

**SQA/SNIJIB**



# **Training and Assessment Programme for SVQ 3 level 3 Domestic Plumbing and Heating**

**H94X 04: Apply Health and Safety and  
Environmental Legislation in the Building Services  
Engineering Sector**

**Section; Environmental Legislation**

**Stage 1 — Syllabus Codes H.S.E.L. 1.1–1.3**

**Stage 2 — Syllabus Codes H.S.E.L. 2.1**

## Learning and delivery guidance

This Unit covers all aspects of applying good practices and procedures which protect the environment and promote efficient use of resources: from initial theory to practical installations. Delivering this Unit to a group of learners will involve many teaching and learning techniques and approaches.

It is recommended that teaching and learning take place in an environment where learners experience simulated, full-scale working in domestic plumbing systems. The use of modern teaching and learning aids, eg 'smart' boards, and proprietary interactive teaching materials would also greatly enhance the learning experience.

The syllabus document is set out in a manner to allow the lecturer to determine the areas of work to be covered within a certain time frame. It is envisaged that this Unit will be offered over the first two years of 'off the job' training. It is presented in three syllabus sections with each section concluding with a summative assessment.

The programme structure outlines the progress of the Unit and its integration with the other Units of the qualification.

## Assessment

A holistic approach has been adopted for the formative and summative aspects of the practical installation part of this Unit. This is in conjunction with:

- H98F 04 Install and Test Domestic Plumbing and Heating Systems
- H98G 04 Service and Maintain Domestic Plumbing and Heating Systems
- H98H 04 Inspect and Pre-commission Domestic Plumbing and Heating Systems
- H98K 04 Decommission Domestic Plumbing and Heating Systems

The TAP contains practical tests for both formative assessment (Pipework exercises for Year 1) and summative assessment (H98L 04 Install Sheet Weather Protection) Year 1 and 2 and installation practice Year 2).

Assessments other than practical assessments will be undertaken using the SOLAR e-assessment method. This process is completed entirely online and randomly selects the assessment questions from a bank of questions which cover the Unit content. In this Unit there are three assessments over the two years of the Unit's duration. (Refer to programme structure in Guidance for Assessors.

## Assignment

This Unit has two assignments which are intended to bring together aspects of environmental practices used to preserve and enhance the environment. The first assignment should commence midway through the first year with a completion date being stipulated nearer to the completion date of the first year. The second assignment should commence midway through the second year with the completion date being stipulated nearer to the completion date of the Unit.

Learners should be introduced to the assignment as part of the induction to the Unit — to give direction and motivate learning.

# Syllabus

## HSEL 1.1 Encourage environmental awareness

Assessment method: SOLAR e-assessment/Assignment

- ◆ The need for energy conservation, new and existing dwellings
- ◆ Legislation, the building regulations, approved documents
- ◆ SEDBUK, SAP, Wrap, CHeSS, DEFRA
- ◆ Improving energy efficiency, reduction of CO<sub>2</sub> emissions, CO, and NO<sub>x</sub> from boilers
- ◆ Carbon footprint
- ◆ Environmentally friendly use of materials
- ◆ Recycling, and re-use of materials
- ◆ Energy Efficiency in Pre 1919 traditional/historic buildings
- ◆ Thermal Performance of traditionally built structures

## HSEL 1.2 Encourage environmental awareness

Assessment method: SOLAR e-assessment/Assignment

- ◆ Working methods and systems to be considered from the point of view of environmental impact
- ◆ Consideration should be given to production methods of manufactured materials
- ◆ Consideration, for selection, of appropriate and efficient heat-producing systems for new and existing buildings to meet legislative requirements
- ◆ Consideration, for selection, of heat-producing appliances in relation to emissions to the atmosphere
- ◆ Rainwater harvesting awareness

## HSEL 1.3 Encourage environmental awareness

Assessment method: SOLAR e-assessment/Assignment

- ◆ Reducing waste, safe disposal of waste (hazardous and non-hazardous)
- ◆ Customer advice
- ◆ Preservation of the environment including correct disposal of chemicals used in the work process
- ◆ Consideration should be given to production methods used to manufacture material and methods of their eventual disposal
- ◆ A list of statutory documents, websites, etc should be made available for learners' self-directed study

