T level Technical Qualification in Construction: On-Site Construction (Level 3) (delivered by City and Guilds) (8710-30)

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# Qualification at a glance

<table>
<thead>
<tr>
<th>T Level route</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>T Level pathway</td>
<td>On-site Construction</td>
</tr>
<tr>
<td>City &amp; Guilds number</td>
<td>8710-30</td>
</tr>
<tr>
<td>Age group approved</td>
<td>16+</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>Formal entry requirements are not set by City &amp; Guilds. However, we would expect that learners have the appropriate attainment at Level 2 before commencing their studies.</td>
</tr>
</tbody>
</table>
| Assessment | Core - knowledge tests are externally assessed  
Core – employer-set project is externally assessed  
Occupational specialisms are externally moderated |
| First registration | September 2021 |
| Total GLH | TBC |
| Total TQT | TBC |

### Title and level

| T Level technical Qualification: On-Site Construction (Level 3) (delivered by City and Guilds) | 8710-30 |

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Draft review for Milestone 2
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1 Introduction

What is this qualification about?

The following purpose statement relates to the T Level "Technical Qualification in Construction: Onsite Construction (Level 3) (delivered by City & Guilds)"

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERVIEW</td>
<td>T Levels are new courses which will follow GCSEs and will be equivalent to 3 A Levels. These 2-year courses have been developed in collaboration with employers and businesses so that the content meets the needs of industry and prepares learners for work.</td>
</tr>
</tbody>
</table>
| What is a T Level?                        | A T level is one of three post 16 options for young people which are:  
• A Levels  
• Apprenticeships  
• T Level                                                                                                                                 |
| How does the Technical Qualification work within the T Level? | This Technical Qualification specification contains all the required information you need to deliver the qualification in the T Level in Construction: On-Site Construction.  
The Technical Qualification forms a significant part of the T Level Technical Qualification in Construction: On-site Construction. City & Guilds are responsible for the development and ongoing operational delivery of this Technical Qualification. All other parts of the T Level as listed below will need to be achieved by a Student for the Department for Education to award the successful completion of this T Level. It is important to note that City & Guilds do not have responsibility of delivery for the other parts of the T Level but will continue to support centres where they can on all aspects of T Level delivery.  
Additional mandatory parts of the T Level that need to be achieved:  
• A 315-hour minimum industry placement  
• Level 2 Functional skills or GCSE English and Maths at grade 4 or above |

| Who is this qualification for?             | This qualification is for you if you are a 16-19-year-old learner, who wishes to work within the On-Site construction Industries.                                                                         |

1 T Level is a registered trade mark of the Institute for Apprenticeships and Technical Education
It has been designed to deliver a high level of knowledge about the On-Site construction industry as well as the occupational skills required to enter the industry (known as ‘threshold competence’). A learner who completes this qualification is well placed to develop to full occupational competence with the correct support and training.

| What does this qualification cover? | The qualification will help you gain an understanding of the On-Site construction industry and the sector and you will cover topics such as: Health and Safety, construction science principles design principles, building technology, setting out, digital technologies and construction and the built environment and sustainability in the construction industry.

A learner will choose one occupational specialisms from the list below:
- Carpentry and Joinery
- Plastering
- Bricklaying
- Painting and Decorating

Centres and providers work with local employers who will contribute to the knowledge and delivery of training. Employers will provide demonstrations and talks on the industry and where possible work placements will also be provided by the employers. |

### WHAT COULD THIS QUALIFICATION LEAD TO?

**Will the qualification lead to employment, and if so, in which job role and at what level?**

This technical qualification focuses on the development of knowledge and skills needed for working in the On-Site construction industry, which will prepare you to enter the industry through employment or as an Apprentice. Furthermore, the completion of this qualification gives the learner the opportunity to progress onto higher education courses and training.

**Why choose this qualification?**

This qualification will suit someone who is not yet employed or looking to enter the industry post mainstream education. The structure of the qualification is designed to give learners the breadth of knowledge and understanding across the On-Site construction industry but also equips them with necessary occupational and core skills to enter the industry. This qualification is designed to support fair access and allows learners to manage and improve their own performance.

### WHO SUPPORTS THIS QUALIFICATION?

**Employer route panels**

The content of this qualification is outlined by a representative panel of employers from across the industry.
sector. It therefore prescribes the minimum knowledge and skills required to enter the industry. The content in this specification is approved by the Institute for Apprenticeships and Technical Education (IFATE).
Glossary of terms
The below provides a summary of the key information provided to centres to aide and support in the delivery of this Technical Qualification.

Guided learning hour (GLH) value
This value indicates the amount of Guided Learning Hours a unit will require for delivery to a learner on average. This includes contact with tutors, trainers or facilitators as part of the learning process, and includes formal learning including classes, training sessions, coaching, seminars and tutorials. This value also includes the time taken to prepare for, and complete, the assessment for the unit. Guided learning hours are rounded up to the nearest five hours.

Total qualification time (TQT) value
Total Qualification Time (TQT) is the total amount of time, in hours, expected to be spent by a Learner to achieve a qualification. It includes both guided learning hours (which are listed separately) and hours spent in preparation, study and assessment.

Criteria
This section of the specification outlines the subject or topic that needs to be delivered and assessed. Criteria is often supported by ‘range’ which provides the detail of the information required to be delivered as part of that topic. For example, with BSE systems as the topic, the range would list the systems that would need to be covered in delivery and assessment.

What do learners need to learn?
The primary purpose of the ‘What do learners need to learn’ sections is to support the delivery of the content in the criteria. These sections provide context in relation to the depth and breadth that something needs to be taught.

Skills
The skills section provides a mapping reference to the core, maths, English and digital skills that are embedded within the Technical Qualification content.

Example

3.3 Role of different disciplines involved in design.

Range:
Disciplines - Contractors and all operatives, architects and all professional occupations, planners and building inspectors, manufacturers

What do learners need to learn?
A basic knowledge of key job roles within construction design including the responsibilities and reporting lines/lines of escalation within roles. The key activities aligned to the disciplines with an appreciation of potential career progression routes.
Technical Qualification Structure

The Technical Qualification is made up of two components. Both of which need to be successfully achieved in order to attain the Technical Qualification as well as the full T Level in Construction: On-Site Construction.

The Core Component:
The core component is designed to offer the sufficient breadth of knowledge and skills a learner will need and be able to apply in a variety of contexts related to the industry and those occupational specialisms linked to this T Level.

The core content is the building blocks of knowledge and skills that gives a learner a broad understanding of the industry and job roles. While at the same time developing the core skills they will need to apply when working within the industry.

Occupational Specialisms:
Occupational specialisms develop the knowledge, skills and behaviours necessary to achieve threshold competence in an occupation. Threshold competence is defined as being when a learners attainment against the knowledge, skills and behaviours is of a standard to enter the occupation and industry. While demonstrating the ability to achieve occupational competence over time with the correct support and training.

Insert visual
To achieve the **T Level Technical Qualification in Construction: On-Site Construction (Level 3) (delivered by City & Guilds)** learners must achieve the two components of the Technical qualification. These are known as the core component and the occupational specialism:

- On-Site Construction component (350)
- plus **one** occupational specialism components (301 – 304).

### T Level Technical Qualification in Construction: Building Services Engineering (BSE) (Level 3)

<table>
<thead>
<tr>
<th>City &amp; Guilds component number</th>
<th>Component title</th>
<th>Component level</th>
<th>GLH (provisional)</th>
<th>TQT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandatory</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>On-Site Construction core</td>
<td>Level 3</td>
<td>400</td>
<td>TBC</td>
</tr>
<tr>
<td><strong>Optional (one must be chosen)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>301</td>
<td>Carpentry and Joinery</td>
<td>Level 3</td>
<td>550 TBC</td>
<td>TBC</td>
</tr>
<tr>
<td>302</td>
<td>Plastering</td>
<td>Level 3</td>
<td>550 TBC</td>
<td>TBC</td>
</tr>
<tr>
<td>303</td>
<td>Bricklaying</td>
<td>Level 3</td>
<td>550 TBC</td>
<td>TBC</td>
</tr>
<tr>
<td>304</td>
<td>Painting and Decorating</td>
<td>Level 3</td>
<td>550 TBC</td>
<td>TBC</td>
</tr>
</tbody>
</table>

**Title and level**

<table>
<thead>
<tr>
<th><strong>T Level Technical Qualification in Construction: On-Site Construction (Level 3) (delivered by City &amp; Guilds)</strong></th>
<th><strong>GLH</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TBC</strong></td>
<td><strong>TBC</strong></td>
</tr>
</tbody>
</table>
2 Centre requirements

Approval

New centres will need to gain centre approval. Existing centres who wish to offer this qualification must go through City & Guilds’ full Qualification Approval Process. There is no fast track approval for this qualification. Please refer to the City & Guilds website for further information on the approval process: [www.cityandguilds.com](http://www.cityandguilds.com)

Provider and Technical qualification approval criteria

As part of the approval application, the Provider will be required to demonstrate they meet the TQ approval criteria. The application form will include a self-assessment, where the Provider will confirm the appropriate policies, procedures or processes are in place and provide evidence on how these are met.

<table>
<thead>
<tr>
<th>Management systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective systems in place to ensure communication between all levels of staff within the organisation and to ensure information is shared.</td>
</tr>
<tr>
<td>Effective systems for communication across placements and staff who work remotely or externally to central location.</td>
</tr>
<tr>
<td>Provider Senior Management will ensure sufficient time and resource is allocated to ensure effective delivery of the TQ and will review this annually.</td>
</tr>
<tr>
<td>Effective systems in place to monitor and review the effectiveness of TQ delivery and assessment.</td>
</tr>
<tr>
<td>Robust and effective process in place to monitor delivery and/or assessment risks and to implement changes or allocate resource appropriately.</td>
</tr>
<tr>
<td>Provider has appropriate documented policies and procedures relating to; • Student recruitment and induction (including registration) • Ongoing Student support • Ongoing staff support • Safeguarding • Equality, diversity and inclusivity • Reasonable adjustments • Appeals • Student/staff malpractice, maladministration and plagiarism • Complaints • Conflict of Interest • GDPR • Risk assessments • Health &amp; Safety (including public liability) • Contingency planning (to include in cases of withdrawal of Provider approval).</td>
</tr>
<tr>
<td>Process in place for annual review of above policies and procedures.</td>
</tr>
<tr>
<td>Process to notify Awarding Organisation of any changes pertaining to the delivery and/or assessment of the TQ (e.g. staff changes).</td>
</tr>
<tr>
<td>Effective system in place to store accurate and up to date staff data (including CVs, qualification certificates, CPD evidence etc.).</td>
</tr>
</tbody>
</table>
Process in place to notify Awarding Organisation and other relevant parties where changes to the delivery and/or assessment of the TQ may affect the Providers ability to meet our approval criteria.

Effective system in place to store accurate and up to date Student data (including Student details, assessment and internal verification records, records of standardisation etc.).

All Student data is stored securely in line with GDPR and data protection legislation.

Provider will ensure all assessment records are retained for a minimum period of three years post certification.

**Industry placement**

Provider has appropriate documented policies and procedures relating to:
- Risk assessment and/or health and safety assessment of placement
- Quality assurance of placements
- Ongoing monitoring of placement.

**Resources**

Provider has access to the appropriate resources to meet the specification of the TQ and its delivery and assessment.

There are sufficient staff to meet the demand of the TQ.

Staff have the relevant competencies, occupational competence and knowledge required for the delivery and/or assessment of the TQ.

There are effective systems in place to ensure staff are adequately supported in their role.

Effective systems are in place to ensure Continuous Professional Development (CPD) of all staff involved in the delivery of the TQ.

Staff have adequate time and access to complete CPD.

Resources for assessment in the workplace or Realistic Working Environment (RWE) as specified by the standards setting body/specification are available and are robust.

Any third-party agreements are recorded, impact assessed and made available for review. (It may be necessary for the TQ Approval and Support Consultant to check suitability of premises and resources for third-party agreements).

**Delivery**

There is a detailed programme of delivery plan in place which is realistic and meets the needs of the TQ specification. Evidence of this may include a detailed induction process or plan for Learners or cohorts, a curriculum plan or scheme of work.

There is an initial diagnostics process in place for all Learners to ensure they are suitably supported.

There is a process in place to ensure Learners’ individual needs are assessed, matched against the requirements for the TQ and an individual assessment plan implemented (including initial diagnostics).

There are regular opportunities to review Student progress and support.

Learners receive a handbook which contains accurate information relating to the delivery of the TQ.

Learners are advised of any technical needs for the TQ and the support that will be delivered by the Provider.

**Assessment and standardisation plan**
Plan in place to ensure all Internal Assessors and key staff are trained in line with the marking, standardisation and moderation guidance provided by City & Guilds

Provider has a detailed and robust plan of how they intend to ensure that Internal Assessors and quality assurance staff will be adequately trained to ensure reliable and consistent marking.

Provider has a detailed and robust plan how they intend to ensure that there is an effective internal quality assurance process to actively monitor marking.

Understanding of how additional activities (webinars, training workshops etc.) provided by City & Guilds will support reliable marking and standardisation.

An effective standardisation plan is in place to ensure accurate, consistent and standardised marking across all Internal Assessors.

Provider can outline how it will identify and mitigate any risk where an Internal Assessor is deemed not to be providing reliable results.

**Secure live assessment and administration**

Providers will comply with the requirements set out by City & Guilds for the delivery and assessments of the TQ.

There are effective procedures in place to identify assessment that may not be the Student's own work (plagiarism).

There are effective procedures in place to confirm Learners' identification and record Learners' attendance.

There is a clearly identified Exam policy and procedure that meets with City & Guilds requirements for the TQ, as well as JCQ ICE requirements.

The Provider has in place a detailed Invigilation policy and can demonstrate that Invigilators are suitable trained.

Assessment locations are known to City & Guilds and meet with City & Guilds and JCQ ICE requirements.

The Provider ensures the safe storage, distribution and collection of all assessment and/or Exam material in line with JCQ ICE requirements.

Systems are in place to ensure only authorised personnel have access to assessment or Exam material and the platforms used to facilitate online Exams.
Resource requirements
Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualification before designing a course programme.

Centre staffing
Staff delivering these qualifications must be able to demonstrate that they meet the following requirements:

- Be occupationally competent at or above the level they are delivering
- Be able to deliver across the breadth and depth of the content of the qualification being taught
- Have recent relevant teaching and assessment experience in the specific area they will be teaching, or be working towards this
- Demonstrate continuing CPD
- Experience or training in the following will support the delivery of this Technical Qualification:
  - Delivering project-based qualifications
  - Preparation for exam-based assessments

Physical resources
Centres must be able to demonstrate that they have access to the equipment and technical resources required to deliver this qualification and its assessment.

Specific resources per specialisms to be added when finalised
Internal quality assurance

Internal quality assurance is key to ensuring accuracy and consistency of tutors and markers. Internal Quality Assurers (IQAs) monitor the work of all tutors involved with a qualification to ensure they are applying standards consistently throughout assessment activities. IQAs must have, and maintain, an appropriate level of technical competence and be qualified to make both marking and quality assurance decisions through a teaching qualification or recent, relevant experience.

Learner entry requirements

Centres must ensure that all learners have the opportunity to gain the qualification through appropriate study and training, and that any prerequisites stated in the What is this qualification about? section are met when registering on this qualification.

Formal entry requirements are not set by City & Guilds but we would expect learners to have qualifications at Level 2 or equivalent. This may include:

- GCSEs at grade 4 or above including English and maths
- Level 2 vocational qualification or equivalent in a related subject. For example Construction and the Built Environment
3 Delivering T Level Technical Qualifications

Initial assessment and induction

An initial assessment of each student 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,
• the appropriate type and level of qualification.

We recommend that centres provide an introduction so that learners fully understand 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.

Programme delivery

The Technical Qualification should be delivered through approaches that meets the needs of your learners. We would recommend using a variety of delivery methods including both classrooms and real work environments. Learners may benefit from both direct instruction in more formal learning environments and taking part in investigative projects, e-learning and their own study and learning through indirect approaches to delivery.
4. Competency frameworks

The Technical Qualification has been developed to include competency frameworks for T Levels which demonstrates an array of competencies across maths, English and digital skills as well as four key core skills that have been mapped into the core content. This can be seen in the skills section for each criterion.

Core skills
In the design, delivery and assessment of the Technical Qualification the below core skills are fundamental in the development of the required knowledge, skills and behaviours that learners will need to use when they progress on from completing their T Level. These core skills have been mapped in the design of the qualification content and developed in consultation with industry and providers. The mapping identifies the opportunities where these core skills can be developed and embedded into teaching and learning. It is not expected that all criteria will develop core skills but where these skills exist in the core content it has been referenced to support centres.

- **Core skill A (CSA)** Applying a logical approach to solving problems, identifying issues and proposing solutions
  - Comply with the requirements of risk assessments and method statements.
  - Ensure allocated tasks are completed on time, to the required standard.
  - Ensure the planning and design of a project meets the needs of the clients brief.
  - Assess the problems associated with building on brown field or reclaimed land.
  - Identify health and safety issues which may have been the product of poor design.
  - Improve communication networks within construction projects.
  - Ensure construction projects maximise their opportunity to make a profit.
  - Ensure all building work meets the required planning and control considerations.
  - Consider all environmental obligations at design, and throughout the construction period.
  - Design considerations must consider inclusivity versatility, access to and use of building.
  - Produce risk assessments, method statements and safe system of works.
  - The key stages of the design process.
  - The different types of sustainable solutions listed in the range and how they are used to inform the building process.
  - The use of both manufacturer instructions and technical guidance to solve problems.
  - Complying with data storage requirements in relation to security and protection.
  - The use of technology connected to the internet of things and its role in the construction industry to assist in just in time and asset management. BIM Building information Modelling.
  - The use of digital engineering techniques in the construction industry and where to apply them. Total stations in surveying.
  - Utilising benchmarking, KPI's and target setting when measuring business success.
- Ensuring the key requirements of Building Regulations and approved documents are implemented within projects

- **Core skill B (CSB)** Primary research e.g. obtaining measurements related to a design and / or customer requirement
  - Collect information on the HSE web site.
  - Research the various components relating to various sections of the Building Regulations.
  - Researching health and safety requirements to produce risk assessments, method statements and safe systems of work.
  - Researching construction materials to ascertain their properties and suitability
  - Researching construction design job roles.
  - Researching construction technical and professional roles.
  - The structure of the construction industry, including business types, large, medium and small.
  - Research the type of work undertaken within the construction industry and how it may change depending on company size.
  - The role and importance of CPD and how it affects the work of the Architect/Designer.
  - Sustainable construction solutions.
  - Researching the techniques aimed at maximising value and minimising waste within.
  - Research the requirements of current UK Building Regulations to ensure compliance.
  - The procedures and processes for penetrating building structure as detailed in the Building regulations.
  - Standards regulation and guidance used to maintain good practice within the construction industry.
  - Researching corporate social responsibility principles for a range of organisations.
  - Use current UK and international standards (BSEN).

- **Core skill C (CSC)** Communication e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a delay in the project owing to inclement weather.
  - Present a short term programme to the site manager.
  - Present risk assessments, method statements and tool box talks to enable safe working.
  - Communicate with the client when you need to make a small change to the proposed shape of the new garden wall.
  - Communicate the potential implications of poor design to the different parties affected in the construction chain.
  - Explaining the benefits to contractors, the client/customer, to profitability and project success detailing the Implications of not having accurate measurements
  - Communicate Information and data sources for construction projects
  - Communicate using BIM and workflow software packages
  - Promote good customer service providing information and advice to customers
- Implement change requests from various parties, including clients
- Communicate using technology connected to the internet of things and their role in the construction industry to assist in just in time and asset management.
- Setting clear project goals and objectives, defining roles, setting realistic milestones and constraints on cost and time.
- Prepare a short power point presentation on a chosen material i.e., concrete, brick, timber etc and present this to the group.
- Produce sketch designs for a house and then produce a 3D model on sketch up.
- You have seen a dangerous situation on site. Produce a written report for your supervisor.

• **Core skill D (CSD)** Working collaboratively with other team members and stakeholders e.g. to develop content to bid for a construction project
  - Take part in group discussions and presentations in collating information in response to a specification or client brief.
  - Follow the correct procedures for reporting an incident or near miss in the workplace.
  - Reporting lines of escalation within construction roles.
  - Integration of all partners of the supply chain.
  - Building information modelling and the effect they have on real time project delivery in a collaborative way.
  - Work collaboratively with the different types of stakeholders e.g. client, team and end user.
  - Collaborative approach to project delivery and reporting, and how this is applied in practice with the use of BIM and workflow software packages.
  - Working with a range of individuals applying equality and diversity legislation.
  - The use of conflict management techniques.
  - Behaving in an ethical way towards other team members and stakeholders.
  - Fundamental business values and commitment to customers and collaborative working with others.
  - Work collaboratively to ensure quality management systems are completed.
  - Ensuring team members and stakeholders know the key requirements of Building Regulations and approved documents.
  - Give each group a drawing and specification for a kitchen extension. They have to work as a team to work out the quantities of materials, and price the job, produce a method statement and programme, then present their finding to the client.
Maths, English and digital skills

Maths, English and digital skills have been mapped across the core content and each of the occupational specialisms. The lists below identify the core competencies which can be found in the skills sections of each performance criteria.

General English competencies

The General English competencies outline a framework of six General Digital competences, with no prioritisation or interpretation of order intended:

EC1. Convey technical information to different audiences
EC2. Present information and ideas
EC3. Create texts for different purposes and audiences
EC4. Summarise information/ideas
EC5. Synthesise information
EC6. Take part in/lead discussions

General Mathematical Competencies

The General Mathematical Competencies outline a framework of ten General Mathematical Competences, with no prioritisation or interpretation of order intended:

MC1. Measuring with precision
MC2. Estimating, calculating and error spotting
MC3. Working with proportion
MC4. Using rules and formulae
MC5. Processing data
MC6. Understanding data and risk
MC7. Interpreting and representing with mathematical diagrams
MC8. Communicating using mathematics
MC9. Costing a project
MC10. Optimising work processes

General Digital Competencies

The following outlines a framework of six General Digital Competences, with no prioritisation or interpretation of order intended:

DC1. Use digital technology and media effectively
DC2. Design, create and edit documents and digital media
DC3. Communicate and collaborate
DC4. Process and analyse numerical data
DC5. Be safe and responsible online
DC6. Controlling digital functions
5 Assessment

Assessment methods

Learners must complete:

two externally set exams covering knowledge from the On-Site Construction core content (component 300)

The exams provide sufficient sampling of the content, and consisting of a mixture of short answer questions (SAQ), some of which will be structured, and extended response. The balance of questions in assessing across Assessment Objectives (AOs) 1, 2 and 3 will allow for the appropriate differentiation of Learners to support in the reliable setting of boundaries.

one employer-set project covering knowledge and skills from the On-Site Construction core (component 300)

The employer-set project will be made up of well defined, real, industry style brief. The brief will be complex and non-routine and require the use of relevant maths, English and digital skills. The brief will provide a valid context for the Level 3 candidate to demonstrate their knowledge and understanding of the Core content and their Core skills to solve occupationally relevant situations and/or problems.

one occupational specialism practical assignment made up of a number of tasks covering the knowledge and skills from the chosen occupational specialisms (components 301 – 304)

These assessments will feature a considerable practical element and are composed of a series of holistic practical tasks relating to the specialism at hand. They will take place over a period of time, scheduled at the Providers’ preference within an approximate three-month assessment window. By nature of the considerable practical elements, the tasks will generate significant ephemeral evidence and be heavily reliant on Internal Assessor observation notes and records for validation.

