IVQs in Construction (6161)

City & Guilds

Level 1 IVQ Certificate in
– Timber Vocations (6161-02) (500/5789/3)
– Trowel Vocations (6161-03) (500/5792/3)
– Painting and Decorating (6161-04) (500/5793/5)
– Plumbing (6161-05) (500/6023/5)
– Refrigeration and Air Conditioning (6161-06) (500/6024/7)
– Electrical Installation (6161-07) (500/6022/3)
– Preservation Skills (6161-08) (500/5788/1)

Qualification handbook for centres

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Contents

Important notice

Following the accreditation of the IVQs in Construction (6161) on the National Qualifications Framework of England, Wales and Northern Ireland (NQF), some changes have been made to the qualification, at the request of the Office of the Qualifications and Examinations Regulator (Ofqual), the qualifications regulator in England.

These changes took effect on 1 June 2009 and are outlined on pages 05–07.

Note: the content of the qualifications has not changed following accreditation.

Changes to the qualification titles
The qualification titles have changed as follows:

Certificate in Timber Vocations (6161-02)
changed to
Level 1 IVQ Certificate in Timber Vocations (6161-02)
Accreditation number: 500/5789/3

Certificate in Trowel Vocations (6161-03)
changed to
Level 1 IVQ Certificate in Trowel Vocations (6161-03)
Accreditation number: 500/5792/3

Certificate in Painting and Decorating (6161-04)
changed to
Level 1 IVQ Certificate in Painting and Decorating (6161-04)
Accreditation number: 500/5793/5

Certificate in Plumbing (6161-05)
changed to
Level 1 IVQ Certificate in Plumbing (6161-05)
Accreditation number: 500/6023/5

Certificate in Refrigeration and Air Conditioning (6161-06)
changed to
Level 1 IVQ Certificate in Refrigeration and Air Conditioning (6161-06)
Accreditation number: 500/6024/7

Certificate in Electrical Installation (6161-07)
changed to
Level 1 IVQ Certificate in Electrical Installation (6161-07)
Accreditation number: 500/6022/3

Certificate in Preservation Skills – Timber Vocations (6161-08)
changed to
Level 1 IVQ Certificate in Preservation Skills (Timber Vocations) (6161-08)
Accreditation number: 500/5788/1

Certificate in Preservation Skills – Trowel Vocations (6161-08)
changed to
Level 1 IVQ Certificate in Preservation Skills (Trowel Vocations) (6161-08)
Accreditation number: 500/5788/1

Certificate in Preservation Skills – Painting and Decorating (6161-08)
changed to
Level 1 IVQ Certificate in Preservation Skills (Painting and Decorating) (6161-08)
Accreditation number: 500/5788/1

Changes to the unit titles
Following the accreditation of IVQs in Construction, each unit has been given an accreditation reference number which will appear on the Certificate of Unit Credit.

The content of the units is unchanged.

Level 1 IVQ Certificate in Timber Vocations (6161-02)
Accreditation number: 500/5789/3

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
J/502/2732 – Timber Vocations 1 Practice

Optional units (one required)
L/502/2733 – Trowel Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice
Y/502/2735 – Plumbing Basic Skills Practice
D/502/2736 – Refrigeration and Air Conditioning Basic Skills Practice
H/502/2737 – Electrical and Electronic Basic Skills Practice

Level 1 IVQ Certificate in Trowel Vocations (6161-03)
Accreditation number: 500/5792/3

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
K/502/2738 – Trowel Vocations 1 Practice

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice
Y/502/2735 – Plumbing Basic Skills Practice
D/502/2736 – Refrigeration and Air Conditioning Basic Skills Practice
H/502/2737 – Electrical and Electronic Basic Skills Practice

Level 1 IVQ Certificate in Painting and Decorating (6161-04)
Accreditation number: 500/5793/5

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
M/502/2742 – Painting and Decorating 1 Practice

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
L/502/2733 – Trowel Vocations Basic Skills Practice
Y/502/2735 – Plumbing Basic Skills Practice
D/502/2736 – Refrigeration and Air Conditioning Basic Skills Practice
H/502/2737 – Electrical and Electronic Basic Skills Practice

Level 1 IVQ Certificate in Plumbing (6161-05)
Accreditation number: 500/6023/5

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
T/502/2743 – Plumbing 1 Practice

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
L/502/2733 – Trowel Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice
D/502/2736 – Refrigeration and Air Conditioning Basic Skills Practice
H/502/2737 – Electrical Installation Basic Skills Practice

Level 1 IVQ Certificate in Refrigeration and Air Conditioning (6161-06)
Accreditation number: 500/6024/7

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
A/502/2744 – Refrigeration and Air Conditioning 1 Practice

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
L/502/2733 – Trowel Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice
Y/502/2735 – Plumbing Basic Skills Practice
H/502/2737 – Electrical Installation Basic Skills Practice

Level 1 IVQ Certificate in Electrical Installation (6161-07)
Accreditation number: 500/6022/3

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
F/502/2745 – Electrical Installation 1 Practice

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
L/502/2733 – Trowel Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice
Y/502/2735 – Plumbing Basic Skills Practice
D/502/2736 – Refrigeration and Air Conditioning Basic Skills Practice

Level 1 IVQ Certificate in Preservation Skills (Timber Vocations) (6161-08)
Accreditation number: 500/5788/1

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
J/502/2732 – Timber Vocations 1 Practice
L/502/2747 – Preservation Competency (Timber Vocations)

Optional units (one required)
L/502/2733 – Trowel Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice

Level 1 IVQ Certificate in Preservation Skills (Trowel Vocations) (6161-08)
Accreditation number: 500/5788/1

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
K/502/2738 – Trowel Vocations 1 Practice
J/502/2746 – Preservation Competency (Trowel Vocations)

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
R/502/2734 – Painting and Decorating Basic Skills Practice

Level 1 IVQ Certificate in Preservation Skills (Painting and Decorating) (6161-08)
Accreditation number: 500/5788/1

Mandatory units
J/502/2729 – Core Construction Skills Principles
A/502/2730 – Basic Construction Skills Principles
F/502/2731 – Core Construction Skills Practice
M/502/2742 – Painting and Decorating 1 Practice
Y/502/2749 – Preservation Competency (Painting and Decorating)

Optional units (one required)
M/502/2739 – Timber Vocations Basic Skills Practice
L/502/2733 – Trowel Vocations Basic Skills Practice

Registration for theory examination
Registration process for the theory examination has not changed.

Result submission for practical assessment
Result submission process for the practical assessments has not changed.

Change to the grading
The grade 'Credit' has been changed to 'Merit'. All other grades are unchanged. The content of the units concerned is also unchanged.

Notification of Candidate Results (NCR) and Certificate of Unit Credit (CUC)
Notification of Candidate Results (NCR) and Certificate of Unit Credit (CUCs) continue to be available on completion of each assessment (theory or practical).

Final certificate will be issued on successful completion of all the required assessments.

Changes to the certificate layout
Certificates issued on completion of an accredited IVQ show the accredited title and the accreditation number for the qualification. The level in the accredited title refers to the NQF level the qualification is accredited at.

The certificate also lists all the units achieved, including the grade and the unit accreditation number.

The certificate carries the logos of the regulatory authorities in England, Wales and Northern Ireland indicating that the NQF accreditation only applies to these countries.

Levels of City & Guilds qualifications

All City & Guilds qualifications are part of an integrated progressive structure of awards arranged over eight levels, allowing people to progress from foundation to the highest level of professional competence. Senior awards, at levels 4 to 7, recognise outstanding achievement in industry, commerce and the public services. They offer a progressive vocational, rather than academic, route to professional qualifications. An indication of the different levels and their significance is given below.

NQF level#	City & Guilds qualifications/programmes	Other qualifications*
8	Fellowship (FCGI)	Doctorate
7	Membership (MCGI) Master Professional Diploma Level 5 vocational awards NVQ/SVQ Level 5	Master's Degree Postgraduate Diploma Postgraduate Certificate
6	Graduateship (GCGI) Associateship (ACGI)**	Bachelor's Degree Graduate Certificate and Diploma
5	Level 5 IVQ Advanced Technician Diploma Full Technological Diploma	Higher National Diplomas Foundation Degree Diplomas of Higher and Further Education
4	Licentiateship (LCGI) Higher Professional Diploma Level 4 vocational awards NVQ/SVQ Level 4	Certificate of Higher Education
3	Level 3 IVQ Advanced Diploma Level 3 IVQ Specialist Advanced Diploma*** Level 3 IVQ Technician Diploma Level 3 vocational awards NVQ/SVQ Level 3	A Level Scottish Higher Advanced National Certificate in Education BTEC National Certificate/Diploma
2	Level 2 IVQ Diploma Level 2 IVQ Specialist Diploma*** Level 2 IVQ Technician Certificate Level 2 vocational awards NVQ/SVQ Level 2	GCSE grades A*-C Scottish Intermediate 2/Credit S Grade BTEC First Certificate
1	Level 1 IVQ Certificate Level 1 vocational awards NVQ/SVQ Level 1	GCSE grades D-G Scottish Intermediate 1/General S Grade Scottish Access 1 and 2

\# National Qualifications Framework of England, Wales and Northern Ireland (NQF)
* Broad comparability in level
** Only graduates of the City & Guilds College, Imperial College of Science, Technology and Medicine, are awarded the Associateship (ACGI)
*** Part of a new qualification structure which is being introduced across the IVQ provision
IVQ International Vocational Qualifications
NVQ National Vocational Qualifications

About City & Guilds

We provide assessment and certification services for schools and colleges, business and industry, trade associations and government agencies in more than 100 countries. We have 120 years of experience in identifying training needs, developing assessment materials, carrying out assessments and training assessment staff. We award certificates to people who have shown they have mastered skills that are based on world-class standards set by industry. City & Guilds International provides a particular service to customers around the world who need high-quality assessments and certification.

Introduction to this programme

We have designed the Awards in the Construction Industry programme for those undergoing training or employed in these areas of work. The programme aims to reflect the international nature of the knowledge and skills and activities needed for different countries or cultures.

We do not say the amount of time a candidate would need to carry out the programme, but we do provide advice on guided learning hours for each level (see below). The programme has three related levels.

Certificate
The certificate (about 360 guided learning hours) provides a broad introduction to the theory and practical side of construction for a front-line worker on a construction site.

Diploma
The diploma (about 360 guided learning hours) provides specialised skills and knowledge in any one of the six crafts covered by this programme at an appropriate level for a person who will be working independently.

Advanced diploma
The advanced diploma (about 360 guided learning hours) takes these skills to the level appropriate for a person preparing for or working in a supervisory role.

We stress that these figures are only a guideline and that we award certificates and diplomas for gaining and showing skills by whatever mode of study, and not for periods of time spent in study.

We provide certificates for all work-related areas at seven levels within our structure of awards shown in appendix C. This programme covers level 1. The standards and assessments for the diploma (level 2) and the advanced diploma (level 3) are published separately.

Making entries for assessments

Candidates can only be entered for the assessments in this subject if the approved examination centres agree. Candidates must enter through an examination centre we have approved to carry out the assessments for 6161 Awards in the Construction Industry.

There are two ways of entering candidates for assessments.

Internal candidates
Candidates can enter for examinations if they are taking or have already finished a course at a school, college or similar training institution that has directed their preparation, whether by going to a training centre, working with another institution, or by open learning methods.

External candidates
These are candidates who have not finished a programme as described above. The examination centres must receive their application for entry well before the date of the examination concerned. This allows them to act on any advice you give about assessment arrangements or any further preparation needed. External candidates must carry out practical assignments and projects if necessary, and they will need extra time and guidance to make sure that they meet all the requirements for this part of the assessment.

In this publication we use the term 'centre' to mean a school, college, place of work or other institution.

Resources

If you want to use this programme as the basis for a course, you must read this booklet and make sure that you have the staff and equipment to carry out all parts of the programme. If there are no facilities for realistic practical work, we strongly recommend that you develop links with local industry to provide opportunities for hands-on experience.

Assessments

There is one level of this award.

Certificate

We use a numbering system to allow entries to be made for our awards. The numbers used for this programme are as follows.

Award numbers
6161-
02 Certificate in Timber Vocations
03 Certificate in Trowel Vocations
04 Certificate in Painting and Decorating
05 Certificate in Plumbing
06 Certificate in Refrigeration and Air Conditioning
07 Certificate in Electrical Installation
08 Certificate in Preservation Skills

We use award numbers to describe the subject and level of the award.

Component numbers
001 Core Skills Principles
002 Basic Construction Skills Principles
008 Preservation Competency
101 Core Skills Practice
102 Timber Vocations Basic Skills Practice
103 Trowel Vocations Basic Skills Practice
104 Painting and Decorating Basic Skills Practice
105 Plumbing Basic Skills Practice
106 Refrigeration and Air Conditioning Basic Skills Practice
107 Electrical Installation Basic Skills Practice
112 Timber Vocations 1 Practice
113 Trowel Vocations 1 Practice
114 Painting and Decorating 1 Practice
115 Plumbing 1 Practice
116 Refrigeration and Air Conditioning 1 Practice
117 Electrical Installation 1 Practice

We use component numbers to show units for which we may award a certificate of unit credit.

We use these numbers throughout this booklet. You must use these numbers correctly if you send forms to us.

Certificate in Timber Vocations
To carry out what is needed for the Certificate in Timber Vocations, candidates must be successful in all of the following assessments.

6161-02-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-02-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-02-101] Core Skills Practice

[6161-02-112] Timber Vocations 1 Practice
(Total two written papers)

And in any one of the following practical assessments.

[6161-02-103] Trowel Vocations Basic Skills Practice

[6161-02-104] Painting and Decorating Basic Skills Practice

[6161-02-105] Plumbing Basic Skills Practice

[6161-02-106] Refrigeration and Air Conditioning Basic Skills Practice

[6161-02-107] Electrical Installation Basic Skills Practice

The practical assessment is carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Trowel Vocations
To carry out what is needed for the Certificate in Trowel Vocations, candidates must be successful in all of the following assessments.

6161-03-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-03-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-03-101] Core Skills Practice

[6161-03-113] Trowel Vocations 1 Practice
(Total two written papers)

And in any one of the following practical assessments.

[6161-03-102] Timber Vocations Basic Skills Practice

[6161-03-104] Painting and Decorating Basic Skills Practice

[6161-03-105] Plumbing Basic Skills Practice

[6161-03-106] Refrigeration and Air Conditioning Basic Skills Practice

[6161-03-107] Electrical Installation Basic Skills Practice

The practical assessment is carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Painting and Decorating
To carry out what is needed for the Certificate in Painting and Decorating, candidates must be successful in all of the following assessments.

6161-04-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-04-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-04-101] Core Skills Practice

[6161-04-114] Painting and Decorating 1 Practice
(Total two written papers)

And in any one of the following practical assessments.

[6161-04-102] Timber Vocations Basic Skills Practice

[6161-04-103] Trowel Vocations Basic Skills Practice

[6161-04-105] Plumbing Basic Skills Practice

[6161-04-106] Refrigeration and Air Conditioning Basic Skills Practice

[6161-04-107] Electrical Installation Basic Skills Practice

The practical assessment is carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Plumbing
To carry out what is needed for the Certificate in Plumbing, candidates must be successful in all of the following assessments.

6161-05-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-05-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-05-101] Core Skills Practice

[6161-05-115] Plumbing 1 Practice
(Total two written papers)

And in any one of the following practical assessments.

[6161-05-102] Timber Vocations Basic Skills Practice

[6161-05-103] Trowel Vocations Basic Skills Practice

[6161-05-104] Painting and Decorating Basic Skills Practice

[6161-05-106] Refrigeration and Air Conditioning Basic Skills Practice

[6161-05-107] Electrical Installation Basic Skills Practice

The practical assessment is carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Refrigeration and Air Conditioning
To carry out what is needed for the Certificate in Refrigeration and Air Conditioning, candidates must be successful in all of the following assessments.

6161-06-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-06-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-06-101] Core Skills Practice

[6161-06-116] Refrigeration and Air Conditioning 1 Practice
(Total two written papers)

And in any one of the following practical assessments.

[6161-06-102] Timber Vocations Basic Skills Practice

[6161-06-103] Trowel Vocations Basic Skills Practice

[6161-06-104] Painting and Decorating Basic Skills Practice

[6161-06-105] Plumbing Basic Skills Practice

[6161-06-107] Electrical Installation Basic Skills Practice

The practical assessment is carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Electrical Installation
To carry out what is needed for the Certificate in Electrical Installation, candidates must be successful in all of the following assessments.

6161-07-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-07-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-07-101] Core Skills Practice

[6161-07-117] Electrical Installation 1 Practice (Total two written papers)

And in any one of the following practical assessments.

[6161-07-102] Timber Vocations Basic Skills Practice

[6161-07-103] Trowel Vocations Basic Skills Practice

[6161-07-104] Painting and Decorating Basic Skills Practice

[6161-07-105] Plumbing Basic Skills Practice

[6161-07-106] Refrigeration and Air Conditioning Basic Skills Practice

The practical assessment is carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Preservation Skills (Trowel Vocations)
To carry out what is needed for the Certificate in Preservation Skills (Trowel Vocations) award, candidates must be successful in the following assessments.

[6161-08-008] Preservation Competency (Trowel Vocations)

Additionally candidates must be successful in all of the following assessments in the Construction Industry (6161) certificate level programme.

6161-03-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-03-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-03-101] Core Skills Practice

[6161-03-113] Trowel Vocations 1 Practice (Total two written papers)

And in any one of the following practical assessments.

[6161-03-102] Timber Vocations Basic Skills Practice

[6161-03-104] Painting and Decorating Basic Skills Practice

The practical assessments are carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Preservation Skills (Timber Vocations)
To carry out what is needed for the Certificate in Preservation Skills (Timber Vocations) award, candidates must be successful in the following assessments.

[6161-08-008] Preservation Competency (Timber Vocations)

Additionally candidates must be successful in all of the following assessments in the Construction Industry (6161) certificate level programme.

6161-02-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-02-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-02-101] Core Skills Practice

[6161-02-112] Timber Vocations 1 Practice (Total two written papers)

And in any one of the following practical assessments.

[6161-02-103] Painting and Decorating Basic Skills

[6161-02-104] Trowel Vocations Basic Skills

The practical assessments are carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

Certificate in Preservation Skills (Painting and Decorating)
To carry out what is needed for the Certificate in Preservation Skills (Painting and Decorating) award, candidates must be successful in the following assessments.

[6161-08-001] Preservation Competency (Painting and Decorating)

Additionally candidates must be successful in all of the following assessments in the Construction Industry (6161) certificate level programme.

6161-04-001 Core Skills Principles (written multiple choice paper which lasts one hour)

6161-04-002 Basic Construction Skills Principles (written multiple choice paper which lasts one and a half hours)

[6161-04-101] Core Skills Practice

[6161-04-114] Painting and Decorating 1 Practice (Total two written papers)

And in any one of the following practical assessments.

[6161-04-102] Timber Vocations Basic Skills Practice

[6161-04-104] Trowel Vocations Basic Skills Practice

The practical assessments are carried out during the learning programme and should be finished by the date of the written examination so you can send all the results to us. (See appendix B.)

We provide assessments in two ways.

a Fixed date
These are assessments which are carried out on dates and times we set. These assessments have no brackets around their numbers.

b Free date
These are assessments which are carried out at a college or other training establishment on a date or over a period which the college chooses. These assessments have brackets around their numbers.

In this programme the written assessment is fixed date. The practical assessments are free date.

You must carry out assessments according to our International Directory of Examinations and Assessments. If there are any differences between information in this publication and the current directory, the Directory has the most up-to-date information.

Results and certification

Everyone who enters for our certificates, diplomas and advanced diplomas receives a 'Notification of Candidate Results' giving details of how they performed.

If candidates successfully finish any assessment within this programme (for example, the examination paper) they will receive a certificate of unit credit towards the certificate for which they are aiming. We grade practical and course work assessments as pass or fail. We grade written assessments on the basis of fail, pass, credit or distinction. The certificate of unit credit will not mention assessments which they do not enter, which they failed or from which they were absent.

Each certificate clearly states what candidates need for full certification at the relevant level, allowing schools, colleges and employers to see whether they have met the full requirements.

If candidates successfully finish all the requirements for a full certificate, they will automatically receive the appropriate certificate.

We will send the 'Notification of Candidate Results', certificates of unit credit and certificates to the examination centre to be awarded to successful candidates. It is your responsibility to give the candidates the certificates. If candidates have a question about the results and certificates, they must contact you. You may then contact us if necessary.

We will also send you a results list showing how all candidates performed.

How to offer this programme

To offer this programme you must get approval from us. There are two categories of approval.

Subject approval
We give approval to offer a teaching course based on this syllabus.

Examination centre approval
We give approval to enter candidates for examinations.

To be approved by us to offer a teaching course you must send us the application form.

To enter candidates for examinations you must be approved by us as an examination centre. For this programme it is possible to act as a registered examination centre only, and accept external candidates. Approved examination centres must provide suitable facilities for taking examinations, secure places to keep the examination papers and materials, and may have an appointed Visiting Verifier to review practical work.

After we have received and accepted an application, we will send an approval letter confirming this. You can then send entries in at any time using the International Directory of Examinations and Assessments for guidance.

Please note that in this section we have provided an overview of centre approval procedures. Please refer to the current issue of 'Delivering International Qualifications – Centre Guide' for full details of each aspect of these procedures.

Other infromation

Designing courses of study

Candidates for the Awards in the Construction Industry will have come from different backgrounds and will have different employment and training experiences. We recommend the following:

- carry out an assessment of the candidates' achievements so you can see what learning they already have and decide the level of entry they will need; and
- consider what learning methods and places will best suit them.

When you assess a candidate's needs, you should design teaching programmes that consider:

- what, if any, previous education qualifications or training the candidate has, especially in the various general vocational education certificates we provide; and
- what, if any, previous practical experience the candidate has which is relevant to the aims of the programme and from which they may have learned the relevant skills and knowledge.

When you choose learning methods and places, you should consider the results of your assessments and whether the following are available.

- Open or distance learning material.
- Workplace learning that can be carried out on site or between you and a local workplace. This will allow the candidates access to specialised equipment and work experience.
- Working with other registered centres to share facilities.
- Opportunities for co-operative learning between candidates who need to gain similar skills.

As long as the candidates meet the aims of this learning programme the structures of courses of study are up to you. So, it is possible to include extra topics that meet local needs.

You should avoid teaching theory alone. As far as possible the practical work should be closely related to work in the classroom so that candidates use their theory in a realistic work environment. You can use formal lectures in the classroom with appropriate exercises and demonstrations. Candidates should keep records of the practical work they do so they can refer to it at a later date.

We assume that you will include core skills, such as numeracy, communication, working with people, and organisation and planning throughout a teaching programme.

Presentation format of units

Practical competences
Each module starts with a section on practical competences which shows the practical skills candidates must have.

At times we give more detail about important words in each 'competence statement'.

For example:

'1.10a Identify the various types of protective clothing/equipment and their uses.
Protective clothing: overalls, ear defenders/plugs, safety boots, knee pads, gloves/gauntlets, hard hats, particle masks, glasses/ goggles/visors'

In the above statement the words 'protective clothing' are given as a range which the candidate should be familiar with. If a range starts with the abbreviation 'eg' the candidates only need to cover some of the ranged areas or you can use suitable alternatives.

Knowledge requirements
Immediately after the section on practical competences the module tells you what knowledge is needed for that area. The knowledge needed is closely linked to the practical competences, so it is best to teach the two together so that the candidate appreciates the topic more.

Practical assessments
The end of each unit contains practical assessments which deal with the practical competences we mentioned earlier. Candidates must carry out the practical assessments. You should make sure all practical assessments are supervised and instructors should make sure that the results reflect the candidate's own performance. You must hold all the evidence in a file (portfolio) for each candidate for eight weeks after the application for a certificate. You must also keep separate records of the dates of all attempts by each candidate.

Entry levels

We consider the following programme to be relevant preparation for this programme.

Numeracy (3750)

We also consider the following Pitman Qualifications award as relevant alongside this programme.

English for Speakers of Other Languages – intermediate level

Progression routes and recognition

We have a range of related programmes for onward progression. These include:

Technician Certificate in Construction (6165)
Diploma Awards in The Construction Industry (6161)
Advanced Diploma Awards in The Construction Industry (6161).

A number of UK universities and other higher-education institutions may accept success in this programme combined with the Diploma and Advanced Diploma awards towards evidence for direct entry onto higher-level programmes. The decision to accept a candidate on to a degree programme, and the level of entry, is up to the institution. We provide details of organisations recognising achievement in this programme.

Useful publications

We can provide a list of suggested text books covering specific areas of this programme. We may also have knowledge about other support materials. You should make sure that you have the latest information. We will automatically send updated lists to centres we have approved to offer this programme.

Syllabus
IVQ in Construction Industry 6161

Unit numbers

1a Core Skills: Safety at Work

Introduction

The aim of this module is to introduce the candidate to:

a safe working within their own area of work
b the prevention of hazards.

Practical competences

The candidate must be able to do the following:

1.1a Carry out basic first aid treatments in simulated conditions.
Treatments: shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries

1.2a Select correct equipment and carry out basic fire fighting techniques in simulated conditions.
Equipment: fire extinguishers (water, CO_2, foam, powder), sand/water bucket, blanket, fire hose
Simulations: wood/paper, oil/spirit, electrical

1.3a Participate in emergency procedures.
Procedures: raising alarms, alarm types, safe/efficient evacuation, means of escape, assembly points

1.4a Carry out manual handling operations.
Handling: lifting techniques, mechanical lifting devices

1.5a Select and use protective clothing and equipment as applicable to the task.
Protective clothing: overalls, ear defenders/plugs, safety boots, knee pads, gloves/gauntlets, safety helmet (hard hat), particle masks, glasses/goggles/visors
Equipment: machine guards, residual current devices

1.6a Apply good housekeeping practices at all times.
Practices: clean/tidy work areas, removal/disposal of waste products, protect surfaces

1.7a Carry out risk assessments as applicable to the task and prepare a report identifying potential hazards.
Risk assessment: hazard identification, dangerous substances (adhesives, oils, greases, solvents, gases), site machinery, noise, reports

1.8a Prepare an accident report.
Report: name, date/time of incident, date/time of report, location, weather conditions, lighting conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/manager notified

1.9a Use all equipment, powered or hand operated, safely and in accordance with National Standards.

1.10a Correctly wire appliance plugs.

1.11a Use low level access equipment safely and in accordance with National Standards.

