



## **National Unit specification: general information**

**Unit title:** Carpentry and Joinery: Roof Construction (SCQF level 6)

**Unit code:** H0RM 12

**Superclass:** TG

**Publication date:** March 2012

**Source:** Scottish Qualifications Authority

**Version:** 01

### **Summary**

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

### **Outcomes**

- 1 Demonstrate knowledge and understanding of terminology, function of components and forms of construction associated with Roofs.
- 2 Produce a cutting list for a pitched roof with a flat roof dormer.
- 3 Produce fully annotated scale drawings detailing the construction of pitched roofs.
- 4 Participate in the construction of a traditional pitched roof with a flat roof dormer to a given specification
- 5 Participate in the construction of a trussed roof to a given specification.

### **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.

## General information (cont)

**Unit title:** Carpentry and Joinery: Roof Construction (SCQF level 6)

### Credit points and level

2 National Unit credits at SCQF level 6 (12 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

Achievement of this Unit gives automatic certification of the following:

Complete Core Skill	None
Core Skill components	Critical Thinking @ SCQF level 4 Using Graphical Information @ SCQF level 4

There are also opportunities to develop aspects of Core Skills which are highlighted in the Support Notes of this Unit Specification.

## **National Unit specification: statement of standards**

**Unit title:** Carpentry and Joinery: Roof Construction (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 terminology, function of components and forms of construction associated with Roofs.

#### **Performance Criteria**

- (a) Defined Roof construction terminology correctly.
- (b) Define the function of Roof components correctly.
- (c) Describe forms of construction and legislation associated with Roofs correctly.

### **Outcome 2**

Produce cutting lists for a pitched roof with a flat roof dormer.

#### **Performance Criteria**

- (a) Calculate materials correctly from the given specification.
- (b) Compile accurate and legible cutting lists of materials and components allowing for wastage.
- (c) Comply with current Health and Safety and sustainability requirements during all work methods and activities.

### **Outcome 3**

Produce fully annotated scale drawings detailing the construction of pitched roofs.

#### **Performance Criteria**

- (a) Produce fully annotated scale drawings showing the position of rafters in a pitched roof.
- (b) Produce fully annotated scale drawings showing the position of components around a chimney stack in accordance with current legislation.
- (c) Produce fully annotated scale drawings of ridge and eaves details.
- (d) Determine true shapes of openings in pitched roofs.
- (e) Comply with current Health and Safety and sustainability requirements during all work methods and activities.

## **National Unit specification: statement of standards (cont)**

**Unit title:** Carpentry and Joinery: Roof Construction (SCQF level 6)

### **Outcome 4**

Participate in the construction of a traditional pitched roof with a flat roof dormer to a given specification.

#### **Performance Criteria**

- (a) Determine bevels and calculate lengths of common, jack and hip rafters correctly.
- (b) Cut and fix a common, jack and hip rafter correctly.
- (c) Cut flat roof dormer components correctly.
- (d) Position and fix flat roof dormer structural components correctly.
- (e) Correctly position and fix flat roof decking including verge and eaves finishing.
- (f) Comply with current Health and Safety and sustainability requirements during all work methods and activities.

### **Outcome 5**

Participate in the construction of a trussed roof to a given specification.

#### **Performance Criteria**

- (a) Erect trussed rafters correctly.
- (b) Fix trusses at centres correctly.
- (c) Brace roof trusses correctly.
- (d) Form gable ladders to accommodate sheet material soffit and suitable overhang.
- (e) Finish verge and eaves to suit maximum use of materials.
- (f) Comply with current Health and Safety and sustainability requirements during all work methods and activities.

#### **Evidence Requirements for this Unit**

Evidence is required to demonstrate that the candidates have achieved this Unit to the standard specified in all 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, function of components and legislation associated with Roof construction. Evidence for this Outcome will take the form of question papers and will be conducted under controlled, closed-book supervised conditions.

## National Unit specification: statement of standards (cont)

### Unit title: Carpentry and Joinery: Roof Construction (SCQF level 6)

Product evidence is required to demonstrate that the candidate has achieved Outcomes 2 and 3, to the standards specified in the Performance Criteria. The cutting list must be completed with materials calculated correctly from the workshop drawing allowing for wastage. The cutting list must be compiled accurately and legibly using terminology that is technically correct throughout. Evidence in the form of a folio is needed to show the candidate can produce accurate scale drawings of plans, elevations and sections in first angle projection showing the position of all necessary components, details of constructional joints and details of finishes at pitched roof projections. Evidence for these Outcomes will take the form of an open-book assignment conducted under controlled and supervised conditions.

