



Higher National Unit Specification:

General information for centres

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

Unit code: F8PX 34

Unit Purpose: This Unit is designed to enable the candidate to develop their knowledge, understanding and skills relevant to the layout and detailed operations of a stonemasonry yard including, running costs and the relevant machinery involved in the machine production of stone. The candidate will demonstrate their understanding of techniques and practices as well as their practical abilities in the use of geometry to measure and calculate angles for the purpose of setting out and constructing a stone bay window.

On completion of the Unit the candidates should be able to.

- 1 Explain the function and layout of machinery in stone yard and provide cost analysis of stone production.
- 2 Set out an obtuse angled wall.
- 3 Build stone complex bay window.

Credit points and level: 1 HN credit at SCQF level 7: (8 SCQF credit points at SCQF level 7*)

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Recommended prior knowledge and skills: Access to this Unit is at the discretion of the centre. However it is recommended that candidates have completed the Professional Award in Stonemasonry at SCQF level 6 or have the equivalent level of industrial experience and prior learning.

Core Skills: There are opportunities to develop the Core Skills of *Communication, Numeracy, Working with Others* and *Problem Solving* all at SCQF level 5 and *Information and Communication Technology* at SCQF level 4 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

General information for centres (cont)

Context for delivery: If this Unit is delivered as part of a Group Award, it is recommended that it should be taught and assessed in the subject area of the Group Award to which it contributes. This Unit was developed as part of the Professional Development Award in Stonemasonry at SCQF level 7 and is aimed at candidates following a career in stonemasonry and with current industrial experience.

Assessment: The candidate will be given the opportunity to enhance their skills and knowledge in stonemasonry by producing accurate scale drawing of a stonemasonry yard, including the practical positioning of machinery. Knowledge of the functions of machinery and the tools employed will be assessed by related questions. Candidates will be further assessed with costing the operational functions of producing machine cut stone.

Candidate will also be required to complete a project using natural stone or a combination of natural stone, reconstituted stone and precast concrete including cutting of stone.

The principles and techniques should be explained throughout the practical activities.

This Unit is assessed on the candidates' performance of drawing stonemasonry yard and setting and building bay window, and the ability to meet the Evidence Requirements in all Outcomes.

In order to achieve this Unit, candidates are required to present sufficient evidence that they have met all the Knowledge and/or Skills elements for each Outcome. Details of these requirements are given for each Outcome.

The assessment instruments used should follow the general guidance offered by the Scottish Qualifications Authority (SQA) assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Evidence will be gathered through observation of work processes and assessment of completed work. Assessment should be carried out under controlled, supervised conditions. Candidates must achieve all of the Knowledge and/or Skills and Evidence Requirements specified for each Outcome to gain this Unit. Centres may use the instrument of assessment which they consider to be most appropriate but are advised to use the Stonemasonry Training and Assessment Programme (TAP) which has been developed centrally by SQA. Any other instruments of assessment used must be comparable to the TAP and have been through prior verification.

Accurate records should be made of the assessment instruments used showing how evidence is generated for each Outcome and giving marking schemes, checklists and recorded candidate feedback. Records of candidates' achievements should be retained. These records will be made available for external verification.

Higher National Unit Specification: statement of standards

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

Outcome 1

Explain the function and layout of Machinery in Stone Yard and Provide cost Analysis of Stone Production

Knowledge and/or skills

- ◆ Layout of stonemasonry yard and machinery
- ◆ Functions and process of machinery
- ◆ Tools and equipment used in a stonemasonry yard
- ◆ Purchase and operational costs

Evidence Requirements:

Candidates will need to provide evidence to demonstrate their knowledge and skills by showing they can:

- ◆ explain the operations and production of machine cut stone including the process of slabbing, primary sawing, secondary sawing, dimensional six sided sawn stone, lathes, generic stone polisher and shot blasting for surface finishes, evidence should be in the form of candidates producing annotated scale
- ◆ produce annotated scale drawings of a facility involving the machine production of stone and the layout of the various machinery
- ◆ explain the functions and process of machinery
- ◆ explain use and limitations of machinery
- ◆ recognise and relate tools and equipment used in a stonemasonry yard
- ◆ produce purchase costs related to replacement tools, equipment and operational procedures

All the Evidence Requirements must be met and all items in the knowledge and skills covered. Evidence should be generated through assessments under supervised conditions. Candidates need to demonstrate their knowledge in all aspects of Machine Production of Stone and relevant Health and Safety issues. This can be assessed by question papers. Candidates will also be assessed in their drawing skills in producing a layout of a Stonemasonry Yard.

The evidence for this should be obtained under closed-book, supervised conditions at an appropriate point in the Unit.

Assessment Guidelines

In the assessment candidates will be required to complete an assignment based on drawings and specifications for an actual work project. This could be conducted as an assignment partly in a classroom environment.

