



## National Unit Specification: general information

**UNIT** Building Services in Domestic Low Rise Buildings (SCQF level 5)

**CODE** F3JG 11

### SUMMARY

This Unit is suitable for candidates who are interested in a career within the Building industry; the purpose of this Unit is to introduce candidates to the building services provided in Domestic low-rise buildings up to two storeys in height. The services considered will be the provision of drainage, hot and cold water, electricity and space heating. Candidates will be required to complete graphical layouts and specification notes for building services provision in domestic low-rise buildings. Candidates will be introduced to building services drawings and the means to interpret them.

### OUTCOMES

- 1 Demonstrate knowledge and understanding of drainage systems in a domestic low rise building.
- 2 Demonstrate knowledge and understanding of hot and cold water supply systems in a domestic low rise building.
- 3 Demonstrate knowledge and understanding of the supply and distribution of electricity in a domestic low rise building.
- 4 Demonstrate knowledge and understanding of heating systems in a domestic low rise building.

### RECOMMENDED ENTRY

Entry is at the discretion of the centre.

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#### Administrative Information

**Superclass:** TH

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## **National Unit Specification: general information (cont)**

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### **CREDIT VALUE**

1 credit at Intermediate 2 (6 SCQF credit points at SCQF level 5\*).

*\*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 Core Skills are highlighted in *Guidance on Learning and Teaching Approaches*.

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

### **UNIT        Building Services in Domestic Low Rise Buildings (SCQF level 5)**

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 drainage systems in a domestic low rise building.

##### **Performance Criteria**

- (a) Explain the layout of above and below ground drainage systems in a domestic low rise building.
- (b) Identify the location of components within the drainage systems correctly.
- (c) Explain the importance of design and material selection of drainage systems.

#### **OUTCOME 2**

Demonstrate knowledge and understanding of hot and cold water supply systems in a domestic low rise building.

##### **Performance Criteria**

- (a) Explain the factors influencing the design, installation, testing and maintenance of hot and cold water supply systems.
- (b) Identify and explain appropriate selection of water supply systems for a domestic low rise building.
- (c) Explain requirements to ensure water supply to a domestic low rise building is safe and hygienic.

#### **OUTCOME 3**

Demonstrate knowledge and understanding the supply and distribution of electricity in a domestic low rise building.

##### **Performance Criteria**

- (a) Explain the supply of electricity from local substations to the consumer.
- (b) Explain the arrangement of circuits for the distribution of electricity in a domestic low rise building.

#### **OUTCOME 4**

Demonstrate knowledge and understanding heating systems in a domestic low rise building.

##### **Performance Criteria**

- (a) Explain gas fired wet central heating system correctly.
- (b) Explain electric storage heating systems correctly.
- (c) Identify an appropriate heating system for a domestic low rise building and justify this selection.

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

### **UNIT        Building Services in Domestic Low Rise Buildings (SCQF level 5)**

#### **EVIDENCE REQUIREMENTS FOR THIS UNIT**

Written and/or recorded oral evidence is required to demonstrate that the candidate has achieved this Unit to the standard specified in the Outcomes and Performance Criteria. The evidence for this Unit should be obtained under controlled, supervised conditions. The assessment will be open-book, candidate can refer to candidate notes and the assessment of all Outcomes should last no more than two hours

In this Unit an appropriate instrument of assessment would be a question paper based on case study material, consisting of a balance of short answer, restricted response and structured questions which could include annotate drawings.

Evidence will be gathered at appropriate points throughout the delivery of the Unit. Assessments must be manageable and practicable for centres and candidates.

Centre should provide candidates with a case study of a typical domestic low rise building on which to answer questions to demonstrate their knowledge of the standards specified in the Outcomes and Performance Criteria.

Evidence is required to demonstrate that the candidate understands appropriate drainage systems for above and below ground drainage, hot and cold water systems, supply and distribution of electricity and appropriate heating systems in a domestic low rise building. This can be achieved through a series of questions and the completion of annotated graphical layouts which illustrate the technology and component location within the systems.