## HSEL 2.1 Encourage environmental awareness

Assessment method: Assignment

- ◆ Consideration of the use of emerging technologies in the plumbing industry
- ◆ Biomass
- ◆ Solar power
- ◆ Ground- and air-source heat pumps
- ◆ Water conservation
- ◆ Insulation methods of modern buildings
- ◆ Selection of heating systems/emitters
- ◆ Modern building technology (construction practices)
- ◆ Insulation methods for traditional buildings

# Assignments

## Information for assessors

### HSEL 1.1, 1.2 and 1.3 Encourage environmental awareness

The learner will complete an assignment to show how working methods and selection of more environmentally friendly materials can help to protect the environment for this and future generations. For example, using less fuel, or biologically degradable materials, or installing systems which are more energy efficient such as insulation heating controls, condensing boilers, etc. Note these are only suggestions. The learner can develop an assignment on any material, system or method of work, etc which will minimise impact on the environment.

The assignment will be in three parts:

- 1 The learner will produce a 500–1,000 word written report which can be supported by the use of labelled diagrams on the subject matter using a computer program (desk-top publishing or word processing).
- 2 The learner will give an oral presentation to the class on the subject matter.
- 3 In the completed report the learner will make clear references to where their research is derived from.

Satisfactory achievement of the assessment will be based on the learner completing the assignment in accordance with the following Performance Criteria:

- (a) The selected subject is relevant to the plumbing industry.
- (b) The assignment demonstrates a clear understanding on the learner's part of its effect on the environment.
- (c) The written report is clearly written in the chosen computer package.
- (d) The oral presentation gives a clear understanding of the subject matter.

## Information for learners

### HSEL 1.1, 1.2 and 1.3 Encourage environmental awareness — Assignment

A client is concerned that their fuel bills are high. They have asked your company to prepare a report on how to upgrade their building to be more energy efficient. The building was constructed in 1950 and is used as an administration centre. It is situated in an industrial estate and is not a listed building.

The building is a one-storey construction comprising:

- ◆ Composite stone wall 350 mm thick. Floor to ceiling height 3 m.
- ◆ Single-glazed timber windows in good condition.
- ◆ Timber and glass double-swing doors leading to entrance hall.
- ◆ A pitched slated roof (which is showing signs of 'nail sickness'). One pitch is south facing.
- ◆ Uninsulated roof void (which contains a large volume of pigeon waste and feathers).
- ◆ Painted concrete floor in good condition.
- ◆ The electrical system was installed in 1960 using PVC cables with one power point per room.
- ◆ Fluorescent tubes provide all lighting.
- ◆ Gravity fed hot water system comprising 28 mm copper distribution pipes with a 22 mm secondary return. The insulation on the hot water cylinder appears to be cement based (possibly asbestos coated) and is in a poor condition.
- ◆ Cold water indirect system with 28 mm copper pipes and a galvanised steel storage system (showing signs of 'pinholing').
- ◆ Solid fuel central heating system (installed in 1950), with gravity fed 28 mm low-carbon steel flow and return pipes running along the inside of the outside wall. There are column radiators in each room that are controlled by wheel-head valves.

### Brief

- 1 Prepare a word-processed report of 500–1,000 words including the following items:
  - (a) The most cost effective measures you would recommend to make the property more energy efficient.
  - (b) The benefits of upgrading the building.
- 2 Present a five minute oral presentation to your class on the above topic. This can be presented to the class by OHP, PowerPoint presentation or handout for added support.
- 3 You must make clear references in the completed report to where your research is derived from.

## Marking schedule and learner feedback sheet

### HSEL 1.1, 1.2 and 1.3 Encourage environmental awareness — Assignment

<b>Name:</b>	<b>Class:</b>	<b>Date:</b>
<b>Result:</b>	<b>Assessor:</b>	<b>Date:</b>

<b>Marking schedule</b>	<b>Yes</b>	<b>No</b>
(a) The selected subject is relevant to the plumbing industry.		
(b) The assignment demonstrates a clear understanding on the learner's part of its effect on the environment.		
(c) The written report is clearly written in the chosen computer package.		
(d) The oral presentation gives a clear understanding of the subject matter.		
<b>Learner feedback</b>		
<b>Learner's response</b>		
<b>Learner's signature</b>		

**Note to assessor: Learner feedback should relate to the marking schedule**

## Checklist

### HSEL 1.1, 1.2 and 1.3 Encourage environmental awareness — Assignment

Class: Assessor:		Learner's name										
No.	Marking schedule											
(a)	The selected subject is relevant to the plumbing industry.											
(b)	The assignment demonstrates a clear understanding on the learner's part of its effect on the environment.											
(c)	The written report is clearly written in the chosen computer package.											
(d)	The oral presentation gives a clear understanding of the subject matter.											