Higher National Unit Specification: statement of standards (cont)

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

Outcome 2

Set out an obtuse angled wall

Knowledge and/or skills

- ◆ Setting out
- ◆ Establishing angles
- ◆ Transfer levels
- ◆ Sequencing of the work
- ◆ Tools and equipment

Evidence Requirements:

Candidates will need to provide evidence to demonstrate their knowledge and skills by showing they can:

- ◆ set out to reference drawing establishing sizes
- ◆ establish angles through knowledge of geometry
- ◆ transfer and establish level points a minimum distance of 5m apart
- ◆ plan sequence of work in relation to setting out stone bay window
- ◆ use of appropriate tools and equipment
- ◆ comply with health and safety legislation and produce risk assessment for project

Outcomes 2 and 3 should be assessed by a single instrument of assessment. Evidence of actual performance is needed to show that candidate can set out obtuse angled walling for a bay window as per drawing and transfer and establish level points a minimum distance of 5m apart

Candidate will demonstrate skills in the sequencing of the work and the ability to comply with health and safety legislation.

To ensure health and safety is compliant candidate will produce a risk assessment for all works to be carried out on this project.

An assessor observation checklist should be completed to ensure that the candidate has met the required specification and tolerances and this observation checklist should be retained as evidence.

Specification Checklist	Tolerance
Setting out and measuring building line	+/- 4mm
Setting out and measuring front line of bay	+/- 4mm
Setting out and measuring angled bays	+/- 4mm
Levelling datum points	+/- 2mm
Sequencing of work	Yes/No

Higher National Unit Specification: statement of standards (cont)

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

Evidence will be gathered through observation of work processes and assessment of the completed work. Assessment should be carried out under controlled, supervised conditions. In order to achieve this Outcome, candidates are required to present sufficient evidence that they have met all the Knowledge and/or Skills elements. An assessor observation checklist should be completed to ensure that the candidate has met the required specification and tolerances and this observation checklist should be retained as evidence.

Assessment Guidelines

This Outcome is assessed on the candidates' actual performance of setting out an obtuse bay window to a given specification and required tolerances.

Candidates should be provided with drawings and specifications for the practical task. Assessment should be carried out in a suitable workshop environment. Timing for this assessment should be determined prior to commencement. An observation checklist should be completed to ensure the candidate has evidenced all the knowledge and skills included in this Outcome to the specifications and tolerances required.

Outcome 3

Build stone complex bay window

Knowledge and/or skills

- ◆ Build stonework to form angled bay
- ◆ Build components of window
- ◆ Pointing of stonework
- ◆ Types of natural stone
- ◆ Use of pre-cast products

Evidence Requirements:

Candidates will need to provide evidence to demonstrate their Knowledge and Skills by showing they can:

- ◆ build a stone bay window in accordance with drawing and specification
- ◆ complete an angled bay window using a combination of machine produced natural stone, random or snecked rubble, reconstituted stone and precast window components
- ◆ cut stone to suit build and size
- ◆ bed precast or stone window sill
- ◆ fix mullion using appropriate methods and dowel
- ◆ flush point finished work
- ◆ demonstrate knowledge of types of stone and pre-cast products
- ◆ demonstrate knowledge of the effects of defective pointing and methods of protection
- ◆ select tools and equipment appropriate to the work
- ◆ sequence work methods and activities
- ◆ carry out the work in line with health and safety legislation

Higher National Unit Specification: statement of standards (cont)

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

Candidate will be required to complete from a drawing a project using natural stone or a combination of natural stone/reconstituted stone. They will also cut and dress stone to form bay window.

Oral or written evidence is needed to show the candidate can select mortar mixes, bonding arrangements and describe methods of maintaining alignment

All working practices must be in line with current and relevant health and safety legislation and regulations.

Evidence will be gathered through observation of work processes and assessment of the completed work. Assessment should be carried out under controlled, supervised conditions. In order to achieve this Outcome, candidates are required to present sufficient evidence that they have met all the Knowledge and/or Skills elements. An assessor observation checklist should be completed to ensure that the candidate has met the required specification and tolerances and this observation checklist should be retained as evidence.

Specification Checklist	Tolerance
Sequencing and setting out stonework	+/- 4mm
Alignment of random rubble	+/- 4mm
Alignment of ashlar quoins and mullions	+/- 2mm
Levelling of stone quoins and sill	+/- 1mm
Joints in ashlar build	+/- 2mm
Underside of sill to datum level	+/- 4mm
Face of Stone Clean	Yes/No
Pointing — neat flush finish	Yes/No

Assessment guidelines:

Knowledge evidence is required for Outcome 3 to show that the candidate can demonstrate knowledge of types of natural stone and pre-cast products.

Written and/or recorded oral evidence is required which demonstrates that the candidate has achieved the knowledge elements of the Unit to the standard specified in the Outcomes. The evidence for this should be obtained under closed-book, controlled, supervised conditions.

Assessment should be carried out in a suitable workshop environment. Timing for this assessment should be determined prior to commencement. An observation checklist should be completed to ensure the candidate has evidenced all the knowledge and skills included in this Outcome to the specifications and tolerances required.

Administrative Information

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Superclass category: TG

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Higher National Unit Specification: support notes

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

This part of the Unit specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours

Guidance on the content and context for this Unit

This Unit has been developed as a mandatory Unit in the Professional Development Award in Stonemasonry and may be delivered in a sequence suitable to individual candidates and centres.

