



National Unit specification

General information

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 5)

Unit code: H8WT 45

Superclass: TG

Publication date: February 2015

Source: Scottish Qualifications Authority

Version: 01

Unit purpose

This Unit is suitable for learners with no or limited experience in the construction and heritage industries who wish to gain knowledge and understanding of the preparation of traditional Lime Mortars. It is also suitable for learners from the construction and related service industries and trades, both skilled manual professions and non-manual professions, who wish to gain knowledge and understanding of the preparation and mixing of lime mortars.

This Unit has been designed to develop the learner's ability to select, measure, mix and produce traditional lime mortars for the repair and maintenance of stone and brick structures. It also develops the learner's knowledge and understanding of the tools and procedures involved in carrying out conservation works.

Outcomes

- 1 Demonstrate knowledge and understanding of lime terminology, techniques and practices.
- 2 Prepare and mix a range of traditional mortars.

Credit points and level

0.5 National Unit credit at SCQF level 5: (3 SCQF credit points at SCQF level 5)

Recommended entry to the Unit

Entry is at the discretion of the centre, however it may be beneficial if the learner had some industry experience and knowledge.

National Unit specification: General information (cont)

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the Support Notes for this Unit specification.

There is no automatic certification of Core Skills or Core Skill components in this Unit.

Context for delivery

If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed within the subject area of the Group Award to which it contributes.

Equality and inclusion

This Unit specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

National Unit specification: Statement of standards

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

Outcome 1

Demonstrate knowledge and understanding of lime terminology, techniques and practices.

Performance Criteria

- (a) Explain the lime cycle.
- (b) Explain the preparation of hydraulic lime.
- (c) Explain the preparation of non-hydraulic lime
- (d) Describe the gauging of mortars.

Outcome 2

Prepare and mix a range of traditional mortars.

Performance Criteria

- (a) Select and measure hydraulic and non-hydraulic limes and aggregates.
- (b) Gauge and mix mortars.

Evidence Requirements for this Unit

All Outcomes

Evidence is required to demonstrate that learners have achieved all Outcomes and Performance Criteria.

Evidence must be provided to show that learners can demonstrate, and work with, an understanding of information, materials, terminology, practices and techniques related to preparing and mixing lime mortars. Evidence must also be provided to show that learners can apply relevant knowledge and skills in a practical context.

Evidence is required to show that learners can identify the needs of other occupations associated with preparing and mixing lime mortars and work accordingly.

Written and/or oral recorded evidence is required to demonstrate that the learner has achieved Outcome 2 to the standard specified in the Performance Criteria. learners will be required to demonstrate their knowledge of terminology, techniques and practices associated with the preparing and mixing traditional lime mortars. Health and Safety issues of working with mortars should be fully understood.

National Unit specification: Statement of standards (cont)

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Outcome 1

Demonstrate knowledge and understanding of lime terminology, techniques and practices.

Performance Criteria

(a) Explain the lime cycle.

Evidence must be provided to show that the learner can:

- ◆ describe and explain the lime cycle, referencing burning, calcination, hydration, slaking.
- ◆ identify a range of traditional lime binders, referencing regional and locational variations.
- ◆ explain the reasons for sampling and analysing existing lime mortars in traditional structures.
- ◆ explain the reasons for producing a best-fit to match an existing traditional lime mortar.

Performance Criteria

(b) Explain the preparation of hydraulic lime.

Evidence must be provided to show that the learner can:

- ◆ explain the accurate preparation of hydraulic lime mortars.
- ◆ identify a range of suitable storage conditions for lime mortar materials.

Performance Criteria

(c) Explain the preparation of non-hydraulic lime.

Evidence must be provided to show that the learner can:

- ◆ explain the accurate preparation of non-hydraulic lime.

Performance Criteria

(d) Describe the gauging of mortars.

Evidence must be provided to show that the learner can:

- ◆ describe the gauging of lime mortars accurately.
- ◆ identify sources and uses of materials for the mixing and preparation of lime mortars such as aggregates, pozzolans, pigments, additives and fibres.
- ◆ identify a range of lime mortars and lime products, their uses, values and reasons for using different forms of lime, such as putty, renders, washes, coarse and fine stuff.
- ◆ identify suitable storage conditions for lime mortar materials.
- ◆ explain correct methods of batching, grading, knocking-up, sampling and storing lime mortars.

National Unit specification: Statement of standards (cont)

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Outcome 2

Prepare and mix a range of lime mortars.

Performance Criteria

(a) Select and measure hydraulic and non-hydraulic limes and aggregates.

