Level 2 Diploma in Wood Machining for Joinery Manufacture (6706-28)

September 2019 Version 2.0
Qualification at a glance

<table>
<thead>
<tr>
<th>Subject area</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>City &amp; Guilds number</td>
<td>6706-28</td>
</tr>
<tr>
<td>Age group approved</td>
<td>16-18, 19+</td>
</tr>
<tr>
<td>Entry requirements</td>
<td>None</td>
</tr>
<tr>
<td>Assessment</td>
<td>Multiple choice/assignment</td>
</tr>
<tr>
<td>Support materials</td>
<td>Centre handbook</td>
</tr>
<tr>
<td></td>
<td>Assessor guidance</td>
</tr>
<tr>
<td></td>
<td>Task manual</td>
</tr>
<tr>
<td>Registration and certification</td>
<td>Consult the Walled Garden/Online Catalogue for last dates</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title and level</th>
<th>GLH</th>
<th>TQT</th>
<th>City &amp; Guilds number</th>
<th>Accreditation number</th>
</tr>
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<td>Level 2 Diploma in Wood Machining for Joinery Manufacture</td>
<td>365</td>
<td>420</td>
<td>6706-28</td>
<td>601/3190/1</td>
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<table>
<thead>
<tr>
<th>Version and date</th>
<th>Change detail</th>
<th>Section</th>
</tr>
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<tbody>
<tr>
<td>1.1 July 2014</td>
<td>Centre staffing amended</td>
<td>Centre requirements</td>
</tr>
<tr>
<td>1.2 December 2015</td>
<td>Updated range for LO 1, 3 and 4 in unit 201/601</td>
<td>5. Units</td>
</tr>
<tr>
<td>2.0 September 2019</td>
<td>GLH and TQT added</td>
<td>To qualification at a glance</td>
</tr>
</tbody>
</table>
## Contents

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<td></td>
<td>Candidate entry requirements</td>
<td>7</td>
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<td>Initial assessment and induction</td>
<td>8</td>
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<tr>
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<td>Support materials</td>
<td>8</td>
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<td>Assessment</td>
<td>9</td>
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<td>Units</td>
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<td>Principles of machine manufactured joinery</td>
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<tr>
<td>Unit 201/601</td>
<td>Health, safety and welfare in construction</td>
<td>20</td>
</tr>
<tr>
<td>Unit 262</td>
<td>Setting and operating fixed sawing machines</td>
<td>26</td>
</tr>
<tr>
<td>Unit 263</td>
<td>Setting and operating fixed planing machines</td>
<td>31</td>
</tr>
<tr>
<td>Unit 264</td>
<td>Setting and operating fixed jointing machines</td>
<td>35</td>
</tr>
<tr>
<td>Unit 265</td>
<td>Setting and operating fixed profiling machines</td>
<td>39</td>
</tr>
<tr>
<td>Unit 266</td>
<td>Setting and operating fixed sanding machines</td>
<td>44</td>
</tr>
<tr>
<td>Unit 267</td>
<td>Setting and operating NC/CNC machines</td>
<td>48</td>
</tr>
<tr>
<td>Appendix 1</td>
<td>Sources of general information</td>
<td>51</td>
</tr>
</tbody>
</table>
1 Introduction

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

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who is the qualification for?</td>
<td>It is for candidates who work or want to work as Wood Machinists.</td>
</tr>
<tr>
<td>What does the qualification cover?</td>
<td>It allows candidates to learn, develop and practice the skills required for employment and/or career progression in Wood Machining.</td>
</tr>
<tr>
<td></td>
<td>It covers the setting and operating of machines for the following activities:</td>
</tr>
<tr>
<td></td>
<td>• sawing</td>
</tr>
<tr>
<td></td>
<td>• planing</td>
</tr>
<tr>
<td></td>
<td>• jointing</td>
</tr>
<tr>
<td></td>
<td>• profiling</td>
</tr>
<tr>
<td>What opportunities for progression are there?</td>
<td>It allows candidates to progress into employment as a Wood Machinist in the Construction Sector.</td>
</tr>
</tbody>
</table>
**Structure**

To achieve the **Level 2 Diploma in Wood Machining for Joinery Manufacture (6706-28)**, learners must achieve **42** credits from the mandatory units below. Learners may also achieve up to **13** credits from the elective units, however this will not contribute towards achievement of the overall qualification.

<table>
<thead>
<tr>
<th>Unit accreditation number</th>
<th>City &amp; Guilds unit number</th>
<th>Unit title</th>
<th>Credit value</th>
<th>Guided Learning Hours (GLH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y/506/2202</td>
<td>Unit 131</td>
<td>Principles of machine manufactured joinery</td>
<td>5</td>
<td>42</td>
</tr>
<tr>
<td>A/504/6719</td>
<td>Unit 201/601</td>
<td>Health, safety and welfare in construction</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>T/506/2207</td>
<td>Unit 262</td>
<td>Setting and operating fixed sawing machines</td>
<td>8</td>
<td>64</td>
</tr>
<tr>
<td>A/506/2208</td>
<td>Unit 263</td>
<td>Setting and operating fixed planing machines</td>
<td>7</td>
<td>58</td>
</tr>
<tr>
<td>T/506/2501</td>
<td>Unit 264</td>
<td>Setting and operating fixed jointing machines</td>
<td>7</td>
<td>61</td>
</tr>
<tr>
<td>M/506/2206</td>
<td>Unit 265</td>
<td>Setting and operating fixed profiling machines</td>
<td>8</td>
<td>70</td>
</tr>
<tr>
<td>T/506/2210</td>
<td>Unit 266</td>
<td>Setting and operating fixed sanding machines</td>
<td>6</td>
<td>50</td>
</tr>
<tr>
<td>F/506/2212</td>
<td>Unit 267</td>
<td>Setting and operating NC/CNC machines</td>
<td>7</td>
<td>61</td>
</tr>
</tbody>
</table>
2 Centre requirements

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

Resource requirements

Physical resources and site agreements
Centres will have well equipped workshops with a comprehensive range of hand and portable power tools that meet current industry standards. All powered equipment should be well maintained and PAT certified. All machinery shall be to industrial standards and comply with current regulations.

Centre staffing
All staff who assess (tutor/deliver) these qualifications must:
• have recent relevant experience in the specific area they will be teaching;
• be technically competent in the area for which they are delivering training and/or have experience of providing training;
• have a CV available demonstrating relevant experience and any qualifications held.

All staff who quality assure these qualifications must:
• have a good working knowledge and experience within the construction industry;
• have an established strategy and documentary audit trail of internal quality assurance;
• have a good working knowledge of quality assurance procedures;
• have a CV available demonstrating relevant experience and any qualifications held.

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

Continuing professional development (CPD)
Centres must support their staff to ensure that they have current knowledge of the occupational area, that delivery, mentoring, training, assessment and verification is in line with best practice, and that it takes account of any national or legislative developments.
Candidate entry requirements
City & Guilds does not set entry requirements for these qualifications. However, centres must ensure that candidates have the potential and opportunity to gain the qualifications successfully.