Grading and marking

- The On-Site Construction core (component 300) is graded overall A* - E plus ungraded (U).
- The occupational specialisms (components 301 – 304) are graded overall Distinction, Merit, Pass and Ungraded. Each occupational specialism achieved will receive a grade.
## Technical Qualification Assessment structure

### Core Component – Learners must complete all assessment components

<table>
<thead>
<tr>
<th>Assessment component</th>
<th>Method</th>
<th>Duration</th>
<th>Marks</th>
<th>Weighting</th>
<th>Marking</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam paper 1</td>
<td>Externally set exam</td>
<td>2.5 hours</td>
<td>110</td>
<td>35%</td>
<td>Externally marked</td>
<td>This component will be awarded on the grade scale A* - E</td>
</tr>
<tr>
<td>Exam paper 2</td>
<td>Externally set exam</td>
<td>2.5 hours</td>
<td>110</td>
<td>35%</td>
<td>Externally marked</td>
<td></td>
</tr>
<tr>
<td>Employer set project</td>
<td>Externally set project</td>
<td>18 hours</td>
<td>100</td>
<td>30%</td>
<td>Externally marked</td>
<td></td>
</tr>
</tbody>
</table>

### Occupational Specialism Component - Learners must complete one assessment component

<table>
<thead>
<tr>
<th>Assessment component</th>
<th>Method</th>
<th>Duration</th>
<th>Marks</th>
<th>Weighting</th>
<th>Marking</th>
<th>Grading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpentry and Joinery</td>
<td>Externally set assignment</td>
<td>24 hours</td>
<td>90</td>
<td>100%</td>
<td>Externally moderated</td>
<td></td>
</tr>
<tr>
<td>Plastering</td>
<td>Externally set assignment</td>
<td>22 hours</td>
<td>90</td>
<td>100%</td>
<td>Externally moderated</td>
<td></td>
</tr>
<tr>
<td>Bricklaying</td>
<td>Externally set assignment</td>
<td>20 hours</td>
<td>90</td>
<td>100%</td>
<td>Externally moderated</td>
<td></td>
</tr>
<tr>
<td>Painting and Decorating</td>
<td>Externally set assignment</td>
<td>20 hours</td>
<td>90</td>
<td>100%</td>
<td>Externally moderated</td>
<td></td>
</tr>
</tbody>
</table>

All occupational specialism components will be awarded on the grade scale P, M, D.
Core component assessment

The assessments for this component consist of two core exams and an employer-set project which are set against a set of assessment objectives (AOs) which are used to promote consistency among qualifications of a similar purpose. They are designed to allow judgement of the candidate to be made across a number of different categories of performance.

Each assessment for this component has been allocated a set number of marks against these AOs based on weightings recommended by stakeholders of the qualification. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

Assessment objective weightings for the assessment components related to the core content are detailed below.
## Core exam

<table>
<thead>
<tr>
<th>Assessment objective</th>
<th>Description</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AO1 a</strong> Demonstrate knowledge</td>
<td>All AOs require the ability to recall knowledge. AO1a) refers to instances where the candidate is simply required to demonstrate basic recall. In the test, this helps to give confidence in sufficiency of coverage of the content, and recognises that not all knowledge requires further understanding e.g. terminology, number facts etc.</td>
<td>10%</td>
</tr>
<tr>
<td><strong>AO1 b</strong> Demonstrate understanding</td>
<td>The ability to explain principles and concepts beyond recall of definitions in order to be able to transfer these principles and concepts between contexts. Learners have built connections between related pieces of knowledge. AO1b) focuses on the ability of the learners to show understanding by summarising or explaining concepts in their own words, exemplifying or comparing and making inferences in general terms that show e.g. cause and effect.</td>
<td>25%</td>
</tr>
<tr>
<td><strong>AO2</strong> Apply knowledge and understanding to different situations and context</td>
<td>Using and applying knowledge and understanding, of processes, procedures, generalisations principles and theories to specified, concrete situations. AO2 is about being able to take the understanding of generalities (AO1b) and apply them to specific novel situations. It is more granular than the more extended synthesis/creation that may respond to an analysis (AO3a) of a more holistic complex situation/brief.</td>
<td>45%</td>
</tr>
<tr>
<td><strong>AO3</strong> Analyse and evaluate information and issues</td>
<td>Learners will be provided with information e.g. in the form of a detailed scenario requiring the Learners to analyse the interrelated issues arising and evaluate, for example, the strengths and weaknesses or advantages and disadvantages of approaches they may take to achieve a good outcome. Marks will be given for the quality of analysis and evaluation and the range of considerations considered.</td>
<td>20%</td>
</tr>
</tbody>
</table>
### Employer-set project

<table>
<thead>
<tr>
<th>Assessment objective</th>
<th>Typical evidence</th>
<th>Approximate weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AO1</strong> Planning skills and strategies</td>
<td>Clearly structured response to brief, cohesive response with ordered sections, logical approach to referencing, research and sources, response completed to deadline and meeting required parameters, sources used effectively and integrated into response (not just an afterthought), effective use of time allocation available for presentations.</td>
<td>10%</td>
</tr>
<tr>
<td><strong>AO2</strong> Apply knowledge and skills to the context of the project</td>
<td>Relevant core knowledge applied to respond to brief, references relevant legislation, building controls materials, concepts, waste disposal and site access considerations.</td>
<td>50%</td>
</tr>
<tr>
<td><strong>AO3</strong> Analyse contexts to make informed decisions</td>
<td>Analysis of key issues, evidence of risk rating and prioritisation of key issues relating to brief, drawing together considerations and considering impacts of elements on each other (not just in isolation), consideration and analysis of the reasons for doing things in a particular way.</td>
<td>20%</td>
</tr>
<tr>
<td><strong>AO4</strong> Use Maths, English and Digital skills</td>
<td>Use of correct terminology, abbreviations, units of measurement in context, consideration of audience of brief response (technical vs non-technical wording), use of calculations / graphs etc. appropriately, consideration of the use of ICT and digital methods both in brief response and in presentation.</td>
<td>10%</td>
</tr>
<tr>
<td><strong>AO5</strong> Carry out tasks and evaluate for fitness for purpose</td>
<td>Considered analysis and evaluation of project outcome, what went well and what could be improved, response conclusion or evaluation section, identification of solutions in response to brief problem with evidence of evaluation of other options and reasons for rejection of other options where not appropriate.</td>
<td>10%</td>
</tr>
</tbody>
</table>
### Summary of core assessment methods and conditions

<table>
<thead>
<tr>
<th>Component</th>
<th>Assessment method</th>
<th>Description and conditions</th>
</tr>
</thead>
</table>
| Core exam   | Externally marked tests    | These tests are **externally set and externally marked**, and will be sat through paper passed question papers provided by City & Guilds. These tests are designed to assess candidate’s depth and breadth of understanding across the core component in the qualification at the end of the period of learning, and will be sat under invigilated examination conditions. See JCQ requirements for details: [http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations](http://www.jcq.org.uk/exams-office/ice---instructions-for-conducting-examinations) For the first sitting the Core exams and Employer-set project must be taken in the same assessment window. Following this they can re sit in any assessment window as long as the below condition is met:  
  - Candidates who fail either one or both exams in the core exam will need to re sit both exams and must do in the same assessment window. |
<table>
<thead>
<tr>
<th>Component</th>
<th>Assessment method</th>
<th>Description and conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer-set project</td>
<td>Externally marked project</td>
<td>This project is <strong>externally set and externally marked</strong>, and is designed to require the candidate to identify and use effectively in an integrated way an appropriate selection of skills, techniques, concepts, theories, and knowledge from across the whole of the BSE core. Projects will be released to centre staff towards the end of the learners’ programme, usually the week before Easter each year. Centres will be required to maintain the security of all live assessment materials until assessment windows are open. Projects will therefore be password protected and released to centres through a secure method. Guidance on equipment, resources and duration will be released as appropriate to ensure centres can plan for delivery of the project in advance. The marking grid for the project will be available to centres from the start of the learning programme. Candidates who fail the Employer-set project on first the submission can resit in any assessment window. If a candidate fails both the core exams and the Employer-set project after the first sitting they do not need to be retaken in the same assessment window.</td>
</tr>
</tbody>
</table>
Occupational specialism component assessment

Occupational specialism assessments will be set and assessed at task level. Each task will have a number of sub tasks that will produce types of assessment themes (type of performance/ evidence). Assessment themes will be broad enough to ensure all performance criteria across the specialism are assessed ensuring the assessment is as valid & reliable as possible. The assessment themes will be the same in every version of the assignment ensuring comparability between performances in every version of the assessment. Sub tasks will allow flexibility at the setting stage of the assignment to ensure predictability is avoided.

The assessment for this component has been allocated a set number of marks against tasks based on recommendations by a panel of technical experts. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

<table>
<thead>
<tr>
<th>Assessment method</th>
<th>Grade scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical assignment</td>
<td>U/P/M/D</td>
</tr>
<tr>
<td>Component</td>
<td>Assessment method</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Occupational specialism assignment</td>
<td>Externally set, externally moderated</td>
</tr>
</tbody>
</table>
6 Grading

A grade
To achieve an ‘A’ grade a candidate will:

Show clear ability to demonstrate a comprehensive understanding of the full range of principles that influence construction processes and procedures in routine contexts and allow successful implementation to non-routine contexts.

Make links between relevant knowledge and understanding when responding to problems in a logical and methodical format. Legitimate and justified approaches are provided in response to complex construction industry briefs and problems.

Demonstrate the ability to comprehensively identify and interpret a full range of considerations in analysing complex briefs or problems. Including the impacts their decisions have on the wider industry and not solely on individual trades. There is a meticulous approach in the selection of tools, materials and methods when planning approaches or responses to construction industry briefs or problems.

Use a range of communication strategies and an ability to adapt their style and format to respond well to audience and stakeholder needs in presenting approaches to solving problems.

Demonstrate a high degree of accuracy in knowledge and skills from across the core content and critically evaluate their own performance in meeting a brief or problem to improve.

E grade
To achieve an ‘E’ grade a candidate will:

Demonstrate a limited understanding some of the key principles and how they influence construction process and procedures in routine contexts.

Make general links in knowledge and understanding that can sometimes be superficial and are supported by partial reasoning and not evidenced based that relates to routine problems or industry briefs.

Respond to briefs or problems with little awareness of the impact in relation to the wider construction industry context. There is some understanding in selection of tools, materials and methods to meet the requirements of routine construction industry briefs or problems.

Demonstrate a small range of communication strategies that are sometimes not suitable in language and format for audiences and stakeholders with inaccuracies in technical references.

Provide an evaluation of performance and how requirements have been met is brief with no reference on how to improve.
7 Administration

Lost candidate work
If work is lost, City & Guilds should be notified immediately of the date of the loss, how it occurred, and who was responsible for the loss. Centres should use the JCQ form, JCQ/LCW, to inform City & Guilds Customer Services of the circumstances.

Learners who move from one centre to another during the course may require individual attention. Possible courses of action depend on the stage at which the move takes place. Centres should contact City & Guilds at the earliest possible stage for advice about appropriate arrangements in individual cases.

Malpractice
Please refer to the City & Guilds guidance notes Managing cases of suspected malpractice in examinations and assessments. This document sets out the procedures to be followed in identifying and reporting malpractice by candidates and/or centre staff and the actions which City & Guilds may subsequently take. The document includes examples of candidate and centre malpractice and explains the responsibilities of centre staff to report actual or suspected malpractice. Centres can access this document on the City & Guilds website.

Examples of candidate malpractice are detailed below (please note that this is not an exhaustive list):

- falsification of assessment evidence or results documentation
- plagiarism of any nature
- collusion with others
- copying from another candidate (including the use of ICT to aid copying), or allowing work to be copied
- deliberate destruction of another’s work
- false declaration of authenticity in relation to assessments
- impersonation.

These actions constitute malpractice, for which a penalty (eg disqualification from the assessment) will be applied.

Where suspected malpractice is identified by a centre after the candidate has signed the declaration of authentication, the Head of Centre must submit full details of the case to City & Guilds at the earliest opportunity. Please refer to the form in the document Managing cases of suspected malpractice in examinations and assessments.
Accessibility
In the design of the Technical Qualification and its assessments the following principles have been applied:

- In the development of content, tasks and assessments all learners are considered.
- Well-designed materials that do not create barriers to attainment. This will include content being presented logically and uncluttered.
- No particular characteristic or group of learners are disadvantaged by features of a qualification.
- Language is appropriate including carrier language which is presented in its simplest for fair access to all learners.
- In the design of content and assessments the impact on learners social, behavioural and emotional well-being will be considered.
- Physical and sensory needs of learners in accessing content and assessments.

Access arrangements
Access arrangements are adjustments that allow candidates with disabilities, special educational needs and temporary injuries to access the assessment and demonstrate their skills and knowledge without changing the demands of the assessment. These arrangements must be made before assessment takes place.

It is the responsibility of the centre to ensure at the start of a programme of learning that candidates will be able to access the requirements of the qualification.

Please refer to the JCQ access arrangements and reasonable adjustments and Access arrangements - when and how applications need to be made to City & Guilds for more information. Both are available on the City & Guilds website: http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments

Special consideration
We can give special consideration to candidates who have had a temporary illness, injury or indisposition at the time of the examination. Where we do this, it is given after the examination.

Applications for either access arrangements or special consideration should be submitted to City & Guilds by the Examinations Officer at the centre. For more information please consult the current version of the JCQ document, A guide to the special consideration process. This document is available on the City & Guilds website: http://www.cityandguilds.com/delivering-our-qualifications/centre-development/centre-document-library/policies-and-procedures/access-arrangements-reasonable-adjustments
8 Components

Content of components
The components in this qualification are written in a standard format and comprise the following:

- City & Guilds reference number
- Title
- Level
- Guided learning hours (provisional)
- Assessment method
- Introduction section
- Underpinning knowledge outcome – including range and depth sections
- What learners need to learn
- How will this benefit learners when working in industry or progressing to further study?
- Links to maths, English and digital skills
- Guidance for delivery
- Suggested learning resources
- Mapping to apprenticeship standards *

* NB to be added post milestone 2
What is the component about?

This component focuses on the learner’s knowledge and understanding of contexts, concepts, theories and principles relevant to On-Site construction. The component is designed to raise learners’ awareness of the industries and develop knowledge and understanding of:

- Fundamental Health & Safety practices associated with carrying out construction work
- Scientific principles related to construction activities
- The construction industry and careers within it
- Principles of sustainability and design, relevant to construction projects
- Information, data and principles of measurements
- Tools, equipment and materials used in construction work
- Legislation, regulations and approved standards that apply to the construction industry

Learners may prepare by asking themselves questions such as:

- How are teams of different specialists co-ordinated to work together on construction projects?
- What are different career pathways and destinations within the construction industry?
- What factors influence whether construction projects are profitable?
- What kind of tasks do On-site trades perform?
- What tools and equipment On-Site trades use as part of their role?
Underpinning knowledge outcomes
On completion of this specialism, learners will understand:
1. Health and safety in construction
2. Construction science principles
3. Construction design principles
4. Construction & the built environment industry
5. Construction sustainability principles
6. Construction measurement principles
7. Building technology principles
8. Construction information and data principles
9. Relationship management in construction
10. Digital technology in construction
11. Construction commercial/business principles

Completion of the On-Site construction core will give learners the opportunity to develop their maths, English and digital skills. Details are presented in the specification content.
Onsite Core content

1. Health and safety
Criteria

1.1 Construction legislation and regulations.

Range:
Legislation and regulations - Health and Safety at Work Act (HASAWA), 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 regulation, environmental regulations, waste management, manufacturers safety data sheets

What do learners need to learn?

How current legislation listed can impact on the employer, employee and construction projects within a domestic and commercial setting.

Be aware of the implications of not adhering to the legislation listed on the public, client, business and employers.

The difference between statutory and non-statutory legislation, where each legislation is applicable in terms of construction activities. Who is responsible for maintaining legislation and the process of consultation and updating.

<table>
<thead>
<tr>
<th>Skills</th>
<th>CSB EC5</th>
</tr>
</thead>
</table>

1.2 Public liability and employer’s liability.

What do learners need to learn?

What liability is and what the current requirements are relating to public and employer liability for construction employees and employers.

The implications of public liability such as, legal action and compensation and employer’s liability such as compensation, medical cost, legal costs and loss of income

<table>
<thead>
<tr>
<th>Skills</th>
<th>EC5</th>
</tr>
</thead>
</table>
1.3 Approved construction codes of practice.

Range:  
Codes of practice - L5 control of substances hazardous to health, L8 legionnaires’ disease, the control of legionella in water systems.


Approved Code of Practice and guidance, L64 Safety signs and signals: the Health and Safety (Safety Signs and Signals) Regulations.


Approved code of practice, regulations and guidance, L 102 Construction (Head Protection) Regulations 1989, L 108 controlling noise at work, L113 Safe use of lifting equipment.


What do learners need to learn?  
The purpose of the codes of practice and how these are applied in terms of managing Health and Safety in the Construction industry. How to gain access to the listed publications.  

Skills  
EC5

1.4 Development of safe systems of work.

Range:  
Safe systems of work - company management systems, risk assessments, method statements, permits to work, safety notices and CSCS cards.

What do learners need to learn?  
Current safe systems of work used in construction projects. Roles and responsibilities, recording and reviewing and any potential implications of not having systems in place.  

Skills  
EC3  
EC5
1.5 Safety conscious procedures

Range:
Safety conscious procedures - safe systems of work, reporting of potential hazards, site inductions, training, toolbox talks, good housekeeping (working systematically, keeping areas clean and clear).

What do learners need to learn?
Procedures that aim to promote and support safety consciousness within construction sites/environments/workshop areas.

The benefits of having these procedures in place and the potential implications of not adhering to them – (i.e. injury/death, loss of business, fines, increased costs, project timescales slipping etc.).

Skills
EC1
EC3

1.6 Safety inspection of a work environment.

Range:
Safety inspection - sensory inspections, visual inspections, risk assessments, method statements, permits to work.

What do learners need to learn?
The methods used to inspect a workplace to ensure it is safe for work — the documentation to complete, technical terms used and how to mitigate any risks.

Skills
CSA
CSC
EC3
2. Construction science principles

Criteria

2.1 Materials science principles.

Range:
Materials – pure metals, ferrous metals, alloys/solders, thermos setting plastics, fireclays/ceramics.

Principles - material properties, chemical composition, degradation, failure, effects of environmental conditions.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The principles of material science in construction design and how buildings will perform in terms of durability and stability.</td>
<td>CSB MC4</td>
</tr>
</tbody>
</table>

2.2 Mechanical science principles.

Range:
Mechanical science principles - force, work, energy, power

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key principles of Mechanical Science and how they are used to inform construction methods.</td>
<td>MC4</td>
</tr>
</tbody>
</table>

2.3 Electricity principles.

Range:
Electricity principles - sources of power, generation, transformation, distribution, voltage, current, resistance, electrical power, energy, efficiency.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The various uses of electricity within the built environment including basic DC circuit principles, ohms law and relationships between circuit values.</td>
<td>MC4</td>
</tr>
</tbody>
</table>
2.4 Structural science principles.

Range:
Structural science principles - forces, loads, materials, structural members

What do learners need to learn?
Structural science principles its use and effects in the construction of buildings.

Skills
CSB
MC4

2.5 Heat principles.

Range:
Heat principles - heat transfer, air temperature, air density humidity, condensation air movement, heat loss, thermal conductivity, resistance, convection cycles.

What do learners need to learn?
Key principles of heat transfer and how it is used within the built environment.

Skills
MC4

2.6 Light principles.

Range:
Light principles - refraction, difference in artificial and natural light, glare, directed and reflected light, flow of light energy, daylight factor, colour rending.

What do learners need to learn?
Key principles of natural and artificial light and its relationship with the built environment.

Skills
MC4

2.7 Acoustics principles.

Range:
Acoustics principles - frequencies, reverberation, decibels, comfort levels, privacy.

What do learners need to learn?
How key principles of acoustics and acoustic barriers are applied to the built environment.

Skills
MC4
2.8 Earth science principles.

Range:
Earth science principles - physical geography, hydrology, geology, earth forces, natural phenomenon (e.g. earthquakes, subsidence), weather.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How earth science principles influence the built environment and basic construction design principles.</td>
<td></td>
</tr>
</tbody>
</table>
3. Construction design principles

Criteria

3.1 Benefits of good design.

Range:
Benefits - aesthetics, longevity of building, maintenance factors, on – budget

What do learners need to learn?
The benefits of good design, the potential implications of poor design and the different parties affected in the construction chain. Factors that can impact on the profitability of projects – i.e. over specification leading to higher costs, difficulty of assembly leading to increased timescales and increased budgets

Skills
CSC
MC9
MC10

3.2 Design principles.

Range:
Design principles - Environmental Protection, safety, speed, economics, aesthetics, buildability manufacture, installation and construction feasibility, integration of services, infrastructure, inclusivity, accessibility, heat, acoustics, lighting and air quality.

What do learners need to learn?
Factors that need to be considered during the design of building services and how the range of design principles are influenced by the end design including buildability.

The stages and outcomes of the RIBA plan of work.

Skills
DC1
DC6

3.3 Role of different disciplines involved in design.

Range:
Disciplines - contractors and all operatives, architects and all professional occupations, planners and building inspectors, manufacturers.

What do learners need to learn?
A basic knowledge of key job roles within construction design including the responsibilities and reporting lines/lines of escalation within roles.

The key activities aligned to the disciplines with an appreciation of potential career progression routes.

Skills
CSB
CSD
3.4 Design process from conception to completion.

**Range:**
*Process* - research, site analysis, assessment of current and proposed characteristics, planning, approval/ review, design sign off.

**What do learners need to learn?**
The key stages of the design process from initial enquiry to completed design and factors that may impact or influence design changes.

3.5 The concept of the ‘whole building’, including life cycle assessment.

**Range:**
*Life cycle assessment* - raw material supply, manufacture of construction products, the construction process stage, occupation, demolition, when the materials are disposed of or recycled.

**What do learners need to learn?**
The concept of the building services and how design and construction is influenced by building systems working together, including life cycle assessments and how they influence project planning and are influenced by regulations and legislation.
4. Construction and the built environment industry

Criteria

4.1 Structure of the construction industry.

What do learners need to learn?
The structure of the construction industry, including business types (e.g. sole traders, contractors, small, medium and large organisations).

The role of building regulators and the relationship with the customer/client.

The different scales of building project and types of development i.e. commercial, residential, private and public. Scale and size in determining who is involved.

Skills
MC3

4.2 How the construction industry serves the economy as a whole.

What do learners need to learn?
How the construction industry contributes to the UK economy with reference to scale.

Factors that impact growth of the industry, including political changes, developments in technology/practice skilled labour resources and environmental considerations.

Skills
MC3

4.3 Integration of the supply chain through partnering and collaborative practices.

Range:
Supply chain – client, architect, engineers, building contractor, sub-contractors, operatives, manufacturers, suppliers.

What do learners need to learn?
The integration of all partners of the supply chain in the building process. Be aware of the importance of effective planning and collaborative working ensuring that the project is completed to standards, budget and on time and the consequences of poor planning and communication.

Skills
CSD
4.4 Procurement of projects within the construction sector.

Range:
Procured - need/demand, tendering and bidding processes, supply chain, estimation, quotation, tender documentation.

What do learners need to learn?
The key stages within procurement and the development of construction projects with consideration of different scales of building projects from domestic through to commercial and industrial.

Skills
MC3

4.5 Roles and responsibilities of the construction professions.

Range:
Construction professions - architect, civil engineer, craft operative, ground works, plant occupation, non-skilled operative, building services design engineer, building services engineer technician, building services engineer site management, facilities manager, client representatives, contract managers.

What do learners need to learn?
The key job roles and responsibilities of construction professionals within construction industry listed in the range.

Skills

4.6 The role of CPD in developing the knowledge and skills of those working in the sector.

Range
Role of CPD - upskilling staff, legal requirements, product knowledge.

What do learners need to learn?
The role of CPD to individuals, companies and the building industry as a whole.

It's importance in maintaining currency and best practice, and the link to keeping clients/customers/public safe. CPD and career progression. Providers of CPD i.e.

- Professional bodies
- Accreditation
- Certification bodies.
- Manufacturers
- In house/ toolbox talk
4.7 Building information modelling (BIM)

What do learners need to learn?
The aspects of building information modelling and the effect they have on real time project delivery in a collaborative way.

BIM government levels 1-3.

