Higher National Unit specification

General information for centres

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Unit code: F8P3 34

Unit purpose: This Unit is designed to enable students to develop their knowledge, understanding and skills of complex timber formwork construction. The Unit is designed to develop candidate's competence in the construction and erection of complex formwork for in-situ concrete work, adopting safe working practices, producing detailed drawings, quantifying and costing materials.

On completion of the Unit this candidate should be able to:

1 Demonstrate knowledge and understanding of constructing timber and proprietary formwork for complex in-situ work.
2 Design, draw and sketch constructional details for complex formwork for in-situ work.
3 Produce accurate quantities and costing for formwork.
4 Construct and erect complex in-situ timber formwork for a straight flight stair and quarter landing.

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 will be at the discretion of the centre. It would be beneficial if candidates have successfully completed the Professional Development Award (PDA) in Carpentry and Joinery at SCQF level 6 (G9AR 46) or have the equivalent level of industrial experience and prior learning.

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

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. This Unit was developed as part of the Professional Development Award in Carpentry and Joinery at SCQF level 7 and is aimed at candidates following a career in Carpentry and Joinery and receiving complementary industrial experience.

General information for centres (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Assessment: This Unit is assessed on the candidate's knowledge and actual performance of Complex Timber Formwork Construction. The Unit will be achieved when the candidate presents sufficient evidence of the Knowledge and/or Skills and Evidence Requirements as specified for each of the Outcomes.

It would be possible to approach assessment holistically or to break this assessment down into four assessment events that assess each Outcome separately.

The assessment instrument used should follow the assessment guidelines specified for each of the Outcomes. Centres may use the instruments of assessment which they consider to be most appropriate but are advised to use the Carpentry and Joinery Training and Assessment Programme (TAP) SCQF level 7 which has been developed centrally by SQA. Any other instruments of assessment used must be comparable to the TAP 7.

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

Assessment Guidelines

Outcome 1 — The assessment should be in four distinct sections and assessed separately.

- Define five from six factors affecting the selection of timber and sheet materials for formwork
- Define six from eight factors affecting the erection and support of in-situ timber formwork
- Define five from six factors related to easing and striking of in-situ timber formwork
- Select and state the specific use of five from six ancillary items of formwork equipment

Evidence should be generated through assessment taken in controlled, supervised open-book conditions, with students working individually using their own notes and reference material.

Outcome 2 — Students should draw or sketch the design, selecting components sizes and materials for three projects.

- A straight flight stair with quarter landing from a lecturer supplied specification and pictorial sketch. This project can be integrated with Outcome 4.
- A project comprising, rectangular columns, an integrated beam and an intermediate floor or roof slab from a lecturer supplied specification and pictorial sketch. This project can be integrated with Outcome 3.
- A more aesthetically alternative to rectangular columns (Project 2); a circular column

General information for centres (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Outcome 3 — The Outcome can be integrated with Outcome 2 with the drawing and sketches being used to for the costing and measurement assessment. An integrated project comprising, rectangular columns, an integrated beam and an intermediate floor or roof slab requires the student to draw and sketch potential formwork designs from a lecturer supplied specification and pictorial sketch.

A change from rectangular columns to similar sized circular columns for the same project should be measured and costed.

It is expected that all arithmetical working be presented in a clear tabulated format.

Outcome 4 — The candidate will, as one of a pair or team, provide sufficient practical performance evidence necessary to produce a rod and manufacture the formwork required for a straight flight stair in accordance with the Evidence Requirements. Candidates should be provided with drawings and specifications for the practical task and assessment should be carried out in a suitable workshop environment.

Higher National Unit specification: statement of standards

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Unit code: F8P3 34

The sections of the Unit stating the Outcomes, Knowledge and/or Skills, and Evidence Requirements are mandatory.

