Level 3 Construction T Level: On-Site Construction (8710-30)

February 2020 Version 1.4

Draft Qualification Content Pack
# Qualification at a glance

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Construction</th>
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</thead>
<tbody>
<tr>
<td><strong>City &amp; Guilds number</strong></td>
<td>8710-30</td>
</tr>
<tr>
<td><strong>Age group approved</strong></td>
<td>16+</td>
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<tr>
<td><strong>Entry requirements</strong></td>
<td>tbc</td>
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</tbody>
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| **Assessment** | Core - knowledge tests  
Core - employer set project  
Occupational specialism - practical assignment |

## Title and level

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1 Introduction

Structure

To achieve the Level 3 Construction T Level: On-Site Construction learners must achieve

- the construction core component (300)
- plus one occupational specialism (301 – 304).

### Level 3 Construction T Level: On-Site Construction

<table>
<thead>
<tr>
<th>City &amp; Guilds component number</th>
<th>Component title</th>
<th>Component level</th>
<th>GLH (provisional)</th>
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<tbody>
<tr>
<td><strong>Mandatory</strong></td>
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<tr>
<td>300</td>
<td>Construction core</td>
<td>Level 3</td>
<td>400</td>
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<tr>
<td><strong>Optional (one must be chosen)</strong></td>
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<td>301</td>
<td>Carpentry and joinery</td>
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<td>Plastering</td>
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<td>304</td>
<td>Painting and decorating</td>
<td>Level 3</td>
<td>500</td>
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2 Assessment

**Summary of assessment methods**

Learners must complete:

**two** externally set tests covering knowledge from the construction core (component 300)

one employer set project covering knowledge and skills from the construction core (component 300)

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

**Grading and marking**

- The 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
3 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
- Performance outcomes – including range and depth sections
- Links to maths, English and digital skills
- Guidance for delivery
- SEN considerations
- Suggested learning resources
What is the component about?

The core knowledge and understanding focuses on the learner’s knowledge and understanding of contexts, concepts, theories and principles relevant to on-site construction and BSE. Learners will develop their knowledge and understanding of:

- health and safety when working on construction sites
- 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 measurements relevant to construction

Learners may be introduced to this specialism 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?
**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 core will give learners the opportunity to develop their maths, English and digital skills. Details are presented in the specification content.
1. Health and safety in construction

Criteria

1.1 Construction legislation

Range:

Legislation - Health and safety guidance used during the construction process, 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.

1.2 Public liability and employer’s liability

1.3 Approved construction codes of practice

Range:


1.4 Implications of poor health and safety performance

Range:

Implications - Ethical, Legal, Environmental, Financial, Accidents

1.5 Development of safe systems of work

Range:

Safe systems of work - Company management systems, Risk assessments, Method statements, Permits to work

1.6 Safety conscious behaviours
Range:

**Safety conscious behaviours** - Safe systems of work, reporting of potential hazards, Site inductions, Training, Toolbox talks, good housekeeping (working systematically, keeping areas clean and clear)

**Depth of content – Common knowledge criteria**

1.1 Key current legislation and their impact on construction projects. Employee and employer roles and responsibilities in relation to key legislation. Enforcement and potential implications of not adhering to legislation (to employees, businesses/clients and the public). The meaning of the terms statutory and non-statutory

1.2 Definition of what liability is and what the current requirements are relating to public and employer liability for construction employers 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

1.3 Codes of practice, their purpose and content and how they are applied in practice

1.4 Potential implications of poor health and safety and who this impacts at different levels i.e. employee, employer/business, client/customer/public

1.5 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

1.6 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.).
2. Construction science principles

Criteria

2.1 Scientific principles, their applications, interaction between them to meet the purpose of the built environment and how their performance in the building is measured.

Scientific principles as listed below:

2.2 Materials science
   **Range:**
   Material properties, chemical composition, degradation, failure, effects of environmental conditions.

2.3 Mechanical science
   **Range:**
   Force, work, energy, power.

2.4 Electricity
   **Range:**
   Sources of power, generation, transformation, distribution, voltage, current, resistance, electrical power, energy, efficiency and work done.

2.5 Structural science
   **Range:**
   Forces, loads, materials, structural members.

2.6 Heat
   **Range:**
   Heat transfer, air temperature, air density humidity, condensation air movement, heat loss, thermal conductivity, resistance.

2.7 Light
   **Range:**
   Refraction, difference in artificial and natural light, glare, directed and reflected light, flow of light energy, daylight factor.

2.8 Acoustics
   **Range:**
   Frequencies, reverberation, decibels, comfort levels, privacy.

2.9 Earth science
   **Range:**
   Physical geography, hydrology, geology, earth forces, natural phenomenon (e.g. earthquakes), weather.
**Depth of content – Common knowledge criteria**

2.1 The interaction of key scientific principles and how they are applied and measured in the construction of buildings

2.2 The use of material science in Construction design and how buildings will perform in terms of durability and stability

2.3 The key principles of Mechanical Science and how they are used to inform construction methods and the relationship between force, work energy and power

2.4 The use of electricity within the built environment

2.5 Structural science and its use in the construction of buildings

2.6 The key principles of heat and how it is used within the built environment

2.7 The key principles of light, its use and its relationship with the built environment

2.8 The key principles of acoustics and how they are applied to the built environment

2.9 The influence of Earth science on the built environment

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**3. Construction design principles**

**Criteria**

3.1 **Benefits** of good design

**Range:**

**Benefits** - Aesthetically pleasing, Longevity of building, Maintenance factors, on – budget.

3.2 **Design principles**

**Range:**

**Design principles** - Environmental Protection; Safety; Speed; Economy; Aesthetics; Buildability manufacture, installation and construction feasibility; Integration of services; infrastructure.

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.
3.4 Design **process** from conception to completion.

**Range:**

**Process** - Research, Site analysis, Planning, Approval/ Review, Building sign off.

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.

**Depth of content – Common knowledge criteria**

3.1 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.

3.2 Construction design principles including buildability and integration. The process of design and how it’s applied to integrate within services and how they are influenced by building management systems.

3.3 Key job roles within construction design including responsibilities and reporting lines/lines of escalation within roles, key activities aligned to roles and potential career progression routes.

3.4 Key stages of the design process with consideration of human factors such as inclusivity, accessibility, heat, acoustics, lighting and air quality.

3.5 The concept of the whole building and how construction design is influenced by building systems working together, including life cycle assessments and how they influence project planning.
4. Construction & the built environment industry

Criteria

4.1 Structure of the construction industry

4.2 How the construction industry serves the economy as a whole

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.

4.4 How projects are procured within the construction sector
   Range:
   Procured - Need/demand, Tendering and bidding processes, Supply chain

4.5 Roles and responsibilities of the construction professions
   Range:
   Construction professions - Professional e.g. Architect, Craft trade Operatives, Ground works, Plant occupations, Non-skilled operatives.

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.

4.7 Building information modelling.

4.8 How current examples of PESTLE factors may impact the industry
   Range:
   PESTLE - Political, Economic, Social, Technological, Legal, Environmental.

Depth of content – Common knowledge criteria

4.1 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
4.2 Construction industry contributions to the UK economy with reference to scale. The factors that impact growth of the industry, including political changes, developments in technology and practice, environmental considerations.

4.3 The integration of all partners of the supply chain in the building process. The importance of planning to ensure collaborative working, and that the project is completed to budget and time.

4.4 The key stages within procurement and the development of construction projects with consideration of different scales of building projects.

4.5 The key job roles and responsibilities of construction professionals within construction industry.

4.6 The role and importance of CPD to individuals, companies and the building industry as a whole, 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 The aspects of building information modelling and the effect they have on real time project delivery in a collaborative way. 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 Current examples of PESTLE and how it is used for analysis in building 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. Construction sustainability principles

Criteria

5.1 Importance of sustainability when planning and delivering a construction project
Range:

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

5.2 Types of sustainable solutions
Range:

Sustainable solutions - Social, Environmental, Economic, Human (habitability).

5.3 Obligations under environmental legislation
Range:

Environmental legislation - Environmental Protection Act, Climate Change Act, Clean Air Act, Water Act, Building regulations, COSHH.

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.

5.5 Environmental performance measures
Range:

Performance 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.