The collaborative role of building information modelling in delivering real time projects:
- Digital Plan of Works (DPoW)
- Employer’s Information Requirements (EIR)
- Common Data Environment (CDE)

4.8 PESTLE factors

Range:
PESTLE - political, economic, social, technological, legal, environmental

What do learners need to learn?
Current examples of PESTLE and how it is used for analysis in building services and construction projects.
The potential impact these factors have on current and future building projects e.g. changes post Grenfell, tax changes for self-employed, augmented reality and impacts of Building Regulations and compliance.
5. Sustainability principles

Criteria

5.1 Sustainability when planning and delivering a construction project.

Range:
Planning - using renewable and recyclable resources, reducing energy consumption and waste, creating a healthy and environmentally friendly environment, protecting the natural environment.

What do learners need to learn?
The importance of sustainability in relation to the stages of project development. Including design, planning and delivery and across different types/scales of construction project as well as environmental protection. The relevance of local sourcing, resource protection, re-use and refurbishment of materials.

Skills

5.2 Types of sustainable solutions.

Range:
Sustainable solutions - social, environmental, economic, human (habitability).

What do learners need to learn?
The different types of sustainable solutions listed in the range and how they are used to inform the building or development process.

Skills

5.3 Environmental legislation.

Range:
Environmental legislation - Environmental Protection Act, Climate Change Act, Clean Air Act, Water Act, Building Regulations, COSHH, WEEE, Hazardous Waste Act.

What do learners need to learn?
The obligations and responsibilities of employers and employees in relation to construction/maintenance activities and environmental protection measures including hazardous waste, material considerations, disposal methods, BOCs, PPE, user guide instructions, specific risk assessments.

Skills
5.4 Environmental policies and initiatives and how they impact on design and construction

Range:

Policies and initiatives - Hazardous Waste Act, material considerations, disposal methods, BOCs, PPE, user guide instructions, Specific risk assessments.

What do learners need to learn? 
Implementation of environmental initiatives and the impact on design and construction.

5.5 Environmental performance measures.

Range:

Measures - source of materials, use of materials, energy source, energy consumption, water source, water consumption, radioactive waste, flexibility, durability and resilience, pollution and waste processing, transport, landscape and ecology, deconstruction and disposal.

What do learners need to learn? 
The key environmental performance measures of construction industry and how they are considered during design and monitored during building operation times.

5.6 Principles of heritage and conservation.

Range:

Principles - protection through listed building, regular maintenance, understand history and construction methods, sensitive use of materials, repair to match existing.

What do learners need to learn? 
Heritage and conservation considerations such as listed buildings, traditional buildings and maintenance of existing stock and how current regulations affect the selection of materials used for building services activities.

5.7 Lean construction.

What do learners need to learn? 
The efficient use of materials/ types of materials that can be recycled or reclaimed. The techniques aimed at maximising value and minimising waste within the building services industry.
5.8 Waste management.

Range:
Waste management - Waste Management plan, waste segregation, recycling.

What do learners need to learn?
All current and statutory waste management systems, the way they are used in the disposal of construction materials including hazardous or specialised waste disposal.

Skills

5.9 Energy production and energy use.

Range:
Energy - Wind, water (hydro), solar, nuclear, fossil fuels.

What do learners need to learn?
Current UK energy production and use in relation to embodied energy along with current methods used to monitor energy use within a building/system.

Skills
6. Measurement principles
Criteria

6.1 Accurate and appropriate measurement

What do learners need to learn?
The benefits of accurate measurements to contractors, the client/customer, to profitability and project success detailing the Implications of not having accurate measurements – in terms of costs, time, and safety.

<table>
<thead>
<tr>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>CSC MC1 MC9</td>
</tr>
</tbody>
</table>

6.2 Standard units of measurement and measurement techniques.

Range:
Units of measurement - mm millimetres, cm centimetres, m metres, km kilometres, g gram, kg kilogram, tn tonne, ltr litres, sq square and cm cubic metres.

Measurement techniques - Approximation, use of measuring equipment including tapes, lasers and surveying equipment

What do learners need to learn?
The types of units of measurement and how these are applied and used in construction projects including methods of obtaining measurements in differing situations (height, length, distance, area, volume, weight, mass, quantity).

<table>
<thead>
<tr>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>MC1 MC2</td>
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</tbody>
</table>

6.3 Measurement standards, guidance and practice.

Range:
Measurement standards - scale, tolerances

What do learners need to learn?
How to use standardised scales for recording or displaying measurements, including measurement rules. How tolerances are applied and implications of not meeting tolerances.

Why particular scales are selected and importance of showing detail. Drawing sizes used to display information and detail.

<table>
<thead>
<tr>
<th>Skills</th>
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<tbody>
<tr>
<td>MC1 MC3 MC4</td>
</tr>
</tbody>
</table>
7. Building technology principles

Criteria

7.1. Construction methods.

Range:
Construction methods - modular, on-site, off site, 1st fix, 2nd fix, self-driving vehicles, computer-controlled manufacturing robots, large-scale 3D printers, drones.

What do learners need to learn?
Applications, limitations procedures of both traditional and modern construction methods including the use of robotics during the construction process.

Skills

7.2 Forms of construction.

Range:
Forms - substructure, superstructure, foundation, roof (flat, pitched), shell and core, structural frame, floor.

What do learners need to learn?
Current forms of construction and their use for both built environment and civil engineering structures.

Skills

7.3 Key content and required notifications of Building Regulations and Approved Documents.

Range:

What do learners need to learn?
The purpose of all current UK Building Regulations in renovations and construction of buildings and building services.
7.4 Building standards

Range:


<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current British Standards, International Standards and construction industry guidance in both the renovation and construction of buildings, including ISO, British and industry.</td>
<td>EC5</td>
</tr>
</tbody>
</table>

7.5 Manufacturers’ instructions.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical contents of both manufacturer instructions and technical guidance that are used and how they are applied in the construction and maintenance of buildings and services.</td>
<td>CSA</td>
</tr>
</tbody>
</table>
8. Information and data principles

Criteria

8.1 Data.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key elements of data, including accuracy, generalisation, interoperability, level of detail and metadata used to inform construction and building services processes.</td>
<td>MC5 MC6 MC9 EC4 EC5 DC3</td>
</tr>
</tbody>
</table>

Different sources that data can be generated from including:

- Design and construction processes
- Building Information Modelling
- Post occupancy evaluation
- Utilities, building services, meters, building management systems.
- Infrastructure and transport systems.
- Enterprise systems such as purchasing systems, performance reporting, work scheduling.
- Maintenance and replacement systems.
- Operational cost monitoring.
- ICT systems and equipment.

Data from these sources can be used to understand behaviour, assess performance, improve market competitiveness, allocate resources.

8.2 Sources of information.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be able to interpret types of information and data sources used within construction and building services projects:</td>
<td>CSC EC1 EC2 EC3 DC1 DC3</td>
</tr>
</tbody>
</table>

- product data
- manufacturer’s specifications
- client’s specifications
- Common Date Environment
- BIM
- Gantt charts
- Critical path networks
- Certification and commissioning data
- Test data schedules
- Condition reports
8.3 **Data** management and confidentiality

**Range:**
**Data** - physical storage, virtual storage.

**Confidentiality** - encrypted data, virus protection software, software updates, firmware updates, GDPR Requirements, business procedures.

**What do learners need to learn?**

| Current legislation including GDPR and organisational procedures that are used to manage data and increase confidentiality. |
|---|---|
| Data storage requirements in relation to security and protection and how they help to prevent common threats e.g. cyberattacks, malware, Trojans, data loss, data recovery. |

<table>
<thead>
<tr>
<th>Skills</th>
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<tbody>
<tr>
<td>DC5</td>
</tr>
</tbody>
</table>
9. Relationship management in construction

Criteria

9.1 Stakeholders.

**What do learners need to learn?**
The different types of stakeholders including: client, team, suppliers and end user.

**Skills**
CSD

9.2 Roles, expectations and interrelationships

**What do learners need to learn?**
The roles, expectations and interrelationships of all stakeholders throughout the construction project delivery e.g. at design stage, through construction, to handover and in use. To include:

- Hierarchy of project management
- Promoting good relationships across the project
- Cost control measures
- Time management methods
- Handover processes
- Public relations
- Follow up and review

**Skills**
CSD

9.3 Collaborative working to project delivery and reporting

**What do learners need to learn?**
The importance of a collaborative approach to project delivery and reporting, and how this is applied in practice with the use of BIM and workflow software packages as well as face to face methods.

**Skills**
CSC
CSD
EC1
EC2
EC3
DC3
9.4 Customer service principles.

Range:
Customer service principles - product knowledge, time, communication, honesty and integrity.

What do learners need to learn?
The basic principles of good customer service as listed in the range including product knowledge, good communication, accuracy, efficiency, respect and prompt responses during all stages of the project.

Skills
CSC
EC6

9.5 Team work to team and project performance.

What do learners need to learn?
The importance of team work to team and project performance and the consequence of poor teamwork and how it impacts on a construction project.

Skills

9.6 Team dynamics.

Range:
Team dynamics - accountability, cooperation, trust, support, reliability, communication, participation.

What do learners need to learn?
The principles of good team dynamics, including what is expected of a team member, what qualities are needed and how these qualities are demonstrated.

Skills
EC6

9.7 Equality, diversity and representation.

Range:
Equality, diversity and representation - age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, sexual orientation.

What do learners need to learn?
current equality and diversity legislation and the protected characteristics detailed under the Equality Act including its application in the workplace.
9.8 **Negotiation techniques.**

**Range:**

**Negotiation techniques** - Distributive Negotiation or Win-Lose Approach, lose-lose approach, compromise approach, integrative negotiation or win-win approach.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods of negotiation which are used within the construction industry.</td>
<td>EC6</td>
</tr>
</tbody>
</table>

9.9 **Conflict management techniques.**

**Range:**

**Conflict management techniques** - preventative measures, workplace changes, job role changes, training staff, conflict resolution policy, alternative dispute resolution (Informal discussions, mediation, conciliation, arbitration).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Conflict management techniques including preventative measures and common reasons for conflicts.</td>
<td>CSD</td>
</tr>
</tbody>
</table>

9.10 **Methods and styles** of communication.

**Range:**

**Methods** - verbal (Face to face, telephone,), written (Email, Text, letter)
**Styles** - formal, informal

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The methods and styles of communication and their suitability for different situations that may arise throughout a typical construction project.</td>
<td>EC1 EC3 EC6 DC1 DC3</td>
</tr>
</tbody>
</table>
9.11 Employment **rights and responsibilities**.

**Range:**
**Rights and responsibilities** - wage rules, dispute resolution, dismissal and redundancy, health and safety and welfare, the employment rights act, time off work, contract of employment.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The current employment rights and responsibilities of both employees and their employer.</td>
<td></td>
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</tbody>
</table>

9.12 Ethics and **ethical behaviour**.

**Range:**
**Ethical behaviour** - honesty, integrity, loyalty, fairness, caring, respect, law abiding, commitment, morale, reputation, accountability.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethics and ethical behaviour within the construction industry.</td>
<td>CSD</td>
</tr>
</tbody>
</table>
10. Digital technology in construction

Criteria

10.1 Internet of things.

Range:
Internet of things - Smart Technology, smart/automated building, smart learning and of artificial intelligence (AI)

What do learners need to learn?

The use of technology to capture data in a completed building and how this data is used for the purpose of manufacture and delivery.

The different uses of technology connected to the internet of things and their role in the construction industry to assist in just in time and asset management.

Skills
DC6
DC1

10.2 Digital engineering techniques.

Range:
Digital engineering techniques - Simulation, animation, virtual reality, 3D modelling

What do learners need to learn?

Current Digital engineering techniques and their application in the construction industry.

Skills
DC6

10.3 Opportunities for the use of technology used in other industries and contexts and adapting for use in construction and the built environment.

Range:
Technology - Machine manufacturing through robotics, CADCAM, computer modelling, smart technologies.

What do learners need to learn?

The use of current technologies from other industries and how they can be adapted for use in the construction and the built environment.

Skills
DC1
DC6
11. Construction commercial/business principles
Criteria

11.1 Business structures.

Range:
Business structures - Sole Trader, partnership, Limited Company (PLC. Ltd.), SMEs, not for profit organisations, community interest companies.

What do learners need to learn?  
Typical business structures that exist in the built environment and construction industry.

11.2 Business objectives.

Range:
Business objectives - revenue, social, brand, sales, customer experience, customer relationship, organisation culture, quality, innovation, compliance, sustainability.

What do learners need to learn?  
The business objectives used to measure the performance of the organization.

11.3 Business values.

What do learners need to learn?  
The fundamental business values e.g. care for life, ethical and transparent, commit to customer and collaborative working.

11.4 Principles and examples of corporate social responsibility.

Range:
Principles - Community, people, customer, suppliers, environment.  
Examples - Local recruitment, sustainable resourcing.

What do learners need to learn?  
The basic principles of corporate social responsibility.
11.5 **Principles** of entrepreneurship and innovation.

**Range:**
**Principles** - Solution provider, vision, viable product/service, capital, growth and marketing, research, priorities.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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<tbody>
<tr>
<td>The basic principles of entrepreneurship and innovation in business.</td>
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</table>

11.6 Measuring success.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How organisations in the built environment and construction industry use benchmarking, KPI's and target setting when measuring business success.</td>
<td>CSA</td>
</tr>
</tbody>
</table>

11.7 Project management.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The principles of project management including, setting clear goals and objectives, defining roles, setting realistic milestones and constraints on cost and time. Ensuring all objectives are measurable and achievable.</td>
<td>CSC</td>
</tr>
</tbody>
</table>

11.8 Quality management.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The quality management systems and techniques used in business including:</td>
<td>CSD</td>
</tr>
<tr>
<td>• Self-assessment</td>
<td></td>
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<tr>
<td>• Internal audit</td>
<td></td>
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<tr>
<td>• External audit</td>
<td></td>
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<tr>
<td>• Quality control</td>
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<tr>
<td>• Quality improvement</td>
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<td>• ISO 9000</td>
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</tbody>
</table>
Links to occupational specialisms

All aspects of the On-site core content can be related and contextualised on delivery with the occupational specialisms. However, the following are key areas of the content that may be of particular relevance when delivering the practical content in the occupational specialisms and provide efficiencies for teaching core knowledge in context:

On-site specific core content
- Health and safety – Regulations and safe working practices
- Tools and equipment – Use and maintenance
- Construction design principles
- Construction sustainability principles
- Scientific principles
- Building technology principles
- Information and data principles

Guidance for delivery
- visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery
- Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities
  - Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
  - Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT
- Ways of ensuring content is delivered in line with current, up to date industry practice
  - Centres will need to ensure a realistic representation of On-site components are available
  - Centres will need to provide the appropriate tools, equipment and materials
  - The provision must represent the type of equipment currently available in the UK On-site industry
  - Current and emerging On-site technology should be included in delivery where possible

Suggested learning resources

TBC

Websites
- Institute for apprenticeships and technical education - www.instituteforapprenticeships.org
- Building Regulations portal - www.planningportal.co.uk
- British Standards Institution www.standardscentre.co.uk
- RIBA - www.architecture.com
- RIBA plan of work - https://wwwribaplanofwork.com/
Books

- Building Regulations – Ray Trucker – Routledge 2019
- IRVINE, W. and MACLENNAN Surveying for Construction 5th Ed.
- Sadgrove B.M. Setting out procedures for the modern built environment. London.
What is this specialism about?

The purpose of this specialism is for learners to know and undertake carpentry and joinery work. Learners will have the opportunity to plan, perform and evaluate their work whilst utilising a range of materials, methods and techniques.

Carpentry and joinery are trades involving the use of timber in the building industry, from erecting timber frame, roofs and hanging doors through to making doors, windows and stairs. This specialism will introduce the variety of timber and materials available to a carpenter and joiner and how these are cut, jointed and fixed to construct a variety of products. Learners will be introduced to safe working practices whilst carrying out carpentry and joinery work.

Learners will develop their knowledge and understanding of, and skills in:

- Knowledge of carpentry work undertaken
- Knowledge of joinery work undertaken
- Skills to plan carpentry and joinery work
- Skills to set out, mark out, cut and fix timber components to carry out structural and first fix carpentry
- Skills to mark out, cut, fit and fix timber components to carry out second fix carpentry
- Skills to set out, mark out, produce, assemble, and finish joinery products.

Learners may be introduced to this specialism by asking themselves questions such as:

- What skills do I need to be a successful carpenter/joiner?
- What kind of tasks does a carpenter and joiner perform?
- What tools, equipment and materials do carpenter and joiners use as part of their role?
Underpinning knowledge outcomes
On completion of this specialism, learners will understand:
1. Carpentry and joinery knowledge criteria

Performance outcomes
On completion of this specialism, learners will be able to:
2. Prepare for the production of complex timber-based building products and structures
3. Produce complex timber-based components
4. Assemble complex timber-based products
5. Install complex timber-based products into complex structures

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills. Details are presented at the specification content.
Specialism content

Common knowledge criteria

Health and safety
1.1 Implications of legislation

Range:

Legislation and guidance - The Health and Safety at Work Act (HASAWA), Construction Design Management, (CDM) regulations, Reporting injuries, diseases and dangerous occurrences act (RIDDOR), Control of substances hazardous to health (COSHH), Provision and use of Work Equipment Regulations (PUWER), Manual Handling 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), Hazardous waste regulations, Approved code of practice (ACOP), HSE information including HSE Woodwork Information Sheets, BWF information.

What do learners need to learn?

Current legislation and guidance to ensure tasks are undertaken in a safe manner for those working on the production and installation of timber-based products.

Skills EC5

1.2 The identification of hazards and the development of safe systems of work

Range:

Hazards - Slips, trips and falls; sharp edges; plant and equipment; moving parts; working with adhesives; working at height; hazardous materials; Power tools; Electrocution.

Safe systems of work - Identification of workplace hazards, Risk assessments, method statements, Employer and employee responsibilities, First aid requirements, Accident reporting procedures, Sources of information.

What do learners need to learn?

The types of hazards and risks associated with carpentry and joinery activities and the precautions taken to minimise them.

Skills EC5
Information

1.3 Types of information and how to obtain information from building regulations and standards

Range:

Information - Program of work, Drawings (includes use of scales and drawing conventions), Specifications, Schedules, Method statements, Building regulations directly applying to carpentry and joinery, Data sheets, Manufacturer's information.

What do learners need to learn?

Obtain relevant information using a range of methods, including researching internet, sources, seeking information from relevant parties, liaising with manufacturers etc.

Skills
EC5
DC1
DC5

1.4 How to obtain relevant information from building regulations, standards

Range:

Information - Planningportal.co.uk, gov.uk, library, manufactures instructions.

What do learners need to learn?

Types of hand tools and equipment used for access, measuring, marking out, cutting, shaping and assembling/finishing/fixing and their characteristics, purpose and suitability for tasks.

Skills
EC5
Tools and Equipment

1.5 Hand tools and equipment

Range:

**Access equipment** - Ladders (pole, extension, roof, telescopic, step), Podium, Hop-up, scaffolds (independent, putlog, tower, proprietary, trestle).

**Hand tools and equipment** - Measuring, Tape measures, Rules (steel and folding), Digital measuring equipment.

**Setting out and marking out** - Squares (steel, try, box, combination, mitre), Drawing equipment (30/60 degree and 45 degree set squares, Tee square, protractor, flexicurve, French curves, compass), Sliding bevel, Dividers/scribering compass, Trammel heads and beam, gauges (combination, marking, mortice, cutting), Pencils (grades of hardness and uses), Straight edge.

**Cutting** - Saws (rip, hand/crosscut, floorboard, panel, tenon, pull, dovetail, pad, coping, hack), Chisels (bevel edged, mortice, paring, butt), Planes (try, jack, smoothing, block, shoulder, rebate, plough, bullnose, hand router).

**Shaping** - Spokeshaves (convex and flat), Compass plane, Scratch stock.

**Assembly/fixing** - Sash cramp (T-bar and flat), G cramp, F cramp, Mitre cramps, strap cramps, Bench bearers, Squaring rod, Winding sticks, Mallet (rubber and timber), Hammer (claw, cross pein/Warrington, pin), Punches, ancillary items such as (pincers, pliers, cork rubbers, scrapers, dogs, string line, chalk line,), levelling and plumbing tools (spirit levels, laser levels, plumb/centre-bob, scribing block).

**What do learners need to learn?**
Types of hand tools and equipment used for access, measuring, marking out, cutting, shaping and assembling/finishing/fixing and their characteristics, purpose and suitability for tasks.

<table>
<thead>
<tr>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of hand tools and equipment used for access, measuring, marking out, cutting, shaping and assembling/finishing/fixing and their characteristics, purpose and suitability for tasks.</td>
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</tbody>
</table>
1.6 Portable **power tools**

**Range:**

**Portable power tools** - Power sources, (240V/110V, battery, gas, ballistic cartridge, pneumatic), Cutting tools and associated tooling, Chopsaw, Circular saw (handheld and table), Power planer, band saw (handheld), Timber frame morticer.

**Shaping tools** - Jigsaw, Router (including associated jigs and tooling).

**Jointing/fixing tools** - Drills, (Keyed, keyless, SDS, rotary, rotary percussion) including associated tooling, Biscuit jointer, Dowel and loose tenon jointers, Nailers (framer and finishing), Ballistic fixing tools, Impact/drill driver (including tooling).

**Finishing tools** - Belt sander, Orbital sander (including associated abrasive types and grades).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of portable power tools used for cutting, shaping, jointing/fixing and finishing and their characteristics, purpose and suitability for task.</td>
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</tbody>
</table>

1.7 Types of **fixed machinery**

**Range:**

**Fixed machinery** - Power sources (three phase 415V, single phase 240V/110V, pneumatic).

**Cutting** - Saws (dimensioning, rip, wall, crosscut/radial arm, narrow band and resaw) including tooling.

**Jointing** - Hollow chisel morticer, including tooling, Single ended tenoner including tooling, Dovetail machine.

**Shaping profiling and finishing** - Planers (surface, thicknesser, combination, multi Head planer-moulders), Spindle moulder including tooling, CNC router, Table router including tooling, Sanders (drum, bobbin, belt, disk).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Types of fixed machinery used for cutting, jointing and shaping/profiling/finishing and their characteristics, purpose and suitability for tasks.</td>
<td></td>
</tr>
</tbody>
</table>
1.8 **Operation and handling** requirements of tools and equipment.

Range:

**Operation and handling** - Accuracy, Selection/suitability, common defects, cleanliness, PPE, Trained, Competent.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements when operating and handling tools and equipment. Including, safe handling and safe working methods, safe storage minimising damage and risk of theft.</td>
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</tbody>
</table>

1.9 Importance of **maintenance** and how to maintain tools and equipment

**Maintenance** - Maintenance scheduling, Sharpening, cleaning, lubrication, storage methods, common faults, efficiency/lifespan, Quality of finished product.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining tools and equipment, its importance and the consequences of not keeping up regular maintenance (breakdown, increased force required, poor finish, reduced safety).</td>
<td></td>
</tr>
</tbody>
</table>

**Wood science**

1.10 **Classification and types** of Timber

**Range:**

**Classification and types** - Botanical classification, Cell structures, Hardwood (oak, beech, ash, mahogany substitutes, teak substitutes, poplar), Softwood (whitewood/spruce, European redwood, cedar).

**Properties** - Colour/appearance, Workability including ability to take a finish, Grade/class, Durability, Density.

**Processing** - Conversion methods (through and through, quarter sawn, tangential, boxed heart), Seasoning (air, klin), Engineered (finger jointed, laminated), Treatments (acetylated, pressure treated/vac-vac, dipped, brushed and sprayed).

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<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification and types of Timber used in construction, their properties, and how they are processed.</td>
<td></td>
</tr>
</tbody>
</table>
1.11 Natural, conversion and seasoning **defects** and those arising from time, use, neglect and the elements and their causes and the implications to the production and installation of timber-based products.

**Range:**

**Defects** - Natural defects, Shakes (ring, cup, upset/thunder, star and heart), Knots (dead, live, face, edge and arris), Sap/resin pockets, Blue stain.

**Conversion defects:** - Waney edge, Sloping grain.

**Seasoning defects** - Collapse, Case hardening, Cupping, Springing, Bowing, Twisting, End checking/splits, Honeycombing.

