## Unit 107: Working with brick, block and stone

# Sample scheme of work

This sample scheme of work covers both classroom and workshop based learning for Unit 107. It is based on two hours per session for 70 sessions. It is an example only of a possible scheme of work and is based on theory and practical within an FE centre, but can be amended to suit all learning facilities with the necessary adjustments to meet individual learners’ needs.

**You can use the sample scheme of work as it is, adjust it or extract content to create a scheme of work to suit your delivery needs. It can also be adjusted by adding theory and practical workshops to support learners who have/need additional learning time.**

Centres should also incorporate the following themes, where appropriate, as strands running through each of the sections within the qualification. Although they are not specifically referred to in the section content, City & Guilds regards these as essential in the teaching of the qualification:

* health and safety considerations, in particular the need to impress upon learners the fact that they must preserve the health and safety of others as well as themselves
* Essential Skills (Application of Number, Communication, Digital Literacy and Employability)
* extension tasks and differentiation, inclusion, entitlement and equality issues
* spiritual, moral, social and cultural issues
* environmental education and related European issues
* British Values
* use of information learning technology (ILT).

Unit 107: Working with brick, block and stone

# Sample scheme of work

**Course/qualification:** Foundation in Construction and Building Services Engineering **Tutor’s name:** Enter the tutor’s name here

**Number of sessions**:70 **Delivery hours**: 140 **Venue**:Enter the venue here **Group**: Enter the group here

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| **Learning outcomes**   1. Understand the underlying principles of the trowel occupations 2. Know the processes of stacking, storing and preparing materials for building brick, block and stone walls 3. Planning the completion of common tasks in brick, block and stone 4. Set out and build a range of walls using brick, block and stone 5. Understand the performance criteria for the completion and evaluation of common brick, block and stone tasks |

| Session | Objectives/learning outcomes **The learner will:** | Activities and resources | Skills check |
| --- | --- | --- | --- |
| 1  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.1 Understanding work and roles in the trowel occupations trade area   * Planning work * Preparing work area * Covering, placing and protecting materials | Activities:   * Tutor-led discussion on factors involved in setting out the work area for construction activities (establishing a sequence of work, producing lists of tools and equipment required, calculating quantities of materials required, assessing risks and hazards). * Guided group discussion to identify a range of materials and components for work in brick, block and stone to be selected and brought to the work area. * Detail differences in handling and storing brick, block and stone (weight, size, shape). * Highlight the importance of correctly positioning materials in the work location for building activities. * Learners to consider optimum position of materials at the work location for efficiency/consideration of safety. * Discuss how materials are protected during transport and delivery to site (wrapped, delivered in covered trucks or wagons etc.). * Highlight the importance of protecting materials both when in storage and when loaded out ready for work. * Discuss methods of protecting materials when positioned ready for work (cover with spot board, wrap in polythene). * Detail methods of reducing waste by careful transport and handling of materials and components. * Discuss requirements to segregate and dispose of any waste in line with regulations.   Resources:   * **PowerPoint 1: Preparation and protection of the work area** * **Worksheet 1: Preparing the work area** * **Worksheet 2: Protecting materials** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 1 and 2** |
| 2  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.1 Understanding work and roles in the trowel occupations trade area   * Bedding, levelling, lining, plumbing * Gauging mortar * Environmental considerations | Activities:   * Tutor description of how mortar bed joints are produced efficiently (mortar consistency, rolling mortar, skilful use of trowel). * Explore differences in mortar consistency / workability for brick, block and stone construction. * Detail use of spirit level in levelling courses of brick and block. * Guided discussion on good practice in levelling (tapping bricks and blocks rather than the spirit level to achieve horizontal alignment). * Explain use of the level in lining the face of brick and block courses. * Discuss differences in practice to level and line stone materials (random rubble/coursed stone). * Detail use of string lines in aligning brick, block and stone masonry. * Detail use of the spirit level in plumbing courses of brick and block. * Discuss good practice in plumbing (tapping bricks and blocks rather than the spirit level to achieve vertical alignment). * Explore methods of plumbing walls constructed in stone (end profiles, plumb lines). * Detail differences in proportions of materials in gauged mortar for brick, block and stone. * Explain methods of achieving accurate and consistent proportions of mortar materials (gauge box, weight batching). * Explore environmental considerations in disposing of waste (segregation, regulation). * Research environmental impact of using sustainable materials in construction. * Tutor-led group discussion on the importance of sourcing materials locally and possible ethical considerations.   Resources:   * **PowerPoint 2: Building accurately** * **Worksheet 3: Building accurately** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 3** |