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.

5.7 Lean construction
Depth of content – Common knowledge criteria

5.1 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.

5.2 The types of sustainable solutions and how they are used to inform the building process.

5.3 Obligations and responsibilities of employers and employees in relation to purpose-built design projects and environmental protection.

5.4 Implementation of environmental initiatives and the impact on design and construction.

5.5 Factors that can be used to measure environmental performance including current regulations and requirements. With consideration of how energy is produced.

5.8 Waste management
Range:


5.9 Energy production and energy use
Range:


Depth of content – Common knowledge criteria

5.8 Waste management systems and the way they are used in the disposal of construction materials including hazardous waste.

5.9 Energy production and use in relation to embodied energy. Methods of monitoring energy use.
6. Construction measurement principles

Criteria

6.1 The benefits of accurate and appropriate measurement on built environment performance

6.2 Types of measurement, including standard units of measurement and measurement techniques
   Range:

   **Units of measurement** - mm millimetres, mm centimetres, m metres, km kilometres, gram, kg kilogram, tonne, litres, square and cubic metres.

   **Techniques** - Approximation, Use of measuring equipment including tapes, lasers and surveying equipment.

6.3 Measurement standards, guidance and practice
   Range:

   **Standards** - Scale, tolerances.

Depth of content – Common knowledge criteria

6.1 The benefits to contractors, the client/customer, to profitability and project success. Implications of not having accurate measurements – in terms of costs, time, and safety

6.2 Units of measurements, their application and use in construction projects

6.3 Standardised procedures for recording measurements and their use, including measurement rules.
7. Building technology principles

Criteria

7.1. Construction methods, including traditional and modern methods e.g. on and off-site construction and robotics
Range:

Methods - Modular, On-site, off site, 1st fix, 2nd fix, Self-driving vehicles, computer-controlled manufacturing robots, large-scale 3D printers, drones.

7.2 Forms of construction, built environment and civil engineering structures, sub-structures, superstructures, foundations and external works
Range:

Forms - Substructure, Superstructure, Roof (flat, pitched), Shell and core, Structural frame, Floor.

7.3 Building regulations and their purpose in construction including renovation.
Range:


7.4 Building standards and their purpose in renovation and construction including ISO, British and Industry
Range:


7.5 Manufacturers’ instructions and their purpose in renovation and construction

7.6 Internet of things

Range:

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

Depth of content – Common knowledge criteria

7.1 Traditional construction methods and modern construction methods, including the use of robotics during the construction process

7.2 Current forms of construction used for both built environment and civil engineering structures

7.3 Current UK Building Regulations and their purpose

7.4 Current British Standards, International Standards and construction industry guidance in both the renovation and construction of buildings

7.5 The typical content of manufacturer instructions and technical guidance used for both the renovation and construction of buildings

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

Criteria

8.1 Key elements of data

8.2 Purpose of information standards, regulation, and guidance and practice

Range:

8.3 Sources of information

8.4 Data management and confidentiality, including data protection legislation and typical organisational procedures

Depth of content – Common knowledge criteria

8.1 Key elements of data, including accuracy, generalisation, interoperability, level of detail and metadata used to inform Construction processes. Different sources that data can be generated from including design and construction; building information modelling; Post occupancy evaluation; Utilities, building services, meters, building management systems and so on; Infrastructure and transport systems; Enterprise systems such as purchasing systems, performance reporting, work scheduling, and so on; 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, and so on.

8.2 Standards regulation and guidance used to maintain good practice within the construction industry to include: Quality control, Safety controls, Standard methods.

8.3 Information and data sources and their use within the construction projects, such as product data, manufacturer’s specifications, CDE, BIM, Collaborative working, Specifications, Working drawings, product data.

8.4 Data storage requirements in relation to security and protection and how they help to prevent common threats. Current legislation and organisational procedures that are used to manage data and increase confidentiality.
9. Relationship management in construction

Criteria

9.1 Types of stakeholders

9.2 Roles, expectations and interrelationships of different stakeholders throughout the construction project delivery

9.3 The importance of a collaborative approach to project delivery and reporting, and how this is applied in practice

9.4 Customer service principles
Range:

Customer service principles - product knowledge, time, communication, Honesty and integrity.

9.5 The importance of teamwork to team and project performance.

9.6 Team dynamics
Range:

Team dynamics - Accountability, Cooperation, Trust, Support, Reliability, Communication, Participation.

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.

9.8 Negotiation techniques
Range:

Negotiation techniques - Distributive Negotiation or Win-Lose Approach, Lose-Lose Approach, Compromise Approach, Integrative Negotiation or Win-Win Approach.

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.

9.10 **Methods** and **styles** of communication and suitability for different situations that may arise throughout a construction project.

**Range:**

**Methods** - Verbal (Face to face, telephone,); Written (Email, Text, letter).

**Styles** - Formal, Informal

9.11 **Employment rights and responsibilities** of the employer and employee

**Range:**


9.12 Ethics and **ethical behaviour**

**Range:**

**Ethical behaviour** - Honesty, Integrity, Loyalty, Fairness, Caring, Respect, Law abiding, Commitment, Morale, Reputation, Accountability.

9.13 How sources of information, including social networking contribute to knowledge sharing.

**Depth of content – Common knowledge criteria**

9.1 Types of stakeholders e.g. client, team and end user

9.2 Know 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, Collaborative approach, Good relationships across the project, Cost control, Time management, Public relations, Follow up and review

9.3 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

9.4 The basic principles of good customer service including product knowledge, good communication, accuracy, efficiency, respect and prompt responses

9.5 The importance of team work to team and project performance and the consequence of poor teamwork and how it impacts on a construction project
9.6 The principles of good team dynamics, including what is expected of a team member, what qualities are needed and how these qualities are demonstrated

9.7 Legislation and the protected characteristics detailed under the Equality Act and its application in the workplace

9.8 Methods of negotiation used within the construction industry

9.9 Conflict management techniques including preventative measures

9.10 The methods and styles of communication and their suitability for different situations that may arise throughout a typical construction project

9.11 The employment rights and responsibilities of both employees and their employer

9.12 Ethics and ethical behavior within the construction industry

9.13 How sources of information, including social networking contribute to knowledge sharing within the construction industry.
10. Digital technology in construction

Criteria

10.1 Internet of things

10.2 Digital engineering techniques
Range:

Digital engineering techniques - Simulation, Animation, Virtual reality, 3D modelling.

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

Technology - Machine manufacturing through robotics, CAD/CAM, Computer modelling, smart technologies.

Depth of content – Common knowledge criteria

10.1 The use of technology connected to the internet of things and their role in the construction industry assisting in just in time and asset management.

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

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

11.2 Business objectives
Range:

Business objectives - Revenue, Social, Brand, Sales, Customer experience, Customer relationship, Organisation culture, Quality, Innovation, Compliance, Sustainability.

11.3 Business values

11.4 Principles and examples of corporate social responsibility
Range:

Principles - Community, People, Customer, Suppliers, Environment.

Examples - Local recruitment, Sustainable resourcing

11.5 Principles of entrepreneurship and innovation
Range:

Principles - Solution Provider, Vision, Viable product/service, Capital, Growth and marketing, Research, Priorities.

11.6 How businesses measure success

11.7 Principles of project management

11.8 Quality management and techniques used in business

Depth of content – Common knowledge criteria

11.1 Typical business structures detailed in the range

11.2 The business objectives used to measure the performance of the organisation

11.3 The fundamental business values e.g. care for life, ethical and transparent, commit to customer and collaborative working
11.4 The principles and examples of corporate social responsibility

11.5 The basic principles of entrepreneurship and innovation in business

11.6 Utilising benchmarking, KPI’s and target setting to measure business success

11.7 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.

