NHS National Services Scotland

Water Safety Guidance

Scottish Health Technical Memorandum

Part G - Operational Procedures and Exemplar Written Scheme

SHTM 04-01 part G

Draft 1.09 - March 2026.

Contents

Executive Summary

Scottish Health Technical Memorandum (SHTM) 04-01 “Water safety guidance” is published in seven parts:

- part A: Design, installation, and commissioning
- part B: Operational management
- part C: Microbiological testing
- part D: Disinfection of domestic water systems
- part E: Alternative materials and filtration
- part F: Chloramination of water supplies
- part G: Operational procedures and Exemplar Water Safety Plan

The documents give comprehensive advice and guidance on the legal requirements, design implications, maintenance, and operation of safe water systems in healthcare premises. The use of these premises is very intense, the occupancy level high and the patients may be particularly susceptible to waterborne infection risks. Their condition may also require close control of the clinical and built environment.

This 2026 SHTM suite draws together developments and updates from the previous guidance, including recommendations for the safe management of water systems, via the integration of the principle of Water Safety Groups (WSGs) and Water Safety Plans (WSPs) and how to manage and minimise the risks to health from various aspects, ranging from clinical risks, microbial and chemical contamination, changes to the water system, resilience of the water supply and so on. It also introduces a stronger emphasis on staff competencies and the implementation of water hygiene awareness training.

There has been increasing evidence that the interaction of water supply and above ground drainage can each give rise to problems where the design and/ or operation is poorly configured. Therefore, a brief section on above ground drainage design has been included in this version.

Information regarding the mechanisms for compliance with the Scottish Water Byelaws are also discussed.

This 2026 version of SHTM 04-01 supersedes all previous versions of SHTM 04-01 “Water Safety for Healthcare Premises”.

Guidance in this SHTM applies to all healthcare facilities containing domestic water and above ground drainage systems.

Language used in technical guidance

In SHTMs verbs such as “must”, “should” and “may” are used to convey notions of obligation, recommendation or permission. The choice of modal verb will reflect the level of obligation needed to be compliant.

The following describes the implications and use of these modal verbs in SHTMs (readers should note that these meanings may differ from those of industry standards and legal documents):

A. “Must” is used when indicating compliance with the law
B. “Should” is used to indicate a recommendation (not mandatory/ obligatory), for example among several possibilities or methods, one is recommended as being particularly suitable - without excluding other possibilities or methods
C. “May” is used for permission, for example to indicate a course of action permissible within the limits of the SHTM
D. “Shall”, in the obligatory sense of the word, is never used in current SHTMs

Typical usage examples

A. “All water fittings used in the construction of systems referred to in this SHTM must comply with the requirements of the Water Supply (Water Fittings) (Scotland) Byelaws 2014.” [obligation]
B. “Waterborne bacteria should be considered during the design, construction, installation, commissioning and maintenance of the hot and cold water systems and above ground drainage system in the healthcare-built environment,” [recommendation]
C. “There are also other waterborne bacteria acknowledged to be in the water systems that may require further supplementary management practices to control)” [permission]

Project derogations from the Technical Guidance

Healthcare facilities built for the NHS are expected to support the provision of high-quality healthcare and ensure the NHS Constitution right to a clean, safe and secure environment. It is therefore critical that they are designed and constructed in accordance with appropriate technical standards and guidance. This applies to all new and refurbishment projects, regardless of procurement model.

Note 1: The healthcare organisation, and their project teams, should ensure that they have a fully documented list of technical standards and guidance that are applicable to the specific project.

It is recommended that the starting point for all projects should be one of full adherence to the SHTM guidance or better if that can be demonstrated. While it is recognised that derogations may be required in some cases, these must all be risk-assessed and documented in order that they may be considered within a structured derogation review and approval process. In all instances derogations must not compromise the health and safety or operational resilience of the healthcare facility. Healthcare organisations should ensure that any derogations do not impact on their legal or statutory obligations.

Derogations must be properly authorised by the project's senior responsible officer and informed and supported by appropriate technical advice including that of the WSG, irrespective of a project's internal or external approval processes.

A schedule of derogations should be created for any project, including details of approvals, risk assessment and identified mitigations.

Note 2: This guidance does not alter the healthcare organisations legal or statutory obligations.

NHS Scotland Sustainable Development Policy Drivers

Responding to the global climate emergency is one of the Scottish Government's highest priorities. Sustainable development, the concept that the needs of the present must be met "without compromising the ability of future generations to meet their own needs" is integral to the Scottish Government's overall purpose. The Scottish Government's National Performance Framework (NPF) shares the same aims as the United Nations' Sustainable Development Goals. It highlights the need for a 'whole system approach' to successfully deliver the NPF's national outcomes for Health and recognises the important role that NHS Scotland has in helping to achieve this.

Over recent years the current and future impact of climate change has been well documented, with risks to human health and to health and social care delivery highlighted within Scotland's summary report of the UK Climate Risk Independent Assessment*. NHS Scotland is committed to the delivery of a high quality, environmentally and socially sustainable health service that is resilient to the locked-in impacts of climate change. Director Letter (DL) (2021) 38 'A Policy for NHS Scotland on the Climate Emergency and Sustainable Development' provides the framework for this aim to become a reality, and to maximise NHS Scotland's contribution to mitigating and limiting the effect of the global climate emergency.

* NHS Scotland Climate Change Risk Assessments and Adaptation Plans: A Summary Report on the National Services Scotland (NSS) website.

Who should read this guidance?

This document is aimed at specifiers, designers, suppliers, installers, commissioners, WSGs, estates and facilities managers and operations, and Infection Prevention and Control Teams (IPCTs). Elements of the document will also be relevant to managers concerned with the day-to-day management of healthcare facilities and senior healthcare management. Infection prevention specialists who are involved with monitoring water quality and managing infections and outbreaks potentially linked to water supplies will also find it helpful to be familiar with this guidance.

Main changes since the 2014 suite

- This 2026 edition of SHTM 04-01 provides comprehensive guidance on measures to control waterborne pathogens.
- This edition has been updated to align with the Health and Safety Executive's (HSE's) revised Approved Code of Practice (ACOP) for Legionella (L8) and its associated Health and Safety Guidance (HSG) 274 guidance documents.
- A new chapter on above ground drainage has been added to SHTM 04-01 Part A.
- New guidance has been included in SHTM 04-01 Part A on the hygienic storing and installation of fittings and components and on the competency of installers/ plumbers working on healthcare water systems. The guidance also outlines that any person working on water distribution systems or cleaning water outlets needs to have completed a water hygiene awareness training course.
- Information is discussed in relation to compliance with the Scottish Water Byelaws in SHTM 04-01 Part A.
- SHTM 04-01 Part A and Part E now outlines requests for pipework manufacturers data sheets regarding the product limitations.
- Part B of the SHTM 04-01 now includes updated guidance on the remit and aims of the WSG.
- SHTM 04-01 Part B now includes information on Nontuberculous mycobacteria (NTM).
- Guidance on sampling techniques for, testing for, and the microbiological examination of *Pseudomonas aeruginosa* samples - originally in the Health Technical Memorandum (HTM) 04- 01 Addendum - is now included in SHTM Part C to complement the Total Viable Count (TVC) guidance.
- Whilst SHTM 04-01 Part G provides updated guidance on the WSP and in addition to the 2014 sample templates includes several more.

While some guidance on other water- service applications is included, it is not intended to cover them fully. For example:

- process waters used for laundries, see HTM 01-04 - ‘Decontamination of linen in health and social care’
- endoscopy units, see HTM 01-06 - ‘Decontamination of flexible endoscopes’
- primary care dental premises, see HTM 01-05 Decontamination in primary care dental facilities
- renal units, see Health Building Note (HBN) 07-01 and HBN 07-02, the Renal Association's guidelines and ISO 13959 and 11663
- sterile services departments (SSDs), see Scottish Health Planning Note (SHPN) 13 - Part 1 Decontamination Facilities: Central Decontamination Unit
- hydrotherapy pools, see the Pool Water Treatment Advisory Group’s (PWTAG's) ‘Swimming pool water: treatment and quality standards for pools and spas’
- spa pools, the control of legionella and other infectious agents in spa-pool systems HSG282
- birthing pools, see HBN 21 - ‘Maternity’ and PWTAG’s ‘Swimming pool water: treatment and quality standards for pools and spas’

Acknowledgements

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NHS Scotland Assure would like to thank the National Water Services Advisory Group (NWSAG), Scottish Engineering and Technology Advisory Group (SETAG) and colleagues from Antimicrobial Resistance and Healthcare Associated Infection Scotland (ARHAI) for their contributions and efforts to the production of the SHTM suite revision.

NHS Scotland Assure would also like to thank those who took the time to comment and send feedback during the scoping and technical engagement phases of this document.

NHS Scotland Assure acknowledge contributions from those individuals and organisations involved in the development and publication of previous versions of the SHTM 04-01 suite.

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Background

The Health and Safety Executive's (HSE's) Approved Code of Practice (ACOP) L8 "The control of Legionella bacteria in water systems" refers to Written Schemes in paragraph 60 as follows:

"The written scheme should include, where appropriate, and with reference to the risk assessment:

- up to date plans of installations (schematic drawings would be acceptable)
- a description of correct and safe operation of systems
- precautions to be taken
- checks for efficacy and frequency of checks
- remedial action to be taken if the Written Scheme is ineffective"

Aim of the guidance

Experience has shown that the quality and acceptability of Water Safety Plans (WSPs) and Written Schemes has been variable. This guidance has drawn upon experience in producing the most comprehensive documentation to date in the form of operational procedures leading to the production of WSPs and Written Schemes, a relevant extract from the HSE ACOP L8 and a template or exemplar for healthcare organisations follow in the preparation of a Written Scheme.

Note 3: The format of this document comprises two main parts. The first, consisting of Sections sets out operational procedures that can be adapted by healthcare organisations to suit individual circumstances. As such, it would provide suitable evidence for Health and Safety Inspectorate that the healthcare organisation had procedures in place to allow preparation of Written Schemes which comprise the second part of this guidance in the form of exemplars.

1. Operational procedures for the WSP

General overview

1.1. Premises used by the NHS for the delivery of healthcare are dependent upon water to maintain hygiene through a safe and comfortable risk assessed environment for all who may use, interface, and support the delivery of functional healthcare.

1.2. Healthcare organisation** has a Water Safety Policy, which requires all management and staff across the organisation to be aware of statutory regulations, NHS Scotland mandatory guidance documents and responsibilities with specific arrangements.

** The name of the healthcare organisation would be inserted here.

1.3. In the healthcare delivery environment, there are a number of reasonably foreseeable risks leading from potential exposure in the use of water that have to be avoided, as far as is reasonably practicable.

1.4. With respect to the responsibilities and duties identified in the Water Safety Policy, this document sets out in writing the scheme to manage and control the risks from potential exposure.

Introduction and legislative context

1.5. Legionnaires' disease is a potentially fatal form of pneumonia which can affect anybody but which principally affects those who are susceptible because of age, life-style, illness, or immuno-suppression. It is caused by the bacterium Legionella pneumophila and related bacteria. Legionella bacteria are common and can be found naturally in environmental ground and water sources such as rivers, lakes and reservoirs, usually in low numbers.

1.6. Legionella can survive under a wide variety of environmental conditions and have been found in water at temperatures between 6ºC and 60ºC. Water temperatures in the range 20°C to 45°C seem to favour growth. The organisms do not appear to multiply below 20°C and will not survive above 60°C for any significant time. The organisms may, however, remain dormant in cool water and multiply only when water temperatures reach a suitable level. Temperatures may also influence virulence. Legionella bacteria held at 37°C have greater virulence than the same Legionella bacteria kept at a temperature below 25°C.

1.7. Legionella bacteria also require a supply of nutrients to multiply. Sources include commonly encountered organisms within water systems, such as algae, amoebae and other bacteria. The presence of sediment, sludge, scale and other materials within the system together with biofilms plays an important role in harbouring and providing favourable conditions in which the Legionella bacteria may grow. A biofilm is a thin layer of micro-organism which forms a slime on surfaces which are in contact with water. Sludge, scale and biofilms can protect Legionella bacteria from temperatures and concentrations of biocide that would otherwise kill or inhibit these organisms if they were freely suspended in water.

1.8. *Pseudomonas aeruginosa* is a Gram-negative organism most commonly found in soil and water. It can be isolated from any moist environment. It is often termed an 'opportunistic pathogen'. Water within systems can periodically be contaminated with these organisms. Although mains supplied water is treated and disinfected, it contains at the point-of-use (POU), only residual (relatively low) levels of disinfectant chemicals (such as chlorine). Water is therefore not sterile and has a (highly variable) background level of micro-organisms, measured in terms of the Total Viable Count (TVC).

1.9. Clinical problems are only likely to arise if *Pseudomonas aeruginosa* or other waterborne organisms are present in significant numbers in association with biofilms. There is a combination of factors that may have facilitated *Pseudomonas aeruginosa* becoming a clinical problem. These factors include any or all of the following:

- water system materials which may have facilitated biofilm formation (such as plastic pipework, plastic, and rubber components in thermostatic mixing valves (TMVs) and flexible hose liners and so on)
- water outlets with TMVs designed to regulate water temperature and minimise the risk of scalding, which may also have increased the risk of other waterborne pathogens; Thermostatic mixing devices have complex internal structures that can entrap waterborne bacteria and biofilm
- the increased number of wash hand basins/ sinks in clinical areas, combined with the increased use of alcohol based hand rubs (ABHRs) which may have resulted in a decreased use of water at individual wash hand basins/ sinks
- the use of non-touch (sensor) water fittings, resulting in low water volumes flowing through outlets. This combined with a column of standing water left in the pipework provides an ideal condition for bacterial growth
- Incorrect use of outlets or incorrect cleaning procedures

1.10. There are a number of Regulations involved in the management and control of Legionella, *Pseudomonas* Spp and other similar harmful bacteria. The main requirements are covered in:

- The Health and Safety at Work etc. Act 1974
- The Control of Substances Hazardous to Health (COSHH) 2002
- The Management of Health and Safety at Work Regulations 1999
- The Water (Scotland) Act 1980

1.11. The following documents are cited under these regulations (statutory guidance) and require to be read and used in conjunction with the policy:

- L5 Approved Code of Practice (ACOP) The COSHH Regulations 2002
- L8 ACOP The Control of Legionella Bacteria in Water Systems 2013 and subsequent Parts Health and Safety Guidance (HSG) 274, Part 1,2 and 3 2024
- HSG 274 Part 1 is concerned with cooling towers
- HSG 274 Part 2 is concerned with hot and cold water services (CWS) and includes reference to temperature requirements, Microbiological monitoring, cleaning and disinfection, and control methods
- HSG Part 3 is concerned with “other” systems. There are other risk systems that may produce aerosols, thus posing a foreseeable risk of exposure to legionella. These include; wet scrubbers; sprinkler and hose reel systems; powered dental equipment; fountains and decorative water features; non-disposable nebulisers used for respiratory therapy; fire, dust and odour suppression systems. This is not an exhaustive list.
- Water Byelaws (Scotland) 2014.

Also relevant are:

- Health and Safety Executive (HSE) - OC 255/12 Control of Legionella: Investigation of Outbreaks (and Single Cases) of Legionellosis from Water Systems
- British Standard (BS) 8680:2020 Water quality — Water safety plans — Code of practice
- BS 7592: 2022 Sampling for bacteria in water systems
- BS 8580-1: 2019 Water Quality - Risk Assessments for Legionella Control - Code of Practice
- BS 8580-2: 2022 Water Quality - Risk Assessments for *Pseudomonas aeruginosa* and other waterborne pathogens
- Water safety in buildings, World Health Organization (WHO)

1.12. Reference should be made also to the healthcare specific guiding principles contained in the following NHS Scotland guidance documents:

- Scottish Health Technical Memorandum (SHTM) 03-01 'Ventilation for healthcare premises'
- SHTM 04-01 Part A, B, C, D, E and F

1.13. Healthcare organisation is committed to meeting the requirements of the relevant current statutory and associated guidance. The purpose of this document is to detail the Scheme, set out in writing the principles and procedures by Facilities and Estates in compliance with the above, to manage and control the Legionellosis and water safety risks and in 'so far as is reasonably practicable' with respect to other requirements.

Responsibilities of the Designated Person (Water) appointed by the Duty Holder

1.14. These comprise:

- ensuring the Chief Executive (The Duty Holder) and Management Teams (Duty Holders) and their devolved staff are aware of and co-ordinate with the policy and are familiar with their devolved responsibilities, duties and relevant procedures
- identifying water safety risks and non-compliance
- providing adequate facilities, resources and competency training to support, implement and maintain all aspects of the policy
- providing annual performance reports to Chief Executive, Management Teams, Infection Prevention and Control, Occupational Health and Safety, and Risk Management
- reviewing the effectiveness of the policy across healthcare organisation
- Establish a Water Safety Plan (WSP) in compliance with BS 8680:2020 Water quality, Water safety plans, Code of practice

  "A Water safety plan (WSP) is a strategic plan which defines and documents the arrangements that are required for the safe use and management of all water systems together with all associated systems and equipment within each building or estate to prevent harm arising from all forms of exposure"

- establishing a Water Safety Group (WSG) to provide appropriate expertise, to support, co-ordinate and review operational management and controls in accordance with statutory and mandatory requirements
- seeking support from a consultant medical microbiologist in the event of suspected exposure to Legionella, Pseudomonas Spp and other similar harmful bacteria
- appointing in writing an independent professional advisor to act as "Authorising Engineer" with a brief to provide services in accordance with SHTM guidance under the policy

- appointing in writing an independent professional assessor to act as “Legionella Risk Assessor” with a terms of reference to provide services in accordance BS 8580, SHTM and HSE guidance under this policy
- appointing in writing appropriate Managers to act as “Responsible Person (Water)” as defined in appointment letters, to adopt day-to-day responsibility for controlling and managing any identified risk from potential exposure to Legionella, Pseudomonas Spp and other similar harmful bacteria under the policy
- appointing in writing appropriate deputies and “Authorised Persons (APs) (Water)” who have sufficient authority, competence and knowledge of the water systems and installations to ensure that all operational procedures and SHTM 04-01 requirements are carried out in a timely and effective manner

1.15. The organisational structure for Healthcare organisation inclusive of the above-mentioned local arrangements for the management and control of risk from potential exposure to Legionella, Pseudomonas Spp and other similar harmful bacteria under the Policy are now expanded as shown below in the chart.