| 3  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.2 The tools and equipment used  Tools - and appropriate uses:   * laying trowel * pointing trowel * lump hammer * brick hammer * scutch hammer * bolster, tape * line, pins and corner blocks * spirit level * boat level * jointing iron | Activities:   * Tutor-led discussion to clarify the terms ‘tools’ and ‘equipment’ in relation to identifying and selecting the right items for the specified work task. * Categorise groups that tools fall into (tools for laying, measuring, checking, cutting). * Identify and differentiate specific tools used for brick, block and stone masonry. * Learners to list, describe and categorise the tools required for brick, block and stone construction activities. * Guided discussion on care and maintenance of tools (cleaning, correct storage, sharpening e.g. chisels, hammer heads tight on shaft/handle etc.). * Focus on the importance of caring for fragile tools such as spirit levels (checking accuracy regularly, keeping reference vials clean, avoiding impact damage).   Resources:   * **PowerPoint 3: Tools for masonry work** * **Worksheet 4: Tools for masonry work (1)** * **Worksheet 5: Tools for masonry work (2)** * **Worksheet 6: Tools for masonry work (3)** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 4–6** |
| 4  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.2 The tools and equipment used  Equipment - and appropriate uses.   * gauge rod * shovels * buckets * gauge box * site square * profiles | Activities:   * Review discussion in last session to differentiate between ‘tools’ and ‘equipment’. * List the equipment needed for brick and block work activities (gauge rods, spot boards, buckets). * Explain use of gauge rod in establishing height reference points in brick and block masonry activities. * Comment on methods of producing a gauge rod (saw cuts at brick and block gauge measurements more durable than pencil marks etc.). * List the equipment related to gauging and mixing mortar (shovels, gauge boxes). * List the equipment related to setting out and accuracy (site square, profiles). * Comment on methods of producing site squares and profiles in timber on site. * Refer to need to inspect tools and equipment to confirm safe condition before use * Refer to need to clean and maintain tools and clean and store equipment correctly.   Resources:   * **PowerPoint 4: Equipment for masonry work** * **Worksheet 7: Equipment for masonry work** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 7** |
| 5  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.3 The materials used in trowel occupations   * Bricks * Blocks | Activities:   * Introduce materials that bricks can be manufactured from (clay/shale, concrete, calcium silicate). * Discuss categories of bricks used in construction (face brick, common brick, engineering brick). * Tutor-led discussion on characteristics of different bricks (colour, texture, compressive strength, water absorption). * Discuss applications and uses of various brick types (below ground – substructure, above ground – superstructure). * Introduce different types of blocks (dense concrete, lightweight concrete, thermal, hollow, trench). * Research materials that different blocks are manufactured from (concrete, PFA) and comment on characteristics (strength, water absorption, insulating qualities). * Discuss applications and uses of various block types (load bearing, non-load bearing, insulating, partition walls). * Discuss modular dimensions of bricks/blocks and how they ‘fit’ together in wall construction (e.g. six standard bricks equal in area to one standard block).   Resources:   * **PowerPoint 5: Bricks and blocks** * **Worksheet 8: Bricks and blocks (1)** * **Worksheet 9: Bricks and blocks (2)** * **Worksheet 10: Bricks and blocks (3)** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 8–10** |
| 6  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.3 The materials used in trowel occupations   * Natural stone * Reconstituted stone | Activities:   * Explore different types of natural stone used in masonry construction (blue pennant, granite, sandstone, bath stone). * Guided discussion on suitable applications and uses of different types of natural stone (consider compressive strength, water absorption, tolerance to temperature change). * Feature different methods of stone construction (random rubble, coursed, dry stone walls). * Tutor-led discussion on factors governing the selection of a suitable type of natural stone and method of construction (aesthetics, durability, availability of materials, availability of suitably skilled operatives). * Introduce the requirement to dress stone for certain applications (appearance requirements of wall face, structural bonding requirements, angled quoins, arch construction). * Comment on skill requirements for dressing stone accurately. * Explain the meaning of the term ‘reconstituted’ stone (manufacturing process, modular design). * Discuss facility to manufacture reconstituted stone in colours and textures of choice. * Feature sizing options available in manufacturing of reconstituted stone. * Comment on skill requirements when correctly bonding reconstituted stone (avoiding straight joints, achieving consistent uniform appearance).   Resources:   * **PowerPoint 6: Stone** * **Worksheet 11: Stone** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 11** |