Outcome 1

Demonstrate knowledge and understanding of constructing timber and proprietary formwork for complex in-situ work

Knowledge and/or Skills

- Current practices in formwork
- Timber and materials
- Sustainability of materials
- Procedures for constructing, erecting and supporting formwork
- Procedures for easing and striking formwork
- Ancillary equipment
- Proprietary formwork

Evidence Requirements

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

- define **five** factors affecting the selection of timber and sheet materials for formwork
- define **six** factors affecting the erection and support of in-situ timber formwork
- define **five** factors related to easing and striking of in-situ timber formwork
- select **five** ancillary items of formwork equipment and state their specific use

Evidence must be gathered under controlled, supervised open-book conditions. Candidates must work individually and can use their own notes and reference material.

Assessment Guidelines

The assessment should be in four distinct sections and assessed separately.

- define five from six factors affecting the selection of timber and sheet materials for formwork
- define six from eight factors affecting the erection and support of in-situ timber formwork
- define five from six factors related to easing and striking of in-situ timber formwork
- select and state the specific use of five from six ancillary items of formwork equipment

Evidence should be generated through assessment taken in controlled, supervised open-book conditions, with students working individually using their own notes and reference material.

Higher National Unit specification: statement of standards (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Outcome 2

Design, draw and sketch constructional details for complex in-situ work formwork

Knowledge and/or Skills

- Scale drawing
- Sketching
- Formwork design
- Current practices in formwork
- Materials
- Ground and intermediate floors
- Columns
- Beams
- Stairs
- Landings

Evidence Requirements

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

- produce scale drawings of formwork for an in-situ straight flight concrete stair incorporating a quarter landing
- produce detailed sketches of the constructional details of the timber formwork required for in-situ rectangular columns and intersecting beam
- produce detailed sketches of the constructional details of the timber formwork required for in-situ circular columns and intersecting beam

The candidate will be allowed to use their own reference materials to draw and sketch constructional details using best current practice. The evidence must be gathered under controlled, open-book, supervised conditions. All details must comply with current and relevant health and safety regulations.

Assessment Guidelines

Students should draw or sketch, the design, selecting components sizes and materials for three projects.

- A straight flight stair with quarter landing from a lecturer supplied specification and pictorial sketch. This project can be integrated with Outcome 4.
- A project comprising, rectangular columns, an integrated beam and an intermediate floor or roof slab from a lecturer supplied specification and pictorial sketch. This project can be integrated with Outcome 3.
- A more aesthetically alternative to rectangular columns (Project 2); a circular column.

Higher National Unit specification: statement of standards (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Outcome 3

Produce accurate quantities and costing for formwork

Knowledge and/or Skills

- Working drawings
- Taking off quantities
- Cutting lists
- Costing and measurement of materials
- Numeracy

Evidence Requirements

Candidates will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can accurately produce quantities and costs of materials from a given specification and drawings of in-situ concrete for:

- circular column
- rectangular column
- ground floors
- intermediate floors
- beam

The evidence must be gathered under controlled, open-book, supervised conditions.

Assessment Guidelines

The Outcome can be integrated with Outcome 2 with the drawing and sketches being used to for the costing and measurement assessment. An integrated project comprising, rectangular columns, an integrated beam and an intermediate floor or roof slab requires the student to draw and sketch potential formwork designs from a lecturer supplied specification and pictorial sketch.

A change from rectangular columns to similar sized circular columns for the same project should be measured and costed.

It is expected that all arithmetical working be presented in a clear tabulated format.

Higher National Unit specification: statement of standards (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Outcome 4

Construct and erect complex in-situ timber formwork for a straight flight stair and quarter landing

Knowledge and/or Skills

- Interpreting workshop drawings and specifications
- Current practices in formwork
- Working as a team
- Sequencing of work
- Current Health and Safety regulations
- Straight flight stair formwork

Evidence Requirements

Candidates working in pairs or teams will need to provide evidence to demonstrate their Knowledge and/or Skills by showing that they can accurately interpret a workshop drawing and specification to produce a rod and manufacture the formwork required for a straight flight stair and quarter landing. Stair minimum width 800mm, minimum risers four, minimum step rise 150mm.

