Qualification Guide

Level 3 Award in Safe Systems of Hot and Cold Water and Sanitation (Watersafe experienced worker qualification)

Level 3 Award in Safe Systems of Hot and Cold Water and Sanitation (Watersafe experienced worker qualification)

Introduction

The purpose of this qualification is to provide a vehicle by which experienced workers within the plumbing sector can demonstrate the practical skills and theoretical knowledge required to for registration with the WaterSafe scheme. The qualification is designed solely for experienced workers and is not suitable for new entrants to the Plumbing Industry.

Although the qualification will be open to anybody (in accordance with the requirements for all qualifications), prospective learners will be required to successfully complete an initial assessment as stipulated by the scheme operator, WaterSafe, which will be facilitated by the centre.

Completion of the qualification will **NOT** result in the completion of a Plumbing NVQ, which remains the benchmark for formal recognition within the Industry. Those looking to achieve a full Plumbing qualification which will lead to formal industry recognition should look to complete either of the following qualifications:

- BPEC Level 2 NVQ Diploma in Plumbing and Heating
- BPEC Level 3 NVQ Diploma in Plumbing and Heating

The Level 3 Award in Safe Systems of Hot and Cold Water and Sanitation (Watersafe experienced worker qualification) relates directly to the WaterSafe Scheme and should only be undertaken by learners who are looking to achieve the minimum technical requirements for recognition and registration.

This guide details the requirements for both centres delivering the Award and learners undertaking the qualification - and aims to provide:

- An overview of the structure of the qualification
- An overview of the assessment strategy for the qualification
- Guidance notes for assessors and other centre staff for the qualification

The Level 3 Award in Safe Systems of Hot and Cold Water and Sanitation (Watersafe experienced worker qualification) requires the completion of centre based knowledge and practical assessments and is designed for individuals with experience of carrying out the installation, connection and commissioning of sanitation and water supply systems.

Contents

Rules of Combination

Hot and Cold Water and Sanitation (Watersafe experienced worker qualification)

This is a Level 3 qualification of 9 credits and 69 guided learning hours consisting of 6 mandatory units. **ALL** units must be achieved to achieve the overall qualification.

Successful completion of this qualification proves that learners have the technical knowledge and practical skills to safely install and commission cold water, hot water and sanitation systems and associated components. The qualification and unit details are shown below:

Qualification Title	Level 3 Award in Safe Systems of Hot and Cold Water and Sanitation (Watersafe experienced worker qualification)				
BPEC Qualification Number	600/9431/X				
Last Registration Date	30/06/19				
Last Certification Date	30/06/21				
Unit Ref	**Unit Title**	**Level**	**Credit Value**	**TQT**	**Guided Learning Hours**
A/504/6557	Apply Safe Health and Safety and Working Practices	3	2		14
D/504/1545	The installation, commissioning and safety aspects of hot water systems for domestic use in accordance with UK building regulations	3	1		10
F/504/6561	Safe Installation and Commissioning of Cold Water Systems	3	2		16
J/504/6559	Customer Care and Site Preparation	3	1		7
J/504/6562	Safe Installation and Commissioning of Sanitation Systems	3	2		14
T/504/1602	Water Supply 'Water Fittings' Regulations and Water Byelaws in the UK	3	1		8
	Totals		9	90	69

Note

Notional Learning Time (NLT) is the average time for a learner to achieve the learning outcomes and assessment criteria. An initial assessment of a learner's ability to achieve the qualification should be carried out to estimate the learning time. It can be assumed that a learner with no previous experience in the work activity will require between 20 – 25% additional learning time to complete the qualification, whereas an experienced learner may require some 20 – 25% less learning time.

Guided Learning Hours (GLH) is the estimated number of hours of teacher supervised or directed study time required for learners to achieve the qualification and each unit.

Unit Details

The next pages detail the requirements of the 6 individual Units that make up this Award:

A/504/6557 - Apply Safe Health and Safety and Working Practices

The purpose and aim of this unit is to enable learners to develop the underpinning knowledge and skills required in relation to applying health and safety and safe working practices in the workplace, in order to:

- Allow progression to assessment of occupational competence
- Enable existing workers in the occupation to update their professional competence
- Form part of a qualification for existing operatives to a gain a recognised qualification.

Upon completion of the unit the learner will:

- Know Health and Safety Legislation
- Understand how to identify and apply safe working practices
- Understand how to apply organisational procedures for emergencies and accidents
- Understand health, safety and welfare in the relevant work environment in relation to statutory requirements
- Know electrical safety requirements in relation to the working environment
- Know the meaning of hazards, risks and control measures

Learning Outcome 1
1. Know Health and Safety Legislation
Assessment Criteria
1.1 State the aims of health and safety legislation 1.2 Identify who is responsible for enforcing health and safety legislation 1.3 Identify individuals responsibilities in relation to health and safety legislation 1.4 Identify sources of health and safety information 1.5 State control measures for work on site

Learning Outcome 2
2. Understand how to identify and apply safe working practices
Assessment Criteria
2.1 State safe working practices when carrying out work: a. manual handing b. public areas c. environmental issues 2.2 Identify with hazard warning, prohibition notices and safety signs 2.3 State equipment and protective clothing that is available for own work activities a. PPE b. electrical equipment 2.4 Explain the different working activities in relation to: a. risk assessments b. method statements c. safe systems of work d. permit to work 2.5 Identify the dangers when using heat producing equipment 2.6 Identify the measures needed when carrying out hot work 2.7 State the correct equipment and precautions required for working at height 2.8 Explain how to find relevant health and safety and environmental information 2.7 Identify the responsibilities and key roles under current health and safety and environmental legislation

Learning Outcome 3
3. Understand how to apply organisational procedures for emergencies and accidents
Assessment Criteria
3.1 State the recommended procedures in the event of injuries 3.2 Explain the reporting procedure for serious incidents 3.3 Identify emergency procedures

Learning Outcome 4
4. Understand health, safety and welfare in the relevant work environment in relation to statutory requirements
Assessment Criteria
4.1 Identify welfare and hygiene facilities on site in relation to: a. washing facilities b. toilets c. rest areas 4.2 Explain hazardous substances and occupational diseases 4.3 Explain the reasons for regularly checking health, safety and welfare in the relevant work environment in relation to statutory requirements 4.4 Identify what a confined space is