| 7  Theory  2 hours | 1. **Understand the underlying principles of the trowel occupations**   1.3 The materials used in trowel occupations   * Sand * Cement * Plasticiser * Lime * Water * Additives | Activities:   * Research sources of sand for construction use (dredged, pit sand). * Tutor-led discussion on grading of sand to produce mortar for masonry activities (fine/coarse grains, sharp sand) and effects on consistency/workability of mortar. * Explain purpose of sand as a matrix constituent of mortar. * Discuss requirement to test sand for silt content (contaminant could affect setting process of mortar, reducing strength and durability of mixed materials). * Discuss different types of cement used in mortar (OP, sulphate resisting, rapid setting) and applications (general use, reducing effects of moisture saturation, reducing damage by follow-on construction activities). * Explain purpose of cement as a binding constituent of mortar. * Research different types of plasticiser (liquid and powder chemical, lime). * Explain principle of air entrainment to improve workability of mortar. * Discuss requirement for clean water in mortar (potable standard to avoid undesirable chemical reaction). * Research additives and their purpose (retarder, accelerator, hardener).   Resources:   * **PowerPoint 7: Mortar materials** * **Worksheet 12: Mortar materials** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 12** |
| 8  Theory  2 hours | 1. **Know the processes of stacking, storing and preparing materials for building brick, block and stone walls**   2.1 Reasons for stacking and storing materials   * Protection * Efficiency * Security | Activities:   * Recap previous session content regarding protecting and positioning of materials for work activities. * Review potential causes of concern to be considered in regard to protecting materials (bad weather, mechanical damage, theft). * Emphasise the importance of protective measures when moving, stacking and handling materials (avoiding damage and production of waste, ensuring a high standard of finish in completed work, cost savings). * Tutor-led discussion on reasons for protecting materials loaded ready for work (avoiding saturation leading to staining, avoiding soiling/damage by nearby construction activities, avoid delays caused by loaded materials needing to be replaced). * Discuss positioning of materials for optimum efficiency (near enough to avoid unnecessary operative effort, allowing space to work freely). * Explore impact on productivity of operatives not positioning materials with efficiency in mind (reduced earnings, unmet deadlines, damaged company reputation). * Consider how storing materials securely potentially impacts on efficiency, productivity and costs. * Discuss established measures for storing materials securely (fenced compounds, lockable containers, site hoardings, lighting, CCTV).   Resources:   * **PowerPoint 8: Stacking and storing materials** * **Worksheet 13: Stacking and storing materials** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 13** |
| 9  Theory  2 hours | 1. **Know the processes of stacking, storing and preparing materials for building brick, block and stone walls**   2.2 Methods of preparing mortar for work   * Gauging and mixing mortar * Ratios | Activities:   * Discuss requirement to prepare mortar to set specifications. * Focus on importance of consistent production of mortar to satisfy structural requirements of masonry construction (variation in consistency can lead to weakness, cracking, failure). * Explain definition of ‘gauged’ mortar (consistent proportions throughout mixing operations). * Refer to potential inconsistency when using a ‘shovelful’ measurement of mortar constituents (e.g. wet sand will deliver a larger shovelful than dry sand). * Describe use of gauging box (or other measuring equipment, e.g. bucket) to maintain consistency of mortar constituent proportions. * Explore application of ratios in establishing consistent proportions of mortar constituents. * Learners to research required mortar ratios for a range of applications (e.g. use with engineering bricks, use with thermal blocks, use with perforated clay bricks, use with random rubble stonework). * Research application of ratios when using additives (proportions of liquid and chemical plasticiser, lime powder). * Comment on addition of water as a constituent of mortar (must be clean/potable standard). * Explore effects of too much or too little water in a mortar mix (workability, cracking, shrinkage, staining of masonry).   Resources:   * **PowerPoint 9: Methods of preparing mortar** * **Worksheet 14: Methods of preparing mortar** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 14** |