Product and performance evidence supplemented with an assessor observation checklist is required to show that the candidate has achieved Outcomes 4 and 5 to the standard specified in the Performance Criteria. Candidates will be observed to show that they can work individually to determine the lengths of hip, jack and common rafters, and to mark and cut components accurately, and as a member of a group to set out, position and fix components in accordance with the given specification of an equally pitched roof structure incorporating a hipped end and a gabled end.

<b>Summary of standards (working towards industrial tolerances)</b>	
<b>Traditional pitched roof with flat roof dormer</b>	
Roof component lengths calculated	± 1 mm
Roof component marked to lengths	± 1 mm
Roof components bevels determined	without error
Roof components marked with bevels	without error
<b>Positioning and securing flat roof joists:</b>	
minimum rafter section 50 mm x 75 mm	
rafters fixed at 400 mm centres	
suitable decking fixed to roof deck	
verge and eaves finished to suit centre and maximise use of materials	
correct joist bearing (ie dormer framing)	
joists positioned to required centres	±5 mm
joist positioned with camber uppermost and level	no deviation more than 2 mm in 1.0 m
outer joists adjacent to walls	minimum 50 mm gap and max 60 mm gap
all joints tight fit and securely held	
joists securely fixed as per specification	to line on ends
strutting positioned as per specification	
strutting securely fixed without protruding above or below joist	
joists parallel to each other	±3 mm
firrings laid in accordance with the drawing	
<b>Positioning and securing flat roof joist coverings:</b>	
all joints tight fit and securely held	
nails punched below surface	
sheet material covering positioned and supported	

## National Unit specification: statement of standards (cont)

**Unit title:** Carpentry and Joinery: Roof Construction (SCQF level 6)

<b>Trussed roof</b>	
Trusses positioned to centres	± 5 mm
Trusses plumb	± 3 mm in overall heights
Trusses securely fixed	to specifications
Trusses positioned	to line on ends
Outer trusses adjacent to walls	minimum 50 mm/max 60 mm gap
<b>Ensuring accurate information relating to the resources is available for use in relation to:</b>	
Drawings	
Specifications, schedules	
Manufacturers catalogues/technical information	
Passing information to colleagues and discussing work	

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 title: Carpentry and Joinery: Roof Construction (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 80 hours.

### Guidance on the content and context for this Unit

This Unit has been developed as a mandatory Unit in the PDA Carpentry and Joinery SCQF level 6, which is a mandatory component of the Modern Apprenticeship in Carpentry and Joinery.

The successful completion of this Unit will provide candidates with the required underpinning knowledge and skills relating to the terminology and construction of equally pitched roofs incorporating flat roofs, hipped end and gabled end formations using traditional and trussed rafter methods of construction.

This Unit would 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. Encouragement of the holistic approach should be adopted when delivering this Unit.

This Unit deals with the theory and practice associated with the construction of equally pitched roofs and is complemented by Units dealing with related work in Carpentry and Joinery. 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. Integration with other Units should be encouraged especially during the process of marking and cutting components, and in the compliance of safety legislation. It is anticipated that the practical elements of this Unit will be integrated with the following PDA Units; *Carpentry and Joinery: Woodworking Machine Skills* and *Carpentry and Joinery: Woodworking Power Tool Skills* at SCQF level 6.

All activity should comply with current legislation and health and safety and regulations.

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.

## **National Unit specification: support notes (cont)**

Unit title: Carpentry and Joinery: Roof Construction (SCQF level 6)

### **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 Roofs when the tutor may wish to use audio visual materials, and visual aids in the form of model roofs, to provide a thorough explanation of related terminology. The model roofs could also be used to identify components and form the basis of discussion on the function of each component and on different forms of Roofs. Working drawings, specifications and schedules along with manufacturer's catalogues and technical information will also reinforce the learning experience.

Terminology could include: span; rise; pitch; ridge; hip; valley; eaves; verge; gable; soffit; bellcast; rafter bevels. Additional flat roof terminology could include: abutment, cold and warm roofs, anchoring.

Components could include: wallplates; ceiling joists; ridge boards; rafters; purlins; outriggers; poleplates; sprocket pieces; tilting fillets; gable ladders; ties; hangers; soffit boards; barge boards; roof coverings; soffit ventilators; trussed rafters; braces; soffit; fascia. Additional flat roof components could include: joist, furring piece, decking, insulation, border fillet, angle fillet, wall bearer, apron/drip, strutting, joist hanger.