Learning Outcome 5
5. Know electrical safety requirements in relation to the working environment
Assessment Criteria
5.1 Identify the common electrical dangers to be aware off during working activities 5.2 Explain the safe isolation procedure 5.3 State the importance visual checking of equipment prior to use 5.4 Identify the correct tools and equipment needed for working safely on electrical installations

Learning Outcome 5
6. Know the meaning of hazards, risks and control measures
Assessment Criteria
6.1 Explain what constitutes a hazard in a working environment 6.2 Explain the term risk in relation to a working environment 6.3 Identify the procedures for producing a risk assessment 6.4 State the importance of being aware and dealing with changing circumstances in the working environment which could produce potential hazards and risks

D/504/1545 - The installation, commissioning and safety aspects of hot water systems for domestic use in accordance with UK Building Regulations

The purpose and aim of this unit is to enable learners to develop the underpinning knowledge and skills required in relation to the installation and commissioning of hot water systems for domestic use in accordance with UK Building Regulations, in order to:

- Allow progression to assessment of occupational competence
- Demonstrate competence in relation to the Building Regulation requirements
- Enable existing workers in the occupation to update their professional competence
- Form part of a qualification for existing operatives to a gain a recognised qualification.

Upon completion of the unit the learner will:

- Understand the types and configurations of vented/unvented hot water systems including the design installation requirements
- Know the types and operation of specialist components used in hot water systems
- Understand the design requirements for hot water systems
- Know the installation and safety features of hot water systems and components
- Know the requirements for the installation of cold water components associated with hot water systems
- Be able to diagnose faults in hot water systems and components
- State the checks to be carried out during a visual inspection
- Be able to carry out the commissioning of hot water systems
- Be able to confirm that unvented hot water systems have been serviced in accordance with manufacturer's instructions

Learning Outcome 1

1. Understand the types and configurations of vented/unvented hot water systems including the design installation requirements

Assessment Criteria

1.1 Explain types of domestic hot water supply systems:

a. Centralised systems
   - Unvented hot water systems
   - Open vented hot water systems

b. Localised systems
   - Unvented point of use heaters
   - Instantaneous heaters

1.2 Describe types of unvented/vented hot water systems:

a. Indirect storage systems (include water jacketed tube heaters)
b. Direct storage systems
c. Electrically heated
d. Gas or oil fired
e. Small point of use (under sink)
f. Bulk Storage heaters (combination tank)
g. Solar Thermal hot water systems
h. Combination boilers

1.3 Identify hot water system pipework layout features including systems with secondary circulation:

a. Direct and indirect vented and unvented
b. Direct and indirect cylinders
c. Solar Thermal
d. Thermal stores
e. Combination boilers
f. Secondary circulation
   - Location of pump and type
   - Automated timing devices
   - Methods of balancing systems

Learning Outcome 1
1. Understand the types and configurations of vented/unvented hot water systems including the design installation requirements (Cont.)
Assessment Criteria
1.4 State the recommended design temperatures within hot water systems: a. Hot water storage vessels b. Hot water delivery c. Secondary return d. Point of use - Instantaneous heaters - Storage system - Fixed bath - Basin - Blending valve installations
1.5 Identify the layout requirements, location and safety features for unvented/vented hot water systems a. Expansion and temperature relief pipework b. Vent pipes

Learning Outcome 2
2. Know the types and operation of specialist components used in hot water systems
Assessment Criteria
2.1 State methods of preventing stored water from exceeding 100°C 2.2 State the minimum number of independent safety devices required to prevent overheating in unvented hot water systems 2.3 State the expansion rate of water when converted to steam 2.4 Explain the working principle of functional devices in unvented hot water systems a. Line strainer b. Pressure reducing valve c. Check valves d. Expansion device (vessel or integral to cylinder) e. Tundish f. Composite valve

Learning Outcome 3
3. Understand the design requirements for hot water systems
Assessment Criteria
3.1 Identify factors affecting the selection of hot water systems for domestic use 3.2 Explain how to minimise bacterial growth in hot water systems 3.3 State the criteria for selecting hot water system and component types: a. Occupiers needs or usage (Max usage of water per person per day) b. Building layout and features c. Suitability of system d. Water efficiency e. Environmental impact f. Energy efficiency 3.4 State which regulation applies to the installation of unvented hot water systems of more than 45KW and a capacity of 500 litres 3.5 State which documents should be used when designing domestic hot water systems

Learning Outcome 4
4. Know the installation and safety features of hot water systems and components
Assessment Criteria
4.1 State the effects of unbalanced supply pressures in hot water systems 4.2 State the take off point on a cold water supply to maintain a balanced hot and cold water supply 4.3 State the additional safety components where multiple heat sources exist 4.4 Identify the positioning and fixing requirements of components used in unvented hot water systems a. Control thermostat b. Overheat thermostat c. Temperature relief valve d. Line strainer e. Pressure reducing valve f. Check valves g. Expansion device h. Expansion relief valve i. Composite valves j. Tundish arrangements 4.5 State the installation, fixing and sizing requirements for safety relief pipework a. Discharge D1 b. Discharge D2 c. Tundish d. Multiple discharge pipe arrangements from safety devices e. Termination

Learning Outcome 5
5. Know the requirements for the installation of cold water components associated with hot water systems
Assessment Criteria
5.1 Describe the installation and siting requirements of cold water cisterns 5.2 Describe the requirements for positioning a cold water pipe in relation to sources of heat

Learning Outcome 6
6. Be able to diagnose faults in hot water systems and components
Assessment Criteria
6.1 Carry out diagnosis of hot water systems installation and component faults a. Thermostats b. Expansion and pressure vessels c. Temperature relief d. Expansion relief e. Discharge pipework 6.2 Confirm the correct operation of system components and safety valves a. Thermostats b. Expansion and pressure vessels c. Temperature relief d. Expansion relief e. Discharge pipework 6.3 Confirm the actions required to rectify the diagnosed faults

Learning Outcome 7
7. Know the commissioning requirements of hot water systems and components in accordance with design specifications
Assessment Criteria
7.1 State the checks to be carried out during a visual inspection 7.2 Describe the commissioning procedure for an unvented hot water system 7.3 Describe the procedure for carrying out a soundness test on a hot water system a. Metallic systems b. Plastic pipework systems 7.4 Describe the flushing procedure after completion of a soundness test

Learning Outcome 8
8. Be able to carry out the commissioning of hot water systems
Assessment Criteria
8.1 Carry out the commissioning of a hot water system

Learning Outcome 9
9. Be able to confirm that unvented hot water systems have been serviced in accordance with manufacturer's instructions
Assessment Criteria
9.1 Demonstrate service procedures on an unvented hot water storage system

F/504/6561 - Safe Installation and Commissioning of Cold Water Systems

The purpose and aim of this unit is to enable learners to develop the underpinning knowledge and skills required in relation to the installation and commissioning of cold water systems, in order to:

- Allow progression to assessment of occupational competence
- Enable existing workers in the occupation to update their professional competence
- Form part of a qualification for existing operatives to a gain a recognised qualification.