| 10  Theory  2 hours | 1. **Know the processes of stacking, storing and preparing materials for building brick, block and stone walls**   2.2 Methods of preparing mortar for work   * Hand and mechanical mixing | Activities:   * List methods of preparing mortar for work (by hand, by drum mixer, by silo mixer, by on-site or off-site batching plant). * Tutor-led discussion on the advantages/disadvantages of mixing by hand (suitable for minor projects, no plant or machinery costs, skill required to maintain consistency between mixed batches, etc.). * Discuss established process of hand mixing (three times dry – three times wet). * Focus on mixing with a drum mixer. Discuss sizes of mixer (capacity) and methods of powering (petrol, diesel, electric). * Discuss sequence of adding materials to a drum mixer (water first to avoid materials sticking to inside of drum etc.). * Review previous session reference to use of a gauge box to maintain accuracy in proportions of mortar constituents (gauge box can be used for hand mixing or use with drum mixer). * Describe silo mixer use on site. Discuss advantages (consistent mix, specific quantities, reduced waste, can be used by unskilled workers). * Mixing by factory batching plant – large quantities with quality standards maintained. Consistent workability, colour and strength, reduces machinery on site.   Resources:   * **PowerPoint 10: Methods of mixing mortar** * **Worksheet 15: Methods of mixing mortar** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 15** |
| 11  Theory  2 hours | 1. **Know the processes of stacking, storing and preparing materials for building brick, block and stone walls**   2.3 Methods of preparing the area for work  Efficiency   * Position mortar boards ready for work * Move and stack bricks, blocks and stone ready for work | Activities   * Tutor-led discussion on efficiency considerations when storing, moving and stacking materials in the work area. * Learners to research methods of manually handling materials efficiently (using lifting aids such as brick clamps for moving bricks by hand). * Consider efficiency benefits of centrally located storage on site (security, access, delivery management, stock monitoring). * Explore use of mechanical handling to maximise efficiency in moving materials to the work location (forklift, crane). * Discuss the planning requirements to maintain good access to the work area when positioning and stacking materials (also avoiding blocking access for other workers). * Consider efficiency requirements for positioning mortar ‘spot’ boards along with masonry materials (access for restocking stacked materials, access for replenishing mixed mortar). * Discuss range of weights, sizes and shapes in materials used for masonry activities (brick, block, stone). * Highlight essential considerations when moving and handling different materials to support efficiency (bricks and blocks can be easily stacked due to regular shape and size. Natural stone may be irregular and bulky).   Resources:   * **PowerPoint 11: Methods of preparing the work area – efficiency** * **Worksheet 16: Preparing the work area – efficiency** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 16** |
| 12  Theory  2 hours | 1. **Know the processes of stacking, storing and preparing materials for building brick, block and stone walls**   2.3 Methods of preparing the area for work  Safety   * Position mortar boards ready for work * Move and stack bricks, blocks and stone ready for work | Activities:   * Discussion on the critical impact of risk assessments and method statements on establishing and maintaining safe working practices. * Consider key factors included when writing risk assessments. * Guided group discussion on overarching safety aspects of stacking storing and preparing materials for masonry construction activities (weight of materials, awkward size/shape, kinetic lifting for manual handling). * Discuss danger to personnel from machinery movement during mechanical handling (forklift, crane). * Discuss safe stacking methods to maintain stability in materials set out ready for work (bricks overlapped, blocks overlapped, stone in carefully arranged piles). * Discuss safety implications of the height of stacks when loading out materials (crushing injuries from stacks of materials toppling). * Focus on the need to prepare and level the ground where stacks of materials are to be safely positioned to avoid toppling. * Comment on the increased potential danger when stacking materials along the edge of foundation trenches. * Discuss increased potential hazards when working at height (falling objects, overloading scaffold, reduced area of working platform). * Learners to list safety considerations when loading out materials for masonry construction (trip hazards, crushing injuries from falling objects, muscle injuries when lifting materials, eye damage due to dust and flying debris generated during movement of materials).   Resources:   * **PowerPoint 12: Methods of preparing the work area – safety** * **Worksheet 17: Preparing the work area – safety** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 17** |