Figure 1.1 - A Typical organisational structure for Healthcare organisation

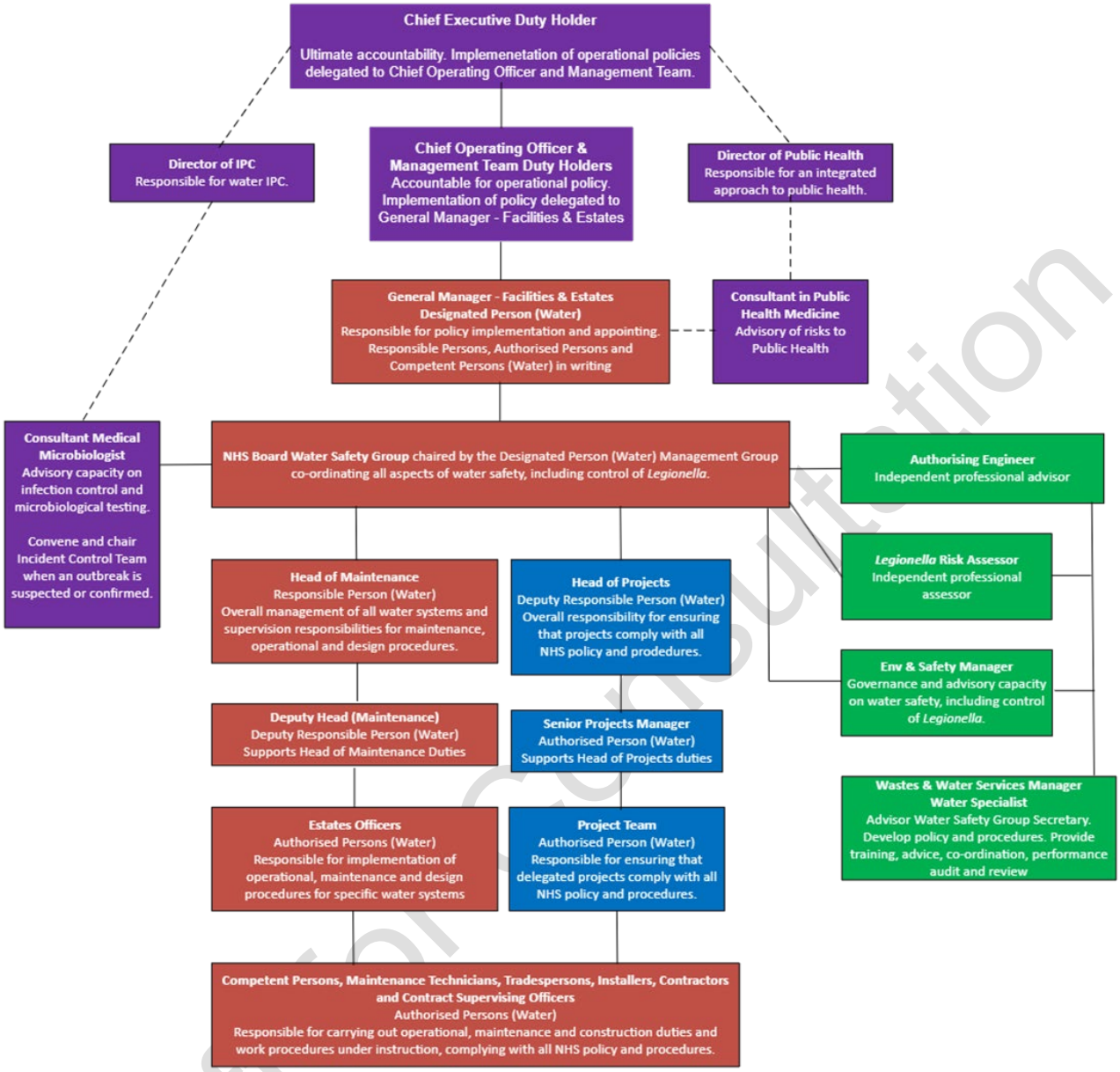

Table 1.1 - Role Holders - Authorised Persons (APs) (Water) will be selected from Table 1.1. and appointed to specific Written Schemes (as shown on Table 1.2).

Water Safety Role	Name	Appointment	Generic Title (Example)	Phone
The Duty Holder			Chief Executive	
Duty Holders			Chief Operating Officer	
Duty Holders			General Manager (Enter General Managers for each site or division as appropriate)	
Designated Person (Water)		In writing by Duty Holder	General Manager, Facilities and Estates	
Deputy Designated Person (Water)		In writing by Duty Holder	Head of Soft FM	
Authorising Engineer (Water)		In writing by Designated Person (Water)		
Legionella Risk Assessor		In writing by Responsible Person (RP) (Water)		
RP (Water)		In writing by Designated Person (Water)	Head of Maintenance	
Deputy RP (Water)		In writing by Designated Person (Water)	Head of Projects	
Deputy RP (Water)		In writing by Designated Person (Water)	Deputy Head of Maintenance	
AP (Water)		In writing by RP (Water)	Estates Officer, Supervisor or Projects Manager (Enter names of all APs as appropriate for sites or divisions)	

Water Safety Role	Name	Appointment	Generic Title (Example)	Phone
Competent Person (Water)		In writing by RP (Water)	CAD Operator	
Competent Person (Water)		In writing by AP (Water)	Plumber/ Maintenance Assistant/ Water Hygiene Operative (Enter names of all Competent Persons as appropriate for sites or divisions)	
Infection Prevention and Control (IPC)		In writing by Duty Holder	Consultant Medical Microbiologist/ Infection Control Doctor	
IPC			Infection Control Practitioner (ICP) (Enter names of all ICPs as appropriate)	
Laboratory Services			Biomedical Scientist	
Sterile Services			Head of Sterile Services	
Renal			Head of Medical Physics	
Physiotherapy			Head of Physiotherapy	
Governance and Advisor			Environment and Safety Support Team Manager	
Public Health			Consultant in Public Health Medicine (CPHM)	
Occupational Health and Safety (OH&S) Auditor			Health and Safety Auditor	
HSE				

Note 4: The names of any member of staff yet to receive relevant training should be entered separately.

1.16. All training and competency assessments provided to and received by all healthcare organisations personnel involved in water systems will be recorded in the individual's personal training file.

1.17. The Authorising Engineer (Water) shall conduct an annual assessment review of competency and training requirements and shall make Training Programme recommendations to the RP (Water) for approved courses run by approved training organisations and where appropriate by the manufacturers of equipment.

APs (Water) shall be appointed in writing. They will be given the role of the named person with responsibility for the water system(s) identified in specific buildings that they have knowledge of (Table 1.2 refers).

1.18. The AP shall conduct and record induction and familiarisation with Estates staff and any new Competent Persons, Maintenance Technicians, Tradespersons, Installers, Contractors and Contract Supervising Officers being introduced to water systems. The AP shall conduct regular reviews of system familiarisation, operational maintenance, monitoring issues and report recommendations to the RP (Water).

Healthcare organisation sites and blocks with water systems

1.19. Table 1.2 extracted from a typical Property and Asset Portfolio, details where there are known applicable piped water distribution systems in owned and leased premises. Non-applicable Sites, Blocks and Systems are shaded in red.

Table 1.2 - Site information

WS Ref No.	NHS Site Code	Site Name	Block No.	Block Name	Gross Internal Area (GIA) m^2	Potential Water Distribution Systems (normally each with 1 cold water (CW) system and 1 domestic hot water (DHW) system)	WSP Contact

2. Managing the risks

Water systems

2.1. Healthcare organisation has a property and asset base of circa xx sites (owned and leased) with circa xxx building blocks (including hospitals, health centres, clinics, and support premises) ranging from large multi-hospital campus to small areas within shared buildings, covering circa xxx,000m^2 with a wide range of construction, age and condition criteria (such as which can include asbestos, contamination, Personal Protective Equipment (PPE) requirements, confined spaces, access restrictions, permit to access/ work).

2.2. Most building blocks will have their own individual water system. However, some systems may cover more than one building block and some building blocks may have multiple water systems.

2.3. Water used in each building block will utilise a Temperature Control Regime (as outlined in Health and Safety Executive (HSE) Approved Code of Practice (ACOP) L8 and Health and Safety Group (HSG) 274) with full temperature control as noted in Scottish Health Technical Memorandum (SHTM) 04-01 A and B to temperatures in the various parts of the water system.

2.4. Each Building Block has a Water Safety Logbook (located in the Estates Department Offices) containing details of the specific local water system(s). Water Safety Log Books may be held in a paper based documentation system or stored in an electronic log book format.

Water Safety Logbooks include:

- confirmation of the location with site name, building block name, system name and the Authorised Person (AP) (Water) who has been appointed in writing as the person with knowledge and full control of the identified water system
- the applicable control measures (Pre Planned Maintenance (PPM))
- a scalding risk assessment covering all installed in thermostatic mixing valves (TMVs)/ TMTs
- the current applicable Legionella Risk Assessment with summary details of system, equipment, safe operation criteria, precautions to be taken and an Action Plan for any remedial works or routine control measures that may be required to control Legionellosis and water safety risks

- Patient Susceptibility Review/ Profiling (clinical assessment) such as augmented care where medical/ nursing procedures render the patients susceptible to invasive disease from environmental and opportunistic pathogens such as *Pseudomonas aeruginosa* and other alert organisms. Refer to SHTM 04-01 Part C for further guidance on *Pseudomonas aeruginosa* risk assessment, SHTM 04-01 Part B and BS 8580-2 (2022) for “other waterborne pathogens” such as Nontuberculous mycobacteria (NTMs)
- an up-to-date plan of the system identifying all system plant, to include:
    - water softeners, filters, strainers, pumps, non-return valves and all outlets including showers, wash hand basins, sinks, baths and equipment - such as ice-making machines, drinking fountains and so on and any external connections to hoses, mobile units or equipment
    - all standby equipment such as spare pumps, with details for incorporating into use
    - all associated pipework and piping routes (including flexible hoses, residual dead legs, blind stub-ends and plugged tee-pieces)
    - all associated storage and header tanks
    - details of the origin of the water supply
    - any parts that may be out of use temporarily
    - TMVs
    - sentinel hot and cold water (CW) outlets
- schematic and detailed drawings of the system are also available at the Estates Department and viewable electronically

Note 5: Plans must be kept up to date to include any alterations made to the water system.

- insurance examination reports (where applicable) by the Competent Person (Pressure Systems)
- any Hazard and Safety Action Notices (SAN) and/ or operational restrictions
- any depreciation and condition reports highlighting actions for planned (in whole or component parts) system replacement
- a clear detailed description of the correct and safe operation of the system
- the precautions to be taken in respect of any identified risks
- the checks to be carried out to ensure efficacy of the scheme and the frequency of the checks
- the remedial action to be taken in the event that the scheme is shown not to be effective

3. Planned maintenance procedures

Operational criteria

3.1. Water used in the water systems will utilise a Temperature Control Regime (as outlined in Health and Safety Executive (HSE) Approved Code of Practice (ACOP) L8/ Health and Safety Group (HSG) 274) with full temperature control as noted in Scottish Health Technical Memorandum (SHTM) 04-01 A and B to temperatures in the various parts of the water system as follows:

- Cold Water Service (CWS) must be stored or distributed to outlets at or below 20ºC
- Domestic Hot Water Service (DHWS) must be at or above 60ºC (at the flow point from heat exchangers/ vessels) as it enters the supply system and returns at no less than 50ºC (at the return point to heat exchangers/ vessels). The hot water temperature should be at least 55°C at the tertiary and sub-ordinate loops
- DHWS supplied to Thermostatic Mixing Valves (TMV) or other outlets must be at no less than 55ºC
- CWS supplied to TMV or other outlets must be at or below 20ºC

3.2. Special attention and escalation in writing to the relevant Authorised Person (AP) (Water) and Responsible Person (RP) (Water) is required where and when any of the above criteria cannot be met.

Note 6: Hot water (and hot surfaces) above 45°C present risks of scalding and burning.

3.3. Point-of-use (POU) Filters will only be installed and used under the direction of a documented policy decision by the Water Safety Group (WSG). For the duration of their use a maintenance programme will be implemented to manage and record the POU. filter change process. This maintenance programme will remain in place until a further documented policy decision by the WSG to remove POU. filters after microbiological sampling results have confirmed that the water system and outlets are safe to be taken back into normal operation.

3.4. Taps or other water outlets should not be installed if they will not be used regularly, that is, less than twice in a week.

3.5. Where taps or water outlets are not, or are unlikely to be, in regular daily use, Management Team Duty Holders and their staff should be alerted and reminded to flush these through and purge to drain, or purge to drain immediately before use, without release of aerosols. In all high risk clinical areas (as defined by the WSG) infrequently used taps should be flushed daily at the start of each day. The Maintenance Department and Designers have a responsibility to take steps to have the outlet removed and the resultant dead-legs

eliminated by taking out redundant branch pipework back to the circulating mains, removing the tee-piece and replacing with a straight coupling.

3.6. Management Team Duty Holders and their staff should also be alerted on awareness and actions to minimise the risk of *pseudomonas aeruginosa* and other similar harmful bacteria in the use of equipment, transmission routes and requirements (such as in the use of hand wash stations and wash basins).

3.7. Prior to taking a plant into use or at intervals not exceeding six months, all parts of the plant that become damp in normal use shall be disinfected following the procedure given below. This will include humidifiers (where installed), cooler batteries/ cooling coils, drainage systems and energy recovery devices.

3.8. All procedures must comply with the Health and Safety at Work etc. Act, Control of Substances Hazardous to Health (COSHH) Regulations and other subordinate legislation.

Table 3.1 - Maintenance schedules summary

Frequency	Item	Procedure	Description
Daily	Temperature Monitoring	ALL incidents logged on Form 004 and Building Energy Management System (BEMS) alarms incidents on 021	Incidents and Faults - BEMS monitoring and log of all alarms
Daily	DHWS Temperature Monitoring	Logged on Form 005A	Manual monitoring of main distribution lines where BEMS not installed or BEMS not operational. On small sites where BEMS is not installed, the WSG should assess the frequency of temperature checks.
Weekly	Water Quality	Logged on Form 027	Chloramine/ chlorine checks (initially weekly)
Weekly	Domestic Hot Water (DHW) Calorifiers	logged on Form 028	Manual change over and log of circulating pumps not on BEMS

Frequency	Item	Procedure	Description
Monthly	Temperature Monitoring	Logged on Form 005	**a.** Sentinel hot water locations **b.** Sentinel cold water (CW) taps **c.** Sentinel TMV taps **d.** DHW calorifier/ heat exchanger flow and return temperatures **e.** Potable Chilled Water heat exchanger flow and return temperatures
Monthly	Air Handling Plant	Logged on Form 022	Inspect, clean and log glass traps
3 Monthly	DHW Calorifiers, DHW and CW Storage/ Buffer Vessels	Logged on Form 006	Flushing of DHW calorifier(s) and Storage/ Buffer Vessel(s) drains associated with Hot/ Cold/ Chilled Water Heat Exchanger(s)
Annually (spread throughout the year)	Water System Sampling (at random water outlets) in High Patient Risk Areas.	As described in Section 23. Pre Flush sampling (as BS 7592: 2022) at sentinel and other randomly selected points.	Annual Water System Sampling in areas where patients may be most at risk. Sampling Results to be tabled at WSG Meetings.

Frequency	Item	Procedure	Description
Quarterly during periods of Change	Water System Sampling (at random water outlets in High-Risk Patient Areas) in Water Systems still serving High Patient Risk Areas.	As described in Section 23. Pre Flush sampling without disinfection (as BS 7592: 2022) at sentinel and other randomly selected outlet points in High-Risk Patient Areas.	In Water Systems serving multiple Wards or Departments, where during periods of change or decanting Section 7 Procedures may not be practical and there are still pockets of operational Wards or Departments with High Patient Risk areas - there will be Water System Sampling (following the protocols and any actions as described in Section 23) in areas where patients may be most at risk for the entire period of change or where there is reduced water use. Sampling Reports to be tabled at WSG Meetings.
Quarterly	Shower/ Spray Heads and Hoses (if applicable)	Logged on Form 005B	Dismantle, clean and de-scale/ or replace with new disinfected Shower Head and Hose
6 Monthly	Summer and Winter Temperature Monitoring	Logged on Form 003	**a.** CW at inlet to building block. Also to be continuously monitored by BEMS
6 Monthly	Water Tanks	Logged on Form 003	**a.** Tank stored and inlet temperature checks **b.** Tank inspection

Frequency	Item	Procedure	Description
6 Monthly	Air Handling Plant	Logged on Form 007	**a.** Humidity section inspection (if installed) **b.** Cooling section inspection **c.** Disinfection
Annually	DHW Calorifiers, DHW and CW Storage/ Buffer Vessels	Logged on Form 006	Drain and cleaning of DHW Calorifier(s) and Storage/ Buffer Vessel(s) associated with Hot/ Cold/ Chilled Water Heat Exchanger(s)
Annually	Temperature Monitoring	Logged on Form 005	**a.** Representative hot water taps **b.** Representative CW taps **c.** Representative TMV taps **d.** DHW calorifier flow and return **e.** BEMS graphs printout

Table 3.2 - Maintenance adhoc works summary

Other procedures	Record	Description
Short/ Limited Closure Record Form	Logged on Form 001	For a period not exceeding 30 days
Indefinite Closure/ Re-Occupation Record Form	Logged on Form 002	For periods exceeding 30 days
Incident Report Record Form	Logged on Form 004	For all incidents and resulting actions
Water Disinfection Risk Based Assessment Form	Logged on Form 023	For assessment for disinfection of systems after work or alterations
Checklist for New Water System Designs	Logged on Form 024	Checklist for designers
Flushing Water Outlets Record Form	Logged on Form 025	Record sheet for Estates Department use
Estates Chloramine Record Form (027) (where relevant)	Logged on Form 026	Record sheet for Estates Department use
Water Safety Control Log - Record Form	Logged on Form 027	For plant status, maintenance tasks and resulting actions
Acceptance of Work to be Conducted and Completed Record Form	Logged on Form 028	Record sheet for designers and Estates Department for alterations to existing and provision of new Water Systems

Temperature monitoring where BEMS is installed - P1C1

3.9. All hot and cold water systems fitted with BEMS monitoring and control devices should be set to give high priority alarms in the event of system failure and/or temperature variances out with alarm set points. Temperature monitoring devices shall be physically tested annually and recalibrated in accordance with manufacturers' instructions. Certification shall be held in the logbook. A register of calibrated sensors and equipment shall be held, and calibration dates and requirements will be added to the Pre Planned Maintenance (PPM) system.