Upon completion of the unit the learner will:

- Know the Regulations/Byelaws and legislation relating to cold water for domestic purposes
- Know the different types of cold water systems and their layout requirements
- Know the notification requirements for work on wholesome and recycled water systems
- Know the requirements for Water Efficiency in domestic dwellings
- Know the backflow prevention requirements for cold water
- Know the fault diagnosis for cold water systems
- Be able to demonstrate the installation and commissioning requirements of a cold water system and its components

Learning Outcome 1
1. Know the Regulations/Byelaws and legislation relating to cold water for domestic purposes
Assessment Criteria
1.1 Identify the Regulations/Byelaws and legislation which control the installation and use of water systems 1.2 State the purpose of the Water regulations 1.3 State how the appropriate legislation impacts on the installation and use of water systems

Learning Outcome 2
2. Know the different types of cold water systems and their layout requirements
Assessment Criteria
2.1 Identify the differences between Direct and Indirect cold water supplies 2.2 Identify alternative water supplies to buildings: a. pumped wells and boreholes b. surface water collection (streams and springs) c. rainwater harvesting d. greywater reuse 2.3 State the system layout requirements for cold water services/systems: a. cold water service into the building b. direct/indirect c. pumped supply from borehole or well d. pumped supply from break cistern 2.4 State the cold water layout requirements for multi- storey dwellings in relation to: a. water supplied via break cisterns b. water supplied direct from mains 2.5 Confirm the recommended layout requirements for storage cisterns used in all types of dwellings a. overflow and warning pipes b. joining of multiple cisterns c. solenoid valves and float switches d. different filling methods 2.6 Identify methods of preventing misconnection of cold water services and the different types of systems used (rainwater/greywater) 2.7 Confirm best practice when temporarily or permanently decommissioning a cold water system a. isolation b. dead legs c. reconnection

Learning Outcome 3
3. Know the notification requirements for work on wholesome and recycled water systems
Assessment Criteria
3.1 Identify the different process for notification 3.2 State the notification periods for work carried out on cold water systems 3.3 State the notification requirements in relation to: a. Water undertaker b. Building control c. Self certification

Learning Outcome 4
4. Know the requirements for Water Efficiency in domestic dwellings
Assessment Criteria
4.1 Confirm the purpose of water efficiency 4.2 Identify the organisations in the UK associated with Water Efficiency 4.3 Identify how to obtain best possible water efficiency whilst maintaining adequate performance 4.4 Identify the aim of the Water Efficiency Product Labelling Scheme- WELPS 4.5 Confirm how to size cold water components in relation to usage and occupancy 4.6 State the working principles of cold water components: a. concussive taps b. pressure reducing valves c. water conservation controls d. flow limiting valves

Learning Outcome 5
5. Know the backflow prevention requirements for cold water
Assessment Criteria
5.1 State the five levels of fluid risks 5.2 Identify the type and where non-mechanical backflow prevention devices may be used 5.3 Identify the type and where mechanical backflow devices may be used 5.4 State methods of preventing cross connection in systems that contain non-wholesome water 5.5 Identify when selecting and applying backflow prevention devices for: a. point of use b. whole site or zone protection

Learning Outcome 6
6. Know the fault diagnosis for cold water systems
Assessment Criteria
6.1 Identify blue water corrosion 6.2 Identify diagnostic checks on cold water system components 6.3 State the prevention of legionella 6.4 Confirm when there is a need for disinfection of a cold water system to be carried out 6.5 Identify cold water components which need to checked to maintain full operation

Learning Outcome 7
7. Be able to demonstrate the installation and commissioning requirements of a cold water system and its components
Assessment Criteria
7.1 Carry out the installation of cold water components and pipework to correct and current standards and regulations 7.2 Carry out the soundness testing of a cold water system 7.3 State the flushing procedure of a cold water system 7.4 Carry out the checking of system pressures and flow rates 7.5 Carry out a disinfection procedure for a cold water system

J/504/6559 - Customer Care and Site Preparation

The purpose and aim of this unit is to enable learners to develop the underpinning knowledge and skills required in relation to ensuring customer care levels are maintained and that site preparation is completed correctly, in order to:

- Allow progression to assessment of occupational competence
- Enable existing workers in the occupation to update their professional competence
- Form part of a qualification for existing operatives to a gain a recognised qualification.

On completion of the unit the learner will:

- Know the relevant people and their responsibilities in the building services industry
- Know the general site preparations needed for domestic plumbing
- Know how to plan work programmes for all plumbing work
- Know how to oversee job responsibilities for building services industry

Learning Outcome 1
1. Know the relevant people and their responsibilities in the building services industry
Assessment Criteria
1.1 Identify the different types of client they may encounter when working: a. Private customer b. Contracting customer c. Customer representatives (managing agents) 1.2 State the different types of communication which may be required during consultations and job progress 1.3 Identify the different parties which may be involved in the consultancy and work programme a. architect b. quantity surveyor c. surveyor d. clerk of works e. contracts manager f. project manager

Learning Outcome 2

2. Know the general site preparations needed for domestic plumbing

Assessment Criteria

2.1 Specify the safety requirements for the work location in order for the work to be carried out:
   a. safe access and egress

2.2 Identify the site preparation required for plumbing work in relation to:
   a. selecting correct materials and equipment

2.3 State what information should be passed on to the customer when carrying out domestic plumbing work

2.4 Identify how to carry out checks prior to work commencing checking for any existing damage

2.5 State how to protect the customers property and building fabric before and during the work process:
   a. use of dustsheets
   b. protection from heat producing equipment
   c. protection for lawns
   d. situations for the removal of breakable items, carpets and furniture

