



National Unit Specification: general information

UNIT Carpentry and Joinery: Formwork and Temporary Works
(SCQF level 6)

CODE F6MV 12

SUMMARY

This Unit is suitable for candidates working towards a Modern Apprenticeship in Carpentry and Joinery and will develop the candidates craft skills in formwork and temporary works. This Unit is designed to provide candidates with competence in the use of tools and equipment to construct and erect formwork and temporary works and the ability to apply these skills in the workplace. It is also designed to enable candidates to develop their skills and understanding in carpentry and joinery terminology, techniques and practices, and production of working drawings.

OUTCOMES

- 1 Describe the terminology and function of components in relation to formwork and temporary works.
- 2 Construct formwork for a pre-cast concrete component.
- 3 Construct formwork for an in-situ paving slab.
- 4 Erect strike and store formwork for a column.
- 5 Set out segmental and semi-circular arched centres and construct an arched centre.

RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates undertaking the Professional Development Award in Carpentry and Joinery at SCQF level 6 must meet the requirements of the Modern Apprentices which include being employed in the relevant craft industry.

Administrative Information

Superclass: TG
Publication date: May 2009
Source: Scottish Qualifications Authority
Version: 01

© Scottish Qualifications Authority 2009

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 Customer Contact Centre, telephone 0845 279 1000.

National Unit Specification: general information (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

CREDIT VALUE

1 credit at SCQF level 6 (6 SCQF credit points at SCQF level 6*).

**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.*

CORE SKILLS

There is no automatic certification of Core Skills or Core Skill components in this Unit. Opportunities for developing aspects of the following Core Skills are highlighted in the Support Notes of this Unit:

- ◆ Problem Solving at SCQF level 4
- ◆ Working with Others at SCQF level 4
- ◆ Information and Communication Technology at SCQF level 3
- ◆ Numeracy at SCQF level 4
- ◆ Communication at SCQF level 4

National Unit Specification: statement of standards

UNIT Carpentry and Joinery: Formwork and Temporary Works (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

Describe the terminology and function of components in relation to formwork and temporary works.

Performance Criteria

- (a) Describe the terminology and function of components used in formwork.
- (b) Describe the terminology and function of components used in temporary works.

OUTCOME 2

Construct formwork for a pre-cast concrete component.

Performance Criteria

- (a) Select suitable materials for the construction of the mould box.
- (b) Mark out the mould box in accordance with the given specification.
- (c) Construct a knock-down mould box in accordance with the given specification.
- (d) Comply with current health and safety regulations in all activities.

OUTCOME 3

Construct formwork for an in-situ paving slab.

Performance Criteria

- (a) Select suitable materials to construct formwork for a paving slab.
- (b) Set out the formwork for the paving slab in accordance with the given specification.
- (c) Construct the formwork for the paving slab in accordance with the given specification.
- (d) Comply with current health and safety regulations in all activities.

OUTCOME 4

Erect strike and store formwork for a column.

Performance Criteria

- (a) Assemble column formwork in accordance with the given specification.
- (b) Secure column formwork using a proprietary system in accordance with the given specification.
- (c) Prop column formwork using a proprietary system in accordance with the given specification.
- (d) Strike and store formwork in accordance with the given specification.
- (e) Comply with current health and safety regulations in all activities.

National Unit Specification: statement of standards (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

OUTCOME 5

Set out segmental and semi-circular arched centres and construct an arched centre.

Performance Criteria

- (a) Set out a segmental arched centre.
- (b) Set out a semi-circular arched centre.
- (c) Construct **an** arched centre in accordance with the given specification.
- (d) Comply with current health and safety regulations in all activities.

EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that the candidates have achieved this Unit to the standard specified in all the Outcomes and Performance Criteria. All working practices must be in line with relevant and current Health and Safety legislation and regulations. A Risk Assessment and Method Statement must be completed **prior** to any practical activities taking place.

Written and/or oral evidence is required for Outcome 1 which demonstrates that the candidate can describe the terminology and function of components associated with formwork and temporary works. The evidence for this Outcome will take the form of a question paper and be obtained under closed-book supervised conditions.

Performance and product evidence for Outcomes 2, 3, 4 and 5, supplemented with an assessor observation checklist, should be used to confirm the candidate has individually met the standards specified in the Performance Criteria and specification.

For Outcome 4 candidates will work as part of a team of two.