11.8 The quality management systems and techniques used in business including: Self-assessment, Internal audit, External audit, Quality control, Quality improvement, ISO 9000.
Links to Maths, English and Digital Skills

Maths
- Principles of budgeting – KO3
- Benefits of accurate measurement – KO6
- Types of measurement – KO6
- Measurement standards and tolerances – KO6
- Calibration of instruments – KO15

English
- Review and interpretation of risk assessment documentation – KO1
- Review of manufacturer safety instructions – KO1
- Interpretation of written plans and briefs containing technical terminology as well as industry recognised abbreviations – KO1
- Documentation to complete to ensure workplace is safe for work – KO1
- Safe systems of work – KO1
- Standardised procedures for recording measurements – KO6
- Key elements of data – KO8
- Information and data sources – drawings, specifications – KO8
- Negotiation techniques – KO9
- Conflict management – KO9
- Methods and styles of communication – KO9
- Documentation required for maintenance activities - KO14

Digital Skills
- Research for design process – KO3
- Building information modelling – KO4
- Controls and monitoring systems – KO5
- Building information modelling – KO6
- Controls and monitoring systems – KO6
- Internet of things – KO7
- The use of technology to capture data in a completed building – KO7
- How data is used for the purpose of manufacture and delivery – KO7
- Data storage requirements in relation to security and protection – KO8
- The basic programming methods and set up requirements of digital systems for BSE systems and which IT resources to use – KO8
- Digital engineering techniques - KO11
- Opportunities for the use of technology (Computer modelling, smart technologies) in construction – KO11
- Types of control and monitoring systems - KO13
Core content
All aspects of the 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 knowledge and practical content for this specialism and may provide efficiencies for teaching core knowledge in context;

Common core content
- Construction sustainability principles
- Building technology principles
- Information and data principles

Links to Core Skills
Examples and reference needs to be made to criteria that support the development of the following:

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.
For example, 9.8/9.10 will support a student’s personal development in how to communicate with others by understanding:
- the different negotiation techniques used within the construction industry
- the different methods and styles of communication and their suitability for different situations

Work collaboratively with other team members and stakeholders e.g. to develop content to bid for a construction project.
For example, 3.3/4.3/9.3 will support a student’s personal development in how to work collaboratively with other trades, contractors, planners and manufactures when determining the role of each discipline in building design and by understanding the importance of a collaborative approach to project delivery and reporting, and how this is applied in practice.

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
For example, 13.3/13.4 will support a student’s personal development in how to apply a logical approach to solving problems by understanding implications to the systems if components fail.

Primary research e.g. obtaining measurements related to a design and / or customer requirements.
For example, 6.1 will support a student’s personal development in how to research and obtain accurate measurements in the built environment and the benefits this has to contractors, clients and the success of the project.

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:
  o 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
  o 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
  o Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
  o 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
  o Centres will need to ensure a realistic representation of construction systems and components are available
  o Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration
  o The provision must represent the type of equipment currently available in the UK Construction Industry
  o Current and emerging Construction 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)
• Physical needs/ability

**Suggested learning resources**

**Websites**
  - Institute for apprenticeships and technical education - [www.instituteforapprenticeships.org](http://www.instituteforapprenticeships.org)
  - Building Regulations portal - [www.planningportal.co.uk](http://www.planningportal.co.uk)
  - British Standards Institution [www.standardcentre.co.uk](http://www.standardcentre.co.uk)
Books
- Building Regulations – Ray Trucker – Routledge 2019
# 301 Carpentry and Joinery

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<th>Level</th>
<th>3</th>
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<td>GLH</td>
<td>500</td>
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<tr>
<td>Assessment method</td>
<td>Practical assignment</td>
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## 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.
1. Carpentry and Joinery knowledge criteria

**Common 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.

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.

**Depth of content – Common knowledge criteria**

1.1 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.

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

1.4 How to obtain relevant information from building regulations, standards

Range:

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

Depth of content – Common knowledge criteria

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

1.4 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.

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/scribing 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).

#### 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).

#### 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).

#### 1.8 Operation and handling requirements of tools and equipment.

**Range:**

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

**Depth of content – Common knowledge criteria**

1.5 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.

1.6 Types of portable power tools used for cutting, shaping, jointing/fixing and finishing and their characteristics, purpose and suitability for task.

1.7 Types of fixed machinery used for cutting, jointing and shaping/profiling/finishing and their characteristics, purpose and suitability for tasks

1.8 Requirements when operating and handling tools and equipment. Including, safe handling and safe working methods, safe storage minimising damage and risk of theft.

1.9 Maintaining tools and equipment, its importance and the consequences of not keeping up regular maintenance (breakdown, increased force required, poor finish, reduced safety).

**Wood science**

1.10 **Classification and types** of Timber used in construction, their **properties**, and how they are processed.

**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, kiln), Engineered (finger jointed, laminated), Treatments (acetylated, pressure treated/vac-vac, dipped, brushed and sprayed).

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.

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.

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

Range:

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

1.14 Sustainable timber

Range:

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

**Depth of content – Common knowledge criteria**

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

1.12 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

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

1.14 Sustainable timber, the supply chain and licensing, the implications of use (environmental) and how to minimise waste.
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/espagnolette,); 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).

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).

Depth of content – Common knowledge criteria

1.15 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

1.16 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.
Math’s

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)

**Depth of content – Common knowledge criteria**

1.17 Application of geometry to the preparation, production, assembly and installation of timber based components and products.

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.

**Depth of content – Common knowledge criteria**

1.18 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.

**Performance outcome knowledge criteria**

**Performance Outcome** - 1 Prepare for the production of complex timber-based building products and structures

**Information**

2.1 Identify information **requirements** from a brief

**Range:**

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

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

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.

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).

2.5 Measure length and calculate area and volume

2.6 Produce scaled **drawings** by hand.

**Range:**

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

2.7 Produce cutting and material lists

**Range:**

**Cutting lists** - Cover units, windows, doors, stairs, allowance for waste.

**Material lists** - Quantities of materials (timber, sheet materials, fixings, ironmongery, metal stud)

2.8 **Inspect** materials

**Range:**

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

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

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

2.10 Inspect equipment

Range

Inspect - Faults, Accuracy, calibration, Serviceable.

2.11 Estimate resource requirements

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

2.12 Follow a method statement

Depth of content – Prepare for the production of complex timber-based building products and structures

2.1 Select and extract the correct information required from a brief to meet the requirements of any given task

2.2 Interpret the types of information required to meet the requirements of any given task

2.3 Use appropriate questioning techniques to ascertain and clarify the information required for any given task

2.4 Calculate lengths and angles using relevant equipment, information and methods for any given task

2.5 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

2.6 Produce (scaled) drawings using manual drafting methods to a prescribed brief producing templates and patterns

2.7 Produce cutting and material lists, these will be informed by drawings, setting out details and specifications

2.8 Inspect materials (visual and inventory) before use and report any omissions or defects
2.9 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

2.10 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

2.11 Estimate resource requirements for the production of complex timber-based building products and structures

2.12 Working in a safe manner according to the method statement including production and installation details. Whether carried out within the workshop or on site.

Performance outcome Skills

Performance outcome 2 - Produce complex timber-based components

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.

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.

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.
3.4 Use woodworking **machinery** and **equipment**

**Range:**

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

3.5 **Label** and prepare components

**Range:**

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

3.6 Use **tools**.

**Range:**

**Tools** - Hand, power

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.

3.8 Produce Test pieces

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.

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).

3.11 Set up and adjust machinery

Range:

Adjust - Change tooling for depth of cut
Depth of content – Produce complex timber-based components

3.1 Research current information sources available for producing complex shapes and components etc.

3.2 Carry out geometrical calculations accurately, for the production of complex 3D components.

3.3 Protect the integrity, quality and conditioning of materials during handling and storage including general housekeeping and safety within the workshop.

3.4 Use woodworking machinery and equipment to produce complex timber based components.

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

3.6 Use tools to produce complex timber based components. All tools should be used in line with safe working practices and in line with training/manufactures instructions to produce joints and components.

3.7 Create templates and work holding jigs for bespoke and curved work when using a moulding machine.

3.8 Produce test pieces for complex timber based components.

3.9 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.

3.10 Feed materials into equipment using work piece support and safety aids adhering to standard workshop working practice.

3.11 Set up and adjust machinery in accordance to requirements and safe practice.

Performance outcome Skills

Performance Outcome 3 - Assemble complex timber-based components

4.1 Assess suitability of information provided

Range:

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

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.

4.4 Use non-permanent joining techniques (dry fit) **techniques**

**Range:**

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

4.5 Use permanent joining **techniques**

**Range:**

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

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.