The Assessment Support Pack for this Unit provides appropriate sample assessment materials. Where centres wish to develop their own assessment materials they should refer to the Assessment Support Pack to ensure a comparable standard.

## **National Unit Specification: support notes**

### **UNIT      Building Services in Domestic Low Rise Buildings (SCQF level 5)**

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 National Certificate in Built Environment at SCQF level 6 and an optional Unit in the National Certificate in Civil Engineering at SCQF level 6 and can also be delivered as a freestanding Unit.

The purpose of this Unit is to develop an understanding of the function, layout, components and materials used in building services systems for domestic low-level buildings. It is aimed at candidates with no previous knowledge of building services engineering.

There are various ways in which the requirements placed on building services systems within domestic low-level buildings may be met. Variations of each system may be suited to an application depending on the particular circumstances involved. The candidate should be able to justify the selection of a particular system for a given building and, after this selection, be able to sketch illustrated layouts and produce annotated notes for the system.

Outcome 1 provides candidates with an introduction to the general principles of above and below ground drainage; the layout has to be such that drains are not subject to undue stress from foundations or traffic and are fully accessible for occasional clearance. They should also be tested and comply with current legislation. Drainage has to be reliable and to require little if any maintenance. The candidate should have the ability to list and explain the ways in which the water seal can be lost from traps and know the diameters, slopes and maximum permitted lengths of waste and drain pipes.

Outcome 2 provides the candidates with an understanding of safe and hygienic water supplies. The candidates should be introduced to BS6700:2006 Design, installation, testing and maintenance of services supplying water. The factors, which influence the choice of system, the fact that a considerable amount of engineering is involved should be emphasised

Outcome 3 introduces the candidates to the methods of handling and distributing electricity from sub-station to final circuit. The advantages of the national grid and distribution at high voltage should be covered, as well as how a single-phase 240V supply is obtained from power generator station. Methods of intake into buildings, control arrangements at consumers' intake, the layout and distribution of lighting and power circuits, as well as protective devices should be covered. It should be stressed to the candidates that the safe and economical use of electricity is of paramount importance to the building user and that electricity in its distributed form is potentially lethal.

## National Unit Specification: support notes (cont)

### UNIT Building Services in Domestic Low Rise Buildings (SCQF level 5)

Outcome 4 introduces the candidate to various types of domestic space heating systems. The candidate will be enabled to select the system best suited to the application. The content of this section should be restricted to gas-fired wet central heating and electric storage heating. The candidates should be introduced to a typical wet central heating system and the variations of boiler, forms of distribution and emitters available. Electric storage heating control arrangements necessary to take advantage of different economy tariff periods should be covered, as well as wiring details and different forms of heater available.

#### GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

This Unit offers considerable scope for the use of case studies, project work and practical investigations, as well as visits to services installations and the use of visiting speakers. Use should be made of Building Research Establishment digests, information papers, and good practice guides; defect action sheets and BRECSU good practice case studies.

For most candidates, this Unit will serve as an introduction to building services. It is therefore intended to give candidates a general appreciation of the principles and layouts of services installations. Illustration by means of photographs, slides and videos should be considered and examination of existing installations should be arranged where possible.

#### OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates will be:

- ◆ select and justify appropriate systems, applying theory to a range of construction needs

These offer opportunities to develop aspects of the Core Skill of:

- ◆ *Problem Solving*

#### GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

##### 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)*.

Centres should provide candidates with a case study of a domestic low rise building. Assessment of this Unit should be in the form of a question paper relating to a case study.

Assessment should be carried out at appropriate points throughout the Unit. Assessment of all Outcomes should not exceed two hours and should be supervised and open-book. Candidates should be permitted to take notes into the assessment.

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

### **UNIT        Building Services in Domestic Low Rise Buildings (SCQF level 5)**

An appropriate instrument of assessment would be a question paper consisting of short answer questions. It would be wholly appropriate to include sketches within the assessment although this would not be mandatory.

#### **CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS**

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* ([www.sqa.org.uk](http://www.sqa.org.uk)).