Learning Outcome 3

3. Know how to plan work programmes for all plumbing work

Assessment Criteria

3.1 Identify the type of programme that would be used for:
   a. private installation work
   b. private service or maintenance work
   c. New-build work
   d. service or maintenance contract work

3.2 State the method for organising the correct resources for specific work
   a. materials
   b. plant
   c. equipment

3.3 Identify factors which may affect the working time allocation for work activities
   a. work with other trades
   b. material deliveries
   c. labour resources
   d. Permitted development

3.4 State equipment and material delivery requirements for different work programmes and the impact that non-availability will have on job completion

3.5 Identify the process for planning work activities against job specifications

Learning Outcome 4
4. Know how to oversee job responsibilities for building services industry
Assessment Criteria
4.1 Identify when direct supervision or detailed direction is required 4.2 State when work schedules would need to be adjusted when health and safety delay the work 4.3 Confirm different methods of supervising individuals

J/504/6562 - Safe Installation of Sanitation Systems

The purpose and aim of this unit is to enable learners to develop the underpinning knowledge and skills required in relation to the installation and commissioning of sanitation systems, in order to:

- Allow progression to assessment of occupational competence
- Enable existing workers in the occupation to update their professional competence
- Form part of a qualification for existing operatives to a gain a recognised qualification.

Upon completion of the unit the learner will:

- Know the Legislation and key installation requirements of above ground sanitation systems
- Know the types of above ground sanitary pipework systems and key system design features
- Know the alternatives to water sealed traps
- Know the specialist appliances (macerator wc and sink waste disposal unit)
- Know the commissioning of above ground sanitary pipework systems
- Know the design and installation of a rainwater system
- Know the different below ground drainage systems

Learning Outcome 1
1. Know the Legislation and key installation requirements of above ground sanitation systems
Assessment Criteria
1.1 State the Building Regulation requirements relating to the design and installation of above ground sanitary pipework systems: a. Controlled service or fitting b. Work falling within building regulation requirements
1.2 Identify key installation requirements relating to: a. Accommodating pipework in timber floor joists b. Fire stopping services pipework c. Sound insulation requirements d. Requirements for sanitary appliances in dwellings e. Sanitary facilities for disabled occupancy f. Specification for plastic pipework materials g. Pipe bracketing and spacing requirements h. Accommodating expansion in plastic systems i. Access into systems pipework j. Trap seal loss k. Connections to below ground systems l. Sizing above ground systems

Learning Outcome 2
2. Know the types of above ground sanitary pipework systems and key system design features
Assessment Criteria
2.1 Identify the main type of above ground sanitary pipework system for use in domestic properties 2.2 State the main design features for: a. primary ventilated stack system b. secondary ventilated stack system c. ventilated branch discharge system 2.2 State the range of methods for connecting ground floor sanitary appliances to the drainage system including greywater reuse

Learning Outcome 3
3. Know the alternatives to water sealed traps
Assessment Criteria
3.1 Identify the key operating principles of the self-sealing traps 3.2 State how the valve overcomes issues in systems that would ordinarily cause trap seal loss 3.3 state the main system installation requirements when using the self-sealing valve

Learning Outcome 4
4. Know the specialist appliances (macerator WC and sink waste disposal unit)
Assessment Criteria
4.1 State the main installation requirements of a macerator type WC 4.2 State the main installation requirements of a sink waste disposal unit

Learning Outcome 5
5. Know the commissioning of above ground sanitary pipework systems
Assessment Criteria
5.1 State the requirements for undertaking soundness testing of above ground sanitary pipework systems 5.2 Identify the procedures necessary to complete a performance test on a ground sanitary pipework system

Learning Outcome 6
6. Know the design and installation of a rainwater system
Assessment Criteria
6.1 Confirm the sizing calculation used for a gutter system to a domestic property 6.2 State the main requirements for installing a gutter system to a domestic property 6.3 State the main requirements for installing a rainwater pipework system to a domestic property a. connection to rainwater harvesting unit

Learning Outcome 7
7. Know the different below ground drainage systems
Assessment Criteria
7.1 State the different types of below ground drainage systems 7.2 Identify advantages for the three types of system 7.3 Identify the dangers associated with a separate system in relation to cross-connection

T/504/1602 - Water Supply 'Water Fittings' Regulations and Water Byelaws in the UK

The purpose and aim of this unit is to enable learners to develop the underpinning knowledge and skills required in relation to the installation and use of water supply fittings in accordance with the Water Supply Regulations and Water Byelaws in the UK, in order to:

- Allow progression to assessment of occupational competence
- Demonstrate competence in relation to the Water Regulation/Water Byelaw requirements
- Enable existing workers in the occupation to update their professional competence
- Form part of a qualification for existing operatives to a gain a recognised qualification.

Upon completion of the unit the learner will:

- Understand the requirements of the Water Supply (Water Fittings) Regulations and Water Byelaws
- Understand terminology used to confirm requirements of the water regulations
- Know the suitability of materials and substances in contact with water
- Understand the requirements for water fittings
- Know the design and installation requirements for a water supply system
- Know the requirements for the prevention of cross connection to unwholesome water
- Know the backflow prevention fluid categories
- Know the requirements for backflow prevention
- Understand the guidance clauses relating to backflow prevention
- Know the installation requirements for cold water services
- Know the installation requirements for hot water services
- Know the installation requirements for WC's, flushing devices and urinals approved for use
- Know the types of bath, sink, showers and taps and their location and installation requirements
- Know the consumption limitations for washing machines, dishwashers and other appliances
- Know the requirements for water supplied for outside use

Learning Outcome 1
1. Understand the requirements of the Water Supply (Water Fittings) Regulations and Water Byelaws
Assessment Criteria
1.1 Explain the requirements of the Water Regulations/Byelaws (Part 1): a. within the domestic environment b. within the commercial, industrial environment
1.2 Explain the requirements of the Water Regulations/Byelaws (Part 2) in relation to: a. the restriction on installation of water fittings b. the requirements for water fittings c. the notification requirements relating to any person who proposes to install a water fitting d. approved contractors
1.3 Explain the requirements of the Water Regulations/Byelaws (Part 3) in relation to: a. penalties for contravening the Water Regulations b. relaxation of the Water Regulations c. any dispute with a water undertaker