| 13  Theory  2 hours | 1. **Planning the completion of common tasks in brick, block and stone**   3.1 Planning the sequence of work   * Timescale * Drawings * Specifications * Labour and materials schedule | Activities:   * Tutor-led discussion on the need to work within set timescales (effect of overruns on budget, company reputation, integrating different trade activities, lead times of delivered materials). * Comment on planning aids used to plan and monitor timescale requirements (Gannt chart / bar chart). * Discuss types of drawings used to provide information for masonry construction activities (block plans, layout drawings, floor plans, elevations, sections). * Expand on different views of the project given by each type of drawing. * Discuss methods of extracting information from drawings concerning features and details of masonry tasks (including appropriate scales). * Detail possible content of a typical specification (materials type, colour, strength, component details, working practices). * Discuss why a specification is a ‘contract’ document (possible legal consequences if specification is not adhered to). * Discuss benefits of utilising schedules in construction activities (identifying resource requirements more easily, reduced comments added to drawings, aids ‘flow’ of planning for labour requirements and materials ordering). * Consider application of labour schedules and list benefits. * Consider application of materials schedule and list benefits.   Resources:   * **PowerPoint 13: Planning the sequence of work (1)** * **Worksheet 18: Planning the sequence of work (1)** * **Worksheet 19: Planning the sequence of work (2)** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 18 and 19** |
| 14  Theory  2 hours | 1. **Planning the completion of common tasks in brick, block and stone**   3.1 Planning the sequence of work   * Manufacturer’s information * Resources * Instructions * Problem solving * Teamwork | Activities:   * Discuss the importance of following manufacturer’s information and instructions (maintaining safety and best practice, maintaining currency through updates on usage and best practice of materials, components, tools and equipment). * Focus on the importance of checking information sources to confirm suitability of resources. * Review range of information sources utilised for masonry construction activities (drawings, specifications, schedules, manufacturer’s information) and discuss how they ‘dovetail’ together. * Discuss methods and manner of reporting discrepancies to line manager. * Consider the responsibility of the bricklayer to check that the work conforms to specifications and drawings before work starts and as work proceeds. * Explore the parameters of the bricklayer’s personal responsibility in following instructions (taking the initiative, liaising with colleagues, consulting with managers). * Discuss importance of working to personal limits and cooperating as part of a team. * Provide scenarios that require learners to plan and sequence tasks (e.g. adding an extension to an existing property, building a garden wall with restricted access).   Resources:   * **PowerPoint 14: Planning the sequence of work (2)** * **Worksheet 20: Planning the sequence of work (3)** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 20** |
| 15  Theory  2 hours | 1. **Planning the completion of common tasks in brick, block and stone**   3.2 Calculating quantities   * Measure areas | Activities:   * Discuss the method of calculating area of wall face to establish quantities. * Discuss requirement and method of deducting areas for doors and windows. * Explain number of bricks and blocks per square metre (m²) (state as formula). * Provide extensive opportunities to practice area calculations of simple wall arrangements (could be in small groups with tutor support). * Add requirement to calculate brick and block quantities from area calculations in accordance with already established formulae. * Consider area calculation for stone walls (difference in outcomes for random rubble – tonnes per m² – compared to coursed stone). * Introduce area calculations to include walls with returns. * Highlight the need to avoid double calculating overlapping areas at returns and quoins (explain terms ‘quoin’ and ‘return’). * Provide extensive opportunities to practice area calculations of wall arrangements that include returns (could be in small groups with tutor support).   Resources:   * **PowerPoint 15: Calculating quantities – area** * **Worksheet 21: Calculating quantities – area (1)** * **Worksheet 22: Calculating quantities – area (2)** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 21 and 22** |
| 16  Theory  2 hours | 1. **Planning the completion of common tasks in brick, block and stone**   3.2 Calculating quantities   * Linear measurements * Allowances for waste | Activities:   * Tutor-led discussion to define and examine examples of ‘linear’ measurements. * Explore use of linear measurements extracted from working drawings (length, perimeter). * Detail how linear measurement can apply to horizontal and vertical dimensions. * Discuss use of horizontal linear measurement (from given corner points, from external walls to establish internal wall positions, from existing buildings). * Explain how working with linear measurement involves understanding how to use overall measurements and running or cumulative measurements. * Learners to be given an opportunity to practise extracting horizontal linear dimensional information from suitable working drawings (e.g. working out missing dimensions, missing dimensional positions of doors and windows etc.). * Discuss how linear measurement is used in calculation when planning the work task. * Discuss requirement to allow for wastage during calculations of quantities of masonry materials. * Explore factors that could be considered in setting waste percentage (additional handling required due to limited access to the work area, resources specified may be more prone to damage). * Identify suitable wastage percentages for brick and block wall examples. * Use wall examples provided in previous session to add calculated waste percentages (could be in small groups with tutor support).   