For Outcome 5, candidates must construct one of the following arched centres in accordance with the given specification:

- ◆ segmental arched centre
- ◆ semi-circular arched centre

Summary checklist (Component):

- ◆ design a suitably constructed knock-down mould box
- ◆ construct mould box
- ◆ horizontal dimension $\pm 2\text{mm}$
- ◆ vertical dimension $\pm 2\text{mm}$
- ◆ infill dimensions $\pm 2\text{mm}$
- ◆ box joints — no gaps exceeding 1mm
- ◆ infill joints — no gaps exceeding 1mm
- ◆ infill nailing punched and filled
- ◆ components secured

National Unit Specification: statement of standards (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

Summary checklist (Paving Slab):

- ◆ the design of the knock-down mould box is appropriate for casting the specified component
- ◆ the constructed knock-down mould box would enable the desired component to be cast
- ◆ horizontal dimensions $\pm 2\text{mm}$
- ◆ vertical dimensions $\pm 2\text{mm}$
- ◆ box joints — no gaps exceeding

Summary checklist (Column):

- ◆ participating effectively in setting out formwork for in situ work
- ◆ all horizontal dimensions at ground level $\pm 5\text{mm}$
- ◆ all forms vertical per metre $\pm 5\text{mm}$
- ◆ formwork straight on edge per metre with no deviations exceeding 4mm
- ◆ distance of upper surface at any point from datum $\pm 5\text{mm}$
- ◆ components secured

Arched Centre

Setting out:

- ◆ the design of the centre is appropriate
- ◆ span $\pm 3\text{mm}$
- ◆ rise $\pm 3\text{mm}$
- ◆ bisectors $\pm 2\text{mm}$
- ◆ curve accurate with no overlap exceeding 3mm
- ◆ construction:
 - ◆ span $\pm 3\text{mm}$
 - ◆ rise $\pm 3\text{mm}$
 - ◆ curve smooth with no deviations exceeding 2mm
 - ◆ components secured 1mm

These Evidence Requirements will be met by the completion of the Training and Assessment Programme (TAP) in Carpentry and Joinery.

National Unit Specification: support notes

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

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 Carpentry and Joinery at SCQF level 6, which is a mandatory component of the Modern Apprenticeship.

The successful completion of this Unit will provide candidates with the required underpinning knowledge and skills relating to terminology, components, component functions, regulations and geometry in relation to, setting out, constructing and erecting formwork and temporary works along with associated equipment.

The Unit will be offered to candidates from the construction and related services industries. The skills and knowledge and understanding are transferable within different working environments but the Unit is primarily aimed at candidates whose normal place of work would be a site, workshop or similar environment.

The Unit deals with the theory and practice associated with the construction and erection of formwork and temporary works, and the method of siting and securing them in position. It is further complemented by Units dealing with related work in Carpentry and Joinery. There would be opportunity to integrate aspects of this Unit with others in the Carpentry and Joinery PDA eg *Construction Craft Drawing*. It should be delivered as part of a structured programme of training and orientated to the context of the candidate's work and area of responsibility.

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

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

The following information may be helpful with regard to specific Outcomes.

Outcome 1

The candidate should be introduced to the terminology related to formwork and temporary works through the use of audio visual material, visual aids, manufacturers catalogues (paper based and/or on-line) and, wherever possible, site visits. These would provide the opportunity for lecturer led discussions surrounding the function of components.

National Unit Specification: support notes (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

Terminology could include: columns; beams; floor slabs; pre-cast; in-situ; knock-down boxes; proprietary systems; non-proprietary systems; striking; release agents; segmental; semi-circular; three centred; springing line.

Components could include: soffit; upstand; kickers; reinforcing bars; spacers; sheet materials; strong backs; struts; braces; cramps; fixings; ribs; yokes; lagging; folding wedges.

The need to work accurately should be emphasised with the candidate fully appreciating that the quality of the finished work is dependant on the skillfull manufacture and erection of the formwork/centres as well as their retention in position. Pressures exerted by wet concrete should also be included as should the effect the shutter faces have on the finished concrete. An input on calculating surface areas should also be included.

Outcomes 2 and 3

The candidate should be introduced to the materials and methods used in the construction of formwork such as knock-down boxes, columns, beams, and slabs.

Pre-cast: Starting with a component such as a plain lintel group discussion could lead on to more complex shapes involving infilling the basic mould box with timber and/or sheet materials in order to produce the desired profiled component. This discussion could be carried out in either (or both) the classroom or workshop using whatever visual aids the lecturer deemed suitable. The mould box would be constructed for either a cill or coping. To re-enforce the importance of accuracy and design it would be very beneficial to fill at least one of each design with concrete.

In-Situ: The in-situ exercise should be carried out in as realistic a site environment as possible. This will give the candidate first hand experience of meeting the demands of accuracy and finish in challenging circumstances. To provide an opportunity for team work/working with others, candidates would be permitted to work in pairs on a double sized slab.