Age restrictions
City & Guilds cannot accept any registrations for candidates under 16 as these qualifications are not approved for under 16s.
3 Delivering the qualification

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

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

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

Support materials
The following resources are available for this qualification:

<table>
<thead>
<tr>
<th>Description</th>
<th>How to access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessor guidance</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
<tr>
<td>Task manual</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
<tr>
<td>Qualification Approval Form</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
</tbody>
</table>
## Assessment

<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Assessment method</th>
<th>Where to obtain assessment materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>131</td>
<td>Principles of machine manufactured joinery</td>
<td>City &amp; Guilds e-volve multiple choice test or on demand externally marked paper. The test covers all of the knowledge in the unit.</td>
<td>Examinations provided on e-volve, or question papers ordered via Walled Garden.</td>
</tr>
<tr>
<td>201</td>
<td>Health, safety and welfare in construction</td>
<td>City &amp; Guilds e-volve multiple choice test or on demand externally marked paper. The test covers all of the knowledge in the unit.</td>
<td>Examinations provided on e-volve, or question papers ordered via Walled Garden.</td>
</tr>
<tr>
<td>262</td>
<td>Setting and operating fixed sawing machines</td>
<td>Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes.</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
<tr>
<td>263</td>
<td>Setting and operating fixed planing machines</td>
<td>Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes.</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
</tbody>
</table>

Both assessments are set by City & Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City & Guilds to make sure they are properly carried out.
<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
<th>Assessment method</th>
<th>Where to obtain assessment materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>264</td>
<td>Setting and operating fixed jointing machines</td>
<td>Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes.</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
<tr>
<td>265</td>
<td>Setting and operating fixed profiling machines</td>
<td>Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes.</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
<tr>
<td>266</td>
<td>Setting and operating fixed sanding machines</td>
<td>Multiple choice question paper, covering knowledge outcomes. Practical assignment, covering performance outcomes.</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
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<thead>
<tr>
<th>Unit</th>
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<th>Assessment method</th>
<th>Where to obtain assessment materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>267</td>
<td>Setting and operating NC/CNC machines</td>
<td>Multiple choice question paper, covering knowledge outcomes.</td>
<td><a href="http://www.cityandguilds.com">www.cityandguilds.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Practical assignment, covering performance outcomes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both assessments are set by City &amp; Guilds, delivered and marked by the tutor/assessor, and will be externally verified by City &amp; Guilds to make sure they are properly carried out.</td>
<td></td>
</tr>
</tbody>
</table>

**Test specifications**

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

**Test 1:**

**Unit 201 Health, safety and welfare in construction**

**Duration:** 60 minutes

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>1 Know the health and safety regulations, roles and responsibilities</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td>2 Know accident and emergency reporting procedures and documentation</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>3 Know how to identify hazards in the workplace</td>
<td>7</td>
<td>17.5</td>
</tr>
<tr>
<td></td>
<td>4 Know about health and welfare in the workplace</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>5 Know how to handle materials and equipment safely</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>6 Know about access equipment and working at heights</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>7 Know how to work with electrical equipment in the workplace</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>8 Know how to use personal protective equipment (PPE)</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>9 Know the cause of fire and fire emergency procedures</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
### Test 2:
**Unit 131 Principles of machine manufactured joinery**
**Duration:** 70 minutes

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>131</td>
<td>1 know timber, timber products and conversion methods</td>
<td>10</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>2 Know how to communicate and interpret information used in joinery manufacture</td>
<td>17</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>3 Know how to mark out for joinery products</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>4 Know how to plan for safe machining operations</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>35</td>
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</table>

### Test 3:
**Unit 262 Setting and operating fixed sawing machines**
**Duration:** 40 minutes

<table>
<thead>
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<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>262</td>
<td>1 Know the principles of using sawing machines safely</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>2 Know how to change blades for sawing machines</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>4 Understand how to set up and operate sawing machines</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

### Test 4:
**Unit 263 Setting and operating fixed planing machines**
**Duration:** 30 minutes

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>263</td>
<td>1 Know the principles of using planing machines safely</td>
<td>7</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>2 Know how to change cutter knives for planing machines</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>4 Understand how to set up and operate planing machines</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Test 5:</td>
<td>Unit 264 Setting and operating fixed jointing machines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration:</td>
<td>30 minutes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>264</td>
<td>1 Know the principles of using jointing machines safely</td>
<td>9</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>2 Know how to change tooling for jointing machines</td>
<td>5</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>4 Understand how to set up and operate jointing machines</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test 6:</th>
<th>Unit 265 Setting and operating fixed profiling machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>40 minutes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>265</td>
<td>1 Understand tools and materials used for manufacturing bench joinery products</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>2 Understand how to prepare for manufacturing bench joinery products</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>4 Understand how to set up and operate profiling machines</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test 7:</th>
<th>Unit 266 Setting and operating fixed sanding machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>266</td>
<td>1 Know the principles of using sanding machines safely</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>2 Know how to change abrasives for sanding machines</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>4 Understand how to set up and operate sanding machines</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Test 8: Unit 267 Setting and operating NC/CNC machines
Duration: 30 minutes

<table>
<thead>
<tr>
<th>Unit</th>
<th>Outcome</th>
<th>Number of questions</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>267</td>
<td>1 Know the principles of using sanding machines safely</td>
<td>7</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>2 Know how to change abrasives for sanding machines</td>
<td>5</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>4 Understand how to set up and operate sanding machines</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
5 Units

Availability of units

The following units can also be obtained from The Register of Regulated Qualifications: [http://register.ofqual.gov.uk/Unit](http://register.ofqual.gov.uk/Unit)

Structure of units

These units each have the following:
- City & Guilds reference number
- unit accreditation number (UAN)
- title
- level
- credit value
- guided learning hours
- unit aim
- learning outcomes which are comprised of a number of assessment criteria

Range explained

Range gives further scope on what areas within the assessment criteria must be covered. The range in a unit must be taught to learners and parts of the range will be assessed.
Unit 131  Principles of machine manufactured joinery

UAN: Y/506/2202
Level: 1
Credit value: 5
GLH: 42
Endorsement by a sector or regulatory body: This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.

Aim: The aim of this unit is to provide the learner with the knowledge of:
- timber used in machine manufactured joinery
- how to communicate and interpret information
- how to mark out for joinery products
- how to plan for safe machining operations.

Learning outcome
The learner will:
1. know timber, timber products and conversion methods.

Assessment criteria
The learner can:
1.1 identify types of timber
1.2 identify types of manufactured boards
1.3 identify standard sizes of materials
1.4 identify methods of timber conversion
1.5 identify defects found in timber
1.6 state methods of drying timber.

Range
Timber
Softwoods (European red wood, white wood, Douglas fir, yellow pine) and hardwoods (oak, mahogany, meranti, sapele, ulite, teak, iroko, beech, ash, maple, cherry).

Manufactured boards
medium density fibre board (MDF), plywood, orientated strand board (OSB), chipboard, hardboard.
Materials
Softwoods, hardwoods, manufactured boards.

Methods (1.4)
Quarter sawn, through and through, tangential, boxed heart.