Types of roof could include: Lean-to; mono pitch; couple; closed couple; collar; collar and tie; single roof; double roof; mansard; trussed rafter, flat.

#### **Outcome 2**

The cutting list must be completed with materials calculated correctly from the summary of standards allowing for wastage. The cutting list must be compiled accurately and legibly using terminology that is technically correct throughout. The cutting list should be consistent in its description of measurement Units. This Outcome can be used to give the candidates the opportunity to develop IT skills through the use of spreadsheets.

#### **Outcome 3**

The candidate should be introduced to the importance of accurate detailing and be encouraged to fully appreciate the need for drawings to be complete in terms of providing all the information necessary to carry out the construction of pitched roofs. The need to produce drawings accurately to scale which clearly illustrate constructional details should be fully emphasised as should the requirement for annotation.



## National Unit specification: support notes (cont)

### Unit title: Carpentry and Joinery: Roof Construction (SCQF level 6)

#### Outcome 4

The candidate should be provided with a workshop drawing and a summary of standards for a traditional pitch roof with flat roof dormer outlining the demands of the practical exercise and Performance Criteria. Guidance on setting out pitched roofs should be given in terms of the positioning and alignment of all constructional components. It is anticipated that the practical exercise will be based on a roof being constructed by a group of approximately six candidates when each candidate will be required to demonstrate competence in every aspect of the project. The determination of the lengths, areas and quantities of components by calculation and geometry should be fully understood before the candidate is assessed. It is imperative that the candidate is fully informed of the demands of the summary of standards for this Outcome.

#### Outcome 5

The candidate should be provided with a workshop drawing and a summary of standards for a trussed roof outlining the demands of the practical exercise and Performance Criteria.

Guidance on setting out trussed roofs should be given in terms of the positioning and alignment of all constructional components. It is anticipated that the practical exercise will be based on a roof being constructed by a group of candidates with each candidate demonstrating competence in every aspect of the project. It is imperative that the candidate is fully informed of the demands of the summary of standards for this Outcome.

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 Productive Working Practices*
- ◆ *Conform to General Workplace Health, Safety and Welfare*
- ◆ *Move, Handle and Store 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 classroom teaching with visual aids, electronic presentations, DVDs, e-learning, reference books, classroom exercises and group discussions. The function of each component should be thoroughly demonstrated. Construction methods should be demonstrated and attempted by candidates showing good technique in measuring, drawing, marking out, nailing, plumbing, levelling, and fixing of components into position. This teaching approach should ensure the candidate is acquiring the underpinning knowledge required for the Unit.

## National Unit specification: support notes (cont)

**Unit title:** Carpentry and Joinery: Roof Construction (SCQF level 6)

### Guidance on approaches to assessment for this Unit

The Carpentry and Joinery Training and Assessment Programme (TAP) provide 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 practise as possible, prior to being set assessment tasks.

The candidates' knowledge and understanding of terminology, components and legislation in relation to pitched roofs could be assessed through a multiple choice question paper.

Candidates will be required to produce a cutting list to meet the requirements of Outcome 2. Candidates will be required to produce a folio of drawings to meet the requirements of Outcome 3.

A series of practical activities will allow evidence to be gathered for Outcomes 4 and 5 through observation that the candidates have met the given standards and tolerances. An assessor observation checklist/record can be used to record this evidence.

### 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 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 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)*.

### Opportunities for developing Core Skills

There are opportunities to develop the Core Skill of *Problem Solving*. 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 4, particularly in Outcomes 4, and 5, as these practical assessments should be carried out in pairs or groups. Candidates can agree responsibilities and provide support and information to each other during the practical group activities.

## National Unit specification: support notes (cont)

### Unit title: Carpentry and Joinery: Roof Construction (SCQF level 6)

There are opportunities to develop the Core Skill of *Information and Communication Technology (ICT)* at SCQF level 3 by researching, use of spreadsheets for the cutting list in Outcome 2, e-learning and e-assessment.

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 and measuring scales.

There will be opportunities for candidates to develop the Core Skills of *Communications* at SCQF level 4 through the knowledge part of the assessment. As candidates complete practical task the candidates, with peer and lecturer assistance, 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.

This Unit has the Critical Thinking component of Problem Solving and the Using Graphical Information component of Numeracy embedded in it. This means that when candidates achieve the Unit, their Core Skills profile will also be updated to show they have achieved Critical Thinking and Using Graphical Information at SCQF level 4.

### 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](http://www.sqa.org.uk/assessmentarrangements)

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**History of changes to Unit**

Version	Description of change	Date

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