4.7 **Prepare** assembled timber-based products for transportation

**Range:**

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

**Depth of content – Assemble complex timber-based components**

4.1 Assess the information available (plans, drawings, job specifications) to ensure it is sufficient to assemble complex timber based products and component.
4.2 Use Tools and equipment to assemble components to form products following standard safe workshop working practice.

4.3 Join and fix timber-based products to non-timber based components.

4.4 Use dry fit techniques in line with job specification requirements, check products are assembled correctly before gluing/permanent fixing.

4.5 Assemble complex timber based products in line with job specification requirements.

4.6 Finish an assembled complex timber products with consideration of standard industry practices and good housekeeping.

4.7 Prepare the assembled timber based product for transportation relevant to job specification.

**Performance outcome Skills**

**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.

5.2 Prioritise and schedule tasks.

5.3 Check compliance with regulations and **standards**

**Range:**

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

5.4 Prepare timber-based products for installation

**Range:**

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

5.5 Prepare **environments** for installation

**Range:**

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

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.

5.7 Maintain tools.

Range:

Maintain - Clean, sharpen, store.

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).

5.9 Carry out quality checks

Range:

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

5.10 Adapt timber-based products to meet installation requirements

Range:

Adapt - trim, adjust, repair.

Depth of content – Install complex timber-based products into complex structures

5.1 Assess risks when installing complex timber-based products into complex structures, consulting risk assessments and method statements prior to working.

5.2 Plan the task ahead, carrying out the work in a logical, orderly sequence.

5.3 Check compliance with building regulations and standards provided before, during and upon completion of the installation.

5.4 Prepare timber-based products for installation (windows and doors), measuring the opening/area to be worked on and adjusting the item ready to fit.
5.5 Prepare the area ready for installation, cleaning down, removing temporary hoarding or protection, clearing the area, protecting the area, providing barriers as required.

5.6 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.

5.7 Maintain and secure tools during installation, ensuring efficiency and quality of finish, minimise damage and loss.

5.8 Install door and window installation, including fitting and fixing ironmongery.

5.9 Carry out quality checks on completed work.

5.10 Trim, adjust and repair product as required when fitting, completing the job to the required standard.

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**Links to Maths, English and Digital Skills**

**Maths**

- Mathematical and calculation processes for Carpentry and Joinery
- Addition subtraction multiplication division percentages ratios, measurement in metric for length height width area volume estimates costs quantity
- Simple arithmetic
- Percentages and ratios
- Spatial measurement
- Calculation of quantities
- Estimation processes for Carpentry and Joinery

**English**

- Understand technical terminology associated with Carpentry and Joinery
- Provide written communication in the form of notes, letters, and forms of business documentation.
- Provide oral communication to work with key stakeholders
- Devise drawings, specifications, schedules, risk assessments and method statements linked to the use of digital formats for presentation purposes.
- Read and extract information from manufacturer and legislative regulation websites and documentation and apply to specific job specifications.
- The completion of requisite forms.
Digital Skills

- Use computer technology and use the skills of folder creation, open and save files, cut and paste and image processing to produce documentation such as safety posters and completion of accident data presentation, letters, estimates, invoices costing documentation and digital presentations. Bar charts and Gantt charts will also be completed for work programmes using digital technology.

- Use word processing, PowerPoint and publishing software to complete presentation and forms. Use information data to produce charts graphs.

Core content

All aspects of the common core content can be related and contextualised on delivery in relation to this specialism.

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:

  o 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
  o 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

  o Practical - Use of pre-set formative assessments carry out tasks and record on standardised form.
  o 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

  o Centres will need to ensure a realistic representation of carpentry and joinery and components are available
  o Centres will need to provide the appropriate tools, equipment and test instrumentation for demonstration and practical training purposes
  o The provision must represent the type of equipment currently available in the UK carpentry and joinery industry
  o 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.
1. Knowledge criteria

Common 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.

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.

Depth of content – Common knowledge criteria

1.1 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 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.
1.3 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.

1.4 Types of **information** required

**Range:**

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

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.

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

1.5 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.

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.

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.

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.

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.

Depth of content – Common knowledge criteria

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

1.8 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.

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

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, preblended systems

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

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.

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.

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).

1.14 Water, moisture and damp, condensation and the **importance** and implications of damp proofing/tanking including chemical damp proofing

**Range:**

**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.
1.15 **Causes, symptoms and rectification of faults in plastering systems**

**Range:**

**Plastering systems** - Internal solid plastering, external rendering, cast and run in situ mouldings.

**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.

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

**Faults** - Structural movement, wood rot, damp.

**Depth of content – Common knowledge criteria**

1.10 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.

1.11 The principles of sound and thermal efficiency including U values, acoustics valuation, and performance with consideration to the implications of relevant legislation and regulations.

1.12 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.

1.13 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.

1.14 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.

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

1.17 **Application** of geometry

**Range:**

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

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.

**Depth of content – Common knowledge criteria**

1.16 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.

1.17 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.

1.18 The application of ratios 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.

**Performance outcome knowledge criteria**

**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.

**Depth of content – Prepare backgrounds for plastering**

1.19 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.

**Depth of content – Prepare backgrounds for plastering**

1.20 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.

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.

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/strippers, angle grinders, mechanical breaker.

**Depth of content – Prepare backgrounds for plastering**

1.21 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 The suitability of materials, equipment and techniques used to control suction and with consideration to manufacturer’s instructions.

1.23 The different ways to prepare background surfaces by hand or mechanical means to 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 manufacturers instructions.

**Performance outcome knowledge criteria**

**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.

1.25 How to **cut and fix** various metal/plastic trim beads.
Processes to cut and fix - setting out, measuring, installing using dabs, nailing, use of staples and mechanical fixings.

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.

1.27 Traditional techniques for plastering

Range:

Techniques - fixing laths, applying sand/lime plasters.

Depth of content – Apply plastering systems (Criteria 3)

1.24 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 Standard processes for cutting and fixing trim beads.

1.26 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.

1.27 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.

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.

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**Depth of content – Apply plastering systems**

1.28 Techniques including traditional and light weight renders. With consideration of the types of common backgrounds for receiving plastering/render systems including external wall insulation and cement board and the need to install different types of reinforcements such expanded metal lath and mesh clothes and location of beads in line with the drawing, specification and manufacturer’s instructions.

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**Performance outcome knowledge criteria**

**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.

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.

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.

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.

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).

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

**Range:**

**Methods** – firtings, secondings, one and two gauge process.

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.

**Depth of content – Fix plaster casted from moulds**

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

1.31 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 The process required for applying casting plaster to the bench to produce a reverse mould including coring out and mixing of plaster.

1.33 The methods for preparing the reverse mould for casting.

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

1.35 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

1.37 Methods of running moulds in-situ

**Range:**

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66 Level 3 Construction T Level: On-Site Construction (8710-30)
**Methods** - Running, forming, turning, spinning, scotch bracketing, coring out, topping off

**Depth of content – Fix plaster casted from moulds**

1.36 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 The methods of running moulds in-situ.

**Fixing moulds**

1.38 How to cut mitres

Range:

**Cut** - Free hand, template, mitre box

1.39 **Methods** of fixing plaster casts

Range:

Methods – screws, adhesives

1.40 **Principles** of jointing casts when fixing

Range:

Principles - leaving gaps, application of plaster to gaps

**Depth of content – Fix plaster casted from moulds**

1.38 Cutting mitres including both internal and external angles

1.39 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, with consideration of the type of fixing used, internal/external mitres, stop ends, straight joints and stopping in.

**Performance outcome knowledge criteria**

**Performance Outcome 4 - Repairing plastering systems**

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

Range:

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

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

**Range:**

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

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

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

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

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

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

**Range:**

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

1.47 **Reinstating** external render systems

**Range:**

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

1.48 **Methods** of reinstating ornate plaster systems

**Range:**

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

**Depth of content – Repair plastering systems**

1.41 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
1.42 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

1.43 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)

1.44 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

1.45 Methods to reinstate internal plasterwork to various systems and the process of removing defective external rendering to reinstate and make good (e.g. repairs to plain faced render finishes, light weight render finishes) by selecting appropriate tools and completing the work in line with the method statement

1.46 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

1.47 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

1.48 Materials, preparation methods and process to carry out and make good/reinstate defective external rendering work, e.g. matching up to existing work, to meet industry standards with consideration of appropriate tools selection and requirements for completing the work in line with the method statement.