Defects
Natural (sloping grain, knots, shakes, upset, waney edge, resin pockets, foreign bodies, decay, pith, blue stain, insect infestation); seasoning (cupping, winding, twist, case hardening, bowing, springing, collapse).

Methods (1.6)
Air, klin, to appropriate moisture content.

Learning outcome
The learner will:
2. know how to communicate and interpret information used in joinery manufacture.

Assessment criteria
The learner can:
2.1 state job roles within the joinery manufacturing industry
2.2 identify documents used to communicate information within the joinery manufacturing industry
2.3 identify information sources required for setting out joinery products
2.4 state the methods of checking accuracy of information
2.5 state types of discrepancies that can be identified when setting out.
2.6 identify component parts of joinery products
2.7 identify sectional details of joinery component parts
2.8 identify joints used in the construction of joinery products.

Range
Job roles
Designer/architect, manager, workshop supervisor, surveyor/setter out, draftsman/CAD operator, marker out, machinist, bench joiner, estimator, CNC programmer, CNC operator.

Documents
Risk assessments, work restrictions, method statement, production plans, authorised operator lists, legislation.

Information sources
working drawings, job sheets, specifications, schedules, technical and manufacturers' information, Building Regulations, patterns, cutting lists.

Joinery products (2.3)
Doors, door and window frames, staircases, linings, units, mouldings (skirting, architraves, dado).

Methods
Drawings match each other, match requirements (ironmongery requirements, Building Regulations), measurements given on the drawings match the existing work and the customer’s requirements.

**Discrepancies**
measurement errors, incorrect drawing details, design issues.

**Component parts (2.6)**

*Frames and linings*: heads, cills, jambs, transoms, Mullions.

*Doors and sashes*: stiles, rails (bottom, middle, top, frieze intermediate), glazing bars, meeting rails, muntins, panels, glazing beads, bed and bolection mouldings.

*Stairs*: strings, treads, risers, string cappings, balusters, newels, hand rails, nosings, wedges, glue blocks.

*Units*: ends, sides, shelves, tops, standards/end panels, plinths, rails (top, front, fascia), divisions, drawers, back panels, doors, posts.

**Joinery products (2.6)**
Doors, door and window frames, staircases, linings, units.

**Component parts (2.7)**

*Frames*: heads, cills, jambs, transoms, Mullions.

*Doors and sashes*: stiles, rails (bottom, middle, top, frieze intermediate), glazing bars, meeting rails, muntins, panels, glazing beads, bed and bolection mouldings.

*Stairs*: treads, string cappings, hand rails, nosings.

**Joints**
Mortice and tenon (haunched, long and short shoulder, double, scribed), finger, halving (cross, tee), widening (tongue and groove, loose tongue, but, reversible glue joint, biscuit, dowel), housing (through, stopped, tongued), dovetail (through and lapped), comb.

**Joinery products (2.8)**
Doors, door and window frames, staircases, linings, units.

### Learning outcome

The learner will:

3. know how to mark out for joinery products.

### Assessment criteria

The learner can:

3.1 identify tools and information sources required for marking out for joinery components

3.2 state the purpose of using face side and face edge marks

3.3 state methods of marking out joints and sections on timber components.

### Range

**Tools**
Mortice gauge, marking gauge, try square, combination square, sliding bevel, box square, tape measure, rule.

**Information sources**
Setting out rod, cutting list.
Methods
use of patterns, templates, marking in pairs, minimisation of waste, removal of defects within sections.

Learning outcome
The learner will:
4. know how to plan for safe machining operations.

Assessment criteria
The learner can:
4.1 state the requirements of a wood machining environment
4.2 state the operations that can be carried out on woodworking machines
4.3 state the machining order for producing joinery components.

Range
Requirements
Efficient machine shop layout, non-slip flooring, dust extraction, good house-keeping, appropriate lighting, appropriate temperature

Woodworking machines
Sawing, planing, jointing, profiling, finishing.
Unit 201/601  Health, safety and welfare in construction

UAN: A/504/6719
Level: 2
Credit value: 7
GLH: 70
Endorsement by a sector or regulatory body: This unit is endorsed by Construction Skills, the Sector Skills Council for the construction industry.

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

Learning outcome
The learner will:
1. know the health and safety regulations, roles and responsibilities

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

Range
Health and safety legislation
Health and Safety at Work Act, Reporting Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), Control of Substances Hazardous to Health (COSHH), Construction, Design and Management (CDM) regulations, Provision and Use of Work Equipment Regulations (PUWER), manual handling operations Regulations, Personal Protective Equipment (PPE) at Work Regulations, Work at Height Regulations, Control of Noise at Work Regulations, Control of Vibration at Work Regulations, Electricity at Work Regulations, Lifting operations and Lifting Equipment Regulations (LOLER)

Employer responsibilities
Safe working environment, adequate staff training, health and safety information, site inductions, toolbox talks, risk assessment, supervision, PPE, reporting hazards, accidents and near misses, sections 2 to 9 of Health and Safety at Work Act, CDM reg’s, construction phase plans, welfare, display public liability Insurance and health and safety law poster.

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

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

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

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

**Range**

**Types of emergencies**
Fires, security incidents, gas leaks.

**Records:**
Accident book, first aid records, organisational records and documentation.

**Authorised personnel**
First aiders, supervisors/managers, health and safety executive, emergency services, safety officer.
### Actions
Area made safe, call for help, emergency services.

### Learning outcome
The learner will:
3. know how to identify hazards in the workplace

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

### Range
**Good housekeeping:**
Cleanliness, tidiness, use of skips and chutes, segregation of materials, clear access to fire escapes, clear access to fire extinguishers.

**Types of hazards:**
Fires, slips, trips and falls, hazardous substances (relating to inhalation, absorption, exposure, ingestion, cross-contamination), electrical, asbestos, manual handling, plant and vehicle movement, adverse weather.

**Signs and safety notices:**
Prohibition, mandatory, warning, safe condition, supplementary.

### Learning outcome
The learner will:
4. know about health and welfare in the workplace

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

### Range
**Precautions**
Reducing noise at source, PPE, isolation, exposure time.

**Risks**
Reduced risk perception, loss of concentration, balance problems, absenteeism and reduced productivity.
### Learning outcome
The learner will:

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<tbody>
<tr>
<td>5.</td>
<td>know how to handle materials and equipment safely</td>
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</table>

### Assessment criteria
The learner can:

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<tr>
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<tbody>
<tr>
<td>5.1</td>
<td>identify legislation relating to safe handling of materials and equipment</td>
</tr>
<tr>
<td>5.2</td>
<td>state procedures for safe lifting and manual handling activities in accordance with guidance and legislation</td>
</tr>
<tr>
<td>5.3</td>
<td>state the importance of using <strong>lifting aids</strong> when handling materials and equipment.</td>
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</tbody>
</table>

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

### Learning outcome
The learner will:

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<tbody>
<tr>
<td>6.</td>
<td>know about access equipment and working at heights</td>
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### Assessment criteria
The learner can:

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<tr>
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<tbody>
<tr>
<td>6.1</td>
<td>identify legislation relating to working at heights</td>
</tr>
<tr>
<td>6.2</td>
<td>identify types of <strong>access equipment</strong></td>
</tr>
<tr>
<td>6.3</td>
<td>state <strong>safe methods</strong> of use for <strong>access equipment</strong></td>
</tr>
<tr>
<td>6.4</td>
<td>identify <strong>dangers</strong> of working at height.</td>
</tr>
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</table>

### Range
**Access equipment:**
Stepladders, ladders (pole, extension), trestles, hop-ups, proprietary scaffolding, podium, stilts

**Safe methods**
Regular inspection, check for broken, damaged or missing components, responsible use, consideration of adverse weather conditions, good housekeeping

**Dangers**
Falling tools, falling equipment, falling materials, persons falling from height (injuries to themselves and others).