This Unit is designed to enable the candidate to develop their knowledge, understanding and skills relevant to a modern stonemasonry yard and the setting out and construction of a bay window.

Candidates following a career in stonemasonry and with current industrial experience will benefit from undertaking this Unit.

The knowledge and skills for this Unit should be incorporated with modern methods associated with a stonemasonry yard and setting out and building a bay window, applied Terminology commonly associated with stonemasonry should also be used throughout this Unit.

It is vitally important that candidates gain an understanding and knowledge of the sequencing of operations with regard to setting out and building a bay window.

Current Health and Safety, sustainability and waste management issues should be fully emphasised throughout the delivery of this Unit.

Working to specified tolerances and methods of checking completed work should be demonstrated and undertaken by the candidate.

Guidance on the delivery and assessment of this Unit

The principles and methods of laying out a stonemasonry yard and to determine the positioning of buildings structures and machinery should be demonstrated to the candidate before summative assessment takes place.

The differing constraints candidates could encounter on site with various construction methods with regard to setting out and building of an obtuse bay window should be fully explained.

Health and Safety and Sustainability are integral and key to the Construction Industry therefore throughout the Unit emphasis will be placed where appropriate on the application of Health and Safety and Sustainability. Safety working practices should be looked at in accordance with current safety codes of practice and regulations. Sustainability should include reference to criteria affecting sustainability, impact of not implementing sustainability on the environment and the legislation promoting sustainability.

Working tolerances should be explained as being the minimum standard which will be accepted and candidates should be encouraged to evaluate their own work.

Higher National Unit Specification: support notes (cont)

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

Opportunities for developing Core Skills

Communication skills at SCQF level 5 may be developed by the completion of the assignment for Outcome 1. Candidates are required to produce a written assignment outlining the processes, regarding the function and layout of machinery in stone yard and providing cost analysis of stone production

Working with Others at SCQF level 5 could be developed when working in pairs when setting out and building stone bay window. Candidates can agree responsibilities and provide support and information to each other during the assessments. After assessment, they should be encouraged to consider how effectively they supported each other.

Information and Communication Technology at SCQF level 4 may be developed by the candidates' carrying out individual research of modern and traditional methods of setting out and constructing a stone bay window, techniques, health and safety legislation and sustainability relating to the task.

Problem Solving at SCQF level 5 could be developed as candidates compare and contrast modern and traditional surrounds and stonework construction techniques. Candidates will need to take account of a range of factors in order to work efficiently and safely, such as the choice of tools, appropriate materials, safety issues, safety equipment and sustainability. Individual discussions with assessors will enhance the evaluation of efficient working practices.

Numeracy could be developed at SCQF level 5 when taking off dimensions from working drawings, measuring, calculating and setting out.

Open learning

Although this Unit could be delivered by distance learning, it would require a considerable degree of planning by the centre to ensure the sufficiency and authenticity of candidate evidence. Arrangements would have to be made to ensure that:

- ◆ the practical activity in outcome 2 and 3 is supervised by a responsible person and clearly recorded (using an assessment checklist, or on video) for the assessor
- ◆ the assessor is, at some point able to question the candidate on the performance (face to face, by telephone, online)
- ◆ the closed-book assignment for outcome 1 is conducted in a supervised environment

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website

www.sqa.org.uk/assessmentarrangements

General Information for Candidates

Unit Title: Stonemasonry: Machine Production of Stone and Bay Window Construction

This Unit is designed to enable you to recognise the operations and production of machine cut stone, candidates will produce annotated scale drawings of a facility involving the Machine Production of Stone and the layout of various types of machinery. The Unit will also cover tools and equipment used in the production of machine cut stone and the cost of replacement. You will also carry cost analysis taking into account the running costs of the operation.

Outcome 1

Recognise the function and layout of Machinery in Stone Yard and Provide cost Analysis of Stone Production.

The assessment for this Outcome will be closed-book and conducted in a supervised environment.

Outcome 2

Set out an obtuse angled wall.

- ◆ setting out
- ◆ establishing angles
- ◆ transfer levels
- ◆ sequencing of the work
- ◆ tools and equipment

To complete this Unit successfully you will also demonstrate skills in setting out an obtuse wall in accordance with drawings and specifications, including referencing drawing to establish sizes and angles.

Outcome 3

Build stone complex bay window.

- ◆ build stonework to form angled bay
- ◆ build components of window
- ◆ pointing of stonework
- ◆ types of natural stone
- ◆ use of pre-cast products

You will be assessed in supervised workshop conditions to specified tolerances contained in an observation checklist. These tolerances should be fully explained and available prior to you commencing the assessment. You will be required to work individually for the assessment and where required in pairs. You will receive both oral and written feedback on your performance from the assessor.

There are opportunities for you to develop your Core Skills of *Communication*, *Numeracy*, *Working with Others* and *Problem Solving* all at SCQF level 5 and *Information and Communication Technology* at SCQF level 4 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.