Knowledge requirements

The instructor must ensure the candidate is able to:

1.1a State the responsibilities of employers and employees for creating and maintaining a safe working environment.
Employers: safe working environment, tools, equipment, supervision, records, training
Employees: safe working practices

1.2a Identify the appropriate basic first aid treatments.
Treatments: shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries

1.3a State the essential contents of a first aid box.
Contents: bandages, plasters, eye bath, antiseptic, sling, tweezers, scissors

1.4a State the basic principles of fire and identify the different types of fire.
Principles of fire: heat, fuel, oxygen
Types: wood/paper, oil/spirit, electrical

1.5a Identify the types of fire fighting equipments and their uses.
Equipment: fire extinguishers (water, CO_2, foam, powder), sand/water bucket, blanket, fire hose
Uses: wood/paper, oil/spirit, electrical

1.6a Describe emergency procedures.
Procedures: raising alarms, alarm types, safe/efficient evacuation, means of escape, assembly points
Emergencies: fire drill, bomb warning

1.7a Describe the procedures for the safe storage of materials and fixings.
Procedures: loading, unloading, storage

1.8a Describe the methods for the safe handling of materials.

1.9a Identify the various types of protective clothing/equipment and their uses.
Protective clothing: overalls, ear defenders/plugs, safety boots, knee pads, gloves/gauntlets, safety helmet (hard hat), particle masks, glasses/goggles/visors
Equipment: machine guards, residual current devices

1.10a State the reasons for carrying out good housekeeping practices.
Practices: clean/tidy work areas, removal/disposal of waste products
Reasons: safety, efficiency, security

1.11a State the reasons for carrying out a risk assessment for all working practices.
Reasons: hazard identification, dangerous substances (adhesives, oils, greases, solvents, gases), site machinery, noise

1.12a Describe reporting procedures for risk assessment and hazards.
Procedures: written, verbal

1.13a State the contents of an accident report.
Contents: name, date/time of incident, date/time of report, location, weather conditions, lighting conditions, persons involved, sequence of events, injuries sustained, damage sustained, actions taken, witnesses, supervisor/ manager notified

1.14a Identify the sources of electrical danger and the methods of protection.
Sources: damaged (sockets, cables, plugs, equipment), incorrectly wired appliance plugs, water
Methods of protection: transformers, fuses, plugs, circuit breakers, double insulation, safe working practices

1.15a Identify the hazards associated with pneumatic equipment.
Hazards: directing the air jet at body/clothing

1.16a Describe the method of correctly wiring appliance plugs.
Method: use of colour coding, fuse rating

1.17a Identify low level access equipment.
Equipment: hop up stools, steps, trestles

1b Core Skills: Mathematics and Drawing

Introduction

The aim of this module is to introduce the candidate to:

a mathematical calculations
b drawing equipment
c construction drawings.

Practical competences

The candidate must be able to do the following:

Mathematics

1.1b Carry out calculations applied to whole and decimal numbers.
Calculation: addition, subtraction, multiplication, division

1.2b Read measuring equipment.
Equipment: rule, tape

1.3b Solve calculations, involving the use of an electronic calculator, applied to whole and decimal numbers.
Calculation: addition, subtraction, multiplication, division, square, square root, reciprocal

1.4b Calculate the areas and perimeters of various shapes.
Shapes: square, rectangle

1.5b Calculate percentage increases and decreases.

Drawing

1.6b Set out a drawing sheet to required standards with borders and title blocks.
Standards: eg national/local standards

1.7b Produce, read and work from scale drawings.
Scale: eg 1:1, 1:2 , 1:5, 1:10, 1:20, 1:50, 1:100, 1:500

1.8b Construct lines and angles using drawing equipment.
Equipment: rule, tee square, set square, protractor, scale rule, compasses

1.9b Bisect lines and angles using drawing equipment.

Knowledge requirements

The instructor must ensure the candidate is able to:

Mathematics

1.1b Identify calculations applied to whole and decimal numbers.
Calculation: addition, subtraction, multiplication, division

1.2b Identify the various types of basic linear measuring equipment.
Equipment: rule, tape

1.3b Identify calculations, involving the use of an electronic calculator, applied to whole and decimal numbers.
Calculations: addition, subtraction, multiplication, division, square, square root, reciprocal

1.4b Identify calculations involving the areas and perimeters of various shapes.
Shapes: square, rectangle

1.5b Identify calculations involving percentage increases and decreases.

Drawing

1.6b State the various equipments used in drawing.
Equipment: rule, tee square, set square, protractor, scale rule, compasses

1.7b Identify the symbols and abbreviations used in the construction industry.
Symbols/abbreviations: materials, fixtures/fittings, electrical, plumbing, heating

1.8b State the use of the scale ratios used in construction drawings.
Scale: 1:1, 1:2, 1:5, 1:10, 1:20, 1:50, 1:100, 1:500, 1:1250, 1:2500, 1:5000

1.9b Identify the various elements of a circle.
Parts: radius, diameter, circumference, chord, tangent, sector, segment, arc, radian

1c Core Skills: Communications and Information Technology

Introduction

The aim of this module is to introduce the candidate to:

a communication in the work place
b the use of information technology in the work place.

Practical competences

The candidate must be able to do the following:

Communications

1.1c Interpret drawings, specifications and other administrative documents.

1.2c Use different methods of communication to liaise with the building team.
Methods: oral, written

1.3c Receive customer requirements and promptly deal with them.
Receipt: orally (face to face), written, telephone

1.4c Fill out a daily/weekly diary or log of work activities.

1.5c Access and use technical information from different sources.
Sources: trade/suppliers catalogues, libraries

Information technology

1.6c Prepare a report identifying computer information technology system hardware.

1.7c Prepare a report identifying the use of computer information technology systems.
Use: word processing, database, spreadsheet, computer aided design (CAD), e-mail, internet

1.8c Prepare a report identifying the types of electronic communication system used in the construction industry.

Knowledge requirements

The instructor must ensure the candidate is able to:

Communications

1.1c Describe the various documents used in the construction industry.
Documents: location drawings, block plans, site plans, general location plans, component drawings, specifications, schedules, bill of quantities, conditions of contract, terms of employment

1.2c Describe the use of various site administration documents.
Documents: time sheets, day work sheets, orders/requisitions, delivery records, disciplinary rules

1.3c Identify the main types of communication used to liaise with staff.
Communications: verbal, written, drawings/diagrams, telephone, radio, signs, tannoy

1.4c Identify the main types of communication used to liaise with the customer.
Communications: verbal, written, telephone, fax, telex, e-mail

1.5c Describe the use of libraries and the selection of information from different sources.
Library: index, classification systems, document index/contents pages
Sources: appropriate to each stage of investigation, use of trade/suppliers' catalogues

1.6c List the members of the building team and explain their role in the industry.
Member: client, architect, surveyor, specialist engineers, clerk of works, local authority, health and safety personnel, building contractors, craftspeople, suppliers

Information technology

1.7c Identify computer information technology system hardware and software.
Hardware: computer, four stage model, memory, input devices, CD ROM, printers/plotters, visual display units/monitors, auxiliary storage systems, communication
Software: operating systems, word processing, database, spreadsheets

1.8c State the use of computer technology systems for word processing, databases and spreadsheets.
Word processor: letters, job application, curriculum vitae/résumé, instruction sheets, reports
Database: technical information, client records, employee records, legal requirements for the protection of data
Spreadsheets: financial planning

1.9c Identify the types of electronic communication system used in the construction industry.
Systems: telephone, telex, facsimile, e-mail, internet

1a Core Skills: Safety at Work

Practical competences

The candidate must be able to do the following:

1.1a	Carry out basic first aid treatments in simulated conditions.	☐
1.2a	Select correct equipment and carry out basic fire fighting techniques in simulated conditions.	☐
1.3a	Participate in emergency procedures.	☐
1.4a	Carry out manual handling operations.	☐
1.5a	Select and use protective clothing and equipment as applicable to the task.	☐
1.6a	Apply good housekeeping practices at all times.	☐
1.7a	Carry out risk assessments as applicable to the task and prepare a report identifying potential hazards.	☐
1.8a	Prepare an accident report.	☐
1.9a	Use all equipment, powered or hand operated, safely and in accordance with National Standards.	☐
1.10a	Correctly wire appliance plugs.	☐
1.11a	Use low level access equipment safely and in accordance with National Standards.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Practical competences

The candidate must be able to do the following:

Mathematics

1.1b Carry out calculations applied to whole and decimal numbers. ☐

1.2b Read measuring equipment. ☐

1.3b Solve calculations, involving the use of an electronic calculator, applied to whole and decimal numbers. ☐

1.4b Calculate the areas and perimeters of various shapes. ☐

1.5b Calculate percentage increases and decreases. ☐

Drawing

1.6b Set out a drawing sheet to required standards with borders and title blocks. ☐

1.7b Produce, read and work from scale drawings. ☐

1.8b Construct lines and angles using drawing equipment. ☐

1.9b Bisect lines and angles using drawing equipment. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

1c Core Skills: Communications and Information Technology

Practical competences

The candidate must be able to do the following:

Communications

1.1c Interpret drawings, specifications and other administrative documents. ☐

1.2c Use different methods of communication to liaise with the building team. ☐

1.3c Receive customer requirements and promptly deal with them. ☐

1.4c Fill out daily/weekly diary or log of work activities. ☐

1.5c Access and use technical information from different sources. ☐

Information technology

1.6c Prepare a report identifying computer information technology systems. ☐

1.7c Prepare a report identifying the use of computer information technology systems. ☐

1.8c Prepare a report identifying the types of electronic communication system used in the construction industry. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Introduction

The aim of this module is to introduce the candidate to:

a basic tool skills
b setting out and making basic joints and components to form products.

Practical competences

The candidate must be able to do the following:

2.1 Select, use, clean and store basic hand tools to prepare timber joints, components and products.
Tools: tenon saw, smoothing plane, chisel, marking out equipment, setting out equipment, mallet, screwdriver, rules, tape, wheelbrace, twist bits, countersink bit, bradawl
Joints: halving, mortice and tenon, bridle
Components: stiles, rails
Products: frames

2.2 Select, use, clean and store portable power tools.
Use: frames (clean, smooth)
Tools: orbital sander

2.3 Set out basic joints and components to form products.
Joints: halving, mortice and tenon, bridle
Components: stiles, rails
Products: frames

2.4 Produce basic joints to form components and products.
Joints: halving, mortice and tenon, bridle
Components: stiles, rails
Products: frames

2.5 Assemble and finish components to form products.
Components: stiles, rails
Products: frames
Assemble: square, true, flat
Finish: plane, sand

Knowledge requirements

The instructor must ensure the candidate is able to:

2.1 Identify a selection of basic hand tools and explain their use.
Tools: saws (coping, rip, tenon), planes (smoothing, block), chisels (bevel edge, firmer, mortice), marking out, setting out, driving (hammer, mallet, screwdrivers), measuring (rules, tapes), boring (wheelbrace, twist bits, countersink bit, bradawl)

2.2 State the method of cleaning and storing basic hand tools.
Method: wipe clean/dry, secure storage

2.3 Identify portable power tools suitable for cleaning and smoothing frames and explain their use.
Tools: sander (orbital, belt), transformer
Power: electric, pneumatic

2.4 State the method for cleaning and storing portable power tools.
Method: clean, dry, lubricated, cable care, secure

2.5 Identify the basic types of materials and fixings used to form joints, components and products.
Materials: softwood, hardwood, sheet materials
Fixings: dowels, screws, nails, wedges, adhesives

2.6 Identify the basic joints used to form components and products.
Joints: halving, mortice and tenon, bridle

2.7 Identify basic products associated with the industry.
Products: windows, doors, stairs, tables, units/fitments, roofs, partitions, flooring

Practical competences

The candidate must be able to do the following:

2.1 Select, use, clean and store basic hand tools to prepare timber joints, components and products. ☐

2.2 Select, use, clean and store portable power tools. ☐

2.3 Set out basic joints and components to form products. ☐

2.4 Produce basic joints to form components and products. ☐

2.5 Assemble and finish components to form products. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

3 Trowel Vocations: Basic Skills

Introduction

The aim of this module is to introduce the candidate to:

a basic tool skills
b mixing and laying concrete
c mixing mortar and laying bricks or blocks.

Practical competences

The candidate must be able to do the following:

3.1 Batch and mix mortar and concrete by hand and small rotary mixer.
Mortar: bricklaying
Concrete: floor slab (75mm thick x 1m2), smooth trowelled finish

3.2 Clean and store a small rotary mixer.
Clean/store: wash, dry, oil reservoir checked, cable care

3.3 Select, use, clean and store a bricklaying trowel or masons trowel to build a straight length of single skin wall.
Use: pick up/spread mortar for bricklaying/block laying
Wall: stretcher bond, 6 bricks or blocks long, 6 bricks or 3 blocks high, joints left clean from the trowel

3.4 Select, use, clean and store tools to pick up mortar and render prepared vertical surface in two coats.
Tools: hand hawk, trowel, scratcher (comb), wooden float, spirit level/plumb bob
Use: fix/plumb screeding battens, apply scratch coat, apply second coat to a true face plane, finish surface with wooden float

Knowledge requirements

The instructor must ensure the candidate is able to:

3.1 State the required ratios by volume for mixing mortar and concrete.
Mortar: for laying medium strength facing brick
Concrete: medium density for floor slab

3.2 Identify the basic materials used to produce mortar and concrete.
Materials: fine/coarse aggregates, cements

3.3 State the method of cleaning and storing a small rotary mixer.
Clean/store: wash, dry, oil reservoir checked, cable care

3.4 Identify and explain the use of bricklaying and masonry walling tools.
Tools: bricklaying/masons trowel, hand hawk, line and pins, spirit level/plumb bob, jointers, hammers, chisels

3.5 State the method of cleaning and storing bricklaying and masonry walling tools.
Method: wash, dry, oil steel tools

3.6 Identify and explain the use of tools and equipment required for laying and finishing a concrete floor slab.
Tools: shovel, tamper, screeding rule, steel trowel, steel float, wooden float, brush

3.7 State the method of cleaning and storing tools and equipment required for laying and finishing a concrete floor slab.
Method: wash, dry, oil steel tools

3.8 Identify and explain the use of tools and equipment required for rendering a vertical wall surface.
Tools: hand hawk, trowel, scratcher (comb), wooden float, spirit level/plumb bob

3.9 State the method of cleaning and storing tools and equipment required for rendering a vertical wall surface.
Method: wash, dry, oil steel tools

3 Trowel Vocations: Basic Skills

Practical competences

The candidate must be able to do the following:

3.1 Batch and mix mortar and concrete by hand and small rotary mixer. ☐

3.2 Clean and store a small rotary mixer. ☐

3.3 Select, use, clean and store a bricklaying trowel or masons trowel to build a straight length of single skin wall. ☐

3.4 Select, use, clean and store tools to pick up mortar and render prepared vertical surface in two coats. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

4 Painting and Decorating: Basic Skills

Introduction

The aim of this module is to introduce the candidate to:

a basic tool skills
b surface preparation
c applying oil and water based paints.

Practical competences

The candidate must be able to do the following:

4.1 Select, use, clean and store basic hand tools for the preparation of surfaces.
Tools: scraper, putty knife, dust brush, shave hook, chisel knife, nail punch, filling knife/spatula
Use: eg new/painted surfaces (timber, board, plaster)

4.2 Select, use, clean, store and maintain brushes and rollers.
Brushes: bristle, nylon
Rollers: lambs wool, synthetic
Clean/store: brushes (white spirit/turpentine substitute then hot soapy water), rollers (cold water)
Use: brushes (oil based paint, timber surfaces), rollers (water based paint)

4.3 Select, use, clean and store wet paint containers and trays.
Cleaning: oil based paint (white spirit/turpentine substitute), water based paint (cold water)

4.4 Select, operate safely, clean, store and maintain portable power tools for surface preparation.
Equipment: electric sander, pneumatic sander

4.5 Select, use, clean, store and maintain liquid petroleum gas (LPG) burning-off equipment.
Select: propane, butane
Use: remove previously painted surface
Store: store (dedicated, ventilated), no naked flame, external light switch, vapour proof light fittings

Knowledge requirements

The instructor must ensure the candidate is able to:

4.1 Identify a selection of basic surface preparation hand tools and explain their use.
Tools: scraper, putty knife, dust brush, shave hook, chisel knife, nail punch, filling knife/spatula
Use: new/painted timber surfaces, wall paper/painted surface removal, filler/putty/sealant removal, filler application

4.2 State the method for cleaning and storing basic surface preparation hand tools.
Cleaning: oil based paint (white spirit/turpentine substitute), water based paint (cold water)
Storage: wipe clean/dry, secure

4.3 Identify the basic types of paints used for surface coatings.
Materials: oil based, water based

4.4 State the method for cleaning and storing dry brushes, dry rollers, pads, mittens.
Cleaning: oil based paint (white spirit/ turpentine substitute then hot soapy water), water based paint (cold water), dry
Store: dry, ventilated

4.5 State the method for storing brushes wetted with paint.
Store: vapour box (keep), immerse in water

4.6 Name the parts and materials used in the construction of brushes.
Parts/materials: handle (wood, plastic), ferrule (stainless steel, copper), filling (bristle, synthetic)

4.7 Name the parts and materials used in the construction of rollers.
Parts/materials: handle (plastic), covering (lambs wool, synthetic)

4.8 Describe the methods of cleaning wet paint from containers and trays.
Method: oil based paint (white spirit/turpentine substitute), water based paint (cold water)

4.9 Identify portable power tools suitable for surface preparation and describe their use.
Equipment: electric sander, pneumatic sander, needle gun

4.10 State the method for storing portable power tools.
Method: clean, dry, lubricated, cable care, secure

4.11 State the method for storing liquid petroleum gas (LPG) burning-off equipment.
Method: store (dedicated, ventilated), no naked flame, external light switch, vapour proof light fittings

4 Painting and Decorating: Basic Skills

Practical competences

The candidate must be able to do the following:

4.1 Select, use, clean and store basic hand tools for the preparation of surfaces. ☐

4.2 Select, use, clean, store and maintain brushes and rollers. ☐

4.3 Select, use, clean and store wet paint containers and trays. ☐

4.4 Select, operate safely, clean, store and maintain portable power tools for surface preparation. ☐

4.5 Select, use, clean, store and maintain liquid petroleum gas (LPG) burning-off equipment. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

5 Plumbing: Basic Skills

Introduction

The aim of this module is to introduce the candidate to:

a basic tool skills
b cutting and bending pipe
c making pipe joints.

Practical competences

The candidate must be able to do the following:

5.1 Select, use, clean and store basic hand tools to install a domestic cold water supply to a tap.
Tools: hacksaw, hammers, tape measure, spirit level, reamer, jointing equipment (eg spanners, portable heating equipment), benders (eg hand bender, spring)

5.2 Select, use, clean and store portable power tools.
Use: drilling walls for screw fixings/pipe access
Tools: electric drill

5.3 Set out pipe runs and install pipework for a domestic cold water supply to a tap.
Pipework: pipe (eg steel, copper), jointing system (eg compression, solder, screw), pipe clips

5.4 Hand bend pipework to fit pipe run.
Bending: eg spring, hand bender, sand

5.5 Fix plumbing accessories to walls.
Accessories: tap

5.6 Terminate pipework into accessories.
Accessories: tap

5.7 Select, use, clean, store and maintain portable heating equipment.
Equipment: eg oxy-acetylene, propane, butane
Use: solder joints, bending
Store: store (dedicated/ventilated), no naked flame, external light switch, vapour proof light fittings

Knowledge requirements

The instructor must ensure the candidate is able to:

5.1 Identify a selection of basic hand tools and explain their use.
Tools: hacksaw, hammers, tape measure, spirit level, reamer, jointing equipment (spanners, portable heating equipment), benders (hand bender, spring)

5.2 State the method of cleaning and storing basic hand tools.
Method: wipe clean/dry, secure storage

5.3 Identify portable power tools suitable for drilling walls for screw fixings and pipe access.
Equipment: electric drill, hammer drill, rechargeable battery operated drill, transformer

5.4 Identify the different types of twist drills suitable for various applications.
Applications: walls, thin metal plate
Twist drills: masonry, high speed steel

5.5 State the method for storing portable power tools.
Method: clean, dry, lubricated, cable care, secure

5.6 Identify the basic types of pipe and clips used for domestic water services.
Pipes: steel, copper, plastic

5.7 Identify the basic types of jointing system used for domestic water services.
Jointing system: solder, compression, push fit, threaded

5.8 Identify the basic types of pipework accessories used for domestic water services.
Accessories: taps, fittings (bend, elbow, tee, connectors, valves)

5.9 State the method for storing portable heating equipment.
Method: store (dedicated/ventilated), no naked flame, external light switch, vapour proof light fittings

5 Plumbing: Basic Skills

Practical competences

The candidate must be able to do the following:

5.1	Select, use, clean and store basic hand tools to install a domestic cold water supply to a tap.	☐
5.2	Select, use, clean and store portable power tools.	☐
5.3	Set out pipe runs and install pipework for a domestic cold water supply to a tap.	☐
5.4	Hand bend pipework to fit pipe run.	☐
5.5	Fix plumbing accessories to walls.	☐
5.6	Terminate pipework into accessories.	☐
5.7	Select, use, clean, store and maintain portable heating equipment.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

6 Refrigeration and Air Conditioning: Basic Skills

Introduction

The aim of this module is to introduce the candidate to:

a basic tool skills
b cutting and bending refrigeration quality pipe
c making pipe joints.

Practical competences

The candidate must be able to do the following:

6.1 Select, use, clean and store basic hand tools to install components of a refrigeration system.
Tools: tape measure, spirit level, tube cutter, pipe reamer, screw drivers, spanners, jointing equipment (eg pipe flaring tools, swaging tools, portable heating equipment), benders (eg spring, hand bender)

6.2 Select, use, clean and store portable power tools.
Use: drilling walls for screw fixing/pipe access, drilling thin metal plate for component/accessory fixing
Tools: electric drill

6.3 Set out pipe runs and install pipework from a liquid receiver to an evaporator.
Pipework: copper pipe, jointing system (compression, braze), pipe clips, drain lines (eg plastic, copper)

6.4 Hand bend pipework to fit pipe runs and link accessories.
Bending: eg spring, hand bender

6.5 Fix refrigeration accessories to walls or framework.
Accessories: evaporator, heat exchanger

6.6 Terminate pipework into accessories.
Accessories: evaporator, heat exchanger

6.7 Select, use, clean, store and maintain portable heating equipment.
Equipment: eg oxy-acetylene, propane, butane, inert gas (eg oxygen free nitrogen)
Use: brazed joints
Store: store (dedicated/ventilated), no naked flames, external light switches, vapour proof light fittings

Knowledge requirements

The instructor must ensure the candidate is able to:

6.1 Identify a selection of basic hand tools and explain their use.
Tools: tape measure, spirit level, tube cutter, pipe reamer, screw drivers, jointing equipment (pipe flaring tools, swaging tools, portable heating equipment), benders (spring, hand bender)

6.2 State the method of cleaning and storing basic hand tools.
Method: wipe clean/dry, secure storage

6.3 Identify portable power tools suitable for drilling.
Drilling: walls for screw fixing/pipe access, thin metal plate
Equipment: electric drill, hammer drill, cordless drill, site transformer

6.4 Identify the different types of twist drills suitable for various applications.
Applications: walls, thin metal plate
Twist drills: masonry, high speed steel

6.5 State the method for storing portable power tools.
Method: clean, dry, lubricated, cable care, secure

6.6 Identify the basic types of pipe used for refrigeration and air conditioning.
Pipes: thick walled, soft drawn annealed copper coils, half hard straight tube, plastic, pipe clips, pipe clamps

6.7 Identify the basic types of jointing systems used for refrigeration and air conditioning.
Jointing system: braze, compression (copper), push fit, threaded, solvent welded (plastic)

6.8 Identify the basic types of pipework accessories used for refrigeration and air conditioning.
Accessories: filter driers, heat exchangers, fittings (long/short radius bends, tee pieces, flare nuts, unions, capillary fittings)

6.9 State the method for storing portable heating equipment.
Method: store (dedicated, ventilated), no naked flames, external light switch, vapour proof light fittings

6 Refrigeration and Air Conditioning: Basic Skills

Practical competences

The candidate must be able to do the following:

6.1	Select, use, clean and store basic hand tools to install components of a refrigeration system.	☐
6.2	Select, use, clean and store portable power tools.	☐
6.3	Set out pipe runs and install pipework from a liquid receiver to an evaporator.	☐
6.4	Hand bend pipework to fit pipe runs and link accessories.	☐
6.5	Fix refrigeration accessories to walls or framework.	☐
6.6	Terminate pipework into accessories.	☐
6.7	Select, use, clean, store and maintain portable heating equipment.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

7 Electrical Installation: Basic Skills

Introduction

The aim of this module is to introduce the candidate to:

a basic tool skills
b setting out and installing domestic single phase circuits
c installing accessories and terminating cables.

Practical competences

The candidate must be able to do the following:

7.1 Select, use, clean and store basic hand tools to install and terminate domestic single phase circuits.
Tools: screw drivers (flat blade, Philips, star), pliers, wire cutters, wire strippers, hammers, tape measure

7.2 Select, use, clean and store portable power tools.
Use: drilling walls for screw fixings/cable access
Tools: electric drill

7.3 Set out cable runs and install cable for domestic single phase lighting circuits.
Cable: insulated and sheathed multi-core, cable clips

7.4 Fix electrical accessories to walls and ceilings.
Accessories: mounting boxes, switches, ceiling rose, joint box

7.5 Terminate electrical conductors into accessories.
Accessories: switches, ceiling rose, joint box

Knowledge requirements

The instructor must ensure the candidate is able to:

7.1 Identify a selection of basic hand tools and explain their use.
Tools: screw drivers (flat blade, Philips, star), pliers, wire cutters, wire strippers, hammers, tape measure

7.2 State the method of cleaning and storing basic hand tools.
Method: wipe clean/dry, secure storage

7.3 Identify portable power tools suitable for drilling walls for screw fixings and cable access.
Equipment: electric drill, hammer drill, rechargeable battery operated drill, transformer

7.4 State the method for storing portable power tools.
Method: clean, dry, lubricated, cable care, secure

7.5 Identify the different types of twist drills suitable for various applications.
Applications: walls, thin metal plate
Twist drills: masonry, high speed steel

7.6 Identify the basic types of cables and materials used for domestic single phase circuits.
Cables/materials: insulated and sheathed multi-core, cable insulation colour coding, cable clips, single core insulated cable within PVC conduit/mini-trunking

7.7 Identify the basic types of electrical accessories used for domestic single phase circuits.
Accessories: mounting blocks, socket outlets, switches (single pole, double pole), ceiling rose, consumer unit

7 Electrical Installation: Basic Skills

Practical competences

The candidate must be able to do the following:

7.1	Select, use, clean and store basic hand tools to install and terminate domestic single phase circuits.	☐
7.2	Select, use, clean and store portable power tools.	☐
7.3	Set out cable runs and install cable for domestic single phase lighting circuits.	☐
7.4	Fix electrical accessories to walls and ceilings.	☐
7.5	Terminate electrical conductors into accessories.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Test specification for written paper Basic Construction Skills Principles (6161-001)

This is a written multiple choice examination paper lasting one hour and containing 50 questions. Candidates must answer **all** questions.

