

National Unit Specification: general information

UNIT Hot and Cold Water Systems: An Introduction (Intermediate 2)

CODE F1L7 11

SUMMARY

This Unit is suitable for candidates who have had some experience in plumbing services. The purpose of this Unit is to introduce candidates who are interested in pursuing a career in the plumbing industry to the basic layouts of components and materials used in hot and cold water supply systems in domestic buildings. Candidates who complete this Unit can feel confident progressing further in the Construction Craft Industry.

OUTCOMES

- 1 Outline the pipe work layouts of both hot and cold water systems.
- 2 Identify materials, fittings and components used within both hot and cold water systems.
- 3 Describe the basic function of the main components of both hot and cold water systems.

RECOMMENDED ENTRY

Whilst entry is at the discretion of the centre, it would be beneficial for the candidate to have attained the following of equivalent:

- ◆ Plumbing Services: An Introduction (Intermediate 1)

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.*

Administrative Information

Superclass: TH

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National Unit Specification: general information (cont)

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CORE SKILLS

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

National Unit Specification: statement of standards

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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 the Scottish Qualifications Authority.

OUTCOME 1

Outline the pipe work layouts of both hot and cold water systems.

Performance Criteria

- (a) Draw and annotate layouts clearly and correctly in terms of connection to components and appliances.
- (b) Locate components and controls in terms of system performance.
- (c) Identify components and controls of pipe work legibly using correct terminology.
- (d) Ensure layouts comply with current plumbing standards.

OUTCOME 2

Identify materials, fittings and components used within both hot and cold water systems.

Performance Criteria

- (a) Identify plumbing materials and fittings used in domestic hot and cold water systems.
- (b) Identify the main components used within domestic hot and cold water systems.

OUTCOME 3

Describe the basic function of the main components of hot and cold water systems.

Performance Criteria

- (a) Demonstrate a basic understanding of the methods of providing hot water.
- (b) Demonstrate a basic understanding of the control of water flow.
- (c) Demonstrate a basic understanding of the control of water temperature.
- (d) Demonstrate a basic understanding of the prevention of heat loss.
- (e) Demonstrate a basic understanding of the provision for expansion of hot water.
- (f) Demonstrate a basic understanding of the correct method of storage.
- (g) Demonstrate a basic understanding of the methods of delivery of cold water supply.

National Unit Specification: statement of standards (cont'd)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that candidates have achieved all Outcomes and Performance Criteria.

Written and/or oral evidence is required which demonstrates that the candidate has achieved all Outcomes to the standards specified in the Outcome and Performance Criteria. The evidence for these Outcomes should be obtained through a structures assessment under controlled, supervised conditions. The assessment will be closed-book.

Outcome 1 will consist of an individual closed-book assessment where the candidate will be presented with two duplicate drawings. Each will comprise of an A4 size elevation section of a domestic building with the position of the sink, bath, W.C., WHB and point of entry of the cold water supply pipe. The candidate will be required to complete and annotate the drawings to show the pipework layouts for a direct or indirect system of cold water supply and a direct vented system of hot water supply.

Outcome 2 will consist of a variety of samples of plumbing materials fittings and components with the candidate correctly identifying 80% of the selected items.

Outcome 3 will consist of an individual closed-book structured assessment to show that the candidate has a knowledge and understanding of the functions of components within a hot and cold water supply system. The candidate will meet the Performance Criteria by successfully answering 8 from 10 questions correctly.

Assessment of this Unit should be completed over a period of time and evidence should be gathered at appropriate intervals.

The Assessment Support Pack for this Unit provides sample assessment material. Centres wishing to develop their own assessments should refer to the Assessment Support Pack to ensure a comparable standard.

National Unit Specification: support notes

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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 National Progression Award in Construction and can also be delivered as a freestanding Unit.

The systems should be uncomplicated layouts of Direct and Indirect Systems of Cold Water Supply and Direct Vented Systems of Hot Water Supply. The primary heating equipment may be a boiler or electrical immersion heater(s).

The systems should comply with current regulations and standards and good plumbing practice in relation to:

- ◆ pipework layouts and respective connection points between cisterns, HW storage vessels, boilers and terminal fittings
- ◆ location and relationship of components and controls
- ◆ function, installation requirements and location of controls including stop valves, float valves, servicing valves drain valves and terminal fittings
- ◆ materials used for pipes, controls and components
- ◆ flow of water in systems

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 teaching approach for this Unit will essentially be classroom based, although it would be desirable to offer candidates practical demonstrations and simulated working systems. The candidate should be encouraged to become familiar with, and use, correct terminology and good presentation throughout the content of the Unit. All centres are respectfully requested to provide clear and simplified diagrams and notes and avoid complexities. This approach will provide the candidate with the knowledge and confidence required to continue with their pre-vocational training and development.

National Unit Specification: support notes (cont)

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OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

The elements of the Core Skill of Problem Solving, such as planning and organising and critical thinking will be developed and enhanced as candidates undertake this knowledge-based Unit, as will co-operative working skills. Though candidates are not assessed practically in Health and Safety issues arising in the workplace in this Unit, they will gain knowledge of the need for safe working practices in discussion with tutors and each other.

Although Communication skills are not formally assessed, candidates will have the opportunity to develop written and oral communication skills as they acquire the knowledge necessary for the teaching and learning assessments for all Outcomes in this Unit. Candidates should be encouraged to communicate with others using the correct terminology, tone and style suited to the workplace.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Centres may use the Instruments of Assessment which they consider to be most appropriate but are encouraged to use the Assessment Support Pack (ASP) developed centrally by SQA.

It is expected that candidates will be given as much practise as possible in block walling techniques, prior to being set the assessment tasks.

The candidate's knowledge and understanding of hot and cold water systems will be assessed through a set of structures questions and a matching exercise covering all Outcomes and Performance Criteria. This assessment should be conducted under controlled, supervised condition. Assessment should show that the candidate has achieved all Performance Criteria and reassessment of any area of this Outcome can be conducted through an oral question/answer session.

Outcome 1

Candidates are expected to produce clean, precise, annotated drawings which clearly demonstrates their understanding of the systems layouts. Candidates should be allowed to amend one or two minor errors without the necessity for re-assessment.

Outcome 2

Candidates will be presented with a matching exercise consisting of 5 different samples of materials and 5 different samples of components used in hot and cold water systems from which they will correctly identify 4 components and 4 materials. Candidates should be encouraged to be precise in terms of the identification. For example in the identification of copper tube it would not be acceptable to describe it as a metal tube. Neither would it be acceptable to describe a gate valve as simply a valve.

National Unit Specification: support notes (cont)

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Outcome 3

Candidates will be presented with a paper containing 10 structured questions on the functions of the main components of hot and cold water systems from which they will be required to answer 8 from 10 correctly. Candidates achieving seven correct responses should be allowed a second attempt at the questions which had incorrect responses.

It is expected that candidates will be given as much teaching and guidance as possible before assessment and then, if required, additional reinforcement of the subject prior to reassessment

Candidates will also be assessed on their compliance of health and safety legislations in the Construction Industry including the correct use of PPE, safe working practices, manual handling methods and the correct and safe use of tools.

The ASP includes a bank of questions which may be used to form the assessment of Outcome 1 and assessor observation checklist/records for the Unit

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).