Outcome 4

The candidate could be introduced to methods and materials used in the manufacture of shutters and to methods of setting out such components as bases and lines of columns. The use of kickers should be fully explained with a brief introduction to the use and placement of steel reinforcement leading to the provision of cover to the reinforcement by means of spacers. Audio-visual material showing examples of formwork could be used to focus on the important skills required to ensure formwork is effective in achieving the desired requirements. The tutor could lead group discussions on the techniques and sequencing of striking and storing formwork components. Whilst it is not the intention of applying any form of release agents to the forms, the preparation of forms for subsequent reuse could be included in the discussions. Safety issues should be emphasised throughout with special focus on the absolute necessity of de-nailing and working in an orderly manner.

National Unit Specification: support notes (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

Outcome 5

The preliminary work for this Outcome would be covered during the delivery of the Construction Craft Drawing Unit. Candidates should be given the opportunity to develop skills and expertise in bisecting lines using beam compasses and/or trammel rods. These skills, once mastered, through lecturer led group discussions, would then be applied in a practical context eg constructing arched centres. Candidates should be encouraged to collaborate with their brickwork colleagues to gain an insight into the importance of using suitable sizes for span and rise to match brick coursing.

Candidates would then produce a setting out rod for a segmental and semi-circular arched centre showing all the relevant geometrical setting out details. Once completed the candidate would construct **one** of the centres using suitable materials. The lecturer would ensure that at least one of each type was constructed within the class group to enable candidates to see the complexities of each design.

A beneficial exercise would be for the bricklayers to use one of each centre type manufactured to build a brick arch. Feedback could then be provided in terms of accuracy, suitability and design.

Where appropriate, opportunities should be taken throughout delivery of this Unit to meet the requirements of the generic Units of the Training and Assessment Programme including:

- ◆ Conform to Efficient Working Practices
- ◆ Conform to General Workplace Safety
- ◆ Move and Handle Resources
- ◆ Confirm Work Activities and Resources for the Work
- ◆ Develop and Maintain Good Working Relationships
- ◆ Confirm the Occupational Method of Work

The candidate should be given the opportunity to further develop their skills through visual aids, electronic presentations, DVD's, e-learning, reference books, classroom exercises and group discussions. The function of each component should be thoroughly demonstrated and practised by each candidate through elevations, sections, plans and detailed drawings. Construction methods should be demonstrated and attempted by candidates in order to show good techniques in measuring, drawing (including workshop rods), marking out, plumbing, levelling and nailing and fixing of components from manufacture to fitting. This teaching approach should ensure the candidate is acquiring the underpinning knowledge and skills required for the Unit.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

There are opportunities to develop aspects of the Core Skill of *Problem Solving* at SCQF level 4. 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 and the use of role play will enhance the evaluation of efficient working practices.

National Unit Specification: support notes (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

There are opportunities for candidates to develop the Core Skill of *Working with Others* at SCQF level 4, particularly in Outcomes 2, 3, 4 and 5. Candidates can agree responsibilities and provide support and information to each other during the practical group activities. Candidates will be working as part of a team of two in Outcome 4.

Opportunities also arise for candidates to develop the Core Skill of *Information and Communication Technology* at SCQF level 3 by researching, use of spreadsheets, e-learning and e-assessment.

Numeracy skills at SCQF level 4 could be developed through the interpretation of information from 3-dimensional working drawings and the practical use of calculation and measuring scales.

Candidates will have the opportunity to develop *Communication* skills at SCQF level 4 through out practical tasks, as they should be expected to communicate with others using the correct terminology, tone and style suited to the workplace.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Section 4 of the Carpentry and Joinery Training and Assessment Programme (TAP) provides detailed assessment material for this Unit. It is advised to use the 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. It is expected that candidates will be given as much practice as possible, prior to being set assessment tasks.

The candidates' knowledge and understanding of terminology and components in relation to formwork and temporary works will be assessed through a question paper and conducted under controlled, supervised conditions.

Candidates will be required to produce a knock-down mould box, an in-situ shutter; erect, strike and store formwork for a column; produce setting out rods for a segmental and semi-circular arched centre and construct one of them to meet the requirements of Outcome 2, 3, and 4.

Evidence will be gathered for Outcomes 2, 3 and 4 through observation that the candidates have met the given standards and tolerances during the practical activity. An assessor observation checklist can be used to record this evidence. Assessment should be conducted under controlled, supervised conditions.

Opportunities for the use of 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 communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

National Unit Specification: support notes (cont)

UNIT Carpentry and Joinery: Formwork and Temporary Works (SCQF level 6)

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