3.10. All system failures and/or temperature alarms should be continually monitored 24 hours a day, with alarms being generated at Estate locations and by remote notifications of Estates staff (i.e. controls engineer or duty engineer and so on).

3.11. The Estates person carrying out the monitoring or being notified of an alarm condition should log all incidents in the Estates Incident Report Record Form (004) and also where appropriate in the Estates BEMS Record Form (021).

3.12. The incident should be investigated by the Estates staff and appropriate action taken (see Legionella Operational Procedures, SHTM 04-01 and Legionella ACOP L8/ HSG 274) and recorded in the Estates Incident Report Record Form (004).

Temperature monitoring where a BEMS is not installed or where the BEMS is not operational - P1CC1A

3.13. Check the flow and return temperatures at the flow point from heat exchangers/vessels and the tertiary and sub-ordinate loop temperatures on the DHW distribution system as defined in the local plan of the system being checked, using the temperature gauges fitted or a suitable surface temperature probe.

3.14. The flow temperature to be at least 60ºC and the return temperature at the heat exchangers / vessels to be no less than 50ºC. The hot water temperature should be at least 55°C at the tertiary and sub-ordinate loop monitoring points.

3.15. Record all temperatures daily on the Record Form (005A). On small sites where BEMS is not installed, the WSG should assess the frequency of when temperature checks are required.

3.16. Inspect CW tank and conduct temperature checks - P1C7 as per 3.7 below and record all inspection and temperatures on the Record Form (003).

The frequency of manual temperature checks and recording can be found in Table 3.3.

Table 3.3 - Frequency of manual temperature checks

Policy Generic Areas	Frequency for DHW System	Frequency for CW Systems
High Risk - Acute and Primary Care Premises, Hospitals and any premises concerned with the treatment of care of the elderly and susceptible immuno-compromised patients.	Daily	6 Monthly
Moderate Risk - **all** other Hospital clinical premises	Daily	6 Monthly
Moderate Risk - **all** other Non-hospital (health centres, clinics, and specialist clinical premises	Weekly	6 Monthly
Low Risk - **all** Non clinical premises	Monthly	6 Monthly

Water dosing systems - P1C2

(Applicable where chloramination disinfection is provided by the water authority)

3.17. If, under the Water Supply (Water Quality) (Scotland) Regulations as amended, the water across the Healthcare organisation area as supplied by the water authority is subject to a chloramination disinfection regime, sampling results of Healthcare organisation water systems shall be recorded in the Estates Chloramine Record Form (027). Sampling will be taken from a hot or cold water outlet point, representative of each secondary distribution pipework system. These will initially be conducted weekly and then subject to ongoing trend based frequency risk assessment, limited to no less than at once per month sampling test frequency. Frequency risk assessments shall be held in the Water Safety Logbook.

Should the water authority's disinfection regime across the Healthcare organisations change, then all CW tanks and any systems with water treatment dosing systems should be checked weekly in accordance with the manufacturers' recommended instructions as follows:

- the relevant AP (Water) should produce and implement local planned maintenance tasks in accordance with the manufacturers recommended instructions for the approval of the RP (Water)
- this and all maintenance tasks should be recorded in the Water Safety Logbook on Form (028)
- all water test readings should also be recorded on an appropriate record sheet

Manual changeover of circulating pumps - P1C3

3.18. Any plumbed-in duplicate circulating pump should be removed from the system. Where BEMS are not installed, and where removal of the duplicate pump is not practicable, the duty pump should be manually changed over a least once per week to reduce any danger of water stagnation. A spare pump should be kept for immediate replacement in the event of pump failure.

3.19. The relevant AP (Water) should produce and implement local maintenance tasks.

3.20. This and all maintenance tasks should be recorded in the Water Safety Log Book in Form (028).

Monthly temperature checks - P1C4

Sentinel temperature testing

3.21. Sentinel locations for hot water services (and any recirculating CW systems) are the return legs of principal loops on a recirculating system, as well as those identified long branches. For non-recirculating CW systems (or non-circulating hot water systems), they will comprise the nearest and furthest taps from the storage tank along with those identified long branches. The choice of further sentinel taps may also include other taps that are considered to represent a particular risk as determined by the WSG and the relevant manufacturer's instructions.

3.22. Check the temperatures at the sentinel locations as defined in the local plan of the system being checked:

- using a calibrated temperature probe, check the temperature of water from the CW tap does not rise above 20ºC after running the tap for 2 minutes. Where temperatures are to be taken from principal loops these will be taken by using a contact probe on the metallic surface of the pipework
- using a calibrated temperature probe, check the temperature of water from the hot water tap reaches 55ºC after running the tap for 1 minute. Where temperatures are to be taken from principal loops these will be taken by using a contact probe on the metallic surface of the pipework
- record all temperatures on Record Form (005)

3.23. Sentinel TMVs or Thermostatic Mixing Taps (TMT):

- check the temperatures at the TMVs/ TMTs on a sentinel basis as defined in the local plan of the system being checked. The system should achieve 55°C under normal use at the supply to the furthermost draw-off point in the circulating system
- using a calibrated temperature surface probe check that the temperature of water in the hot water pipework to the TMV/ TMTs reaches 55ºC after running the tap for 1 minute
- record all temperatures on Record Form (005)

3.24. DHW Calorifier(s) and Plate Heat Exchanger(s):

- check the flow and return temperatures on the DHW system as defined in the local plan of the system being checked, using the temperature gauges fitted or a suitable surface temperature probe
- the flow temperature to be at least 60ºC and the return temperature shall be no less than 50ºC at heat source
- record all temperatures on the Record Form (005)

3.25. Domestic Cold/ Chilled Water Heat Exchanger(s):

- check the flow and return temperatures on the domestic cold/ chilled water system as defined in the local plan of the system being checked, using the temperature gauges fitted or a suitable surface temperature probe
- the flow and return temperatures shall be no more than 20ºC
- record all temperatures on the Record Form (005)

Water glass trap drains on ventilation units - P1C5

3.26. Visually inspect condition of glass (borosilicate) drain trap assembly:

- top up glass trap assembly (to the marked level on the trap) with clean water if required
- dismantle, clean and descale any glass trap assemblies that are dirty and top up with clean CW (to the marked level on the trap)
- record checks Record Form (022).

DHW calorifier and storage/ buffer vessel(s) associated with hot/ cold water heat exchanger(s) flushing - P1C6

3.27. Flush each DHW calorifier or hot, cold or chilled water storage/buffer vessel through its drain valve by opening the drain valve 3 times, each time for a 3-minute period. The hose from the drain valve should be discharged to the nearest drain.

3.28. Record all actions on the top section of Record Form (006).

Water tank inspection and temperature checks - P1C7

3.29. Summer/ Winter Inspection of water tank as per Record Form (003).

3.30. Where the system has no BEMS temperature sensors connected the readings should be taken using a temperature sensor. The tank temperature should be below 20ºC.

3.31. Record all inspection and temperatures including the mains water supply at the building/block inlet on the Record Form (003).

Air Handling Unit Inspection - P1C8

3.32. Sodium Hypochlorite solution of strength 5 parts per million (ppm) will normally be used. The solution may be made up using Actichlor (or equivalent) tablets and mains tap water. This should only be done by personnel who have relevant training and the authority from the AP (Ventilation). Follow the instructions provided with the Actichlor, taking care to use appropriate Personal Protective Equipment (PPE):

- the Sodium Hypochlorite solution 5 ppm should be used without delay, normally within 2 hours of issue
- notify all persons working in those areas served by the plant to be disinfected
- switch off all ventilation systems containing devices to be disinfected
- close the plant isolating dampers
- open and remove the inspection covers/ access doors on both sides of the devices
- spray all internal surfaces of the humidifier section or cooler battery/ cooling coil with a 5 ppm chlorine solution until all surfaces are thoroughly wetted, also flood drip trays and drainage system with the same solution and allow to stand for a minimum of 2 hours
- spray all internal surfaces of the humidifier and cooler battery/ cooling coil with sufficient clean water to remove all traces of the chlorine solution from the device, its drip trays and drainage system
- restore the plant to normal operation

3.33. Record all actions on “Air Handling Unit Disinfection Record Form” (007) for each system.

Note 7: If any suspicion arises as to the possible contamination of the system then the microbiologist should be requested to take swab tests from all drain trays and cooler battery/cooling coil tubes and fins.

DHW calorifier(s) and storage/ buffer vessel(s) associated with hot/ cold/ chilled water heat exchanger(s), drain and clean - P1C9

3.34. Follow the manufacturers’ maintenance instructions (in Water Safety Logbook). Record all actions where applicable on the lower section of “Calorifier and Storage/Buffer Vessel Maintenance Record Form” (006) for each system:

- isolate DHW calorifier or hot, cold, or chilled water storage/ buffer vessel service valves
- heat any DHW calorifier or hot water storage/ buffer vessel up until the contents has reached 60ºC and hold at this temperature for a period of at least 1 hour

- drain DHW calorifier or hot, cold, or chilled water storage/ buffer vessel and remove inspection hatch
- examine the internal and external condition of the DHW calorifier or hot, cold or chilled water storage/ buffer vessel and pipework, any defects should be reported in writing to the relevant AP (Water)
- hose out the DHW calorifier or hot, cold, or chilled water storage/ buffer vessel to remove any debris, scale, or other deposit. Care should be taken to keep aerosols to a minimum
- if the DHW calorifier or hot, cold, or chilled water storage/ buffer vessel does not have an inspection hatch, the pipework at the top of the vessel should be disconnected to allow the insertion of a water hose to allow debris to be washed down off internal surfaces
- The safety valve should be checked, overhauled, and reset as necessary. The temperature, altitude, and pressure gauges to be checked for operation

3.35. On completion of examination and any repairs, the DHW calorifier or hot, cold or chilled water storage/buffer vessel should be re-constructed.

3.36. On completion of the DHW calorifier or hot, cold, or chilled water storage/ buffer vessel assembly, the following sequence must be undertaken:

- refill with CW
- drain the DHW calorifier or hot, cold or chilled water storage/ buffer vessel
- refill with CW, leave cold feed valve open
- run DHW calorifier or hot water storage/ buffer vessel at a temperature of 60ºC for at least 1 hour. Test the operation of high limit cut-out system if fitted. Check the temperature of the calorifier/vessel top and bottom with a surface thermometer
- adjust any controls as necessary

3.37. Take bacteriological samples, as specified by the WSG, from the DHW calorifier or hot, cold, or chilled water storage/buffer vessel drainage trap (where possible) and nearest and furthest outlet.

3.38. Record all actions on the Record Form (006).

Annual temperature monitoring - P1C10

Representative hot and cold taps

3.39. Check the temperatures at the hot and cold taps on a representative number of taps each month on a rotational basis as defined in the local plan of the system being checked:

- using a temperature probe check the temperature from the CW tap does not go above 20ºC after running the tap for 2 minutes

- using a temperature probe check the temperature in the hot water tap reaches 55ºC within running the tap for 1 minute
- record all inspection and temperatures on the Record Form (005). Add “Annual Monitoring Procedure” to the Comments/ Action box to clarify

BEMS data

3.40. DHW and CW system performance data is valuable for assurance and continuous improvement of Legionellosis risk control. Data should be reviewed by the AP (Water)/ Compliance Manager for the site with areas of non-compliance reported at each WSG meeting, as follows:

- produce a building management system (BMS) plot covering a typical week, for each DHW and CW system
- identify non-compliant systems and prioritise them for remedial actions by risk category
- repeat the plots on an annual basis and when there is a change for example change of use, engineering modifications, and so on
- maintain hard copy and/ or digital records in the Water Safety Logbook

Shower head and hoses replacement - P1C12

3.41. Planned Shower Head and Hose replacement Programme conducted 3 monthly in High-Risk Areas and as required elsewhere, but undertaken at least once per annum, as follows:

- remove the shower head and hose assembly. Place shower head and hose assembly into a plastic bag and seal
- check that the new clean disinfected head and hose package is intact
- open replacement new clean disinfected shower head and hose assembly sealed packaging, remove and fit following the manufacturer’s instructions
- Ensure the length of shower head hose is as short as possible, is adequately clipped and cannot syphon water from the shower tray
- run water and flush for 3 minutes in accordance with Legionella Risk Assessment in such a way as to avoid the creation of aerosols
- check final temperature for compliance and working order and return shower appliance to use
- return redundant sealed bag with shower head and hose assembly to workshop for disposal in accordance with Waste Procedures
- record all actions on the Record Form (005B)

4. Procedure for DHW system following plant failure, allowing system water temperature to drop below control levels

4.1. This escalation procedure should be employed if the Calorifier or Plate Heat Exchanger outflow temperature falls below 45ºC.

4.2. Table 4.1 should be used to decide on the actions necessary in the event of a plant breakdown such as power failure or steam supply failure.

Table 4.1 - Decision Table for Hot Water System Breakdown for High Risk Category

Breakdown leading to temperature <45ºc, lasting for	Action
<12 hrs	Verify*
>12 hrs	Thermally pasteurize/ Chemically disinfect**
>24 hrs	Thermally pasteurize/ Chemically disinfect
>72 hrs	Thermally pasteurize/ Chemically disinfect

Table 4.2 - Decision Table for Hot Water System Breakdown for Significant Risk Category

Breakdown leading to temperature <45ºc, lasting for	Action
<12 hrs	Verify
>12 hrs	Verify
>24 hrs	Thermally pasteurize/ Chemically disinfect
>72 hrs	Thermally pasteurize/ Chemically disinfect

* Verify action - Ensure that normal temperature performance has been resumed, such as 60ºC.

** Chemically disinfect action - Calorifier or plate Heat Exchanger and complete distribution system.

Table 4.3 - Decision Table for Hot Water System Breakdown for Moderate Risk Category

Breakdown leading to temperature <45ºc, lasting for	Action
<12 hrs	Verify
>12 hrs	Verify
>24 hrs	Verify
>72 hrs	Thermally pasteurize/ Chemically disinfect

4.3. In the event of a reduction in domestic hot water (DHW) temperature the Authorised Person (AP) (Water) should be notified in writing as soon as possible. The reason for failure must be identified and rectified as soon as possible.

4.4. The AP (Water) shall notify the Duty Holder and users on the failed system that they must not draw off any hot water from the affected services until further notice.

4.5. The relevant Duty Holder shall ensure that their staff and Water Safety Groups (WSG) members are aware of the situation, and that they in turn shall prevent use of the affected services.

4.6. Where thermal pasteurisation is to be carried out, the temperature of the calorifier or plate heat exchanger shall be raised to 70ºC, and the water shall be circulated throughout the affected distribution system for at least one 1 hour. Each tap or appliance should be run in sequence until full temperature is achieved (this should be measured). To be effective the temperature in the calorifier or plate heat exchanger should be high enough to ensure that all distribution outlets receive water at a temperature of greater than 60ºC. Ensure the return flow to the calorifier or plate heat exchanger is no less than 50ºC.

4.7. The AP (Water) shall inform users that the system is back in operation.

4.8. Bacteriological samples should be taken in consultation with the Infection Prevention and Control Team (IPCT).

4.9. The AP (Water) shall complete an Incident Report Record (004) and ensure the Responsible Person (RP) (Water) is notified in writing as soon as possible. Maintain hard copy records in the Water Safety Logbook.

5. Procedures for cold water tanks following the identification of water temperature above 20°C

5.1. Drinking water, to a relevant water quality under the Scottish Water Byelaws, is provided by Business Stream, a Licensed Provider (LP), which works with Scottish Water to make sure that the water supply is connected properly, and that the water is clean and ready to use.

5.2. These obligations cover the supply network up to the boundary point (normally the meter point). Thereafter obligations rest with Healthcare organisation. Currently there is no legal maximum water supply temperature from the LP. In practice the water supply temperature to boundary point will be subject to seasonal variation. In winter this would normally be expected to be within the 5 to 10ºC range and in summer up to 20ºC.

5.3. The following staged risk assessment escalation procedure should be employed where the water temperature in Cold Water (CW) Storage Tanks is greater than 20ºC. (such as the water storage tanks for Domestic Cold Water Systems and for Domestic Hot Water (DHW) Systems).