**Performance Outcome 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.

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

*Range:*

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

2.4 Produce **scaled drawings** by hand in plan, elevation and section

**Range:**

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

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

2.6 **Remove** loose materials from backgrounds

**Range:**

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

2.7 **Apply** preparations

**Range:**

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

2.8 **Inspect** materials

**Range:**

*Inspect* - Visual

2.9 **Inspect** tools and equipment

**Range:**

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

2.10 **Estimate** resource requirements

**Range:**

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

2.11 Follow a method statement

2.12 Apply keys to differing **backgrounds**

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

2.13 **Protect** surrounding areas

**Range:**

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

**Depth of content - Prepare backgrounds for plastering**

2.1 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

2.2 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

2.3 Measure lengths and angles accurately in the preparation of background surfaces for plastering. Consideration should be made to the correct interpretation of scales and use of units of measurement appropriate to the specification

2.4 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

2.5 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

2.6 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

2.7 Apply preparations, using tools, equipment and materials in accordance with manufacturer’s guidance

2.8 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

2.9 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

2.10 Estimate requirements with consideration. With reference to all available sources (job specification, plans, drawings etc.)
2.11 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)

2.12 Apply keys to a range of background surfaces by forming hand and mechanical key to improve adhesion of plaster

2.13 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

**Performance outcome Skills**

**Performance outcome 2 - Apply plastering systems**

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

3.2 Use tools including hand and power tools

3.3 **Set out** plasterboard to stud work and direct bond

**Range:**

**Set out** - Checking backgrounds, Set out dimensions

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

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

**Range:**

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

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

**Range:**

**Plasters:** two coat, three coat and finishing plaster.

3.7 Apply tape to a drywall system joint

3.8 Apply render plasters to internal surface

3.9 Fix laths to surfaces

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

3.10 **Apply** sand and lime plasters.

**Range:**

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

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

**Range:**

**Trims** – metal, plastic

**Techniques** – mechanical fixes, adhesives

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

3.13 Produce traditional external render **finishes**

**Range:**

**Finishes** - plain face, ashlar, Tyrolean and dry dash

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

**Depth of content - Apply plastering systems**

3.1 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

3.2 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

3.3 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

3.4 Fix plasterboard systems to timber, metal and solid backgrounds

3.5 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.

3.6 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.

3.7 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.

3.8 Prepare, mix and apply specialists render systems. Applying and forming plain and textured surfaces in line with manufactures instructions. Recognizes different backgrounds such as EWI, Cement board, EML and solid.

3.9 Fix laths to surfaces including walls and ceilings to reinforce and form background surfaces to receive plaster application.

3.10 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.

3.11 Fix a variety of trims using different techniques.

3.12 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.

3.13 Produce traditional external render finishes using a range of techniques used to create different plain and textured surfaces.

3.14 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.

Performance outcome Skills

Performance outcome 3 - Fix plaster casted from moulds

4.1 Transferring 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.

4.2 Cutting shapes from metal.

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

4.3 **Join** templates to running moulds

**Range:**

**Join** - Hammer, pins

4.4 **Apply** running rule to casting bench

**Range:**

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

4.5 **Grease** bench in preparation for reverse mould

4.6 **Prepare** materials

**Range:**

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

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

**Range:**

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

4.8 **Prepare** moulds ready for casting

**Range:**

**Prepare** - Drawing, cut to required size, shellac, grease

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

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

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

4.12 **Mark out** materials including mitres

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

4.13 Cut castings to produce internal and external angles

Range:

Cut - Square, tape measure, mitre box, saw

4.14 Fix plaster casts.

Range:

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

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

Range:

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

**Depth of content - Fix plaster casted from moulds**

4.1 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

4.2 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

4.3 Construct running mould components and Join templates to stock using appropriate hand tools

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

4.5 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

4.6 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

4.7 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

4.8 Prepare reverse moulds using shellac sealer and release agents in preparation for casting from solid and flexible reverse moulds

4.9 Cast moulds from reverse plaster, rubber and fiberglass models using one and two gauge casting methods and procedures

4.10 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
4.11 Set out and run in-situ moulding work including coring out/bracketing to form straight, curved and raking moulding work using traditional materials.
4.12 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.
4.13 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.
4.14 Fix moulding work using adhesive, screws and wire and wad methods in line with the method of work.
4.15 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.

**Performance outcome Skills**

**Performance outcome 4 - Repair plastering systems**

5.1 **Inspect** plastering system for damage

*Range:*

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

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, (in-situ mouldings), casting plaster, canvas, plaster lath (fibrous mouldings)

5.3 **Maintain** integrity of plastering system **materials** and surrounding building fabric

*Range:*

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

5.4 Match new materials to existing plastering system materials.

*Range:*

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

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

*Range:*

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**Depth of content - Repair plastering systems**

5.1 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.

5.2 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.

5.3 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.

5.4 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.

Carry out visual inspections on materials for quality and any potential defects (e.g. correct type of plaster, render, ornate plasterwork 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. Ensure loose materials are disposed of safely.

Apply preparations, using tools, equipment and materials in accordance with manufacturer’s guidance.

5.5 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.

Repairs should also meet conservation and heritage legislation when applicable to meet listed building design.

**Links to Maths, English and Digital Skills**

**Maths**

- Mathematical and calculation processes for working out areas of plasterboard for timber and metal stud and ceiling surfaces, pre-blended bagged backing and finishing plasters, loose plastering material such as sand, cement, lime including additives for plain and complex internal walls. Calculating coverages of pre-blended and premixed renders for external elevation surfaces, calculating linear lengths of beads, reinforcements and fixings when preparing and applying both internal and external plastering systems. Calculating
coverage surface for sealers, glues and bonding agents when preparing background surfaces for plastering.

- Addition subtraction multiplication division percentages ratios, measurement in metric for working out length height width area volume estimates costs quantity for internal and external plastering systems which include plain surface areas, ceilings, walls with openings such as doorways and windows, dividing walls and beams, stair walls, curved and splayed walls, attached and independent piers, beams and coffered ceilings.

- Simple arithmetic when calculating backgrounds surfaces to receive plasterboard, pre-blended and loose plasters, renders, bonding adhesives, reinforcements and beads. Working out surface areas to receive one, two and three coat application, single boarded and double boarded plasterboard surfaces. Working out to the nearest bag, board, bead including adding allowances for waste. Work out percentages and ratios of loose materials such as sand, cement, lime, additives and bonding agents to ensure consistent and accurate mixing regarding quality of product to meet industry standards.

- Spatial measurement to include drying and setting times of plasters and rendering products, curing and hardening process of cementitious plastering and rendering mixes, adding additives to enhance performances of plasters and renders. The effects of poor spatial measurement that lead to loss of strength and problematic defected surfaces.

- Calculation of quantities when planning plastering tasks in line with drawings, specifications and Method statement. Estimate amounts in line with the task to minimise waste and over ordering of specific plastering materials.

- Estimation processes for plastering and rendering tasks regarding quantity of labour, materials and resources to carry out and complete tasks with minimum disruption in line with set work programs.

English

- Understand technical terminology associated with specific plastering and rendering techniques, methods and procedures to accurately carry out and complete tasks to the required standards as stated within the manufactures guidelines.

- Provide written communication in the form of notes, letters, and forms of business documentation.

- Provide oral communication to work with key stakeholders

- Devise drawings, specifications, schedules, risk assessments and method statements linked to the use of digital formats for presentation purposes.

- Read and extract information from drawings, specifications, job sheets, manufacturer and legislative regulation websites and documentation when applying and installing plastering systems to ensure compliance to safe methods of work and meeting industry standards regarding performance and quality.

- The completion of requisite forms, time sheets progress charts to monitor work progress and completion schedules.
Digital Skills

- Use computer technology and use the skills of folder creation, open and save files, cut and paste and image processing to produce documentation such as safety posters and completion of accident data presentation, letters, estimates, invoices costing documentation and digital presentations. Bar charts and Gantt charts will also be completed for work programmes using digital technology.
- Use word processing, PowerPoint and publishing software to complete presentation and forms. Use information data to produce charts graphs.
- Use digital measuring and levelling equipment when setting out.
- Referring to manufacturers plastering and rendering systems by downloading apps.