### Learning outcome
The learner will:

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<tr>
<td>7.</td>
<td>know how to work with electrical equipment in the workplace</td>
</tr>
</tbody>
</table>

### Assessment criteria
The learner can:
### 7.1
State precautions to take to avoid risks to self and others when working with electrical equipment.

### 7.2
State dangers of using electrical equipment.

### 7.3
Identify voltages and voltage colour coding that are used in the workplace.

### 7.4
State methods of storing electrical equipment.

#### Range

**Precautions**
Check leads, check plugs, use of cable hangers, check tools and equipment, current valid PAT certificate.

**Dangers:**
Burns, electrocution, fire.

**Voltages**
Battery powered, 110/115 volts, 230/240 volts and 415 volts.

**Methods**
Components present, equipment cleaned, checked for damage, stored in a clean and secure location.

#### Learning outcome
The learner will:

8. Know how to use Personal Protective Equipment (PPE)

#### Assessment criteria
The learner can:

8.1 State the legislation governing use of Personal Protective Equipment (PPE)

8.2 State types of PPE used in the workplace

8.3 State the importance of PPE

8.4 State why it is important to store, maintain and use PPE correctly

8.5 State the importance of checking and reporting damaged PPE.

#### Range

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

#### Learning outcome
The learner will:

9. Know the cause of fire and fire emergency procedures

#### Assessment criteria
The learner can:

9.1 State elements essential to creating a fire

9.2 Identify methods of fire prevention
9.3 state actions to be taken on discovering a fire
9.4 state **types of fire extinguishers** and their uses.

<table>
<thead>
<tr>
<th>Range</th>
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<tbody>
<tr>
<td><strong>Elements</strong></td>
</tr>
<tr>
<td>Oxygen, fuel, heat.</td>
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</table>

**Types of fire extinguishers:**
Water, foam, CO2, dry powder.
Unit 262

Setting and operating fixed sawing machines

UAN: T/506/2207
Level: 2
Credit value: 8
GLH: 64
Endorsement by a sector or regulatory body: This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.

Aim: The aim of this unit is to provide the learner with the knowledge and skills to set and operate fixed sawing machines.

Learning outcome
The learner will:
10. know the principles of using sawing machines safely.

Assessment criteria
The learner can:
10.1 describe the requirements of current legislation applicable to sawing machines
10.2 state operations carried out on sawing machines
10.3 identify components of sawing machines
10.4 describe pre-start checks in relation to sawing machines
10.5 state dust extraction requirements for sawing machines
10.6 describe safety aids and features of sawing machines.

Range

Current legislation
Provision and Use of Work Equipment Regulations (PUWER), approved code of practice (ACoP), Health and Safety at work act, personal protective equipment at work (PPE), control of substances hazardous to health (COSHH), control of noise at work regulations, environmental regulations.

Operations
Dimensioning, trenching, mitre/compound cuts, bevelling, shaped cuts, saddle and jig work.

Sawing machines
Cross cut (radial arm, pullover type, travelling head), circular rip, dimension (wall and table), panel, narrow bandsaw, band re-saw.

Components
Guards (top/bottom, pressure, crown/top), extraction points, fences, riving knife, bed, blade, information plate, mouth piece, packings, finger plate, machine controls, adjusting mechanisms, scoring saw, thrust wheels, guides, tensioning and tracking adjustment.

**Pre-start checks**
Missing or damaged or incorrectly fitted guards, faulty or incorrectly fitted tooling and damage to equipment, riving knife (thickness, distance, height), debris in work area, correct blade tension, correct tracking, guide assembly correctly adjusted, report any faults to supervisor, scoring saw position, fence position.

**Safety aids**
Push sticks, jigs (saddle, wedge), false fence.

**Features**
Crown/top saw guard, riving knife, braking systems, isolation switch, outfeed table, power-feed, roller support, tables, wedge, safety interlocks.

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<tr>
<th>Learning outcome</th>
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<tbody>
<tr>
<td>The learner will:</td>
</tr>
<tr>
<td>11. know how to change blades for sawing machines.</td>
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<table>
<thead>
<tr>
<th>Assessment criteria</th>
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<tbody>
<tr>
<td>The learner can:</td>
</tr>
<tr>
<td>2.1 calculate minimum saw blade diameters for safe operation</td>
</tr>
<tr>
<td>2.2 identify the different <strong>characteristics</strong> of <strong>blades</strong> for sawing machines</td>
</tr>
<tr>
<td>2.3 identify <strong>parts</strong> of saw blades</td>
</tr>
<tr>
<td>2.4 state the sequence of changing blades for <strong>sawing machines</strong></td>
</tr>
<tr>
<td>2.5 state the handling and storage requirements for saw blades.</td>
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<thead>
<tr>
<th>Range</th>
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<tbody>
<tr>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td>Tooth geometry (top bevel type, positive, negative and neutral), tooth set (skip, swage, spring set), cutting action (crosscut, rip, combination), material (high speed steel, stellite, tungsten carbide tipped), expansion slots, noise reduction design.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Blades</th>
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<tbody>
<tr>
<td>Circular, band.</td>
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<table>
<thead>
<tr>
<th>Parts</th>
</tr>
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<tbody>
<tr>
<td>Root, top, face, back, point, heel, hook, gullet, tip, kerf.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sawing machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross cut, circular rip, dimension (wall and table), bandsaw (narrow and wide, including position, tracking and tension).</td>
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<tr>
<th>Learning outcome</th>
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<tbody>
<tr>
<td>The learner will:</td>
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</table>
12. be able to change blades on sawing machines.

Assessment criteria
The learner can:
12.1 carry out risk assessment for changing saw blades
12.2 select the type of saw blade for the operation being carried out
12.3 change saw blades using appropriate tools in accordance with manufacturer’s instructions
12.4 set saw blade position according to given specification
12.5 carry out pre-start checks
12.6 follow current environmental and relevant health and safety legislation relating to changing saw blades.

Range
Saw blades
Circular, narrow band.

Learning outcome
The learner will:
13. understand how to set up and operate sawing machines.

Assessment criteria
The learner can:
13.1 state information contained in a cutting list
13.2 describe the adjustments made to sawing machines
13.3 describe how to cut materials efficiently
13.4 state methods of cutting materials safely to given specifications.