**Time, use and neglect** - UV damage, Weathering, Rot (dry, wet), Insect attack, Wear and tear.

**What do learners need to learn?**

Types of defects and their causes (selection and position), and the implication (structural and aesthetics) to the production and installation of timber based products.

**Skills**

1.12 Types of man-made carpentry and joinery related **panel products**

**Range:**

**Panel products** - Plywood, Chipboard, fibreboard (L M and H Density), oriented strand board (OSB), Door blanks, Plasterboard, Cement fibre board.

**What do learners need to learn?**

Types of manufactured carpentry and joinery related panel products, their characteristics and their suitability for different purposes in construction including durability, stability, acoustic properties, and resistance to fire and moisture.

**Skills**

1.13 Formats and stock **sizes** of timber-based products

**Range:**

**Formats and sizes** - Commercially available timber sizes, commercially available sheet sizes.

**What do learners need to learn?**

Types of formats (board and sheet) and stock sizes of timber-based products and their suitability for different functions in construction.

**Skills**

MC3
1.14 Sustainable timber

**Range:**

**Sustainable timber**- supply chain, licensing (FSC and PEFC), identification, waste management (reduce recycle and reuse).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable timber, the supply chain and licensing, the implications of use (environmental) and how to minimise waste.</td>
<td></td>
</tr>
</tbody>
</table>

Fixings and ironmongery

1.15 Types of **fixings** and **ironmongery**

**Range:**

**Fixings** - Screws (commercially available sizes, ferrous and non ferrous, head/thread types and finishes), Nails and pins (commercially available sizes, materials, head/shank types and finishes). Other fixings (bolts, cavity and solid wall fixings, chemical, star dowels, timber dowels, corrugated fasteners/wiggle pins, staples).

**Ironmongery**- Hinges (rising butt, loose pin butt, solid drawn butt, cranked/storm-proof, back flap, ball race butt, parliament, piano, friction, concealed, fire rated); Locks and latches (mortice, sash, dead, privacy rim, tubular, cylinder night, Suffolk, euro/espagnollette,); Door furniture (lever, knob, D Handles, rose, escutcheon, emergency exit push bar, Push and kick plates, Door closers (concealed, overhead, floor springs); Door selectors (overhead, fire-door retainer) Sliding bolts (flush, barrel, tower, cranked), letter plates; Window ironmongery (casement stays, fasteners, sliding sash fastener, pulleys); Security ironmongery (hinge bolts, rack bolts, hasp and staple, security viewer, door chain and security bolt).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Different types of fixings and ironmongery and their characteristics, material properties, commercially available sizes, design features and suitability for different purposes including compatibility with different wood types.</td>
<td></td>
</tr>
</tbody>
</table>
1. 16 Types of **adhesives**

**Range:**

**Types of assembly and finishing materials** - Polyvinyl acetate (PVA), Polyurethane (PU), Contact, Epoxy resin, Grab/panel, Resorcinol-formaldehyde (RF), Urea-formaldehyde (UF), Cyanoacrylate (superglue and activator, Abrasives (grit grades, grit types, purposes, uses).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The types of adhesives and their suitability for different types of timber-based products (moisture resistance, gap filling properties, strength, staining and shelf/pot life), components and assembly requirements taking into consideration the open time, curing time, end location, cost, timber being bonded, workability and durability.</td>
<td></td>
</tr>
</tbody>
</table>

**Maths**

1. 17 **Application** of geometry and formulas to the preparation, production, assembly and installation of timber-based components and products.

**Application** - Angles, shapes, points in space on a plane, lines, curves, true lengths; Application of formulas to calculate quantities (linear, area, volume) In application for carpentry and joinery projects including determining (stair details, roof details, dimensions and pitch using mathematical methods).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application of geometry to the preparation, production, assembly and installation of timber based components and products.</td>
<td>MC1 MC4 MC7</td>
</tr>
</tbody>
</table>

**Business and Commercial**

1.18 **Costs** associated with the production, assembly and installation of timber-based products and components and how they impact on profitability including wastage

**Range:**

**Costs** - Labour, Materials, Consumables, Overheads.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Costs associated with the production, assembly and installation of timber-based products and components (on site and in workshops) and how they impact on profitability including planning, efficient use of materials/wastage, time management, storage and phased delivery.</td>
<td>MC2 MC9</td>
</tr>
</tbody>
</table>
Specific knowledge criteria for performance outcomes

Prepare for the production of complex timber-based building products and structures (PO1)

Information
2.1 Identify information requirements from a brief.

Range:

Requirements - Size, Shape, Function, Budget, Timeframes, Scale of project, Materials.

What do learners need to learn?
How to select and extract the correct information required from a brief to meet the requirements of any given task.

Skills EC5

2.2 Interpret drawings, specifications and schedules

Range:

Interpret

Drawings - Location, Position, Range of products, Assembly details.
Specifications - Quantities, Quality of work/materials, Tolerances, Finish.
Schedules - Prescribed requirements/components.

What do learners need to learn?
How to interpret the types of information required to meet the requirements of any given task.

Skills EC5

2.3 Use questioning techniques to obtain and clarify information required

Range:

Questioning techniques - open questions, closed questions, probing questions, leading questions, Verbal, Written, in person or remote.

What do learners need to learn?
How to use appropriate questioning techniques to ascertain and clarify the information required for any given task.

Skills
2.4 **Calculate** lengths and angles required to meet specification

**Calculate** - lengths from drawings/plans using scales, lengths and angles using mathematical and geometrical methods, Use of traditional methods (traditional measuring), Use of modern methods (digital measure).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to calculate lengths and angles using relevant equipment, information and methods for any given task.</td>
<td>MC1 MC5 MC7</td>
</tr>
</tbody>
</table>

2.5 Measure length and calculate area and volume

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to measure length (including millimetres and metres) and calculate area and volumes for the production of complex timber based building products and structures. Calculate quantities of materials required from working drawings and measured dimensions.</td>
<td>MC1 MC MC5 MC7</td>
</tr>
</tbody>
</table>

2.6 Produce scaled **drawings** by hand.

**Range:**

**Drawing type** - Orthographic, Isometric, Workshop rods, Scaled (plan elevation and section).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to produce (scaled) drawings using manual drafting methods to a prescribed brief producing templates and patterns.</td>
<td>MC1</td>
</tr>
</tbody>
</table>
2.7 Produce cutting and material lists

**Range:**

**Cutting lists** - Cover units, windows, doors, stairs, and allowance for waste.
**Material lists** - Quantities of materials (timber, sheet materials, fixings, ironmongery, metal stud).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>Produce cutting and material lists, these will be informed by drawings, setting out details and specifications.</td>
<td>MC1 MC4 MC5</td>
</tr>
</tbody>
</table>

2.8 **Inspect** materials

**Range:**

**Inspect** - Grade, Defects, Quantity, Quality, Missing items, Damage/breakages.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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<tbody>
<tr>
<td>How to Inspect materials (visual and inventory) before use and report any omissions or defects.</td>
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</tbody>
</table>

2.9 Mark out measurements on to timber-based products and sheet materials

**Range:**

**Mark outs** - wall plates, rafters from pattern, soles, heads.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to mark out materials, positions of components and joints to meet requirements of job specification and setting out details, using patterns where appropriate to make templates.</td>
<td>MC1</td>
</tr>
</tbody>
</table>
2.10 Inspect equipment

Range

Inspect - Faults, Accuracy, calibration, Serviceable.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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<tbody>
<tr>
<td>Inspection of setting out equipment and tools in line with standard workshop practice to ensure they are serviceable/fully operational including correctly calibrated and set accuracy/squareness. Where necessary adjusting and tightening of equipment in line with training and guidance.</td>
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</tr>
</tbody>
</table>

2.11 Estimate resource requirements

Resources - Lead/production time, materials, equipment availability, Plant requirements, labour.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to estimate resource requirements for the production of complex timber-based building products and structures.</td>
<td>MC9</td>
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</tbody>
</table>

2.12 Follow a method statement

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>Working in a safe manner according to the method statement including production and installation details. Whether carried out within the workshop or on site.</td>
<td>EC5</td>
</tr>
</tbody>
</table>
Produce complex timber-based components (PO2)

3.1 Research information required for producing complex shapes and components

Range:

Information - Catalogues, Manufacturer's information, instructions for use, drawings, rod details, Building Regulations, legislation materials, risk assessment documentation, method statements, data sheets.
Types of complex shapes - single curvature, gothic, semi-circular, elliptical, segmental.
Types of components in which they are used - Rails, stiles, cills, cutting/material lists.

What do learners need to learn?
Where and how to research current information sources available for producing complex shapes and components etc.

Skills
DC1
DC5

3.2 Use geometry to determine complex 3D shapes.

Range:

Geometry - True lengths, Bevels, Area/volume
Complex shapes - Handrails with turns (single curvature), Conservatory/porch roofs, Cut roofs.

What do learners need to learn?
How to carry out geometrical calculations accurately, for the production of complex 3D components.

Skills
MC4

3.3 Protection of materials during handling and storing

Range:

Protection - Racking systems, Use of bearers, preventing warping, Ensuring cleanliness, Safe storage, Use of correct stacking techniques, Protection from weather damage, Use of covers and wrappings.

What do learners need to learn?
How to protect the integrity, quality and conditioning of materials during handling and storage including general housekeeping and safety within the workshop.

Skills
3.4 Use woodworking machinery and equipment

Range:

Machinery - Planer, Saws (circular, band), Spindle moulders/table routers, Hollow chisel morticers, Sanders (bobbin, disk).

What do learners need to learn?

How to use woodworking machinery and equipment to produce complex timber based components.

Skills

3.5 Label and prepare components

Range:

Label - Face marks, edge marks, identification marks (component, profile location and joint location).

What do learners need to learn?

How to label and prepare components with reference to potential imperfections or defects in materials which will be identified through visual inspection.

Skills

3.6 Use tools.

Range:

Tools - Hand, power.

What do learners need to learn?

How to use tools to produce complex timber based components, used in line with safe working practices and in line with training/manufactures instructions to produce joints and components.

Skills
3. 7 Create **templates** and work holding jig

**Range:**

**Templates** - Pattern rafters for roof work, Stair templates, Radial and elliptically shaped templates for curved work.

**What do learners need to learn?**

How to create templates and work holding jigs for bespoke and curved work when using a moulding machine.

**Skills**

3.8 Produce Test pieces

**What do learners need to learn?**

How to produce test pieces for complex timber based components.

**Skills**

MC1

3.9 Produce **complex shaped** shapes their components, range of **techniques** and considerations

**Range:**

**Types of complex shapes** - single curvature, gothic, semi-circular, elliptical, segmental and the types of components in which they are used e.g. rails, stiles, and cill.

**Techniques** - used to form curved shapes (e.g. built up, laminated); produce templates and work holding jigs from drawings; mark out and produce pattern rafters for complex cut roof components (common, hip, jack and cripple rafters, purlins); mark out and cut complex roof components using patterns; Work safely according to legislation, guidance and best practice.

**What do learners need to learn?**

How to produce complex shaped components using a range of techniques and considerations including minimising wastage and following standard site working procedures, safe use and set up.

**Skills**

MC1
3.10 Set up, adjust and use woodworking machinery using work piece support safety aids and standard workshop working practice

Range:

Set up adjust - Inspect for damage/faults, change tooling, adjust beds as required, adjust fences and settings, depth of cut; Wood working machinery; Circular saw, narrow band saw, surface planer, thicknesser, profiling machine.

Work piece support - Roller table, Independent roller support stand,

Safety aids - Push sticks/blocks, Jigs and saddles, Standard workshop practice, Safe use of equipment, training (only using equipment once trained to do so), minimising wastage etc. Use of jigs and saddles (wedge jig, saddles for angled ripping).

What do learners need to learn?  
The correct way to feed materials into equipment using work piece support and safety aids adhering to standard workshop working practice.

Skills

3.11 Set up and adjust machinery

Range:

Adjust - Change tooling for depth of cut

What do learners need to learn?  
How to set up and adjust machinery in accordance to requirements and safe practice.

Skills
Assemble complex timber-based components (PO3)

4.1 Assess **suitability** of information provided

**Range:**

**Suitability** - Up to date, Accurate, Sufficient, Version controlled.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to assess the information available (plans, drawings, job specifications) to ensure it is sufficient to assemble complex timber based products and component.</td>
<td>EC5</td>
</tr>
</tbody>
</table>

4.2 Use **tools** and **equipment** to assemble components to form products

**Range:**

**Tools and equipment** - Cramps (sash, G and F), Bench bearers, Assembly jigs (step jig, ledged and braced door jig), Squaring rods, Mallets and hammers (claw/warrington, pin), Draw pins, Fixings (nails, pins, screws, bolts).

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>How to use tools and equipment to assemble components to form products following standard safe workshop working practice.</td>
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</tbody>
</table>

4.3 **Join** timber-based components to other non-timber-based components and to non-timber-based components including fixtures and fittings.

**Range:**

**Join** - Floors, Walls, cut roof (hipped, gable-end), trussed roof, panelling/cladding, windows, with opening lights, door and hatch linings and frames, staircases with turns, structural carcassing, kitchen carcasses, accessible encasements, partitions with openings, products with single curvature features, engineered solutions, double and non-standard doors including associated ironmongery.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to join and fix timber-based products to non-timber based components</td>
<td></td>
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</tbody>
</table>
4.4 Use non-permanent joining techniques (dry fit) **techniques**

**Range:**

**Techniques** - Use of cramps, draw pins, temporary fixing in.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>How to use dry fit techniques in line with job specification requirements, check products are assembled correctly before gluing/permanent fixing.</td>
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</table>

4.5 Use permanent joining **techniques**

**Range:**

**Techniques** - Drilling, pegging/dowelling, scribing, wedging, nailing and screwing, use of adhesives.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to assemble complex timber based products in line with job specification requirements</td>
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</tr>
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</table>

4.6 Finish products ready for end-use

**Range:**

**Finish** - Removing horns, removing arrises, clean up with smoothing plane, sand up to key ready for finishes, Apply base-coat finishes as required.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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<tbody>
<tr>
<td>How to finish an assembled complex timber products with consideration of standard industry practices and good housekeeping.</td>
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</tbody>
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4. 7 **Prepare** assembled timber-based products for transportation

**Range:**

**Prepare** - Wrapping, Boxing, Palletising.

**What do learners need to learn?**

How to prepare the assembled timber based product for transportation relevant to job specification.
Performance outcome 4 - Install complex timber-based products into complex structures

5.1 Assess **risks** associated with the installation task

**Range:**
**Risks** - Access, Slips, trips, falls, damage to product, risks associated with glass.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>How to assess risks when installing complex timber-based products into complex structures, consulting risk assessments and method statements prior to working.</td>
<td>EC5</td>
</tr>
</tbody>
</table>

5.2 Prioritise and schedule tasks.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to plan the task ahead, carrying out the work in a logical, orderly sequence.</td>
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</table>

5.3 Check compliance with regulations and **standards**

**Range:**
**Standards** - building regulations, drawings, specifications, tolerances.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>When, how and where to check compliance with building regulations and standards provided before, during and upon completion of the installation.</td>
<td>EC5 DC1</td>
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</tbody>
</table>

5.4 **Prepare** timber-based products for installation

**Range:**
**Prepare** - Trim and adjust, cut, plane, sand, finish or repair if required.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to prepare timber-based products for installation (windows and doors), measuring the opening/area to be worked on and adjusting the item ready to fit.</td>
<td></td>
</tr>
</tbody>
</table>
5.5 Prepare environments for installation

**Range:**
**Prepare** - Protection, Removing existing component to be replaced, Removing debris, levelling, cleaning.

**What do learners need to learn?**
How to safely prepare the area ready for installation, cleaning down, removing temporary hoarding or protection, clearing the area, protecting the area, providing barriers as required.

**Skills**

5.6 Position **fix and secure complex** timber-based and non-timber-based products to building fabric.

**Range:**
**Fix and secure** - Plumb, level, straight, secure.

**What do learners need to learn?**
How to position fix and secure complex timber based and non-timber based products to building fabric, including door frames, hang doors, windows and kitchens using appropriate fixings and according to specifications.

**Skills**

5.7 Maintain tools.

**Range:**
**Maintain** - Clean, sharpen, store.

**What do learners need to learn?**
How to maintain and secure tools during installation, ensuring efficiency and quality of finish, minimise damage and loss.

**Skills**
5.8 Install door and window ironmongery into timber-based products

**Range:**

**Ironmongery** - Hinges (rising butt, loose pin butt, solid drawn butt, cranked/storm-proof, back flap, ball race butt, parliament, piano, friction, concealed, fire rated); Locks and latches (mortice, sash, dead, rim, tubular, night latch, Suffolk, euro/espagnolette); Handles (lever, knob furniture, D Handles, rose, escutcheon, emergency exit push bar; Window ironmongery (casement stays, fasteners, sliding sash fastener, pulleys); Security ironmongery (hinge bolts, rack bolts, hasp and staple, security viewer, door chain); Push and kick plates; Door closers (concealed, overhead, floor springs); Door selectors (overhead, fire-door retainer); Sliding bolts (flush, barrel, tower, cranked).

**What do learners need to learn?**

How to install door and window installation, including fitting and fixing ironmongery.

**Skills**

5.9 Carry out quality checks

**Range:**

**Quality checks** - Plumb, Level, straight, Secure, Correct size.

**What do learners need to learn?**

How and what to check when carrying out quality checks on completed work.

**Skills**

5.10 Adapt timber-based products to meet installation requirements

**Range:**

**Adapt** - trim, adjust, repair.

**What do learners need to learn?**

How to trim, adjust and repair product as required when fitting, completing the job to the required standard.

**Skills**
**Links to Core Skills**

As part of delivery of the skills and knowledge within this specialism reference should be made to criteria that support the development of the four core skills – communication, working collaboratively, problem solving and research. Some examples of criteria that may be linked to supporting these core skills include:

- Communication e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a change to an industrial system or making a presentation to a stakeholder on the implications of change.

- Working collaboratively with other team members and stakeholders e.g. to develop content to bid for a construction project.

- Applying a logical approach to solving problems, identifying issues and proposing solutions e.g. through setting criteria for successful implementation of a system, using cost / benefit analysis of the introduction of new procedures or equipment.

- Conducting primary research e.g. obtaining measurements related to a design or customer requirements.

**Guidance for delivery**

- Opportunities for efficiencies in delivery
- Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery
- Considerations for innovative methods of delivery to include blended learning and other forms of technology,

  Innovative methods of delivery could include:

  - Presentation/demonstration – delivery of topics using SmartScreen presentation (PowerPoint example available) lecture/discussions/oral Q&A
  - Reinforcing and engaging learners through different teaching methods and resources
  - Observation of measuring activities
  - Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
  - Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

- Ways of ensuring content is delivered in line with current, up to date industry practice
  - Centres will need to ensure a realistic representation of carpentry and joinery and components are available
  - Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
The provision must represent the type of equipment currently available in the UK carpentry and joinery industry.

Current and emerging carpentry and joinery technology should be included in delivery where possible.

**SEN consideration**

In the development of this qualification specific consideration with support of expert consultants have considered:

- Cognition and learning – Language, Literacy, Mathematics, Numeracy
- Social, behavioural, emotional and well-being
- Speech, language and communication needs
- Sensory (colour blindness)
- Confined spaces
- Physical needs/ability

**Suggested learning resources**

**Websites**

- Institute of Carpenters - www.instituteofcarpenters.com
- British Woodworking Federation - www.bwf.org.uk
- The National Association of Shopfitters - www.shopfitters.org
- The Carpenters’ Company - www.carpentersco.com

**Books**

- Site Carpentry and Bench Joinery – City and Guilds
- Geometrical drawing – John J O’Connor - Gill Education
- Modern Carpentry – Fred T Hodgen – Drake 2005
- Carpentry and Joinery – Peter Brett _ Nelson Thornes 2010
- Carpentry and Joinery – Paul N Hasluck – Tools for working wood - 2010
What is this specialism about?

The purpose of this specialism is for learners to cover all aspects of the plastering trade including both traditional and modern methods and techniques in both private and commercial sector of the construction industry. They will gain knowledge and understanding of skills and techniques required to practise and demonstrate the ability to carry out and complete specific solid plastering, rendering and fibrous related tasks.

Learners will prepare and plan tasks, evaluating resources and programs to complete plastering activities within set time frames. They will demonstrate accurate measuring, setting out of complex surfaces to allow for specific installation and application of solid and fibrous plaster components in line with technical information sources.

Learners will develop their knowledge, understanding and skills in:

- Internal and external plastering materials
- Selecting and using plastering materials and methods for moulding work
- Plastering application methods
- Planning and preparation requirements
- Safe working methods when on site and in the workshop

Learners may be introduced to this specialism by asking themselves questions such as:

- What skills do I need to be a successful plasterer?
- What kind of tasks does a plasterer perform?
- What tools, equipment and materials do plasterers use as part of their role?
Underpinning knowledge outcomes
On completion of this specialism, learners will understand:

1. Plastering knowledge criteria

Performance outcomes
On completion of this specialism, learners will be able to:

2. Prepare backgrounds for plastering
3. Apply plastering systems
4. Fix plaster casted from moulds
5. Repair plastering systems

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills. Details are presented at the end of the specification content.
Specialism content

Common knowledge criteria

Health and safety

1.1 Implications of legislation

Range:

Legislation - Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Approved Code of Practice (ACoP), Control of Substances Hazardous to Health (COSHH), HSE Plastering Information Sheets, LOLER, RIDDOR, Manual Handling, HASWA.

Implications - Fines, imprisonment, loss of reputation, loss of current or potential staff, down time and loss of productivity, loss of future contracts.

What do learners need to learn?

Current legislation and the implications to employers and those working on the production and installation of plaster-based products and how the tasks are undertaken.

1.2 The identification of hazards and risks associated with plastering tasks

Range:

Identification - Tripping hazards, slipping hazards, inadequate or lack of personal protective equipment, defective (unsafe) equipment, cutting and trimming, manual handling, working at heights.

What do learners need to learn?

Common hazards and risks associated with plastering/rendering tasks and the controls that need to be in place

Controls: Identify correct PPE and maintain PPE, Method statements, risk assessments, complete accident book/ record, training, good house-keeping, tool box talks, job hazard analysis.
Communication

1.3 The impact of positive and negative body postures and tone of voice on effective communication

Range:

Positive impact - good relationships, improves team working, better motivation, better communication, increased morale, boost productivity, satisfaction improves.

Negative impact - Poor relationships, teamwork suffers, low morale, poor communication, misunderstanding arises, increased dissatisfaction.

What do learners need to learn?

The impacts of positive and negative body language and tone of voice in relation to professionalism considering approach and conduct, expression and translation, setting and achieving work targets and effective teamwork.

Consideration of the importance the role of the individual as part of a team within the workplace.

Skills

Information

1.4 Types of information required

Range:

Information – Drawings, specifications, schedules, method statements, programme of work.

What do learners need to learn?

Types of plastering source documentation and any related symbols, conventions and terminology needed to aid interpretation and development in plastering tasks.

Skills

1.5 Requirements of the building regulations and industry standards

Range:

Requirements - Protect public interest, provides minimum standards for health and safety and general wellbeing, and specifies standards.

What do learners need to learn?

The requirements of building regulations and Industry standards (including tolerances). Consideration should be made to the importance of specific plastering materials, tools/equipment, techniques, processes and how they comply with the building regulations.

Skills EC5
Tools and equipment

1.6 Types of tools and equipment used for plastering tasks

Range:

Hand Tools- hand board, finishing trowel(materials, sizes, types) bucket trowel, gauging trowel, margin trowels, floats (materials types sizes), levels( traditional, water, laser), straight edge, feather edge, Darby, small tools (types), joint rules, busk, files, craft knife, square, water brush, tool brush scratcher, snips, tape measure, lath hammer.

Power tools – mega mixer, drill, hammer drill, drywall gun.

Equipment - drum/cement mixer, pan mixer, mixing bath, drag (larry), shovel, brush, access equipment.

