and relevant health and safety legislation.

Range
Features Horizontal and diagonal panels, panel surrounds, over-sailing courses, dog-toothing, dentil courses.

Learning outcome
The learner will: 3. understand how to set out and build obtuse and acute angle quoins.
Assessment criteria
The learner can: 3.1 explain **processes** required to build obtuse and acute angle quoins 3.2 describe construction methods used to build **obtuse and acute angle quoins**.

Range
Processes Setting out and measuring (including geometry), bonding , templates, cutting. **Obtuse and acute angle quoins** up to one and a half brick thick walling: brick specials (dogleg, squint and cut bricks).

Learning outcome
The learner will: 4. be able to set out and build obtuse and acute angle quoins.
Assessment criteria
The learner can: 4.1 interpret drawings to establish the location of obtuse and acute angle quoins 4.2 produce work method statements to build obtuse and acute angle quoins 4.3 produce risk assessments for building obtuse and acute angle quoins 4.4 use templates to build obtuse and acute angle quoins 4.5 cut components for obtuse and acute angle quoins 4.6 build obtuse and acute angle quoins in walling one brick thick 4.7 follow current environmental and relevant health and safety legislation.

Learning outcome
The learner will: 5. understand how to set out and build reinforced brickwork.
Assessment criteria
The learner can: 5.1 describe **construction methods** used to build reinforced brickwork

5.2 describe **bonding arrangements** for one-and-a-half brick thick walls.

Range
Construction methods Vertical reinforcement, horizontal reinforcement, Quetta bond, 1.5 brick thick. **Bonding arrangements** English bond, English garden wall, Flemish bond, Flemish garden wall, Quetta bond.

Learning outcome
The learner will: 6. be able to set out and build reinforced brickwork.
Assessment criteria
The learner can: 6.1 interpret drawings to establish the location, and shape of reinforced brickwork 6.2 produce work method statements to build reinforced brickwork 6.3 produce risk assessments for building reinforced brickwork 6.4 cut components for reinforced brickwork 6.5 build reinforced brickwork in quetta bond 6.6 follow current environmental and relevant health and safety legislation.

Unit 305 Constructing fireplaces and chimneys

Level:	6
Credit value:	10
Aim:	The aim of this unit is to provide the learner with the knowledge and skills to enable them to construct fireplaces and chimneys.

Learning outcome
The learner will: 1. understand how to select resources for fireplace and chimney construction.
Assessment criteria
The learner can: 1.1 identify different **types of information** 1.2 describe the **characteristics and materials** for fireplace and chimney construction 1.3 identify checks for different types of resources required for fireplace and chimney construction 1.4 identify type, size and position of **components** for fire place and chimney construction 1.5 describe the **hazards** associated with fireplace and chimney repair and alteration 1.6 describe linear measurements for flue liners.

Range
Types of information Architect drawings and specification, Building Regulations, British standard specifications, codes of practice, manufacturers' instructions, HSE guidelines. **Characteristics and materials** Quality, strength, defects, durability, sustainability, fire resistance, sulphate resistance, weather resistance. **Components** Throat lintel, flue liners (metal, clay, concrete, specials), chimney breast, fireback and jambs, stack, chimney pot, cowl, bricks, blocks, firebricks, mortar, hearth, DPCs, flashings, aprons, back gutter, flaunching systems, adhesives, reducers, mid-feathers and withers.

Hazards

Structural collapse, inhalation of particulates, slips, trips and falls, working at height, harmful gases, manual handling.

Learning outcome

The learner will:

2. be able to select resources for fireplace and chimney construction.

Assessment criteria

The learner can:

2.1 interpret different **types of information** for fireplace and chimney construction

2.2 produce work method statements to establish all aspects of fireplace and chimney construction

2.3 produce risk assessments to identify safe systems of work

2.4 select methods of building fireplaces and chimneys to required specifications

2.5 calculate quantities of **material and components** to construct fire place and chimneys

2.6 check suitability of resources for building fireplaces and chimneys

2.7 follow current environmental and relevant health and safety legislation.

Range

Types of information

Architect's specification, schedules, good practice guidelines, Building Regulations, British standard specifications, codes of practice, manufacturers' information, current legislation and official guidance, safety regulations, drawings, method statement, risk assessment.

Materials and components

Flue liners, bricks, blocks, mortar.

Learning outcome

The learner will:

3. understand how to set out and build fireplaces and chimneys.

Assessment criteria

The learner can:

3.1 explain the importance of setting out fireplaces and chimneys

3.2 identify **materials** for constructing fireplaces and chimneys

3.3 identify methods of cutting and preparing materials by hand

3.4 describe **methods** of provision within fireplace construction

3.5 explain the importance of the provision of damp-proof barriers

3.6 state methods used to provide over-sailing and capping to chimney stacks

3.7 describe **techniques** used to construct fireplaces and flues

3.8 describe **methods** and materials for finishing chimney tops.

Range
Materials Throat lintel, flue liners (metal, clay, concrete, specials), chimney breast, fireback and jambs, stack, chimney pot, cowl, bricks, blocks, firebricks, mortar, hearth , DPCs, flashings, aprons, back gutter, flaunching systems, adhesives, reducers, mid-feathers and withers. **Methods (AC3.4)** Pipe ducts, back boiler, ventilation, services, liners, expansion. **Techniques** Traditional, modern. **Methods (AC3.8)** Traditional, modern.

Learning outcome
The learner will: 4. be able to set out and build fireplaces and chimneys.
Assessment criteria
The learner can: 4.1 set out to construct fireplaces and chimneys 4.2 select materials suitable for the construction of fireplaces and chimneys 4.3 position bricks, blocks and materials ready for use 4.4 prepare and cut materials 4.5 build fireplaces and chimneys 4.6 follow current environmental and relevant health and safety legislation.

Appendix 1 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Centre Manual - Supporting Customer Excellence contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification, as well as updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document includes sections on:

- The centre and qualification approval process
- Assessment, internal quality assurance and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Management systems
- Maintaining records
- Assessment
- Internal quality assurance
- External quality assurance.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for candidates who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information on such things as:

- **Walled Garden:** how to register and certificate candidates on line
- **Events**: dates and information on the latest Centre events
- **Online assessment**: how to register for e-assessments.

Useful contacts

International learners General qualification information	E: **intcg@cityandguilds.com**
Centres Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results	E: **centresupport@cityandguilds.com**
Single subject qualifications Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change	E: **singlesubjects@cityandguilds.com**
International awards Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports	E: **intops@cityandguilds.com**
Walled Garden Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems	E: **walledgarden@cityandguilds.com**
Employer Employer solutions, Mapping, Accreditation, Development Skills, Consultancy	E: **business@cityandguilds.com**
Publications Logbooks, Centre documents, Forms, Free literature	

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