Range
Information
Description of the item, quantity, material, length, width, thickness (sawn and planed), remarks, contract details, requirements according to current legislation and approved code of practice.

Adjustments
Appropriate blade height, appropriate angle, positioning of guards and fences in relation to saw blades and materials, guide assembly.

Methods
Cutting speeds, in-feeding of materials, position of materials to fence, feed speed, outfeed support, use of jigs and templates for straight and curved cuts, push sticks.

Learning outcome
The learner will:
14. be able to set up and operate sawing machines.

Assessment criteria
The learner can:
14.1 carry out risk assessment for cutting operations
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<tbody>
<tr>
<td>14.2</td>
<td>adjust saw blades, guards and fences to given specification</td>
</tr>
<tr>
<td>14.3</td>
<td>carry out pre-start checks</td>
</tr>
<tr>
<td>14.4</td>
<td>cut materials to given cutting list</td>
</tr>
<tr>
<td>14.5</td>
<td>follow current environmental and relevant health and safety legislation relating to cutting operations.</td>
</tr>
</tbody>
</table>
Unit 262  Setting and operating fixed sawing machines
Supporting information

Guidance
The unit contains two assessment criteria in relation to carrying out pre-start checks (Assessment Criteria 3.5 and 5.3). It is expected that learners should be able to carry out these checks both after changing saw blades and before operating a machine (regardless of whether saw blades have been changed or not).
Unit 263  Setting and operating fixed planing machines

UAN: A/506/2208
Level: 2
Credit value: 7
GLH: 58
Endorsement by a sector or regulatory body: This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.

Aim: The aim of this unit is to provide the learner with the knowledge and skills to set and operate fixed planing machines.

Learning outcome
The learner will:
1. know the principles of using planing machines safely.

Assessment criteria
The learner can:
1.1 describe the requirements of current legislation applicable to planing machines
1.2 state operations carried out on planing machines
1.3 identify components of planing machines
1.4 describe pre-start checks in relation to planing machines
1.5 state dust extraction requirements for planing machines
1.6 describe safety aids and features of planing machines.

Range
Current legislation
Provision and Use of Work Equipment Regulations (PUWER), Approved Code of Practice (ACoP), Health and Safety at Work etc Act, Personal Protective Equipment at Work (PPE), Control of Substances Hazardous to Health (COSHH), Control of Noise at Work Regulations, Environmental Regulations, Abrasive Wheel Regulations.

Operations
Facing, edging, bringing to size, tapering, bevelling.

Planing machines
Surfacer, thicknesser, combination, four-sided.

Components
Guards (bridge guard, shaw guard, electrically interlocked hoods and enclosures), extraction points, fences, bed, knives, information plate, machine controls, adjusting mechanisms, through feed rollers, anti-kickback fingers, pressure bars, sectional rollers, anti-friction rollers.

**Pre-start checks**
Missing or damaged or incorrectly fitted guards, faulty, incorrectly fitted or incorrectly set tooling, damage to equipment, extraction ports open, debris in work area, report any faults to supervisor, position of feed rollers.

**Safety aids**
Jigs, pushblock, saddles, push sticks.

**Features**
Braking systems, isolation switch, power-feed, roller support tables, anti-kickback fingers, safety interlocks, feed rollers.

**Learning outcome**
The learner will:
2. know how to change cutter knives for planing machines.

**Assessment criteria**
The learner can:
2.1 identify factors that affect cutter pitch
2.2 identify types of cutter knife for planing
2.3 identify types of knife securing mechanisms
2.4 state the sequence of changing cutter knives for planing machines
2.5 state the handling and storage requirements for cutter knives.

**Range**

**Factors**
Feed speed, number of knives, cutter block speed.

**Cutter knife**
Slotted, reversible/disposable, serrated back cutters.

**Learning outcome**
The learner will:
3. be able to change cutter knives on planing machines.

**Assessment criteria**
The learner can:
3.1 carry out risk assessment for changing cutter knives
3.2 select the type of cutter knives for the block in use
3.3 change cutter knives using appropriate tools in accordance with manufacturer’s instructions
3.4 reset machine tables
3.5 carry out pre-start checks
3.6 follow current environmental and relevant health and safety legislation relating to changing cutter knives.
## Learning outcome

The learner will:

4. understand how to set up and operate planing machines.

## Assessment criteria

The learner can:

4.1 describe the **adjustments** made to planing machines
4.2 describe how to plane materials efficiently
4.3 state **methods** of planing materials safely to given specifications.

## Range

### Adjustments

Depth of cut, angle, thickness, out-feed table, feed speed, anti-friction rollers, guards and fences.

### Methods

Cutting speeds, in-feeding of materials, position of materials to fence, feed speed, out-feed support, use of jigs, push blocks, planing with the grain, selection of appropriate tooling (Tungsten Carbide Tipped (TCT), High Speed Steel (HSS)).

## Learning outcome

The learner will:

5. be able to set up and operate planing machines.

## Assessment criteria

The learner can:

5.1 carry out risk assessment for planing operations
5.2 adjust feed speeds, guards and fences to given specification
5.3 carry out pre-start checks
5.4 produce planed components to given specification
5.5 follow current environmental and relevant health and safety legislation relating to planning operations.
Unit 263  Setting and operating fixed planing machines
Supporting information

Guidance
The unit contains two assessment criteria in relation to carrying out pre-start checks (Assessment Criteria 3.5 and 5.3). It is expected that learners should be able to carry out these checks both after changing cutter knives and before operating a machine (regardless of whether cutter knives have been changed or not).
Unit 264  Setting and operating fixed jointing machines

UAN: T/506/2501
Level: 2
Credit value: 7
GLH: 61
Endorsement by a sector or regulatory body: This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.

Aim: The aim of this unit is to provide the learner with the knowledge and skills to set and operate fixed jointing machines.

Learning outcome
The learner will:
1. know the principles of using jointing machines safely.

Assessment criteria
The learner can:
1.1 describe the requirements of current legislation applicable to jointing machines
1.2 state operations carried out on jointing machines
1.3 identify components of jointing machines
1.4 describe pre-start checks in relation to jointing machines
1.5 state dust extraction requirements for jointing machines
1.6 describe safety aids and features of jointing machines.

Range
Current legislation
Provision and Use of Work Equipment Regulations (PUWER), Approved Code of Practice (ACoP), Health and Safety at Work etc Act, Personal Protective Equipment at Work (PPE), Control of Substances Hazardous to Health (COSHH), Control of Noise at Work Regulations, Environmental Regulations, Abrasive Wheel Regulations.

Operations
Morticing, tenoning, scribing, trenching, dovetailing.

Jointing machines
Chain and chisel morticer, single-ended tenoner, double-ended tenoner, dovetailer, spindle moulder.

Components
Guards (pressure, false fences, finger fences), extraction points, fences, bed, knives, blocks, machine controls, adjusting mechanisms, holding devices, tensioning bar, chip breaker, depth stops.

**Pre-start checks**
Missing or damaged or incorrectly fitted guards, faulty or incorrectly fitted tooling and damage to equipment, extraction ports open, debris in work area, report any faults to supervisor, correct tooling speed.