What do learners need to learn?  
Types of tools and equipment used for plastering tasks in installing, mixing, applying, keying and finishing plastering systems, their characteristics, purpose and suitability and limitations for different tasks.

1.7 Operation and handling requirements of tools and equipment

Range:

Requirements - Age restrictions, training, competence, maintenance and storage, PPE, Provision and Use of Work Equipment Regulations 1998 (PUWER), risk assessment and method statements.

What do learners need to learn?  
Operation and handling requirements for tools and equipment including, safe handling and safe working methods and their suitability for a given task.
1.8 **Importance** of maintenance and how to maintain equipment

**Range:**

**Importance** - Efficiency, minimise down time, increased productivity, safe usable condition.

**Maintenance** – Cleaning, storing, access, inspection, setting up, portable appliance testing (PAT), reporting.

**What do learners need to learn?**

The processes used to maintain tools and the importance of regular maintenance of tools and equipment to ensure safe working and fit for purpose, including PAT testing

**Skills**

1.9 Types of **fixings** for installing plastering components

**Range:**

**Fixings** - Drywall screws varying sizes, coarse thread suitable for fixing to timber, fine thread for fixing to metal), nails varying sizes (galvanised finish, jagged shank for increased holding strength, large head to distribute load), plugs, nails and insulation fixings.

**What do learners need to learn?**

Types of fixings, their characteristics, material properties, stock sizes and suitability for different purposes including compatibility with internal/external situations.

**Skills**
Scientific concepts and principles applied to plastering

1.10 Plastering materials science

Range:

**Type of Plaster** - Class A (plaster of Paris), Class B (retarded plaster) and Class C (anhydrous plaster).

**Characteristics** - plaster containing gypsum, lime, or cement, as a dry powder and is mixed with water.

**Types of Render Materials and Products** - traditional, pre-blended systems.

**Characteristics** – traditional, loose materials, cement, sand, aggregate.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastering materials science: Consideration of the type of plastering and rendering products that are used in plastering situations and their compatibility/suitability to achieve the desired finish. The importance of their characteristics including how materials set and the timings of materials including strength and curing to ensure successful installation and application of different plastering/rendering systems. In addition, consideration of background surfaces and compatibility with plaster as well as traditional and modern backing and finishing plasters, additives and polymers, bonding agents, chemicals, reinforcements and types of beads, minimum/maximum thickness.</td>
<td></td>
</tr>
</tbody>
</table>

1.11 Principles of thermal and sound efficiency and the relationship with substrates and plastering materials and techniques

Range:

**Principles** - Heat transfer/insulation and sound transmittance/insulation/absorption

**Relationship** - U values of substrates i.e. blockwork, brickwork, concrete, insulating plaster products, thermal boards, backing plasters, EWI systems.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The principles of sound and thermal efficiency including U values, acoustics valuation, and performance with consideration to the implications of relevant legislation and regulations.</td>
<td></td>
</tr>
</tbody>
</table>
1.12 **Principles** of fire protection

Range:

**Principles** - Prevention: controlling ignition and *fuel* sources so that *fires* do not start.  
Containment: *fire* should be contained to the smallest possible *area*, limiting the threat to life *safety* and the extent of *property* likely to be damaged.

**Types of products used for passive fire protection** - . Plaster boarding to steel beams and columns, fire resistant partitions, fixings, manufacturer’s information, specifications, Approved Document B.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles of fire protection with reference to materials used and methods of application, plastering and plasterboard products and their performance within a building. Consideration of evaluation, performance, current legislation (introduction to Document B) and regulations.</td>
<td></td>
</tr>
</tbody>
</table>

1.13 **Chemical reactions** from various plasters and additives and the *effect* these can have on the finished product

Range:

**Chemical reactions** – Efflorescence – migration of salt to the surface of a porous material

**Effects** - water proofer (creates surface imperious to water ingress), dextrin (gives a harder surface finish to a plaster cast), retarder (creates a slower setting plaster), accelerator alum (creates a quicker setting plaster), accelerator rendering (speeds up the setting process of cement to protect from frost), and pigments (add differing colours).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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<tbody>
<tr>
<td>Reactions from chemicals used in plastering processes including retarders, accelerators, additives, waterproofer, stabilisers, plasticiser, salt inhibitors, cement, gypsum, lime etc. with consideration of impacts on workability, strength, curing, air drying. With consideration to the types of additives and how they enhance traditional and modern plastering and rendering materials with consideration of types of systems, products, performance and compatibility.</td>
<td></td>
</tr>
</tbody>
</table>
1.14 Water, moisture and damp, condensation and the \textit{importance} and implications of damp proofing/tanking including chemical damp proofing

\textbf{Range:}

\textbf{Importance} - Prevention of water ingress to a building structure and damage caused, i.e. damaged plasterwork, rotten timbers and possible collapse of floors and other timber structures.

\textbf{What do learners need to learn?}

The importance and implications of damp proofing/ tanking and chemical damp proofing from water, moisture, damp and condensation and the problems associated with backgrounds and applied plasters, their effects and methods for repair and reinstating to prevent rising and penetrating damp.

\textbf{Skills}

1.15 \textbf{Causes, symptoms} and rectification of \textbf{faults} in \textit{plastering systems}

\textbf{Range:}

\textbf{Plastering systems} - Internal solid plastering, external rendering, cast and run insitu mouldings.

\textbf{Causes:} - Poor mix, poor preparation i.e. backgrounds/ mould preparation, incorrect application, poor material storage, out of date materials, structural movement, lack of movement beads, weather conditions, damp, water ingress.

\textbf{Symptoms:} - Bond failure, cast sticking, flash setting, cracking, crazing, visible signs of damp, surface blowing (frost/efflorescence).

\textbf{Faults} - Structural movement, wood rot, damp.

\textbf{What do learners need to learn?}

The causes, symptoms and rectification of faults associated with plastering systems including consideration of the impact of poor workmanship.

\textbf{Skills}
Maths

1.16 Application of maths including working out quantities both in areas, linear and volume

Range:

Application - Areas (walls, ceilings, windows doors), Volumes (floor screed) Linear (beads, cornice), Circumference (walls, ceilings, floor screed, beads, cornice), U values (compliance with Approved Documents part L), Pythagoras Theorem (setting out).

What do learners need to learn?

The application of math’s including working out quantities in areas, linear, and volume in both metric and imperial units of measurements, when planning plastering related tasks. For example, calculating loose materials, bagged materials, beads/fixings and waste

Skills
MC1
MC2
MC4

1.17 Application of geometry

Range:

Application - Setting out arches, Right angled quoins, Pythagoras Theorem, Curved walls on plan.

What do learners need to learn?

The application of Geometry in plastering tasks. Consideration should be made to the use of geometry in the set out and installation of complex plastering work from drawings, specifications, schedules and method statements - measuring, setting out, squaring levelling, plumbing and bisecting.

Skills
MC1
MC4

1.18 Application of ratios to plastering tasks

Range:

Ratios - water ratios according to manufacturer’s recommendations, mix ratios for PVA, SBR, water proofer, other additives.

What do learners need to learn?

The application of rations in relation to measuring, calculating and gauging for plastering work with consideration of appropriate resources and equipment for example when mixing loose aggregates and binders, pre blended plasters, premixed materials etc. to ensure accurate mixing and consistency to meet the industry standards.

Skills
MC4
Specific knowledge criteria for performance outcomes

Performance outcome 1 - Prepare backgrounds for plastering

**Business/commercial**
1.19 *Costs* associated with the preparation of backgrounds for plastering

**Range:**

*Costs* – labour, location, transportation, overheads, materials, design implications, waste, climate conditions, renewable and sustainable requirements.

**What do learners need to learn?**

The costs associated with the preparation of backgrounds for plastering with consideration on how they impact on profitability and how selecting appropriate plastering systems to meet the buildings performance needs may impact on costs including traditional or modern, age and design.

**Protection**
1.20 *Techniques* used to protect the areas of work

**Range:**

*Techniques* - Floor coverings, signs, fencing, hoardings, barriers, cones.

**What do learners need to learn?**

The types of methods used to protect internal and external surfaces such as openings in structures, building elements, services, access routes, mixing areas and general work areas as well as types of covering materials prior to carrying out the plastering work.
Background preparation

1.21 The differing internal/external backgrounds and the preparation needed to allow for effective plastering to take place

Range:

**Backgrounds** - Solid backgrounds brick and block, composite, concrete, stone/slate, plasterboard backgrounds, expanded metal lath, timber lath.

**What do learners need to learn?**
The different types of internal and external backgrounds and areas including walls, ceilings, curved walls, piers, columns and beams with consideration of preparation methods needed to allow effective plastering to take place.

1.22 Suitability of materials, equipment and techniques to control suction

**Techniques** - scraping down, grinding/raking out of mortar joints, brushing down, hacking, removal, chemical keys, bonding agents, EML, rib lath, mechanical keys and water Scratch coats, damping down, removal of mortar snots, scutching to create key, slurry coats.

**What do learners need to learn?**
The suitability of materials, equipment and techniques used to control suction and with consideration to manufacturer’s instructions.

1.23 Suitability of materials, equipment and techniques to produce a key

Range:

**Hand tools** - lump hammer, broom, bolster, floor scraper, skutch hammer, claw hammer, paint brushes, paint rollers, tin snips, spirit levels, window gauge, tape measure, straight edge, timber rules.

**Power tools** - SDS hammer drill, rotary scabblers/stripers, angle grinders, mechanical breaker.

**What do learners need to learn?**
The different ways to prepare background surfaces by hand or mechanical meansto form a key by hand or mechanically to ensure adequate adhesion of different plaster applications.

Identify different surfaces and select appropriate bonding agents to improve key in line with the manufactures instructions.
Performance outcome 2 - Apply plastering systems

Application of modern and traditional plastering systems

1.24 The suitability of trim beads for internal and external use.

Range:

Trim beads types:

- **Galvanized beads** main use internal due to thin coating which can be removed when used with external render, most beads are available in thin coat and floating coat versions.
- **Stainless steel** main use external work.
- **Plastic beads** main use external rendering and swimming pools (due to chemical attack).
- **Corner beads**, form external angles.
- **Stop beads**, form finished edges.
- **Plasterboard edge beads**, form finished edge.
- **Bell cast bead**, forms weathering to base of external renders.
- **Movement beads**, used where cracking could occur, i.e. expansion joints in brick/blockwork.

What do learners need to learn?

Types of trim beads and their suitability (benefits/potential limitations) for external and internal surfaces. And procedure of installing, position and purpose when forming angles to returns, splays, stops, movement joints and drips when installing plastering and rendering systems.

1.25 How to **cut and fix** various metal/plastic trim beads.

Range:

**Processes to cut and fix** - setting out, measuring, installing using dabs, nailing, use of staples and mechanical fixings.

What do learners need to learn?

Standard processes for cutting and fixing trim beads.
1.26 Modern **techniques** used to apply plaster to **internal surfaces**

**Range:**

**Internal surfaces** - Solid block/brick/stone/slate/concrete masonry backgrounds, textured, solid old plaster and timber/metal studs/Joists.

**Type of walls** - Plain walls, walls with returns, walls with openings, curved walls, beams, plain ceilings, ceilings with curves and raking ceilings.

**Techniques** - Preparing, installing plasterboards, mixing, applying keying, ruling, consolidating and finishing, spray application, two coat work, three coat work, direct bond, plaster boarding, dry wall systems and render finishes.

**System of application** - Scratch coats, pricking up coats, backing floating coats and finishing coats.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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<tbody>
<tr>
<td>Modern techniques used to apply plaster to internal walls, including, two coat work, three coat work, direct bond, plaster boarding, dry wall systems and render finishes. With consideration of the importance of completing work in line with necessary industry standards.</td>
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</tbody>
</table>

1.27 Traditional **techniques** for plastering

**Range:**

**Techniques** - fixing laths, applying sand/lime plasters.

<table>
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<tr>
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<tbody>
<tr>
<td>Traditional techniques for plastering. With consideration of the importance when cutting in and cleaning of internal walls angles, ceiling and skirting lines, cleaning of beads, timber door linings and window frames, removal of plaster from service points as well as the importance of completing work in line with necessary industry standards.</td>
<td></td>
</tr>
</tbody>
</table>
1.28 **Techniques** used for **application** of external **render finishes**

**Range:**

**Materials** – including loose materials, pre blended materials, pre-mixed materials.

**Backgrounds surfaces** – including solid block/brick/stone/ slate/concrete, composite, masonry backgrounds, insulation expanded metal lath.

**Type of walls** – including plain walls, walls with returns, walls with openings.

**Methods** - including preparing, mixing, applying and finishing.

**System of application** – including scratch coats, pricking up coats, backing floating coats and render coats.

**Types of render finish** – including plain face, textured, scraped, dry dash, wet dash, ashlar, tyrolean and sprayed/rubbed.

**What do learners need to learn?**

Techniques including traditional and light weight renders. With consideration of the types of common backgrounds for receiving plastering/render systems.

This includes external wall insulation, cement board and the need to install different types of reinforcements such as expanded metal lath and mesh clothes, location of beads in line with the drawing, specification and manufacturer’s instructions.
Performance outcome 3 - Fix plaster casted from moulds

Casting from moulds on bench

1.29 Methods for constructing a running mould including materials used.

Range:

Materials used -

Parts - Template, profile, stock, slipper, brace, and muffle.

Types - single slipper, double slipper, double stock, peg moulds, hinged moulds, run plaster reverse mould, piece mould, case mould, flood mould, insertion mould, run loose piece mould.

What do learners need to learn?

Methods for constructing a running mould and the materials used. With consideration to creating templates from drawing/squeeze, forming parts of the running mould (stock, slipper brace) using timber, attaching template to stock, fixing stock to slipper and fixing brace to stock and slipper.

1.30 Types of materials used to produce moulds used in casting.

Range

Materials – Plasters, reinforcements, additives, retarders accelerators, flexible moulding compounds, sealing agents, release agents, glues, fibreglass, clay, fixings, laths.

What do learners need to learn?

The types of materials used to produce moulds used in casting.

1.31 How to prepare the casting bench ready for running a reverse mould.

Range:

Preparation - Repair timber /plaster topped, prepare surfaces, seal, shellac, grease.

What do learners need to learn?

The process required in the preparation of the casting bench ready to run a reverse mould with consideration of tools, materials, traditional vs modern construction (plaster topped / timber topped).
1.32 **Process** for applying casting plaster to the bench to produce a reverse mould.

**Range:**

Process - setting up and preparation of fibrous bench to run and cast mouldings, set out and select specific hand tools, apply release agents and sealers, fix running rule and establish a suitable working surface.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>The process required for applying casting plaster to the bench to produce a reverse mould including coring out and mixing of plaster.</td>
<td></td>
</tr>
</tbody>
</table>

1.33 **Methods** of preparing the reverse mould for casting.

**Range:**

Methods – Sealing, greasing agents and release agents (French chalk, tallow, paraffin/vegetable oil, methylated spirits and shellac flakes).

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>The methods for preparing the reverse mould for casting.</td>
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</tbody>
</table>

1.34 **Methods** of mixing the casting plaster to produce the cast.

**Range:**

Methods – firstings, secondings, one and two gauge process.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Methods of mixing the casting plaster to produce the cast.</td>
<td></td>
</tr>
</tbody>
</table>
1.35 **Methods** used to reinforce casts.

**Range:**

**Methods** – Hessian ropes, timber, matting, fibres, wooden laths, lightweight metal sections (GRG), matting continuous strand (GRG) fibers.

**What do learners need to learn?**

Methods used to reinforce casts made from reverse moulds.

---

**In-Situ moulds**

1.36 **Techniques** for taking templates of existing in-situ moulds

**Range:**

**Techniques** - Design pattern - Plain and ornamental.

**Types of squeeze process** - Cut and draw, clay, plaster and rubber/silicone.

**What do learners need to learn?**

Techniques for taking templates of existing in situ moulds with consideration of design pattern required including plain and ornamental and types of squeeze process including cut and draw, clay, plaster and rubber/silicone.

---

1.37 **Methods** of running moulds in-situ

**Range:**

**Methods** - Running, forming, turning, spinning, scotch bracketing, coring out, topping off.

**What do learners need to learn?**

The methods of running moulds in-situ.
Fixing moulds

1.38 How to cut mitres

Range:
Cut - Free hand, template, mitre box.

**What do learners need to learn?**
How to cut mitres using both internal and external angles.

1.39 Methods of fixing plaster casts

Range:
Methods – screws, adhesives

**What do learners need to learn?**
Methods of fixing plaster casts, with consideration to techniques for preparation, setting out, fixings and lining all members.

1.40 Principles of jointing casts when fixing

Range:
Principles - leaving gaps, application of plaster to gaps

**What do learners need to learn?**
Principles of jointing casts when fixing, with consideration of the type of fixing used, internal/external mitres, stop ends, straight joints and stopping in.
Performance outcome 4 - Repairing plastering systems

1.41 **Techniques** for the inspection of plastering systems

**Range:**

**Techniques** - Visual, manual, mechanical testing (impact, adhesion).

**What do learners need to learn?**

The techniques for the inspection of plastering systems. With consideration to the reasons for carrying out checks (defect analysis and identification) and assessing material quality for plastering and rendering systems including effects of damaged and defected plasters, renders, plasterboard and accessories used with the work and possible defects that can be caused.

**Skills**

---

1.42 How to **protect** surrounding areas when repairing plastering systems

**Range:**

**Protect** - Protect surfaces and surroundings, remove/relocate services, protection of public areas and access and egress routes, (polythene sheeting, floor protection, door and jamb protection, protection of glazing).

**What do learners need to learn?**

Protection methods for surrounding areas when repairing plastering systems with consideration to method statements, waste management and potential consequences of poor protection measures in the work area.

**Skills**

---

1.43 **Methods** for the removal of damaged plaster in various internal plastering systems.

**Range:**

**Methods** – hand and mechanical, waste and disposal.

**What do learners need to learn?**

Key removal methods for damaged plaster in internal plastering systems.

**Skills**
1.44 **Techniques** for the removal of damaged ornate plaster systems

**Techniques** – assess moulding surfaces, preparation, match mould pattern.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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<tbody>
<tr>
<td>Methods for the removal of damaged ornate plastering systems and the types of procedures for removing defective internal plastering work to reinstate and make good (e.g. repairs to plasterboard, solid walls).</td>
<td></td>
</tr>
</tbody>
</table>

1.45 **Methods** for the removal of damaged renders in various external rendering systems

**Methods** - By hand, mechanical means (breaker, grinding, scabbling)

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Methods for the removal of damaged renders in various rendering systems and the process of removing defective plain and ornate moulding work to reinstate and make good by selecting appropriate tools and completing the work in line with the method statement.</td>
<td></td>
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</tbody>
</table>

1.46 **How to reinstate** internal plasterwork to various plaster systems

**Range:**

**Reinstate** - Float & set, board & Set, bonding agent & set, patch repairs.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Methods used to reinstate external render system. Consideration of materials, preparation methods and process to carry out and make good/reinstate defective internal plastering work (e.g. plasterboard, solid walls) to meet industry standards by selecting appropriate tools and completing the work in line with the method statement.</td>
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</tr>
</tbody>
</table>
1.47 **Reinstating** external render systems

**Range:**

**Reinstate** - Hand applied, scratch coat, floating coat, aggregates, machine applied, beads, hard angles.

### What do learners need to learn?  
Methods used to reinstate external render system. Consideration of materials, preparation methods and process to carry out and make good/reinstate defective internal plastering work (e.g. plasterboard, solid walls) to meet industry standards by selecting appropriate tools and completing the work in line with the method statement.

### Skills

1.48 **Methods** of reinstating ornate plaster systems

**Range:**

**Methods** - matching up to existing work, plug and screw, nail, adhesive, wire and wad.

### What do learners need to learn?  
Methods used to reinstate ornate plaster work. Consideration of materials, preparation methods and process to make good defective plain and ornate molding work, including joint lines, to meet industry standards with consideration of appropriate tools selection and requirements for completing the work in line with the method statement.

### Skills
Performance outcome 1 - Prepare backgrounds for plastering

2.1 **Interpret** drawings, specifications and schedules

**Range:**

**Interpret** - Materials type, positioning, shapes of moldings and joints, scale, dimensions, costs, timescales.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to use technical information available to aid the preparation of backgrounds for plastering (Work planning, selecting materials and the preparation/installation methods to be used) to meet job requirement.</td>
<td>EC5</td>
</tr>
<tr>
<td></td>
<td>MC7</td>
</tr>
</tbody>
</table>

2.2 **Use questioning techniques** to obtain and clarify information required.

**Range:**

**Questioning techniques** - Open/closed, funnel, probing, leading.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</tr>
</thead>
<tbody>
<tr>
<td>How to use questioning techniques to obtain the information, response or outcome required to effectively complete the task. Questioning may be in person or remote i.e. on the telephone</td>
<td>EC1</td>
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<td>EC3</td>
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<td>EC5</td>
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<td>EC6</td>
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</tbody>
</table>

2.3 **Measure** length, area and volume  **Range:**

**Measure** - Backgrounds surfaces (walls and Ceilings) Pre blended plasters, Loose plastering materials, Sheet materials, Beads, Additives, Components, Fixings.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to measure surfaces for plastering systems.</td>
<td>MC1</td>
</tr>
</tbody>
</table>
2.4 Produce **scaled drawings** by hand in plan, elevation and section

**Range:**

**Scaled drawings** - Drawing equipment, symbols, hatchings, scale, orthographic and isometric projections.

**What do learners need to learn?**

How to produce scaled drawings by hand. Consideration should also be made to the correct interpretation of scales and use of units of measurement appropriate to specification.

Skills

| MC1  |
| MC7  |
| MC8  |

2.5 Inspect **backgrounds** for suction and/or defects.

**Range:**

**Backgrounds**: aerated blocks, breeze blocks, concrete blocks, engineering bricks, common bricks, stock bricks, clay bricks, stone, composite.

**What do learners need to learn?**

Inspect different types of background surfaces in preparation for carrying out work. Select appropriate methods and procedures for controlling suction by carrying out a simple water absorption test to determine low/medium and high absorption rate.

Skills

2.6 **Remove** loose materials from backgrounds

**Range:**

**Remove** - Method of removal (by hand or mechanical)

**What do learners need to learn?**

How to remove loose material from backgrounds in accordance with the task. Assess risks and hazards with the work activity to ensure compliance with health and safety legislation when carrying out the removal of loose plaster/render from backgrounds.

Skills
2.7 **Apply preparations**

**Range:**

**Preparations** - Clean background surfaces, Primer, Bonding agent, Dubbing out coat, scratch coat, damping, hacking.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to apply preparations, using tools, equipment and materials in accordance with manufacturer's guidance.</td>
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</tbody>
</table>

2.8 **Inspect** materials

**Range:**

**Inspect** – Visual

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to carry out visual inspections on materials for quality and any potential defects (e.g. correct type of plaster etc.) If defects are identified consideration should be made as to whether defects can be removed or minimised or if disposal of unusable materials is necessary.</td>
<td>EC5</td>
</tr>
</tbody>
</table>

2.9 **Inspect** tools and equipment

**Range:**

**Inspect** – Visual check, check lists, maintenance records, service document, PAT testing

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to carry out inspections of tools and equipment e.g. safety guards, electrical cables etc. in line with standard workshop practice to ensure they are serviceable/fully operational including checking fitness for use. Where necessary adjusting and calibrating of equipment in line with training and guidance. Escalate/report faulty or inappropriate tools/equipment that have been identified in line with health and safety reporting.</td>
<td></td>
</tr>
</tbody>
</table>
2.10 Estimate resource requirements

**Range:**

**Resource requirements** - timelines, materials, quantities, stock, equipment availability, resources/labour, location, budget.

**What do learners need to learn?**

How to estimate requirements with consideration. With reference to all available sources (job specification, plans, drawings etc.).

**Skills**

MC9

2.11 Follow a method statement

**What do learners need to learn?**

How to follow a method statement to carry out work duties safely, methodically and competently in line with the method statement with consideration to the location of tasks – (workshop and on site task requirements).