Learning Outcome 2
2. Understand terminology used to confirm requirements of the water regulations
Assessment Criteria
2.1 Explain the meanings of the following key factors within the interpretations of the Water Regulations: a. Backflow b. cistern c. combined feed and expansion cistern d. combined temperature and pressure relief e. contamination f. distributing pipe g. expansion cistern/vessel h. expansion valve i. flushing cistern j. overflow pipe k. pressure relief valve l. primary circuit m. secondary circuit n. secondary system o. servicing valve p. stop valve q. storage cistern r. temperature relief valve s. terminal fitting t. vent pipe 2.2 Identify the different types of water treatment apparatus available to dwellings

Learning Outcome 3
3. Know the suitability of materials and substances in contact with water
Assessment Criteria
3.1 Describe the situations where the following materials or substances either alone or in combination are likely to cause contamination of water: a. different classes of steel pipes b. copper tubes and their connections above and below ground c. unplasticised PVC d. polyethylene pipes e. stainless steel pipes 3.2 Identify suitable fittings for use above and below ground 3.3 Identify suitable jointing materials and compounds

Learning Outcome 4

4. Understand the requirements for water fittings

Assessment Criteria

4.1 State the fitness for purpose of water fittings in relation to:

a. British Standards or equivalent
b. immunity and protection from galvanic action

4.2 In relation to installed water fittings state the requirements for the following:

a. Water tightness
b. prevention of ingress from contaminants
c. prevention from damage by freezing and other causes
d. prevention from deterioration by permeation
e. the supporting pipework
f. the fixings for water fittings

4.3 Describe the requirement for pressure testing:

a. metallic pipework systems
b. plastic pipework systems

4.4 Explain how surges within a pipework system can affect system performance in relation to:

a. Water hammer
b. relief valve discharge
c. pneumatic accumulators

4.5 State the connection requirements for the following in relation to the installation of a pump on a supply pipe:

a. permissible pump output capacity
b. permitted siting of a pump

4.6 State the connection requirements for the following in relation to the installation of a pumped shower:

a. permissible pump output capacity
b. recommended siting of a pump

4.7 State the installation requirements for pipes and operational fittings:

a. located in the cavity of a cavity wall
b. embedded in any wall or solid floor
c. located below a suspended floor
d. below a solid floor at ground level, location and accessibility to operational fittings

4.8 State the following installation requirements for pipes entering a building:

a. Depth of pipework
b. Insulation requirements
c. Protection of pipework

4.9 State the installation requirements for underground pipework in relation to:

a. Pipes laid underground
b. Pipes laid over an underground obstruction
c. Pipes under an underground obstruction
d. Pipes supplying water to a building below street level
e. Pipes beneath a stream

4.10 Explain the terms ‘concealed fitting’ and ‘dezincification resistant material’

Learning Outcome 5
5. Know the design and installation requirements for a water supply system
Assessment Criteria

5.1 State factors to be taken into consideration in the design of a water supply system in relation to:

a. total daily consumption
b. maximum and average flows required
c. availability of mains supply
d. mains pressure variance
e. water storage capacity where needed
f. transient or surge pressures
g. environmental issues surrounding area and supply

5.2 Describe types of distribution system available for the following within a dwelling:

a. Direct fed system
b. Indirect fed system
c. Combination of direct and indirect fed systems

5.3 Explain the methods of preventing the contamination of water fittings and the water contained within them when passing through contaminated environments

5.4 State the distribution temperature of cold water

5.5 State the installation requirements relating to Stop valves for the following:

a. Individual properties
b. Locations within premises supplied with water
c. Blocks of flats supplied from a common supply pipe
d. Blocks of flats with separate supply pipes to each flat

5.6 State the installation requirements for the provision, operation and location of servicing valves in relation to the:

a. Inlet to Float Operated Valve (FOV)
b. Outlet of storage cisterns
c. Inlet to appliances
d. Accessibility of servicing valves
e. Methods of operation

5.7 State the installation requirements for the provision of draining taps in relation to:

a. Location
b. Accessibility
c. Types of draining taps

5.8 State the requirements with respect to dead legs and redundant fittings

5.9 State the requirements for pressure testing the following different systems:

a. Systems that do not include any plastic
b. Systems that include plastic pipes

5.10 Explain the reason for the flushing of a system installation

5.11 State when system disinfection is required

Learning Outcome 6
6. Know the requirements for the prevention of cross connection to unwholesome water
Assessment Criteria
6.1 State the meaning of unwholesome water in relation to: a. rainwater b. recycled water c. any fluid not supplied by a water undertaker 6.2 State the requirements for identifying an unwholesome water system so that it is readily distinguishable from a wholesome system in relation to: a. colour coding for pipes and fittings b. labelling for pipes and terminal fittings 6.3 Identify the correct arrangement for connecting a wholesome water supply to a re-use system

Learning Outcome 7
7. Know the backflow prevention fluid categories
Assessment Criteria
7.1 Define the five fluid categories

Learning Outcome 8
8. Know the requirements for backflow prevention
Assessment Criteria
8.1 State the requirements for the arrangements or devices to prevent the cross connection to unwholesome water 8.2 Identify devices or arrangements used for backflow, back pressure and back siphonage prevention and their suitability

Learning Outcome 9
9. Understand the guidance clauses relating to backflow prevention
Assessment Criteria

9.1 Describe the requirements whereby water can flow back into a supply or distributing pipe

9.2 Explain the terms 'upstream' and 'downstream'

9.3 Identify the method of protection against the backflow of water into a supply or distributing pipe without the need for a mechanical backflow prevention device

9.4 Describe installation requirements for a mechanical backflow protection device relating to:

a. Accessibility of the mechanical backflow protection device
b. Location within the premises
c. Requirement to not be buried in the ground
d. Vented and verifiable
e. Devices with relief outlets not being installed in chambers below ground or where liable to flooding
f. The installation of line strainers
g. The lowest point of discharge from the ground
h. Termination with a Type AA air gap

9.5 State the requirements for appliances supplied through or incorporating a pump

9.6 State the requirements for the installation of a bidet or appliance with a hand held spray in relation to:

a. Ascending spray type
b. Over rim type
c. Spray handset fittings used with bidets and WC's

9.7 Explain the requirements for a water supply to a manually operated WC or urinal using a pressure flushing valve when supplied from a supply pipe or distributing pipe

9.8 Explain the requirements for tap outlets in relation to:

a. single outlet taps
b. combination tap assembly outlets
c. fixed shower heads over basins, baths and bidets