5.4. **Stage 1** - Verification:

- where tepid CW occurrence (such as more than 20ºC) is reported from any number of CW outlets, from maintenance procedures, from Building Energy Management System (BEMS) monitoring, or from the manual monitoring of storage tanks, the person identifying/ making a report must notify the relevant Authorised Person (AP) (Water) as soon as possible and confirm this in writing within 24 hours
- the AP (Water) should liaise with the person identifying the problem and verify the problem by independently rechecking the water temperature of the appropriate Cold Water Storage Tank (CWST), the temperature of the incoming mains CW at the site boundary point/ building entry point and the outflow distribution temperature
- if the CWST temperature is confirmed greater than 20ºC, then the AP (Water) should record this in writing as well as conducting continuous monitoring of the incoming CW mains, the CWST, and the outflow temperatures to establish the temperature profiles and in more detail over at least a one-week period to determine the level of risk
- the AP (Water) should also review and take into account the recent water system history specifically to include any water sampling carried out; system monitoring data, including temperature monitoring and water quality chlorine or chloramine checks; recent maintenance history; recent alterations, changes or additions to the water system; and any other changes made by Duty Holders or users of the water system

- on reviewing continuous monitoring temperature profiles, in conjunction with Water Safety Logbook and recent history, action as Stage 2 or Stage 3 or Stage 4 as appropriate. The AP (Water) will ensure the Responsible Person (RP) (Water) is notified immediately in writing at each Stage and also recorded in the Water Safety Logbook

5.5. **Stage 2** - Initial Action - high incoming mains CW temperature:

- where the incoming mains CW is 18ºC or greater for more than a 48-hour period the RP (Water) should contact Business Stream the LP, who will work with Scottish Water to establish the reasons and determine a resolution. Continuous monitoring should continue and recorded in the risk assessment

5.6. **Stage 3** - water temperatures fluctuating above and below 20ºC (but no greater than 25ºC):

- where water temperatures are fluctuating above and below 20ºC in a regular cyclic manner over 72 hour periods in response to regular user water demand (but no greater than 25ºC) and are more than 2ºC higher than the incoming CW mains supply temperature at the building entry point, then continuous monitoring should be continued by the AP (Water), the reason(s) for failure(s) identified and rectified as soon as possible. This should be recorded by updated risk assessment (specifically in relation to the patient risk rating - where there may be increased risk and appropriate actions may be required to mitigate exposure)
- Considerations for failures include:
    - accuracy of temperature sensors (requiring recalibration
    - temperature sensors being located in water (requiring reposition where tank storage levels have been reduced and sensor no longer sensing stored water)
    - inappropriate standby tank configuration
    - temperature sensor in standby system
    - temperature sensor measuring stagnation (requiring reposition)
    - inappropriate siting (not in a cool location)
    - heat gain to the tank and pipework (due to lack of appropriate insulation or located close to heat gain from other heat sources)
    - storage capacity not minimised to match daily use (changes in user water demand)
    - ingress of hot water through cross connection or mixing valve failure (such as from DHW system or Steam systems)

5.7. **Stage 4** - water temperatures fluctuating above and below 25ºC (and rarely below 20ºC):

- in this situation continuous monitoring should be continued by the AP (Water), the reason(s) for failure(s) (as Stage 3) identified and rectified on an urgent basis. This should be recorded by updated risk assessment (specifically in relation to the patient risk rating – where there will be an increased risk and appropriate actions will be required to mitigate exposure)

- in this situation a permanent solution, such as ventilation for the plant room, or changing the water storage arrangements, or forming a circulating distribution system (with or without chilling depending on the circumstances) should be implemented
- the AP (Water) should, unless instructed in writing to the contrary by RP (Water)
- arrange to drain the tank contents and clean if necessary
- inform the users of the failed system that they must not draw off any CW (and hot water if a single DHW header) from the affected system until further notice
- chlorine (or other suitable) disinfection of the tank and distribution system shall be carried out; Refer to Scottish Health Technical Memorandum (SHTM) 04-01: Part D: Disinfection of domestic water systems
- thereafter the tank shall be brought back into service
- then the users shall be informed that the system is back in operation

5.8. The AP (Water) shall complete an Incident Report Record Form (004). An entry should also be made in the Water Safety Logbook and ensure the RP (Water) is notified in writing as soon as possible.

5.9. Water systems should be cleaned and disinfected under the circumstances in Table 5.1.

Table 5.1 - Circumstance Requiring Cleaning and Disinfection

System/ Service	Circumstance Requiring Cleaning and Disinfection* (* for disinfection check current Risk Assessment)	Frequency
Domestic CW and DHW Tanks	New installations.	As required
	Re-commissioning empty/ unused tanks.	As required
	Tank temperature exceeds 25˚C. (check with Risk Assessment).	As required
	Tank contains moderate sediment, such as a complete covering of tank base.	As required
	Evidence of tank corrosion (check with Risk Assessment).	As required
	Gross organic contamination for example large number of dead insects, feathers, animal or bird bodies and so on.	As required
	Regular program for high-risk healthcare category, with disinfection* where identified in the local Written Scheme (check with Risk Assessment).	Annually
	Regular program for medium risk healthcare category, with disinfection* where identified in the local Written Scheme (check with Risk Assessment).	2 Yearly
	Regular program for non-healthcare premises, with disinfection* where identified in the local Written Scheme (check with Risk Assessment).	5 Yearly
Domestic CW Distribution System	New installations and modifications or additions.	As required
	Temperature exceeds 25˚C. (check with Risk Assessment).	As required
	Any contamination of tank (by organic, by vermin or vermin faeces or similar).	As required
	Gross organic contamination for example large number of dead insects, feathers, animal or bird bodies and so on.	As required

System/ Service	Circumstance Requiring Cleaning and Disinfection* (* for disinfection check current Risk Assessment)	Frequency
DHW Calorifier and Storage/ Buffer Vessels	New installations and modifications or additions. Temperature has fallen below 45°C. Re-commissioning of empty/ unused plant. Any contamination of header tank (by organic, by vermin or vermin faeces or similar). Regular program.	As required As required As required As required Annually
DHW Distribution System	New installations and modifications or additions. Temperature has fallen below 45°C. Any contamination of header tank (by organic, by vermin or vermin faeces or similar).	As required As required As required
Air Handling Units	Any contamination (by organic, by vermin or vermin faeces or similar). Gross organic contamination e.g. large number of dead insects, feathers, animal or bird bodies and so on. Chiller battery, drip trays and drainage pipework.	As required As required 6 monthly

6. Protection of maintenance personnel

6.1. The disinfection procedures presented for cold water (CW) storage tanks, domestic hot water (DHW) vessels and water systems are designed to minimise the risk to staff and others that may come into contact with water which may have been contaminated with *Legionella* spp or other harmful bacteria. In all instances of draining, water should be drained in such a way as to avoid the creation of an aerosol.

6.2. Appropriate protective clothing should be worn during such procedures. This could be a powered filter and hood, European Class TH3 (assigned protection factor of 40) or a power assisted filter and close fitting full face mask TM3 (assigned protection factor 40). It should be borne in mind that the filter on these systems is liable to get wet and subsequent resistance to air can increase with consequent discomfort to the operator.

6.3. Where possible, cleaning methods which create an aerosol (for example high-pressure water jets) should be avoided. If this is not possible, the operation should be executed when the building is unoccupied or, in the case of permanently occupied building, windows in the vicinity should be closed and air inlets temporarily blanked off. As systems requiring cleaning will have high organic load the operator and others closely involved should wear suitable respiratory protective equipment along with any other Personal Protective Equipment (PPE) identified in the risk assessment for the task.

6.4. If plant is located in confined spaces, reference on entry into confined spaces can be sought from Safe Work in Confined Spaces Approved Code of Practice (ACOP), Regulations and Guidance (L101), and Healthcare organisation's Confined Space Entry procedure. Personnel shall not be permitted to enter any water storage system (such as tank, calorifier, Air Handling Unit (AHU)) without working to the Healthcare organisation safe system (including a permit to work) for access or work.

6.5. Because water treatment chemicals, including chlorine-containing chemicals and solutions, are often toxic or corrosive they should be used cautiously to ensure that they do not endanger the users or other occupants of the building. Caustic resistant gauntlet type gloves will be required. Water treatment should be carried out by, or under the direction of, people who are suitably competent (qualified and experienced).

6.6. The use of water treatment chemicals should be subject to a Control of Substances Hazardous to Health (COSHH) assessment in advance and permission would be required from the Water Authority prior to any discharge to sewers, storm water drains and watercourses.

Note 8: Scottish Water and Scottish Environmental Protection Agency (SEPA) should always be contacted prior to direct discharge to watercourses.

Safe purging of stagnant water

6.7. Stagnant water may potentially contain large concentrations of Legionella bacteria. In order to avoid Legionellosis and water safety risks, precautions must be taken to avoid the creation of aerosols and to avoid the exposure of people to any unavoidable aerosols.

6.8. The specific precautions may vary according to the particular circumstances, but typically include:

- work on or removal of dead-leg pipework
- running a hose from the outlet into a container of clean water
- running hoses directly into a drain cover
- running fire hoses at a distance from occupied buildings
- testing fire mains or fire suppression systems
- closing windows and air conditioning/ ventilation intakes where aerosols are created outdoors
- closing windows and air conditioning/ ventilation intakes where excavations and soils removal is conducted outdoors
- wearing respiratory protective equipment (remember this does not protect nearby members of the public and others who are not wearing masks)

Note 9: Care should be taken at all times to avoid the risk of contamination by the possibility of back siphonage into mains water supplies.

7. Procedure in the event of ward or department closures

Background

7.1. Where a ward or department is planned to close for a period of greater than 7 days, the Duty Holder must ensure that the manager of that department/ ward has notified the relevant Authorised Person (AP) (Water) of the details so that the impact on the safety of the water system can be evaluated.

7.2. Following a decision to close a ward/ department, full collaboration between the ward or department manager and the AP (Water) must take place to assess the risks and ensure that relevant safety procedures are established to mitigate the risks of exposure to *Legionella, Pseudomonas Spp* and other similar harmful bacteria. The documented procedures shall clearly define responsibilities and the actions named individuals shall perform, including record keeping.

7.3. The period of closure should be established at the earliest point in negotiations as the duration can play an important part in assessing the likelihood of exposure to *Legionella, Pseudomonas Spp* and other similar harmful bacteria, the cost implications and the arrangements involved in closure.

Short/ limited closure

7.4. Where a short term or limited closure of a ward/department is required (typically not exceeding 30 days) a nominated, competent, individual shall be identified to run every tap for three (3) minutes and to flush every toilet at least on a twice weekly basis or as per the Water Safety Groups (WSGs) flushing risk assessment. The nominated individual should then complete the Record Form (001), signed by themselves and their relevant manager, the completed form being forwarded to the Estates Department for the attention of the AP (Water).

7.5. Before the department/ ward is re-occupied the Estates Department shall organise an inspection and tests (as agreed by the WSG) of the water systems and report its condition to the AP (Water) for any remedial works that may be required.

Indefinite closure

7.6. When a ward/ department is to close with no planned re-opening date, or where the closure period typically exceeds 30 days, the WSG must be notified of closure and the water risk assessment (RA) updated as necessary. The Estates Department must be consulted and provided with funding in order to alter or disconnect and drain the relevant water services 'so far as is reasonably practicable'. The department or ward manager should be aware that considerable cost for modifications could be needed to achieve this requirement in some large properties with multiple wards/ departments being served by the water system. The top section of Record Form (002) shall be completed "Indefinite Closure - System removed from operation from (the date closed)" by the AP (Water).

Detail of works for an indefinite closure (where relevant)

7.7. All water tanks associated with the affected area shall be drained, cleaned, dried out, and removed when possible. If the tanks remain empty the seals may become dry and crack, a risk assessment should be undertaken about retaining these. Other system components may also require risk assessed if to be retained.

7.8. All pipework and devices shall be drained and domestic hot water (DHW) calorifiers (or other storage vessels) shall be opened up, cleaned, and left open to the atmosphere.

7.9. To avoid dead-legs, pipework shall be disconnected from the mains services and tees replaced with straight couplings. Mains cold water services (CWS) shall be isolated at the mains, capped off from the system and all relevant pipework drained.

7.10. Notices shall be posted throughout the affected department or ward area stating that all water services are disconnected, along with notices on the tanks and vessels.

7.11. The Estates Department shall be responsible for ensuring that an adequate water seal exists in unused toilets etc. to prevent odours from the foul drain system entering the premises.

Re-occupation of an indefinitely closed area

7.12. In the event of re-occupation of an indefinitely closed department or ward, discussions must take place between the WSG, ward/department manager and the Estates Department prior to the re-occupation exercise. With regard to disinfecting the system, refer to Scottish Health Technical Memorandum (SHTM) 04-01: Part D: Disinfection of domestic water systems.

7.13. The Estates Department will require the following information:

- the planned re-opening date
- any proposed changes in use of the department or ward
- any areas which will not be used
- the approval of the AP (Water) in advance

7.14. The Estates Department will provide the department/ ward manager with a cost to put the water systems back in service.

7.15. Before the water system is put back into service, any necessary modifications and maintenance shall be carried out prior to cleaning and disinfecting the system. With regard to disinfecting the system, Refer to SHTM 04-01: Part D: Disinfection of domestic water systems.

7.16. The bottom section of Record Form (002) shall be completed at re-occupation and operation from (the date re-occupied)" by the AP (Water).

8. Occupation after alterations to water systems including refurbished and new premises - safe operation of water systems

Procedure until occupation

8.1. This procedure is designed to minimise the risks from Legionellosis and other water borne pathogens developing during alterations to water systems, and post-completion. The procedure covers new buildings and refurbished facilities, and incorporates the interim periods following system alterations, including construction, commissioning, and interface activities with the Authorised Person (AP) (Water) for managing handover and occupancy.

8.2. In design and build type contracts - outbreaks of Legionnaires' disease have been encountered, whereby the client did not retain a clerk of works on site and/ or where there was no 'commissioning' period on completion of the work. It is vital that the measures outlined in Scottish Health Technical Memorandum (SHTM) 04-01 have been implemented immediately before re-occupation.

8.3. Disinfection and cleaning shall be in accordance with:

- SHTM 04-01 Part A: Testing and Commissioning
- SHTM 04-01 Part E: Alternative materials and filtration

8.4. Once the system has been cleaned and disinfected prior to hand over, an AP (Water) shall be nominated to monitor and observe the system until it has been commissioned and handed over. The AP (Water) shall ensure that the system is operated in accordance with Healthcare organisation's 'procedure for ward/ department closure - short/ limited closure' and the relevant Record Forms (001) completed.

8.5. At the point of hand over all relevant information written on operating the system, system performance, together with accurate 'as-fitted' drawings and design criteria of the domestic hot water (DHW) systems and cold water services (CWS) shall be submitted to Healthcare organisation (such as an appropriate current Written Scheme, accepted in writing by the relevant AP (Water)).

8.6. Full operation of the system and occupancy of the building/ property should be as soon after hand over as possible to reduce the potential of Legionellosis and other water safety risks and avoid further costs being incurred due to any further re-disinfection of the water systems.

Residential accommodation owned or leased by Healthcare organisation NHS board

8.7. This sub-section applies to domestic residential properties served by individual water systems. Where domestic residential properties share a common water system, the procedures for the larger premises apply.

8.8. Healthcare organisation recognises its obligations as a provider of residential accommodation. In practical terms it fulfils these by routine maintenance actions/ checks immediately prior to the occupation of a domestic residential dwelling by a new tenant and by the provision of information to the new tenant.

Maintenance actions/ checks prior to occupation by tenant

8.9. Whenever the expected time delay between vacation of accommodation by one tenant and occupation by the next is greater than one week, the following actions should be taken where appropriate.

8.10. A member of the Estates staff visits the accommodation unit within one week prior to occupation. The following actions are taken, in the order stated:

- the hot water is switched on
- all WCs are flushed twice (one full flush where dual flush type WCs)
- the CW storage tank, where present, is checked for contamination for example microbiological growth, the presence of organic debris or live organisms such as insects. In the event of discovering such contamination the Estates Officer shall arrange tank cleaning and disinfection.

8.11. The remaining actions below are not undertaken until the cleaning and disinfection of the tank is complete;

- each water outlet is run for three minutes, creating as little aerosol as possible
- the shower head is removed, and the shower hose run under water for three minutes
- the hot water system is left switched on
- any defects are reported to the Estates Officer and wherever possible, rectified prior to tenant occupation

Note 10: These actions apply to accommodation served by either a conventional hot water system or a combination boiler.

Provision to inform new tenants

8.12. Healthcare organisation can influence but not control the actions of its domestic tenants. It exerts its influence by the provision of the following guidance as part of the general information pack as provided to new tenants.

"The water systems in this accommodation have been prepared by the Estates Department in such a way as to protect water hygiene. Personal health and safety can be protected by:

- ensuring that all outlets are used regularly (preferably once per week) or run for a couple of minutes per week to keep water fresh
- reporting any water system defects, such as hot water temperatures failure or dirty drinking water, to the Estates Department as soon as possible"

9. Domestic hot water systems

9.1. The default hot water treatment method used by Healthcare organisation is that of the Temperature Control Regime (as outlined in Health and Safety Executive (HSE) Approved Code of Practice (ACOP) L8/ Health and Safety Guidance (HSG) 274) with full temperature control as advocated in Scottish Health Technical Memorandum (SHTM) 04-01.

9.2. Should an alternative water treatment regime be sought, the onus shall be on Healthcare organisation to establish the efficacy of the system in its control of Legionella and water safety for each site, this shall be in the form of a trial to establish: a control level;

- the ability to achieve that control level
- the assurance that the control levels will be maintained
- develop a Written Scheme for operation and control

Information on alternatives can be found in SHTM 04-01: Part D: Disinfection of domestic water systems and HSG 274 Part 2.