**Skills**

EC1
EC2
EC5

2.12 Apply keys to differing backgrounds

**Range:**

**Backgrounds** - Splatter dash to concrete, EML to wood/concrete, bonding agents.

**What do learners need to learn?**

How to apply keys to a range of background surfaces by forming hand and mechanical key to improve adhesion of plaster.

**Skills**

2.13 Protect surrounding areas

**Range:**

**Protect** - dust sheets, timber sheeting, visquin, netting, and hoarding

**What do learners need to learn?**

Protect internal and external surfaces prior and during the work activity. Including surfaces such as windows, doors, services, drains, furniture, floors, surrounding surfaces using a range of coverings.

**Skills**
Performance outcome 2 - Apply plastering systems

3.1 Protect integrity, quality and condition of materials during handling and storage

What do learners need to learn?
How to protect and store material to maximize limitation of product. Considers safe handling, lifting and transporting requirements of materials and components to competently complete plastering/rendering related tasks.

Skills

3.2 Use tools including hand and power tools

What do learners need to learn?
How to use tools including hand and powered tools (both wired, and battery operated) in relation when preparing, mixing, applying, ruling and keying backing and finishing coats plasters/renders including installation of performance plasterboard system to the job specification. All tools should be used in line with safe working practices and in line with training/manufactures instructions.

Skills

3.3 Set out plasterboard to stud work and direct bond

Range:

Set out - Checking backgrounds. Set out dimensions

What do learners need to learn?
How to set out plasterboard to studwork and direct bond. Plans the work task in line with the drawing and specification, carries out pre installation checks, prepare background surfaces and selects appropriate materials, fixings and adhesives for the chosen system.

Skills MC1

3.4 Fix plasterboard to timber/metal stud work and solid backgrounds

Range:

Fix - Traditional Lath, wall plates, dry wall screws, jointing tape, jagged plasterboard nails, adhesive.

What do learners need to learn?
How to fix plasterboard systems to timber, metal and solid backgrounds.

Skills
3.5 **Mix** mortar, including plaster and render

**Range:**

Mix - Ratios, thickness, materials, consistency, additives, equipment, procedure.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to mix mortar, including plaster and render gauging quantities of loose materials such as aggregates, binders and additives when mixing including mixing pre blended plasters and renders to ensure accuracy of strength and consistency of materials for applying and finishing.</td>
<td></td>
</tr>
</tbody>
</table>

3.6 Apply light weight **plasters** to internal surfaces

**Range:**

Plasters: two coat, three coat and finishing plaster.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to apply light weight plasters to internal surfaces, selecting suitable and compatible gypsum-based plaster systems. Use techniques for applying, ruling and consolidating the surface of backing coat including cutting back. Consider any reinforcement requirements before applying finishing plaster to solid and plasterboard background surface ready for decoration.</td>
<td></td>
</tr>
</tbody>
</table>

3.7 Apply tape to a drywall system joint

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to apply tape to drywall system joints, preparing plasterboard surfaces and carrying out tape and joint application to butt joints, internal and external corners and spotting to fixings. Prepare jointed surfaces by sanding and sealing if they are being decorated.</td>
<td></td>
</tr>
</tbody>
</table>

3.8 Apply render plasters to internal surface

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to prepare, mix and apply specialists render systems. Applying and forming plain and textured surfaces in line with manufacturers instructions. Recognizes different backgrounds such as EWI, Cement board, EML and solid.</td>
<td></td>
</tr>
</tbody>
</table>
3.9 Fix laths to surfaces

**Range:**

**Laths** - Expanded metal, rib and timber

**What do learners need to learn?**

How to fix laths to surfaces including walls and ceilings to reinforce and form background surfaces to receive plaster application.

**Skills**

3.10 **Apply** sand and lime plasters.

**Range:**

**Apply** - pricking up coats, scratch coats, floating coats and finishing coats.

**What do learners need to learn?**

How to apply sand and lime plasters. Apply traditional lime-based finishing coats to consolidated lime based backing plasters in line with manufactures instructions and specification.

Recognize tolerances in the completed work, providing adequate key, cutting in and cleaning of wall, ceiling and skirting lines, cleaning of beads, timber door linings and window frames, removal of plaster from service points.

**Skills**

3.11 Fix **trims** using different **techniques**.

**Range:**

**Trims** – metal, plastic

**Techniques** – mechanical fixes, adhesives

**What do learners need to learn?**

How to fix a variety of trims using different techniques.

**Skills**
3.12 Cut various metal/plastic **trim**.

**Range:**
**Trim** - beads including stainless/galvanized/plastic angle beads, stop beads, expansion beads, bell cast/ drip beads, stop beads.

**What do learners need to learn?**
How to cut metal/plastic trim (including beads) used in line with plastering and rendering systems. Use measuring techniques to cut beads to length, position correctly and fix.

**Skills**

3.13 Produce traditional external render **finishes**

**Range:**
**Finishes** - plain face, ashlar, Tyrolean and dry dash.

**What do learners need to learn?**
How to produce traditional external render finishes using a range of techniques used to create different plain and textured surfaces.

**Skills**

3.14 Apply light weight **one coat renders**

**Range:**
**One coat renders** - plain, ashlar, brick render, pebble dash/ dry dash, rough casting/wet dash, scraped texture, rubbed texture and Tyrolean.

**What do learners need to learn?**
How to apply light weight one coat renders to plain/ complex surfaces in line with the manufacturer’s instructions.

Considering how different materials are mixed for different types of external finishes in relation to mix ratios depending on strength, correct consistency of material for application and correct colour consistency.

**Skills**
Performance outcome 3 - Fix plaster casted from moulds

4.1 **Transfer moulding shapes** to metal

**Range:**
Transfer - Drawings, draw directly onto zinc, use of squeeze to produce a drawing, stick pre-drawn template to zinc

Moulding shapes/members - cyma recta, cyma reversa, ovolo and cavetto, fillet, scotia, torus/bead, drip, weathering

**What do learners need to learn?**

How to transfer moulding shapes to metal. Construct reverse running moulds from drawings, specifications and squeezes, transfer moulding outlines designs to templates and assemble various running mould components to construct a reverse running mould

**Skills**
MC7

4.2 **Cut** shapes from metal

**Range:**
Cut – Hand and power tools, Aviation snips curved and straight, nibblers, files straight, half round, round, drill, screw gun, vice.

**What do learners need to learn?**

How to transfer moulding profile outlines to sink or aluminum metal sheet and cut out shapes accurately using appropriate hand tools and power tools in line with the method of work.

**Skills**

4.3 **Join** templates to running moulds

**Range:**
Join - Hammer, pins

**What do learners need to learn?**

How to construct running mould components and Join templates to stock using appropriate hand tools.

**Skills**
4.4 **Apply** running rule to casting bench

**Range:**  
**Apply** - Chalk line, straight edge, timber rule, screws, and nails

**What do learners need to learn?**

How to fix running rules to prepared fibrous bench using correct fixings to ensure reverse mould is run accurately, straight and in line.

**Skills**

4.5 Grease bench in preparation for reverse mould

**What do learners need to learn?**

How to prepare grease release agent and apply to bench and reverse mould surfaces to ensure positive and cast moulds can be removed and released without damage.

**Skills**

4.6 Prepare materials

**Range:**  
**Materials** - hessian ropes, wooden laths and casting plaster, retarder (size), shellac, grease

**What do learners need to learn?**

How to prepare moulding materials for producing casts using different types of plasters one and two gauge systems, using reinforcements such as canvas, laths for strengthening, release agents, additives and appropriate mixing equipment.

**Skills**

4.7 **Run** a reverse mould on the bench

**Range:**  
**Run** - Bench preparation, running lath, muffle, core, finish

**What do learners need to learn?**

How to run positive and reverse moulds using traditional mortar and plaster core and using modern materials such as plasterboard including using plaster muffles and timber templates.

**Skills**
4.8 Prepare moulds ready for casting

**Range:**
**Prepare** - Drawing, cut to required size, shellac, grease.

**What do learners need to learn?**
How to prepare reverse moulds using shellac sealer and release agents in preparation for casting from solid and flexible reverse moulds.

**Skills**

4.9 Cast from moulds

**Range:**
**Cast** - Size, canvas, laths, ropes, reinforcing wads, strike off.
**Moulds** - One gauge, two gauge, Plaster moulds, Rubber moulds, Fibreglass moulds.

**What do learners need to learn?**
How to cast moulds from reverse plaster, rubber and fiberglass models using one and two gauge casting methods and procedures.

**Skills**

4.10 Take templates from an existing in-situ mould

**Range:**
**Take templates** - Remove section of original, take a squeeze (saw cut and profile, clay, rubber plaster), transferring profiles.

**What do learners need to learn?**
How to take squeeze templates using different methods and procedures for reproducing plain and pattern designs. Transfer moulding members to sink profile and construct in-situ running mould.

**Skills**
4.11 **Run** moulds in-situ including coring out and topping off

**Range:**

**Run** - Sweetening, running rules, running mould, scotch brackets, laths, sand/lime, putty lime, casting plaster, muffle, core, finish.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to set out and run in-situ moulding work including coring out/bracketing to form straight, curved and raking moulding work using traditional materials.</td>
<td></td>
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</tbody>
</table>

4.12 **Mark out** materials including mitres

**Range:**

**Mark out** - Square, level, chalk line, tape measure, mitre box.

<table>
<thead>
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<tr>
<td>How to mark out complex moulding designs to include intersections of moulding members at miters, returns and stop ends to ensure moulding members meet and intersect in line accurately when setting out straight, curved and raking moulding work.</td>
<td>MC1</td>
</tr>
</tbody>
</table>

4.13 **Cut** castings to produce internal and external angles

**Range:**

**Cut** - Square, tape measure, mitre box, saw.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>How to cut produced in-situ moulds including short breaks to required dimensions when forming internal and external mitres including stop end returns using free hand methods, templates and mitre boxes and appropriate hand tools.</td>
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</tbody>
</table>
4.14 **Fix** plaster casts.

**Range:**

Fix - Drill, hammer, punch, plugs, screws, galvanised nails, adhesive, joint rules, small tools, wire and wad.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to fix moulding work using adhesive, screws and wire and wad methods in line with the method of work.</td>
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</table>

4.15 **Apply** plaster to internal and external joints to produce a finish

**Range:**

Apply - Small tools, joint rules, tool brush, busk

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>How to apply and make good internal and external mitres and stop end returns using appropriate reinforcements, mortars and casting plaster ensuring moulding members in line and accurate using small tools, joint rules, busks and small brushes.</td>
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</tbody>
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Draft "under review" - Milestone 2
### Performance outcome 4 - Repair plastering systems

5.1 **Inspect** plastering system for damage  

**Range:**

- **Inspect** – Visual, manual, mechanical analyses, testing

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>How to inspect different types of damaged/defected surfaces to internal plastered surfaces, external rendered surfaces and ornate plasterwork in preparation for carrying out repair work to make good defects. Identify the cause of defect and implement methods and procedures for carrying out repairs.</td>
<td></td>
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</table>

5.2 **Remove** damaged **materials**  

**Range:**

- **Remove** - Protect surroundings, tools manual and powered, removal of waste product in line with current regulations, comply with health and safety legislation.

**Materials** - internal plastering, external render and ornate plaster finishes, lightweight preblended backing/finish plasters, loose materials (traditional render systems), preblended modern render systems, sand/lime mixes, plaster lath, (insitu mouldings), casting plaster, canvas, plaster lath (fibrous mouldings).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>How to remove damaged materials, setting up work areas safely to remove damaged surfaces by hand or by mechanical means in line with risk assessments and method statements.</td>
<td></td>
</tr>
</tbody>
</table>
5.3 **Maintain** integrity of plastering system **materials** and surrounding building fabric

**Range:**

**Maintain** - Check for shelling, cracking, and effects of other structures

**What do learners need to learn?**

How to maintain the integrity of plastering system materials and surrounding building fabric. Assess and evaluate the type of work to be repaired, private, commercial or listed and plan methods for protecting the surrounding area with regards to people, vehicles and surrounding buildings. Consider time frames to complete repairs and the affects it will have on the building and surrounding. Prepare means of access, protection and safe routes to carry out and complete the repairs in line with health and safety legislations.

**Skills**

5.4 Match new materials to existing plastering system materials.

**Range:**

**Match** - Traditional, modern, Drawings, schedules, specifications

**What do learners need to learn?**

How to match new materials to existing plastering system materials. Removing loose material from backgrounds in accordance with the task. Assess risks and hazards with the work activity to ensure compliance with health and safety legislation when carrying out the removal of loose plaster/render/ornate plaster work from backgrounds.

**Skills**

5.5 **Blend** new materials to existing plastering system

**Range:**

**Blend** - Lime plasters, horse hair/goats hair, heritage England

**What do learners need to learn?**

How to blend new materials to existing plaster systems. Ensuring surfaces match existing with regards to using appropriate materials, binders, aggregates, additives, reinforcements, beads, colour, surface being plain, textured, pattern design including moulding members and enrichments.

How repairs should also meet conservation and heritage legislation when applicable to meet listed building design.
Links to Core Skills

As part of delivery of the skills and knowledge within this specialism reference should be made to criteria that support the development of the four core skills – communication, working collaboratively, problem solving and research. Some examples of criteria that may be linked to supporting these core skills include:

- Communication e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a change to an industrial system or making a presentation to a stakeholder on the implications of change.

- Working collaboratively with other team members and stakeholders e.g. to develop content to bid for a construction project.

- Applying a logical approach to solving problems, identifying issues and proposing solutions e.g. through setting criteria for successful implementation of a system, using cost / benefit analysis of the introduction of new procedures or equipment.

- Conducting primary research e.g. obtaining measurements related to a design or customer requirements.

Guidance for delivery

- Opportunities for efficiencies in delivery
- Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery
- Considerations for innovative methods of delivery to include blended learning and other forms of technology. Innovative methods of delivery could include:
  - Presentation/demonstration – delivery of topics using SmartScreen presentation (PowerPoint example available) lecture/discussions/oral Q&A enthusing and engaging learners through different teaching methods and resources
  - Reinforcement of candidate learning – revisit learning, group discussions, peer support, sample questions
- Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities
  - Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
  - Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT
- Ways of ensuring content is delivered in line with current, up to date industry practice
  - Centres will need to ensure a realistic representation of plastering tasks are available
  - Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
  - The provision must represent the type of equipment currently available in the UK plastering industry
Current and emerging plastering technology should be included in delivery where possible

**SEN consideration**

In the development of this qualification specific consideration with support of expert consultants have considered:

- Cognition and learning – Language, Literacy, Mathematics, Numeracy
- Social, behavioural, emotional and well-being
- Speech, language and communication needs
- Sensory (colour blindness)
- Confined spaces
- Physical needs/ability

**Suggested learning resources**

**Web sites**

- Plasters and performance plasterboards:
- British Gypsum - www.british-gypsum.com
- Siniat - www.siniat.co.uk/en
- Weber - www.uk.weber
- K-rend - www.k-rend.co.uk
- Weatherby - https://www.wbs-ltd.co.uk
- Parex - www.parex.co.uk

**Books**

- Plastering: J. B. Taylor: Pearson Education
- The City and Guilds Textbook – Level 2 Diploma in Plastering: Mike Gashe: City and Guilds
Bricklaying

What is this specialism about?

The purpose of this specialism is for learners to know and undertake fundamental bricklaying work within different construction environment’s such as domestic brick and block work (cavity walling) design and build complex masonry structures, and use masonry skills to refurbish different types of buildings. Learners will have the opportunity to plan, perform and evaluate their work whilst utilising a range of materials, methods and techniques to allow the learner to progress.

Learners will develop their knowledge and understanding and skills in:

- Fundamental Health and safety regulations, control of noise, and working at height, while working safely across different construction projects.
- Bricklaying tools and equipment, building regulations and methods of work.
- Setting out masonry structures, and calculating for building resources.
- Establishing sub and superstructure elements of a building.
- Finishing and establishing working areas.
- Calculating both labour and material costs.

Learners may be introduced to this specialism by asking themselves questions such as:

- What kind of tasks does a Bricklayer perform?
- What tools and equipment do bricklayer’s use as part of their role?
- What are the steps required to become a qualified bricklayer?

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills. Details are presented at the specification content.
Underpinning Bricklaying knowledge outcomes
On completion of this specialism, learners will understand:

1. Bricklaying knowledge criteria

Performance outcomes
On completion of this specialism, learners will be able to:

2. Prepare for the construction of complex masonry structures
3. Construct complex masonry structures
4. Renovate masonry structures

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills. Details are presented at the end of each performance outcome.
Specialism content

Common knowledge criteria

Health and safety:

1.1 Implications of legislation and guidance

Range:

Legislation and guidance - HASWA, CDM regulations, Control of Noise at Work Regulations, Control of Vibrations at Work Regulations, Provision and Use of Work Equipment Regulations (PUWER), Working at Height Regulations, Control of Substances Hazardous to Health (COSHH) and additional guidance (including HSE Information Sheets), LOLER, RIDDOR, PPE, Manual Handling, Approved Code of Practice (ACoP).

What do learners need to learn?

Overview of current legislation and the implications to employers and those working on the production of complex masonry structures.

Skills

EC5

1.2 The identification of hazards and risks

Range:

Common hazards and risks - Tripping hazards, Slipping hazards, Inadequate or lack of personal protective equipment, Defective (unsafe) equipment, Cutting and trimming, Manual handling, Working at heights.

Controls - Identify correct PPE and maintain PPE, Method statements, Risk assessments, complete accident book/record, training, good house-keeping, tool box talks, job hazard analysis.

What do learners need to learn?

Common hazards and risks associated with bricklaying tasks and the controls that need to be in place.

Skills
1.3 **Controls**

Content of *inductions, method statements* and *risk assessments*

**Range:**

**Inductions** - Site layout, site specific hazard, location of welfare facilities, location of emergency areas.

**Method statement** - Understand job descriptions, hazards specific to the job, control measures.

**Risk assessment** - Identify hazards, personnel at risk, measures to remove/reduce risk.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>The content within inductions, method statements and risk assessments and how they are used in when preparing for the construction of complex masonry structures.</td>
</tr>
</tbody>
</table>

**Skills**

| EC1 | EC2 | EC3 | EC5 |

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**Information**

1.4 **Types of information**

**Range:**

**Information** - Drawings, Specifications, Schedules, Method statements, Programme of work

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>The types of information and their use in the production, assembly, and installation of masonry and its components, and the construction hatchings, symbols, conventions and terminology required to aid interpretation and development .</td>
</tr>
</tbody>
</table>

**Skills**

| EC5 | DC1 |

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1.5 **Requirements** of building regulations and standards

**Range:**

**Requirements** - Protect public interest, provides minimum standards for health and safety and general wellbeing, specifies standards.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current requirements of building regulations and standards relating to complex masonry structures</td>
</tr>
</tbody>
</table>

**Skills**

| DC1 |
1.6 Quality standards applicable to masonry structures

Range:

Industry standards/tolerances - Gauge, level, plumb, square, Ranging, Dimensional accuracy, clean face.

What do learners need to learn?

Current quality industry standards and tolerances applicable to masonry structures.

Skills
MC7

Tools and equipment

1.7 Types and handling of tools and equipment used for bricklaying

Range:

Tools and equipment

Hand tools - Laying trowels, Pointing trowel, Pointing hawk, Spirit levels, 900mm 1.2m 2.0m, Pocket level, Hammers, (club, brick, comb), Line and pins, Quoin blocks, Brick bolsters, Jointing/plugging chisel, Tape measures, 3m 10m 30m; Half round jointer, Recess jointer, Gauge rod, Propriety corner profiles, Hand brush.

Equipment - Storey rod, Hand saw, Block splitter, Trammel heads, Trammel rod, Sanding block, Rasp/File, Tin Snips, Ranging poles, Surveying staff, Laser level, Optical level, Sliding bevel, Dividers, Templates, Strong boys, Sole plates.

Power - Drum Mixer (110v), Extension lead (110v), Hammer drill and bits, Jig saw (110v), Power plane (110v), Masonry saw/disc cutter (hand and table), Mortar silo.

What do learners need to learn?

Types of tools and equipment (hand and power) used in bricklaying, and their characteristics, purpose and suitability for given tasks

Skills
1.8 **Operation and handling** requirements of tools and equipment

**Range:**

**Operation and handling** - Accuracy, safe working methods, cleanliness, PPE, trained, competent, storage, method statements, risk assessments.

**What do learners need to learn?**

Operation and handling requirements for tools and equipment including, safe handling and safe working methods and their suitability for a given task.

1.9 Importance of tools and equipment **maintenance** and how to maintain tools

**Range:**

**Maintenance** - Cleaning routines for all hand tools and equipment, secure hammer heads, deburring bolster and chisels, Sharpening bolsters and chisels, sharp scutch combs, lubricating tape measures, check levels for accuracy, storage methods.

**What do learners need to learn?**

The processes used to maintain tools and the importance of regular maintenance of tools and equipment to ensure safe working and fit for purpose, including PAT testing.

**Scientific concepts and principles applied to bricklaying**

1.10 Masonry **classifications** and the **implications** of use

**Range:**

**Classifications** - Half brick wall, Solid wall, Cavity wall, Partition wall, Party wall, Decorative bonding, Decorative panels, Obtuse angled quoins, Acute angled quoins.

**Implications** - Stability, appearance, efflorescence, staining, subsidence, water penetration (porosity, capillary attraction, permeability), frost damage, spalling, cracking, movement.

**What do learners need to learn?**

Types of masonry classifications and the associated implications, when used in bricklaying situations.
1.11 Types and classifications of mortars, *techniques* for strengthening mortars and the implications

**Range:**

**Types** - Lime mortar, Cement mortar, ready mixed mortar (on-site or off-site)

**Techniques** - Chemical additive, increased aggregate gauge, increased cement content, Use of adjusted mortar ratios

**Implications** - Resistance to loading, joint failure, Lateral movement, Variation in strength, Resistance to attack by chemicals, Colour variation, Effects of excessive moisture

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different types of mortar and how they are applied, the techniques for strengthening and the implications of use in different bricklaying situations.</td>
<td></td>
</tr>
</tbody>
</table>

1.12 Types of pointing *techniques* and *materials*

**Range:**

**Techniques** - Different types of joint finishes, flush, half round, recessed, weather struck and cut; (Renovation work) Tuck pointing, Gun application, By hand

**Materials** - Coloured mortars, Gauged pigments, Sand Lime, Gauged aggregates, Resin based, Lime putty.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The types of pointing techniques and the use of appropriate materials, their application and suitability for different situations.</td>
<td></td>
</tr>
</tbody>
</table>

1.13 Effects of the *external environment* on masonry products and structures

**Range:**

**External environment** - Drainage management, tree proximity, water table, wind exposure, frost effects, prolonged adverse weather conditions.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The effects of the external environment on masonry products and structures.</td>
<td></td>
</tr>
</tbody>
</table>
1.14 **Manufacture** of brick, blocks and mortar used in construction, their **properties** and characteristics

**Range:**

**Manufacture** - Kiln fired, Steamed, Autoclave, Handmade, Machine pressed, Wire cut

**Properties** – Bricks (Load bearing capacity, water absorption, appearance, texture and colour) and Blocks (Non load bearing and load bearing capacity, thermal insulation, water absorption, appearance, texture and colour)

**Characteristics** - Perforated, Frogged, Solid

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The manufacturing processes for bricks, blocks and mortars used in construction and their suitability for different purposes including, high compressive strength, low water absorption, use for strength and exposed positions.</td>
<td></td>
</tr>
</tbody>
</table>

1.15 **Causes, effects, prevention** and **treatment** of efflorescence

**Range:**

**Causes** - Producing brickwork in damp and wet conditions, Use of damp or wet resources, Not protecting the finished work. Soluble salt crystallising on masonry

**Effects** - Spoils appearance of masonry

**Prevention** - Keep resources dry, Cover work on completion, Specify bricks less susceptible to efflorescence

**Treatment** - Brush off crystalline products in dry weather, Use a muriatic solution.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The causes, effects, prevention and treatment of efflorescence</td>
<td></td>
</tr>
</tbody>
</table>
1.16 The principles of thermal and sound efficiency their purpose, application and installation

Range:

Principles and purpose - Heat transfer, Sound transmittance

Application and installation - selection of resources, appropriate location

What do learners need to learn?
The causes, effects, prevention and treatment of efflorescence

1.15 The principles and purpose of thermal and sound efficiency (including limiting heat transfer through external walls, limiting sound transmittance through masonry structure). Their application and installation as described in the range:

Selection of resources

Including, mineral fibre, polyisocyanurate board (PIR), lamb’s wool, insulation blocks, dense concrete blocks (sound)

Appropriate location

Including, full envelope, walls (cavity), solid wall, external wall insulation (EWI), internal dry wall application. The relationship with masonry materials and techniques including, maintaining air tightness, taped insulation board joints, flush pointed mortar joints

Skills

1.17 Movement joints and differential movement

Range

Movements - Vertical movement joints in long lengths of masonry, Regulation of positioning of movement joints, Materials used to crate movement joints.