9.9 Explain the requirements for a sink in a non domestic environment

9.10 Identify the requirements for submerged inlets to baths and washbasins in:

a. a dwelling
b. a non-dwelling

9.11 Identify the requirements for the installation of a drinking water fountain

9.12 Identify the requirements for the installation of washing machines, washer-dryers and dishwashers in relation to:

a. a dwelling
b. a non-dwelling

9.13 State the requirements for the installation of hose pipes for:

a. a house garden
b. commercial installations

Learning Outcome 9
9. Understand the guidance clauses relating to backflow prevention (Cont.)
Assessment Criteria
9.14 Explain when whole site and zone protection are required 9.15 State the requirements for fire protection systems in relation to: a. Direct fed sprinkler systems with no additives b. Direct fed sprinkler systems with additives c. Elevated storage cisterns with or without additives by gravity d. Elevated storage cisterns with pumped outlet with or without additives e. Dual feed cisterns with water from the water undertaker and from another source 9.16 State the requirements when applied to the following commercial and industrial applications: a. Pumped supply to laboratory fittings b. Separation of wholesome water from supplementary sources c. Separation of wholesome water from water that has been used d. Water supply taken directly from a supply pipe to a ship e. Water supply taken by gravity from storage on a quayside f. Water supply pumped from storage on a quayside g. Water taken from a hose union tap on a quayside

Learning Outcome 10
10. Know the installation requirements for cold water services
Assessment Criteria
10.1 Describe the installation requirements and methods of connection for water fittings in relation to: a. float operated valves b. inlets to cisterns c. outlets from cisterns d. warning and overflow pipes e. cold water storage cisterns

Learning Outcome 11
11. Know the installation requirements for hot water services
Assessment Criteria
11.1 Describe the installation requirements and methods of connection for water fittings in relation to: a. Directly heated unvented hot water systems b. Indirectly heated unvented hot water systems c. Independent water heaters d. Methods of accommodating expanded water in a hot water system e. Maximum temperature within a hot water system f. Hot water distribution temperatures g. Temperature of hot water at terminal fittings and surfaces of hot water pipes 11.2 State the requirements for discharge pipes from safety devices 11.3 State the requirements for discharge pipes from expansion valves 11.4 State the requirements for vent pipes from a primary circuit 11.5 State the requirements for vent pipes from a secondary hot water storage system 11.6 State the requirements for vented systems requiring dedicated storage cisterns or mechanical safety devices 11.7 State the methods of filling closed circuits

Learning Outcome 12
12. Know the installation requirements for WC's, flushing devices and urinals approved for use
Assessment Criteria
12.1 Identify the installation methods and requirements for the operation of WC pans in regard to: a. Single flush cisterns b. Dual flush cisterns c. Single flush siphonic outlet d. Dual flush siphonic outlet e. Drop and flap valves f. Dual flush cistern capacities g. Operating instructions for dual flush cisterns h. Pressure flushing valves i. Cistern water line marks j. Requirements for warning pipes k. Internal overflows 12.2 Explain methods for flushing urinals in relation to: a. Manually operated cisterns b. Automatically operated cisterns c. Pressure flushing valves 12.3 Describe methods for filling a urinal cistern in relation to: a. Manual infill b. Electronic sensor c. Pressure pad d. Time switch e. Frequency of flushing 12.4 State the requirements for urinal cistern filling rates for: a. a single urinal bowl b. a urinal stall or slab serving two or more urinals 12.5 State the requirements for the renewal of a WC cistern installed before 1st July 1999

Learning Outcome 13
13. Know the types of bath, sink, showers and taps and their location and installation requirements
Assessment Criteria
13.1 State the requirements for drinking water points in premises 13.2 State the requirements for drinking water supplies in relation to: a. Water supplied from a supply pipe b. Water supplied from a pumped supply pipe c. Water supplied from a storage cistern d. Water that has been softened and used for drinking purposes 13.3 State the requirements for waste outlets from appliances

Learning Outcome 14
14. Know the consumption limitations for washing machines, dishwashers and other appliances
Assessment Criteria
14.1 State the upper limits of water consumption for domestic: a. horizontal axis washing machines b. washer – driers c. dish washers

Learning Outcome 15
15. Know the requirements for water supplied for outside use
Assessment Criteria
15.1 State the installation requirements for animal drinking troughs or bowls in relation to: a. methods of controlling the inflow to a trough or bowl b. the siting of servicing valves c. backflow protection 15.2 State the installation requirements for ponds, fountains and pools in relation to: a. impervious liners and water tightness b. temporary connections to ponds, pools and fountains

Assessment of Requirements for Individual Units

Unit Ref: A/504/6557 - Apply Safe Health and Safety and Working Practices

To achieve the completion of this **knowledge unit**, you must satisfactorily complete the applicable knowledge assessment for the knowledge learning outcomes within the unit (detail contained with BPEC assessment specification).

Unit Ref: D/504/1545 - The installation, commissioning and safety aspects of hot water systems for domestic use in accordance with UK building regulations

To achieve the completion of this **combination/performance unit**, you must satisfactorily complete the applicable knowledge assessment for the knowledge learning outcomes within the unit (detail contained with BPEC assessment specification). You must also complete the appropriate practical performance activities in simulated conditions as per the requirements of the appropriate BPEC Practical Assessment (HW-1) as detailed in the BPEC L3 Award in Hot and Cold Safe Systems and Sanitation qualification manual – and meet the on-site assessment requirement (also contained in the Qualification Manual).

Unit Ref: F/504/6561 - Safe Installation and Commissioning of Cold Water Systems

To achieve the completion of this **combination/performance unit**, you must satisfactorily complete the applicable knowledge assessment for the knowledge learning outcomes within the unit (detail contained with BPEC assessment specification). You must also complete the appropriate practical performance activities in simulated conditions as per the requirements of the appropriate BPEC Practical Assessment (CW-1) as detailed in the BPEC L3 Award in Hot and Cold Safe Systems and Sanitation qualification manual – and meet the on-site assessment requirement (also contained in the Qualification Manual).

Unit Ref: J/504/6559 - Customer Care and Site Preparation

To achieve the completion of this **knowledge unit**, you must satisfactorily complete the applicable knowledge assessment for the knowledge learning outcomes within the unit (detail contained with BPEC assessment specification).