Resources:   * **PowerPoint 16: Linear measurement** * **PowerPoint 17: Waste percentages** * **Worksheet 23: Calculating quantities – area (3)** * **Worksheet 24: Linear measurement (1)** * **Worksheet 25: Linear measurement (2)** * **Worksheet 26: Waste percentages** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 23–26** |
| 17  Theory  2 hours | 1. **Planning the completion of common tasks in brick, block and stone**   3.3 Recording work   * Timesheets * Job sheets * Tools and materials list * Snagging list * Recording deliveries | Activities:   * Tutor-led discussion on the benefits of using documents in recording and transmitting information (permanent record, avoids confusion). * Emphasise the value of recording information (record of work completed in relation to pay, record of extended work hours, aid to efficient future planning, aid to maintaining productivity, efficiency in managing resources). * List and describe range of documents used on site to manage work and personnel (timesheets, job sheets). * List and describe documents used to manage resources (tools list, materials list). * Describe use and application of snagging list (ordered and structured identification, management and correction of defects). * Discuss purpose and process of recording deliveries to site (management of resources, supporting planning of resource usage, supporting efficiency and productivity, strengthening security of delivered materials). * Tutor to develop a construction site scenario to allow learners to practise completing documents in the stated range.   Resources:   * **PowerPoint 18: Recording work** * **Worksheet 27: Recording work** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 27** |
| 18  Theory  2 hours | 1. **Set out and build a range of walls using brick, block and stone**   4.1 Set out and build straight walls   * Brick and block stretcher bond, half bond, dry bonding | Activities:   * Tutor-led discussion on the skills and qualities required by a bricklayer when setting out and building brick and block walls (precision in use of laying tools, attention to detail, habitual checking of standards, consistent evaluation of work, ability to plan ahead). * List information sources that are used for setting out masonry walls (drawings, specification, schedules, manufacturer’s information). * Discuss common use of stretcher bond in masonry construction and describe bonding arrangement (half bond). * Discuss requirement to maintain half bond in stretcher work to maintain acceptable appearance and support load distribution as a structural function (maintaining plumb perps). * Explain need to cut half-bricks at wall stopped ends to maintain bonding arrangement. * List and describe hand tools needed to cut bricks and blocks (lump hammer, bolster chisel, brick hammer, scutch hammer, tape measure). * Describe ‘dry’ setting out process to establish bonding arrangement in brick and block walls (accommodating slight variation in brick and block sizes by varying perp joint sizes). * Describe method of using string lines in constructing straight walls in brick and block (ensuring brick or block is aligned with the string line along its full length, not allowing bricks or blocks to disturb accuracy by touching the string line, ‘eyeing’ down the string line and wall to ensure accurate face plane).   Resources:   * **PowerPoint 19: Straight walls in brick and block** * **Worksheet 28: Straight walls in brick and block** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 28** |
| 19  Theory  2 hours | 1. **Set out and build a range of walls using brick, block and stone**   4.1 Set out and build straight walls   * Stone, bonding | Activities:   * Describe different methods of using stone in straight walls (random rubble, coursed stonework, dry-stone walls). * Compare how string line is used with different stone wall construction methods (stone in random rubble will not have straight arris or edges to align with string line, coursed stone will have a more uniform shape to align to string line). * Discuss methods of using profiles to position a string line along the length of a straight wall. * Discuss bonding arrangements in stone walls for different methods of construction (random rubble, coursed stone, dry-stone). * Explore skill requirements for setting out and building stone walls in comparison to brick and block laying (is a more artistic ‘eye’ needed? – what bonding rules might apply to each method of stone construction? – how can structural stability be maintained when using irregular shaped components?). * Recap methods of cutting stone materials with hand tools (specialist hammers and trimming/dressing tools). * Learners to produce a simple comparative table showing skills and techniques required when producing straight walls in brick/block and stone (learners could consult in small groups with tutor support before individually producing a table).   Resources:   * **PowerPoint 20: Straight walls in stone** * **Worksheet 29: Straight walls in stone** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 29** |