What do learners need to learn?
The relationship between contaminants and moisture damp proof barriers and their purpose (to protect vulnerable positions in a cavity from moisture ingress) and their application and installation (where the risk of moisture bridging occurs).
1.17 Resistance to **contaminants and moisture**

**Range:**

**Contaminants and moisture** - Sulphate attack, lime leaching


<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The relationship between masonry (as a cladding) and the different forms of framed structures.</td>
<td></td>
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</tbody>
</table>

1.18 The relationship between masonry and different forms of **construction frames**

**Range:**

**Construction frames** - Timber, Steel, Concrete

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The relationship between masonry (as a cladding) and the different forms of framed structures.</td>
<td></td>
</tr>
</tbody>
</table>

1.19 **Chemical reactions** from combining masonry materials, the **effect** of adding waterproofing chemicals and the **effect** plasters/mortars have on hardwoods

**Range:**

**Chemical reactions and effects** - Colour and grain distortion, Removal of natural oils

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The different consequences of chemical reactions from combining masonry materials (plasters/mortars), including the effect of adding waterproofing chemicals on hardwoods. Regulation of positioning of movement joints, and materials used to crate movement joints.</td>
<td></td>
</tr>
</tbody>
</table>
Building Technology

1. 21 Integral building components and their purpose

Range:
Components and purpose - Ties (help and maintain structure stability in cavity walls), Expansion joints (to allow for structural/thermal movement in walls), Lintels (carry the weight of masonry over openings), Bearers/padstones (to distribute loadings).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integral building components, their purpose and their application and installation in accordance with building regulations.</td>
<td></td>
</tr>
</tbody>
</table>

1.22 Types of radial and battered brickwork

Range:
Radial - Serpentine wall, curved on plan (concave and convex), axed semicircle, three centred arch

Battered - Plain battered brickwork, buttress, tumbling in.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The different types of radial and battered brickwork.</td>
<td></td>
</tr>
</tbody>
</table>

1.23 Types of reinforced brickwork

Range:
Types - Horizontal (Expanded Metal Lath, welded fabric,), Brick and a half wall (quetta bond) vertical reinforcement, Isolated brick piers including vertical reinforcement.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The different types of reinforced brickwork, their purpose (to increase tensile strength of the wall), application and installation (vertical and horizontal reinforcement in bed joints and masonry voids).</td>
<td></td>
</tr>
</tbody>
</table>
1.24 Different types of **openings**

**Range:**
**Openings** - Fireplace, Chimney, Flues.

**What do learners need to learn?**
The different types of openings involved in fireplace and chimney construction (including single and back to back fireplace) and their purpose (to contain the combustion process and to conduct flue gases to the outside of the structure) and its application and installation in accordance with building regulations.

---

1. 25 Types of **finishes** to wall plate and rafter level

**Range**

**Finishes** - Mortar bedding of the wall plate, placing restraint straps horizontal and into gable end, Use of timber and restraint straps and bolts.

**What do learners need to learn?**
The types of finishes to level a timber wall plate and the use of restraint straps.

---

1. 26 Different types of bonds used in masonry structures

**Range:**

**Bonds** - English, Flemish, Stretcher, Header, Block bonded quoins, Garden wall bonds, Decorative panels - herringbone and basket weave (diagonal and vertical), Dentil, Dog tooth.

**What do learners need to learn?**
The different types of bonds used in masonry structures including 337mm thick English Bond, 337mm thick Flemish Bond, English and Flemish Garden wall bonds, Dutch Bond, Monk Bond, Header Bond, Block bonded quoins and closing a cavity: Block on flat at gutter level/forming a stopped end.
1.27 Types of cladding systems

**Range:**

**Cladding systems** - Brick, Steel, Timber, Composite, Plastic, Concrete, Slate, Tile.

**What do learners need to learn?**
The different types of bonds used in masonry structures and other decorative features.

**What do learners need to learn?**
The basic principles of cavity ties and ancillary brick support systems.

1.28 Basic **principles** of cavity ties and ancillary brick support systems

**Range:**

**Principles** - Cavity Ties, structural stability to a cavity wall, ancillary, joining new brickwork to existing masonry, Cladding to main structures, maths.

**What do learners need to learn?**
The basic principles of cavity ties and ancillary brick support systems.

1.29 **Application** of maths

**Range:**

**Type of application** - Areas, Volumes, linear, Circumference (Perimeter), U values, Pythagoras Theorem

**Calculations** - Number of bricks per Liner Metre, Number of bricks per m2, Volume of excavation M3, and Volume of Concrete required M3, Surface area of columns/Piers, U values to a cavity wall, Determine liner measurements.

**What do learners need to learn?**
The types of building calculations used on a building site.
1.30 **Application of geometry** for setting out and verification.

**Range:**

**Application** - Setting out arches, verification of concrete amounts (area and volumes), obtuse and acute brickwork, Right angled quoins, Pythagoras Theorem, Curved walls on plan.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The processes used to set out geometrical designs (segmental/3 centre arches) for setting out and verification.</td>
<td>MC4</td>
</tr>
</tbody>
</table>

1.31 **Application** of ratios to bricklaying tasks.

**Range:**

**Application** - Mortar mixes for low and high strength brickwork, Mortar mix ratios for pointing new and existing brick/Block work.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The application of ratios used for mixing and preparing mortar for laying bricks and blocks and pointing mortar.</td>
<td>MC4</td>
</tr>
</tbody>
</table>
Specific Knowledge criteria for performance outcomes

Prepare for the construction of complex masonry structures (PO1)

Business/commercial

1.32 Costs associated with the production, assembly and installation of Masonry products and components

Range:

Costs - labour, materials, consumables/overheads, wastage, price per M2 of both brick and block work, pricing brickwork per liner metre.

What do learners need to learn?

The costs associated in the construction of complex masonry structures including the price of brickwork for cavity walling, detailed panels, raking cuts and building details at gable end and price work for different arch designs

Skills

MC9
Performance outcome 1 - Prepare for the construction of complex masonry structures

2.1 Identify **information** requirements from a client brief

**Range:**
**Information** - Size, location, design, function, budget, specification

**What do learners need to learn?**
How to select and extract the correct information required from a brief to meet the requirements of any given task.

Skills
EC5

2.2 Use **questioning techniques** to obtain and clarify information required

**Range:**
**Questioning techniques** - Verbally, Open and closed questions, listing priorities, Probing, Leading.

**What do learners need to learn?**
Questioning techniques used to obtain and clarify information on site and or with stakeholders/client/customers.

Skills
EC1
EC2
EC4
EC5
EC6

2.3 Calculate areas and linear measurements

**What do learners need to learn?**
How to calculate areas of both brick and block face work, linear measurements of brick/block work and areas of door and window openings.

Skills
MC1
MC2
MC3
MC4

2.4 Measure: length, height and area

**What do learners need to learn?**
How to measure the lengths and height and calculate the area of face brick/block work.

Skills
MC1
MC2
2.5 **Interpret** scaled drawings

**Range:**

*Interpret* - Dimensional references, Architectural features, Position of door and window openings, Roof configuration, establishing corner positions.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to interpret scaled drawings in elevation and section.</td>
<td>MC5 MC7</td>
</tr>
</tbody>
</table>

2.6 **Inspect** tools and equipment and materials for defects

**Range:**

*Inspect* - Visual inspection, PAT testing, Calibration, Routine checks for accuracy

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to inspect and maintain the bricklayers hand tools, equipment and materials.</td>
<td></td>
</tr>
</tbody>
</table>

2.7 Mark out measurements for **gauging & setting out bonding**

**Range:**

*Gauging and bonding* - Gauging brick/block work, Dry bonding brick/block work including half brick, one brick, one and a half brick, standard joint size, standard gauge.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to gauge both horizontally and vertically. Set out dry and bond Half/one/one and a half brick thick bonding dry bond brick walls.</td>
<td>MC1</td>
</tr>
</tbody>
</table>

2.8 **Inspect** equipment and tools for accuracy

**Range:**

*Inspect* - Check levels for plumb, Check levels for level, Check square for accuracy – 90 degrees

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to check spirit levels and building squares for accuracy.</td>
<td></td>
</tr>
</tbody>
</table>

---

**What do learners need to learn?**

- How to interpret scaled drawings in elevation and section.
- How to inspect and maintain the bricklayers hand tools, equipment and materials.
- How to gauge both horizontally and vertically. Set out dry and bond Half/one/one and a half brick thick bonding dry bond brick walls.
- How to check spirit levels and building squares for accuracy.
2.9 Select materials and resources required to enable setting out

Range:
Setting out - Profiles, Builders square, Tape measures, Optical level, Laser level.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to identify correct tools and equipment to help set out masonry below and above ground level.</td>
<td></td>
</tr>
</tbody>
</table>

2.10 Estimate resource requirements

Range:
Resources - Bricks, Blocks, Mortar, Concrete, Labour, Plant, wastage.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to take measurements and apply building calculations to calculate estimate resources required.</td>
<td>MC9</td>
</tr>
</tbody>
</table>

2.11 Follow a method statement and risk assessment

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Be able to create or follow instructions from a method statement and complete risk assessments.</td>
<td>EC1 EC2 EC3 EC4 EC5</td>
</tr>
</tbody>
</table>
### Performance outcome 2 - Construct complex masonry structures

3.1 Present **information** on constructed masonry to stakeholders

**Range:**

**Information** - Working drawings, Building Information Modelling (BIM), Building regulations.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to present using communication technology the design, construction methods and finished construction.</td>
<td>EC1 EC2 EC3 EC4 EC6</td>
</tr>
</tbody>
</table>

3.2 Operate tools and equipment.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to use hand tools to lay and cut materials in accordance with manufacturer instruction.</td>
<td></td>
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</tbody>
</table>

3.3 **Mix** mortar to application requirements

**Range:**

**Mix** - mortar/concrete by hand, Use of 110v mortar mixer

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to mix mortar to the correct standards.</td>
<td></td>
</tr>
</tbody>
</table>

3.4 Protect integrity and quality of **materials** during handling and storing

**Range:**

**Materials** - Bricks, Blocks, Mortar

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The correct handling, storage and protection of bricklaying materials, including adhering to safe working practices.</td>
<td></td>
</tr>
</tbody>
</table>
3.5 **Maintain** plumb, line, level and axial deviation

**Range:**

**Maintain** - Gauge, Level, Plumb, Ranging, Square.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to adapt bricklaying skills to both brick/block work.</td>
<td></td>
</tr>
</tbody>
</table>

3.6 **Construct complex masonry structures**

**Range:**

**Complex masonry structures** - Brick arches, Concave and convex brickwork, Battered brickwork, Decorative courses and panels, obtuse and acute quoins.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to set out to build complex structures.</td>
<td></td>
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</tbody>
</table>

3.7 **Produce templates**

**Range:**

**Templates** - Segmental, Semi circle, Obtuse, Acute, Axed bricks.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which types of special bricks to use to form angled walls and techniques to shape components.</td>
<td></td>
</tr>
</tbody>
</table>

3.8 **Shape components for obtuse and acute quoins.**

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to build solid walls with obtuse and acute angles.</td>
<td></td>
</tr>
</tbody>
</table>

3.9 **Insert** obtuse and acute quoins into masonry structures

**Range:**

**Insert** - Flemish Bond with a squint quoin

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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<tbody>
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<td></td>
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</tbody>
</table>
3.10 Set out **decorative brickwork features**

**Range:**

**Decorative brickwork features** - Block bonded quoins, Decorate panels, Decorate string courses Rusticated quoins, Herring bone panels, Basket weave panels.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to build decorate brickwork including panels.</td>
<td></td>
</tr>
</tbody>
</table>

3.11 Shape masonry products to application requirements

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show to set out and build curved walls, such as Serpentine walling.</td>
<td></td>
</tr>
</tbody>
</table>

3.12 Advanced **bonding patterns**

**Range:**

**Bonding patterns** - Quetta, English and Flemish garden wall, Dutch, Monk.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to set out and build complex bonding patterns.</td>
<td></td>
</tr>
</tbody>
</table>

3.13 **Maintain** cavity widths, straight and returns and apply joints to finished masonry structures

**Range:**

**Maintain** - Cavity walls, Quoins, Junctions, Pointing, Jointing.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to maintain/build cavity walls.</td>
<td></td>
</tr>
</tbody>
</table>
### 3.14 Classify and organise waste for disposal

<table>
<thead>
<tr>
<th><strong>What do learners need to learn?</strong></th>
<th><strong>Skills</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct procedures of the disposal of waste materials relating to bricklaying requirements including the use of segregated skips.</td>
<td></td>
</tr>
</tbody>
</table>
Performance outcome 2 - Renovate masonry structures

4.1 Assess suitability of information

Range:

Information - Planning regulations, HSE Website, Building Regulations.

What do learners need to learn?  
How and where to source accurate information from relevant source.  

Skills  
DC1  
DC5

4.2 Use questioning techniques to obtain and clarify information required

Range:

Questioning techniques - open, closed, funnel and probing.

What do learners need to learn?  
How to use a range of questing techniques to clarify specification requirements when renovating masonry structures.  

Skills  
EC1  
EC2  
EC4  
EC5  
EC6

4.3 Inspect masonry structures for damage

Range:

Damage - Movement cracks, Structural damage, Water penetration, Wind damage to gable end.

What do learners need to learn?  
How to inspect masonry structures for damage and what the key damages are and what they look like.  

Skills
4.4 Remove damaged materials

**Range:**

**Damaged materials** - Brick, Block, Wall ties, Damp Proof Course (horizontal and vertically), Lintels, Stonework Range.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to remove damaged materials safely and in accordance with building regulations.</td>
<td></td>
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</tbody>
</table>

4.5 **Maintain** integrity of masonry structure

**Range:**

**Maintain** - Repointing, Replacing loose brickwork.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to maintain structures and structural stability for both brick and block work. Maintain air tightness regarding masonry structures. Ensure consistency of mortar strength, correct use of wall ties and correct use of lateral straps.</td>
<td></td>
</tr>
</tbody>
</table>

4.6 Match **masonry** to the period of construction

**Range:**

**Masonry** - Imperial bricks, Stonework.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to match masonry according to different periods of construction, including heights, colour and positions of resources when building new to old.</td>
<td></td>
</tr>
</tbody>
</table>

4.7 **Blend** new masonry products and materials to existing building Fabric

**Range:**

**Blend** - Colour/Texture

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to select and blend new brickwork to older existing brickwork, bonding into existing when required.</td>
<td></td>
</tr>
</tbody>
</table>
4.8 Insert **supports** to maintain the structural integrity following refurbishment

**Range:**

**Supports** - Adjustable steel props, Strong boys, isolated brick/block piers.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to insert supports/resources accurately when altering and repairing masonry structures.</td>
<td></td>
</tr>
</tbody>
</table>
Links to Core Skills

As part of delivery of the skills and knowledge within this specialism reference should be made to criteria that support the development of the four core skills – communication, working collaboratively, problem solving and research. Some examples of criteria that may be linked to supporting these core skills include:

- Communication e.g. providing information and advice to customers and / or wider stakeholders on the potential risks of a change to an industrial system or making a presentation to a stakeholder on the implications of change.

- Working collaboratively with other team members and stakeholders e.g. to develop content to bid for a construction project.

- Applying a logical approach to solving problems, identifying issues and proposing solutions e.g. through setting criteria for successful implementation of a system, using cost / benefit analysis of the introduction of new procedures or equipment.

- Conducting primary research e.g. obtaining measurements related to a design or customer requirements.

Guidance for delivery

- Opportunities for efficiencies in delivery

- Opportunities for visits/engagement with local industry, employers and manufacturers should be provided throughout the delivery

- Considerations for innovative methods of delivery to include blended learning and other forms of technology, Innovative methods of delivery could include:
  - Presentation/demonstration – delivery of topics using SmartScreen presentation (PowerPoint example available) lecture/discussions/oral Q&A enthuising and engaging learners through different teaching methods and resources
  - Reinforcement of candidate learning – revisit learning, group discussions, peer support, sample questions

- Formative assessment – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities
  - Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
  - Knowledge – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT

- Ways of ensuring content is delivered in line with current, up to date industry practice
  - Centres will need to ensure a realistic representation of bricklaying tasks are available
  - Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
  - The provision must represent the type of tools and equipment currently available in the UK bricklaying industry
Current and emerging bricklaying technology should be included in delivery where possible

**SEN consideration**

In the development of this qualification specific consideration with support of expert consultants have considered:

- Cognition and learning – Language, Literacy, Mathematics, Numeracy
- Social, behavioural, emotional and well-being
- Speech, language and communication needs
- Sensory (colour blindness)
- Confined spaces
- Physical needs/ability

**Suggested learning resources**

**Websites:**

- City Guilds - www.cityandguildsgroup.com
- HSE - www.hse.gov.uk
- Building Regulations - www.gov.uk/building-regulations-approval
- English Heritage - www.english-heritage.org.uk
- City and Guilds - Level 3 Bricklaying smart screen resources.

**Books**

- City and Guilds Bricklaying text books levels 1, 2, and 3 - Clayton Rudman and Tony Tucker, Mike Jones
- Brickwork and Bricklaying – Jon Collinson
- Bricklaying Level 3 Diploma – Leeds College of Building – Oxford University Press
- Modern Bricklaying – Alfred Searle – Earnest Benn
What is this specialism about?

The purpose of this specialism is for learners to know and undertake painting and decorating work. Learners will have the opportunity to plan, perform and evaluate their work whilst utilising a range of materials, methods and techniques.

Learners will develop their knowledge and understanding of, and skills in:

- Knowledge of health and safety as applied specifically to painting and decorating.
- Knowledge of tools, equipment and materials utilised in the process of painting and decoration.
- Knowledge of a range access equipment
- Knowledge of a range of processes to prepare for the application of surface coatings and wallcoverings.
- Knowledge of identification of high quality finishing processes.
- Skills of planning and implementation including preparation of the work area.
- Skills of identifying and selection procedures for correct tools, equipment and materials.
- Skills of identifying and rectifying faults in surfaces, materials and application.
- Skills of application techniques for water borne and solvent borne coatings.
- Skills of application techniques for a range of wallcoverings.

Learners may be introduced to this specialism by asking themselves questions such as:

- What skills do I need to be a successful painter and decorator?
- What kind of tasks does a painter and decorator perform?
- What tools, equipment and materials do painters and decorators use as part of their role?
**Underpinning knowledge outcomes**

On completion of this specialism, learners will understand:

1. Painting and Decorating knowledge criteria

**Performance outcomes**

On completion of this specialism, learners will:

1. Prepare for the application of surface coatings and wallcoverings
2. Apply specialist surface coatings in complex environments
3. Apply specialist wallcoverings in complex environments

Completion of this specialism will give learners the opportunity to develop their maths, English and digital skills. Details are presented at the specification content.
Specialism content

Common knowledge criteria

Tools and equipment

1.1 Types of tools and equipment for tasks

Range:

Common tools and equipment:

- **Work area preparation** - Dust sheets, protective sheeting, masking materials,
- **Access equipment** - hop ups, steps, ladders, working platforms, tower scaffold
- **Measuring equipment** - tape measures, rulers, levels
- **Marking out equipment** - pencil, chalk line, straight edge
- **Cutting equipment** - shears, trimming knives.
- **Surface preparation** - sanding machines, sanding block, scrapers, filling knives, steam stripper, hot air gun, caulking gun.
- **Applications** - brushes, rollers, trays, scuttle, kettle, spray equipment, paperhanging equipment.
- **Safety** - PPE, signs and barriers, fall arrest equipment, hard hat, gloves, overalls, safety footwear, goggles, ear defenders, RPE.

What do learners need to learn?  
The type of tools and equipment available, their characteristics, purpose and suitability for a range of given tasks.  

Skills EC5

1.2 Operation and handling requirements for tools and equipment

Range:

Operation and handling - Accuracy, safe working methods, cleanliness, trained, competent, maintenance, storage, Method statements, Risk assessment PPE competent PPE.

What do learners need to learn?  
Operation and handling requirements for tools and equipment including, safe handling and safe working methods and their suitability for a given task.  

Skills EC5
1.3 Importance of **maintenance** and how to maintain equipment

**Range:**

**Maintenance** - Sharpening, cleaning, lubrication, storage methods, safety.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintaining tools and equipment, its importance and the consequences of not keeping up regular maintenance</td>
<td></td>
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</tbody>
</table>

1.4 The **environmental impact** of tools and equipment

**Range:**

Environmental impact - Manufacture, transportation, quality, disposal (waste improper disposal, reusable items, sharps).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The environmental impact of tools and equipment through their lifecycle.</td>
<td></td>
</tr>
</tbody>
</table>

1.9 **Principles** of waste management

**Range:**

**Principles** - Re-use, recycle, reduce, correct disposal methods

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The principles of waste management and the importance of segregation of waste, including the disposal of sharps and contaminated waste.</td>
<td></td>
</tr>
</tbody>
</table>
Science

1.10 Internal and external **environmental effects** which may affect the preparation and application of surface coatings and wallcoverings

**Range:**

**Environmental effects** - Weather, temperature, humidity, type of substrate, ventilation/air conditioning

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The types of internal and external environmental effects and how these impact on the application of surface coating and wallcoverings, including, drying times, chemical reactions, physical damage and defects.</td>
<td></td>
</tr>
</tbody>
</table>

1.11 Principles of **moisture transmission and ventilation**

**Range:**

**Moisture transmission and ventilation** - Internal, External, Structural

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The types of moisture transmission and ventilation and their affects, including drying times, the use of specialised primers and the methods required to rectify or remove paint and wallpaper defects.</td>
<td></td>
</tr>
</tbody>
</table>

Maths

1.12 **Application** of geometry to the preparation and application of surface coatings and wallcoverings

**Range:**

**Application** - length, perimeter, girding, area, volume, angles, shapes, points in a plane, lines and curves, Pythagoras theorem

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant geometry for the preparation and application of surface coating and wallcoverings.</td>
<td>MC1 MC2 MC4</td>
</tr>
</tbody>
</table>
1.13 Application of **ratio**, proportion and rates of change

**Range:**

**Ratios related to** - thinning of paints, paint thickness, drying times, filler, 2-pack paint, working time, mixing colour, manufacturer's instructions.

**What do learners need to learn?**

Relevant ratio calculations and their use for the preparation and application of surface coating and wallcoverings.

<table>
<thead>
<tr>
<th>Skills</th>
<th>MC4</th>
</tr>
</thead>
</table>

**Business/commercial**

1.14 **Costs** associated with the preparation and application of surface coatings and wallcoverings

**Range:**

**Costs** - Quantities, location, area, size and complexity, overheads, waste, quality of finish hire vs purchase of equipment, effects of labour, quality of materials, efficiency.

**What do learners need to learn?**

The costs associated with the preparation and application of surface coatings and wall coverings and the impacts on profitability.

**Building technology**

1.16 **Key factors and systems** of working in different sectors

**Range:**

**Factors** - signage, barriers, protective coverings and routes, low VOC, working hour restrictions, accessibility, good communication, updating information to clients ventilation, good communication

**Systems** - Safe working methods

**What do learners need to learn?**

The key factors and systems to consider when working in different sectors such as occupied properties, health and education facilities where residents, patients and learners may be present

| Skills | MC4 |
1.17 Different **types** of construction materials to be coated and their **reaction** to coating materials

**Range:**

**Types** - Timber, Timber sheet products, metals, plaster, plasterboard, brickwork/blockwork, previously painted surfaces, Plastics.

