



Higher National Unit specification

General information for centres

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

Unit code: F8P4 34

Unit purpose: This Unit is designed to enable the candidates to develop their knowledge, understanding and skills relevant to the setting out and building of complex pitched roofs. The candidate will also enhance their practical experience by producing of templates to assist with the setting out and building of a complex pitched roof.

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

- 1 Demonstrate knowledge and understanding of complex forms of pitched roof construction.
- 2 Produce scale drawings and calculations for an asymmetrical pitched roof including a pitched roof dormer.
- 3 Construct an asymmetrical pitched roof with irregular plan and a pitched roof dormer.

Credit points and level: 1.5 HN credits at SCQF level 7: (12 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 *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.

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 Pitched Roof Construction

Assessment: This Unit is assessed on the candidates' actual performance of the construction and erection of an asymmetrically pitched roof with a pitched roof dormer. 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 combine assessment of Outcomes 1 and 2, or to break this assessment down into separate assessment events that assess each Outcome separately

Evidence will be gathered through observation of work processes and assessment of the 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 instruments of assessment which they consider to be most appropriate but are advised to use the carpentry and joinery, 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

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

Outcome 1

Demonstrate knowledge and understanding of complex forms of pitched roof construction

Knowledge and/or Skills

- ◆ Pitched roof construction
- ◆ Pitched roof components
- ◆ Dormer construction
- ◆ Design factors
- ◆ Sketching
- ◆ Sustainability considerations

Evidence Requirements

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

- ◆ sketch sections of asymmetrically pitched, irregular plan, mansard, turret and dormer roof
- ◆ identify components correctly
- ◆ describe the function of components correctly
- ◆ identify suitable roof types for dormer construction
- ◆ describe factors affecting roof design

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

Assessment Guidelines

In this assessment candidates could complete an assignment based on drawings and specifications for an actual work project. Evidence could be gathered through the production of a report outlining the processes related to complex pitched roof construction. This could be conducted as an in class assignment lasting up to three hours. It would be possible to consider holistic assessment of Outcomes 1 and 2 or they could be treated as separate assessments.

Higher National Unit specification: statement of standards (cont)

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

Outcome 2

Produce scale drawings and calculations for an asymmetrical pitched roof including a pitched roof dormer

Knowledge and/or Skills

- ◆ Interpretation of drawings and specifications.
- ◆ Production of scale drawings of elevations, sections and plan.
- ◆ Geometrical setting out of rafters.
- ◆ Calculation of surface area and true lengths of rafters.
- ◆ Sustainability considerations

Evidence Requirements

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

- ◆ Draw accurately to scale, a pitched roof showing:
 - elevations
 - plan
 - sections
 - component layout
 - geometry
 - details
- ◆ Accurately calculate true lengths of rafters
- ◆ Accurately calculate surface areas

Evidence must be in the form of scale drawings and calculations for an asymmetrical pitched roof including a pitched roof dormer. The evidence must be gathered under open-book, supervised conditions.

Assessment Guidelines

In this assessment candidates could complete an assignment based on drawings and specifications for an actual work project. This could be conducted as an in class assignment lasting up to three hours. It would be possible to consider holistic assessment of Outcomes 1 and 2 or they could be treated as separate assessments.

Higher National Unit specification: statement of standards (cont)

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

Outcome 3

Construct an asymmetrically pitched roof with irregular plan and a pitched roof dormer

Knowledge and/or Skills

- ◆ Interpretation of drawings and specifications
- ◆ Geometrical setting out for pitched roof construction
- ◆ Components selection, cutting and fixing
- ◆ Pitched roof tools, power tools and equipment
- ◆ Sustainability and site waste management
- ◆ Woodworking machinery set up and use.
- ◆ Current Health and Safety legislation and safe working practices

Evidence Requirements

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

- ◆ set out positions for components
- ◆ cut and fix joists and rafters
- ◆ determine true lengths and angles
- ◆ cut and fix soffit/fascia
- ◆ construct a pitched roof dormer
- ◆ follow safe working practices
- ◆ minimise the waste of resources throughout practical tasks
- ◆ work to specified tolerances identified in the specification

Summary of standards

- | | |
|--|------------------------------|
| ◆ Minimum span | 2.000m |
| ◆ Minimum common rafter section | 38 × 50mm |
| ◆ Minimum hip and ridge section | 150 × 30mm |
| ◆ Ceiling joist cut and fixed in position | |
| To line on ends | ± 5mm |
| Lateral | ± 5mm |
| Square ends | ± 2mm |
| ◆ Common, hip and jack rafters cut and fixed in position | |
| Lateral | ± 5mm |
| Joints tight | ± 3mm |
| Ridge board straight per 2m run | No deviation exceeding ± 6mm |
| ◆ Dormer formed in correct position | |
| To position within | ± 20mm |
| Opening square to within | ± 20mm |
| Trimming to common rafters | No gaps exceeding ± 3mm |
| ◆ Cheeks plumb per 2m run to within | ± 5mm |
| ◆ Wall head for dormer roof level per meter run | ± 5mm |
| ◆ Fascia board level per 2m run | ± 5mm |

Higher National Unit specification: statement of standards (cont)

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

The evidence must be gathered under 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 provide sufficient practical performance evidence necessary to set out and construct the roof 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: F8P4 34

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

Superclass category: TG

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History of changes:

Version	Description of change	Date

Source: SQA

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Higher National Unit specification: support notes

Unit title: Carpentry and Joinery: Complex Pitched Roof 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 60 hours.