Topic	Approximate % examination weighting
	All questions carry equal weighting
01 Core Skills: Safety at work	
01 Core Skills: Mathematics and Drawing	
01 Core Skills: Communication and Information	
01 Core Skills: Technology	

Test specification for written paper Basic Construction Skills Principles (6161-002)

This is a written multiple choice examination paper lasting one and a half hours and containing 40 questions. Candidates must answer **all** questions.

Topic	Approximate % examination weighting
	All questions carry equal weighting
02 Basic Skills – Timber	
03 Basic Skills – Trowel	
04 Basic Skills – Painting and Decorating	
05 Basic Skills – Plumbing	
06 Basic Skills – Refrigeration and Air Conditioning	
07 Basic Skills – Electrical Installation	

12a Timber Vocations 1: Safety at Work

Introduction

The aim of this module is to enable the candidate to maintain safe working conditions and to adopt safe procedures for themselves and others.

Note: The use of national/local regulations and working practices must be included in all practical competences.

Practical competences

The candidate must be able to do the following:

12.1a Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.
Hazards: wood dust, preservatives, obstructions, sharp tools, warning notices

12.2a Carry out safe working practices using various equipment/materials to protect surrounding work areas from infringement or contamination.
Equipment/materials: dust extraction, ventilation, dust sheets, masking tapes/paper, shields (boards)

12.3a Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, hop up stools, scaffold boards

12.4a Inspect for faults, set up and safely use steps and ladders in general use.
Faults: metal components (corrosion), timber components (deterioration, splits, cracks)
Set up: firm/level base, clip/lash down

12.5a Set up safety barriers around obstructions to protect working personnel and members of the public.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)

12.6a Select and use protective clothing and safety equipment for specific tasks.
Equipment/clothing: overalls, gloves, eye protection, face mask, ear defenders/plugs, safety shoes, safety helmet (hard hat), machine guards, residual current device
Tasks: producing joints and components to form products, use of dangerous substances (preservatives, adhesives, lubricants)

12.7a Use and store toxic materials in a safe manner.
Use: manufacturers' instructions, toxic effect
Materials: wood dust, preservatives, adhesives, lubricants

Knowledge requirements

The instructor must ensure the candidate is able to:

12.1a State the methods used to prevent hazards and to ensure the safety of working personnel and members of the public.
Methods: warning notices, barriers

12.2a State the methods used to protect surrounding work areas from infringement or contamination.
Methods: dust extraction, ventilation, dust sheets, masking tapes/paper, shields (boards)

12.3a Explain the safe use of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, hop up stools, scaffold boards
Safe use: manufacturers' instructions, nationally/locally applied regulations

12.4a State the faults, possible hazards and dangerous practices when using ladders and steps.
Faults: metal components (corrosion), timber components (deterioration, splits, cracks)
Hazards: base fixing/stabilising, clip/lash at platform level, clear space around base
Dangerous practices: uneven/loose ground

12.5a Explain the purpose and use of barriers and warning signs/lights to protect working personnel and members of the public from possible accidents.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)
Purpose: segregation of different work activities, segregation of work from members of the public

12.6a Describe the purpose and use of protective clothing and safety equipment for a range of applications.
Equipment/clothing: overalls, gloves, eye protection, face mask, ear defenders/plugs, safety shoes, safety helmet (hard hat), machine guards, residual current device
Purpose: handling corrosive/heavy materials, cutting/preparing timber products, using power tools, protecting feet from heavy objects, working below other workers or machines
Applications: producing joints and components to form products, use of dangerous substances (preservatives, adhesives, lubricants)

12.7a State the toxic effect of materials used in timber vocations.
Effect: eyes, skin, breathing
Materials: wood dust, preservatives, adhesives, lubricants

12.8a Describe the preventative and remedial actions to be taken in the case of exposure to toxic materials.
Exposure: ingested, contact with skin, inhaled
Preventative action: dust extraction, ventilation, masks, protective clothing/equipment
Remedial action: immediate first aid, report to supervisor
Materials: wood dust, preservatives, adhesives, lubricants, manufacturers' instructions

12b Timber Vocations 1: Materials

Introduction

The aim of this module is to enable the candidate to:

a identify and select materials from given specifications
b describe the basic properties of the main types of materials in use.

Note: The properties of locally manufactured materials or materials in local general use should be considered.

Practical competences

The candidate must be able to do the following:

12.1b Identify and select common softwoods from given specifications.
Softwoods: eg pine, redwood, white wood
Identify/select: visual appearance, dimensions

12.2b Identify and select common hardwoods from given specifications.
Hardwoods: eg mahogany, oak, teak
Identify/select: visual appearance, dimensions

12.3b Identify and select manufactured boards and sheet materials from given specifications.
Board/sheet: chipboard, hardboard, medium density fibreboard (MDF), plywood
Identify/select: visual appearance, dimensions

12.4b Identify and select wood preservatives from given specifications.
Preservatives: water based, spirit based, tar/oil based
Identify/select: visual appearance, dimensions

12.5b Identify and select adhesives from given specifications.
Adhesives: eg polyvinyl acetate (PVA), urea-formaldehyde (uf), hot melt, contact, animal
Identify/select: visual appearance, dimensions

12.6b Identify and select abrasive sheets from given specifications.
Abrasive sheets: sand, glass, garnet, aluminium oxide
Identify/select: visual appearance, dimensions

12.7b Identify and select screws and nails from given specifications.
Screws: eg counter sunk, raised counter sunk, round-head, dome-head, twin fast, Philips, posidrive, slotted, brass, bronze, chromium, sheradized, japanned, steel, alloy, cups, caps
Nails: eg lost head, oval, round wire, hardboard pins, panel pins, annular ring shank, masonry
Identify/select: visual appearance, dimensions

Knowledge requirements

The instructor must ensure the candidate is able to:

Timber

12.1b Explain the process of tree growth.
Process: moisture, sun light, photosynthesis, minerals

12.2b Identify and explain the use of the various elements of a log.
Elements: rays, pith, heartwood, sapwood, growth/annual rings, bark, knots

12.3b Explain the reasons for seasoning timber.
Reasons: removal of moisture, stability, workability

12.4b Explain what happens to timber during the seasoning process.
Process: air, kiln, dehumidifying

12.5b Identify various defects in timber and explain the reasons for their presence.
Defects: ring shake, star shake, heart shake, knots in growth/converted timber
Reasons: seasoning defect, branches

12.6b Identify and explain the various types of timber grain.
Grain: open, close, straight, figured

12.7b State the basic properties of common softwoods.
Softwood: pine, redwood, white wood
Properties: structure, density, texture, strength, workability

12.8b State the basic properties of common hardwoods.
Hardwood: mahogany, oak, teak
Properties: structure, density, texture, strength, workability

12.9b Describe the various methods of log conversion.
Method: through and through (slab/slash sawn), quarter sawn, boxed heart

Manufactured boards

12.10b State the various types of manufactured board.
Boards: plywood (3 ply, multiply, block board, lamin board, batten board), fibreboard (medium density fibreboard/MDF, hardboard), particle board (chipboard, wafer board), veneered board (melamine, Formica, cloth, real wood)

12.11b Explain the advantages and disadvantages of sheet materials compared with solid wood.
Advantages/disadvantages: stability, strength, workability, problems in the manufacturing process, commercial availability, size

12.12b Explain the reason for using 'sheet balancers' when applying surface coatings and finishes.
Reason: stabilising the sheet

12.13b Explain the process and reason for sizing hardboard.
Process: damping
Reason: stability

Preservatives

12.14b Explain the reasons for using preservatives.
Reason: prolong life, prevent infestation

12.15b State the various types of preservative.
Preservatives: water based, spirit based, tar/oil based

12.16b List and explain the different methods of application for various types of preservative.
Methods: pressure/vacuum treatments, deluge, spray, dip, brush

Adhesives

12.17b State the various types of adhesive.
Adhesives: polyvinyl acetate (PVA), urea-formaldehyde (uf), hot melt, contact, animal

12.18b Describe the different methods of application for various types of adhesive.
Methods: brush, hand roller, spray, roller coat, hot melt applicator, two part chemical action

Abrasives

12.19b State the characteristics and uses of various types of abrasive.
Abrasives: sand, glass, garnet, aluminium oxide
Characteristics: grades, wear resistance, open/closed coat, backing, bonding, storage

Fixings

12.20b List the various types of wood screw and component.
Screws: counter sunk, raised counter sunk, round-head, dome-head, twin fast, Philips, posidrive, slotted, steel, alloy, brass, bronze, chromium, sheradized, japanned
Components: cups, caps

12.21b Explain the terms 'gauge' and 'thread' in relation to wood screws.
Gauge: shank/head size, relationship of gauge to length of screw
Thread: wood, chipboard, twin fast

12.22b Explain the reason for using pilot holes and clearance holes.
Reasons: pull joint together, prevent timber splitting, prevent screw from shearing

12.23b List the various types of nails.
Nails: lost head, oval, round wire, hardboard pins, panel pins, annular ring shank, masonry

12c Timber Vocations 1: Calculations, Setting Out and Drawing

Introduction

The aim of this module is to enable the candidate to:

a take off dimensions from drawings of linear and rectangular structures
b calculate quantities to assist in preparing, costing and estimating
c set out components to form products.

Practical competences

The candidate must be able to do the following:

Calculations

12.1c Take off accurate dimensions from drawings of linear and rectangular structures.
Drawings: plans, sectional drawings
Dimensions: lengths/width/thickness of components

12.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures.
Dimensions: setting out

12.3c Calculate areas from dimensions taken off drawings of linear and rectangular structures.
Areas: walls, floors, openings

12.4c Calculate volumes from dimensions taken off drawings of linear and rectangular structures.
Volumes: timber

12.5c Calculate the quantity and cost of materials required from drawings of linear and rectangular structures.
Materials: timber, timber based products, fixings
Costs: product catalogues, price lists, discounts
Drawings: joinery components

12.6c Calculate component spacings of linear and rectangular structures.
Component: eg glazing bars, joists, palings, dovetail joints

Setting out

12.7c Measure and set out components to produce workshop rods and drawings to manufacture linear and rectangular products.
Workshop rods: vertical sections, horizontal sections
Drawings: elevations
Products: doors, windows, frames, linings, cupboards

12.8c Draw cut away and hidden detail onto setting out rods.
Detail: eg mortice and tenon detail

12.9c Set out component spacings of linear and rectangular structures.
Component: eg glazing bars, joists, palings

12.10c Prepare cutting lists from setting out rods of linear and rectangular structures.
Setting out rods: eg doors, windows, frames, linings, cupboards

Drawing

12.11c Produce working drawings from plans and details of linear and rectangular structures.
Drawing: dimensions, detail (eg glazing bars, rails, stiles, heads), exploded views

Knowledge requirements

The instructor must ensure the candidate is able to:

Calculations

12.1c Identify calculations involving area and volume of linear and rectangular structures.
Areas: walls, floors, openings
Volumes: timber

12.2c Identify compilations of overall linear dimensions from drawings.
Overall dimensions: setting out

12.3c Identify calculations involving quantities and costs of materials of linear and rectangular structures.
Materials: timber, timber based products, fixings
Costs: product catalogues, price lists, discounts

Setting out

12.6c State the tools and equipment used to produce setting out rods.
Tools: square, combination square, dividers, compasses, tape measure, rule, pencil, adjustable bevel, straight edge

12.7c Explain the correct procedures to produce a setting out rod.
Procedures: face of product towards bottom of the rod, top of product to left hand side of the rod
Products: doors, windows, frames, linings, cupboards

12.8c Identify components from setting out rods and drawings of linear and rectangular structures.
Components: jambs, mullions, transom, head, cill, glazing bars, rails, styles, muntins

12.9c Identify joints used to form components and products.
Joints: butt, tongue and groove, tongue grooved and vee, housing, dovetailed, bridle

Drawing

12.10c Identify scale working drawings of items taken from plans and details of linear and rectangular structures.
Drawings: dimensions, detail (glazing bars, rails, stiles, heads), exploded views

12d Timber Vocations 1: Practical Skills

Introduction

The aim of this module is to enable the candidate to:

a maintain and sharpen tools
b select and use hand tools in a correct and safe manner
c cut joints and form components to make products out of solid wood and composite materials.

Practical competences

The candidate must be able to do the following:

Basic skills

12.1d Select, use, clean and store basic hand tools to prepare timber joints, components and products.
Tools: tenon saw, smoothing plane, chisel, marking out equipment, setting out equipment, mallet, screw driver, rules, tape, wheel brace, twist bits, counter sink bit, bradawl
Joints: halving, mortice and tenon, bridle
Components: stiles, rails
Products: frames

12.2d Select, use, clean and store portable power tools.
Use: frames (clean, smooth)
Tools: orbital sander

12.3d Set out basic joints and components to form products.
Joints: halving, mortice and tenon, bridle
Components: stiles, rails
Products: frames

12.4d Produce basic joints to form components and products.
Joints: halving, mortice and tenon, bridle
Components: stiles, rails
Products: frames

12.5d Assemble and finish components to form products.
Components: stiles, rails
Products: frames
Assemble: square, true, flat
Finish: plane, sand

Tool maintenance

12.6d Sharpen, set and top tenon saws.

12.7d Sharpen and hone chisels and plane blades.

12.8d Assemble hand planes ready for use.
Planes: eg rebate, plough, block, bull nose.

Tool skills

12.9d Select, use, clean and store setting out and marking out tools and equipment.
Tools: eg try square, mitre square, combination square, sliding bevel, marking gauge, marking knife, mortice gauge, compasses, dividing compasses, box square, mitre template, dovetail template, tape measure, rule

12.10d Select, use, clean and store hand tools to produce joints, components and products.
Tools: saws (coping, rip), block plane, chisels (bevel edge, firmer, mortice), hammer (Warrington, claw), screw drivers (slotted, cross head), brace and bit
Joints: half lap, tee halving, bridle, dovetail half lap, cross halving, mitering, housings, mortice and tenon, haunched mortice and tenon, mortice and tenon on rebated section (square and off set shoulder), mortice and tenon on grooved and moulded section (masons mitre, pocket scribing) through dovetails, lapped dovetails
Components: stiles, rails
Products: frames

12.11d Select, use, clean and store hand tools to set out and construct basic frames and products.
Frames/products: tool box with dovetailed joints, gate with morticed and tenoned joints and palings, scaled external door (framed, ledged, braced, battened), opening window

Knowledge requirements

The instructor must ensure the candidate is able to:

Tool maintenance

12.1d Identify and describe the use of setting pliers, files and gauges for saw maintenance.

12.2d Identify the different types and grades of honing stone.
Types: oil, wet, slip
Grades: fine, medium, course

Tool skills

12.3d Identify hand tools for setting out and marking, and describe their use.
Tools: try square, mitre square, combination square, sliding bevel, marking gauge, marking knife, mortice gauge, compasses, dividing compasses, box square, mitre template, dovetail template, tape measure, rule

12.4d Describe the maintenance and care of hand tools for setting out and marking.
Maintenance/care: wipe clean/dry, secure storage

12.5d Identify and describe the use of hand saws.
Saws: rip, cross cut, tenon, dovetail, coping, bow, key hole/pad, compass

12.6d Identify and describe the use of hand planes.
Planes: jack, try, smoothing, rebate, side rebate/side filister, plough, shoulder, bull nose, spoke shave, routing

12.7d Identify and describe the use of hand chisels and axes.
Chisels: bevel edge, firmer, mortice, paring, internal/external curve gouges

12.8d Identify and describe the use of boring tools.
Tools: ordinary brace, wheel brace, cordless/battery drills, Jennings bit, centre bit, expanding bit, flat bit, twist drill bits, counter sink bit

12.9d Identify and describe the use of various hand tools.
Tools: screwdrivers (ratchet, pump), punches, plugging/seaming chisel, cold chisel, bolster, pincers, pliers, G cramps, sash cramps, bench holdfast, mitre box, spirit levels, plumb lines, winding strips, squaring rod

12a Timber Vocations 1: Safety at Work

Practical competences

The candidate must be able to do the following:

12.1a	Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.	☐
12.2a	Carry out safe working practices using various equipment/materials to protect surrounding areas from infringement or contamination.	☐
12.3a	Carry out safe erection, use and dismantling of simple scaffold platforms less than 2m high.	☐
12.4a	Inspect for faults, set up and safely use steps and ladders in general use.	☐
12.5a	Set up safety barriers around obstructions to protect working personnel and members of the public.	☐
12.6a	Select and use protective clothing and safety equipment for specific tasks.	☐
12.7a	Use and store toxic materials in a safe manner.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

12b Timber Vocations 1: Materials

Practical competences

The candidate must be able to do the following:

12.1b Identify and select common softwoods from given specifications. ☐

12.2b Identify and select common hardwoods from given specifications. ☐

12.3b Identify and select manufactured boards and sheet materials from given specifications. ☐

12.4b Identify and select wood preservatives from given specifications. ☐

12.5b Identify and select adhesives from given specifications. ☐

12.6b Identify and select abrasive sheets from given specifications. ☐

12.7b Identify and select screws and nails from given specifications. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

12c Timber Vocations 1: Calculations, Setting Out and Drawing

Practical competences

The candidate must be able to do the following:

Calculations

12.1c Take off accurate dimensions from drawings of linear and rectangular structures. ☐

12.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures. ☐

12.3c Calculate areas from dimensions taken off drawings of linear and rectangular structures. ☐

12.4c Calculate volumes from dimensions taken off drawings of linear and rectangular structures. ☐

12.5c Calculate the quantity and cost of materials required from drawings of linear and rectangular structures. ☐

12.6c Calculate component spacings of linear and rectangular structures. ☐

Setting out

12.7c Measure and set out components to produce workshop rods and drawings to manufacture linear and rectangular products. ☐

12.8c Draw cut away and hidden detail onto setting rods. ☐

12.9c Set out component spacings of linear and rectangular structures. ☐

12.10c Prepare cuttings from setting out rods of linear and rectangular structures. ☐

Drawing

12.11c Produce working drawings from plans and details of linear and rectangular structures. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Practical competences

The candidate must be able to do the following:

Basic skills

12.1d Select, use, clean and store basic hand tools to prepare timber joints, components and products. ☐

12.2d Select, use, clean and store portable power tools. ☐

12.3d Set out basic joints and components to form products. ☐

12.4d Produce basic joints to form components and products. ☐

12.5d Assemble and finish components to form products. ☐

Tool maintenance

12.6d Sharpen, set and top tenon saws. ☐

12.7d Sharpen and hone Chisels and plane blades. ☐

12.8d Assemble hand planes ready for use. ☐

Tool skills

12.9d Select, use, clean and store setting out and marking out tools and equipment. ☐

12.10d Select, use, clean and store hand tools to produce joints, components and products. ☐

12.11d Select, use, clean and store hand tools to set out and construct basic frames and products. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

13a Trowel Vocations 1 : Safety at Work

Introduction

The aim of this module is to enable the candidate to maintain safe working conditions and to adopt safe procedures for themselves and others.

Note: The use of national/local regulations and working practices must be included in all practical competences.

Practical competences

The candidate must be able to do the following:

13.1a Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.
Hazards: excavations, obstructions, wet concrete, warning notices

13.2a Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, hop up stools, scaffold boards

13.3a Inspect for faults, set up and safely use steps and ladders in general use.
Faults: metal components (corrosion), timber components (deterioration, splits, cracks)
Set up: firm/level base, clip/lash down

13.4a Set up safety barriers around an excavation hazard to protect working personnel and members of the public.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)

13.5a Select and use protective clothing and safety equipment for specific tasks.
Equipment/clothing: overalls, gloves, eye protection, face mask, ear defenders/plugs, safety boots, safety helmet (hard hat)
Tasks: bricklaying, plastering, concreting, brick/concrete cleaning, use of dangerous substances (acids, alkali)

13.6a Use and store toxic materials in a safe manner.
Use: manufacturers' instructions, toxic effect
Materials: cements, limes, plasticisers, masonry cleaning fluids, waterproofing agents, concreting additives, lubricants, insulating materials

Knowledge requirements

The instructor must ensure the candidate is able to:

13.1a State the methods used to prevent hazards and to ensure the safety of working personnel and members of the public.
Methods: warning notices, barriers

13.2a Explain the safe use of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, hop up stools, scaffold boards
Safe use: manufacturers' instructions, nationally/locally applied regulations

13.3a State the faults, possible hazards and dangerous practices when using ladders and steps.
Faults: metal components (corrosion), timber components (deterioration, splits, cracks)
Hazards: base fixing/stabilising, clip/lash at platform level, clear space around base
Dangerous practices: uneven/loose ground

13.4a Explain the purpose and use of barriers and warning signs/lights to protect working personnel and members of the public from possible accidents.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)
Purpose: segregation of different work activities, segregation of work from members of the public

13.5a Describe the purpose and use of protective clothing and safety equipment for a range of applications.
Equipment/clothing: overalls, gloves, eye protection, face mask, ear defenders/plugs, safety boots, safety helmet (hard hat)
Purpose: handling corrosive/heavy materials, cutting bricks/stones/blocks, using power tools, protecting feet from heavy objects, working below other workers or machines
Applications: bricklaying, plastering, concreting, brick/concrete cleaning, use of dangerous substances (acids, alkali)

13.6a State the toxic effect of materials used in trowel operations.
Effect: eyes, skin, breathing.
Materials: cements, limes, plasticisers, masonry cleaning fluids, waterproofing agents, concreting additives, lubricants, insulating materials

13.7a Describe the preventative and remedial actions to be taken in the case of exposure to toxic materials.
Exposure: ingested, contact with skin, inhaled
Preventative action: ventilation, masks, protective clothing/equipment
Remedial action: immediate first aid, report to supervisor
Materials: cements, limes, plasticisers, masonry cleaning fluids, waterproofing agents, concreting additives, lubricants, insulating materials, manufacturers' instructions

13b Trowel Vocations 1: Materials

Introduction

The aim of this module is to enable the candidate to:

a identify and select materials from given specifications
b describe the basic properties of the main types of materials in use.

Note: The properties of locally manufactured materials or materials in local general use should be considered.

Practical competences

The candidate must be able to do the following:

13.1b Identify and select clay bricks from given specifications.
Bricks: eg common, facing, engineering, pressed with frog, solid wire cut, perforated wire cut
Identify/select: visual appearance, dimensions

13.2b Identify and select pre-cast concrete components from given specifications.
Components: bricks (eg common, facing, engineering), blocks (eg solid, hollow, cellular, lightweight, dense, facing, common, insulating), lintels
Identify/select: visual appearance, dimensions

13.3b Identify and select calcium silicate bricks from given specifications.
Bricks: common, facing, engineering
Identify/select: visual appearance, dimensions

13.4b Identify and select natural and reconstructed stones from given specifications.
Stone: sedimentary, igneous, reconstructed
Identify/select: visual appearance, dimensions

13.5b Identify and select thermal insulating materials from given specifications.
Insulating materials: mineral wool, fibreglass, polystyrene
Identify/select: visual appearance, dimensions

13.6b Identify and select wall ties from given specifications.
Ties: galvanised steel, epoxy coated, stainless steel, plastic
Identify/select: visual appearance, dimensions

13.7b Identify and select steel lintels from given specifications.
Lintels: painted, epoxy coated, galvanised, stainless steel
Identify/select: visual appearance, dimensions

13.8b Identify and select street paving materials from given specifications.
Materials: kerbs, flags, paving blocks, setts/cobbles, concrete
Identify/select: visual appearance, dimensions

13.9b Identify and select sands and aggregates from given specifications.
Sands: fine, medium, coarse
Aggregates: natural, crushed rock, manufactured, lightweight, dense
Identify/select: visual appearance, dimensions

13.10b Identify and select various types of cement, lime, plastering product and plasticiser from given specifications.
Types: cement (ordinary, rapid hardening, high alumina), lime (hydraulic, non hydraulic), gypsum plasters, plasticisers (powder, liquid)
Identify/select: visual appearance, dimensions

13.11b Identify and select floor and wall tiles from given specifications.
Flooring: ceramic, concrete
Walling: ceramic, concrete
Identify/select: visual appearance, dimensions

13.12b Identify and select drainage materials and fittings from given specifications.
Materials/fittings: clay, plastic, concrete, porous, perforated, impervious
Identify/select: visual appearance, dimensions

13.13b Identify and select roofing tiles and slates from given specifications.
Slates: natural, resin bonded
Tiles: clay, concrete, plastic
Identify/select: visual appearance, dimensions

Knowledge requirements

The instructor must ensure the candidate is able to:

13.1b State the basic properties of clay bricks.
Bricks: common, facing, engineering, pressed with frog, solid wire cut, perforated wire cut
Properties: salts content, efflorescence, water absorption, compressive strength

13.2b State the basic properties of pre-cast concrete bricks, blocks and lintels.
Bricks: common, facing, engineering
Blocks: solid, hollow, cellular, lightweight, dense, facing, common, insulating
Lintels: simple steel reinforced
Properties: compressive/tensile strength, water absorption, insulation (lightweight aggregate, bonded insulation), load bearing capacity (dense aggregate), decorative (facing, split face, profiled face, colours, textures)

13.3b State the basic properties of calcium silicate bricks.
Bricks: common, facing, engineering
Properties: compressive strength, water absorption, decorative (facing, split face, profiled face, colours, textures)

13.4b State the basic properties and types of natural building stone and reconstructed stone block.
Stone: igneous, sedimentary, metamorphic rocks
Properties: compressive strength, water absorption, surface finishes to facing stones, surface treatments for reconstructed stones

13.5b State the basic properties of thermal insulating materials.
Insulating materials: mineral wool, fibreglass, polystyrene
Properties: thermal resistance

13.6b State the basic properties of wall ties.
Ties: galvanised steel, epoxy coated, stainless steel, plastic
Properties: corrosion resistance, tensile strength

13.7b State the basic properties of steel lintels.
Lintels: painted, epoxy coated, galvanised, stainless steel
Properties: load bearing capacity, corrosion resistance

13.8b State the basic properties and types of the various types of kerb and paving materials.
Kerb: square, battered, chamfered, footpath
Paving: flag, random, block, sett, cobble
Properties: wear resistance, weather resistance, drainage

13.10b State the basic properties of natural and manufactured aggregates.
Manufactured: lightweight, high density
Natural: sands, gravels, crushed rock, lightweights
Properties: density, water absorption, wear resistance

13.11b State the basic properties of cements, limes and plaster.
Cements: ordinary, rapid hardening, high alumina
Limes: hydraulic, non-hydraulic
Plasters: gypsum
Properties: setting, hardening

13.12b State the basic properties of plasticisers.
Plasticisers: powder, liquid
Properties: plasticity

13.13b State the basic properties and types of wall and floor tile.
Tile: ceramic, quarry, concrete
Types: size, manufacture, use, internal, external
Properties: wear resistance, water resistance, frost resistance, decorative finish

13.14b State the basic properties and types of drainage materials and fittings.
Materials/fittings: high strength clay, salt glazed clay, concrete, plastic
Types: rigid/flexible jointing, surface water drainage, foul drainage
Properties: smooth bore, impervious to water, compressive strength, durability

13.15b State the basic properties and types of roofing tile and slate.
Slates: natural, resin bonded
Tiles: clay, concrete, plastic, wood shingles
Properties: weather resistance, weight, plain/interlocking, decorative finish

13c Trowel Vocations 1 : Calculations, Setting Out and Drawing

Introduction

The aim of this module is to enable the candidate to:

a take off dimensions from drawings of linear and rectangular structures
b calculate quantities to assist in preparing, costing and estimating
c set out building details.