Core content

All aspects of the common core content can be related and contextualised on delivery in relation to this specialism.

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:

  o 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
• Plastering: J T Sawyer: Routledge: 2007
• Lime and Lime mortars: A D Cowper: Donhead - 1998
What is this specialism about?

The purpose of this specialism is for learners to know and undertake fundamental bricklaying work within different construction environments 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 utilizing 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.
Bricklaying knowledge criteria

Common 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)

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

Depth of content – Common knowledge criteria

1.1 Current legislation and the implications to employers and those working on the production of complex masonry structures

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

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

Depth of content – Common knowledge criteria

1.3 The content within inductions, method statements and risk assessments and how they are used in when preparing for the construction of complex masonry structures.

Information

1.4 Types of information

Range:

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

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

1.6 Quality standards applicable to masonry structures

Range:

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

Depth of content – Common knowledge criteria

1.4 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

1.5 Current requirements of building regulations and standards relating to complex masonry structures

1.6 Current quality industry standards and tolerances applicable to masonry structures.

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

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

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

Depth of content – Common knowledge criteria

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

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

1.9 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

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

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

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

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
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

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

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

1.18 Resistance to contaminants and moisture

Range:

 Contaminants and moisture - Sulphate attack, lime leaching

Resistance - Horizontal damp proof course, Damp proof membrane, Cavity trays, Radon/gas barriers

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

Depth of content – Common knowledge criteria

1.10 Types of masonry classifications and the associated implications, when used in bricklaying situations

1.11 Different types of mortar and how they are applied, the techniques for strengthening and the implications of use in different bricklaying situations

1.12 The types of pointing techniques and the use of appropriate materials, their application and suitability for different situations

1.13 The effects of the external environment on masonry products and structures

1.14 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

1.15 The causes, effects, prevention and treatment of efflorescence

1.16 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, tapered insulation board joints, flush pointed mortar joints

1.17 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)

1.18 The relationship between masonry (as a cladding) and the different forms of framed structures

1.19 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.

Building Technology

1.21 Integral building components and their purpose
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)

1.22 Types of radial and battered brickwork

Radial - Serpentine wall, curved on plan (concave and convex), axed semicircle, three centred arch

B battered - Plain battered brickwork, buttress, tumbling in

1.23 Types of reinforced brickwork

Types - Horizontal (Expanded Metal Lath, welded fabric,), Brick and a half wall (quetta bond) vertical reinforcement, Isolated brick piers including vertical reinforcement

1.24 Different types of openings

Openings - Fireplace, Chimney, Flues

1. 25 Types of finishes to wall plate and rafter level

Finishes - Mortar bedding of the wall plate, placing restraint straps horizontal and into gable end. Use of timber and restraint straps and bolts

1. 26 Different types of bonds used in masonry structures

Bonds - English, Flemish, Stretcher, Header, Block bonded quoins, Garden wall bonds, Decorative panels - herringbone and basket weave (diagonal and vertical), Dentil, Dog tooth

1.27 Types of cladding systems

Cladding systems - Brick, Steel, Timber, Composite, Plastic, Concrete, Slate, Tile

1.28 Basic principles of cavity ties and ancillary brick support systems
**Principles** - Cavity Ties, structural stability to a cavity wall, ancillary, joining new brickwork to existing masonry, Cladding to main structures, maths

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

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

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

**Depth of content – Common knowledge criteria**

1.21 Integral building components, their purpose and their application and installation in accordance with building regulations

1.22 The different types of radial and battered brickwork

1.23 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)

1.24 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 The types of finishes to level a timber wall plate and the use of restraint straps

1.26 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

1.26 The different types of bonds used in masonry structures and other decorative features

1.27 The different types of cladding systems (their purpose (weatherproofing, decorative), application (fixed external face to the outside of a structure) and installation (mechanically fixed/resin applied to framing)

1.28 The basic principles of cavity ties and ancillary brick support systems

1.29 The types of building calculations used on a building site

1.30 The processes used to set out geometrical designs (segmental/3 centre arches) for setting out and verification

1.31 The application of ratios used for mixing and preparing mortar for laying bricks and blocks and pointing mortar.

Performance outcome knowledge criteria

PO1 Prepare for the construction of complex masonry structures

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

Depth of content – Prepare for the construction of complex masonry structures

1.32 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.

Performance outcome Skills

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

**Range**

**Questioning techniques** - Verbally, Open and closed questions, listing priorities, Probing, Leading

2.3 Calculate areas and linear measurements

2.4 Measure: length, height and area

2.5 **Interpret** scaled drawings

**Range:**

**Interpret** - Dimensional references, Architectural features, Position of door and window openings, Roof configuration, establishing corner positions

2.6 **Inspect** tools and equipment and materials for defects

**Range:**

**Inspect** - Visual inspection, PAT testing, Calibration, Routine checks for accuracy

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

2.8 **Inspect** equipment and tools for accuracy

**Range:**

**Inspect** - Check levels for plumb, Check levels for level, Check square for accuracy – 90 degrees

2.9 Select materials and resources required to enable setting out

**Range:**

**Setting out** - Profiles, Builders square, Tape measures, Optical level, Laser level

2.10 Estimate **resource** requirements

**Range:**

**Resources** - Bricks, Blocks, Mortar, Concrete, Labour, Plant, wastage

2.11 Follow a method statement and risk assessment

**Depth of content - Prepare for the construction of complex masonry structures**
2.1 Select and extract the correct information required from a brief to meet the requirements of any given task

2.2 Questioning techniques used to obtain and clarify information on site and or with stakeholders/client/customers

2.3 Calculate areas of both brick and block face work, linear measurements of brick/block work and areas of door and window openings

2.4 Measure the lengths and height and calculate the area of face brick/block work

2.5. Interpret scaled drawings in elevation and section

2.6 Inspect and maintain the bricklayers hand tools, equipment and materials

2.7 Gauge both horizontally and vertically. Set out dry and bond Half/one/one and a half brick thick bonding dry bond brick walls

2.8 Check spirit levels and building squares for accuracy

2.9 Identify correct tools and equipment to help set out masonry below and above ground level

2.10 Correctly take off measurements and apply building calculations to calculate a range of estimates

2.11 Be able to read and follow instructions from a method statement and complete risk assessments.

Performance outcome Skills

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

3.2 Operate tools and equipment.

3.3 Mix mortar to application requirements

Range:

Mix - mortar/concrete by hand, Use of 110v mortar mixer

3.4 Protect integrity and quality of materials during handling and storing

Range:

Materials - Bricks, Blocks, Mortar
3.5 **Maintain** plumb, line, level and axial deviation

**Range:**

**Maintain** - Gauge, Level, Plumb, Ranging, Square

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

3.8 Produce templates

**Range:**

**Templates** - Segmental, Semi circle, Obtuse, Acute, Axed bricks

3.9 Shape components for obtuse and acute quoins.

3.10 **Insert** obtuse and acute quoins into masonry structures

**Range:**

**Insert** - Flemish Bond with a squint quoin

3.11 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

3.12 Shape masonry products to application requirements

3.13 Advanced **bonding patterns**

**Range:**

**Bonding patterns** - Quetta, English and Flemish garden wall, Dutch, Monk

3.14 **Maintain** cavity widths, straight and returns and apply joints to finished masonry structures

**Range:**

**Maintain** - Cavity walls, Quoins, Junctions, Pointing, Jointing

3.15 Classify and organise waste for disposal
Depth of content - Construct complex masonry structures

3.1 Present using communication technology the design, construction methods and finished construction
3.2 Use hand tools to lay and cut materials in accordance with manufacturer instruction
3.3 Be able to mix mortar to the correct standards
3.4 Correct handling, storage and protection of bricklaying materials, including adhering to safe working practices
3.5 Adapt bricklaying skills to both brick/block work
3.6 Set out and build complex walls
3.7 Set out and make timber templates for different shaped walls and arches
3.8 Use of special bricks to form angled walls
3.9 Be able to build solid walls with obtuse and acute angles
3.10 Build decorate brickwork including panels
3.11 Set out and build curved walls including Serpentine walling
3.12 Set out and build complex bonding
3.13 Build cavity walls including a quoin and junction
3.14 Dispose of waste materials relating to bricklaying requirements including the use of segregated skips.