**Safety aids**
Saddles, tilting piece.

**Features**
Guards, braking systems, isolation switch, roller support, tables, safety interlocks, holding devices, false beds, false fences, backing fence/saddle.

---

**Learning outcome**
The learner will:
2. know how to change tooling for jointing machines.

**Assessment criteria**
The learner can:
2.1 identify types of tooling for jointing machines
2.2 identify component parts of tooling
2.3 state the sequence of changing tooling for jointing machines
2.4 state the handling and storage requirements for tooling.

**Range**

**Tooling**
Chisel, cutter heads and blocks, chains, cut off saw, tenoning head.

**Component parts**
Chisels, augers, chains, chain bars, sprockets, bushes/collars and collets, chuck, knives, shoulder and scribing cutters.

**Jointing machines**
Chain and chisel morticer, single-ended tenoner, double-ended tenoner dovetailer, spindle moulder.

---

**Learning outcome**
The learner will:
3. be able to change tooling for jointing machines.

**Assessment criteria**
The learner can:
3.1 carry out risk assessment for changing tooling
3.2 select tooling for the operation being carried out
3.3 change tooling using appropriate tools in accordance with manufacturer’s instructions
3.4 carry out pre-start checks
3.5 follow current environmental and relevant health and safety legislation relating to changing tooling.

**Learning outcome**

The learner will:

4. understand how to set up and operate jointing machines.

**Assessment criteria**

The learner can:

4.1 describe the *adjustments* made to *jointing machines*

4.2 state *methods* of jointing materials safely to given specifications.

**Range**

**Adjustments**

Height, projection, auger clearance, head and block vertical/horizontal positioning, guards, cramping devices, fences, length stops, depth stop, position to marking out/gauge lines, cut off saw.

**Jointing machines**

Chain and chisel morticer, single-ended tenoner, double-ended tenoner dovetailer, spindle moulder.

**Methods**

Use of test pieces, false fences, backing fences, saddles, tilting pieces, use of stops, roller support/stand.

**Learning outcome**

The learner will:

5. be able to set up and operate jointing machines.

**Assessment criteria**

The learner can:

5.1 carry out risk assessment for jointing operations

5.2 adjust jointing machines to produce joints to given specification

5.3 adjust guards and cramping

5.4 carry out pre-start checks

5.5 produce jointed components

5.6 follow current environmental and relevant health and safety legislation relating to jointing operations.
Unit 264  Setting and operating fixed jointing machines
Supporting information

Guidance
The unit contains two assessment criteria in relation to carrying out pre-start checks (Assessment Criteria 3.4 and 5.4). It is expected that learners should be able to carry out these checks both after changing tooling and before operating a machine (regardless of whether tooling has been changed or not).
Unit 265  Setting and operating fixed profiling machines

<table>
<thead>
<tr>
<th>UAN:</th>
<th>M/506/2206</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
<td>2</td>
</tr>
<tr>
<td>Credit value:</td>
<td>8</td>
</tr>
<tr>
<td>GLH:</td>
<td>70</td>
</tr>
<tr>
<td>Endorsement by a sector or regulatory body:</td>
<td>This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.</td>
</tr>
<tr>
<td>Aim:</td>
<td>The aim of this unit is to provide the learner with the knowledge and skills to set and operate fixed profiling machines.</td>
</tr>
</tbody>
</table>

### Learning outcome

The learner will:

1. know the principles of using profiling machines safely.

### Assessment criteria

The learner can:

1.1 describe the requirements of current legislation applicable to profiling machines

1.2 state operations carried out on profiling machines

1.3 identify components of profiling machines

1.4 describe pre-start checks in relation to profiling machines

1.5 state dust extraction requirements for profiling machines

1.6 describe safety aids and features of profiling machines.

### Range

**Current legislation**

Provision and Use of Work Equipment Regulations (PUWER), approved code of practice (ACoP), Health and Safety at work act, personal protective equipment at work (PPE), control of substances hazardous to health (COSHH), control of noise at work regulations, environmental regulations.

**Operations**

Rebating, grooving, bevelling, moulding/profiling, end/edge jointing, chamfers, trenching, shaping.

**Profiling machines**

Spindle moulders, overhead routers, through-feed moulders.

**Components**
Guards (bonnet, cage, hood, pressure, false fences, finger fences, electrically interlocked enclosures), extraction points, fences, bed, machine controls, adjusting mechanisms, guides, table rings, sliding table, compound table, spindle, spacing rings, collets, pins, mechanical feed, foot treadle, turret/depth stops, mechanical break, frequency changer.

Pre-start checks
Missing or damaged or incorrectly fitted guards, faulty or incorrectly fitted tooling and damage to equipment, correct air pressure, extraction ports open, correct frequency selected, debris in work area, report any faults to supervisor, correct cutter speeds.

Safety aids
Push sticks, jigs, push blocks, spikes, feather boards.

Features
Safety interlocks, braking systems, isolation switch, out-feed table, power-feed, roller support, tables.

Learning outcome
The learner will:
2. know how to change tooling for profiling machines.

Assessment criteria
The learner can:
2.1 identify information sources on tooling for profiling
2.2 describe types of tooling for profiling machines
2.3 identify types of cutter profiles
2.4 state the sequence of changing tooling for profiling machines
2.5 state the handling and storage requirements for tooling.

Range

Information sources
Manufacturers’ instructions (manual/power feed, tooling speeds), specifications, drawings, setting out rods, manufacturers’ catalogues.

Tooling
Solid profile blocks, removable, disposable, limited projection tooling, router cutters (fluted, panel, profile), serrated, Tungsten Carbide Solid/Tipped (TCT), High Speed Steel (HSS), Polycrystalline Diamond (PCD).

Cutter profiles
Ovolo, torus, bullnose, chamfer, bevelled, ogee, grooving, rebated.

Profiling machines
Spindle moulders, overhead routers, through-feed moulders.
### Learning outcome
The learner will:
3. be able to change tooling on profiling machines.

### Assessment criteria
The learner can:
3.1 carry out risk assessment for changing tooling
3.2 select the type of tooling for the operation being carried out
3.3 change tooling using appropriate tools in accordance with manufacturer’s instructions
3.4 carry out pre-start checks
3.5 follow current environmental and relevant health and safety legislation relating to changing tooling.

### Learning outcome
The learner will:
4. understand how to set up and operate profiling machines.

### Assessment criteria
The learner can:
4.1 state information required to produce profiles
4.2 describe the adjustments made to profiling machines
4.3 describe how to profile materials efficiently
4.4 state methods of profiling materials safely to given specifications.

### Range

**Information**
Patterns, marking out, drawings, specifications, manufacturer's catalogue, setting out rod.

**Adjustments**
Appropriate height, appropriate angle, depth of cut, feed speeds, fences, guards, false fences, hood, finger fence, ring fence, bonnet guard, top and side pressures, table rings, holding devices, stops, frequency selection, spindle speed.

**Methods**
In-feeding of materials, position of materials to fence, out-feed support, use of jigs, templates and back stops for straight, curved and stopped work, packing pieces for staged cuts, use of feather boards and false fences, fence stops.