Guidance on the content and context for this Unit

This Unit has been developed as a mandatory 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 and manufacturing of complex pitched roofs to a high standard of finish.

It is recommended that lecturers fully explain the following terms:

- ◆ pitched roofs
- ◆ setting out
- ◆ geometry
- ◆ angles/bevels
- ◆ measurement
- ◆ specifications
- ◆ drawings

Lecturers should also cover the following topics:

- ◆ measurement and setting out
- ◆ determining roof pitch/angle.
- ◆ cutting timbers to correct length
- ◆ fascia/soffit
- ◆ roof covering

Outcomes 1 and 2 require the candidate to explain the factors affecting the design of roofs; illustrate roof forms and identify components of roofs; produce scale drawings and calculations for roofs asymmetrical pitched roofs. Candidates will also be required to demonstrate their knowledge of terminology, geometry, setting out techniques and construction practices by successful completion of an assignment related to complex pitched roofs.

Outcome 3 involves practical carpentry and joinery skills and should be delivered in an appropriate workshop environment. The main emphasis of this Outcome is the ability to set out and build an asymmetrically pitched roof including a pitched roof dormer. All relevant materials and equipment must be supplied to the candidate in order to complete Outcome 3. It is fundamental to this Unit that professional discussions on appropriate setting out techniques, construction practices and sequences of building is used for complex pitched roofs and that the candidate is given time to develop their methodology prior to assessment.

The following safety requirements apply at the time of writing: HSW Act (Health and Safety at Work etc Act); COSHH (Control of Substances Hazardous to Health) Regulations; Working at height regulations.

Higher National Unit specification: support notes (cont)

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

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 lectures and formative theory and practical examples which will involve the candidate carrying out the activities outlined in the Outcomes. Candidates should be encouraged to use visual evidence from the internet, textbooks and notes which illustrate the design, manufacture and installation requirements of complex roof construction.

Demonstrations and professional discussions by tutors/trainers, especially in the application of practical aspects of these Outcomes, should reinforce and augment the candidate's previous knowledge. Safety factors should be highlighted where applicable during practical activities.

Candidates should be given as much practise as possible in carpentry and joinery techniques and setting out techniques, prior to being set the assessments. Candidates should be evidenced as individually meeting the requirements during all Outcomes.

It is the responsibility of the centre to satisfy themselves that the portfolio of evidence submitted for assessment is entirely original and solely the respective student's work.

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.

Opportunities for developing Core Skills

There are opportunities to develop the Core Skill of *Communication* at SCQF level 5 throughout this Unit by the candidates describing various aspects of complex roof construction. Candidates will interpret specifications and workshop drawings, 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.

Higher National Unit specification: support notes (cont)

Unit title: Carpentry and Joinery: Complex Pitched Roof Construction

There are opportunities to develop the Core Skill of *Numeracy* at SCQF level 5 through the interpretation of information from 3 dimensional working drawings and the practical use of calculation and measuring scales.

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 pairs. 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 *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 *Information and Communication Technology* at SCQF level 4 in Outcomes 1 and 2 where the candidates will be encouraged to access information through internet research. They could also be encouraged to word process responses for formative assessments and could use digital images as part of their evidence.

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 Pitched Roof Construction

This Unit has been designed to further your career in the construction industry by developing your competence and improving your knowledge of complex pitched roofs. The Unit will allow you to get practical hands-on complex pitched roof construction experience in order to appreciate Carpentry and Joinery at an advanced level. 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.

Outcome 1: You are required to explain and illustrate techniques used to produce sketches of complex roofs such as:

- ◆ asymmetrical pitched
- ◆ irregular plan.
- ◆ mansard
- ◆ turret
- ◆ dormer

Your work will be assessed via an assignment.

Outcome 2: You are required to carry out the geometrical setting out to enable you to produce scale drawings of an asymmetrical pitched roof including a pitched roof dormer.

Your work will be assessed via an assignment:

- ◆ read and interpret drawings
- ◆ carry out the geometrical setting out of rafters
- ◆ produce scale drawings of elevations, plan and sections
- ◆ produce calculations of surface areas and lengths of rafters

Outcome 3: You are required to set out and construct a complex pitched roof including a pitched roof dormer. Drawings and suitable materials will be provided and your work will be assessed via an observation/operational checklist to provide evidence to demonstrate your knowledge and skills by showing that you can:

- ◆ set out components
- ◆ cut and fit joists
- ◆ cut and fit rafters
- ◆ construct a pitched roof dormer
- ◆ cut and fit fascia/soffit

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.

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 of the PDA if you progress on to the HNC Construction.