**Reactions** - Physical, Chemical.

**What do learners need to learn?**

The different types of materials which are coated and their reaction. The methods for their preparation including primers used and the safety considerations required in the process.

**Skills**

1.18 The relationship between the **type** of building structure and the painting and decorating **task** to be completed

**Range:**

**Type** - New, commercial, domestic, industrial, heritage

**Task** - Scale, size, Protection of surfaces, preparation of work area, Access and thoroughfare i.e. street work.

**What do learners need to learn?**

The requirements when working on different types of building structures when using water borne and solvent borne coatings.

**Skills**

**Coating science**

1.19 **Classification** of paint coatings

**Range:**


Drying methods, evaporation, oxidation, polymerisation

**What do learners need to learn?**

The function of paint coatings, their properties, characteristics and suitability for different purposes.

**Skills**
1.19 **Properties** of commonly used materials and **potential chemical reactions** when using common surface coatings and decorating materials

**Range:**

**Properties** - Water based, Solvent based, Spirit based, High solid adhesive, Low solid adhesive

**Chemical reactions** - Chemically active: alkaline (saponification), acidic. Mould growth, Lack of adhesion, Reversible and non-reversible

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The properties of commonly used materials and how to deal with potentially chemically active surfaces and their treatment.</td>
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</tbody>
</table>

1.20 **Causes** and symptoms of **defects** found in coatings

**Range:**

**Causes** - Poor preparation, Poor application technique, Incorrect material selection.

**Defects** - Physical, chemical, environmental.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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<tbody>
<tr>
<td>The causes and symptoms of defects and the impact of those on the application and the finished effect.</td>
</tr>
</tbody>
</table>

1.21 The environmental **impact** and **considerations** of paint manufacture

**Range:**

**Impact** - local pollution, global pollution.

**Considerations** - water based against oil based, recycling, transportation, use, disposal, VOC's.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>The environmental impact of the manufacture, selection, use and disposal of paints.</td>
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</tbody>
</table>
Surface Coating Application

1.22 **Application techniques** and factors affecting their suitability

Range:

**Application Techniques** - Brush, Roller, Spray,

**Factors** - Size of task, complexity of work area and environment, space for working, noise, fume, dust pollution, ventilation, protection of surfaces and work area.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The application techniques and their suitability when applying surface coatings to complex areas such as ceilings, panels, windows and alcoves.</td>
<td></td>
</tr>
</tbody>
</table>

1.23 The **implications** of not following manufacturers’ guidance for application, drying and recoating times

Range:

**Implications** - Defects, financial, time, wastage

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The range of implications and potential defects that may occur if manufacturer’s guidance is not followed</td>
<td></td>
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</tbody>
</table>

1.24 **Principles** of good design

Range:

**Principles**
- **Theory of colour** - including primary, secondary, tertiary
- **Colour referencing systems** - BS 4800, RAL, NCS, Munsell
- **Colour terminology** - colour, contrast, tone, value, tint, shade
- **Colour schemes** - monochrome, analogous harmony, achromatic, complementary
- **Visual design** - Shape, pattern. Effects of artificial light: metameric

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>The principles of good design and the impact of colour theory in creating decorative schemes.</td>
<td></td>
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</tbody>
</table>
1.25 Application of specialist **decorative techniques**

**Range:**

**Decorative techniques** - rag rolling, additive, subtractive, sponge stippling, dragging, glaze and wipe, replicate oak and mahogany using graining methods, replicate carrara and vert de mer using marbling methods, single and multi-plate stencilling designs, Gold leaf application, Paint finish effects (Glitter Paints, Metallic, Chalk Paints, textured effect paints).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The range of decorative techniques when applying specialist finishes to a substrate.</td>
<td></td>
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</tbody>
</table>

1.26 **Techniques** for identifying and **rectifying** coating defects

**Range:**

**Techniques** - Visual checks for defects

**Defects** - Patchiness, misses, uneven pattern, skid marks, uneven appearance, Lack of adhesion, shrivelling, flaking tarnishing

**Rectify** - Correct poor/incorrect preparation, and application

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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<tbody>
<tr>
<td>Techniques that identify defects and the methods used to rectify them.</td>
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</tbody>
</table>

**Wallcovering and adhesive science**

1.27 Ways in which wallcoverings and adhesives are **classified**

**Range:**

**Classification** - Papers production methods, printing methods, types, properties, size, application methods, adhesives.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>Classification of wallcoverings and adhesives, their characteristics, properties and suitability for different purposes.</td>
<td></td>
</tr>
</tbody>
</table>
1.28 Properties of commonly used **substrates** and potential chemical reactions when using wall coverings

**Range:**

**Substrates** - Timber, metal, plaster, brick, block etc., plasterboard, previously decorated surfaces

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</thead>
<tbody>
<tr>
<td>The properties of commonly used materials and potential chemical reactions (preparation and application defects) when using wallcoverings.</td>
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</tbody>
</table>

1.29 Causes and symptoms of **defects** found in wallcoverings and adhesives and the **implications** to their application and the finished effect

**Range:**

**Causes** - Inappropriate selection of materials for surface, poor preparation, poor application

**Defects** - Pre application defects, post application defects

**Implications** - Financial, time, wastage

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>The implication of poor preparation, poor selection and poor application when applying wallcoverings.</td>
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</tbody>
</table>

1.30 The environmental **impact** of wallcovering and adhesives

**Range:**

Environmental impact – Manufacturing methods, transportation, disposal methods

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
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</tr>
</thead>
<tbody>
<tr>
<td>The environmental impact of the manufacture, selection, use and disposal of wallcoverings and adhesives.</td>
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</tbody>
</table>
Wall Covering

1.31 **Principles** of good design

**Range:**

**Principles** - Planning process, setting out process, pattern types, visual balance, aesthetics

*What do learners need to learn?*
The principles of good design, including pattern types, use of repeats, colour and contrasts and the required and potential impact

**Skills**

1.32 Hanging **techniques** for differing wallcoverings

**Range:**

**Techniques** - Manufacturing guidance, pasting and hanging methods, cutting methods, folding techniques.

*What do learners need to learn?*
The range of hanging techniques and their suitability when applying wallcoverings

**Skills**

1.33 **Techniques** for dealing with **structural complexities** and their applications.

**Range:**

**Techniques** - Correct selection and application procedures

**Structural Complexities** - Working on staircases, ceilings, odd shaped and oversized spaces, chimney breasts, alcoves, columns, Reveals.

*What do learners need to learn?*
The types of application techniques for dealing with structural complexities when selecting wallcoverings and the range of application methods used that are appropriate to the structural complexity.

**Skills**
1.34 The **implications** of not following manufacturers’ guidance for application, drying and finishing

**Range:**
**Implications** - Wastage, time, financial.

**What do learners need to learn?**
The implications of not following manufacturer’s guidance during application, drying and finishing of wallcoverings.

**Skills**
EC5
DC1

1.35 The importance of **techniques** used to reduce wastage

**Range:**
**Techniques** - Correct measuring procedures, measurement methods (area method, girthing method), using two rolls for cutting when using drop patterns, maximum 100mm per end when cutting lengths.

**What do learners need to learn?**
The techniques used to ensure economy of use and the impact on reduction of waste.

**Skills**

1.36 Techniques for **identifying and rectifying** wallcovering defects

**Range:**

**Identification** - Visual checking

**Rectifying techniques** - Correct material selection, preparation and application processes, removal and rehanging.

**What do learners need to learn?**
Techniques used to identify, avoid and or correct defects when hanging wallcoverings.

**Skills**
### Specific knowledge criteria for performance outcomes

#### Performance outcome 1 - Prepare for the application of surface coatings and wallcoverings

**Preparation Methods**

1.37 Suitability of preparation methods for the task **environment**

**Range:**

**Environment** - Surfaces: Timber, Metal, Trowelled, plasterboard surfaces and previously decorated surfaces.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The range of methods required when preparing interior and exterior surfaces</td>
<td></td>
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</tbody>
</table>

1.38 The importance of **protection** of work in progress and completed work

**Range:**

Protection – Domestic areas (Room furniture, floor/carpet, door and window furniture, wall-mounted fixtures and fittings, television, media/it systems, lighting) and Commercial areas (workstations, machinery, equipment, furniture, lighting).

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>The types of protection required in accordance with given specifications, including: the importance of maintaining a clean work space, and the correct disposal of waste during progress and on completion.</td>
<td></td>
</tr>
</tbody>
</table>
1.39 How to apply **traditional and modern** preparation techniques for different types of surfaces

**Range:**

**Traditional techniques** - may include materials and processes that require permits or license (e.g. lead based)

**Modern techniques** - preferably used to reduce VOCs and low risk methods for removal (e.g. Non heat)

**What do learners need to learn?**

The types of preparation methods (traditional and modern) used for a range of bare and previously decorated surfaces and substrates.
Performance outcome 1 - Prepare for the application of surface coatings and wallcoverings

2.1 Identify information requirements from a brief

Range:

Information/requirements - Size shape and scale of project, function, budget, material specification.

What do learners need to learn?

How to select and extract the correct information required from a brief to meet the requirements of any given task.

Skills
EC5

2.2 Interpret drawings, specifications and schedules

Range:

Interpret - specifications, of painting works, schedules of paint colours and finishes, drawings, Plans, elevations, sections, method statements, schedules, bill of quantities, programme of works, Building Information Modelling (BIM), safety data sheets, risk assessments.

What do learners need to learn?

How to interpret the types of information required to meet the requirements of any given task.

Skills
EC5
MC7

2.3 Use questioning techniques to obtain and clarify information required

Range:

Questioning techniques – Open/closed, probing, funnel, non ambiguous, correct technical terminology, focussed.

What do learners need to learn?

How to use appropriate questioning techniques to ascertain and clarify the information required for any given task.

Skills
EC1
EC2
EC4
EC5
EC6
2.4 Advise customers on **design choices**

**Range:**

**Design choices** - Size and scale of project, function of project, ascertain client requirements, provide examples when advising clients, design principles related to form, shape, scale, colour, pattern, appropriate material selection from a range.

**What do learners need to learn?**

How to provide well informed advice to clients on design choices, including colour schemes and products using terminology based on established design principles.

**Skills**

EC1  
EC2  
EC4

2.5 Use **appropriate terminology** with key stakeholders

**Range:**

**Appropriate terminology** - Clear unambiguous terminology used when explaining unfamiliar terms. Acronyms need explaining or writing in full with clear explanations. Drawings, pictures or written texts used to confirm or add further explanation. Refer to given project documentation.

**What do learners need to learn?**

How to use concise clear unambiguous language and refer to key documentation to assist in explaining concepts with key stakeholders.

**Skills**

EC1

2.6 **Design** decorative scheme to meet customer requirements

**Range:**

**Design** - Follow the brief, colour theory and terminology, colour referencing systems, sample schemes and boards, alternative solution.

**What do learners need to learn?**

How to select from a range of colour specifications using appropriate colour terminology to design a decorative scheme to meet the needs of the customer.

**Skills**

EC5
2.7 Calculate area and volume of different geometric **shapes**.

**Range:**

**Shapes** - Square, rectangle, irregular shapes such as L shaped, cube, cylinder, circle.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to calculate areas and volumes of different geometric shapes using a range of mathematical processes.</td>
<td>MC1, MC2, MC4</td>
</tr>
</tbody>
</table>

2.8 Produce **scaled drawings** by hand

**Range:**

**Scaled drawings** - plan, elevation and section. Including 1:1250-Site plan, 1:100 Ground and first floor plan, 1:100 Elevations, 1:100 Sections Symbols and hatchings to elevations and plans and sections. Hatchings: Blockwork, Brickwork, Insulation, Concrete, Hardcore. Symbols: Window and door on plan, north point, title block.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to produce building (scaled) drawings using manual drafting methods to a prescribed brief.</td>
<td>MC7</td>
</tr>
</tbody>
</table>

2.9 **Inspect** materials

**Range:**

**Inspect** - missing items, breakages, damage to items, frost damage, check use by dates, quality, match specification, record keeping of deliveries

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to inspect materials and any deliveries before use and report any omissions or defects.</td>
<td></td>
</tr>
</tbody>
</table>
2.10 **Prepare** working **environment** for task

**Range:**

**Prepare** - Clear work area, secure working area to protect public, workforce etc. Protect surfaces, Use correct selection procedures for materials, tools and equipment. Select and use appropriate access equipment, Follow correct working processes for the preparation of a range of surfaces, keep a clean and tidy workspace, Clear away at end of each stage and end of project.

**Surfaces** - Internal and External.

**Environment** – internal and external surfaces (timber and timber sheets, metal, plasterboard and trowelled finishes, brickwork and blockwork, previously decorated surfaces).

**What do learners need to learn?**

How to prepare the working environment for a given task, including preparation of substrates, removal of existing materials from surfaces using different methods and materials and making good surfaces with fillers and any safety implications.

**Skills**

2.11 **Mark out** measurements on to materials and backgrounds

**Range:**

**Mark out** - Rulers, tape measures, plumb lines, chalk lines, spirit levels, laser levels, pencil.

**What do learners need to learn?**

Which equipment should be used for planning and setting out measurements, and how to use the equipment correctly and accurately.

**Skills**

2.12 **Inspect** equipment

**Range:**

**Inspect** - oil moving parts, free from damage, levels calibrated, mechanical equipment serviceable tested before use.

**What do learners need to learn?**

How to inspect and provide maintenance to equipment to ensure safe and proper function.
2.13 Estimate **resource requirements**

**Range:**

**Resources - labour**, materials, overheads, plant and equipment, profits, VAT.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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<tbody>
<tr>
<td>How to estimate the resources required, for the task given including time, materials and equipment availability.</td>
<td>MC9</td>
</tr>
</tbody>
</table>

2.14 **Follow** a method statement

**Range:**

**Follow** - Parameters of the activity or project, plant and equipment required, procedures, safe working methods, risk assessments, emergency procedures, safe handling and storage of materials to prevent pollution, waste disposal procedures.

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
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</thead>
<tbody>
<tr>
<td>How to create or follow to a plan of work adhering to safe working methods including risk assessments when carrying out activities.</td>
<td>EC1 EC2 EC3 EC4 EC5</td>
</tr>
</tbody>
</table>
Performance outcome 2 - Apply specialist surface coatings in complex environments

3.1 **Apply** coating techniques for complex areas

**Range:**

**Apply** - Water borne, Solvent borne, Interior, Exterior.

**What do learners need to learn?**

How to apply appropriate surface techniques and treatments for complex areas including broad, linear and specialist.

**Skills**

3.2 **Apply** water-borne and solvent-borne coatings

**Range:**

**Application** - rollers with sleeves of synthetic filament, woven pile, woven fabric, mohair, lamb’s wool, short, medium, long pile; brushes in natural bristle, synthetic filament; trowel/texturing tools including rollers and brushes; equipment: roller cages, paint stirrers, strainers, paint pots, extension poles, buckets, scuttles, trays, dust sheets, masking machine.

**What do learners need to learn?**

How to apply waterborne and solvent borne coatings, using the correct tools and equipment for a given task. Ensuring safe methods of working and following specification and manufacturer’s guidance.

**Skills**

3.3 Use different types of **equipment** to apply different coatings in complex areas

**Range:**

**Equipment** - Brush and roller, Airless spray, HVLP, Brushes and specialist equipment for specialist techniques: Broken colour effects, stencilling, marbling, graining and gilding.

**What do learners need to learn?**

How to determine the correct equipment dependent on the application and different areas and then how to use them use.

**Skills**
3.4 **Inspect** finish

**Range:**

**Inspect** - Visual checks to ensure quality and specification has been met, check for runs and other defects, smooth even finish with no misses, test wet and dry film thickness to compliance with the given specification

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to inspect finishes of work to ensure the specification is met and that it is defect free</td>
<td></td>
</tr>
</tbody>
</table>

3.5 **Rectify** irregular surface **coating problems**

**Range:**

**Problems** - misses, grinning, runs and sags, excessive brush marks and ropiness, fat edges and wet edge build up, paint on adjacent surfaces, roller edge marks and roller skid marks, irregular cutting in, orange peel, excessive bits and nibs

**Rectification** - Eradicate: poor material selection, poor preparation and poor application

<table>
<thead>
<tr>
<th>What do learners need to learn?</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to identify any defects in surface coatings and select remedies to rectify them.</td>
<td></td>
</tr>
</tbody>
</table>
Performance outcome 3 - Apply specialist wallcoverings in complex environments

4.1 Measure lengths

Range:

Measure - Folding rule, tape measure, straight edge, pencil

What do learners need to learn?  
How to use a range of measuring equipment to correctly cut wallcoverings to the required length.  

Skills  
MC1

4.2 Cut wallcoverings for complex environments

Range:


What do learners need to learn?  
How to use a range of cutting equipment and methods for wallcoverings to minimise waste

Skills

4.3 Apply adhesives to wallcoverings.

Range:

Application - adhesive to back of covering, adhesive to wall surface.

What do learners need to learn?  
How to determine the appropriate application method and apply appropriately adhesives to wallcoverings when hanging to wall and ceilings.

Skills
4.4 Apply **techniques** for the hanging of a range of wallcoverings

**Range:**

**Techniques** - Vertical application, Horizontal application, Planning processes, Measuring and cutting, Pasting and hanging, Cutting around obstacles.

**What do learners need to learn?**

How to use appropriate techniques when planning, setting out and hanging a range of wallcoverings.

**Skills**

4.5 Apply **techniques** for hanging wallcoverings in complex environments

**Range:**

**Techniques** - Vertical application, Horizontal application, Planning processes, Measuring and cutting, Pasting and hanging, Cutting around obstacles.

**What do learners need to learn?**

How to select and use the correct techniques, tools and equipment for hanging wallcoverings in complex environments Complex environment include working on staircases, ceilings, odd shaped and oversized spaces, chimney breasts alcoves, columns, reveals, internal and external angles.

**Skills**

4.6 **Inspect** finish

**Range:**

Inspect - Defects, cleanliness

**What do learners need to learn?**

How to inspect wallcovering finishes for defects and ensure cleanliness throughout.

**Skills**
4.7 Rectify complex wallcovering problems

**Range:**
- **Rectify** - preparation, pasting methods, application methods, cutting techniques.

**What do learners need to learn?**

How to identify complex wallcovering problems and defects and apply rectification methods.
Links to Core Skills
As part of delivery of the skills and knowledge within this specialism reference should be made to criteria that support the development of the four core skills – communication, working collaboratively, problem solving and research. Some examples of criteria that may be linked to supporting these core skills include:

- **Communication** e.g. providing information and advice to customers and/or wider stakeholders on the potential risks of a change to an industrial system or making a presentation to a stakeholder on the implications of change.

- **Working collaboratively with other team members and stakeholders** e.g. to develop content to bid for a construction project.

- **Applying a logical approach to solving problems**, identifying issues and proposing solutions e.g. through setting criteria for successful implementation of a system, using cost/benefit analysis of the introduction of new procedures or equipment.

- **Conducting primary research** e.g. obtaining measurements related to a design or customer requirements.

Guidance for delivery

- **Opportunities for efficiencies in delivery**

- **Opportunities for visits/engagement with local industry, employers and manufacturers** should be provided throughout the delivery.

- **Considerations for innovative methods of delivery** to include blended learning and other forms of technology. Innovative methods of delivery could include:
  - Presentation/demonstration – delivery of topics using SmartScreen presentation (PowerPoint example available) lecture/discussions/oral Q&A enthrusting and engaging learners through different teaching methods and resources.
  - Reinforcement of candidate learning – revisit learning, group discussions, peer support, sample questions.

- **Formative assessment** – oral Q&A, SmartScreen worksheets (samples available) observation of measuring activities.
  - **Practical** - Use of pre-set formative assessments carry out tasks and record on standardised form.
  - **Knowledge** – pre-set paper-based activity to confirm skills and understanding. Learners can use variety of methods to carry out activities, calculators, apps, office IT.

- **Ways of ensuring content is delivered in line with current, up to date industry practice**
  - Centres will need to ensure a realistic representation of decorating systems and components are available.
  - The provision must represent the type of equipment currently available in the UK decorating industry.
  - Current and emerging decorating technology should be included in delivery where possible.
SEN consideration

In the development of this qualification specific consideration with support of expert consultants have considered:

- Cognition and learning – Language, Literacy, Mathematics, Numeracy
- Social, behavioural, emotional and well-being
- Speech, language and communication needs
- Sensory (colour blindness)
- Confined spaces
- Physical needs/ability

Suggested learning resources

Websites

- Royal Institute of British Architects - www.architecture.com
- Anstey wallpaper manufacturer’s - www.Anstey.com
- Graham and Brown - www.Grahambrown.com, wallpaper suppliers
- Muraspec - www.muraspec.com, wallpaper suppliers
- Tektura - www.tektura.com, wallpaper suppliers
- www.Handover.co.uk for all decorative effects tools, equipment and materials for specialist decorative techniques, books and DVDs
- www.Stonehouses.co.uk, Signwriting and gilding supplies
- Dulux Paints - www.dulux.co.uk
- Crown paints - www.crownpaints.co.uk
- Brewers decorating merchants and suppliers - www.brewers.co.uk
- HSE Health and Safety legislation and advice – www.hse.gov.uk
- PASMA Mobile Tower scaffold industry body - www.pasma.co.uk
- Johnstone’s Paints - www.johnstonestrade.com
- Polyvine - www.polyvine.co.uk
- Lincrusta - www.lincrusta.com
- Farrow and Ball - www.farrow-ball.com
- Little Greene - www.littlegreene.com
Books

- Level 2 Diploma in Painting and Decorating - Cook A, Fearn, C, Walter, S, Yarde, B, Burdfield, M Published by: City & Guilds 2014

- Painting and Decorating 6th Edition - Butterfield, D, Fulcher, A, Rhodes, B, Stewart, B; Tickle, D; & Windsor, J
  - Published by: Wiley-Blackwell, 2011
  - ISBN-10: 1444335014

- Design and Construction Best, - A; de Valence, B; & Langstone, C
  - Published by Butterworth-Heinemann, 2002
  - ISBN: 0-750-65149-0

- Parry's Graining & Marbling - (John Wiley & Sons 1995)
  - ISBN-10: 0632034165

- Practical Gilding - Peter and Margaret Mactaggart
  - Published by: Archetype Publishing Ltd
  - ISBN-10: 1873132832

- Painting & Decorating Level 3
  - Published by OUP Oxford, 2015
  - ISBN-10:1408526972

- For spray equipment and techniques
  - DeVilbiss (manufacturer) - www.devilbiss.com
  - Graco (Manufacturer) - www.graco.com
  - Health & Safety Executive - www.hse.gov.uk
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.

City & Guilds Centre Manual 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.

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents and sets out the criteria that centres should adhere to pre and post centre and qualification approval.
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.

Centre Guide – Delivering International Qualifications 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. Specifically, the document includes sections on:
- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of candidates
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

**Linking to this document from web pages**
We regularly update the name of documents on our website, therefore in order to prevent broken links we recommend that you link to our web page that the document resides upon, rather than linking to the document itself.
## Useful contacts

<table>
<thead>
<tr>
<th>Category</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UK learners</strong></td>
<td>General qualification information</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:learnersupport@cityandguilds.com">learnersupport@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>International learners</strong></td>
<td>General qualification information</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:intcg@cityandguilds.com">intcg@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Centres</strong></td>
<td>Exam entries, Certificates, Registrations/enrolments, Invoices, Missing or late exam materials, Nominal roll reports, Results</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:centresupport@cityandguilds.com">centresupport@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Single subject qualifications</strong></td>
<td>Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:singlesubjects@cityandguilds.com">singlesubjects@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>International awards</strong></td>
<td>Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:intops@cityandguilds.com">intops@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Walled Garden</strong></td>
<td>Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:walledgarden@cityandguilds.com">walledgarden@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Employer</strong></td>
<td>Employer solutions including, Employer Recognition: Endorsement, Accreditation and Quality Mark, Consultancy, Mapping and Specialist Training Delivery</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:business@cityandguilds.com">business@cityandguilds.com</a></td>
</tr>
</tbody>
</table>

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