### Learning outcome
The learner will:
5. be able to set up and operate profiling machines.

### Assessment criteria
The learner can:
5.1 carry out risk assessment for profiling operations
5.2 set up profiling machine to given specification
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3</td>
<td>carry out pre-start checks</td>
</tr>
<tr>
<td>5.4</td>
<td>produce trial cuts safely</td>
</tr>
<tr>
<td>5.5</td>
<td>produce profiled materials to given specification</td>
</tr>
<tr>
<td>5.6</td>
<td>follow current environmental and relevant health and safety legislation relating to profiling operations.</td>
</tr>
</tbody>
</table>
**Unit 265 Setting and operating fixed profiling machines**

Supporting information

**Guidance**
The unit contains two assessment criteria in relation to carrying out pre-start checks (Assessment Criteria 3.4 and 5.3). It is expected that learners should be able to carry out these checks both after changing tooling and before operating a machine (regardless of whether tooling has been changed or not).
Unit 266

Setting and operating fixed sanding machines

UAN: T/506/2210
Level: 2
Credit value: 6
GLH: 50
Endorsement by a sector or regulatory body: This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.

Aim: The aim of this unit is to provide the learner with the knowledge and skills to set and operate fixed sanding machines.

Learning outcome

The learner will:
1. Know the principles of using sanding machines safely

Assessment criteria

The learner can:
1.1 describe the requirements of current legislation applicable to sanding machines
1.2 state operations carried out on sanding machines
1.3 identify components of sanding machines
1.4 describe pre-start checks in relation to sanding machines
1.5 state dust extraction requirements for sanding machines
1.6 describe safety aids and features of sanding machines.

Range

Current legislation
Provision and Use of Work Equipment Regulations (PUWER), approved code of practice (ACoP), Health and Safety at work act, personal protective equipment at work (PPE), control of substances hazardous to health (COSHH), control of noise at work regulations, environmental regulations.

Operations
Sanding, shaping, thicknessing, profiling.

Sanding machines
Wide belt, narrow belt, disc, bobbin, profile.

Components
Abrasives (belt, disc, roll), guards (pressure), extraction points, fences, bed, machine controls, adjusting mechanisms, guides, tensioning, sliding table,
spindle, mechanical feed, discs, drums, sensors, interlocks, setting devices, measuring devices, pneumatic tensioning devices.

**Pre-start checks**
Damaged/worn abrasives, correctly fitted abrasives, correct pneumatic pressures, missing/damaged/incorrectly fitted guards, debris in work area, extraction, correct dimensional settings, feed belt condition, report any faults to supervisor.

**Safety aids**
Push sticks, jigs, push blocks, hand pressure pad.

**Features**
Safety interlocks, limit switch, braking systems, isolation switch, out-feed table, roller support, tables.

<table>
<thead>
<tr>
<th>Learning outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner will:</td>
</tr>
<tr>
<td>2. know how to change abrasives for sanding machines.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner can:</td>
</tr>
<tr>
<td>2.1 identify <strong>information sources</strong> on abrasives for sanding</td>
</tr>
<tr>
<td>2.2 describe different types of <strong>abrasive material</strong> used for sanding machines</td>
</tr>
<tr>
<td>2.3 identify appropriate grit grades for sanding operations</td>
</tr>
<tr>
<td>2.4 state the sequence of changing abrasives for <strong>sanding machines</strong></td>
</tr>
<tr>
<td>2.5 state the handling and storage requirements for abrasive materials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information sources</strong></td>
</tr>
<tr>
<td>Machine manufacturers’ information, abrasives manufacturers’ information (rotation direction and grit size), specifications, back of the belt (rotation direction and grit size).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Abrasive material</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral, ceramic, aluminium oxide, silicon carbide, garnet, paper, cloth, open coat, closed coat, antistatic properties.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Sanding machines</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide belt, narrow belt, disc, bobbin, profile.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner will:</td>
</tr>
<tr>
<td>3. be able to change abrasives on sanding machines.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner can:</td>
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<tr>
<td>3.1 carry out risk assessment for changing abrasives</td>
</tr>
<tr>
<td>3.2 select the type of abrasive for the operation being carried out.</td>
</tr>
</tbody>
</table>
3.3 change abrasives using appropriate methods in accordance with manufacturer's instructions
3.4 carry out pre-start checks
3.5 follow current environmental and relevant health and safety legislation relating to changing abrasives.

**Learning outcome**
The learner will:
4. understand how to set up and operate sanding machines.

**Assessment criteria**
The learner can:
4.1 describe the adjustments made to sanding machines
4.2 state methods of sanding materials safely to given specifications
4.3 state methods of using sanding machines efficiently
4.4 identify problems that can occur during sanding.

**Range**

**Adjustments**
Appropriate height, appropriate angle, feed speeds, fences, guards, top and side pressures, holding devices, stops, dimension settings, belt tracking.

**Methods (4.2)**
In-feeding of materials, position of materials to fence, out-feed support, use of jigs and holding devices for straight and shaped work.

**Methods (4.3)**
Maintaining cutting efficiency of abrasives, removal of sanding dust with vacuum cleaners, efficient machine loading (for wide belt sanders), use of abrasive cleaning stick.

**Problems**
Machine malfunction, detached disc, clogging, tearing and shredding of abrasive materials, burning, snaking, glazing, ejection of material.

**Learning outcome**
The learner will:
5. be able to set up and operate sanding machines.

**Assessment criteria**
The learner can:
5.1 carry out risk assessment for sanding operations
5.2 set up sanding machine to given specification
5.3 carry out pre-start checks
5.4 carry out sanding to given specification
5.5 follow current environmental and relevant health and safety legislation relating to sanding operations.
Unit 266 Setting and operating fixed sanding machines
Supporting information

Guidance
The unit contains two assessment criteria in relation to carrying out pre-start checks (Assessment Criteria 3.4 and 5.3). It is expected that learners should be able to carry out these checks both after changing abrasives and before operating a machine (regardless of whether abrasives have been changed or not).
Unit 267  Setting and operating NC/CNC machines

<table>
<thead>
<tr>
<th>UAN:</th>
<th>F/506/2212</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level:</td>
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<td>Credit value:</td>
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<td>GLH:</td>
<td>61</td>
</tr>
<tr>
<td>Endorsement by a sector or regulatory body:</td>
<td>This unit is endorsed by ConstructionSkills, the Sector Skills Council for the construction industry.</td>
</tr>
</tbody>
</table>

**Aim:**
The aim of this unit is to provide the learner with the knowledge and skills to set and operate NC/CNC machines.

**Learning outcome**
The learner will:
1. know the principles of using NC/CNC machines safely.

**Assessment criteria**
The learner can:
1.1 describe the requirements of current legislation applicable to NC/CNC machines
1.2 state operations carried out on NC/CNC machines
1.3 identify NC/CNC-specific components
1.4 describe pre-start checks in relation to NC/CNC machines
1.5 state dust extraction requirements for NC/CNC machines
1.6 describe safety aids and features of NC/CNC machines.