Practical competences

The candidate must be able to do the following:

Calculations

13.1c Take off accurate dimensions from drawings of linear and rectangular structures.
Drawings: plans, sectional drawings
Dimensions: lengths of walling/excavation, heights, depths

13.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures.
Overall dimensions: setting out, excavation

13.3c Calculate areas from dimensions taken off drawings of linear and rectangular structures.
Areas: walls, floors, openings

13.4c Calculate volumes from dimensions taken off drawings of linear and rectangular structures.
Volumes: excavation, hardcore, concrete

13.5c Calculate the quantity and cost of materials required from drawings of linear and rectangular structures.
Materials: bricks, blocks, tiles, hardcore, mortar, concrete
Costs: product catalogues, price lists, discounts
Drawings: walls, floors, openings

Setting out

13.6c Measure and set out a gauge rod and a storey rod for vertical measurement on site.
Gauge rod: top of bricks/blocks, window sill heights, lintel heights, wall plate level
Storey rod: window sill heights, lintel height, floor joists, wall plate level

13.7c Measure and set out foundations from drawings of linear and rectangular structures.
Foundations: profiles, excavations, wall positions

Drawings

13.8c Produce working drawings from plans and details of linear and rectangular structures.
Drawings: dimensions, detail (eg door/window openings, drainage holes, ducts, ventilators), exploded views

Knowledge requirements

The instructor must ensure the candidate is able to:

Calculations

13.1c Identify calculations involving area and volume of linear and rectangular structures.
Area: walls, floors, openings
Volume: excavation, concrete, hardcore

13.2c Identify compilations of overall linear dimensions from drawings.
Dimensions: setting out, excavations

13.3c Identify calculations involving quantities and costs of materials of linear and rectangular structures.
Quantities: bricks, blocks, wall/floor/roof tiles, mortar, concrete, additives, adhesive, grout
Costs: product catalogues, price lists, discounts
Areas: walling, flooring, roofing

Setting out

13.4c State the tools and equipment used to produce gauge rods, storey rods and setting out profiles.
Tools: tape measure, pencil, knife, hammer, saw

13.5c Explain the correct procedure for producing gauge rods, storey rods and setting out profiles.
Gauge rod: top of individual bricks/blocks, window sill heights, lintel heights, wall plate level
Storey rod: window sill heights, lintel height, floor joists, wall plate level
Profiles: overall ranging lines, set out profile, mark wall positions on foundations

Drawings

13.6c Identify scale working drawings of items taken from plans and details of linear and rectangular structures.
Drawings: dimensions, detail (door/window openings, drainage holes, ducts, ventilators),exploded views

13d Trowel Vocations 1: Practical Skills

Introduction

The aim of this module is to enable the candidate to:

a select and use hand tools in a correct and safe manner
b develop trowel handling skills
c develop basic wall building and paving techniques.

Practical competences

The candidate must be able to do the following:

13.1d Batch and mix mortar and concrete by hand and small rotary mixer.
Mortar: bricklaying
Concrete: floor slab (75mm thick x 1m2), smooth trowelled finish

13.2d Clean and store a small rotary mixer.
Clean/store: wash, dry, oil reservoir checked, cable care

13.3d Select, use, clean and store a bricklaying trowel or masons trowel to build a straight length of single skin wall.
Use: pick up/spread mortar for bricklaying/block laying
Wall: stretcher bond, 6 bricks or blocks long, 6 bricks or 3 blocks high, joints left clean from the trowel

13.4d Select, use, clean and store tools to pick up mortar and render prepared vertical surface in two coats.
Tools: hand hawk, trowel, scratcher (comb), wooden float, spirit level/plumb bob
Use: fix/plumb screeding battens, apply scratch coat, apply second coat to a true face plane, finish surface with wooden float

13.5d Cut walling materials by hand using the correct tools.
Materials: bricks, blocks, pre-cast concrete components, wall/floor tiles, drainage pipes (plastic, concrete, clay)
Cutting: marking, measurement
Tools: hammer, chisel, bolster, masonry hand saw, guillotine, hydraulic cutter, scriber/tile cutter, hacksaw

13.6d Cut a chase and a pipe hole in a brick or block wall using hand tools.
Tools: hammer, chisel, comb chisel

13.7d Build a half brick wall in stretcher bond with plumbing and levelling to industry standards.
Wall: straight lengths of wall 8 bricks long 6 courses high, stopped ends and racking back, square return corner up to 10 courses high, T junction up to 5 courses high
Plumbing: 3mm in 1m height
Levelling: 3mm in 2m length

13.8d Build a block wall in stretcher bond with plumbing and levelling to industry standards.
Wall: straight lengths of wall 6 blocks long and 4 courses high, stopped end and racking back, square return corners up to 5 courses high, T junction 5 courses high
Plumbing: 3mm in 1m height
Levelling: 3mm in 2m length

13.9d Lay and compact concrete insitu flooring and finish surface.
Compacting: hand tamping off edge forms, hand tamping with trowel
Surface finish: steel trowel, wood float, stiff brush
Floor: $2m^2$ (minimum)

13.10d Prepare compacted sand bedding and lay precast concrete paving flags to a specified fall using basic hand tools.
Sand bedding: compacted 50mm (minimum)
Paving: footpath not less than 2 flags wide and 8 flags long with cross fall to kerb 1 in 20
Tools: tamper, trowel, wood/rubber mallet, spirit level, tapered rule, straight edge

13.11d Bed and joint floor tiles with mortar onto previously prepared concrete floor. (13.9d above).
Tiles: eg quarry, ceramic, natural stone, concrete.

13.12d Fit flexible joints to drainage pipes in accordance with the manufacturers' instructions.
Pipes: eg concrete, clay, plastic
Drainage: straight runs with one branch

Knowledge requirements

The instructor must ensure the candidate is able to:

13.1d Identify tools for hand cutting clay and concrete products.
Tools: hammer, chisel, bolster, masonry hand saw, guillotine, hydraulic cutter, scriber/tile cutter

13.2d Describe the use and maintenance of specified cutting tools.
Tools: masonry hand saw, guillotine, hydraulic cutter
Use: manufacturers' instructions, safety
Maintenance: cleaning, blade care, hydraulic oil level

13.3d Identify the bonding required for brick walls from drawings.
Drawings: plans, elevations
Bonding: stretcher, English, Flemish
Walls: straight length, corners, junctions

13.4d Identify the bonding required for block walls from drawings.
Drawings: plans, elevations
Bonding: stretcher
Walls: straight lengths, corners, junctions

13.5d Describe the build up of a footpath.
Build up: compacted base course/hardcore, bedding sand, edging, paving materials
Footpath: method of ensuring fall (taper rule, spirit level, straight edge)

13.6d Describe the bedding for tiles.
Bedding: adhesive, cement/sand, monolithic

13.7d Identify drainage jointing systems.
Systems: sleeves, ring, manufacturers' technical information

13a Trowel Vocations 1: Safety at Work

Practical competences

The candidate must be able to do the following:

13.1a	Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.	☐
13.2a	Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.	☐
13.3a	Inspect for faults, set up and safely use steps and ladders in general use.	☐
13.4a	Set up safety barriers around an excavation hazard to protect working personnel and members of the public.	☐
13.5a	Select and use protective clothing and safety equipment for specific tasks.	☐
13.6a	Use and store toxic materials in a safe manner.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

13b Trowel Vocations: Materials

Practical competences

The candidate must be able to do the following:

13.1b	Identify and select clay bricks from given specifications.	☐
13.2b	Identify and select pre-cast concrete components from given specifications.	☐
13.3b	Identify and select calcium silicate bricks from given specifications.	☐
13.4b	Identify and select natural and reconstructed stones from given specifications.	☐
13.5b	Identify and select thermal insulating materials from given specifications.	☐
13.6b	Identify and select wall ties from given specifications.	☐
13.7b	Identify and select steel lintels from given specifications.	☐
13.8b	Identify and select street paving materials from given specifications.	☐
13.9b	Identify and select sands and aggregates from given specifications.	☐
13.10b	Identify and select various types of cement, lime, plastering product and plasticiser from given specifications.	☐
13.11b	Identify and select tiles from given specifications.	☐
13.12b	Identify and select drainage materials and fittings from given specifications.	☐
13.13b	Identify and select roofing tiles and slates from given specifications.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

13c Trowel Vocations 1: Calculations, Setting Out and Drawing

Practical competences

The candidate must be able to do the following:

Calculations

13.1c Take off accurate dimensions from drawings of linear and rectangular structures. ☐

13.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures. ☐

13.3c Calculate areas from dimensions taken off drawings of linear and rectangular structures. ☐

13.4c Calculate volumes from dimensions taken off drawings of linear and rectangular structures. ☐

13.5c Calculate the quantity and cost of materials required from drawings of linear and rectangular structures. ☐

Setting out

13.6c Measure and set out a gauge rod and a storey rod for vertical measurement on site. ☐

13.7c Measure and set out foundations from drawings of linear and rectangular structures. ☐

Drawings

13.8c Produce working drawings from plans and details of linear and rectangular structures. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

13d Trowel Vocations 1: Practical Skills

Practical competences

The candidate must be able to do the following:

13.1d	Batch and mix mortar and concrete by hand and small rotary mixer.	☐
13.2d	Clean and store a small rotary mixer.	☐
13.3d	Select, use, clean and store a bricklaying trowel or masons trowel to build a straight length of single skin wall.	☐
13.4d	Select, use, clean and store tools to pick up mortar and render prepared vertical surface in two coats.	☐
13.5d	Cut walling materials by hand using the correct tools.	☐
13.6d	Cut a chase and a pipe hole in a brick or block wall using hand tools.	☐
13.7d	Build a half brick wall in stretcher bond with plumbing and levelling to industry standards.	☐
13.8d	Build a block wall in stretcher bond with plumbing and levelling to industry standards.	☐
13.9d	Lay and compact concrete insitu flooring and finish surface.	☐
13.10d	Prepare compacted sand bedding and lay precast concrete paving flags to a specified fall using basic hand tools.	☐
13.11d	Bed and joint floor tiles with mortar onto previously prepared concrete floor (13.9d above).	☐
13.12d	Fit flexible joints to drainage pipes in accordance with the manufacturers' instructions.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

14a Painting and Decorating 1: Safety at Work

Introduction

The aim of this module is to enable the candidate to maintain safe working conditions and to adopt safe procedures for themselves and others.

Note: The use of national/local regulations and working practices must be included in all practical competences.

Practical competences

The candidate must be able to do the following:

14.1a Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.
Hazards: fumes, obstructions, spillage, wet paint surfaces, warnings notices

14.2a Carry out safe working practices using various equipment/materials to protect surrounding work areas from infringement or contamination.
Equipment/materials: dust sheets, masking tapes/paper, shields (boards)

14.3a Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.
Scaffolding: steps, hop up stools, scaffold boards

14.4a Select and use protective clothing and safety equipment for specific tasks.
Equipment/clothing: goggles, rubber gloves, gauntlets, face mask, ear defenders/plugs, safety helmet (hard hat), rubber apron, clothing, overalls, safety shoes, residual current device
Tasks: surface preparation, use of dangerous substances (acid, alkali, solvents)

14.5a Use and store toxic materials in a safe manner.
Use: manufacturers' instructions, toxic effect
Materials: solvents, spirits, thinners, acids, alkali, oils.

Knowledge requirements

The instructor must ensure the candidate is able to:

14.1a State the methods used to prevent hazards and to ensure the safety of working personnel and members of the public.
Methods: warning notices, ventilation

14.2a State the methods used to protect surrounding work areas from infringement or contamination.
Methods: dust sheets, masking tapes/paper, shields (boards)

14.3a Explain the safe use of simple scaffold platforms less than 2m high.
Scaffolding: steps, hop up stools, scaffold boards
Safe use: manufacturers' instructions, nationally/locally applied regulations

14.4a Describe the purpose and use of protective clothing and safety equipment for a range of applications.
Equipment/clothing: goggles, rubber gloves, gauntlets, face mask, ear defenders/plugs, safety helmet (hard hat), rubber apron, clothing, overalls, safety shoes, residual current device
Purpose: handling corrosive/toxic materials, scaffolding area, atmospheric dust/fumes, flying particles (grit, sand)
Applications: surface preparation, use of dangerous substances (acid, alkali, solvents)

14.5a State the toxic effect of materials used in painting and decorating.
Effect: eyes, skin, breathing
Materials: solvents, spirits, thinners, acids, alkali, oils

14.6a Describe the preventative and remedial actions to be taken in the case of exposure to toxic materials.
Exposure: ingested, contact with skin, inhaled
Preventative action: ventilation, masks, protective clothing/equipment
Remedial action: immediate first aid, report to supervisor
Materials: solvents, spirits, thinners, acids, alkali, oils, manufacturers' instructions

14b Painting and Decorating 1: Materials

Introduction

The aim of this module is to enable the candidate to:

a identify and select materials from given specifications
b describe the basic characteristics of surface preparation and coating materials.

Note: The properties of locally manufactured materials or materials in local general use should be considered.

Practical competences

The candidate must be able to do the following:

Surface preparation

14.1b Identify and select abrasives from given specifications.
Abrasives: sand paper, glass paper, carbon silicate
Identify/select: visual appearance, dimensions

14.2b Identify and select stoppers and fillers from given specifications.
Stoppers: linseed oil putty, cellulose
Fillers: water based, cellulose
Identify/select: visual appearance, dimensions

14.3b Identify and select knotting and sealers from given specifications.
Knotting: shellac
Sealers: oil based, water based
Identify/select: visual appearance, dimensions

14.4b Identify and select paint removers from given specifications.
Paint removers: spirit, solvent, alkaline
Identify/select: visual appearance, dimensions

14.5b Identify and select liquid petroleum gas (LPG) flame surface preparation materials/equipment from given specifications.
Liquid petroleum gas: butane, propane
Identify/select: visual appearance, dimensions

Surface coatings

14.6b Identify and select solvents and thinners from given specifications.
Solvents/thinners: white spirit, turpentine substitute, methylated spirits, cellulose thinners, water
Identify/select: visual appearance, dimensions, inflammability

14.7b Identify and select oil based surface coating materials from given specifications.
Oil based coatings: non-reversible (convertible), primers, undercoats, sealers, finishes
Identify/select: visual appearance, dimensions, colour

14.8b Identify and select water based surface coating materials from given specifications.
Water based coatings: non-reversible (convertible), primers, undercoats, sealers, finishes
Identify/select: visual appearance, dimensions, colour

14.9b Identify and select spirit based surface coating materials from given specifications.
Spirit based coatings: reversible (non-convertible), cellulose, knotting, lacquer, bitumen
Identify/select: visual appearance, dimensions, colour

Knowledge requirements

The instructor must ensure the candidate is able to:

Surface preparation

14.1b State the basic characteristics, reason for selection, uses and limitations of dry abrasives.
Abrasives: sand paper, glass paper, carbon silicate
Characteristics: grades, wear resistance
Limitations: grade (surface finish), not moisture resistant, creates dust

14.2b State the basic characteristics, reason for selection, uses and limitations of wet abrasives.
Abrasives: carbon silicate (wet or dry)
Characteristics: grades, water resistance, wear resistance, dust free
Limitations: grade (surface finish)

14.3b State the basic characteristics, reason for selection, uses and limitations of stoppers.
Stoppers: linseed oil putty, cellulose
Characteristics: waterproof, flexible
Limitations: ageing

14.4b State the basic characteristics, reason for selection, uses and limitations of fillers.
Fillers: water based, cellulose
Characteristics: non-flexible
Limitations: internal use only

14.5b State the basic characteristics, reason for selection, uses and limitations of knotting.
Knotting: shellac
Characteristics: sealer, quick drying, unaffected by wood resin
Limitations: reversible coating

14.6b State the basic characteristics, reason for selection, uses and limitations of sealers.
Sealers: oil based, water based
Characteristics: clear, satisfy absorption
Limitations: material compatibility, smell/fumes (oil based), raise grain in timber (water based)

14.7b State the basic characteristics, reason for selection, uses and limitations of paint removers.
Paint removers: spirit, solvent, alkaline
Characteristics: pungent
Limitations: dangerous to (skin, eyes, inhale)

14.8b State the basic characteristics, reason for selection, uses and limitations of liquid petroleum gas (LPG) flame surface preparation materials/equipment.
Liquid petroleum gas: butane, propane
Characteristics: inflammable
Limitations: dedicated storage

Surface coatings

14.9b State the basic characteristics, reasons for selection, uses and limitations of solvents and thinners.
Solvents/thinners: white spirit, turpentine substitute, methylated spirits, cellulose thinners, water
Characteristics: reduce viscosity of surface coatings to aid application, inflammability
Limitations: toxic effect

14.10b State the basic characteristics, reasons for selection, uses and limitations of reversible (non- convertible) surface coating materials.
Materials: cellulose, knotting, lacquer, bitumen
Characteristics: softened by own thinners
Limitations: recoating difficult by brush (best spray applied)

14.11b State the basic characteristics, reasons for selection and uses of non-reversible (convertible) surface coating materials.
Materials: oil based, water based (emulsion, acrylic)
Characteristics: not softened by own thinners

14.12b Describe the function of the primer within a paint system.
Primer: oil based, water based
Function: satisfy absorption, provide a key to the substrate, prevent chemical reaction

14.13b Describe the function of the undercoat within a paint system.
Undercoat: oil based, water based
Function: provide colour, give body to system

14.14b Describe the function of the sealer within a paint system.
Sealer: oil based, water based
Function: friable surfaces

14.15b Describe the function of the finish within a paint system.
Finish: oil based, water based
Function: protective, durable, aesthetic

14.16b Describe the processes by which oil/resin based paint films dry and harden.
Process: evaporation, oxidation, polymerisation

14.17b Describe the processes by which water based paint films dry and harden.
Process: evaporation, coalescence

14c Painting and Decorating 1: Calculations and Drawing

Introduction

The aim of this module is to enable the candidate to:

a take off dimensions from drawings of linear and rectangular structures
b calculate quantities to assist in preparing, costing and estimating.

Practical competences

The candidate must be able to do the following:

Calculations

14.1c Take off accurate dimensions from drawings of linear and rectangular structures.
Drawings: plans, sectional drawings
Dimensions: lengths, widths, heights, depths

14.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures.
Overall dimensions: lengths, widths, heights, depths

14.3c Calculate areas from dimensions taken off drawings of linear and rectangular structures.
Areas: walls, floors, ceilings, openings

14.4c Calculate the quantity and cost of materials required from drawings of linear and rectangular structures.
Materials: paint (primer, undercoat, top coat)
Costs: product catalogues, price lists, discounts
Drawings: walls, floors, ceilings

14.5c Calculate the quantity and cost of labour required from drawings of linear and rectangular structures.
Labour: time, wages
Drawings: walls, floors, ceilings

Drawings

14.6c Produce working drawings of a rectangular room from plans and details.
Drawings: dimensions, detail (eg door/window openings, ceilings, skirting boards), exploded views

14.7c Produce an isometric drawing of a rectangular room.
Drawings: detail (eg door/window openings, ceilings, skirting boards)

Knowledge requirements

The instructor must ensure the candidate is able to:

Calculations

14.1c Identify calculations involving areas of linear and rectangular structures.
Area: walls, floors, ceilings, openings

14.2c Identify compilations of overall linear dimensions from drawings of linear and rectangular structures.
Dimensions: lengths, widths, heights, depths

14.3c Identify calculations involving quantities and costs of materials of linear and rectangular structures.
Materials: paint (primer, undercoat, top coat)
Costs: product catalogues, price lists, discounts
Drawings: walls, floors, ceilings

14.4c Identify calculations involving quantities and costs of labour of linear and rectangular structures.
Labour: time, wages
Drawings: walls, floors, ceilings

Drawings

14.5c Identify scale working drawings of a rectangular room from plans and details.
Drawings: dimensions, detail (door/window openings, ceilings, skirting boards), exploded views

14.6c Identify isometric drawings of a rectangular room.
Drawings: detail (door/window openings, ceilings, skirting boards)

14d Painting and Decorating 1: Practical Skills

Introduction

The aim of this module is to enable the candidate to:

a select and use hand tools in a correct and safe manner
b prepare surfaces and surrounding areas prior to the application of surface coatings
c prepare and apply surface coatings.

Practical competences

The candidate must be able to do the following:

Tool skills

14.1d Select, use, clean and store basic hand tools for the preparation of surfaces.
Tools: scraper, putty knife, dust brush, shave hook, chisel knife, nail punch, filling knife/spatula
Use: eg new/painted surfaces (timber, board, plaster)

14.2d Select, use, clean, store and maintain brushes and rollers.
Brushes: bristle, nylon
Rollers: lambs wool, synthetic
Clean/store: brushes (white spirit/turpentine substitute then hot soapy water), rollers (cold water)
Use: brushes (oil based paint, timber surfaces), rollers (water based paint)

14.3d Select, use, clean and store wet paint containers and trays.
Cleaning: oil based paint (white spirit/turpentine substitute), water based paint (cold water)

14.4d Select, operate safely, clean, store and maintain portable power tools for surface preparation.
Equipment: electric sander, pneumatic sander

14.5d Select, use, clean, store and maintain liquid petroleum gas (LPG) burning-off equipment.
Select: propane, butane
Use: remove previously painted surface
Store: store (dedicated, ventilated), no naked flame, external light switch, vapour proof light fittings

Surface preparation

14.6d Select and use surface preparation materials.
Surfaces: timber backgrounds, plaster, plaster boards, building boards, previously painted metal
Materials: abrasives, stoppers, fillers, knotting, sealers, paint removers, liquid petroleum gas (LPG) flame

14.7d Identify and treat surface imperfections.
Surfaces: new, previously painted
Treatment: new surfaces (scale removal, rust removal, degreasing, fine surface fillers, oil/water fillers, cellulose paste fillers, absorption satisfied, keying of non-porous surfaces), previously painted surfaces (removal of coating, washing, sugar soap, degreasing solvents/detergents)

Surface coatings

14.8d Prepare surface coating materials for application.
Preparation: mixing, thinning, decanting
Materials: oil based coatings, water based coatings, spirit based coatings

14.9d Apply surface coatings using various methods.
Coatings: oil based, waterbased, spirit based
Methods: brush, roller, pad, mitten

Knowledge requirements

The instructor must ensure the candidate is able to:

Surface preparation

14.1d Identify the materials used for surface preparation.
Materials: abrasives, stoppers, fillers, knotting, sealers, paint removers, liquid petroleum gas (LPG) flame

14.2d Describe the preparation of new surfaces prior to the application of surface coatings.
Treatment: scale removal, rust removal, degreasing, fine surface fillers, oil/water fillers, cellulose paste fillers, absorption satisfied, keying of non-porous surfaces

14.3d Describe the preparation of previously painted surfaces prior to the application of surface coatings.
Treatment: abrading, removal of coating, washing, sugar soap, degreasing solvents/detergents

Surface coatings

14.4d Describe the preparation of surface coating materials prior to application.
Materials: oil based coatings, water based coatings, spirit based coatings

14.5d Describe the various methods of applying surface coating materials.
Methods: brush, roller, pad, mitten

14a Painting and Decorating 1: Safety at Work

Practical competences

The candidate must be able to do the following:

14.1a	Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.	☐
14.2a	Carry out safe working practices using various equipment/materials to protect surrounding work areas from infringement or contamination.	☐
14.3a	Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.	☐
14.4a	Select and use protective clothing and safety equipment for specific tasks.	☐
14.5a	Use and store toxic materials in a safe manner.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

14b Painting and Decorating 1: Materials

Practical competences

The candidate must be able to do the following:

Surface preparation

14.1b Identify and select abrasives from given specifications. ☐

14.2b Identify and select stoppers and fillers from given specifications. ☐

14.3b Identify and select knotting and sealers from given specifications. ☐

14.4b Identify and select paint removers from given specifications. ☐

14.5b Identify and select liquid petroleum gas (LPG) flame surface preparation materials/equipment from given specifications. ☐

Surface coatings

14.6b Identify and select oil based surface coating materials from given specifications. ☐

14.7b Identify and select water based surface coating materials from given specifications. ☐

14.8b Identify and select spirit based surface coating materials from given specifications. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

14c Painting and Decorating 1: Calculations and Drawing

Practical competences

The candidate must be able to do the following:

Calculations

14.1c Take off accurate dimensions from drawings of linear and rectangular structures. ☐

14.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures. ☐

14.3c Calculate areas from dimensions taken off drawings of linear and rectangular structures. ☐

14.4c Calculate the quantity and cost of materials required from drawings of linear and rectangular structures. ☐

14.5c Calculate the quantity and cost of labour required from drawings of linear and rectangular structures. ☐

Drawings

14.6c Produce working drawings of a rectangular room from plans and details. ☐

14.7c Produce an isometric drawing of a rectangular room. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Practical competences

The candidate must be able to do the following:

Tool skills

14.1d Select, use, clean and store basic hand tools for the preparation of surfaces. ☐

14.2d Select, use, clean, store and maintain brushes and rollers. ☐

14.3d Select, use, clean and store wet paint containers and trays. ☐

14.4d Select, operate safely, clean, store and maintain portable power tools for surface preparation. ☐

14.5d Select, use, clean, store and maintain liquid petroleum gas (LPG) burning-off equipment. ☐

Surface preparation

14.6d Select and use surface preparation materials. ☐

14.7d Identify and treat surface imperfections. ☐

Surface coatings

14.8d Prepare surface coating materials for application. ☐

14.9d Apply surface coatings using various methods. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

15a Plumbing 1: Safety at Work

Introduction

The aim of this module is to enable the candidate to maintain safe working conditions and to adopt safe procedures for themselves and others.

Note: The use of national/local regulations and working practices must be included in all practical competences.