Evidence must be provided to show that the learner can:

- ◆ select, measure, prepare and a hydraulic lime.
- ◆ select, measure, prepare and a non-hydraulic lime.
- ◆ identify additives and aggregates used in the mixing processes.
- ◆ select, use, clean and store all tools used in the effective preparation of hydraulic lime.
- ◆ work in accordance with current health and safety legislation at all times.

Performance Criteria

(b) Gauge and mix mortars.

Evidence must be provided to show that the learner can:

- ◆ mix and gauge lime mortars.
- ◆ select, use, clean and store all tools used in the effective preparation of non-hydraulic lime.
- ◆ work in accordance with current health and safety legislation at all times.

In the completion of this Unit all working practices must be in accordance with current and relevant health and safety legislation and regulations.

The following health and safety regulations, acts, approved codes of practice and any amendments or updates made by statutory bodies apply to all Outcomes in this Unit:

- ◆ Health & Safety at Work Act 1974
- ◆ The Personal Protective Equipment at Work Regulations 1992 (as amended)
- ◆ Provision and Use of Work Equipment Regulations 1998 (as amended)
- ◆ The Construction (Design & Management) Regulations 2007
- ◆ The Control of Substances Hazardous to Health 2002 (as amended)
- ◆ The Lifting Operations and Lifting Equipment Regulations 1998(as amended)
- ◆ The Work at Height Regulations 2005
- ◆ The Management of Health and Safety at Work Regulations 1999 (as amended)
- ◆ The Manual Handling Operations Regulations 1992 (as amended)



National Unit Support Notes

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Unit Support Notes are offered as guidance and are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 20 hours.

Guidance on the content and context for this Unit

This Unit has been developed as a mandatory Unit in the National Progression Award in the Conservation of Masonry at SCQF level 6. It can also be delivered as a free-standing Unit.

Much previous long-term damage to traditional structures has been caused by well-intentioned, but inappropriate or poorly-considered application of skills and materials through a lack of understanding. This Unit provides underpinning understanding and knowledge to help prevent future long term damage to traditional structures being carried out by those who successfully complete the Unit.

Learners successfully completing this Unit will gain knowledge, understanding to be competent in the preparation and mixing of traditional lime mortars. Learners will also have applied relevant knowledge and skills in a practical context.

The Unit is suitable for learners with limited experience of the construction and heritage industries who wish to gain knowledge and understanding of conservation/restoration, repair and maintenance of traditional (pre-1919) structures.

It is also suitable for learners from the construction and related service industries and trades. It is applicable to skilled manual professions and non-manual professions. The skills are transferable within different working environments, but the Unit is aimed at learners whose normal work is related directly to a site, conservation/restoration project, or a similar working environment.

The Unit is applicable to all areas of construction or other related industries but specifically with the consolidation and repair of masonry structures. It also includes the safe working practices associated with working with lime based mortars and is complemented by other building Units in Stonemasonry.

This Unit has been developed as a replacement for Units:

GOWTMv0.5 (F2FX 12) *Working with Traditional Mortars (SCQF level 6)*

National Unit Support Notes (cont)

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Where this Unit is being taken as part of the National Progression Award in Conservation of Masonry at SCQF level 6, it is recommended that it is delivered after learners have completed the following Unit:

- ◆ *Understanding Conservation, Repair and Maintenance of Traditional Structures (SCQF level 6)*

This Unit may be assessed on a live project or alternatively on a simulation module incorporating a stone built structure that provides all of the Evidence Requirements listed.

This Unit has been developed to gain knowledge, understanding and practical application related to the National Occupational Standards:

- ◆ VR548 *Prepare and mix lime mortars*

This Unit provides underpinning knowledge related to the Recommended Qualifications Structure (RQS) for SVQ's in Heritage Skills suite as provided by the CITB.

This Unit is relevant and provides underpinning knowledge for progression to HNC/HND qualifications in the conservation and restoration of traditional (pre-1919) structures.

Guidance on approaches to delivery of this Unit

The achievement of skills and underpinning knowledge required for this Unit will be assisted by the provision of information sources in the form of: oral and/or written instructions; graphic and photographic materials; technical information and examples from manufacturers of limes, sands and pre-mixed mortars; codes of practice; building standards; statutory regulations; information on extracting and converting limestone by calcinations and hydration and sourcing and extracting clay sands and aggregates.

Teachers/Lecturers should demonstrate practical elements step-by-step until the learner feels competent enough to attempt them under assessment conditions. The requirement to adopt safe working practices and comply with safety legislation must be emphasised throughout.