Performance outcome Skills

Performance outcome 2 - Renovate masonry structures

4.1 Assess suitability of information

Range:
Information - Planning regulations, HSE Website, Building Regulations

4.2 Use questioning techniques to obtain and clarify information required

Range:
Questioning techniques - open, closed, funnel and probing

4.3 Inspect masonry structures for damage

Range:
Damage - Movement cracks, Structural damage, Water penetration, Wind damage to gable end.

4.4 Remove damaged materials

Range:
**Damaged materials** - Brick, Block, Wall ties, Damp Proof Course (horizontal and vertically), Lintels, Stonework Range

4.5 **Maintain** integrity of masonry structure

**Range:**

**Maintain** - Repointing, Replacing loose brickwork

4.6 **Match masonry** to the period of construction

**Range:**

**Masonry** - Imperial bricks, Stonework

4.7 **Blend** new masonry products and materials to existing building fabric

**Range**

**Blend** - Colour/Texture

4.8 **Insert supports** to maintain the structural integrity following refurbishment

**Range:**

**Supports** - Adjustable steel props, Strong boys, isolated brick/block piers

**Depth of content - Renovate masonry structures**

4.1 Source accurately information from relevant source

4.2 Source information verbally using a range of questing techniques to clarify specification requirements when renovating masonry structures

4.3 Inspect masonry after bad weather during renovation of masonry structures

4.4 Inspect remove and replace damage materials

4.5 Ensure the structural stability is maintained with 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

4.6 Match heights, color, and positions of resources when building new to old

4.7 Select and blend new brickwork to older existing brickwork, bonding into existing when required

4.8 Use support resources accurately when altering and repairing masonry structures.
Links to Maths, English and Digital Skills

Maths:
- Areas of brick/block work
- Addition subtraction multiplication division percentages ratios, measurement in metric for length height width area volume estimates costs quantity
- Simple arithmetic
- Percentages and ratios for bricklaying tasks
- Calculation of quantities (areas and volumes)
- Estimation processes for bricklaying tasks
- Quantity of bricks and blocks
- Areas of top soil
- Volume of top soil
- Volume of mortar required (laying and pointing)
- Area of different shaped surfaces.
- Number of insulation batts
- Number of wall ties required.
- Volume of excavations
- Volume of concrete required.

English:
- Checking and producing method statements.
- Producing risk assessments.
- Working to job sheets, and signing off tasks
- Completing accidents records and books.
- Communicating electronically on site.
- Following regulations.
- Interpreting notifications and probation notices.
- Understand technical terminology associated with Bricklaying
- Provide written communication in the form of notes, letters and forms of business documentation.
- Provide oral communication to work with key stakeholders
- Devise drawings, specifications, schedules, and method statements linked to the use of digital formats for presentation purposes.
- Read and extract information from manufacturer and legislative regulation websites and documentation and apply to specific job specifications.
- The completion of requisite forms.
Digital Skills:

- Use of working with electronic copies of the drawings.
- Use of onsite communication MOB and hand held devices
- Resourced information from the websites. Use computer technology and use the skills of folder creation, open and save files, cut and paste and image processing to produce documentation such as safety posters and completion of accident data presentation, letters, estimates, invoices costing documentation and digital presentations. Bar charts and Gantt charts will also be completed for work programmes using digital technology
- Use word processing, PowerPoint and publishing software to complete presentation and forms. Use information data to produce charts graphs.
- Shared information across different trades and individuals Laptops, tablets, and mobile phones.

Core content

All aspects of the common core content can be related and contextualised on delivery in relation to this specialism.

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 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.
1. Knowledge criteria

Common criteria

Health and safety

1.1 Implications of legislation

Range:

Legislation - Health and safety guidance used during the construction process: 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, Work at Height Regulations, Control of Noise at Work Regulation, Environmental Regulations, Waste management, Manufacturers safety data sheets

1.2 The identification of hazards

Range:

Hazards - Sharp edges, moving parts, working with chemicals, existing toxic / hazardous materials - lead, asbestos, mould, Working at height, slips, trips and falls, fumes, dust, cuts, use of PPE, RPE, fall arrest equipment

Depth of content – Common knowledge criteria

1.1 Current HSE guidance, legislative documentation, manufacturer’s advice and guidance to ensure that tasks are undertaken in a safe manner in the application of surface coatings and wallcoverings and how the tasks are undertaken

1.2 Types of hazards and risks associated with painting and decorating activities and the precautions taken to minimise them, including risk assessments and method statements.

Information

1.3 Types of information required for the preparation and application of surface coatings and wallcoverings

Range:

Information - Specifications, Drawings (orthographic projection, isometric projection, hand, Computer-Aided Design (CAD) including the drawing information: scale, symbols, hatchings), method statements, schedules, bill of...
quantities, programme of works, Building Information Modelling (BIM), safety data sheets, risk assessments

1.4 How to obtain relevant information from building regulations and standards

Range:

Information sources - GOV.uk, HSE, Manufacturers, Local authorities, Energy savings trust

Depth of content – Common knowledge criteria

1.3 The types of information used to manage, support and organise projects for the application of surface coatings and wallcoverings including the planning, preparing, measuring, marking out, application methods, manufacturer’s guidance and safety legislation

1.4 Building regulation and standards Information relevant to the preparation and application of surface coating and wallcovering, where it is sourced and its importance (sustainable use of materials) in the profitable completion of a given task

Tools and equipment

1.5 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

1.6 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
1.7 Importance of maintenance and how to maintain equipment

Range:

Maintenance - Sharpening, cleaning, lubrication, storage methods, safety

1.8 The environmental impact of tools and equipment

Range:

Environmental impact - Manufacture, transportation, quality, disposal (waste improper disposal, reusable items, sharps)

1.9 Principles of waste management

Range:

Principles - Re-use, recycle, reduce, correct disposal methods

Depth of content – Common knowledge criteria

1.5 The type of tools and equipment available, their characteristics, purpose and suitability for a range of given tasks

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

1.7 Maintaining tools and equipment, its importance and the consequences of not keeping up regular maintenance

1.8 The environmental impact of tools and equipment through their lifecycle

1.9 The principles of waste management and the importance of segregation of waste, including the disposal of sharps and contaminated waste.

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

1.11 Principles of moisture transmission and ventilation

Range:

Moisture transmission and ventilation - Internal, External, Structural
Depth of content – Common knowledge criteria

1.10 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.

1.11 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.

Maths

1.12 Application of geometry to the preparation and application of surface coatings and wallcoverings

Range:

Application - length, perimeter, girth, area, volume, angles, shapes, points in a plane, lines and curves, Pythagoras theorem

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

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

Depth of content – Common knowledge criteria

1.14 The costs associated with the preparation and application of surface coatings and wall coverings and the impacts on profitability.
Building technology

1.15 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

1.16 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

Depth of content – Common knowledge criteria

1.15 The key factors and systems to consider when working in different sectors such as occupied properties, health and education facilities where residents, patients and students may be present

1.16 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.