## Information for assessors

### 2.1 Encourage environmental awareness — Assignment

#### Aims of the project

The aim of the assignment is to introduce learners to new and emerging technologies in the plumbing industry. It further develops skills already gained.

#### Assignment overview

The assignment focuses on a new two storey domestic dwelling where the learner will provide evidence to demonstrate their knowledge and/or skills by showing that they can formulate a report with technical information on their choice of component system/s for an eco-friendly domestic building. Consideration for the assignment should include a linked up fuel system, a selection of heat emitters for multi-zoning and multi-programming purposes.

There is no practical activity or SOLAR assessment for this assignment, the learner will have to successfully complete an open-book assignment in which they will be given the task of researching using all the resources that are available to them, eg textbooks, internet, manufacturers' literature, library, case studies, etc.

The learner will formulate a short computer generated report (500–1,000 words as guidance and can be supported with labelled diagrams to enhance the assignment) supported by technical information, justifying the reasons for their choice of component/installations. Sketches can be used to justify installation practices.

The tutor/assessor should discuss installation topics with the learner and agree the basis for the report. This could include experiences that the learner has gained in the workplace.

The learner will be asked to specify major components/controls for the system and to report on their choices.

Tutor sessions should be a means of support for the learner with short formative assignments at the beginning of the Unit and negotiated deadlines for the completed assignment.

Suggested formative individual assignment work could include:

- ◆ Solar power
- ◆ Water conservation
- ◆ Air- and ground-source heat pumps
- ◆ Biomass
- ◆ Types of heating system and heat emitters
- ◆ An appreciation of Multi-fuel/dual fuel Link Up installations

This list is not exhaustive and centres can decide on their preferred guidance for their learners to allow flexibility in delivery.

Assessors may use the points set out in the assignment brief as a guide when marking the report, or devise their own to suit their chosen approach.

Satisfactory achievement of the assessment will be based on the learner completing the assignment in accordance with the following Performance Criteria:

- (a) The selected subjects are relevant to the plumbing industry.
- (b) The assignment demonstrates a clear understanding of new technologies in the plumbing industry.
- (c) The written report is clearly written in the chosen computer package.

## Information for learners

### 2.1 Encourage environmental awareness — Assignment

The assignment focuses on a new two storey domestic dwelling where you will provide evidence to demonstrate your knowledge and/or skills by showing that you can formulate a report with technical information on your choice of component system/s for an eco-friendly domestic building.

There is no practical activity or SOLAR assessment for this assignment, you will have to successfully complete an open-book assignment in which you will be given the task of researching using all the resources that are available to you, eg textbooks, internet, manufacturers' literature, library, case studies, etc.

As a guideline, you will formulate a short computer-generated report between (500–1,000 words as guidance and can be supported with labelled diagrams to enhance the assignment). The report will focus on new technology in the plumbing industry. Your report will be supported by technical information, justifying the reasons for your choice of component/installations and materials that you have agreed with your tutor.

#### Assignment brief

There can be no specific answer for this assignment because of the vast range of possible answers.

You should consider the following points when working on your assignment:

- ◆ Can you justify your choice of topic?
- ◆ Have you allowed enough time to complete the report?
- ◆ Have you researched your component/installation thoroughly?
- ◆ Have you made yourself familiar with your chosen new technologies?
- ◆ Are you able to understand the technical specifications on your selected component / installation thoroughly?
- ◆ Are all the decisions that you have made on the types of component / installation considered to be new technology (eco-friendly)?
- ◆ Are you able to use the design information from the technical documents that are available?
- ◆ Can you use the skills that you have been using in the industry as a part of your own on-site training to help in the development of this assignment?
- ◆ Have you given clear justification of your choice of component/installation practices?
- ◆ Have you included all the technical data asked for in the assignment?
- ◆ Is your report legible, succinct and set out in a coherent manner?
- ◆ Is your name, class code and submission date completed at the top of your report?
- ◆ Have you included a bibliography of resources?



## Checklist

### HSEL 2.1 Encourage environmental awareness — Assignment

Class: Assessor:		Learner's name										
No.	Marking schedule											
(a)	The selected subject is relevant to the plumbing industry.											
(b)	The assignment demonstrates a clear understanding on the learner's part of its effect on the environment.											
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