9.3. With regard to scalding risk Healthcare organisation will ensure that all that is reasonably practicable will be done to follow the requirements of the Safe Hot Water and Surface Temperature guidance in SHTM 04-01.

Hot water storage and distribution temperatures

9.4. The storage of domestic hot water (DHW) should be arranged to ensure that a water outflow temperature of at least 60ºC is achieved. Through periodic monitoring operational system performance, the system outflow temperature should be set to over 60ºC to ensure an outflow of 60ºC is achieved under normal draw-off demand and achieve 55°C at the supply to the furthermost draw-off point(s) in the circulating system.

9.5. Periodic performance monitoring and a system of continuous monitoring and recording of water temperatures via a building energy management system (BEMS) or data logger is essential to ensure compliant system performance.

9.6. Storage should be calculated on the requirements of peak demand and the rate of heat input. The outflow water temperature at peak flow rates should not be less than 60ºC.

9.7. The interval between peak periods is important, as it affects the recovery time. See Chartered Institution of Building Services Engineers (CIBSE) Guide G: ‘Public health engineering’, which gives guidance on sizing hot water storage.

9.8. Under no circumstances should the DHW flow temperature fall below 55ºC.

9.9. It is recommended that disinfection by pasteurisation is undertaken if the water temperature of the calorifier falls below 45ºC.

9.10. A minimum DHW circulation (return) temperature of 55ºC shall be maintained during the hours of occupancy.

Water temperature check (including cold water outlets)

9.11. Temperature checks on calorifiers and distribution systems should be carried out on a monthly, quarterly, six-monthly, and annual basis. In the event of non-compliance, both the Authorised Person (AP) (Water) and the Responsible Person (RP) (Water) should be informed as soon as possible. Use of a digital thermometer with a touch and immersion probe is recommended.

9.12. Although the HSE recommends spot temperature checks, continuous monitoring and recording may be necessary in certain circumstances to ensure calorifier storage meets the requirements of peak demand and the rate of heat input.

Calorifier operation

9.13. Calorifiers are to be run 24 hours per day, 7 days per week, with the DHW circulation pump kept running. Should it be necessary for interrupted operation or shutdown overnight, then the calorifier should be allowed to maintain its water storage temperature and the DHW pump should be started up to ensure full temperature throughout the distribution system for at least one hour prior to occupation of the premises.

Plate heat exchangers

9.14. Plate heat exchangers and any associated storage/buffer vessels are to be run to the same temperature regime as calorifiers. The large contact area and lack of dead spots should ensure good kill of Legionella bacteria.

9.15. In the event of a plant failure the water outflow temperature will quickly fall below 60ºC and it may be necessary to apply Section 4 - “Procedure for DHW systems following plant failure, allowing system water temperature to drop below control levels”.

Domestic Hot Water circulation pumps

9.16. Domestic hot water circulation pumps should perform in such a way to ensure a minimum water circulation (return) temperature of 55ºC.

9.17. Where possible, any plumbed-in duplicate circulating pump should be removed. Where this is not practicable, the duty pump should be manually changed over a least once per week to reduce any danger of water stagnation. It may be more efficient to utilise an auto-changeover system. A spare pump should be kept for immediate replacement in the event of pump failure.

Stratification checks

9.18. DHW storage vessels and any associated storage/buffer vessels should be subject to water temperature stratification checks every two years for each calorifier/ vessel. These checks should extend over a period of seven (7) days using a logging device. Logging should also be used where de-stratification pumps have been fitted to establish that such a pump will ensure that the water temperature at the base of the vessel achieves 55ºC.

Quarterly flushing

9.19. Each calorifier and any associated storage/buffer vessels should be flushed quarterly through its drain valve by opening the drain valve 3 times, each time for a 3-minute period.

9.20. Calorifier and any associated storage/buffer vessels flushing should be carried out after temperature checks on the calorifier and system have been completed. Record Form (006) should be completed.

Table 9.1 - Hot Water Services Routine Inspection and Frequency Table

Task	Frequency
Arrange for samples to be taken from hot water calorifiers, in order to note condition of drain water (to be recorded on form 006).	Quarterly
Visual check on internal surfaces of calorifiers for scale and sludge. Clean and disinfect. Check representative taps for temperature as above on a rotational basis (to be recorded on form 006).	Annually
Check temperatures in flow and return at calorifiers (to be recorded on form 005).	Monthly
Check water temperature up to one minute to see if it has reached 55ºC in the sentinel taps (to be recorded on form 005).	Monthly

10. Cold Water Systems

Cold Water cisterns and cold feed tanks

10.1. All new domestic cold water (CW) storage cisterns and tanks shall comply with the requirements of the Scottish Water Byelaws. specific to the design and installation of Unplasticised polyvinyl chloride (PVC-U) pipework systems are contained within this section. These are in addition to the general requirements outlined within Section 2.

10.2. The Water Supply (Water Fittings) (Scotland) Byelaws 2014 and relevant parts of British Standard (BS) EN 806 and BS 8558 specify minimum standards for CW storage cisterns to ensure that the stored water is retained at a wholesome standard suitable for domestic use. It is necessary to minimise stagnation and stratification of the stored water. A nominal 12 hours' total on-site storage capacity is recommended. The quantity of the water stored should be carefully assessed in relation to the daily requirement so that a reasonable rate of turnover is achieved. The storage capacity should be reduced where it is known or established that it is excessive and where it is practicable to do so.

Note 11: Care must be taken in the ventilation of water tank rooms to avoid condensation and mould growth. This requires particular attention in basement tank rooms where colder building surfaces can coincide with high specific air moisture content.

10.3. Duplicate tanks often create a risk of water becoming stagnant in one of them, leading to risk of Legionella, Pseudomonas Spp or similar contamination. Consideration should be given to taking one of the tanks out of service.

10.4. All CW storage tanks are to be examined and the temperature tested on a regular summer/ winter six monthly cycles and cleaned on an annual basis as required (on Procedure P1C7 - recorded on Form (003).

10.5. Temperatures in CW storage tanks and the mains inlet to them should be checked during periods of high ambient temperatures (for example summer afternoons between June and August). Water temperatures should be less than 20ºC. At the same time, the furthest and nearest draw off points in the system should be checked to ensure that the water distribution temperatures are less than 20ºC within 2 minutes of running the water (at full flow). A similar temperature check regime should be undertaken during the winter months to identify the performance of CW distribution systems and the impact of heat gain from heating systems. This should include ceiling radiant/ heating panels and associated pipework. Insulation installation should also be checked.

Cold water services - pressurisation/ supply pumps

10.6. Where two or more pumps have been fitted for pressurisation systems, the lead pump shall be changed over at least once a week in order to avoid water stagnation.

10.7. Dates and times of the pump changeover should be recorded in the Water Safety Log Book (on Safety Control Log - Record Form 028). Printouts of regimes for automatic systems will be adequate.

10.8. Where pumps have not been in service for a period of four weeks or greater, or have been removed for any reason, the pump and associated pipework shall be thoroughly washed out and disinfected before being brought back into service. Disinfection of pumps shall be as per the boards accepted method an in line with BS 8558 and PD855468. Incident report Record Form (004) shall be completed giving details of why the pump was out of use.

Tank cleaning procedures

10.9. Healthcare organisation staff or contract staff shall not be permitted to enter any water storage system (such as tank, calorifier, AHU) without working to the Healthcare organisation safe system (including a permit to work) for access, or work or if they are suffering or have recently suffered from any gastric or other communicable illness, or a condition which may result in their increased susceptibility to Legionellosis, Pseudomonas Spp and other similar harmful bacteria. It is the responsibility of the individual to inform the supervisor immediately if applicable.

10.10. The relevant Authorised Person (AP) (Water) shall notify all users of the proposed line of action, and of any disruption or modification to service.

10.11. All equipment and tools to be employed during the cleaning and disinfection process must be dedicated only to this task - this will include hire equipment. All equipment should be disinfected in a high concentration of chlorine solution prior to commencement of the process.

10.12. The Process Steps:

1. isolate and shut down the CW storage tank and remove the cover or inspection hatch. The operator shall display warning labels in and around the plant room stating disinfection in progress
2. permission must be obtained from Scottish Water before dumping the tank contents. The Water Authority will need to be informed of the volume to be discharged. Any further quantities of disinfected/ chlorinated water that are to be dumped as a result of tank cleaning should be included

3. the tank shall be examined visually for signs of damage, corrosion, debris and biological growth. The water storage temperature and any such defects identified are recorded for report to the Estates Department
4. tank cleaning shall be performed using non-abrasive cleaning materials
5. protective clothing, footwear, face goggles and masks (where applicable) are to be employed. These items must be specific to the task of cleaning and chlorination, and must not have been used for other activities
6. where tanks are to be painted, only paints or coatings and materials that are recognised and approved by the Water Research Centre (WRc)/ Water Regulations Advisory Scheme (WRAS) and detailed in "The Water Fittings and Materials Directory" shall be employed. The specification for any such product must be submitted to the AP (Water) or their nominated deputies for their approval prior to use;
7. details of all cleaning and painting materials shall be listed on Record Form (003);
8. on completion of the cleaning/ painting exercise, and after the necessary paint maturing period (if required), the tank shall be thoroughly flushed and washed out with water, refilled to the tanks normal working level and dosed to a level of 50 parts per million (ppm) free residual chlorine. The tank shall be left to stand for a period determined by the potential of hydrogen (pH) and as per BS 8558 and PD855468 (minimum period of one hour). During this period the level of free chlorine shall be monitored and maintained at 50 ppm
9. on completion of the tank chlorination period, the tank contents shall be neutralised and discharged as previously detailed in (b) above. The tank is then refilled to its normal operating level with fresh water. The free chlorine level in the tank water shall be monitored until it matches that of the incoming water supply
10. on completion of this exercise the tank shall be put back into service immediately, and water samples taken for analysis - A sample of water should be taken using sterile bacteriological techniques for deposit and examination at a United Kingdom Accreditation Service (UKAS) accredited laboratory
11. the Total Viable Count (TVC) and Legionella Sampling and Test Protocol are detailed in Scottish Health Technical Memorandum (SHTM) 04-01 Part B and Part C. As described, sampling must follow that set out in BS 7592: 2022 Code of Practice and BS EN ISO 5667-1: 2008 on Water Quality Sampling. Those organising sampling must make clear in advance which water quality technique is to be undertaken in order that systematic conclusion on risk can be drawn

12. for initial water system sampling take a Post-Flush sample (as defined in BS 7592: 2022) at sentinel points without disinfection. Where there is an initial concern with a particular outlet location - say, a combined system and outlet problem - a BS Pre-Flush sample should be taken. If concerns persist with an outlet location (typically, a known dead-leg issue or lack of, or low, water use, a further BS Pre-Flush sample should be taken followed by disinfection before a BS Post-Flush with disinfection sample. Water should be allowed to run hot for 1 minute and cold for 2 minutes by which sampling would be temperature calibrated;

Note 12: Samples following SHTM 04-01 Part C, taken for Legionella must be in a 1 litre container, available from the Microbiology Laboratory.

Sampling in accordance with BS 7592:2022. Container must contain neutraliser. Legionella samples must be stored and transported at ambient temperatures and within 48 hours max. All other organisms in temperature controlled environment 5 - 20°C and within 24 hours.

13. on receipt of analysis results, these shall be submitted to the AP (Water). The assistance of Infection Prevention and Control Team (IPCT) may be required to aid with the interpretation of the results, and the identification of remedial actions if necessary
14. on completion of the tank cleaning or inspection exercise, it is recommended that details should be entered onto a tank cleaning record label to be posted on or adjacent to the tank. Such a label must be robust, and able to withstand contact with water
15. details of findings, actions taken, and test results are to be entered onto the Water Storage Tank Maintenance Record Form (003). Chlorination certificates are to be obtained and be retained in the Water Safety Logbook

Note 13: Any defect shall be reported immediately to the AP (Water) or Nominated Deputies.

16. once a system has been filled Healthcare organisation and/ or their Contractors will not drain that system unless full disinfection is to be undertaken before the system is brought into use again. The only exception is in the case of an emergency and with the consent of the IPCT.

Table 10.1 - Cold water services (CWS) routine inspection and frequency table

Service	Task	Frequency
Cold Water tanks	Check tank water temperature remote from water level control valve and mains temperature at ball valve. Note maximum temperatures recorded by fixed maximum thermometers where fitted (to be recorded on form 003).	Six monthly
Cold water tanks	Check that temperature is below 20ºC after running the water for up to two minutes in the sentinel taps (to be recorded on form 005).	Monthly
Cold water tanks	Visually inspect CW storage tanks and carry out remedial work where necessary. Check representative taps for temperature as above on a rotational basis (to be recorded on 003).	Annually
Shower Heads	Dismantle, clean and de-scale shower heads and hoses/ or replace with new disinfected Shower Head and Hose (to be recorded on form 005B).	3 Monthly
Little Used Outlets	Flush through and purge to drain, or purge to drain immediately before use, without release of aerosols (on Risk Control Notice 11/04. recorded on Sample Record Sheet by Duty Holder). NB Little-used outlets in high-risk areas should be flushed daily at the start of each day.	Twice weekly

11. Air conditioning plant

General

11.1. Air conditioning plant and ductwork should be inspected at the access point(s) on an annual basis in order to check cleanliness, general condition and assess risk. After several years of service, even a correctly filtered system may contain dirt accumulation. It may be necessary to consider cleaning of the system taking account of Healthcare Associated Infection Systems for Controlling Risk in the Built Environment (HAI-SCRIBE) procedures and the risk assessment.

11.2. In particularly recurring polluted areas, it may be necessary to consider the installation of high grade final and pre-filters. The quality of filter housing design and in particular the seals are critical factors in maintaining the efficiency of the filtration system by ensuring that air does not bypass the filter panels.

11.3. All information on condition, cleanliness and so on, to be recorded in the plant room log book, with any non-compliance or incidents being identified to the Authorised Person (AP) (Water) immediately on identification. An Incident Report Record Form (004) should be completed and the Responsible Person (RP) (Water) must be notified as soon as possible.

Draining traps and pipework

11.4. A drainage drip tray should be provided to collect condensation build-up on cooling coils (including the return bends and headers), for humidifiers (if installed), eliminators and, if necessary, heat recovery devices. The drainage drip tray should be constructed from a corrosion resistant material and be so arranged that it will completely drain - such as the drain connection should have no upstand in order to prevent 'pooling'. The drainage tray should be large enough to collect all the water produced by the device it serves. Provision should be made to allow for inspection of the drainage tray (such as viewing window/ access panel). A slope of 1:20 in all directions towards the drain outlet position should be incorporated.

11.5. Drainage drip trays should be connected to a drainage trap assembly which should discharge via a Type ‘A’ air gap as laid down in British Standard (BS) 6281: Part1: 1992.

11.6. The depth of any trap should be at least twice the static pressure head generated by the fan so that the water seal is not 'blown out' during plant start up.

11.7. A trap need not be directly under the drainage drip tray which it serves, provided that the connecting pipework has a continuous fall. Each trap shall be made of the clear (borosilicate) glass or transparent plastic type in order to show clearly the integral water seal level and should be fitted with a screw-top cap to permit re-filling. The water seal level shall be permanently marked on the trap, to indicate the water seal levels when the fan is operational at its design duty.

11.8. Traps fitted to plant located outside or in unheated plant rooms may require trace heating to prevent freezing damage during the winter period. The trace heating system employed should not raise the temperature of the water in the trap to greater than 5ºC. Similarly, it may be necessary to shield the trap from direct sunlight in mid-summer in order to prevent heat gain and algae growth.

11.9. The pipework from each trap should be constructed of thermoplastic, copper or stainless steel tube. Stainless steel may be particularly useful in instances where greater mechanical strength is required. The pipework shall have a minimum fall of 1 in 60 in the direction of water flow.

11.10. Water from each trap should discharge over an open tundish connected to a drainage stack via a second trap or a floor gully.

11.11. Where the drainage pipework from the tundish outlet, which should be ventilated, discharges to a surface water drainage stack or a dedicated plant drainage stack, then the connection shall be in the form of an easy-sweep tee.

11.12. It may be necessary to employ chlorine or other chemicals in order to clean humidifiers and cooling coils etc. Under such circumstances it is necessary to discharge the plant effluent produced to the foul drainage system.

11.13. Individual drain trap systems should be separate wherever possible. All drain trap systems are to be examined, cleaned, and topped up on a monthly basis as required. (on Procedure P1C5 - recorded on Form 022)

Humidifiers (where installed)

11.14. Humidification was originally required for some healthcare ventilation applications in order to control the risk associated with the use of flammable anaesthetic gases. The use of such gases has now ceased.

11.15. Where humidification is still required this must follow the requirements of Scottish Health Technical Memorandum (SHTM) 03-01 and this should be included in the Legionella risk assessment.

11.16. The steam supply connections to the humidifier should be provided with a dirt pocket and trap set installed as close as practicable to the humidifier. The water supply to the steam generating unit shall be designed as if potable supply right up to the device.

11.17. The humidifier chamber should be inspected on a six-monthly basis and specified in the plant Pre Planned Maintenance (PPM) schedule. Particular attention should be given to any pooling of water. The chamber interior should be clean, and free from any scale or other build-up on the walls.

Heater Batteries

11.18. Inspection of the heater batteries is needed in order to ensure free airflow and no build-up of dirt, scale, or other debris. Cooling coils should be examined regularly to ensure that correct drainage is being achieved, and that there is no pooling of water or development of slime, algae, or other deposit. Drainage drip trays should be removed (if possible) and cleaned on a regular basis.