Practical competences

The candidate must be able to do the following:

15.1a Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.
Hazards: excavations, obstructions, fumes, dust, warnings notices

15.2a Carry out safe working practices using various equipment/materials to protect surrounding work areas from damage.
Equipment/materials: heat shields, dust sheets, shields (boards)

15.3a Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, steps, hop up stools, scaffold boards

15.4a Set up safety barriers around a plumbing hazard to protect working personnel and members of the public.
Barriers: security tape, barrier material (timber/metal/plastic), safety/warning (signs, lights)

15.5a Select and use protective clothing and safety equipment for specific tasks.
Equipment/clothing: glasses, goggles, visors, face mask, ear defenders/plugs, safety helmet (hard hat), overalls, safety shoes, knee pads, gloves, gauntlets, barrier cream, residual current device, machine guards
Tasks: pipe cutting/bending, soldering, using power tools to drill holes in walls/floors, use of dangerous substances (solvents)

15.6a Locate and manually operate the isolating valve to disconnect domestic water services from the main water supply.
Operation: operate isolator valve, label
Services: mains, cold/hot water services

15.7a Use and store toxic materials in a safe manner.
Use: manufacturers' instructions, toxic effect
Materials: solvents, flux, lead

Knowledge requirements

The instructor must ensure the candidate is able to:

15.1a State the methods used to prevent hazards and to ensure the safety of working personnel and members of the public.
Methods: warning notices, barriers

15.2a State the methods used to protect surrounding work areas from infringement or contamination.
Methods: dust sheets, shields (boards)

15.3a State the method used to protect the surrounding work areas from damage due to portable heating equipment.
Method: heat shields, safe working practices

15.4a Explain the safe use of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, steps, hop up stools, scaffold boards
Safe use: manufacturers' instructions, nationally/locally applied regulations

15.5a Explain the purpose and use of barriers and warning signs/lights to protect working personnel and members of the public from possible accidents.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)
Purpose: segregation of different work activities, segregation of work from members of the public.

15.6a Describe the purpose and use of protective clothing and safety equipment for a range of applications.
Use: own safety, regulations
Equipment/clothing: glasses, goggles, visors, face mask, ear defenders/plugs, safety helmet (hard hat), overalls, safety shoes, knee pads, gloves, gauntlets, barriers cream, residual current device, machine guards
Applications: pipe cutting/bending, soldering, using power tools to drill holes in walls/floors, use of dangerous substances (solvents)

15.7a Identify the requirement to isolate domestic water services from the main water supply.
Requirement: avoid flood/damage

15.8a Identify domestic water services isolating valves.
Valves: mains, hot/cold distribution

15.9a State the toxic effect of materials used in plumbing installations.
Effect: eyes, skin, breathing
Materials: solvents, flux, lead

15.10a Describe the preventative and remedial actions to be taken in the case of exposure to toxic materials.
Exposure: ingested, contact with skin, inhaled
Preventative action: ventilation, masks, barrier cream, protective clothing/equipment
Remedial action: immediate first aid, report to supervisor
Materials: solvents, flux, lead, manufacturers' instructions

15b Plumbing 1: Materials

Introduction

The aim of this module is to enable the candidate to:

a identify and select materials from given specifications
b describe the basic properties of the main types of materials in use.

Note: The properties of locally manufactured materials or materials in local general use should be considered.

Practical competences

The candidate must be able to do the following:

15.1b Identify and select copper pipe and fittings from given specifications.
Pipe: grades (eg table W, X, Y, Z), sizes (diameter, wall thickness)
Fittings: joint types (eg compression, solder), materials (eg copper, brass), bends, elbows, tees, branches, connectors, valves
Identify/select: visual appearance, dimensions

15.2b Identify and select steel pipe and fittings from given specifications.
Pipe: grades (eg heavy, medium, light), diameter
Fittings: joint types (eg screw, welded, compression), materials (eg steel, brass), bends, elbows, tees, branches, connectors, valves
Identify/select: visual appearance, dimensions

15.3b Identify and select plastic pipe and fittings from given specifications.
Pipe: types (eg ABS, PVC, uPVC, MuPVC, MDPE), sizes (diameter, wall thickness)
Fittings: joint types (eg compression, solvent, push fit), materials (eg ABS, PVC, uPVC, MuPVC, MDPE, brass) bends, elbows, tees, branches, connectors, valves
Identify/select: visual appearance, dimensions

15.4b Identify and select iron pipe and fittings from given specifications.
Pipe: type (eg cast, ductile, spun), sizes (diameter, wall thickness)
Fittings: joint types (eg caulked, clamped, compression), materials (eg steel, stainless steel, iron, brass) bends, elbows, tees, branches, connectors, valves
Identify/select: visual appearance, dimensions

15.5b Identify the different types of solder and flux used for copper pipework.

15.6b Identify and select sanitary accessories and fittings from given specifications.
Accessories/fittings: materials (ceramic, stainless steel, steel, cast iron, plastic, brass), sinks, shower, bath, basin, water closet (WC), cistern, drinking fountain, taps
Identify/select: visual appearance, dimensions, colour

15.7b Identify water storage tanks from given specifications.
Tanks: cold, hot, materials (plastic, steel, cooper)

15.8b Identify and select various fixings from given specifications.
Fixings: masonry, concrete, timber
Identify/select: visual appearance, dimensions

Knowledge requirements

The instructor must ensure the candidate is able to:

15.1b State the basic properties of copper pipe and fittings.
Pipe: grades (table W, X, Y, Z), sizes (diameter, wall thickness)
Fittings: joint types (compression, solder), materials (copper, brass), bends, elbows, tees, branches, connectors, valves
Properties: corrosion resistance, pressure

15.2b State the basic properties of steel pipe and fittings.
Pipe: grades (heavy, medium, light), diameter
Fittings: joint types (screw, welded, compression), materials (steel, brass), bends, elbows, tees, branches, connectors, valves
Properties: corrosion resistance, pressure

15.3b State the basic properties plastic pipe and fittings.
Pipe: types (ABS, PVC, uPVC, MuPVC, MDPE), sizes (diameter, wall thickness)
Fittings: joint types (compression, solvent, push fit), materials (ABS, PVC, uPVC, MuPVC, MDPE, brass), bends, elbows, tees, branches, connectors, valves
Properties: corrosion resistance, pressure

15.4b State the basic properties of iron pipe and fittings.
Pipe: type (cast, ductile, spun), sizes (diameter, wall thickness)
Fittings: joint types (caulked, clamped, compression), materials (steel, stainless steel, iron, brass) joint, bends, elbows, tees, branches, connectors, valves
Properties: corrosion resistance, pressure

15.5b State the basic properties and use of the different types of solder and flux.
Use: pipework (copper, stainless steel)

15.6b State the basic properties and types of sanitary accessories and fittings.
Accessories/fittings: materials (ceramic, stainless steel, steel, cast iron, plastic, brass), sinks, shower, bath, basin, water closet (WC), cistern, taps
Properties: appearance, colour

15.7b State the basic properties and types of water storage tanks.
Tanks: cold, hot, materials (plastic, steel, copper)
Properties: corrosion resistance, mechanical strength

15.8b State the basic properties of various fixings.
Fixings: masonry, concrete, timber
Properties: corrosion resistance, mechanical strength

15c Plumbing 1: Calculations, Setting Out and Drawing

Introduction

The aim of this module is to enable the candidate to:

a take off dimensions from drawings
b calculate quantities to assist in preparing, costing and estimating
c set out building details.

Practical competences

The candidate must be able to do the following:

Calculations

15.1c Take off accurate dimensions from drawings of linear and rectangular structures.
Drawings: plans, sectional drawings
Dimensions: lengths of pipework, heights, depths

15.2c Take off and compile overall linear dimensions from drawings.
Overall dimensions: setting out

15.3c Calculate volumes from dimensions taken off drawings of water storage tanks.

15.4c Calculate the quantity and cost of materials required from drawings.
Materials: pipe, fittings, accessories, sanitary accessories/fittings
Costs: product catalogues, price lists, discounts

Setting out

15.5c Measure and set out domestic pipework systems from drawings.
Pipework: cold, sanitation

Drawings

15.6c Produce working drawings from plans and details.
Drawings: dimensions, detail (pipe, fittings, accessories, sanitary accessories/fittings), exploded views

Knowledge requirements

The instructor must ensure the candidate is able to:

Calculations

15.1c Identify calculations involving volume.
Volume: water storage tanks

15.2c Identify compilations of overall linear dimensions from drawings.
Dimensions: setting out

15.3c Identify calculations involving quantities and costs of materials.
Materials: pipe, fittings, accessories, sanitary accessories/fittings
Costs: product catalogues, price lists, discounts

Setting out

15.4c State the tools and equipment used to set out domestic pipework systems.
Tools: tape measure, pencil, spirit level, sliding bevel (angle finder), square, chalk, setting out board

15.5c Explain the correct procedure for setting out domestic pipework systems.
Pipework: cold, sanitation.
Setting out: bend, offset, step over

Drawings

15.6c Identify scale working drawings of items taken from plans and details.
Drawings: dimensions, detail (pipe, fittings, accessories, sanitary accessories/fittings), exploded views

15d Plumbing 1: Practical Skills

Introduction

The aim of this module is to enable the candidate to:

a select and use hand tools in a correct and safe manner
b set out pipe runs and pipework domestic water services
c fix and connect accessories for domestic water services.

Practical competences

The candidate must be able to do the following:

15.1d Select, use, clean and store basic hand tools to install a domestic cold water supply to a tap.
Tools: hacksaw, hammers, tape measure, spirit level, reamer, jointing equipment (eg spanners, portable heating equipment), benders (eg hand bender, spring)

15.2d Select, use, clean and store portable power tools.
Use: drilling walls for screw fixings/pipe access
Tools: electric drill

15.3d Set out pipe runs and install pipework for a domestic cold water supply to a tap.
Pipework: pipe (eg steel, copper), jointing system (eg compression, solder, screw), pipe clips

15.4d Hand bend pipework to fit pipe run.
Bending: eg spring, hand bender, sand

15.5d Fix plumbing accessories to walls.
Accessories: tap.

15.6d Terminate pipework into accessories.
Accessories: tap

15.7d Select, use, clean and store basic hand tools to install domestic water services.
Services: cold
Tools: hacksaw, hammers, tape measure, spirit level, reamer, jointing equipment (spanners, portable heating equipment), benders (hand bender, spring)

15.8d Select, use, clean and store pipe bending equipment.
Equipment: eg hydraulic, mechanical

15.9d Set out pipe runs and install copper pipework for domestic water services.
Services: cold
Pipework: fittings (compression, solder), pipe clips, taps, valves

15.10d Set out pipe runs and install steel pipework for domestic water services.
Services: cold
Pipework: fittings (eg screw, weld), pipe clips, taps, valves

15.11d Set out pipe runs and install plastic pipework for domestic water services.
Services: cold
Pipework: fittings (push fit, compression), pipe clips, taps, valves

15.12d Install storage tanks and sanitary fittings.
Tanks: cold water, material (eg plastic, steel, copper)
Sanitary fittings: eg sink, shower, bath, basin, water closet (WC), cistern

15.13d Terminate pipework into a storage tank and a sanitary fitting.
Pipework: copper, steel, plastic

15.14d Select, use, clean and maintain portable heating equipment.
Equipment: eg oxy-acetylene, propane, butane
Use: solder joints, bending
Store: store (dedicated, ventilated), no naked flame, external light switch, vapour proof light fittings

15.15d Set out pipe runs and install sanitary pipework for domestic services.
Pipe: eg plastic, iron
Domestic services: sink, shower, bath, basin, water closet (WC)

15.16d Terminate sanitary pipework into fittings.
Fittings: eg sink, shower, bath, basin, water closet (WC)

Knowledge requirements

The instructor must ensure the candidate is able to:

15.1d Identify pipe bending equipment.
Equipment: hydraulic, mechanical

15.2d Describe the use and maintenance of pipe bending equipment.
Equipment: hydraulic, mechanical
Use: steel pipe, manufacturers' instructions, safety
Maintenance: cleaning, lubrication, hydraulic oil levels

15.3d Identify pipe threading equipment.
Equipment: hand, electrical

15.4d Describe the use and maintenance of pipe threading equipment.
Equipment: hand, electrical
Use: steel pipe, manufacturers' instructions, safety
Maintenance: cleaning, lubrication, pipe, inspect dies

15.5d Identify the types of pipe, fittings and jointing systems used for sanitary pipework.
Pipe: iron, plastic
Jointing systems: caulked, clamped, compression, push fit, solvent, manufacturers' instructions
Fittings: traps, elbows, bends, tee, branch, pan/WC connection

15.6d Identify the various types of floor, wall and ceiling construction used in domestic buildings.
Floor: timber, concrete
Wall: brick/block (cavity, solid), timber, plasterboard
Ceiling: plasterboard, concrete, timber

15a Plumbing 1: Safety at Work

Practical competences

The candidate must be able to do the following:

15.1a	Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.	☐
15.2a	Carry out safe working practices using various equipment/materials to protect surrounding work areas from damage.	☐
15.3a	Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.	☐
15.4a	Set up safety barriers around a plumbing hazard to protect working personnel and members of the public.	☐
15.5a	Select and use protective clothing and safety equipment for specific tasks.	☐
15.6a	Locate and manually operate the isolating valve to disconnect domestic water services from the main water supply.	☐
15.7a	Use and store toxic materials in a safe manner.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

15b Plumbing 1: Materials

Practical competences

The candidate must be able to do the following:

15.1b	Identify and select copper pipe and fittings from given specifications.	☐
15.2b	Identify and select steel pipe and fittings from given specifications.	☐
15.3b	Identify and select plastic pipe and fittings from given specifications.	☐
15.4b	Identify and select iron pipe and fittings from given specifications.	☐
15.5b	Identify the different types of solder and flux used for copper pipework.	☐
15.6b	Identify and select sanitary accessories and fittings from given specifications.	☐
15.7b	Identify water storage tanks from given specifications.	☐
15.8b	Identify and select various fixings from given specifications.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Practical competences

The candidate must be able to do the following:

Calculations

15.1c Take off accurate dimensions from drawings of linear and rectangular structures. ☐

15.2c Take off and compile overall linear dimensions from drawings. ☐

15.3c Calculate volumes from dimensions taken off drawings and water storage tanks. ☐

15.4c Calculate the quantity and cost of materials required from drawings. ☐

Setting out

15.5c Measure and set out domestic pipework systems from drawings. ☐

Drawings

15.6c Produce working drawings from plans and details. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Practical competences

The candidate must be able to do the following:

15.1d Select, use, clean and store basic hand tools to install a domestic cold water supply to a tap. ☐

15.2d Select, use, clean and store portable power tools. ☐

15.3d Set out pipe runs and install pipework for a domestic cold water supply tap. ☐

15.4d Hand bend pipework to fit pipe run. ☐

15.5d Fix plumbing accessories to walls. ☐

15.6d Terminate pipework into accessories. ☐

15.7d Select, use, clean and store basic hand tools to install domestic water services. ☐

15.8d Select, use, clean and store pipe bending equipment. ☐

15.9d Set out pipe runs and install copper pipework for domestic water services. ☐

15.10d Set out pipe runs and install steel pipework for domestic water services. ☐

15.11d Set out pipe runs and install plastic pipework for domestic water services. ☐

15.12d Install storage tanks and sanitary fittings. ☐

15.13d Terminate pipework into a storage tank and a sanitary fitting. ☐

15.14d Select, use, clean and maintain portable heating equipment. ☐

15.15d Set out pipe runs and install sanitary pipework for domestic services. ☐

15.16d Terminate sanitary pipework into fittings. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

16a Refrigeration and Air Conditioning 1: Safety at Work

Introduction

The aim of this module is to enable the candidate to maintain safe working conditions and to adopt safe procedures for themselves and others.

Note: The use of national/local regulations and working practices must be included in all practical competencies, as must the environmental impact of all processes and materials used.

Practical competences

The candidate must be able to do the following:

16.1a Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.
Hazards: ladders, platforms, fumes, asphyxiating gases, hot surfaces, liquefied gases under pressure, warning notices

16.2a Carry out safe working practices using various equipment/materials to protect surrounding work areas from damage.
Equipment/materials: barriers, heat shields, dust sheets, shields (boards)

16.3a Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, steps, hop up stools, scaffold boards

16.4a Set up safety barriers around refrigeration and air conditioning hazards to protect working personnel and members of the public.
Barriers: security tape, barrier material (timber, metal, plastic) safety/warning (signs, lights)

16.5a Select and use protective clothing and safety equipment for specific tasks.
Equipment/clothing: glasses, goggles, visors, face mask, respirator, ear defenders/plugs, safety helmet (hard hat), flame retarding overalls, safety shoes, knee/elbow pads, gauntlets, barrier cream, residual current device, machine guards, electrically insulated hand tools
Tasks: pipe cutting/bending, brazing, using power tools to drill holes in timber/metal/masonry, use of hazardous substances (refrigerants, solvents, fluxes)

16.6a Locate and manually operate the isolating switch to disconnect a refrigeration/air conditioning system, or circuit from the electrical supply.
Operation: operate isolator switch, lock off isolator switch, fit warning notice
System: refrigeration/air conditioning plant, defrost circuit, lighting system, fans, motorised dampers

16.7a Locate and manually operate refrigeration and air conditioning system service valves to isolate components/fluid circuits for service/maintenance.
Operation: operate valve, fit warning notice
Components/fluid circuits: compressor service valves, pump down systems, liquid receiver/line stop valves

16.8a Use and store toxic, hazardous and environmentally unfriendly materials in a safe manner.
Use: manufacturers' instructions, environmental protection guidelines, toxic effect
Materials: refrigerants, brazing material, fluxes, solvents, oils

Knowledge requirements

The instructor must ensure the candidate is able to:

16.1a State the methods used to prevent hazards and to ensure the safety of working personnel and members of the public.
Methods: warning notices, barriers

16.2a State the methods used to protect surrounding work areas from infringement or contamination.
Methods: barriers, dust sheets, shields

16.3a State the method used to protect the surrounding work areas from damage due to portable heating equipment.
Method: heat shields, safe working practices

16.4a Explain the safe use of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, steps, hop up stools, scaffold boards
Safe use: manufacturers' instructions, nationally/locally applied regulations

16.5a Explain the purpose and use of barriers and warning signs/lights to protect working personnel and members of the public from possible accidents.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)
Purpose: segregation of different work activities, segregation of work from members of the public

16.6a Describe the purpose and use of protective clothing and safety equipment for a range of applications.
Use: own safety, regulations
Equipment/clothing: glasses, goggles, visors, face mask, respirator, ear defenders/plugs, safety helmet (hard hat), flame retarding overalls, safety shoes, knee/elbow pads, gauntlets, barrier cream, residual current device, machine guards, electrically insulated hand tools
Applications: pipe cutting/ bending, brazing, using power tools, use of hazardous substances (refrigerants, solvents, fluxes, oils)

16.7a Identify the means of isolating electrical equipment/circuits.
Means of isolation: isolators, fuses, miniature circuit breakers

16.8a Identify the dangers associated with the use of electrical equipment.
Dangers: electrical shock, burns, fire

16.9a Identify the means of isolating refrigerant circuits.
Means of isolation: compressor service valves, pump down systems, liquid receiver/line stop valves

16.10a Identify the dangers associated with the release of refrigerant from a system.
Dangers: frost bite, asphyxiation, toxic products of decomposition, harmful to the environment

16.11a State the toxic effect of materials used in refrigeration and air conditioning systems.
Effect: eyes, skin, breathing
Materials: refrigerants, brazing material, fluxes, solvents, oils

16.12a Describe the preventative and remedial action to be taken in the case of exposure to hazardous material.
Type of exposure: ingested, contact with skin, inhaled, burns
Preventative action: masks/respirators, barrier cream, protective clothing/equipment
Remedial action: immediate first aid, report to supervisor
Materials: refrigerants, brazing material, flux, products of decomposition due to combustion, oils

16b Refrigeration and Air Conditioning 1: Materials

Introduction

The aim of this module is to enable the candidate to:

a identify and select materials from given specifications
b describe the basic properties of the main types of materials in use.

Note: The properties of locally manufactured materials or materials in local general use should be considered.

Practical competences

The candidate must be able to do the following:

16.1b Identify and select refrigeration quality copper pipe and fittings from given specifications.
Pipe: thick walled-soft drawn-annealed copper, half hard copper
Fittings: joint types (eg compression, solder), materials (eg copper, brass), bends, elbows, tees, unions, valves, line fittings (eg sight glass, dryer)
Identify/select: visual appearance, dimensions

16.2b Identify and select plastic pipes and fittings from given specifications.
Pipe: eg ABS, uPVC, PVC, polypropylene, polyethylene
Fittings: joint types (eg push fit, compression, solvent weld), connectors, bends, elbows, tees, traps, tank connectors
Identify/select: visual appearance, dimensions

16.3b Identify and select sheet materials from given specifications.
Materials: copper, mild steel, galvanised mild steel, lead, zinc, plastics
Identify/select: visual appearance, dimensions

16.4b Identify and select construction materials from given specifications.
Materials: eg timber, brick, lightweight block, sheet metal, metal frames
Identify/select: visual appearance, dimensions

16.5b Identify and select insulating materials from given specifications.
Materials: eg rigid plastic foams, flexible plastic foams, insitu foams, fibreglass, mineral wools, renewable materials
Identify/select: visual appearance, dimensions

16.6b Identify and select the different types of solder and flux used from given specifications.
Applications: copper to copper brazing, dissimilar metal brazing

Knowledge requirements

The instructor must ensure the candidate is able to:

16.1b State the basic properties of refrigeration quality copper pipe and fittings.
Pipe: thick walled-soft drawn-annealed copper, half hard copper
Fittings: joint types (compression, solder), materials (copper, brass), bends, elbows, tees, unions, valves, line fittings (eg sight glass, dryer)
Properties: wall thickness, safe working pressure

16.2b State the basic properties of plastic pipes and fittings used for evaporator drain lines.
Pipe: eg ABS, uPVC, PVC, polypropylene, polyethylene
Fittings: joint types (push fit, compression, solvent weld), connectors, bends, elbows, tees, traps, tank connectors
Properties: rigidity, thermal stability

16.3b State the basic properties of sheet materials.
Materials: copper, mild steel, galvanised mild steel, lead, zinc, plastics
Properties: corrosion resistance

16.4b State the basic properties and describe the use of timber products.
Properties: rot/vermin resistant, stable in changing temperature/humidity, strength
Use: frames, floors duck boards, shelves

16.5b Describe the use of bricks and blocks.
Use: walls, bearer supports

16.6b Describe the use of sheet metal and metal frames.
Use: coverings for inner/outer walls, floor covering, duct manufacture, structural frames, equipment supports/brackets

16.7b State the basic properties of insulating materials.
Properties: thermal, non toxic, flame resistance, rigidity, ease of application

16.8b State the properties and use of the different types of solder and flux.
Use: copper to copper brazing, dissimilar metal brazing
Solder: must be cadmium free

16.9b Describe how a refrigerant can be identified using a compound gauge and a thermometer.

16c Refrigeration and Air Conditioning 1: Calculations, Setting Out and Drawing

Introduction

The aim of this module is to enable the candidate to:

a take off dimensions from drawings of linear and rectangular structures
b calculate quantities to assist in preparing, costing and estimating
c set out equipment and accessory details.

Practical competences

The candidate must be able to do the following:

Calculations

16.1c Take off accurate dimensions from drawings of linear and rectangular structures.
Drawings: plans, sectional drawings, equipment manufacturers' drawings
Dimensions: lengths of pipework, duct (length, rectangular section)

16.2c Take off and compile overall linear dimensions from drawings of linear and rectangular structures.
Overall dimensions: setting out

16.3c Take off plant base plate dimensions from manufacturers' drawings.
Dimensions: overall length/width, diameter and spacing of holes for holding down bolts

16.4c Calculate volumes of regular rectangular structures from dimensions taken off drawings.
Volumes: liquid receivers, cold space storage capacity

16.5c Calculate the quantity and cost of materials required from drawings.
Materials: pipe, fittings, accessories
Costs: product catalogues, price lists, discounts

16.6c Calculate the heat transfer through a single layer flat surface by use of simple linear formula.
Formula: $Q = kA \delta T / d$

16.7c Convert temperature readings between different temperature scales.
Temperature scales: eg Fahrenheit to Celsius (F to C), Celsius to Kelvin (C to K)

Setting out

16.8c Measure and set out pipework for a small commercial refrigeration system.
Pipework: liquid line, suction line, evaporator drain

16.9c Use equipment to construct accurate right angles to enable the fabrication of simple structures.
Equipment: set squares, 3:4:5 proportioned cord/string
Structures: eg gallows brackets, coldroom bases

Drawings

16.10c Produce working drawings of pipe layouts from plans and details.
Drawings: scale, dimensions, detail (pipe, fittings, accessories), exploded views

16.11c Produce working drawings for equipment bases from sketches, plans and details.
Drawings: scale, dimensions, location of securing bolt holes, location of mounting bolt holes
Equipment: gallows brackets, rag bolt frames

Knowledge requirements

The instructor must ensure the candidate is able to:

Calculations

16.1c Identify calculations involving volume.
Volume: liquid receivers, coldroom storage capacity

16.2c Identify compilations of linear dimensions from drawings.
Dimensions: setting out

16.3c Identify calculations involving quantities and costs of materials.
Quantities: pipe lengths, fittings, accessories
Costs: product catalogues, price lists, discounts

16.4c Identify calculations involving heat transfer through a single layer flat surface by use of simple linear formula.
Formula: $Q = kA \delta T / d$

16.5c Identify calculations involving the conversion of temperature readings between different temperature scales.
Temperature scales: eg Fahrenheit to Celsius (F to C), Celsius to Kelvin (C to K)

Setting out

16.6c State the tools and equipment used to set out small commercial refrigeration pipework systems.
Tools: tape measure, pencil, spirit level, sliding bevel (angle finder), set square, chalk

16.7c Explain the procedure used to set out a large right angle using string or cord.
Procedure: string or cord marked in proportions of 3:4:5

Drawings

16.8c Identify scale working drawings of items taken from plans, details and sketches.
Drawings: dimensions, detail (pipe, fittings, accessories), exploded views

16d Refrigeration and Air Conditioning 1: Practical Skills

Introduction

The aim of this module is to enable the candidate to:

a select and use hand tools in a correct and safe manner
b set out and form pipe runs for small commercial installations
c make pipe joints.