Unit Ref: J/504/6562 - Safe Installation and Commissioning of Sanitation Systems

To achieve the completion of this **knowledge/performance unit**, you must satisfactorily complete the applicable knowledge assessment for the knowledge learning outcomes within the unit (detail contained with BPEC assessment specification). You must also meet the on-site assessment requirement for sanitation systems as detailed in the BPEC L3 Award in Hot and Cold Safe Systems and Sanitation qualification manual.

Unit Ref: T/504/1602 - Water Supply 'Water Fittings' Regulations and Water Byelaws in the UK

To achieve the completion of this **knowledge unit**, you must satisfactorily complete the applicable knowledge assessment for the knowledge learning outcomes within the unit (detail contained with BPEC assessment specification).

SummitSkills Assessment Strategy for Building Services Engineering (Knowledge and Performance requirements)

Knowledge unit/Knowledge Learning Outcome assessment requirements	
3.5	The assessment instruments for **Knowledge Units** must be as identified in the "Additional Information" of the unit, be fit-for-purpose and be one or more of; 3.5.1 Knowledge tests - centrally set, centrally marked and quality assured by the Awarding Organisations who offer a unit(s) or qualification(s) identified in this strategy. 3.5.2 Knowledge based projects or assignments that are centrally set, centre marked and quality assured by the Awarding Organisations who offer a unit(s) or qualification(s) identified in this strategy. 3.5.3 Knowledge based professional discussion that is centre devised following centrally specified guidance, centre marked and quality assured by the Awarding Organisations who offer a unit(s) or qualification(s) identified in this strategy.
Performance unit/Performance Learning Outcome assessment requirements (simulated)	
3.6	The environment in which the evidence and the quantity of evidence for **Performance Units** must be assessed, i.e. sourced from the real working environment or simulated conditions, will be detailed in the "Additional Requirements" for each Performance Unit. This could be applicable to all the Learning Outcomes in the unit or particular Learning Outcomes.
Performance unit/Performance Learning Outcome assessment requirements (real working environment)	
3.7	Evidence that is sourced from the real working environment for **Performance Units** must be naturally occurring and can be generated by; 3.7.1 Direct observation of performance in the workplace by a qualified assessor and/or testimony from an expert witness subject to the activity being assessed (Also see 3.6 above). This will be the primary source of evidence. 3.7.2 Candidate's reflective account of performance. (Write up of work completed) 3.7.3 Work plans and work based products e.g. diagrams, drawings, specifications, customer testimony, authorised & authenticated photographs/ images an audiovisual records of work completed. 3.7.4 Evidence from prior achievements that demonstrably match the requirements of the Performance Unit. 3.7.5 Witness testimony

Recognition of Prior Learning (RPL)

Learners who have already completed an Approved Water Regulations training course (e.g. BPEC Water Regulations course) and/or the Unvented Hot Water Systems and Building Regulations* qualification (again, such as the BPEC Unvented Hot Water Systems qualification) will be able to RPL these achievements against the content of the following units:

- T/504/1602 - Water Supply 'Water Fittings' Regulations and Water Byelaws in the UK
- D/504/1545 - The installation, commissioning and safety aspects of hot water systems for domestic use in accordance with UK Building Regulations

Meaning that they will not have to sit the assessments for these units.

**Note: The Unvented Hot Water Systems qualification must be under 5 years old in order for the RPL exemption to be claimed*

Scheme Documentation

The following documentation will also be supplied by BPEC Certification Ltd. to support the delivery of the Award in Hot and Cold Safe Systems and Sanitation.

- Qualification assessment manual, including:
  - Unit Assessment (UA) documentation
    - In centre practical performance assessment guidance
    - In centre practical performance assessment material
    - On the job evidence recording documentation
- Knowledge assessment papers and question specifications *(centre only)*
- Delivery support materials
  - Enhanced scheme of work
  - Supporting Powerpoint presentations
  - Links to manufacturer's and other useful sources of information

Unit Assessment (UA) Documentation

Simulated Performance Assessments

For all Combination units learners will be required to successfully complete a number of different practical assessments. All appropriate information and supporting documentation is contained within the BPEC qualification assessment manual which for this qualification, applies to the following units:

- D/504/1545 - The installation, commissioning and safety aspects of hot water systems for domestic use in accordance with UK building regulations
- F/504/6561 - Safe Installation and Commissioning of Cold Water Systems

Marking Performance Assessments

The pass rate for the performance assessments is 100%

1. First Attempt - learners are given a first attempt in all areas of the performance assessment
2. Second Attempt – performance areas not satisfactorily completed will be re-attempted
3. At the assessors discretion, the learner is re-assessed by oral questioning and/or observing the performance in an attempt to establish competence in all remaining areas
4. Learners who have not achieved the 100% pass mark at this stage will be deemed to have failed the performance assessment. Learners wishing to retake the assessment will be required to re-attempt the full performance assessment in its entirety

Knowledge and Understanding Assessments

The units listed below all require the learner to complete a unit summative (knowledge) assessment. The knowledge assessments (and supporting rationale) are provided by BPEC Certification Ltd.

- A/504/6557 - Apply Safe Health and Safety and Working Practices
- D/504/1545 - The installation, commissioning and safety aspects of hot water systems for domestic use in accordance with UK building regulations
- F/504/6561 - Safe Installation and Commissioning of Cold Water Systems
- J/504/6559 - Customer Care and Site Preparation
- J/504/6562 - Safe Installation and Commissioning of Sanitation Systems
- T/504/1602 - Water Supply 'Water Fittings' Regulations and Water Byelaws in the UK

*The completed knowledge assessment papers (questions and answers) must be retained in the centre portfolio – **KNOWLEDGE ASSESSMENT QUESTIONS AND ANSWERS MUST NOT BE RETAINED IN THE LEARNER PORTFOLIO**

Marking Knowledge Assessments

The pass rate for the knowledge assessments is 60%

1. Learners who have not achieved the 60% pass mark will be deemed to have failed the knowledge assessment. Learners wishing to retake the assessment will be required to re-attempt the full theory paper in its entirety

Learner Result Form

A Learner Result Form has been produced for the Award in Hot and Cold Safe Systems and Sanitation. This document shall be used to record that the learner has completed the whole qualification in a satisfactory manner. The document shall be completed and signed by the centre assessor and the internal verifier.

The completed Learner Result Form shall be sent to BPEC Certification Ltd. (with attached passport photo) for certification. Copies of the Learner Result Form shall also be retained in the Learner Portfolio and the Centre Portfolio.