12. Hydrotherapy pools, whirlpool baths, whirlpool spas and birthing pools

General

12.1. Hydrotherapy pools, whirlpool baths, whirlpool spas, birthing pools and water features provide conditions which may favour the growth of Legionella, Pseudomonas Spp and other similar harmful bacteria. Whirlpool spas are particularly vulnerable because of the recirculation of a relatively small volume of water, and careful maintenance and chemical water treatment is needed in order to maintain water quality. A detailed log must be kept detailing the treatment method, filter cleaning, temperature, potential of hydrogen (pH), chlorine residual, quantity and concentration of chemicals applied and other key parameters.

12.2. Whirlpool baths and birthing pools normally employ a single fill for each user, and do not present the same level of risk as spas, provided that the guidance recommended for hot and cold water (CW) systems is followed.

Guidance

12.3. Hydrotherapy pools and spa pools should be operated to the guidance given in the following publications published by the Public Health Laboratory Service (PHLS):

- 'Hygiene for Hydrotherapy Pools'
- 'Hygiene for Spa Pools'

Reference should also be given to Health and Safety Executive (HSE) Health and Safety Guidance (HSG) 282 ‘The control of legionella and other infectious agents in spa-pool systems.’

12.4. Copies of these publications should be held in the Estates Department and used as the primary source of guidance for the management of such pools.

12.5. All information on condition, cleanliness, servicing and monitoring to be recorded in a pool logbook. Non-compliance or incidents to be identified to the Water Safety Group (WSG) and Authorised Person (AP) (Water) immediately, and the Incident Report Record Form (004) completed and ensure the Responsible Person (RP) (Water) is notified as soon as possible.

12.6. For further information refer to

- Pool Water Treatment Advisory Group's (PWTAG's) 'Swimming pool water: treatment and quality standards for pools and spas'
- birthing pools, see Health Building Note (HBN) 21 - 'Maternity' and PWTAG's 'Swimming pool water: treatment and quality standards for pools and spas'

13. Showers/ unused outlets

13.1. Showers and other water outlets which are rarely used should preferably be removed or, if retained, flushed to waste at intervals for a 3-minute period. The interval should be at least twice weekly. Where the outlet may be used by high-risk patients, more frequent flushing will be needed, and the increased frequency should be determined by the Water Safety Group (WSG) following risk assessment. In Intensive Care Units (ICUs) little-used outlets should be flushed daily at the start of each day.

13.2. The flushing must be carried out in such a way as to avoid the creation of aerosols. Full flow is not necessary.

13.3. A record must be kept of the flushing operation and should be retained for at least 5 years. The sample Record Form for Estates Department use is (026).

14. Monitoring requirements for other risk systems

Table 14.1 - Monitoring requirements for other risk systems

Service	Task detailed under Risk Assessment	Frequency
Ultrasonic humidifiers/ foggers and water misters	**Not** to be used in Healthcare organisation	-
Spray humidifiers, air washers and wet scrubbers	**Not** to be used in Healthcare organisation	-
Water Softeners and Reverse Osmosis (RO) Systems	Clean and disinfect resin and brine tank - check with manufacturer what chemicals can be used to disinfect resin bed. Duty Holders and their Local Managers to **note** their specific responsibilities for systems installed and used by functional departments (Renal and so on)	As recommended by specific manufacturer
CBRN, Deluge and Emergency Showers and Eye Wash Sprays	Flush through and purge to drain. Duty Holders and their local Managers to **note** their specific responsibilities for systems installed and used by functional departments	2 times per week following Risk Control Notice 11/04
Fire Sprinkler/ Suppression and Hose Reel Systems	When witnessing tests of sprinkler/ suppression system blow down and hose reels ensure that there is minimum risk of exposure to aerosols. Any Hose Reels identified must be reported on Incident Report Record Form (004) for immediate removal including all dead-leg pipework	As directed by specific manufacturers
Pressure Washers	When using pressure washers ensure the water supply is from a known quality, there is a testing regime in place and there is backflow prevention in place.	As indicated by risk assessment
Lathe and Machine Tool coolant systems	Coolant **not** to be used in Healthcare organisation Systems	-
Horticultural misting systems	**Not** to be used in Healthcare organisation	-

Service	Task detailed under Risk Assessment	Frequency
Dental Equipment	Drain down and clean refer to Decontamination in primary care dental practices (Health Technical Memorandum (HTM) 01-05)	At the end of each working day
Trolley Wash and Vehicle and Power Washing Plant	To be operated in line with manufacturer's instructions	See manufacturer's instructions
External Fountains and Water Features	**Not** to be used in Healthcare organisation	-
Internal Fountains and Water Features	**Not** to be used in Healthcare organisation	-
Vending, Chilled Water and Ice-Making Machines	Duty holders and their Local Managers to note Freestanding water dispensing machines using proprietary water containers should **not** to be used in healthcare applications (remove and return to supplier if found)	-

15. Alterations to (including refurbishment or new) water systems guidance

15.1. Where alterations are planned to water systems, Record Form 029 should be used to record the acceptance of work to be conducted and conformation of work completed on a water system and all conditions involving Duty Holders and their staff, Water Safety Group (WSG), the Authorised Person (AP) (Water) of the written scheme of the system and the AP (Water) from the Project Team accepting responsibility for the work).

> Note 14: Record Form 029 shall be used to record the acceptance of all work to be conducted, confirmation of all work completed on a water system, all conditions involving Duty Holders and their staff, the AP (Water) for the system and the AP (Water) from the Project Team accepting responsibility for the work.

15.2. At the point of hand over all relevant information written on operating the system, system performance, commissioning documentation, together with accurate as-fitted drawings and design criteria of the domestic hot water (DHW) systems and cold water services (CWS) shall be submitted to Healthcare organisation (such as an appropriate current Written Scheme, accepted in writing by the relevant AP (Water)).

15.3. Full operation of the system and occupancy of the building/ property should be as soon after hand over as possible to reduce the potential of Legionellosis, Pseudomonas Spp, other similar harmful bacteria and avoid further costs being incurred due to any further necessary re-disinfection of the water systems.

16. Control of contractors

16.1. Contractors shall only be engaged in work on water systems or air conditioning plant under the control of the Authorised Person (AP) (Water) co-ordinated with any Estates persons.

16.2. The Healthcare organisation Management and Control of Contractors - Health, Safety and Environment Policy and Procedural Arrangements along with the associated Guide for Contractors (and Consultantsand so on) will apply.

16.3. The AP (Water) shall ensure that the contractor is competent for the task(s) to be undertaken and shall ensure that the contractor is aware of and has made provision for all responsibilities under the various Environmental, Health and Safety Regulations, including Construction Design Management (CDM), Control of Substances Hazardous to Health (COSHH), Legionella, water safety and so on.

16.4. The AP (Water) shall ensure that the contractor:

- is suitably briefed in writing on the task(s) to be undertaken and is fully aware of the water safety implications and prescribed Procedures to be followed
- demonstrates that all workforce to be engaged on the task(s) are suitably competent for the task and are properly managed and supervised
- has provided appropriate equipment for the task including Personal Protective Equipment (PPE)
- carries out the task(s) to the correct standards and in the correct manner all in accordance with ALL Healthcare organisation and Estates policies and procedures

16.5. The AP (Water) shall review/ record the evidence provided by the contractor and store it for future reference and maintain records in the Water Safety Log Book.

17. Designer responsibilities

Safety Criteria

17.1. In order to avoid potentially costly remedial works, the design of new buildings or the installation or alterations to existing buildings and their water systems should be controlled in order to “get it right first time”. The checklist provided in the “Control of Water Record Forms” document 025 (included in Appendix C for ease of reference), should be used by relevant Estates staff and/ or supplied to design consultants in order that they may check their own design. The Designer (such as the person identified to perform the design duties through clarifying assumptions, eliminating hazards and risks, and providing the information about remaining risks - in compliance with the Construction (Design and Management) Regulations: 2015 which are part of the Health and Safety at Work regulatory framework) shall ensure the Client and CDM Co-ordinator are aware.

17.2. This checklist is not a design brief and is not intended to deal with the potential design issues but is a management checklist. If these issues are incorrect, it is likely that other aspects of the design are also not compliant with regulatory and mandatory standards, or best practice. Also see Record Form 029.

17.3. The checklist should be used to record, take account, and weigh up all relevant matters regarding the safety of the water system, the operating parameters, the assumptions and what is known (or importantly the level not known) or reasonably be expected to be known to eliminate or mitigate risk (‘reasonably practicable’).

17.4. Water systems operate in premises across a wide range of settings - through a scale from suites of rooms within larger premises, to premises with single building blocks, to premises with multiple building blocks with multiple functions, up to large health campus containing multiple hospitals and complex specialist care services.

Additionally, due to the age, construction type and nature of Healthcare organisation premises there are a wide number of potential health hazards arising from care and support functions (such as infectiousness, hazardous, dangerous substances, and radiation and so on) and the nature of the physical environment (such as exposure to asbestos, confined spaces and access restriction and so on). Where buildings owned or leased by Healthcare organisation were built or refurbished prior to 2004 the use of asbestos-containing materials in their construction was common practice and it is possible that personnel could encounter asbestos material in difficult physical environments whilst undertaking work activities. It may also be very difficult to safely investigate intrusively, so considerations and assumptions on what is actually known must be recorded.

Healthcare organisation takes a positive approach to controlling and reducing any potential risk exposure to those conducting work or exposing others to risk through the work activities. This will be achieved by staff and contractors co-operating, working together to the control measures and work methods outlined in NHS board Policies and associated Procedural Arrangements.

17.5. Domestic Hot and Cold Water Systems should be designed to ensure safe operation at all times by avoiding, preventing or controlling conditions which permit the growth of Legionella, *pseudomonas aeruginosa* or any other similar harmful bacteria and which allow easy maintenance, cleaning and disinfection. In particular, the following must be considered:

A. materials such as natural rubber, hemp, linseed oil based jointing compounds and fibre washers must not be used in domestic water systems. Materials and fittings for use in water systems, such as plastic pipework, plastic and rubber components in Thermostatic Mixing Valves (TMVs) and flexible hose liners and so on must not support microbial growth. The Water Regulations Advisory Scheme (WRAS) Water Fitting and Materials Directory should be consulted to identify approved products in keeping with regulatory requirements. Flexible hoses, WRAS approved or not, shall not be used in water systems except in exceptional (approved) circumstances

B. water storage tanks should be fitted with covers which comply with the Scottish Water Byelaws, also insect screens fitted to any pipework open to atmosphere, for example the overflow pipe and vent

C. tanks should be provided with a bottom drain outlet that allows the full contents to be safely drained to a suitable drainage point

D. multiple linked storage tanks or tanks with water control valves should be avoided because of operational difficulties due to possible unequal flow rates and possible stagnation

E. accumulator vessels on pressure boosted hot and cold services should be fitted with diaphragms which are accessible for cleaning and that do not support microbial growth

F. point of use hot water generators, with minimal or no storage, with safe temperature guidance should be considered for remote low use outlets

G. TMVs where fitted, should be sited as close as possible to the point of use. A single TMV should serve a single shower outlet or a single tap outlet. A single TMV must not serve multiple tap or shower outlets. Where pipework contains blended water the maximum length of pipe is given in Scottish Health Technical Memorandum (SHTM) 04-01 Part A with the downstream leg not exceeding 2 metres and the complete length of the spur without circulation not exceeding 3 metres

H. duplicate or multiple circulation pumps should not be installed, as the pump on standby may harbour stagnant water. Instead, a single pump should be installed and a spare provided

J. for applications involving high risk clinical areas (as defined by the Water Safety Group (WSG)) there is particular guidance (which should be good practice elsewhere) to ensure engineering and cleaning protocols are achieved and manufacturers' instructions are followed

K. taps and TMVs and Thermostatic Mixing Taps (TMTs) (manual and automated) are commissioned (including programming auto flush cycles) and can be routinely validated, as per the manufacturer's instructions. TMTs should be inspected to ensure that there is no preceding TMV supplying water to the hot port of the tap

L. for automated taps, ensure records of remote flushing can be achieved

M. for automated taps be aware of the type of design and the small bore pipework within. This can lead to an increase biofilm build up and can aid bacterial growth

N. the type of tap should be carefully selected to minimise the formation of water droplets and aerosols. Water flow profile should be compatible with the shape of the wash-hand basin to avoid splashing. The fitting and basin combination should be such that the water stream never discharges directly into the basin's waste outlet (see SHTM 64 - 'Sanitary assemblies')

O. flushing of all hand wash stations and sinks can be performed daily, at the maximum flow rate that this does not give rise to any splashing beyond the sink, for example on the floors

P. that water flowing from the taps cannot flow directly into the drain holes (to prevent splash back). Water flow must impact on the basin offset from the drain hole. Flushing (automated or manual) should not result in splashes beyond the wash hand station area

Q. the wash hand basin should be positioned to ensure that washing hands or flushing (automated or manual) should not result in splashes beyond the hand wash station area

R. where outlets are planned to be flushed daily, there is no additional requirement for weekly (or automated) flushing

S. for some applications, remote sensor-operated taps are available these can come with the option of auto-flushing programmes and can be linked to the hospital's building management system (BMS). These can be monitored, logged, and alarmed if required

T. liaison with the user (Senior Charge Nurse) regarding the potential of infrequently used wash hand stations or sinks (used and/ or flushed once a day) which will have to be subjected to a documented flushing regime, risk assessed and regularly reviewed for the need for the wash hand station or sink to be still there (see: Guidance on the number of hand wash stations required)

U. removal of any redundant branches from circulating mains and provide straight couplings on distribution pipework to eliminate residual dead-legs or blind stub-ends created by plugged tee-pieces (anywhere in the water system under alteration)

V. the length of any dead-legs is checked and minimise where possible by taking the return leg pipework up to wash hand stations and sinks (this should be included in the Legionella Risk Assessment for the water system)

W. before undertaking any modifications to pipework, perform an impact risk assessment. Keep records of risk assessments and modifications made

X. Beware that when draining down water systems, the direction of flow is not reversed. This can disturb the biofilm, releasing unwanted organisms into the system pipework

Y. considering whether thermostatic mixer valves can be located closer to the outlet

Z. new taps, wherever considered necessary, have integral thermostatic control

AA. the careful selection of taps to minimise the formation of aerosols. The water flow profile should be compatible with the shape of the wash hand station. Flow straighteners can capture biofilm, but their removal can create turbulent flow and increased pressure resulting in splashing of surrounding surfaces and flooring. Any policy for removal should result from risk assessments and/ or restricting flow to the same as applied prior to the removal of the straighteners

BB. if flow straighteners are used, then incorporate a system of maintenance on a parts per million (ppm) schedule. Consider replacement rather than cleaning. Note: When selecting new taps, Scottish Health Facilities Note (SHFN) 30 advises against using aerators, strainers, and flow restrictors at the point of discharge

CC. to avoid positioning soap dispensers/ alcohol based hand rubs (ABHRs) such that any drips could fall on to the taps or into the basin of the hand wash station

DD. as it is not possible to have taps, shower heads and hoses and so on ‘pre-disinfected’ in the supply from manufacturers - disinfection will have to rely on normal flushing and disinfection protocols that would apply to any new installation before commissioning and putting into use. In large projects this process should be undertaken as close as possible to the system being handed over to avoid pipework being left unused filled with stagnant water. A daily flushing regime should be put in place until the system is handed over to Healthcare organisation.

Domestic hot water systems

17.6. The storage capacity and recovery rate of the water heater should be selected to meet the normal daily functions in hot water use without any drop in the supply temperature.

17.7. The storage capacity and recovery rate of the water heater should be selected to meet the normal daily functions in hot water use without any drop in the supply temperature.

The flow of water throughout the domestic hot water (DHW) circuit, including tertiary and subordinate loops, shall be balanced by adjusting regulating valves to ensure that the target temperature is achieved throughout the system under all levels of water consumption.

Temperature is used as the means of controlling Legionella and other harmful bacteria. The DHW circulating loop shall be designed to give a return temperature to the storage water heater of 55°C, but certainly no less than 50°C. The pipe branches to the individual hot taps shall be of sufficient size to enable the water in each of the hot taps ideally to reach 55°C, within one minute of turning on the tap.

In normal use, the system should be designed to achieve 55°C at the supply to the furthermost draw-off (sentinel) point in the circulating system, including tertiary and subordinate loops. The set points for the water heating device should be adjusted to be at or above 60ºC to ensure the water system achieves these criteria. Thermometer/immersion pockets shall be fitted on the flow and return to the storage water heating device and in the base of the storage water heater in addition to those required for control.

17.8. In larger domestic storage water heating devices, the fitting of time control shunt pumps (de-stratification pumps) shall be included to overcome temperature stratification of stored water.

DHW distribution pipes should be insulated with sufficient thermal performance to avoid affecting cold water (CW) pipes.

Whether a Building Energy Management System (BEMS) is fitted or not - a visible manual means of monitoring DHW system storage, flow and return temperatures must be available at all time. These temperature measuring devices should be calibrated at regular intervals and calibration certificates held in the logbook. The dates for recalibration should be added to the Pre Planned Maintenance (PPM) system.

Cold water systems

17.9. The CW storage tank should be sited in a cool place and protected from extremes of temperature by thermal insulation. Tanks and piping should be insulated with sufficient thermal performance and kept away from heat sources, hot ducting, and other hot pipes to prevent excessive temperature rises in the CW supply and distribution system.

Care must be taken in the ventilation of water tank rooms to avoid condensation and mould growth. This requires particular attention in basement tank rooms where colder building surfaces can coincide with high specific air moisture content.

Access hatches should be provided on CW tanks for inlet valve maintenance, inspection, and cleaning (more than one hatch may be needed on larger tanks). In new installations consideration should be given to locating hatches on the tanks sides to facilitate means of escape in an emergency for those inspecting the interior.