1.17 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

Depth of content – Common knowledge criteria

1.17 The requirements when working on different types of building structures when using water borne and solvent borne coatings.
Coating science

1.18 **Classification** of paint coatings

**Range:**


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

1.20 **Causes** and symptoms of **defects** found in coatings

**Range:**

**Causes** - Poor preparation, Poor application technique, Incorrect material selection,

**Defects** - Physical, chemical, environmental

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

**Depth of content – Common knowledge criteria**
1.18 The function of paint coatings, their properties, characteristics and suitability for different purposes

1.19 The properties of commonly used materials and how to deal with potentially chemically active surfaces and their treatment

1.20 The causes and symptoms of defects and the impact of those on the application and the finished effect

1.21 The environmental impact of the manufacture, selection, use and disposal of paints.

### 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

1.23 The **implications** of not following manufacturers’ guidance for application, drying and recoating times

**Range:**

**Implications** - Defects, financial, time, wastage

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: metamerism

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)

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

Depth of content – Common knowledge criteria

1.22 The application techniques and their suitability when applying surface coatings to complex areas such as ceilings, panels, windows and alcoves

1.23 The range of implications and potential defects that may occur if manufacturer’s guidance is not followed

1.24 The principles of good design and the impact of colour theory in creating decorative schemes

1.25 The range of decorative techniques when applying specialist finishes to a substrate

1.26 Techniques (visual) that identify defects and the methods used to rectify them.

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

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

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

1.30 The environmental **impact** of wallcovering and adhesives

Range:

Environmental impact – Manufacturing methods, transportation, disposal methods

**Depth of content – Common knowledge criteria**

1.27 Classification of wallcoverings and adhesives, their characteristics, properties and suitability for different purposes

1.28 The properties of commonly used materials and potential chemical reactions (preparation and application defects) when using wallcoverings

1.29 The implication of poor preparation, poor selection and poor application when applying wallcoverings

1.30 The environmental impact of the manufacture, selection, use and disposal of wallcoverings and adhesives.

**Wall Covering**

1.31 **Principles** of good design

Range:

**Principles** - Planning process, setting out process, pattern types, visual balance, aesthetics

1.32 Hanging **techniques** for differing wallcoverings

Range:

**Techniques** - Manufacturing guidance, pasting and hanging methods, cutting methods, folding techniques

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

1.34 The implications of not following manufacturers’ guidance for application, drying and finishing

Range:

Implications - Wastage, time, financial

1.35 The importance of techniques used to reduce wastage

Range:

Techniques - Correct measuring procedures, measurement methods (area method, girtling method), using two rolls for cutting when using drop patterns, maximum 100mm per end when cutting lengths

1.36 Techniques for identifying and rectifying wallcovering defects

Range:

Identification - Visual checking

Rectifying techniques - Correct material selection, preparation and application process removal and rehanging

Depth of content – Common knowledge criteria

1.31 The principles of good design, including pattern types, use of repeats, colour and contrasts and the required and potential impact

1.32 The range of hanging techniques and their suitability when applying wallcoverings

1.33 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

1.34 The implications of not following manufacturer’s guidance during application, drying and finishing of wallcoverings

1.35 The techniques used to ensure economy of use and reduction of waste

1.36 Techniques used to identify, avoid and or correct defects when hanging wallcoverings.
Performance outcome knowledge criteria

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.

1.38 The importance of protection of work in progress and completed work

Range:

Protection – Domestic areas (Room furniture, floor/carpets, door and window furniture, wall-mounted fixtures and fittings, television, media/IT systems, lighting) and Commercial areas (workstations, machinery, equipment, furniture, lighting).

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)

Depth of content – Prepare for the application of surface coatings and wallcoverings

1.37 The range of methods required when preparing interior and exterior surfaces

1.38 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.

1.39 The types of preparation methods (traditional and modern) used for a range of bare and previously decorated surfaces and substrates.

Performance outcome Skills

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

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

2.3 Use **questioning techniques** to obtain and clarify information required

**Range:**

**Questioning techniques** – Open/closed, probing, funnel, non ambiguous, correct technical terminology, focussed

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

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

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.

2.7 Calculate area and volume of different geometric **shapes**.

**Range:**
Shapes - Square, rectangle, irregular shapes such as L shaped, cube, cylinder, circle

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

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

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)

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

1.12 **Inspect** equipment

**Range:**

**Inspect** - oil moving parts, free from damage, levels calibrated, mechanical equipment serviceable tested before use

2.13 **Estimate** **resource requirements**
Range:

Resources - labour, materials, overheads, plant and equipment, profits, VAT

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

Depth of content - Prepare for the application of surface coatings and wallcoverings

2.1 Select and extract the correct information required from a brief to meet the requirements of any given task

2.2 Interpret the types of information required to meet the requirements of any given task

2.3 Use appropriate questioning techniques to ascertain and clarify the information required for any given task

2.4 Provide well informed advice to clients on design choices, including colour schemes and products using terminology based on established design principles

2.5 Use concise clear unambiguous language and refer to key documentation to assist in explaining concepts with key stakeholders

2.6 Select from a range of colour specifications using appropriate colour terminology to design a decorative scheme to meet the needs of the customer

2.7 Calculate areas and volumes of different geometric shapes using a range of mathematical processes

2.8 Produce building (scaled) drawings using manual drafting methods to a prescribed brief

2.9 Inspect materials and any deliveries before use and report any omissions or detects

2.10 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

2.11 Use the correct equipment for planning and setting out measurements

2.12 Inspect and provide maintenance to equipment to ensure safe and proper function
2.13 Estimate the resources required, for the task given including time, materials and equipment availability

2.14 Adhere to safe working methods including risk assessments when carrying out activities.

**Performance outcome Skills**

**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

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

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

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

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

Depth of content - Apply specialist surface coatings in complex environments

3.1 Apply appropriate surface techniques and treatments for complex areas including broad, linear and specialist

3.2 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

3.3 Use the correct types of equipment for specialist decorative techniques

3.4 Inspect finish of work to ensure the specification is met and that it is defect free

3.5 Identify any defects in surface coatings and select remedies to rectify them.

Performance outcome Skills

Performance outcome 3 - Apply specialist wallcoverings in complex environments

4.1 Measure lengths

Range:

Measure - Folding rule, tape measure, straight edge, pencil

4.2 Cut wallcoverings for complex environments

Range:

Cut - Shears, trimming knives, fabric-backed vinyl joint cutter, plastic protective strip

4.3 Apply adhesives to wallcoverings.

Range:

Application - adhesive to back of covering, adhesive to wall surface

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

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

4.6 **Inspect** finish

Range:

Inspect - Defects, cleanliness

4.7 **Rectify complex wallcovering problems**

Range:

**Rectify** - preparation, pasting methods, application methods, cutting techniques

**Depth of content - Apply specialist wallcoverings in complex environments**

4.1 Use a range of measuring equipment to correctly cut wallcoverings to the required length

4.2 Use a range of cutting equipment and methods for wallcoverings to minimise waste

4.3 Select the appropriate application method and apply appropriately adhesives to wallcoverings when hanging to wall and ceilings

4.4 Use appropriate techniques when planning, setting out and hanging a range of wallcoverings

4.5 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

4.6 Visually inspect wallcovering finishes for defects and ensure cleanliness throughout

4.7 Identify complex wallcovering problems and defects and apply rectification methods.
Links to Maths, English and Digital Skills

Maths

- Mathematical and calculation processes for decorating
- Addition subtraction multiplication division percentages ratios, measurement in metric for length height width area volume estimates costs quantity
- Simple arithmetic
- Graphs and charts
- Percentages and ratios
- Spatial measurement
- Calculation of quantities
- Estimation processes for decoration projects

English

- Understand technical terminology associated with painting and decorating
- Provide written communication in the form of notes, letters, and forms of business documentation.
- Provide oral communication to work with key stakeholders
- Devise drawings, specifications, schedules, risk assessments and method statements linked to the use of digital formats for presentation purposes.
- Read and extract information from manufacturer and legislative regulation websites and documentation and apply to specific job specifications.
- The completion of requisite forms.

Digital Skills

- Use computer technology and use the skills of folder creation, open and save files, cut and paste and image processing to produce documentation such as safety posters and completion of accident data presentation, letters, estimates, invoices costing documentation and digital presentations. Bar charts and Gantt charts will also be completed for work programmes using digital technology
- Use word processing, PowerPoint and publishing software to complete presentation and forms. Use information data to produce charts graphs.
- Use of mobile apps used in AR, calculations and presentations.
- Understanding & use of CAD to produce basic drawings and presentations.
Core content
All aspects of the common core content can be related and contextualised on delivery in relation to this specialism.

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
  o Centres will need to ensure a realistic representation of decorating systems and components are available
  o The provision must represent the type of equipment currently available in the UK decorating industry
  o 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>Details</th>
<th>Email Address</th>
</tr>
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<tr>
<td><strong>UK learners</strong></td>
<td>General qualification information</td>
<td><a href="mailto:learnersupport@cityandguilds.com">learnersupport@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>International learners</strong></td>
<td>General qualification information</td>
<td><a href="mailto:intcg@cityandguilds.com">intcg@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Centres</strong></td>
<td>Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results</td>
<td><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>
<td><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>
<td><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>
<td><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>
<td><a href="mailto:business@cityandguilds.com">business@cityandguilds.com</a></td>
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