| 20  Theory  2 hours | 1. **Set out and build a range of walls using brick, block and stone**   4.2 Set out and build return quoins   * Racking back * Stopped ends | Activities:   * Tutor-led discussion on the method of using constructed quoins in brick or block to allow accurate construction of straight walls by attaching a string line from end-to-end of the wall. * Describe the sequence of setting out first course of a right angle quoin. * Focus on the use of the spirit level to level and line first course (level from end-to-end of a course and align face of course). * Detailed description of course-by-course construction of a right angle quoin explaining ‘racking back’ feature (focus on how corner or quoin brick or block acts as a control point – once accurately gauged, the rest of the course is levelled from it as a reference). * Emphasise constant use of the spirit level to check accuracy of level, line and ranging. * Discuss process of constructing a stopped end in brick and block. * Feature plumbing points in quoins and stopped ends (explain why only the face and end of a stopped end can be plumbed – not the back). * Comment on the challenges of building quoins in stone (irregular shaped components). * Review the method of using profiles to guide construction of quoins and stopped ends constructed in stone.   Resources:   * **PowerPoint 21: Quoins and stopped ends** * **Worksheet 30: Quoins and stopped ends (1)** * **Worksheet 31: Quoins and stopped ends (2)** * **PowerPoint 22: Wall ties in cavity walls** * **Worksheet 32: Wall ties in cavity walls** | Tutor observation  Classroom discussion  Focused questioning  **Worksheets 30 and 31**  **Worksheet 32** |
| 21  Theory  2 hours | 1. **Set out and build a range of walls using brick, block and stone**   4.3 Carry out the work effectively and safely | Activities:   * Tutor-led discussion to review the qualities required to work as an effective and safe bricklayer (focus on diligence, thoroughness, being observant of surroundings, considerate of other personnel, proactive not reactive when dealing with problems). * Explore how effectiveness is related to planning and monitoring surroundings when setting out and preparing for masonry activities. * Debate level of personal responsibility in dealing with hazards (safeguarding welfare of others, reporting to line manager, taking preventive action when appropriate). * Discuss appropriate responses when dealing with accidents and emergencies (raising the alarm, alerting first aiders, informing colleagues, reporting to management). * Identify key health and safety legislation in relation to working as a bricklayer (HASAWA, COSHH, working at height regulations, manual handling regulations, PUWER, RIDDOR etc.). * Focus on safe handling and use of materials and equipment. * Explore safe use of access equipment and working at height. * Consider HSE data on current accident statistics and create a simple table of trends/peaks for incidents relating to the work activity of bricklayers (with tutor support).   Resources:   * **PowerPoint 23: Building walls safely and effectively** * **Worksheet 33: Building walls safely and effectively (1)** * **Worksheet 34: Building walls safely and effectively (2)** * **Worksheet 35: Building walls safely and effectively (3)** | Tutor observation.  Classroom discussion.  Focused questioning.  **Worksheets 33–35** |
| 22  Theory  2 hours | 1. **Understand performance criteria for the completion and evaluation of common brick, block and stone tasks**   5.1 Evaluation against standards   * Quality of finish * Working to tolerances | Activities:   * Discuss reasons why maintaining high quality standards in masonry activities is important structurally (stability, durability, longevity). * Discuss reasons why maintaining high quality standards in masonry activities is important aesthetically (brick and stone face work will be ‘on-view’ for the entire life of the structure, first view of a building is often the masonry exterior). * Refer to quality requirements in producing full bed and perp joints (voids in the joints could lead to frost damage and spalling, reduced strength in masonry, shorten the serviceable life of the wall). * Explore good habits that should be developed to produce high quality work (skilled and careful production of joint finishes, careful judging of mortar setting time when jointing, diligence in avoiding mortar smudging, protecting finished work during hardening/curing). * Tutor-led discussion on the meaning of ‘tolerances’ in the context of masonry activities (allowing for manufacturing variation in dimensions of components, building to given datums). * Discuss consequences of not building within given tolerances (specified dimensions of a structure not met, modular components cannot be installed). * Learners to research and list British Standard tolerances for brick and block dimensions with tutor support. * Discuss acceptable tolerances for plumb, level and range in masonry (± mm for vertical measurement, ± mm for level, ± mm for range/face plane).   Resources:   * **PowerPoint 24: Working to standards** * **Worksheet 36: Working to standards** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 36** |