The volume of CW stored should be minimised. It should not normally be greater than a nominal 12 hours water use. Multiple CW storage tanks require care in the connecting piping to ensure water flows through each of the tanks, to avoid stagnation in any one tank.

Each water tank should have a water meter (ideally linked to BMS) so that the volume of water through each tank can be accurately measured, and consumption monitored.

17.10. The pipework should be easy to inspect so that the thermal insulation can be checked to see that it is in position and has remained undisturbed.

17.11. The pipework should be easy to inspect so that the thermal insulation can be checked to see that it is in position and has remained undisturbed.

Whether a BEMS is fitted or not - a visible manual means of monitoring CW system supply (at building block inlet or meter point), tank storage, flow (and return where appropriate) temperatures at no more than 20°C must be available at all time

Packaging

17.12. Domestic hot and CW systems should be temperature monitored by the BEMS performing to SHTM 08-05 to ensure compliance with the temperature standards specified in the relevant regulations and guidance. System parameters must be detailed in the Written Scheme for the water system.

17.13. The minimum BEMS performance monitoring of the water system must be to ensure:

- DHW is continuously monitored and records the parameters highlighted above and described in detail in SHTM 04-01. such as 60ºC flow (minimum) from the water heating device to ensure 55°C at the supply to the sentinel points in the circulating system under normal use and no less than 50ºC return (lowest limit) to the water heating device
- CW is continuously monitored and recorded from the point it enters a building to the furthermost draw-off (sentinel) point(s) in the system to the parameters highlighted above and described in detail in SHTM 04-01 such as no more than 20ºC (highest limit)
- failures out with the parameters are subject to alarms and service response messages
- performance data requires to be secured and retained for at least 5 years but must be easily available to the Authorised Person (AP) (Water), the other independent professional advisors, assessors, and others with an interest in system performance

Note 15: The definition of sentinel taps and information on TMV settings can be found in SHTM 04-01 Part A, Appendix 6.

Other water systems connected or operating in close proximity

17.14. Designers must ensure there are no other water systems (such as for Fire Suppression, Fire Precautions or Fire Protection) connected or in close proximity to the water system. Reference should be made to the Water Safety Log Book and Written Scheme for the Building Block for information, changes or alterations.

18. Scottish water byelaws 2014

18.1. The Scottish Water Byelaws 2014 came into force on 12th July 2014, The Scottish Water Byelaws 2014 replaced the previous 2004 Byelaws in governing the prevention of waste, misuse, undue consumption, and contamination of public water supplies in domestic and commercial plumbing installations and represent important protection for public health and the environment. The Byelaws are based on performance standards, for example British Standards or those European Standards being mandated under the Construction Products Directive.

18.2. The Byelaws are enforced by Scottish Water, and further advice should be sought from them or from the Scottish Water website.

18.3. The Byelaws introduce specifications to prevent the backflow of water. This brought the UK approach into line with the harmonised European Standard. The system consists of five fluid categories, which reflect the potential toxicity of the downstream fluids. These categories relate to the risk posed to public health should fluids contaminate drinking water. The specification then equates each fluid category to the range of suitable backflow prevention devices. Particular reference should be made to the determination of fluid categories when considering alternative water treatment systems. The addition of a treatment chemical to potable water may result in it changing fluid categories to Category 3, with the resultant backflow prevention being required. The 2014 regulation clarifies that fluid category 3 also includes other chloride-based disinfectants and other common disinfectants.

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18.5. Certain aspects of the system will have to comply with the Building Regulations.

18.6. Water storage tanks should be fitted with covers which comply with Byelaws and insect screens fitted to any pipework open to the atmosphere, for example the overflow pipe.

18.7. In the event that tanks are lined/coated then the lining/ coating must be Water Regulations Advisory Scheme (WRAS) approved for tank lining applications as well as complying with the Public Water Supplies (Scotland) Regulations 2014; Regulation 33 application and introduction of substances and products.

18.8. The Scottish Water Byelaws 2014 have a scheme for 'Approved Contractors' (approved plumbers) who are approved to carry out work in compliance with the Water Byelaws. Scottish Water has encouraged all professional plumbers to become members of a Licensing Scheme, showing a commitment to their industry, a willingness to raise quality standards and promote to customers a professional image of the industry. Scottish Water continues to support the Plumbing Industry Licensing Scheme (PILS) operated by the Scottish and Northern Ireland Plumbing Employers Federation (SNIPEF) and recognises members of the Water Industry Approved Plumbers Scheme (WIAPS) operated by the WRAS.

Note 16: Organisations seeking advice on the Scottish Water Byelaws should refer to their Licensed Provider (LP) (Business Stream) in the first instance.

19. Risk assessments

Identification and assessment of risk

19.1. A suitable and sufficient assessment following the requirements of British Standard (BS) 8580-1: 2019 Water Quality - Risk assessments for Legionella Control - Code of Practice is required to identify and assess the risk of exposure to Legionella bacteria from water systems on healthcare organisation premises and any necessary precautionary measures. BS 8680 Water quality, Water safety plans (WSPs), Code of practice is also applicable as the risk assessments inform the WSP, identifying potential hazards caused by Legionella, *pseudomonas aeruginosa* and other relevant pathogens, chemicals, temperature, and events that may arise during supply, storage, delivery, maintenance, and use of water in healthcare facilities.

With regard to significant changes to a risk assessment review, these are identified as:

- changes to the water system or its use
- changes to the use of the building or part of the building in which the system is installed
- changes to the availability of information about risks or control measures
- indications that control measures are no longer effective
- new construction works or system modifications planned
- changes to the key personnel, contractors, and service providers. Where a reassessment has not been triggered by the above, there should be a policy of planned (Extract from BS 8580-1:2019 Water quality, Risk assessments for Legionella control, Code of practice)

19.2. The Legionella Risk Assessor shall be appointed as the Risk Assessor, the company shall be United Kingdom Accreditation Service (UKAS)/ Legionella Control Association accredited and complete Legionella risk assessments to BS 8580-1 criteria and the written terms of reference. The Risk Assessor will have access to competent assistance from the board to assess the risks of exposure to Legionella bacteria in the water systems present in the premises and the required control measures and will themselves be able to prove their competence.

19.3. The assessment will include, but is not limited to:

- identification and evaluation of potential sources of risk and the particular means by which exposure to Legionella bacteria is to be prevented
- the particular means by which the risk from exposure to Legionella bacteria is to be controlled, if prevention is not “reasonably practicable”
- identification of the use of flexible hoses in water supply and distribution systems following Safety Action Notice (SAN) 886, for elimination of risk. Where flexible hoses are essential components to connect the water system to necessary equipment (or are identification of action measures to test and prevent risk
- identification of primary heat sources (such as steam systems and fixed temperature heating systems and so on) that impact (directly, or indirectly, or seasonally) on the control and management of water systems and the operational criteria
- a drinking water quality assessment

19.4. Where the assessment demonstrates that there are no reasonably foreseeable or insignificant risks that are likely to increase, no further assessment or measures are necessary. The assessment needs to be reviewed and any necessary changes implemented should the situation change or whenever there is a reason to believe that the original assessment may no longer be valid.

19.5. With regard to *pseudomonas aeruginosa*, Healthcare organisations should undertake a risk assessment (following BS 8580-2) to identify any additional clinical settings and risks where patients are extremely vulnerable to infection caused by *P. aeruginosa*. This risk assessment should take account of any previous clinical incidents in individual clinical settings. If additional units are identified as being at increased risk, then these units should be included in the local Healthcare organisation’s WSP and the recommendations in this guidance followed in these additional clinical settings. Refer Scottish Health Technical Memorandum (SHTM) 04-01 Part C for further information on *Pseudomonas aeruginosa* and associated risk assessment.

19.6. With regard to other waterborne pathogens, healthcare organisations should undertake a risk assessment, when there is concern of an outbreak, Water Safety Group (WSG) advises or clinical surveillance identifies a need. Similarly to *pseudomonas aeruginosa*, risk assessments for Nontuberculous mycobacteria (NTMs) will also be needed for patient groups that are identified by the WSG as severely immunocompromised. Refer to BS 8580-2 for further guidance.

19.7. The risk assessments will need to be undertaken by a multidisciplinary team, this includes WSG members. Risk assessments will be required at each stage of a new build and refurbishment of an NHS project.

19.8. The types of records are kept in Table 19.1

Table 19.1 - Record retention period

Record	Retention Period
• Policy and Procedure Documents. • Risk Assessments. • Risk minimisation scheme and details of its improvement.	Throughout the period for which they remain current and for at least two further years.
Monitoring, inspection, test and check results, including details of the state of operation of systems.	At least five years.

20. Training

20.1. Healthcare organisation staff appointed to carry out the control measures and strategies shall be suitably informed, instructed and trained and their suitability assessed. Staff shall be trained to a standard, which ensures that tasks are carried out in a safe, technically competent manner.

20.2. The Authorising Engineer (Water) shall conduct an annual assessment review of competency and training requirements and shall make Training Programme recommendations to the Responsible Person (RP) (Water) for approved courses run by approved training organisations and where appropriate by the manufacturers of equipment.

20.3. The Authorised Person (AP) (Water) shall conduct and record induction and familiarisation with any new Competent Persons, Maintenance Technicians, Tradespersons, Installers, Contractors, and Contract Supervising Officers being introduced to water systems. The AP shall also conduct a regular annual review of system familiarisation, operational maintenance, monitoring issues. This review shall include a review of all Competent Persons training and competency, especially where key elements of water management and control are assigned to contractors.

20.4. Recommendations shall be reported to the RP (Water).

20.5. Training will be appropriate to the post holders' duties, covering the following:

- Water Safety Policy, Procedures, and the Water Safety Plan (WSP)
- Scottish Health Technical Memorandum (SHTM) 03-01 'Ventilation for healthcare premises'
- SHTM 04-01 'Water safety for healthcare premises'
- Health and Safety Executive (HSE) Approved Code of Practice (ACOP) L8 - legislation and Health and Safety Guidance (HSG) 274
- Legionellosis and other water safety risks - responsibilities
- prevention or controlling the risk from exposure to Legionella, Pseudomonas Spp and other similar harmful bacteria
- hot and cold water systems
- ventilation systems
- water treatment
- maintenance procedures
- action in the event of a case of outbreak of Legionnaires' disease
- Water Management systems including software systems/ electronic logbooks Barcode readers, temperature recorders and Personal Digital Assistants (PDAs)

20.6. As filtration plants are widely used throughout NHS Scotland, as part of the training requirement there should be a training program in place to cover the following:

- filtration purpose
- filtration types
- filtration design
- differential pressures and alarm systems
- treatment
- connecting to building management system (BMS) and monitoring Filtration Plant
- backwash requirements
- filtration faults and remedies
- risk assessment/ Control of Substances Hazardous to Health (COSHH) issues
- planned maintenance
- cleanliness

20.7. The training will be presented in the following formats:

- annual ‘In-house’ awareness training
- induction training
- toolbox talks
- virtual training sessions
- training (update and refresher on changes)

20.8. Regular refresher training shall be given and records of all initial and refresher training and competency assessments provided to and received by all Healthcare organisation personnel involved in water systems will be recorded in the individual’s personal training file and the national NHS TURAS system.

20.9. Healthcare organisation staff engaged in work which may have a direct or indirect effect on the control of Legionella, shall have adequate information, instruction and training to ensure that the Code of Practice and Written Scheme is applied at all times.

20.10. Healthcare organisation staff that also engage in work which may have a direct or indirect effect on the control of *P. aeruginosa* or other waterborne pathogens, shall have adequate information, instruction and training to ensure that the British Standards and WSP is applied at all times, and so ensure that Healthcare organisation systems are not compromised.

21. Performance monitoring

21.1. Every healthcare organisation must form a Water Safety Group (WSG). The organisational structure, lines of accountability and communication up to top level management by the WSG should be clear and facilitate the regular reporting and review of the status of water risk management and the supporting infrastructure.

21.2. The relevant Authorised Person (AP) (Water), as part of the WSG, will gather and maintain all the relevant information and records for all properties occupied by staff or patients of the board [irrespective of ownership of the property], including relevant Legionella, *pseudomonas aeruginosa* or other waterborne risk assessments, and written schemes. The main findings can be produced in a dashboard format for discussion at the WSG meetings.

21.3. Working with the AE (Water) and Responsible Person (RP) (Water), the relevant AP (Water) in conjunction with the WSG will review and analyse all records for compliance with Legionella and other water safety parameters.

21.4. The relevant AP (Water) will detail on these records any deviations from the Legionella and other water safety parameters giving a brief description as to the reason for this deviation.

21.5. The relevant AP (Water) will discuss these findings with the WSG, agree an action and implementation plan, allocate responsibilities, and monitor until completion.

21.6. After completion, file all relevant information and maintain records as per local policies.

22. Audit/ management review

Internal audit procedure

22.1. This procedure will be audited at agreed intervals by the Responsible Person (RP) (Water) and the Authorised Person(s) (AP(s)) (Water).

22.2. Prepare an Audit Program and ensure the entire procedure is audited and clearly indicate who is responsible for auditing each item.

22.3. The Audit Program will consist of planned audits on the following elements of the procedure:

- documentation associated with this Procedure
- training and competence records review
- individual site Written Schemes of Control, risk assessments, schematic drawings and Water Safety Logbook(s)

22.4. A report will be produced to be issued to the Water Safety Group (WSG) and the DP (Water).

External audit procedure

22.5. A duly appointed AE (Water) will audit the entire Water Safety Systems, Water Safety Plan (WSP), policies, procedures, appointments, training plans, competence evidence, Pre Planned Maintenance (PPM) evidence, remedial work completion progress and emergency actions needed for all properties within Healthcare organisation area of responsibility. A list of properties will be provided to the AE (Water).

22.6. The AE (Water) will issue an annual report to the DP (Water) for management review.

Management review

22.7. The RP (Water) will hold regular review meetings to confirm:

- current compliance with Legionella and Water Safety System requirements
- identification of any deficiencies and actions required to resolve
- staff training needs

22.8. The management review will be based on following:

- results of internal audits
- results of external audits
- staff suggestions
- training records
- operation of the system and procedures over the last six months

23. The course of action for the suspected Nosocomial Legionnaires disease

Suspected or confirmed incident or outbreak

23.1. Healthcare organisation will follow the guidance presented in the following documents:

- Health and Safety Executive (HSE) Approved Code of Practice (ACOP) L8 “The control of Legionella bacteria in water systems”, see Appendix 2
- Scottish Health Technical Memorandum (SHTM) 04-01 “Water safety guidance”, Part B, Appendix B
- Health Protection Network (HPN) 2, “Guideline on management of Legionella incidents, outbreaks and clusters in the community”
- The Healthcare organisation “Outbreak Plan”

23.2. Legionellosis is an atypical and potentially life-threatening form of pneumonia (Legionnaires’ Disease). The majority of cases are isolated although outbreaks can occur (including large community outbreaks and hospital outbreaks).

23.3. In the event of a nosocomial case(s) of Legionnaires’ disease Healthcare organisation will follow the HPN - ‘Guideline on Management of Legionella, Incidents, Outbreaks and Clusters in the Community’ (2009), SHTM 04-01 and Healthcare organisation’s Outbreak Plan.

23.4. An outbreak is defined in HSE Health Safety Group (HSG) 274 Part 2 Appendix A “as two or more cases where the onset of illness is closely linked in time (weeks rather than months) and where there is epidemiological evidence of a common source of infection”. However, HPN2 is set out and defined in Table 23.1.

Table 23.1 - HPN2 definition incident/ outbreak

Definition	Description
Incident	A (first) single case - presumptive or confirmed - where based on the evidence there are concerns about actual or suspected threats to the safety or quality of water systems that could require intervention to protect the public's interest.
Sporadic case	A single case not associated with any other case. No other case may be linked to probable source of exposure in last 2 years.
Outbreak	Two or more cases in the same locality for which there is strong epidemiological evidence of a common source of infection, with or without microbiological evidence, occurring within a 6-month period of the onset of illness from the first case confirmed.
Linked case	Two or more cases associated with a single source with dates of onset more than 6 months apart but less than 2 years apart.
Probable Nosocomial	Legionnaires' disease in a person who was in hospital for between one and nine of the ten days before the onset of symptoms and either became ill in a hospital associated with one or more previous cases of Legionnaires' disease or yielded an isolate that was indistinguishable (by monoclonal antibody subgrouping (mAB) or by molecular typing methods) from isolates obtained from the hospital water system at about the same time.
Possible Nosocomial	Legionnaires' disease in a person who was in hospital for between one and nine of the ten days before the onset of illness in a hospital not previously known to be associated with any case of Legionnaires' disease and where no microbiological link has been established between the infection and the hospital.

23.5. The Healthcare organisation "Outbreak Plan" defines an outbreak and incident as:

- "An outbreak is defined either as two or more linked cases of the same illness or when the observed number of cases exceeds the number expected"
- "An incident is defined as a case of communicable disease that has implications for the public's health e.g. VHF or measles in a health care setting. An Incident Management Team (IMT) should be established using the approach described in this plan"

Actions

23.6. A nosocomial case(s) of Legionnaires' disease (definite/ probable/ possible) should be investigated immediately.

23.7. An IMT or an Outbreak Control Team (OCT) will be convened for a single case or an outbreak of nosocomial Legionnaires' disease respectively; The IMT/ OCT will be convened by the Consultant in Public Health Medicine (CPHM) with responsibility for Health Protection (or the duty CPHM). The CPHM will lead and co-ordinate the investigation and control of the incident/ outbreak in close collaboration with the Infection Prevention and Control (IPC) Doctor. Further information on the roles and responsibilities of the different members of the IMT/ OCT can be found in Healthcare organisation's Outbreak Plan; In the event of a case(s) of nosocomial Legionnaires' disease the following people/ groups will be members of IMT/ OCT and will be briefed by the CPHM:

- CPHM (IMT/ OCT Chair)
- Consultant Physician (involved with care of case)
- Consultant Medical Microbiologist/ IPC Doctor
- IPC Nurse
- Health Protection Nurse Specialist
- Facilities and Estates Department
- Authorising Engineer (Water) and/ or Specialist Consultant
- Environmental Health Officer
- Health and Safety Executive
- Health Protection Scotland
- Corporate Communications (Healthcare organisation)
- Other members from partner agencies as decided by IMT/ OCT Chair

Guidance on the general response to a case(s) of nosocomial Legionnaires' disease can be found in the HPN Guidance, Section 3.1.1.2 and Healthcare organisation Outbreak Plan.