Practical competences

The candidate must be able to do the following:

16.1d Select, use, clean and store basic hand tools to install components of a refrigeration system.
Tools: tape measure, spirit level, tube cutter, pipe reamer, screw drivers, jointing equipment (eg pipe flaring tools, swaging tools, portable heating equipment), benders (eg spring, hand bender)

16.2d Select, use, clean and store portable power tools.
Use: drilling walls for screw fixing/pipe access, drilling thin metal plate for component/accessory fixing
Tools: electric drill

16.3d Set out pipe runs and install pipework from a liquid receiver to an evaporator.
Pipework: copper pipe, jointing system (compression, braze), pipe clips, drain lines (eg plastic, copper)

16.4d Hand bend pipework to fit pipe runs and link accessories.
Bending: eg spring, hand bender

16.5d Fix refrigeration accessories to walls or framework.
Accessories: evaporator, heat exchanger

16.6d Terminate pipework into accessories.
Accessories: evaporator, heat exchanger

16.7d Select, use, clean, store and maintain portable heating equipment.
Equipment: eg oxy-acetylene, propane, butane, inert gas (eg oxygen free nitrogen)
Use: brazed joints
Store: store (dedicated, ventilated), no naked flames, external light switches, vapour proof light fittings

16.8d Set out pipe runs and install pipework for a small commercial refrigeration system.
Pipework: copper pipe, jointing system (compression, braze), pipe clips, drain lines (eg plastic, copper)

16.9d Terminate copper pipework onto receivers, evaporators and line accessories using compression fittings.
Tools/equipment: flaring tool, flare nuts, spanners

16.10d Terminate copper pipework onto compressors using vibration damping.
Damping: fabricated vibration damping loops, vibration eliminators

16.11d Use tools and equipment to make brazed copper to copper joints.
Tools/equipment: swaging tool, pipe reamer, wire wool, portable heating equipment, inert gas, brazing material (eg silver soldering alloy), tube cutter

16.12d Use tools and equipment to make brazed dissimilar metal joints.
Metals: copper to brass, copper to mild steel, brass to mild steel
Tools/equipment: pipe reamer, wire wool, portable heating equipment, inert gas, silver soldering alloy, tube cutter

16.13d Use tools and equipment to cut and deburr copper pipe to dimensions taken from drawings.
Tools: tube cutter, pipe reamer, tape measure

16.14d Use tools and equipment to bend copper pipe to dimensions and configurations taken from drawings.
Tools: pipe bender (spring, hand bender), tape measure, pencil

16.15d Use tools and equipment to identify refrigerants by pressure/temperature relationship.
Tools/equipment: pressure gauge/gauge manifold, thermometer, refrigerant comparator/pressure temperature tables, samples of refrigerant

16.16d Use a gauge manifold to make service connections.
Use: interconnection between system and service accessories (vacuum pump, refrigerant supply)

16.17d Select, use, clean and store a vacuum pump.
Use: remove air from completed pipe systems

16.18d Identify the operating positions of compressor service valves.
Operating positions: front seat, back seat, cracked off back seat

16.19d Identify the operating positions of a liquid receiver stop valve.
Operating positions: front seat, back seat

16.20d Connect the high/low pressure controls to a refrigeration/air conditioning system.

16.21d Select, use, clean and store a refrigerant leak detector.
Detector: appropriate to refrigerant in use

Knowledge requirements

The instructor must ensure the candidate is able to:

16.1d Describe the use and maintenance of hand bending equipment.
Equipment: spring bender, hand bender
Use: form bends and sets in soft drawn annealed copper pipe to conform to predetermined dimensional limits
Maintenance: cleaning, lubrication

16.2d Describe the use and maintenance of a refrigeration pipe flaring tool.
Equipment: flare block and spinner, pipe reamer
Use: burr removal, produce flares on copper pipe to a consistent and acceptable standard
Maintenance: cleaning, lubrication

16.3d Describe the use and maintenance of a tube cutter.
Use: cut copper pipe to predetermined lengths
Maintenance: cleaning, lubrication, inspect/change cutting wheel

16.4d Describe the use and maintenance of pipe swaging equipment.
Equipment: hand held impact swage, mechanical swage (tube expanding tool)
Use: expand the cut end of a copper tube to form a socket to accept a tube of the same original diameter
Maintenance: cleaning, lubrication, remove burrs from driving head of impact swage

16.5d Identify the correct drill and drill bit for various applications.
Drill: electric, hammer
Bits: wood, masonry, metal
Application: correct drill action (hammer, rotary only), drill speed

16.6d Select nozzle size and gas pressures on portable heating equipment suitable for both the brazing alloy in use and the size of pipe being brazed.
Equipment: oxy-acetylene, propane, butane, inert gas (eg oxygen free nitrogen)

16.7d Identify the correct brazing alloy for use in copper to copper brazing.

16.8d Identify the correct brazing alloy for use in dissimilar metal brazing.
Metals: copper to brass, copper to steel, brass to steel

16.9d Identify the inert gas used in pipe systems to prevent scale formation during brazing.
Inert gas: eg oxygen free nitrogen

16.10d Identify the type and application of pressure measuring equipment used in the installation and commissioning of refrigeration and air conditioning systems.
Equipment: pressure gauge, compound gauge, vacuum gauge
Application: high/low pressure sides of system, vacuum pump

16.11d Identify thread forms used in refrigeration and air conditioning plant and associated installation equipment.
Thread forms: eg SAE, Briggs taper, metric, left hand, right hand
Equipment: compression fittings, gas tight plugs/connectors, assembly/holding down bolts, toxic/flammable gas

16.12d Identify the types of fitting used in small commercial refrigeration and air conditioning systems.
Fittings: long/short flare nuts, unions, tees, elbows, capillary/end feed fittings (unions, elbows, tees, long/short radius bends, return bends, reducing fittings), filters, sight glasses, Schraeder fittings, in line stop valves

16.13d Describe the use of a gauge manifold set.
Use: correct connection of flexible hoses, service operations

16.14d Identify and describe the operating positions of a compressor service valve.
Operating positions: front seat, back seat, cracked open

16.15d Identify and describe the location of pressure controls.
Equipment: high pressure control, low pressure control, combined high/low control

16.16d Describe the operation and positive indication method of refrigerant leak detectors.
Detectors: electronic, flame colour, soap/bubble solution

Practical competences

The candidate must be able to do the following:

16.1a	Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.	☐
16.2a	Carry out safe working practices using various equipment/materials to protect surrounding work areas from damage.	☐
16.3a	Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.	☐
16.4a	Set up safety barriers around refrigeration and air conditioning hazards to protect working personnel and members of the public.	☐
16.5a	Select and use protective clothing and safety equipment for specific tasks.	☐
16.6a	Locate and manually operate the isolating switch to disconnect a refrigeration/air conditioning system, or circuit from the electrical supply.	☐
16.7a	Locate and manually operate refrigeration and air conditioning system service valves to isolate components/fluid circuits for service/maintenance.	☐
16.8a	Use and store toxic, hazardous and environmentally unfriendly materials in a safe manner.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

16b Refrigeration and Air Conditioning 1: Materials

Practical competences

The candidate must be able to do the following:

16.1b	Identify and select refrigeration quality copper pipe and fittings from given specifications.	☐
16.2b	Identify and select plastic pipes and fittings from given specifications.	☐
16.3b	Identify and select sheet materials from given specifications.	☐
16.4b	Identify and select construction materials from given specifications.	☐
16.5b	Identify and select insulating materials from given specifications.	☐
16.6b	Identify and select the different types of solder and flux used from given specifications.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

16c Refrigeration and Air Conditioning: Calculations, Setting Out and Drawing

Practical competences

The candidate must be able to do the following:

16.1c	Take off accurate dimensions from drawings of linear, rectangular and cylindrical structures.	☐
16.2c	Take off and compile overall linear dimensions from drawings of linear and rectangular structures.	☐
16.3c	Take off plant base plate dimensions from manufacturers' drawings.	☐
16.4c	Calculate volumes of regular rectangular structures from dimensions taken off drawings.	☐
16.5c	Calculate the quantity and cost of materials required from drawings.	☐
16.6c	Calculate the heat transfer through a single layer flat surface by use of simple linear formula.	☐
16.7c	Convert temperature readings between different temperature scales.	☐
16.8c	Measure and set out pipework for a small commercial refrigeration system.	☐
16.9c	Use equipment to construct accurate right angles to enable the fabrication of simple structures.	☐
16.10c	Produce working drawings of pipe layouts from plans and details.	☐
16.11c	Produce working drawings for equipment bases from sketches, plans and details.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

16d Refrigeration and Air Conditioning: Practical Skills

Practical competences

The candidate must be able to do the following:

16.1d Select, use, clean and store basic hand tools to install components of a refrigeration system. ☐

16.2d Select, use, clean and store portable power tools. ☐

16.3d Set out pipe runs and install pipework from a liquid receiver to an evaporator. ☐

16.4d Hand bend pipework to fit pipe runs and link accessories. ☐

16.5d Fix refrigeration accessories to walls or framework. ☐

16.6d Terminate pipework into accessories. ☐

16.7d Select, use, clean, store and maintain portable heating equipment. ☐

16.8d Set out pipe runs and install pipework for a small commercial refrigeration system. ☐

16.9d Terminate copper pipework onto receivers, evaporators and line accessories using compression fittings. ☐

16.10d Terminate copper pipework onto compressors using vibration damping. ☐

16.11d Use tools and equipment to make brazed copper to copper joints. ☐

16.12d Use tools and equipment to make brazed dissimilar metal joints. ☐

16.13d Use tools and equipment to cut and deburr copper pipe to dimensions taken from drawings. ☐

16.14d Use tools and equipment to bend copper pipe to dimensions and configurations taken from drawings. ☐

16.15d Use tools and equipment to identify refrigerants by pressure/temperature relationship. ☐

16.16d Use a gauge manifold to make service connections. ☐

16.17d Select, use, clean and store a vacuum pump. ☐

16.18d Identify the operating positions of compressor service valves. ☐

16.19d Identify the operating positions of a liquid receiver stop valve. ☐

16.20d Connect the high/low pressure controls to refrigeration/air conditioning system. ☐

16.21d Select, use, clean and store a refrigerant leak detector. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

17a Electrical Installation 1: Safety at Work

Introduction

The aim of this module is to enable the candidate to maintain safe working conditions and to adopt safe procedures for themselves and others.

Note: The use of national/local regulations and working practices must be included in all practical competences.

Practical competences

The candidate must be able to do the following:

17.1a Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.
Hazards: obstructions, exposed live electrical parts, warning notices

17.2a Carry out safe working practices using various equipment/materials to protect surrounding work areas from damage.
Equipment/materials: dust sheets, shields (boards)

17.3a Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, steps, hop up stools, scaffold boards

17.4a Set up safety barriers around electrical hazards to protect working personnel and members of the public.
Barriers: security tape, barrier materials (timber/metal/plastic), safety/warning (signs, lights)

17.5a Select and use protective clothing and safety equipment for specific tasks.
Equipment/clothing: glasses, goggles, face mask, ear defenders/plugs, safety helmet (hard hat), overalls, safety shoes, residual current device, electrically insulated hand tools
Tasks: connecting electrical circuits to single phase supply, using power tools to drill holes in walls/floors, use of dangerous substances (solvents)

17.6a Locate and manually operate the isolating switch to disconnect a domestic single phase installation or circuit from the electrical supply.
Operation: operate isolator switch, lock off isolator switch
Installation/circuits: heating, lighting, cooking, power

17.7a Check the correct operation of electrical test equipment and carry out a test of a domestic single phase circuit to confirm that it has been isolated from the electrical supply.
Test equipment: volt meter, voltage indicator, test lamp

17.8a Carry out the procedure to isolate a person in contact with a simulated live single phase electrical supply.
Procedure: isolate electrical supply before making contact with victim

17.9a Use and store toxic materials in a safe manner.
Use: manufacturers' instructions, toxic effect
Materials: solvents

Knowledge requirements

The instructor must ensure the candidate is able to:

17.1a State the methods used to prevent hazards and to ensure the safety of working personnel and members of the public.
Methods: warning notices, insulate/enclose live electrical parts, barriers

17.2a State the methods used to protect surrounding work areas from infringement or contamination.
Methods: dust sheets, shields (boards)

17.3a Explain the safe use of simple scaffold platforms less than 2m high.
Scaffolding: trestles, folding trestles, steps, hop up stools, scaffold boards
Safe use: manufacturers' instructions, nationally/locally applied regulations

17.4a Explain the purpose and use of barriers and warning signs/lights to protect working personnel and members of the public from possible accidents.
Barriers: security tape, barrier material (timber, metal, plastic), safety/warning (signs, lights)
Purpose: segregation of different work activities, segregation of work from members of the public

17.5a Describe the purpose and use of protective clothing and safety equipment for a range of applications.
Use: own safety, regulations
Equipment/clothing: goggles, face mask, ear defenders/plugs, safety helmet (hard hat), overalls, safety shoes, residual current device, electrically insulated hand tools
Applications: connecting electrical circuits to single phase supply, using power tools to drill holes in walls/floors, use of dangerous substances (solvents)

17.6a Identify the dangers associated with the use of electrical equipment.
Dangers: electrical shock, fire, burns

17.7a Describe how the human body can become part of an electrical circuit.
Circuit: body resistance, current paths at different voltages, body connection between (live terminal/earth, live terminals)

17.8a State the effects upon the human body caused by a single phase electrical shock.
Effect: threshold of perception (1-3mA), tightening of muscles (10-15mA), extension of tightening (25-30mA), fibrillation of the heart (50mA and above)

17.9a Identify the requirement to isolate a single phase domestic installation or circuit from the electrical supply.
Requirement: avoid electrical shock/fire/burns

17.10a Identify domestic single phase electrical supply isolating equipment.
Equipment: mains isolator, switch fuse, distribution board

17.11a Describe the procedure for testing the correct operation of electrical test equipment.
Equipment: volt meter, voltage indicator, test lamp
Procedure: test on known electrical supply

17.12a Describe the procedure for testing a domestic single phase circuit to confirm that it has been isolated from the electrical supply.
Procedure: check correct operation of test equipment, check isolation of supply between phase and neutral

17.13a Describe the procedure to isolate a person in contact with a live single phase electrical supply.
Procedure: isolate electrical supply before making contact with victim

17.14a State the reason why it may be necessary to apply resuscitation to a person having received an electric shock.
Reasons: stopped breathing, heart failure

17.15a State the toxic effect of materials used in electrical installations.
Effect: eyes, skin, breathing
Materials: solvents

17.16a Describe the preventative and remedial actions to be taken in the case of exposure to toxic materials.
Exposure: ingested, contact with skin, inhaled
Preventative action: ventilation, masks, protective clothing/equipment
Remedial action: immediate first aid, report to supervisor
Materials: solvents, manufacturers' instructions

17b Electrical Installation 1: Materials

Introduction

The aim of this module is to enable the candidate to:

a identify and select materials from given specifications
b describe the basic properties of the main types of materials in use for domestic single phase circuits.

Note: The properties of locally manufactured materials or materials in local general use should be considered.

Practical competences

The candidate must be able to do the following:

17.1b Identify and select cables from given specifications.
Cable: insulated and sheathed single/multi-core, single/twin/three core, current rating
Identify/select: visual appearance, dimensions, colour coding

17.2b Identify and select flexible cord from given specifications.
Cord: insulated and sheathed multi-core, twin/three core, current rating
Identify/select: visual appearance, dimensions, colour coding

17.3b Identify and select electrical accessories from given specifications.
Accessories: mounting box, switches (single pole, double pole, with/without neon indicators), ceiling rose, lamp holder, joint box, socket outlet, cable clips
Identify/select: visual appearance, dimensions

17.4b Identify and select single phase distribution boards with a double pole isolating switch from given specifications.
Distribution board: fused (cartridge, re-wireable), miniature circuit breaker, residual current device/RCD, rating
Identify/select: visual appearance, dimensions

17.5b Identify and select insulating sleeving and tapes from given specifications.
Sleeving: protective conductor, live conductors, heat resistant
Tapes: adhesive, heat shrink
Identify/select: visual appearance, dimensions, colour coding

17.6b Identify and select cord grips and glands from given specifications.
Identify/select: visual appearance, dimensions

Knowledge requirements

The instructor must ensure the candidate is able to:

17.1b Describe the component parts of electrical cable.
Component parts: conductor, insulation, sheathing

17.2b State the basic properties of cables used for domestic single phase circuits.
Cable: insulated and sheathed single/multi-core, single/twin/three core, current rating
Properties: rating, temperature range

17.3b State the basic properties of flexible cord used for domestic single phase circuits.
Cord: insulated and sheathed multi-core, twin/three core, current rating
Properties: rating, temperature range, flexibility, appearance

17.4b State the basic properties of electrical accessories used for domestic single phase circuits.
Accessories: mounting box, switches (single pole, double pole, with/without neon indicators), ceiling rose, lamp holder, joint box, socket outlet, cable clips
Properties: rating, appearance, material

17.5b State the basic properties of single phase distribution boards with a double pole isolating switch used for domestic single phase circuits.
Distribution board: fused (cartridge, re-wireable), miniature circuit breaker, residual current device/RCD, rating
Properties: circuit isolation/separation, rating, disconnection time, short circuit protection, earth leakage detection, safety

17.6b State the basic properties of insulating sleeving and tapes used for domestic single phase circuits.
Sleeving: protective conductor, live conductors, heat resistant
Tapes: adhesive, heat shrink
Properties: identification, insulation of exposed conductors, heat protection

17.7b State the basic properties of cord grips and glands used for domestic single phase circuits.
Properties: avoid tension on conductor termination, weather/dirt protection

17c Electrical Installation 1: Calculations, Setting Out and Drawing

Introduction

The aim of this module is to enable the candidate to:

a take off dimensions from drawings
b calculate quantities to assist in preparing, costing and estimating
c set out building details.

Practical competences

The candidate must be able to do the following:

Calculations

17.1c Take off accurate dimensions from drawings of linear and rectangular structures.
Drawings: plans, sectional drawings
Dimensions: lengths of cable/conduit, outlet positions, heights, depths

17.2c Take off and compile overall linear dimensions from drawings.
Overall dimensions: setting out

17.3c Calculate the quantity and cost of materials required from drawings.
Materials: cable, flexible cords, cable clips, conduit, accessories, fixed equipments
Costs: product catalogues, price lists, discounts

17.4c Carry out calculations involving Ohm's Law.
Calculations: series resistive circuits, parallel resistive circuits, combined resistive circuits

17.5c Carry out calculations involving power.
Calculations: series resistive circuits, parallel resistive circuits, combined resistive circuits

17.6c Calculate load currents for specified domestic single phase circuits.
Circuits: lighting, socket outlet, fixed appliance

Setting out

17.7c Measure and set out domestic single phase circuits from drawings.
Circuits: lighting, socket outlet, fixed appliance

Drawings

17.8c Produce working drawings from plans and details of linear and rectangular structures.
Drawings: dimensions, detail (cable routes, outlet positions, fixed appliance positions, distribution board), exploded views

Knowledge requirements

The instructor must ensure the candidate is able to:

Calculations

17.1c Identify compilations of overall linear dimensions from drawings of linear and rectangular structures.
Dimensions: setting out

17.2c Identify calculations involving quantities and costs of materials.
Materials: cable, flexible cords, cable clips, conduit, accessories, fixed equipments
Costs: product catalogues, price lists, discounts

17.3c Describe the structure of an atom.
Structure: proton, neutron, electron (bonded, free), positive/negative charges

17.4c Describe electric current as a flow of charged particles.

17.5c Define the relationship between resistance and the specification of a conductor.
Specification: length, cross sectional area, specific material resistance, variation with temperature

17.6c Identify calculations involving Ohm's Law.
Calculations: series resistive circuits, parallel resistive circuits, combined resistive circuits

17.7c Identify calculations involving power.
Calculations: series resistive circuits, parallel resistive circuits, combined resistive circuits

17.8c Identify calculations involving load currents for specified domestic single phase circuits.
Circuits: lighting, socket outlet, fixed appliance

Setting out

17.9c State the tools and equipment used to set out domestic single phase circuits.
Tools: tape measure, pencil, spirit level, plumb bob, water level, chalk/chalk lines

17.10c Explain the correct procedure for setting out domestic single phase circuits.
Circuits: lighting, socket outlet, fixed appliance
Setting out: cable routes, outlet boxes, distribution board, mounting heights

Drawings

17.11c Identify scale working drawings of items taken from plans and details of linear and rectangular structures.
Drawings: dimensions, detail (cable routes, outlet positions, fixed appliance positions, distribution board), exploded views

17d Electrical Installation 1: Practical Skills

Introduction

The aim of this module is to enable the candidate to:

a select and use hand tools in a correct and safe manner
b set out cable runs and install cable for domestic single phase circuits
c fix and connect electrical accessories for domestic single phase circuits.

Practical competences

The candidate must be able to do the following:

17.1d Select, use, clean and store basic hand tools to install and terminate domestic single phase circuits.
Tools: screw drivers (flat blade, Philips, star), pliers, wire cutters, wire strippers, hammers, tape measure

17.2d Select, use, clean and store portable power tools.
Use: drilling walls for screw fixings/cable access
Tools: electric drill

17.3d Set out cable runs and install cable for domestic single phase lighting circuits.
Cable: insulated and sheathed multi-core, cable clips

17.4d Fix electrical accessories to walls and ceilings.
Accessories: mounting boxes, switches, ceiling rose, joint box

17.5d Terminate electrical conductors into accessories.
Accessories: switches, ceiling rose, joint box

17.6d Set out cable runs and install cable for domestic single phase socket outlet circuits.
Circuits: ring, radial
Cable: insulated and sheathed multi-core, cable clips

17.7d Fix electrical accessories for domestic single phase socket outlet circuits to walls.
Accessories: mounting box, socket outlet, joint box

17.8d Terminate electrical conductors into domestic single phase socket outlet accessories.
Accessories: socket outlet, joint box

17.9d Set out cable runs and install cable for domestic single phase fixed equipment circuits.
Circuits: radial
Cable: insulated and sheathed multi-core, cable clips

17.10d Fix electrical accessories for domestic single phase fixed equipment circuits to walls.
Accessories: double pole switch with neon indicator
Fixed equipment: eg water heater, cooker, washing machine, dishwasher, space heater, fan, air conditioning unit

17.11d Terminate electrical conductors into domestic single phase fixed equipment accessories.
Accessories: double pole switch with neon indicator
Fixed equipment: eg water heater, cooker, washing machine, dishwasher, space heater, fan, air conditioning unit

17.12d Install a domestic single phase distribution board with a double pole isolating switch.
Distribution board: eg fused (cartridge, re-wireable), miniature circuit breaker, residual current device/RCD

17.13d Terminate circuit cables into a domestic single phase distribution board.
Distribution board: eg fused (cartridge, re-wireable), miniature circuit breaker, residual current device

17.14d Connect a domestic single phase distribution board to earth.
Connection: eg earth rod, earthing terminal supplied by distribution company

17.15d Carry out tests of installed circuits.
Tests: continuity of protective conductors, continuity of ring circuit protective conductors, insulation resistance tests (between phase and neutral conductors, between phase and neutral conductors to earth), polarity
Circuits: light, power, fixed appliances

Knowledge requirements

The instructor must ensure the candidate is able to:

17.1d Identify equipment for testing installed domestic single phase circuits.
Equipment: volt meter, low reading ohm meter, 500v high resistance test set

17.2d Describe the use and maintenance of testing equipment.
Equipment: volt meter, low reading ohm meter, 500v high resistance test set
Use: continuity of protective conductors, continuity of ring circuit protective conductors, insulation resistance tests (between phase and neutral conductors, between phase and neutral conductors to earth), polarity, manufacturers' instructions, safety
Maintenance: clean, inspect leads/probes

17.3d Identify the various types of fixed equipment that may be connected to domestic single phase circuits.
Fixed equipment: water heater, cooker, washing machine, dishwasher, space heater, fan, air conditioning unit

17.4d Identify the types of single phase circuits used in domestic installations.
Circuits: ring, radial.
Installations: lighting, socket, fixed appliance

17.5d Identify domestic single phase distribution boards with a double pole isolating switch.
Distribution board: fused (cartridge, re-wireable), miniature circuit breaker, rating, residual current device/RCD

17.6d Identify the various types of floor, wall and ceiling construction used in domestic buildings.
Floor: timber, concrete
Wall: brick/block (cavity, solid), timber, plasterboard
Ceiling: plasterboard, concrete

17a Electrical Installation 1: Safety at Work

Practical competences

The candidate must be able to do the following:

17.1a	Carry out safe working practices to prevent hazards and to ensure the safety of working personnel and members of the public.	☐
17.2a	Carry out safe working practices using various equipment/materials to protect surrounding work areas from damage.	☐
17.3a	Carry out the safe erection, use and dismantling of simple scaffold platforms less than 2m high.	☐
17.4a	Set up safety barriers around electrical hazards to protect working personnel and members of the public.	☐
17.5a	Select and use protective clothing and safety equipment for specific tasks.	☐
17.6a	Locate and manually operate the isolating switch to disconnect a domestic single phase installation or circuit from the electrical supply.	☐
17.7a	Check the correct operation of electrical test equipment and carry out a test of a domestic single phase circuit to confirm that it has been isolated from the electrical supply.	☐
17.8a	Carry out the procedure to isolate a person in contact with a simulated live single phase electrical supply.	☐
17.9a	Use and store toxic materials in a safe manner.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

17b Electrical Installation 1: Materials

Practical competences

The candidate must be able to do the following:

17.1b	Identify and select cables from given specifications.	☐
17.2b	Identify and select flexible cord from given specifications.	☐
17.3b	Identify and select electrical accessories from given specifications.	☐
17.4b	Identify and select single phase distribution boards with a double pole isolating switch from given specifications.	☐
17.5b	Identify and select insulating sleeving and tapes from given specifications.	☐
17.6b	Identify and select cord grips and glands from given specifications.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

17c Electrical Installation 1: Calculations, Setting Out and Drawing

Practical competences

The candidate must be able to do the following:

17.1c	Take off accurate dimensions from drawings of linear and rectangular structures.	☐
17.2c	Take off and compile overall linear dimensions from drawings.	☐
17.3c	Calculate the quantity and cost of materials required from drawings.	☐
17.4c	Carry out calculations involving Ohm's Law.	☐
17.5c	Carry out calculations involving power.	☐
17.6c	Calculate load currents for specified domestic single phase circuits.	☐

Setting out

17.7c	Measure and set out domestic single phase circuits from drawings.	☐

Drawings

17.8c	Produce working drawings from plans and details of linear and rectangular structures.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Practical competences

The candidate must be able to do the following:

17.1d Select, use, clean and store basic hand tools to install and terminate domestic single phase circuits. ☐

17.2d Select, use, clean and store portable power tools. ☐

17.3d Set out cable runs and install cable for domestic single phase lighting circuits. ☐

17.4d Fix electrical accessories to walls and ceilings. ☐

17.5d Terminate electrical conductors into accessories. ☐

17.6d Set out cable runs and install cable for domestic single phase socket outlet circuits. ☐

17.7d Fix electrical accessories for domestic single phase socket outlet circuits to walls. ☐

17.8d Terminate electrical conductors into domestic single phase socket outlet accessories. ☐

17.9d Set out cable runs and install cable for domestic single phase fixed equipment circuits. ☐

17.10d Fix electrical accessories for domestic single phase fixed equipment circuits to walls.

17.11d Terminate electrical conductors into domestic single phase fixed equipment accessories. ☐

17.12d Install a domestic single phase distribution board with a double pole isolating switch. ☐

17.13d Terminate circuit cables into domestic single phase distribution board. ☐

17.14d Connect domestic single phase distribution board to earth. ☐

17.15d Carry out tests of installed circuits. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

Preservation Skills (6161-08-008)

Sections

Core
18a The preservation industry
18b Materials and techniques
18e Working practices
18d Roofing

Optional
18e Preservation skills – trowel vocations
Or
18f Preservation skills – timber vocations
Or
18g Preservation skills – painting and decorating

Candidates must complete all of the core sections and one of the optional sections.

Note. There are no written assessments for these sections of the Construction Industry 6161 programme. Assessment is by observation of practical skills using the competence checklists.