| 23  Theory  2 hours | 1. **Understand performance criteria for the completion and evaluation of common brick, block and stone tasks**   5.1 Evaluation against standards   * Ability to work to set timescales * Safe working practice | Activities:   * Tutor-led discussion on the importance of working to timescales in masonry construction activities (follow-on trades, cost considerations, company reputation). * Explore the bricklayer’s level of contribution to achieving deadlines (reliability, flexibility, cooperation, initiative). * Discuss the use of documents and systems to set and maintain suitable timescales for work activities (review Gannt charts, summarise critical path analysis). * Debate the balance between maintaining/increasing productivity levels and maintaining/increasing safety at work. * Review key points regarding health and safety in relation to safe working practice (concern for the safety of others as well as personal safety). * Focus on how a culture of safe practice can be developed and maintained (importance of job hazard analysis and toolbox talks, being proactive in dealing with emerging hazards, being observant in the workplace, communicating effectively with colleagues). * Confirm importance of documents and assessment systems in promoting safe working practices (risk assessments, accident book, RIDDOR documentation).   Resources:   * **PowerPoint 25: Working safely within timescales** * **Worksheet 37: Working safely within timescales** | Tutor observation  Classroom discussion  Focused questioning  **Worksheet 37** |
| 24  Theory  2 hours | 1. **Understand performance criteria for the completion and evaluation of common brick, block and stone tasks**   5.2 Performance analysis   * Self-evaluation * Peer evaluation * Oral discussion * Written feedback * Quality of work * Grading | Activities:   * Discuss the meaning of the term ‘self-evaluation’ in relation to masonry construction activities (personal quality checks on product of work, evaluation of productivity levels against contract norms, monitoring efficiency and effectiveness when working with others). * Discuss the meaning of the term ‘peer evaluation’ and how it is beneficial (critical evaluation by others can pinpoint factors not immediately apparent, learning from others and sharing best practice). * Explore the relevance of evaluation and analysis of performance in improving skills and competence levels (continuous development, confidence building, extended competence, increased value as an employee). * Discuss the importance of developing oral communication skills when working as part of a team (active listening, open and closed questions, confirming understanding). * Relate development of oral skills to performance analysis (exchange of ideas, collaboration, cooperation). * Consider use of written feedback in the context of masonry construction activities (e.g. confirming compliance of work with building control requirements, confirming compliance of work practices with health and safety requirements etc.). * Discuss methods of providing written feedback to maintain quality of work (producing lists, producing reports, compiling focused comments). * Explore methods of grading work quality and performance (work produced within given tolerances, comparison with given work programme, comparison with accepted norms for similar work).   Resources:   * **PowerPoint 26: Improving performance** * **Worksheet 38: Improving performance** | Tutor observation  Classroom discussion  Focused questioning.  **Worksheet 38** |
| 25–70  Practical activities  92 hours | 1. **Planning the completion of common tasks in brick, block and stone**   3.1 Planning the sequence of work  3.2 Calculating quantities  3.3 Recording work   1. **Set out and build a range of walls using brick, block and stone**   4.1 Set out and build straight walls  4.2 Set out and build return quoins  4.3 Carry out the work effectively and safely | Activities:  Tutor-led workshop demonstrations of setting out straight walls, return quoins and cavity walls in brick, block and stone.   * Ensure that appropriate PPE is available and used. * Check that selected tools and equipment are in a safe condition. * Learners must consider the planning and preparation required when setting out straight walls, return quoins and cavity walls. * Provide an appropriate range of information sources for learners to plan the task. * List, identify and select materials and resources for masonry construction activities. * Calculate quantities of materials. * Learners to work individually to safely and efficiently move materials, following given instructions. * Learners are to set out for line and level of wall. * Learners must use structural components in accordance with regulations. * Learners must demonstrate an understanding of the methods of protecting the work environment. * Provide learners with the opportunity to record outcomes on completion of work tasks.   A range of tasks should be produced to satisfy the unit criteria. Tasks should be designed to allow progressive skills development suited to foundation level learners.   * Appropriate handouts and worksheets to be used at tutor discretion. * Materials required will include: * face bricks * lightweight blocks * selected stone * spot boards * training mortar * wheelbarrows * sack trolleys * shovels | Tutor observation  Focused questioning  Assessed products of work |