It is recommended that this Unit be delivered in order of Outcomes and Performance Criteria.

Guidance on approaches to assessment of this Unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

National Unit Support Notes (cont)

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

It is recommended that learners be assessed on an Outcome by Outcome basis. However centres may choose to assess a combination of Outcomes on a single assessment occasion or combined assessments.

A multiple-choice type question paper could be used for formal assessment of all underpinning knowledge for Outcome 1, delivered under closed-book controlled, supervised conditions at an appropriate point in the Unit.

An appropriate instrument of assessment for Outcome 2 would be a practical assignment which the learners complete in a real or simulated workplace environment. The practical assignment should require learners to select, gauge and mix lime mortars.

In order to allow learners to achieve all Outcomes and Performance Criteria learners should be given a clear brief detailing the nature of the exercises involved.

Centres should retain observation check lists and product evidence in the form of either learners completed work evidence, photographic or video evidence.

Feedback should be provided to learners, this and all assessment material will be subject to internal and external verification.

Opportunities for e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by Information and Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Opportunities for developing Core and other essential skills

Elements of the Core Skill of *Problem Solving*, that is, Critical Thinking, Planning and Organising, and Reviewing and Evaluating, could be effectively developed and enhanced in the Unit, which requires the application of theoretical knowledge to a practical task. Identifying and examining the relevance of all factors at various stages of the preparation and mixing of lime mortars will be essential to ensure successful results.

Initially learners will have to establish the extent of repair needed before analysing requirements for materials in a range of environmental and seasonal contexts, which will involve a high level of critical thinking.

The ability to identify appropriate materials, test their properties, and select solutions which use appropriate approaches to working is a critical competence. Learners will devise an appropriate and safe approach to work, based on assessment of performance characteristics, and demonstrate that they can comply with current and relevant Health and Safety legislation and regulations.

National Unit Support Notes (cont)

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

Formative group discussion of issues such as site requirements, and the impact of environmental and seasonal factors may be useful to support decision making although Learners should independently identify and determine best practice. Class discussions with assessor support during formative work could encourage the analytical evaluation of typical repair strategies and would also be of value in developing problem solving skills.

The ability to calculate and consider the implications of data which may be presented numerically and graphically will underpin the competencies developed in the Unit. Learners have to focus on practical analysis and calculation to determine and test the effects of exposure, environmental, and seasonal influences on the performance of existing and new repair materials. Knowledge and understanding of the mechanisms and effects of decay will be critical to the formulation of sound repair strategies. Practical exercises to support development of skills in the calculation and presentation of data could be undertaken as part of formative work and integrated with other work across the award, with an emphasis on Numeracy as a tool to be used and applied efficiently and critically in working contexts. The provision of appropriate reference materials in numeric and graphic format would assist this process.

History of changes to Unit

Version	Description of change	Date

© Scottish Qualifications Authority 2015

This publication may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Business Development and Customer Support team, telephone 0303 333 0330.

General information for learners

Unit title: Prepare and Mix Traditional Lime Mortars (SCQF level 6)

This section will help you decide whether this is the Unit for you by explaining what the Unit is about, what you should know or be able to do before you start, what you will need to do during the Unit and opportunities for further learning and employment.

This Unit is about the preparation and mixing of traditional lime mortars. It is suitable for those with limited experience in the construction and heritage industries; it is also suitable for those with existing competencies in the construction industries who wish to be able to apply existing competencies to the preparation and mixing of lime mortars.

This Unit is suitable for those who wish to gain knowledge, understanding and practical experience of preparing and mixing traditional lime mortars correctly.

Successful completion of this Unit will provide you with the underpinning knowledge, understanding and practical skills that can be applied to preparing and mixing traditional lime mortars.

On completion you will be able to:

- 1 Demonstrate knowledge and understanding of lime terminology, techniques and practices.
- 2 Prepare and mix a range of traditional mortars.

Assessment is through completion of closed-book multiple-choice questions and in the completion of practical assignments.

Elements of the Core Skills of *Problem Solving*, that is; Critical Thinking, Planning and Organising, and Reviewing and Evaluating, will be developed in the successful completion of this Unit, but they will not be assessed or certificated.

The Unit is valuable in the potential development of enterprise, employability and citizenship in the repair and maintenance part of the construction sector, specifically in respect of traditional structures, which in turn is relevant in sustainability and sustainable development, as traditional structures are principally constructed of indigenous local materials and in many cases have survived in daily use for over a century or longer and will continue to do so for centuries more — but only provided they are cared for competently. This Unit provides underpinning knowledge and understanding to gain relevant competency.