18a Preservation Skills – The Preservation Industry

Introduction

The aim of this section is to enable the candidate to:

a demonstrate a general understanding of the historic preservation movement
b demonstrate the ability to identify historic building styles

Notes:

1 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those for the Construction Industry (6161) programme.
2 At all times health and safety is a prime consideration when meeting the needs of this programme.

Practical competences

The candidate must be able to:

Demonstrate a general understanding of the historic preservation movement

18.1a Explain what is meant by the term historic preservation.

18.2a State a brief history of the historic preservation movement.
Historic preservation movement: relevant to region or country

18.3a State specific examples of different phases of the development of the historic preservation movement.
Historic preservation movement: relevant to region or country

18.4a Explain to a supervisor current trends in the historic preservation movement.
Economic and cultural importance: to the region or country

18.5a Define the following terms: material culture, cultural heritage, built environment artefact, structure, building, historic structure.

18.6a Identify historic building styles.

18.7a Identify a building by its general style name.

18.8a Identify the parts of a building by their correct names.

18.9a Describe the features of a building including finishes, masonry bond, by their correct architectural names.

Demonstrate an understanding of the considerations involved in working on historic structures

18.10a Define the following terms: stabilization, preservation, restoration, adaptive re-use, rehabilitation, reproduction, recreation, original, historic fabric, addition, replace, remodel

18.11a State legislation and practices relevant to the preservation industry.
Legislation and practices: eg local, national, law, codes of practice

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1a Describe what is meant by the term historic preservation.

18.2a Understand the history of the historic preservation movement.
Historic preservation movement: relevant to region or country, examples of different phases of the development of the historic preservation movement
Historic preservation movement: relevant to region or country

18.3a Describe current trends in the historic preservation movement.

18.4a Describe economic and cultural factors affecting historic preservation and their importance.

18.5a Describe terms relevant to the preservation industry.
Terms: material culture, cultural heritage, built environment artefact, structure, building, historic structure

18.6a Describe general style names used in buildings.

18.7a Describe the main parts of a building by their correct names.

18.8a Describe the features of a building including finishes, masonry bond, by their correct architectural names.

18.9a Demonstrate an understanding of the considerations involved in working on historic structures

18.10a Define terms commonly used in the preservation industry.
Terms: stabilisation, preservation, restoration, adaptive re-use, rehabilitation, reproduction, recreation, original, historic fabric, addition, replace, remodel

18.11a Describe legislation and practices relevant to the preservation industry.
Legislation and practices: eg local, national, law, codes of practice

18b Preservation Skills – Materials and Techniques

Introduction

The aim of this section is to enable the candidate to:

a demonstrate an understanding of historic building materials
b demonstrate an understanding of the considerations involved in working on historic structures
c demonstrate an understanding of historic building techniques

Notes:

1 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those for the Construction Industry (6161) programme.
2 At all times health and safety is a prime consideration when meeting the needs of this programme.

Practical competences

The candidate must be able to:

Demonstrate an understanding of historic building materials

18.1b State the basic characteristics of commonly used types of wood, masonry and finishes in building construction.

18.2b State the different characteristics of materials used in historic and present-day construction.
Characteristics: size, material type, composition

18.3b State the common types of fasteners used on historic buildings.

18.4b State different types of composition and metal materials and finishes used for building material in historic structures.

18.5b State appropriate window type and finishes for different styles and time periods.

18.6b State appropriate door types and finishes for different styles and time periods.

Demonstrate an understanding of the considerations involved in working on historic structures

18.7b Identify relevant guidelines specific to the preservation industry.
Relevant: to the region or country
Guidelines: local, national, regional, occupation-specific

18.8b Comply with all applicable health and safety requirements.
Health and safety requirements: relevant to the region or country, materials, equipment

Demonstrate an understanding of historic building techniques

18.9b State the different types of building construction and their main features.
Types: eg timber frame, balloon frame, log construction

18.10b Identify different types of roof construction used in historic structures.

18.11b Identify the level of technology appropriate to different time periods and geographic areas used in historic structures.

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1b Describe the basic characteristics of commonly used types of wood, masonry and finishes in building construction.

18.2b Describe the different characteristics of materials used in historic and present-day construction.
Characteristics: eg size, material type, composition

18.3b Describe the common types of fasteners used on historic buildings.

18.4b Describe the different types of composition and metal materials and finishes used for building material in historic structures.

18.5b Describe appropriate window types and finishes for different styles and time periods.

18.6b Describe appropriate door types and finishes for different styles and time periods.

18.7b Describe and explain relevant guidelines specific to the preservation industry.
Guidelines: local, national, regional, occupation-specific

18.8b Give reasons for complying with all applicable health and safety requirements.
Reasons: protection of self, others, compliance with the law, building components

18.9b Describe the different types of building construction and their main features.
Types: eg timber frame, balloon frame, log construction

18.10b Describe different types of roof construction used in historic structures and reasons for their use.

18.11b Describe the level of technology appropriate to different time periods and geographic areas used in historic structures.

18c Preservation Skills – Working Practices

Introduction

The aim of this section is to enable the candidate to:

a identify and evaluate the deterioration of materials in historic structures
b produce a written inspection and evaluation report for an historic structure
c read and interpret blueprints and specifications for work on historic structures
d demonstrate the ability to prepare the work site
e demonstrate an understanding of the skills needed for demolition and salvage of historic structures
f demonstrate a sensitivity and understanding of how to install and conceal new mechanical systems in an historic building.

Notes:

1 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those for the Construction Industry (6161) programme.
2 At all times health and safety is a prime consideration when meeting the needs of this programme. Practical competences 18.24c to 18.28c are to be demonstrated in a workshop/laboratory environment only.

Practical competences

The candidate must be able to:

Identify and evaluate the deterioration of materials in historic structures

18.1c Identify deterioration of exposed materials and finishes.

18.2c Identify deterioration of concealed materials.

18.3c State whether materials and finishes can be repaired or restored.

Produce a written inspection and evaluation report for an historic structure

18.4c Research and validate historically correct materials and finishes or identify resources for this research and validation.

18.5c Produce a written description of the overall style and form and finishes of an historic structure.

18.6c Produce a written description of the individual components, including finishes of an historic structure.

18.7c Describe, in writing, the overall condition of an historic structure.

18.8c Describe, in writing, the condition of individual components of an historic structure.

18.9c Measure and record the size and amount of material in an historic structure.

18.10c Measure and record the size and amount of material in an historic structure by the category of work needed on it, including finishes needed.

18.11c Present all information gathered in an appropriate format.

Read and interpret blueprints and specifications for work on historic structures

18.12c Identify dimensions.

18.13c Identify construction views, floors plans and elevations.

18.14c Identify interior details.

18.15c Identify mechanical symbols.

18.16c Use a scale rule.

18.17c Identify lists of materials and specifications, including finishes.

18.18c Identify special instructions and finish schedules.

Demonstrate the ability to prepare the work site

18.19c State reasons for placing scaffolding and staging to work efficiently safely.

18.20c State reasons for protecting areas not being worked with plastic and tape, paper and tape, and drops.

18.21c State reasons for containing a work area that could contaminate other areas.

18.22c Give reasons for containment of work on a building that is occupied.

18.23c State safety procedures to be followed when preparing work site and containment.

Demonstrate an understanding of the skills needed for demolition and salvage of historic structures

18.24c Identify the tools used for safe demolition.

18.25c Identify and agree components to be salvaged.

18.26c Remove components to be salvaged, within limits of own authority.

18.27c Assess any damage to components, including finishes, remaining or being salvaged.

18.28c Improve technique for salvaging.

Demonstrate a sensitivity and understanding of how to install and conceal new mechanical systems in an historic building

18.29c Produce shop drawings to reflect ways of concealing electric conduit, plumbing pipe and air handling duct work.

18.30c Produce shop drawings showing possible location of utility requirements, free standing or least obtrusive to the structure.
Utility: eg gas, natural gas, electricity, water

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1c Describe features to be looked for to identify deterioration of exposed materials and finishes.
Features: eg unduly weathered or curled shapes, warped, twisted, bent materials, rot and decay, visible insect, rodent or bird damage, checking, peeling, discolouration, bubbling, visible mould growth

18.2c Describe features to be looked for to identify deterioration of concealed materials.
Features: eg soft spots, sagging, loose fasteners, bubbling or undercutting

18.3c Describe considerations for whether materials and finishes can be repaired of restored.
Considerations: applicable preservation orders and building codes, safety and health, availability of similar or comparable materials for replacement. labour cost for both repair and replacement, are skilled people or machines available to replicate missing or damaged components, will repairs or replacements restore the structure to required usability and life span, and meet owner needs

18.4c Describe the key features to be included in a written description of the overall style and form and finishes of an historic structure.

18.5c Describe the key features of a written description of the individual components, including finishes of an historic structure.
Features: emphasis on retention and restoration to original condition and appearance, modem materials and methods not noticeable as compared with the original, shape, size, scale, method of attachment or installation compatible with the original, replication of colour, shade and tint to appropriate historic period essential

18.6c Describe the key features of a written description of the overall condition of an historic structure.

18.7c Describe how to measure and record the size and amount of material in an historic structure.
Methods: including category of work needed. finishes needed, compare materials needed for a) repair and b) replacement, explain standard sizes, quantities of available materials compute amount and volumes needed based on anticipated coverage and normal waste, interpret tables, measure and calculate area sizes involved, determine number of coats of finish needed and anticipate bleeding and sealing requirements

18.8c Describe appropriate formats for the presentation of information gathered in 3.1 to 3.7 above.
Appropriate formats: identify customer or user and tailor presentation to their level of understanding and usage, use of language and descriptive detail sufficient to serve as contractual content, written, oral, sketching/drawing, audio-visual presentations

18.9c Read and interpret blueprints and specifications for work on historic structures
Read and interpret: identify dimensions, identify construction views, floors plans and elevations, identify interior details, mechanical symbols, use a scale rule.

18.10c Describe materials and specifications, including finishes, commonly used in restoration work.

18.11c Describe special instructions and finish schedules commonly used in restoration work.

18.12c Give reasons for placing scaffolding and staging to work efficiently safely.
Reasons: protection of self, others, compliance with the law, building components

18.13c Give reasons for protecting areas not being worked with plastic and tape, paper and tape, and drops.
Reasons: protection of historic surfaces, importance of protection of areas not requiring treatment, no damage to areas being protected, tape, plastics, and other masking materials must not damage surfaces and be removed without leaving residue or loosening surface to which they adhere, protective materials should be impervious or of sufficient body to prevent soakage or staining of surfaces being protected, other than deliberate blending, or possibly cleaning, protected surfaces should be unaffected by the repair process

18.14c State reasons for containing a work area that could contaminate other areas.
Reasons: failure to contain can damage areas outside field of work, requiring additional work and expense, odours, dust, liquid, smoke and fumes can present health and comfort hazards and may leave traces difficult or impossible to remove, protection and containment always preferable to repair

18.15c Give reasons for containment of work on a building that is occupied.
Reasons: occupied areas being repaired must be protected to the level required for continued habitation, noise, dust, odours, air quality and toxic substances must be controlled.

18.16c State safety procedures to be followed when preparing work site and containment.

18.17c Demonstrate an understanding of the skills needed for demolition and salvage of historic structures.
Skills: correct identification of the tools used for safe demolition, identification of components to be salvaged, safe removal of components to be salvaged, within limits of own authority

18.18c Describe the procedures to be followed when assessing any damage to components, including finishes, remaining or being salvaged.
Procedures: negotiation with person authorised to make decisions relative to the project, identify person responsible for agreeing work, identify damage, state causes and possible solutions, state effects of continuing neglect, agree remedial actions to be taken

18.19c Describe how to improve techniques for salvaging.

18.20c Use drawings to demonstrate a sensitivity and understanding of how to install and conceal new mechanical systems in an historic building.
Sensitivity and understanding: drawings reflect ways of concealing electric conduit, plumbing pipe and air handling duct work, drawings show possible location of utility requirements, free standing or least obtrusive to the structure (utility: eg gas, natural gas, electricity, water)

18d Preservation Skills – Roofing

Introduction

The aim of this section is to enable the candidate to:

a demonstrate an understanding of the skills needed to stabilise, preserve and restore the roof of an historic building.

Notes:

1 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those for the Construction Industry (6161) programme.
2 At all times health and safety is a prime consideration when meeting the needs of this programme. Practical competences 18.1d to 18.6d are to be demonstrated in a workshop/laboratory environment only.

Demonstrate an understanding of the skills needed to stabilise, preserve and restore the roof of an historic building

18.1d State the various types of roofs and their characteristics.

18.2d Explain to a supervisor how to locate damage to an existing roof.

18.3d Identify tools used to remove non-repairable damage to a roof.

18.4d Identify proper tools to install matching materials.

18.5d Explain to a supervisor how to test the effect of repairs in a roof.

18.6d State the health and safety procedures to be followed at all times when working on roofing.

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1d Describe the various types of roofs and their characteristics.
Roof types: eg slate, tile, asbestos shingle, metal, built-up, composition

18.2d Explain to a supervisor how to locate damage to an existing roof.
Methods: make a visual inspection for leaks, sags, bubbles, missing components or other irregularities

18.3d Identify tools used to remove non-repairable damage to a roof.
Tools: dependant on type roof to be repaired, eg compostion and wood shingle – shingle ripper, built-up or asphalt and gravel roof removal – crow bar or lever and removal rippers, tin or metal roof removal – nail pullers and rippers, container for debris

18.4d Identify proper tools to install matching materials.
Tools: according to type of material, eg composition or wood shingle installations – hammers, air tool, knife, saw, measuring tape, tin snips and chalk line, asphalt and gravel – tar kettle, snips, hammers and measuring tape, rubber membrane installation – hammers, heat gun, measuring tape, knife and ships, tin – hammers, awl, crow bar or lever, measuring tape, drills and bits and chalk line

18.5d Explain to a supervisor how to test the effect of repairs in a roof.

18.6d Give reasons for following health and safety procedures at all times.
Reasons: protection of self, others, compliance with the law, building components

18e Preservation Skills – Trowel Vocations

Introduction

The aim of this section is to enable the candidate to:

a describe the role of the trowel vocations in the preservation industry
b demonstrate the ability to stabilise restore and preserve masonry parts of historic buildings
c understand the properties, characteristics and uses of brick and concrete block
d describe the various types and uses of bonding
e clean masonry
f perform building layout
g build foundations

Notes:

1 Completion of this section is only necessary for students intending to gain certification for trowel vocations.
2 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those for the Construction Industry (6161) programme.
3 Practical competences 18.1e to 18.14e may be demonstrated in a real or simulated environment, or during a training programme.
4 The use of the term 'trowel vocations' includes masonry throughout this section.

Practical competences

The candidate must be able to:

Describe the role of the trowel vocations in the preservation industry

18.1e State the importance of the trowel vocations.
Importance: eg, in local, regional, national economy

18.2e State the basic differences between restoration and new construction.

18.3e State issues and topics relevant to the preservation/remodelling building construction industry.
Relevant: to trowel vocations, (eg in local area, region, country)

Demonstrate the ability to stabilise restore and preserve masonry parts of historic buildings

18.4e State different types of masonry and finishes and understand their application.

18.5e Assess damage to masonry components and finishes.

18.6e Agree with supervisor nature and extent of work to be undertaken.

18.7e Erect and secure safety and protective coverings.

18.8e Remove rotten and damaged masonry.

18.9e Clean masonry following safety practices.

18.10e Prepare layout for building.

18.11e Select brick or concrete block appropriate to the task.

18.12e Measure, and lay masonry to match using appropriate bonding.
Masonry: brick, concrete block
Lay: Build foundations to a specified height and range, (eg an 8" block corner to the correct height and range of a given foundation batter board line, bond and build an 8" block corner to the correct height and range on the opposite corner of a given foundation batter board line), make foundation walls waterproof, install flashing, anchor bolts, termite shields and weep holes; install vents for a wooden flooring system

18.13e Use basic hand and power tools for masonry and finishing to substrate

18.14e Follow health and safety procedures at all times.

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1e Describe the importance of the trowel vocations in the preservation industry.
Importance: eg, in local, regional, national economy

18.2e Describe the basic differences between restoration and new construction.
Differences: appearance and character of repairs must match existing structure, materials used, shapes, sizes, scale, workmanship and tool marks, etc. should match the original, repairs or preparation for repairs must harm existing structure as little as possible, and preserve elements of historic character

18.3e Understand issues and topics relevant to the preservation/remodelling building construction industry.
Relevant: to trowel vocations, (eg in local area, region, country)
Issues: skill levels required are high, specialisation is common, work often requires temporary relocation of workers, outdoor work is climate sensitive, in most localities, no central labour registry is available, relatively few construction companies perform restoration work, reputation and networking within the industry becomes a primary means of finding the most lucrative employment, local and regional differences exist in traditional materials, building styles and construction methods

18.4e Describe different types of masonry and finishes and understand their application.

18.5e Describe the properties, characteristics and uses of brick and concrete block
Properties: different types, including shapes and sizes, of bricks and concrete blocks and their principal uses, how bricks are chosen for restoration work, appropriate uses of concrete block in restoration/remodelling work

18.6e Identify brick positioning in a wall.

18.7e Describe the procedures to be followed when assessing damage to masonry components and finishes.
Procedures: identify person responsible for agreeing work, identify damage, state causes and possible solution, state effects of continuing neglect, agree remedial actions to be taken, determine strength of structure and any safety hazard present, determine extent of damage and amount of material to be removed and replaced, determine specialised equipment needs (eg scaffolding), determine availability of matching repair materials and explore procurement problems

18.8e Describe methods for erecting and securing safety and protective coverings, and give reasons for their use.
Safety and protective coverings: eg barricades, scaffolding and protective railings. Debris chutes
Reasons for use: safety of self, safety of others, protection of building, protect from falling objects, to meet health and safety requirements, prevent damage to structure

18.9e Describe methods for removing rotten and damaged masonry.
Methods: masonry to be removed should be chiselled out until a solid area or foundation is reached

18.10e Describe methods and procedure for cleaning masonry.
Methods and procedures: identify reasons for cleaning, select cleaning materials and equipment for brick and concrete block, prepare cleaning solutions, prepare the area, point new and old work, clean the wall. safety procedures

18.11e Describe and carry out the procedures to be followed for performing building layout.
Procedure: read and interpret plot plans. establish building corners, build batter boards and establish building lines and elevations. dig, prepare and pour footings to standards (eg local. national, codes of practice)

18.12e Give reasons and describe methods for the building of foundations
Reasons: masonry must be laid upon an unyielding foundation because it lacks flexing characteristics and must remain rigid
Methods: foundation should be plumb with the structure to be constructed upon it, it should have sufficient thickness, width [foot print] to support the structure built upon it, reinforcing and materials to tie the masonry together should be used as necessary

18.13e Describe methods for how to measure, and lay masonry to match.
Methods: determine volume to be laid, plan blending or repairs to begin at seams, joints and unobtrusive locations, match mortar and bonding materials with existing original.

18.14e Describe the various types and uses of bonding.
Bonding: pattern, structural, layout and adhesive bonding, stretcher. common, English, English cross, Flemish, stack

18.15e Give reasons for following health and safety procedures at all times.
Reasons: protection of self, others, compliance with the law, building components

18f Preservation Skills – Timber Vocations

Introduction

The aim of this section is to enable the candidate to:

a describe the role of the timber vocations in the preservation industry
b demonstrate the ability to stabilise restore and preserve wooden parts of historic buildings other than windows and doors
c demonstrate the ability to stabilise and preserve or restore windows and doors in an historic building
d understand procedures for roofing

Notes:

1 Completion of this section is only necessary for students intending to gain certification for timber vocations.
2 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those for the Construction Industry (6161) programme.
3 At all times health and safety is a prime consideration when meeting the needs of this programme.
4 The use of the term 'timber vocations' includes carpentry throughout this section.

Practical competences

The candidate must be able to:

Describe the role of the timber vocations in the preservation industry

18.1f State the importance of the timber vocations.
Importance: eg, in local, regional, national economy

18.2f State the basic differences between restoration and new construction.

18.3f State issues and topics relevant to the preservation/remodelling building construction industry.
Relevant: to timber vocations, (eg in local area, region, country)

18.4f Demonstrate the ability to stabilise, restore and preserve wooden parts of historic buildings other than windows and doors.

18.5f Assess damage to wood components and finishes.

18.6f Consult with a supervisor on the nature and extent of work to be undertaken.

18.7f Remove rotten and damaged wood.

18.8f Select a system of epoxy or other fillers to replace removed wood.

18.9f Measure, cut, and shape new wood to match.

18.10f Identify different types of wood and finishes and understand their application.

18.11f Use basic hand and power tools for finishing and woodworking to substrate.

18.12f Prepare all surfaces for the application of preservative or paint.

Demonstrate the ability to stabilise and preserve or restore windows and doors in an historic building

18.13f Name parts of doors and windows.

18.14f Recognise damage to doors and windows and their finishes.

18.15f Consult with a supervisor on the nature and extent of work to be undertaken.

18.16f Erect and secure safety and protective coverings.

18.17f Remove doors and/or windows to be treated.

18.18f Remove rotten and damaged wood.

18.19f Choose a system of epoxy or other fillers to replace removed wood.

18.20f Measure, cut, and shape new wood to match.

18.21f Use basic hand and power tools for finishing and wood working to substrate.

18.22f Prepare all surfaces for the application of preservative or paint.

18.23f Replace doors and/or windows after treatment.

18.24f Follow health and safety procedures at all times.

Roofing

18.25f State the procedures to be followed for framing a conventional roof.

18.26f State the procedures to be followed for installing and bracing roof trusses.

18.27f State the materials and methods used for finishing roofing components.

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1f Describe the importance of the timber vocations in the preservation industry.
Importance: eg, in local, regional, national economy

18.2f Describe the basic differences between restoration and new construction.
Differences: appearance and character of repairs must match existing structure; materials used, shapes, sizes, scale, workmanship and tool marks should match the original; repairs or preparation for repairs must harm existing structure as little as possible, and preserve elements of historic character

18.3f Understand issues and topics relevant to the preservation/remodelling building construction industry.
Relevant: to timber vocations, (eg in local area, region, country)
Issues: skill levels required are high, specialization common, work often requires temporary relocation of workers, outdoor work is climate sensitive, in most localities, no central labour registry is available, relatively few construction companies perform restoration work, reputation and networking within the industry becomes a primary means of finding the most lucrative employment, local and regional differences exist in traditional materials, building styles and construction methods

18.4f Describe the procedures to be followed when assessing damage to wood components and finishes.
Procedures: structural integrity is paramount; work must be performed only on sound foundation component; determine wood to be replaced by careful examination based on strength, appearance and ability to perform its original purpose in the structure, formulate and present recommended repair, replacement, restoration procedures

18.5f Describe methods for erecting and securing safety and protective coverings, and give reasons for their use.
Reasons for use: safety of self, safety of others, protection of building
Safety and protective coverings: eg all holes and open areas should be barricaded to prevent unauthorised entry or securely covered to prevent falls, space below raised work area should be kept clear to prevent injury from dropped items or debris, warning tape, rope and signs should clearly mark areas of potential danger

18.6f Describe procedures for removing rotten and damaged wood and explain when each would be used.

18.7f Describe the different systems of epoxy or other fillers used to replace removed wood and state their advantages and disadvantages.
Epoxy and fillers: liquid epoxy systems useful in preventing further decay of wood and, when used with fibreglass or other strengthening material, can restore damaged wood to its original shape and strength; working time is limited by fast hardening, and use is sensitive to temperature, humidity and formulation ratios; paste fillers including epoxies are relatively easy to use and can be considered permanent repair; epoxies can be very strong. Fillers can be coloured to match the original timber base, but most often a surface coat of paint or other opaque finish is applied to the repair

18.8f Describe the procedures for measuring, cutting, and shaping new wood to match.

18.9f Describe different types of wood and finishes and understand their application in preservation.

18.10f Describe the basic hand and power tools used for finishing and wood working to substrate.

18.11f Describe methods for preparing surfaces for the application of preservative or paint.
Methods: clean off all dust, flaking or loose surface material, surface must be dry and free from underlying moisture, complete all preparatory work before application is begun, edges or joinings to existing finishes should be feathered, sanded or otherwise visually softened to assure aesthetic blending of new finish with old

18.12f Describe the different parts of doors and windows

18.13f Describe the procedures to be followed when assessing damage to wood components and finishes in doors and windows.
Procedures: identify person responsible for agreeing work, identify damage, state causes and possible solutions, state effects of continuing neglect, agree remedial actions to be taken

18.14f Describe the procedures to be used when removing doors and/or windows to be treated.
Procedures: doors to be reused are removed by extracting hinge pins, but removal of hinge screws may be necessary, windows to be reused should be carefully removed from frame or casement, taking care to preserve all components of the window and its frame.

18.15f Describe the procedures for removing rotten and damaged wood in doors and windows.
Procedures: careful cutting, chiselling and scraping to remove rotten wood, replacement parts should employ the original joining techniques used, such as dovetails, splines, dowels, etc

18.16f Describe the procedures for measuring, cutting, and shaping new wood to match in doors and windows.

18.17f Describe methods for preparing all door and window surfaces for the application of preservative or paint.
Methods: work in a dry and dust-free environment, mask off all parts not to be re-finished, primer coat, putty glass panes after primer and before finish coat, after painting pull masking tape before finish hardens

18.18f Describe the methods for replacing doors and/or windows after treatment.
Methods: secure services of helper, cover sills and surroundings with protective material to prevent damage by reinstallation process, use of levers or shims to help support weight and aid in alignment, align and seat door hinges and replace top screws in each, adjust alignment and insert remaining screws

18.19f Describe the procedures to be followed for framing a conventional roof.
Procedures: identification of roof members, styles and framing units, calculate lengths of rafters, lay out joins locations, select and install nails and fasteners, lay out, cut and erect rafters, install sheathing

18.20f Describe the procedures to be followed for installing and bracing roof trusses.
Procedures: identification of main parts and hardware to be used
Roof trusses: temporary, permanent

18.21f State the materials and methods used for finishing roofing components.
Materials: composition shingles, roof flashing, ridge vent, asphalt and gravel, metal roofing,
Methods: use of roof finishing tools and techniques – roof flashing measurement, notching, bending and lapping; ridge vent measurement, installation and end capping use and joining of metal in valleys of roof, use of tar kettle

18.22f Give reasons for following health and safety procedures at all times.
Reasons: protection of self, others, compliance with the law, building components

18g Preservation Skills – Painting and Decorating

Introduction

The aim of this section is to enable the candidate to:

a describe the role of painting and decorating in the preservation industry
b demonstrate the ability to assess work required, stabilise and prepare painted and papered parts of historic buildings
c apply stains, varnishes, lacquers and acrylics
d prepare surfaces, fit and apply wallpaper

Notes:

1 Completion of this section is only necessary for students intending to gain certification for painting and decorating.
2 The practical competences and knowledge requirements for this section may be demonstrated and learned alongside those elsewhere in the Construction Industry (6161) programme.
3 At all times health and safety is a prime consideration when meeting the needs of this programme.