Summary of Standards

Accuracy of workshop rod	within 1mm
Overall height of stair	within 6mm
Overall width of stair	within 6mm
Joints fitting and secure	75%
Plumb	within 4mm
Level	within 3mm
All props	Secure with no movement
Risers	Bevelled for concrete finisher

All dimensions and construction details must comply with the requirements of Building Regulations. The evidence must be gathered under controlled, supervised conditions. 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

The candidate will, as one of a pair or team, provide sufficient practical performance evidence necessary to produce a rod and manufacture the formwork required for a straight flight stair in accordance with the Evidence Requirements. Candidates should be provided with drawings and specifications for the practical task and assessment should be carried out in a suitable workshop environment.

Administrative Information

Unit code: F8P3 34

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Superclass category: TG

Original date of publication: August 2010

Version: 01

History of changes:

Version	Description of change	Date

Source: SQA

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

Additional copies of this Unit specification can be purchased from the Scottish Qualifications Authority. Please contact the Customer Contact Centre for further details, telephone 0845 279 1000.

Higher National Unit specification: support notes

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

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 an optional Unit in the Professional Development Award (PDA) in Carpentry and Joinery at SCQF level 7.

This Unit is intended to equip candidates with all necessary underpinning knowledge and skills related to designing, manufacturing, jointing, assembling and installation of complex in-situ timber formwork.

Outcome 1, using previously gained competences, the candidate could be guided to:

- Technical and constructional aspects associated with formwork to floors, columns, beams and stairs with quarter and half landings.
- Methods of construction, easing and striking formwork; cast in fixings; release agents.
- Proprietary systems; column clamps, beam clamps, adjustable props.

The candidate could be provided with a wide range of information sources describing and illustrating the constructional requirements of in-situ timber formworks. These information sources could include site visits, videos, visual aids, text books, technical information sheets, current Building Regulations, Health and Safety regulations and also references to computer websites for formwork information.

Outcome 2, candidates could be introduced to copies of exemplar working drawings also sketches of formwork from a variety of information sources. Emphasis should be placed on the candidate producing technically correct scaled drawings and sketches showing a high level of draughting skill; in particular for columns and beams and straight flight stairs with quarter and half landings.

Outcome 3, it should be stressed to the candidates how important it is to quantify and cost accurately from workshop drawings. This Outcome requires the candidate to produce, in tabular form, accurate costings of the materials required for various types of in-situ timber forms. The emphasis being on circular columns, rectangular columns; floors; and beams in this Outcome. Where calculators are used written stages of working should be shown. Exemplar drawings with material take offs and costings would be most helpful to the candidate. IT skills could be introduced to produce spread sheets for cutting lists to assist in the costing exercise.

Outcome 4 it would be very beneficial if a full size or scale down model of the practical project and workshop rod were made available to the candidates to enhance their understanding of the project. Emphasis should be placed on how essential communication and co-operation are when working within a team. Highlighting the proper sequential operations will also help candidates bring the project to a successful conclusion. Work methods and activities must satisfy current safety regulations.

Candidates could work in a workshop/project area to construct in-situ timber framework. Particular attention should be paid to each individual candidate in the work situation as they will be working in pairs or teams. The spread of work should be as equal as possible when allocating components for the candidate to produce.

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. Safe 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. Emphasis should be placed on appropriate areas such as waste management and effective sourcing and use of materials.

Where feasible, centres should also incorporate modern methods of construction used in industry. Candidates should be made aware of current industry practice and emerging practice or technology which may become conventional in the future.

Guidance on the delivery and assessment of this Unit

As part of the Professional Development Award (PDA) in Carpentry and Joinery at SCQF level 7, this Unit may be delivered in a sequence suitable to individual candidates and centres. When completing this Unit as part of the PDA it is recommended that, where possible, opportunity is taken to integrate aspects of Constructional Technical Communication Skills (DW4D 34).