**Range**

**Current legislation**
Provision and Use of Work Equipment Regulations (PUWER), approved code of practice (ACoP), Health and Safety at work act, personal protective equipment at work (PPE), control of substances hazardous to health (COSHH), control of noise at work regulations, environmental regulations.

**Operations**
Profiling, shaping, planing, jointing, sawing, optimised cutting, boring, sanding edgebanding.

**NC/CNC machines**
Machining centres, routers, tenoners, beam saws, panel/cross cut saws, multi-boring machines, through feed moulding machines, spindle moulders, cutter template makers, lathe, sanders and edgebanders.
NC/CNC-specific components
Computer, hard drive, Visual Display Unit (VDU), digital readout, matrix table, vacuum pods, tool store, adjustable stops, keyboard.

Pre-start checks
Correct pneumatic pressures, correct position of pneumatic clamping devices, missing/damaged/incorrectly fitted guards, debris in work area, extraction, correct program selection, correct holding device, correct tooling, correct tooling speeds, tool path simulation, program proving, sufficient vacuum seal, maintenance schedule adhered to, report any faults to supervisor.

Safety aids
Feeding and holding devices, push sticks, jigs, push blocks.

Features
Safety interlocks, limit switch, braking systems, isolation switch, out-feed table, roller support, tables, power feeds, pressure mats, double push button operation.

Learning outcome
The learner will:
2. understand how to set up and operate NC/CNC machines.

Assessment criteria
The learner can:
2.1 state the set up sequence for NC/CNC machines.
2.2 state the sequence of operating NC/CNC machines.
2.3 identify problems that can occur during the operation of NC/CNC machines.

Range
Set up sequence
Correct isolation procedure/use of safe condition, select appropriate program, check materials against program, setup vacuum table/pods, feeding and holding devices to suit components to be machined, adjust stops to locate position of components, confirm correct tooling, confirm calibration of machine axis if applicable, safely load/feed workpieces, turn on local exhaust ventilation.

Sequence of operating
Accurate positioning of components, activate vacuum/clamping device/feed mechanism, activate machine cycle/feed workpieces, safely unload materials (CNC router), check component against specification.

Problems
Vacuum failure, program error, incorrect program selection, incorrect tool selection, inaccurate positioning of components, incorrect position of pods or holding devices, incorrect feed settings, damaged or blunt cutters, incorrect component finish.
<table>
<thead>
<tr>
<th>Learning outcome</th>
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</thead>
<tbody>
<tr>
<td>The learner will:</td>
</tr>
<tr>
<td>3. be able to set up and operate NC/CNC machines.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>The learner can:</td>
</tr>
<tr>
<td>3.1 carry out risk assessment for using NC/CNC machines</td>
</tr>
<tr>
<td>3.2 set up NC/CNC machines to given specification</td>
</tr>
<tr>
<td>3.3 carry out pre-start checks</td>
</tr>
<tr>
<td>3.4 operate NC/CNC machines to produce components to given specification</td>
</tr>
<tr>
<td>3.5 follow current environmental and relevant health and safety legislation relating to the use of NC/CNC machines.</td>
</tr>
</tbody>
</table>
Appendix 1  Sources of general information

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

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

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

Our Quality Assurance Requirements encompasses all of the relevant requirements of key regulatory documents such as:

- Regulatory Arrangements for the Qualifications and Credit Framework (2008)
- SQA Awarding Body Criteria (2007)

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
- Qualifications and Credit Framework (QCF): general guidance about the QCF and how qualifications will change, as well as information on the IT systems needed and FAQs
• **Events**: dates and information on the latest Centre events
• **Online assessment**: how to register for e-assessments.
Useful contacts

<table>
<thead>
<tr>
<th>Service</th>
<th>Contact Information</th>
</tr>
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<tbody>
<tr>
<td><strong>UK learners</strong></td>
<td>T: +44 (0)844 543 0033</td>
</tr>
<tr>
<td>General qualification information</td>
<td>E: <a href="mailto:learnersupport@cityandguilds.com">learnersupport@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>International learners</strong></td>
<td>T: +44 (0)844 543 0033</td>
</tr>
<tr>
<td>General qualification information</td>
<td>F: +44 (0)20 7294 2413</td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:intcg@cityandguilds.com">intcg@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Centres</strong></td>
<td>T: +44 (0)844 543 0000</td>
</tr>
<tr>
<td>Exam entries, Certificates,</td>
<td>F: +44 (0)20 7294 2413</td>
</tr>
<tr>
<td>Registrations/enrolment, Invoices,</td>
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<tr>
<td>Missing or late exam materials,</td>
<td></td>
</tr>
<tr>
<td>Nominal roll reports, Results</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E: <a href="mailto:centresupport@cityandguilds.com">centresupport@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Single subject qualifications</strong></td>
<td>T: +44 (0)844 543 0000</td>
</tr>
<tr>
<td>Exam entries, Results, Certification,</td>
<td>F: +44 (0)20 7294 2413</td>
</tr>
<tr>
<td>Missing or late exam materials,</td>
<td>F: +44 (0)20 7294 2404 (BB forms)</td>
</tr>
<tr>
<td>Incorrect exam papers, Forms</td>
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<td>request (BB, results entry), Exam</td>
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<tr>
<td></td>
<td>E: <a href="mailto:singlesubjects@cityandguilds.com">singlesubjects@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>International awards</strong></td>
<td>T: +44 (0)844 543 0000</td>
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<tr>
<td>Results, Entries, Enrolments,</td>
<td>F: +44 (0)20 7294 2413</td>
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<td>materials, Nominal roll reports</td>
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<tr>
<td></td>
<td>E: <a href="mailto:intops@cityandguilds.com">intops@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Walled Garden</strong></td>
<td>T: +44 (0)844 543 0000</td>
</tr>
<tr>
<td>Re-issue of password or username,</td>
<td>F: +44 (0)20 7294 2413</td>
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<td>Results, e-assessment, Navigation,</td>
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<tr>
<td></td>
<td>E: <a href="mailto:walledgarden@cityandguilds.com">walledgarden@cityandguilds.com</a></td>
</tr>
<tr>
<td><strong>Employer</strong></td>
<td>T: +44 (0)121 503 8993</td>
</tr>
<tr>
<td>Employer solutions, Mapping,</td>
<td>E: <a href="mailto:business@cityandguilds.com">business@cityandguilds.com</a></td>
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<tr>
<td>Accreditation, Development Skills,</td>
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<td>Consultancy</td>
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<td></td>
<td>T: +44 (0)844 543 0000</td>
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<td>F: +44 (0)20 7294 2413</td>
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<tr>
<td><strong>Publications</strong></td>
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<td>Logbooks, Centre documents,</td>
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<tr>
<td>Forms, Free literature</td>
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About City & Guilds
As the UK’s leading vocational education organisation, City & Guilds is leading the talent revolution by inspiring people to unlock their potential and develop their skills. We offer over 500 qualifications across 28 industries through 8500 centres worldwide and award around two million certificates every year. City & Guilds is recognised and respected by employers across the world as a sign of quality and exceptional training.

City & Guilds Group
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