Practical competences

The candidate must be able to:

Describe the role of painting and decorating in the preservation industry

18.1g State the importance of the painting and decorating industry.
Importance: eg in local, regional, national economy

18.2g State the basic differences between restoration and new construction.

18.3g State issues and topics relevant to the preservation/remodelling building construction industry.
Relevant: to painting and decorating, (eg in local area, region, country)

Demonstrate the ability to assess work required, stabilise and prepare painted and papered parts of historic buildings

18.4g Assess damage to painted and papered components and finishes.

18.5g Consult with supervisor on nature and extent of work to be undertaken.

18.6g Erect and secure safety and protective coverings.

18.7g Remove rotten and damaged finishes.

18.8g Prepare surfaces for application of paint.

18.9g Prepare surfaces for application of paper.

18.10g State different types of paint and paper finishes and understand their application in preservation tasks.

18.11g Use basic hand and power tools for paint and paper finishing to substrate.

Apply stains, varnishes, lacquers and acrylics

18.12g Stain woodwork to a uniform colour.

18.13g Stain wood to match a sample.

18.14g Seal wood for finishing.

18.15g Apply finishes to a prepared wood surface.
Finishes: stain, varnish, oil, lacquer, acrylic

Prepare surfaces, fit and apply wallpaper

18.16g Remove old wall coverings.

18.17g Select and mix paste (for non pre-pasted) wall coverings.

18.18g Apply different types of wall covering.
Types: grass cloth, paper, foil, Mylar, cloth-backed wall covering

18.19g Match a pattern to a corner.

18.20g Fit wallpaper around a window and door.

18.21g Follow health and safety procedures at all times.

Knowledge requirements

The instructor must ensure that the candidate is able to:

18.1g Describe the importance of painting and decorating in the preservation industry.
Importance: eg in local, regional, national economy

18.2g Describe the basic differences between restoration and new construction.
Differences: original character retained in restoration; use of materials and colours to be suitable; surface repairs require duplication of existing finish and well blended, invisible joining of new finish to old; old finish to be repaired must be protected from damage by the restoration process

18.3g Understand issues and topics relevant to the preservation/remodelling building construction industry.
Relevant: to painting and decorating, (eg in local area, region, country)
Issues: skill levels required are high, specialisation is common, work often requires temporary relocation of workers, outdoor work is climate sensitive, in most localities, no central labour registry is available; relatively few construction companies perform restoration work; reputation and networking within the industry becomes a primary means of finding the most lucrative employment; chemicals involved in restoration process may make safety breathing equipment essential

18.4g Describe the procedures to be followed when assessing damage to painted and papered components and finishes.
Procedures: identify person responsible for agreeing work, identify damage, state causes and possible solutions, state effects of continuing neglect, agree remedial actions to be taken

18.5g Describe methods for erecting and securing safety and protective coverings, and give reasons for their use.
Reasons for use: safety of self, safety of others, protection of building

18.6g Describe procedures for removing rotten and damaged finishes and explain when each would be used.

18.7g Describe the methods for preparing surfaces for application of paint.
Methods: prepare a smooth and sound surface, free of oils, waxes and other contaminants, mark and protect areas not to be painted; assure that temperature and humidity are suitable for paint being used; feather and blend lapping paint edges to assure smooth, aesthetically pleasing finish; continue to protect area from dust as paint dries

18.8g Describe the methods for preparing surfaces for application of paper.
Methods: set all nail holes below surface; fill all cracks and holes to achieve a smooth surface, remove dirt, grease, wax or other contaminants; de-gloss glossy paint coatings; if surface is unpainted, seal before applying sizing; apply sizing to prevent surface from absorbing water from wallpaper paste

18.9g Describe the different types of paint and paper finishes and understand their application in preservation tasks.
Types: water – soluble, latex, acrylic, vinyl, paints and stains; paint thinner; soluble; oil based paints and stains or alkyds; polyurethanes; may be coloured or clear and are more resistant to chipping and rubbing than other paints; epoxy paints are an expensive specialized finish that hardens through chemical reaction upon the mixing of components
Application: Paint and stains in restoration work are usually applied by brush, except in the case of the special techniques and tools required by faux finishes
Paper types: vinyls, foils, natural materials – grass cloth, hemp, burlap, cork; flocked; reproduction to replicate a documented historic wallpaper design; pre-pasted or requiring hanging with wallpaper paste
Application: wallpaper for restoration work, chosen to exactly recreate a historically correct surface treatment, to be faithful to the period and character of the building

18.10g Describe the basic hand and power tools used for paint and paper finishing to substrate.

18.11g Describe how to stain woodwork to a uniform colour.

18.12g Describe how to stain wood to match a sample.

18.13g Describe how to seal wood for finishing.

18.14g Describe the finishes that may be applied to a prepared wood surface, and state their advantages/disadvantages.
Finishes: stain, varnish, oil, lacquer, acrylic

Prepare surfaces, fit and apply wallpaper

18.15g Describe the methods used for removing old wall coverings.
Methods: strippable wallpaper – designed for easy removal, begin in one corner and pull strips from the wall one at a time until all are removed, washing of wall surface with solution; non strippable wallpapers – not designed for easy removal, use of special equipment may be necessary; use of steamer to soften the glue between wallpaper and wall; for vinyl paper it is necessary to break the surface to let steam penetrate the glue beneath, steaming can soften underlying wall surface, making it liable to damage by scrapers and knives; chemical removal dissolves the glue between paper and wall, easier to use than steam and is less likely to soften the underlying wall surface; use of ventilation and protective breathing equipment

18.16g Describe the methods for selecting and mixing paste (for non pre-pasted) wall coverings.
Methods: pastes should be mixed one hour before use, use of manufacturer's instructions

18.17g Describe the different types of wall covering, and their uses in the preservation industry.
Types: grass cloth, paper, foil, Mylar, cloth-backed wall covering

18.18g Describe the method for matching a pattern to a corner.
Method: wallpaper strips should overlap at corners by no less than 1/2 inch (2cm), because corners are seldom straight, the distance from a plumb line placed nearby and the corner should be checked in at least three places to ensure the overlap is sufficient

18.19g Describe the method for fitting wallpaper around a window and door.
Method: window or door frame is usually the best place to begin papering, choose the most prominent and visible place in the room to start papering; use of plumb line near the edge of the chosen window or door frame; working from both right and left of this plumb line, if possible completing the papering at the least noticeable location in the room

18.20g Give reasons for following health and safety procedures at all times.
Reasons: protection of self, others, compliance with the law, building components

18a Preservation Skills – The Preservation Industry

Practical competences

The candidate must be able to do the following:

18.1a	Explain what is meant by the term historic preservation.	☐
18.2a	Verbally convey a brief history of the historic preservation movement.	☐
18.3a	State specific examples of different phases of the development of the historic preservation movement.	☐
18.4a	Explain to a supervisor current trends in the historic preservation movement.	☐
18.5a	Define the following terms: material culture, cultural heritage, built environment artefact, structure, building, historic structure.	☐
18.6a	Identify historic building styles.	☐
18.7a	Identify a building by its general style name.	☐
18.8a	Identify the parts of a building by their correct names.	☐
18.9a	Describe the features of a building including finishes, masonry bond, by their correct architectural names.	☐
18.10a	Define the following terms: stabilization, preservation, restoration, adaptive re-use, rehabilitation, reproduction, recreation, original, historic fabric, addition, replace, remodel	☐
18.11a	State legislation and practices relevant to the preservation industry.	☐

Practical competences

The candidate must be able to do the following:

18.1b	State the basic characteristics of commonly used types of wood, masonry and finishes in building construction.	☐
18.2b	State the different characteristics of materials used in historic and present day construction.	☐
18.3b	State the common types of fasteners used on historic buildings.	☐
18.4b	State different types of composition and metal materials and finishes used for building material in historic structures.	☐
18.5b	State appropriate window type and finishes for different styles and time periods.	☐
18.6b	State appropriate door types and finishes for different styles and time periods.	☐
18.7b	Identify relevant guidelines specific to the preservation industry.	☐
18.8b	Comply with all applicable health and safety requirements.	☐
18.9b	State the different types of building construction and their main features.	☐
18.10b	Identify different types of roof construction used in historic structures.	☐
18.11b	Identify the level of technology appropriate to different time periods and geographic areas used in historic structures.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

Instructor name (please print)

Completion date

18c Preservation Skills – Working Practices

Practical competences

The candidate must be able to do the following:

18.1c Identify deterioration of exposed materials and finishes. ☐

18.2c Identify deterioration of concealed materials. ☐

18.3c State whether materials and finishes can be repaired or restored. ☐

18.4c Research and validate historically correct materials and finishes or identify resources for this research and validation. ☐

18.5c Produce a written description of the overall style and form and finishes of an historic structure. ☐

18.6c Produce a written description of the individual components, including finishes of an historic structure. ☐

18.7c Describe, in writing, the overall condition of an historic structure. ☐

18.8c Describe, in writing, the condition of individual components of an historic structure. ☐

18.9c Measure and record the size and amount of material in an historic structure. ☐

18.10c Measure and record the size and amount of material in an historic structure by the category of work needed on it, including finishes needed. ☐

18.11c Present all information gathered in an appropriate format. ☐

18.12c Identify dimensions. ☐

18.13c Identify construction views, floors plans and elevations. ☐

18.14c Identify interior details. ☐

18.15c Identify mechanical symbols. ☐

18.16c Use a scale rule. ☐

18.17c Identify lists of materials and specifications, including finishes. ☐

18.18c Identify special instructions and finish schedules. ☐

18.19c State reasons for placing scaffolding and staging to work efficiently safely. ☐

18.20c State reasons for protecting areas not being worked with plastic and tape, paper and tape, and drops. ☐

18.21c State reasons for containing a work area that could contaminate other areas. ☐

18.22c Give reasons for containment of work on a building that is occupied. ☐

18.23c State safety procedures to be followed when preparing work site and containment. ☐

18.24c Identify the tools used for safe demolition. ☐

18.25c Identify and agree components to be salvaged. ☐

18.26c Remove components to be salvaged, within limits of own authority. ☐

18.27c Assess any damage to components, including finishes, remaining or being salvaged. ☐

18.28c Improve technique for salvaging. ☐

18.29c Produce shop drawings to reflect ways of concealing electric conduit, plumbing pipe and air handling duct work. ☐

18.30c Produce shop drawings showing possible location of utility requirements, free standing or least obtrusive to the structure. ☐

This is to confirm that the candidate has successfully completed the above tasks:

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Candidate name (please print)

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Completion date

18d Preservation Skills – Roofing

Practical competences

The candidate must be able to do the following:

18.1d	State the various types of roofs and their characteristics.	☐
18.2d	Explain to a supervisor how to locate damage to an existing roof.	☐
18.3d	Identify tools used to remove non-repairable damage to a roof.	☐
18.4d	Identify proper tools to install matching materials.	☐
18.5d	Explain to a supervisor how to test the effect of repairs in a roof.	☐
18.6d	State the health and safety procedures to be followed at all times when working on roofing.	☐

This is to confirm that the candidate has successfully completed the above tasks:

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Instructor signature

Instructor name (please print)

Completion date

18e Preservation skills – trowel vocations

Practical competences

The candidate must be able to do the following:

18.1e	State the importance of the trowel vocations.	☐
18.2e	State the basic differences between restoration and new construction.	☐
18.3e	State issues and topics relevant to the preservation/remodelling building construction industry.	☐
18.4e	State different types of masonry and finishes and understand their application.	☐
18.5e	Assess damage to masonry components and finishes.	☐
18.6e	Agree with supervisor nature and extent of work to be undertaken.	☐
18.7e	Erect and secure safety and protective coverings.	☐
18.8e	Remove rotten and damaged masonry.	☐
18.9e	Clean masonry following safety practices.	☐
18.10e	Prepare layout for building.	☐
18.11e	Select brick or concrete block appropriate to the task.	☐
18.12e	Measure, and lay masonry to match using appropriate bonding.	☐
18.13e	Use basic hand and power tools for masonry and finishing to substrate	☐
18.14e	Follow health and safety procedures at all times.	☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

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Completion date

18f Preservation skills – timber vocations

Practical competences

The candidate must be able to do the following:

18.1f State the importance of the timber vocations. ☐

18.2f State the basic differences between restoration and new construction. ☐

18.3f State issues and topics relevant to the preservation/remodelling building construction industry. ☐

18.4f Demonstrate the ability to stabilise, restore and preserve wooden parts of historic buildings other than windows and doors. ☐

18.5f Assess damage to wood components and finishes. ☐

18.6f Consult with a supervisor on the nature and extent of work to be undertaken. ☐

18.7f Remove rotten and damaged wood ☐

18.8f Select a system of epoxy or other fillers to replace removed wood. ☐

18.9f Measure, cut, and shape new wood to match. ☐

18.10f Identify different types of wood and finishes and understand their application. ☐

18.11f Use basic hand and power tools for finishing and wood working to substrate. ☐

18.12f Prepare all surfaces for the application of preservative or paint. ☐

18.13f Name parts of doors and windows. ☐

18.14f Recognise damage to doors and windows and their finishes. ☐

18.15f Consult with a supervisor on the nature and extent of work to be undertaken. ☐

18.16f Erect and secure safety and protective coverings. ☐

18.17f Remove doors and/or windows to be treated. ☐

18.18f Remove rotten and damaged wood. ☐

18.19f Choose a system of epoxy or other fillers to replace removed wood. ☐

18.20f Measure, cut, and shape new wood to match. ☐

18.21f Use basic hand and power tools for finishing and wood working to substrate. ☐

18.22f Prepare all surfaces for the application of preservative or paint. ☐

18.23f Replace doors and/or windows after treatment. ☐

18.24f Follow health and safety procedures at all times. ☐

18.25f State the procedures to be followed for framing a conventional roof. ☐

18.26f State the procedures to be followed for installing and bracing roof trusses. ☐

18.27f State the materials and methods used for finishing roofing components. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature _____

Candidate name (please print) _____

Instructor signature _____

Instructor name (please print) _____

Completion date _____

18g Preservation skills – painting and decorating

Practical competences

The candidate must be able to do the following:

18.1g State the importance of the painting and decorating industry. ☐

18.2g State the basic differences between restoration and new construction. ☐

18.3g State issues and topics relevant to the preservation/remodelling building construction industry. ☐

18.4g Assess damage to painted and papered components and finishes. ☐

18.5g Consult with supervisor on nature and extent of work to be undertaken. ☐

18.6g Erect and secure safety and protective coverings. ☐

18.7g Remove rotten and damaged finishes. ☐

18.8g Prepare surfaces for application of paint. ☐

18.9g Prepare surfaces for application of paper. ☐

18.10g State different types of paint and paper finishes and understand their application in preservation tasks. ☐

18.11g Use basic hand and power tools for paint and paper finishing to substrate. ☐

18.12g Stain woodwork to a uniform colour. ☐

18.13g Stain wood to match a sample. ☐

18.14g Seal wood for finishing. ☐

18.15g Apply finishes to a prepared wood surface. ☐

18.16g Remove old wall coverings. ☐

18.17g Select and mix paste (for non pre-pasted) wall coverings. ☐

18.18g Apply different types of wall covering ☐

18.19g Match a pattern to a corner. ☐

18.20g Fit wallpaper around a window and door. ☐

18.21g Follow health and safety procedures at all times. ☐

This is to confirm that the candidate has successfully completed the above tasks:

Candidate signature

Candidate name (please print)

Instructor signature

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Completion date

Appendix A
Supplementary studies – Employability skills

Introduction

It is recommended that candidates who are thinking about employment in preservation should prepare themselves for employment by following a course of study or other form of preparation based on the following activities. These activities do not form part of an assessment in this programme but teaching centres may wish to design their own tests.

Practical competences

The candidate must be able to:

Demonstrate employability skills

1 State employment opportunities in the preservation industry.

2 Complete a job search and identify advanced-training opportunities.
Training opportunities: eg full time and part time courses, apprenticeship programmes, on-the-job training, government funded programmes

3 Obtain information about a job.

4 State documents that may be required for a job application.
Documents: eg curriculum vitae, education certificates, identification

5 Complete a job application form.

6 Demonstrate competence in job-interview techniques.

7 State to a supervisor productive work habits and positive attitudes.
Work habits and positive attitudes: general (eg timekeeping, health and safety, consideration for others) and job specific

8 State to a supervisor methods used to make job changes appropriately.

9 Identify ethical and responsible practices.

10 Follow acceptable hygiene practices and adopt a professional appearance.

11 Demonstrate the principles of time management, work simplification, and teamwork when performing assigned tasks.

12 State to a supervisor the importance or taking pride in the quality of work performed.

13 State reasons for the importance of a drug-free workplace and industry policies toward drug and alcohol use.

14 State the effects of a poor driving record on employability opportunities.

15 Explain to a supervisor the importance of confidentiality in the workplace.

Demonstrate positive customer relations skills

16 Demonstrate self-control.
Demonstrate: in a real or simulated work environment, in training

17 Identify and demonstrate appropriate responses to criticism.
Demonstrate: in a real or simulated work environment, in training

18 Recognise basic human relations as they relate to success in the industry.

19 Respond to customer complaints in a positive, professional manner.

20 Demonstrate respect for people and property.

Demonstrate an understanding of entrepreneurship

21 Define 'entrepreneurship.'

22 State the importance of entrepreneurship to the economy and the role of small business in a free-enterprise system.

23 State the advantages and disadvantages of business ownership, including risks involved.

24 State the personal characteristics necessary in a successful entrepreneur.

25 State the business skills necessary to operate a small business efficiently and effectively.

26 State the employer's responsibilities to support the business and industry.

Demonstrate problem-solving skills

27 Organise and plan multiple tasks, using various resources such as time, personnel and materials.
Organise and plan: for two tasks relevant to occupational area in which training is being given

28 Analyse problems, identify the causes and devise plans of action.
Problems: for two problems relevant to occupational area in which training is being given

29 Identify obstacles, generate alternatives, and choose the best alternatives.
Obstacles: for two activities relevant to occupational area in which training is being given

30 Create new and better ways to perform tasks, applying the latest ideas to putting work in place.
Tasks: for two tasks relevant to occupational area in which training is being given

Knowledge requirements

The instructor must ensure that the candidate is able to:

1 Describe employment opportunities in the preservation industry.
Opportunities: within city, state, nationally and internationally

2 Understand how to complete a job search and identify advanced training opportunities.
Training opportunities: eg full time and part time courses, apprenticeship programmes, on-the-job training, government funded programmes

3 Describe the documents that may be required for a job application and reasons for including them.
Documents: eg application form, curriculum vitae, education certificates, identification

4 Describe techniques for success in job-interviews.

5 Describe productive work habits and positive attitudes and reasons for using them.
Work habits and positive attitudes: general (eg timekeeping, health and safety, consideration for others) and job specific

6 Describe methods used to make job changes appropriately and the benefits of each.

7 Describe what is meant by ethical and responsible practices in the preservation industry, and give examples.

8 Give reasons for following acceptable hygiene practices and adopting a professional appearance.

9 Explain the importance of time management, work simplification, and teamwork when performing assigned tasks.

10 Describe the importance or taking pride in the quality of work performed.

11 Explain the importance of a drug-free workplace and industry policies toward drug and alcohol use.

12 Describe the effects of a poor driving record on employability opportunities.

13 Explain the importance of confidentiality in the workplace.

14 Describe positive customer relations skills, and the benefits of each.
Customer relations skills: self-control, appropriate responses to criticism, courtesy

15 Recognise basic human relations as they relate to success in the preservation industry.

16 Explain the importance of responding to customer complaints in a positive, professional manner.

17 Describe the importance of demonstrating respect for people and property.

18 Shown understanding of entrepreneurship.
Understanding: define entrepreneurship, its importance to the economy and the role of small business in a free-enterprise system, the advantages and disadvantages of business ownership, including risks involved, personal characteristics necessary in a successful entrepreneur

19 Describe the business skills necessary to operate a small business efficiently and effectively.

20 State the employer's responsibilities to support the business and industry.

21 Show an understanding of problem-solving skills

22 Describe how to organise and plan multiple tasks, using various resources such as time, personnel and materials.

23 Describe methods of dealing with problems.
Methods: analysing problems, identifying the causes and devising plans of action, identifying obstacles, generating alternatives, choosing the best alternatives

24 Describe now to create new and better ways to perform tasks, applying the latest ideas to putting work in place.

Appendix B
Assessments

Two assessment methods are used in the 6161 Awards in The Construction Industry – set examinations by question paper and practical assessments.

Practical assessments
Each unit (assessment component) in this programme has one or more practical assessments which are derived from the practical components that make up the first part of each syllabus module. The competence checklists (tick boxes), given at the end of each unit, serve as the marking criteria for these assessments and should be used to record the outcome of each candidate's performance. The use of local materials, tools, equipment or practice is allowed within the specifications of the 'range' supporting each practical competence statement. The results of the assessment must be documented and available for audit by the visiting verifier. **All** assessments must be successfully completed.

The assessments may be held at any time agreed by the instructor and the candidate so that each candidate has a personal record of his/her practical assessments.

The competence checklists in this publication are intended to be photocopied.

Preparation, supervision and marking
It is essential that the instructor ensures all necessary preparations are carried out. This will involve ensuring:

- the candidate is ready to demonstrate his or her practical skills
- every candidate understands what is involved
- any necessary materials, tools or equipment are available for the assessment.

Marking of the practical performance is determined on outcomes as defined by the practical competences. Each tick box will show either 'yes – the candidate achieved this' or 'no – the candidate did not achieve this'. The candidate must be successful in all competences included in the checklist before it can be 'signed off' and its results transferred to the summative record.

All assessments require supervision to ensure that the results reflect only the work of the individual candidate concerned. You must keep all assessment documentation and material in a file for each candidate until the results have been agreed by the visiting verifier and until confirmation of result has been received from City & Guilds.

Records, results and certification
When all the required practical assessments for a specific award have been achieved, then the result must be sent to City & Guilds. We suggest that you keep a record of each individual's achievements which may then be transferred to the entry forms. A model is given at the end of this section but you may use any form of record keeping that is convenient and accessible.

Results for practical assessments are entered onto Form S which must be countersigned by the visiting verifier and sent to us.

Question paper assessments
The knowledge requirements in the modules of each unit are tested by question papers which are set and marked by us. At the certificate and diploma levels of this programme, candidates will sit multiple choice question papers and short answer question papers at the advanced diploma level.

Entries for these examinations must be made in accordance with the timetable for entries given in the 'Directory' and must be sent in on Form S.

An advantage of this programme is that candidates who successfully complete a component of assessment for a single unit may, if they wish, claim a Certificate of Unit Credit. This may be beneficial for those candidates who only wish to complete part of this programme.

Candidates wishing to gain the full award (Certificate, Diploma or Advanced Diploma) must successfully complete all forms of assessment. We recommend that the practical results are sent at the time of, or shortly before, the date of the written examinations.

Visiting verifier
The operation of this programme requires the appointment of a visiting verifier. **The visiting verifier must countersign the results of the practical assessments on Form S.** The visiting verifier should also be able to inspect records and candidates' work to verify the results before submission.

02 Certificate in Timber Vocations
Candidates practical competence assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference		Date completed	Instructor signature	Instructor name
101a	Safety Practice			
101b	Mathematics and Drawing Practice			
101c	Communications and Information Technology Practice			
And any ONE of				
103	Trowel Vocations Basic Skills Practice			
104	Painting and Decorating Basic Skills Practice			
105	Plumbing Basic Skills Practice			
106	Refrigeration and Air Conditioning Basic Skills Practice			
107	Electrical Installation Basic Skills Practice			
Plus				
112	Timber Vocations 1 Practice			

03 Certificate in Trowel Vocations
Candidates practical competence assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference		Date completed	Instructor signature	Instructor name
101a	Safety Practice			
101b	Mathematics and Drawing Practice			
101c	Communications and Information Technology Practice			
And any ONE of				
102	Timber Vocations Basic Skills Practice			
104	Painting and Decorating Basic Skills Practice			
105	Plumbing Basic Skills Practice			
106	Refrigeration and Air Conditioning Basic Skills Practice			
107	Electrical Installation Basic Skills Practice			
Plus				
113	Trowel Vocations 1 Practice			

04 Certificate in Painting and Decorating
Candidates practical competence assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference		Date completed	Instructor signature	Instructor name
101a	Safety Practice			
101b	Mathematics and Drawing Practice			
101c	Communications and Information Technology Practice			
And any ONE of				
102	Timber Vocations Basic Skills Practice			
103	Trowel Vocations Basic Skills Practice			
105	Plumbing Basic Skills Practice			
106	Refrigeration and Air Conditioning Basic Skills Practice			
107	Electrical Installation Basic Skills Practice			
Plus				
114	Painting and Decorating 1 Practice			

05 Certificate in Plumbing
Candidates practical competence assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference		Date completed	Instructor signature	Instructor name
101a	Safety Practice			
101b	Mathematics and Drawing Practice			
101c	Communications and Information Technology Practice			
And any ONE of				
102	Timber Vocations Basic Skills Practice			
103	Trowel Vocations Basic Skills Practice			
104	Painting and Decorating Basic Skills Practice			
106	Refrigeration and Air Conditioning Basic Skills Practice			
107	Electrical Installation Basic Skills Practice			
Plus				
115	Plumbing 1 Practice			

06 Certificate in Refrigeration and Air Conditioning
Candidates practical competence assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference		Date completed	Instructor signature	Instructor name
101a	Safety Practice			
101b	Mathematics and Drawing Practice			
101c	Communications and Information Technology Practice			
And any ONE of				
102	Timber Vocations Basic Skills Practice			
103	Trowel Vocations Basic Skills Practice			
104	Painting and Decorating Basic Skills Practice			
105	Plumbing Basic Skills Practice			
107	Electrical Installation Basic Skills Practice			
Plus				
116	Refrigeration and Air Conditioning 1 Practice			

07 Certificate in Electrical Installation
Candidates practical competence assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference		Date completed	Instructor signature	Instructor name
101a	Safety Practice			
101b	Mathematics and Drawing Practice			
101c	Communications and Information Technology Practice			
And any ONE of				
102	Timber Vocations Basic Skills Practice			
103	Trowel Vocations Basic Skills Practice			
104	Painting and Decorating Basic Skills Practice			
105	Plumbing Basic Skills Practice			
106	Refrigeration and Air Conditioning Basic Skills Practice			
Plus				
117	Electrical Installation 1 Practice			

6161-08-008 Certificate in Preservation Skills
Candidate assessment record

Candidate's name (and City & Guilds enrolment number, if applicable)

Centre name

Centre number

Assessment reference	Date completed	Instructor signature	Instructor name
008/01 The preservation industry			
008/02 Materials and techniques			
008/03 Working practices			
008/04 Roofing			
And any ONE of			
008/05 Preservation skills – trowel vocations			
008/06 Preservation skills – timber vocations			
008/07 Preservation skills – painting and decorating			

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