This Unit could be delivered through a series of formal lectures, guided student centred activities and practical workshop activities which will involve the candidate carrying out the activities outlined in the Outcomes. Candidates should be encouraged to produce a folio of visual evidence from the internet, textbooks and centre provided notes which illustrate the design and manufacture requirements of complex timber formwork construction. The use of videos, visual aids drawings and manufacturers catalogues would assist in the understanding of underpinning knowledge required.

If feasible, site visits or information about modern and potential future methods of construction would be beneficial. This approach could be used to enhance the candidate’s experience and understanding of how their skills and knowledge might be applied in real industry situations.

Centres may use the instruments of assessment which they consider to be the most appropriate but are advised to use the Carpentry and Joinery Training and Assessment (TAP) at SCQF level 7 which has been developed centrally by SQA. Any other instruments of assessment used must be comparable to the TAP 7.

Higher National Unit specification: support notes (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Opportunities for developing Core Skills

There are opportunities to develop the Core Skill of *Problem Solving* at SCQF level 5. 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.

There are opportunities to develop the Core Skill of *Working with Others* at SCQF level 5, particularly during practical assessments which should be carried out in cooperation with others. Candidates can agree responsibilities and provide support and information to each other during the practical group activities.

There are opportunities to develop the Core Skill of *Communication* at SCQF level 5 throughout this Unit by the candidates selecting and describing various aspects of complex timber formwork construction. Candidates will interpret specifications, workshop drawings and the workshop rod, effectively communicating component sizes and joint details required for product manufacture. As candidates complete practical tasks, they should be expected to communicate with others using the correct terminology, tone and style suited to the workplace.

There are opportunities to develop the Core Skill of *Information and Communication Technology* at SCQF level 4 in Outcomes 1and 4 where the candidates will be encouraged to access information through internet research. They could also be encouraged to word process and generate digital information for their portfolio related to the knowledge and Evidence Requirements.

There are opportunities to develop the Core Skill of *Numeracy* skills at SCQF level 4 through the interpretation of information from 3 dimensional working drawings and the practical use of calculation measuring scales and costing.

Higher National Unit specification: support notes (cont)

Unit title: Carpentry and Joinery: Complex In-Situ Timber Formwork

Open learning

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

- candidates have access to a suitable workshop with suitable equipment and tools
- health and safety considerations are fully taken into account
- the practical activities are supervised by a responsible person and clearly recorded (using an assessment checklist for the assessor)
- the assessor is, at some point, able to question the candidate on that performance
- assessment is carried out under the stated conditions

For information on open learning arrangements, please refer to the SQA guide *Assessment and Quality Assurance of Open and Distance Learning* (**www.sqa.org.uk**)

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: Carpentry and Joinery: Complex In-Situ Timber Formwork

This Unit has been designed to further your career in the construction industry by developing your competence and improving your knowledge of complex timber formwork construction. It has been written as part of the Professional Development Award (PDA) in Carpentry and Joinery at SCQF level 7 and is for experienced crafts persons working in the construction industry as carpenters and joiners.

The Unit will help develop your underpinning knowledge and skills related to designing, jointing, assembling and installing complex in-situ timber formwork.

You will be assessed on your knowledge of factors affecting the selection of timber and sheet materials for formwork; factors affecting the erection; support; easing and striking of in-situ timber formwork; and ancillary formwork equipment.

You will be learn how to produce neat detailed scale drawing of complex timber formwork for straight flight stair also neat detailed sketches of complex timber formwork for a circular column and intersecting beam. You will be assessed at how well your drawings and sketches meet the required standard.

You will also be assessed on your ability to produce quantities and costs of materials from a given specification and drawings of various in-situ concrete formworks.

Finally, you will have to set out and erect complex timber formwork for a straight flight stair and will be observed to see how well you meet the set specification and tolerances.

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

If you successfully complete this Unit and the full PDA at SCQF level 7, you will not only have advanced your craft skills, but will also automatically receive some credit for your achievement if you progress on to the HNC Construction.