Evidence Forms

BPEC Certification Ltd. has designed evidence forms which may be used to capture evidence relating to a learners performance in the workplace. Such evidence may include:

- Assessor feedback to the learner
- Records of supplementary questions posed by the assessor and the learner responses
- Learner feedback – statements made by the learner to clarify their competence
- Witness testimony – statements made by witnesses e.g. supervisor, customer etc. relating to the competence of the learner

These evidence forms are contained in the Qualification Assessment Manual and have been designed so that they can be copied/reprinted as many times as is required.

Portfolio Contents

The table below identifies the contents to be retained within the learner and the centre portfolios:

	Learner Portfolio	Centre Portfolio
Learner CV	✓	✓
Previous qualifications	✓	✓
Learner result form	✓	✓
Evidence collected e.g. work records, evidence forms	✓	
Knowledge assessment documentation		✓
Performance assessment documentation (contained in qualification assessment manual)	✓	✓

Staff Qualification Requirements

Assessors

Assessors **MUST** be vocationally and occupationally competent in the areas they are assessing and have a thorough knowledge of the National Occupational Standards and Units of Assessment.

The assessor must be able to provide appropriate documented evidence that demonstrates they have a minimum of 5 years proven occupational experience in the activities they will be assessing e.g. a signed and dated CV. This verifiable evidence must be at or above the level of competence being assessed.

Qualifications

Assessors shall be technically qualified in Plumbing/H&V Installation, and must be able to provide evidence in one or more of the following ways:

- A relevant qualification (e.g. NVQ/SVQ or equivalent in Plumbing/H&V Installation)
- Registration with the appropriate industry registration body at the relevant occupational level and grade.

The assessor must also hold one of the following assessor qualifications:

- QCF Level 3 Award "Assessing Vocational Related Achievement – in Centres/Colleges or Training Providers" or
- QCF Level 3 Certificate "Assessing Vocationally Related Achievement – in Centres/Colleges and The Workplace" or
- A1 or D32 /D33 with an Upgrade to A1 as a minimum *

‘Workplace Assessors’ MUST hold:

- QCF Level 3 Award “Assessing Competence in the Workplace Environment” or
- QCF Level 3 Certificate “Assessing Vocationally Related Achievement – in Centres/Colleges and The Workplace” or
- A2 or D32 with an upgrade to A2 as a minimum*

Assessors holding D units must have evidence of Continuing Professional Development (CPD) to demonstrate compliance with the A units. Evidence of CPD will be sought by the External Verifier for all Assessors approved to assess for the centre.

‘Candidate assessors’ who are working towards their assessor qualifications must always be supervised by a qualified assessor. They should have a clear action plan for achieving the assessor qualification(s), (assessor approval will be withdrawn if the assessor qualification/units have not been attained within a period of 18 months).

Internal Verifiers

Internal Verifiers should be vocationally and occupationally competent in the areas they are verifying and have a thorough knowledge of the National Occupational Standards and Units of Assessment.

The Internal Verifiers must be able to provide appropriate documented evidence that demonstrates they have a minimum of 5 years proven occupational experience in the activities they will be verifying e.g. a signed and dated CV.

Qualifications

Internal Verifiers shall be technically qualified in Plumbing/H&V Installation, and must be able to provide evidence in one or more of the following ways:

- A relevant qualification (e.g. NVQ/SVQ or equivalent in Plumbing/H&V Installation)
- Registration with the appropriate industry registration body at the relevant occupational level and grade.

Internal Verifiers must hold the following:

- QCF Level 3 Certificate "Assessing Vocationally Related Achievement – in Centres/Colleges and The Workplace"
- QCF Level 4 Award " Internal Quality assurance of assessment processes and practice" or
- QCF Level 4 Certificate "leading the Internal Quality assurance of assessment processes and practice" or
- A1 or D32/D33 with an upgrade to A1 as a minimum*
- V1 or D34 with an upgrade to V1 as a minimum*

*The Teaching Qualification for Secondary Education (TQSE) or the Teaching Qualification for Further Education (TQFE) (which is recognised in Scotland) these awards are acceptable providing they are the versions that are recognised as equivalents to the A1 award. Internal Verifiers holding D units must have evidence of CPD to demonstrate compliance with the A and V units.

It is recommended that 'Candidate Internal Verifiers' have a clear action plan for achieving the Internal Verifier qualification(s). Internal Verifier approval will be withdrawn if the qualification / units have not been attained within the approved period (18 months).

Continuing Professional Development (CPD)

The occupational competence of assessors and internal verifiers must be updated on a regular basis and be periodically reconfirmed via continuing professional development (CPD) which is recorded by the assessment centres.

Further Information

Requests for further information regarding centre/scheme approval or any aspect of assessment of the BPEC qualifications please contact:

BPEC Certification Ltd. 2 Mallard Way, Pride Park, Derby, DE24 8GX
T 0845 644 6558 F 0845 121 1931 E certification@bpec.org.uk W www.bpec.org.uk

Annex 1 - Funding

BPEC Certification Ltd. does not provide details on funding as this may vary between regions. Centres should contact the appropriate funding body to check eligibility for funding and any regional/national arrangements which may apply to the centre or learners.

For funding regulatory purposes, learners should not be entered for a qualification of the same type, level and content as that of a qualification they already hold. Please see below for where to find out more about the funding arrangements.

England
Skills Funding Agency
Cheylesmore House
Quinton Road
Coventry
CV1 2WT

Telephone: 0845 377 5000
Email: info@skillsfundingagency.bis.gov.uk

Scotland
Colleges should contact the Scottish Further Education Funding Council, at www.sfc.ac.uk

Training providers should contact Scottish Enterprise at www.scottish-enterprise.com or one of the Local Enterprise Companies.

Northern Ireland
Please contact the Department for Employment and Learning at www.delni.gov.uk

Wales
Centres should contact the department for education, lifelong learning and skills: www.new.wales.gov.uk

Annex 2 – Sector Skills Councils

The Sector Skills Councils have the responsibility for development of the national occupational standards and in many cases, facilitating the development of relevant sector vocational qualifications. Similarly, the Sector Skills Councils formulate the 'assessment strategy' for these qualifications, contact details of the relevant Sector Skills Council(s) are shown below:

SummitSkills Limited, Vega House, Opel Drive, Fox Milne, Milton Keynes, MK15 0DF
T: 01908 303960 W: www.summitskills.org.uk