See Table 23.2 for the contacts to be used in the event of a confirmed or suspected incident.

Table 23.2 - Contacts to be used in the event of a confirmed or suspected incident

Legionella Role	Name, Title and Phone
Designated Person (Water)	See table 1
Responsible Person (RP) (Water)	See table 1
Authorised Person (AP) (Water)	See table 1
Consultant Microbiologist	See table 1
Infection Control Lead	See table 1
Authorising Engineer (Water)	See table 1
Public Health	See table 1
HSE	See table 1
Health Protection Scotland	Duty Epidemiologist advised by Public Health

23.8. When it is unclear whether there is a threat to public health the CPHM may choose to convene a Problem Assessment Group (PAG) in order to undertake an initial assessment of the problem and determine if an IMT is required. Further information on the role of the PAG can be found in the Scottish Government guidance on the Management of Public Health Incidents: Guidance on the Roles and Responsibilities of NHS led IMT: October 2011.

23.9. The general response to an incident or outbreak may include:

- investigation of all potential sources of Legionella infection. This shall include checking recent maintenance work and project work that may have been carried out on water or air handling systems
- identifying the location of any medical equipment used for dental care, respiratory therapy and within Haemodialysis units
- identifying off-site information such as excavation or earth moving works, alterations to water supply and drainage
- shutting down any processes which are capable of generating and disseminating airborne water droplets and keeping them shut down until sampling procedures and any remedial cleaning or other work has been done. Final clearance to restart the system may be required
- taking water samples from the system before any emergency disinfection being undertaken. This will help the investigation of the cause of the illness. The investigating officers from the local authority may take samples or require them to be taken
- co-operating fully in an investigation of any plant that may be suspected of being involved in the cause of the outbreak. This may involve, for example:
    - tracing of all pipework runs
    - detailed scrutiny of all operational records
    - statements from plant operatives and managers

  - statements from water treatment contractors or consultants
  - any emergency cleaning and disinfection will be undertaken in accordance with Healthcare organisation procedures
- the Designated Person (Water) shall brief relevant Estates staff so that they are aware of the event and can respond to phone calls etc. as instructed. The briefing shall include instructions that any comments to outside parties are agreed by IPC
- report any cases of legionellosis in an employee who has worked on cooling towers or hot and cold water systems that are likely to be contaminated with legionella to the HSE under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- records shall be kept of all relevant information, including that provided by other departments

Appendix A Water safety plan template document

Using this document

A.1 This Water Safety Plan (WSP) headings document is based on British Standard (BS) 8680:2020 “Water quality - Water safety plans - Code of practice”. This list should not be considered exhaustive but may be used by NHS boards to help inform the contents of their WSP. NHS boards will be responsible for amending the document as required for their estate. (NHS board to delete section in yellow once document is populated). A Microsoft word template of the following headings can be issued upon request.

Water Safety Plan for XXX

Document Control Sheet

Revision History

Version	Date	Revision Details	Originator	Changes Marked

Approvals

This document requires the following signed approvals:

Version	Date	Name and Organisation	Role	Signature

Figure A.1 - Example of the Contents Page

Contents

Appendix B Typical report forms

Contents

Note 17: This Control of Water Record Forms document is to be read in conjunction with the WSP and the Guidance for Alterations to Water Systems documents.

Note 18: These are sample templates and may support Healthcare Organisations to develop their organisation specific documentation and record forms.

Figure B.1 - 001 - Temporary Ward/ Department Closure record form

Temporary ward/ Department closure record form (001)

Healthcare organisation					
Estates Department					
Site/Premises		Closure date			
Ward/Department		Closure period (typically not exceeding 30 days)			
Equipment and outlets affected by closure:					
Compiled by (signature)		Print name			
Supervisor (signature)		Print name			

Approval by Authorised Person (Water) to operate on a twice weekly flushing cycle basis (to run every water outlet for 3 minutes and to flush each toilet)

To operate the water system listed above in accordance with the procedure for short/limited closure

Approved by (signature)		Print name	
Date			
Remarks			

Completed record forms to be held in Water Safety Log Book

Figure B.2 - 002 Indefinite Ward/ Department/ Site Closure record form

Indefinite ward/ Department/ Site closure record form (002)

Healthcare organisation			
Estates Department			
Site/Premises		Closure date	
Ward/Department		Closure period	
Work carried out to disconnect and close down water services:			
Closure declaration by Authorised Person (Water)			
Compiled by (signature)		Print name	
Date			
Reoccupation of the area above		Date	
Work carried out and details of modifications:			
Work done by (signature)		Print name	
Clean and disinfect (carried out by)		Print name	
Re-occupation declaration approved by Authorised Person (Water)			
Approved by (signature)		Print name	
Date			

Completed record forms to be held in Water Safety Log Book

Figure B.3 - 003a Annual tank inspection record form

Annual tank inspection record form (003a)

Healthcare organisation			
Estates department			
Site/Premises		Tank Location	
Date		Tank Reference	

Annual tank inspection		
Question	Compliance Yes / No	Comments / Action
Tank Access Locked? (if applicable)		
Adequate Covers?		
Water Regulations Compliant?		
Insect Screens Fitted?		
External Condition?		
Internal Condition?		
Water Level?		
Operation of Ball Valve?		
Bacteriological Results? (if applicable)		
Does tank require cleaning and disinfection?		

Work done by (Print name)		Signature	
Supervisor accepted by (Print name)		Signature	
Summary of remedial works to be completed			
Date			

Completed record forms to be held in Water Safety Log Book

Figure B.4 - 003b 6-Monthly (Summer/ Winter) Temperature recordings record form

6-Monthly (Summer/Winter) Temperature recordings (003b)

Healthcare organisation			
Estates department			
Site/Premises		Tank Location	
Date		Tank Reference	
6-Monthly Temperature Readings:			
Reading at	Temp ºC	Comments / Action	
Ambient Outside Air			
Tank Room			
Water within Tank			
Mains Supply Water at inlet to Building/Block			
Ambient Outside Air			
Work done by (Print name)		Signature	
Temperature meter reference number?		Calibration date?	
Supervisor accepted by (Print name)		Signature	
Summary of remedial works to be completed			
Date			

Completed record forms to be held in Water Safety Log Book

Figure B.5 - 004 Incident report record form

Incident report record form (004)

Healthcare organisation			
Estates department			
Site/Premises		Date	
Ward/Department		Time	
Nature and details of incident/fault			
Identified by (Print name)		Signature	
Actions taken			
Work done by (Print name)		Signature	
Time completed		Date completed	
Supervisor accepted by (Print name)		Signature	

Completed record forms to be held in Water Safety Log Book

Figure B.6 - 005 Water temperature record form

Water temperature record form (005)

Healthcare organisation		Date	
Estates department		Time	
Site/Premises		Ward/Department	

Storage Temperatures (°C)

Detail	Cal/Heat Exchanger No 1 Plant Ref No:	Cal/Heat Exchanger No 2 Plant Ref No:	Cal/Heat Exchanger No 3 Plant Ref No:
Storage Temp			
Outflow Temp			
Return Temp			
Cold Feed Temp			

Outlet Temperatures (°C)

Ward/Department	Room	Temperature		Okay Yes/No	Comments
		Hot	Cold		

Additional Comments/Actions

Reading taken by (Print name)		Signature	
Temperature meter reference number?		Date of last calibration	
Supervisor accepted by (Print name)		Signature	
Date completed		Time completed	

Completed record forms to be held in Water Safety Log Book

Figure B.7 - 005a Daily DHW Calorifier/ Water temperature record form

Daily DHW Calorifier/ Water temperature record form (005a) where a BEMS is not installed or where BEMS is not Operational

Healthcare organisation				
Estates department				
Site/Premises			Month/Year	
Block/System			Calorifier No.	
Temperatures				

Day	Temperature (°C)			Comments	Time of Recording	Name & Signature
	Storage	Flow	Return			
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						

(continued overleaf)

Day	Temperature (°C)			Comments	Time of Recording	Name & Signature
	Storage	Flow	Return			
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Additional Comments / Actions						

Reading taken by (Print name)		Signature	
Temperature meter reference number?		Date of last calibration	
Supervisor accepted by (Print name)		Signature	

Completed record forms to be held in Water Safety Log Book

Figure B.8 - 005b Disinfected shower head and Hose replacement record form

Disinfected shower head and Hose replacement record form (005b)

Healthcare organisation					
Estates department					
Site/Premises				Date	
Block/System(s)				Time	
Replacement details					
Ward / Dept	Room	Shower Ref. or Item No.	Replaced by: Print name	Replaced by: Signed	Attach Disinfection ID and LOT Number (sticker from pack)
Additional Comments/Actions					
Reading taken by (Print name)				Signature	
Temperature meter reference number?				Date of last calibration	
Supervisor accepted by (Print name)				Signature	

Completed record forms to be held in Water Safety Log Book

Figure B.9 - 006 Calorifier and storage/ Buffer vessel maintenance record form

Calorifier and storage/ Buffer vessel maintenance record form (006)

Healthcare organisation				
Estates department				
Site/Premises		System ref		
System (Domestic Hot water calorifier(s) and Storage /Buffer vessel(s) associated with Hot/Cold/Chilled water heat exchanger(s)		Plant ref no		
Quarterly flushing				
Period	Date Undertaken	By (Name)	Signature	Comments
1st Quarter				
2nd Quarter				
3rd Quarter				
4th Quarter				
Annual Plant Cleaning (Plant Ref No as above):				
Plant taken out of service for annual cleaning	Date		Time	
Drain and clean done by (Print name)		Signature		
Drain and clean done by (Second man print name)		Signature		
Start up procedure done by (Print name)		Signature		
Where domestic hot water calorifier or Storage/buffer vessel – held at 60ºC for (hours)				
Date Plant back in service		Time Plant back in service		
Supervisor accepted by (Print name)		Signature		
Additional Comments / Actions – forward to **Authorised Person (Water)**				

Completed record forms to be held in Water Safety Log Book

Figure B.10 - 007 Air handling unit disinfection record form

Air handling unit disinfection record form (007) (Please refer to water operational procedure at all times)

Healthcare organisation							
Estates department							
Site/Premises				Plant Location			
Date		Plant Reference		**NB: Use Sodium Hypochlorite Solution 5ppm within 2 hours of issue**			
Sodium Hypochlorite Solution		Batch Number		Expiry Date			
Safety Checks							
Ref	Details		Yes/No	Comments			
1	Have you read and understood the data COSHH sheet?						
2	Have you read and understood the risk assessment sheet?						
3	Have you put appropriate signage in place?						
4	Are you wearing the appropriate PPE?						
Pre-Disinfection Checks							
1	Was there water present in ductwork?						
2	Was drain glass trap clean? (i.e. transparent)						
3	Any sign of biological growth?						
4	Drainage trays clean and corrosive free?						
How long was 5ppm chlorine applied for before being washed off?				Hours			
Completion Checks							
1	All wetted areas dry?						
2	Was sample taken for analysis?						
3	All panels replaced and plant switched on?						
4	Entry made in local maintenance log?						
Comments							
Signed (Competent Person)					Date		
Accepted by (Authorised Person)					Date		

Completed record forms to be held in Water Safety Log Book

Figure B.11 - 021 Building energy management system water system alarm/ Fault record form

Building energy management system water system alarm/ Fault record form (021)

Healthcare organisation					
Estates department					
Site/Premises				Plant Location	
Date		Time		Plant Reference	
Details of alarm condition					
Details of actual Fault/Alarm					
Action taken					
System back in operation at (date & time):					
Craftsperson or AP who reported (signature)				Date	
Craftsperson who repaired (Signature)				Date	
Accepted by (Signature of Authorised Person (Water))				Date	

Completed record forms to be held in Water Safety Log Book

Figure B.12 - 022 Monthly checks of water drain traps on ventilation plant form

Monthly checks of water drain traps on ventilation plant form (022)

Healthcare organisation						
Estate department						
a) Visually inspect condition of drain trap assembly. b) Top up any drain trap that is below minimum level. c) Remove and clean any dirty glass drain traps.						
Checked by					Date	
Location (Site/Block/Plant Room)	Drain Ref No	Plant drain trap fitted to (or Plant Ref No)	Water level Yes / No	Trap clean/dirty	Remarks	
Signed (Competent Person)					Date	
Accepted by Authorised Person (Water) (Signature)					Date	

Completed record forms to be held in Water Safety Log Book

Figure B.13 - 023 Water disinfection risk based assessment form

Water disinfection risk based assessment form (023)

Healthcare organisation								
Estates department								
Site/Premises:				Location of Work:				
Date:				Project Ref:				
Person Making Assessment: (Print Name)								
Brief description of work / upgrade:								
Assessment for Disinfection of System after Upgrade Completed (refer to "Guidance for Alterations to Water Systems" Section 3 and Disinfection Assessment Risk Table on page 10) Circle appropriate level of risk.								
A. Patients risk rating (see tables in Appendix A): 5, 4.5 or 4	4			4.5			5	
B. Water system risk rating (see tables in Appendix A):	1	2		3	4		5	
C. Level of work being carried out (delete as required):	1 Minimal (non intrusive or work at outlet)	2 Moderate (intrusive work)			3 Extensive (intrusive work taking more than 7 days)			
Risk Score = A. x B. x C. =								
Disinfection assessment (delete as required):	No action	Immersion or spray of fittings			Full disinfection			
Comments								
Assessed by (Signature)		Authorised Person (Water) (Project/Estates Officer)			Date			
Approved by (Signature)		Deputy Responsible Person (Water) (Head of Projects)			Date			
Accepted by (Signature)		Authorised Person (Water) (For the Written Scheme to accept the System back in use)			Date			

Completed record forms to be held in Water Safety Log Book

Figure B.14 - 024 Design checklist for alterations to or new work to water systems

Design checklist for alterations to or new work to water systems (024)

Healthcare organisation			
Estates department			
Site premises		Location of works	
Project reference		Date	
Person Making Assessment (Print name)		'Designer' *in compliance with the Construction (Design and Management) Regulations: 2007.*	
Brief description of alteration/upgrade/project:			

Completed record forms to be held in Water Safety Log Book

Figure B.15 - 024 Design Checklist

Design Checklist (024)

Ref	Design, Planning and Construction	Yes	No	N/A
	General			
1	If you are altering an existing system, are all outstanding and retrospective issues in the *Legionella* Risk Assessment or Written Scheme accounted for in the project work to ensure the Temperature Regime works?			
2	If you are fitting a new system or new components to any existing system, do any of the materials or fittings to be used support the growth of micro-organisms?			
3	Are low corrosion materials used?			
4	Have arrangements been made to follow the requirements of SHTM 04-01 Supplement Part E (materials and filtration) and include the leachate flushing and disinfection regime?			
5	If fitted, are thermostatic mixing valves (TMVs) sited as close as possible to the point of use?			
6	Has the inclusion of flexible hoses been avoided (and any existing removed) in the project?			
7	Are all showers fitted with fixed heads to prevent backflow?			
8	Are all dead-legs and blind stub-ends/plugged-tees been removed from the system?			
9	At hand wash stations – has an assessment been made to ensure that the tap outlet is appropriate and suits the basin? i.e. is without requiring water straighteners to avoid splashing? – and water from the tap outlet does not flow directly into basin drain hole, whilst avoiding splashing?			
10	At hand wash stations, are soap dispensers/ alcohol hand rubs placed to avoid drips on taps or into the basin?			
11	Has the Written Scheme for the water system been *Legionella* risk assessed?			
12	Have arrangements for updating the Written Scheme for the water system been planned to take account of this project, including written operating instructions, accurate schematic and detailed as fitted drawings at handover?			
13	Is the water system connected to BEMS with the required performance parameters?			
14	Have arrangements been made prior to work commencing for water sampling and testing to follow the requirements of SHTM 04-01 Supplement Part C?			
15	Have arrangements been made for Palintest Chlorometer readings of the water system(s) prior to the project? (027)			
16	Have arrangements been made for Palintest Chlorometer readings of the water system(s) to be included in the commissioning details for the project on completion? (027)			

(continued overleaf)

Ref	Design, Planning and Construction	Yes	No	N/A
	Cold Water Systems			
17	Whether a BEMS is fitted or not – is a visible and accessible manual means of monitoring cold water system supply (at building block inlet or meter point), tank storage, flow (and return where appropriate) temperatures available?			
18	Is cold water stored and distributed to outlets at below 20^{0}C?			
19	Is the cold water circulated?			
20	If cold water is circulated will it require to be chilled to ensure distribution below 20^{0}C?			
21	Are low use outlets installed upstream of higher use outlets?			
22	Has cold water storage been assessed and minimised, i.e. holds enough for one days use?			
23	Is supply and distribution piping insulated and kept away from all heat sources?			
24	Is the cold water tank:			
a)	Fitted with a cover and insect screen(s) on any pipework open to the atmosphere?			
b)	Located in a cool place and protected from external temperature?			
c)	Accessible?			
	Domestic Hot Water Systems			
25	Whether a BEMS is fitted or not – is a visible and accessible manual means of monitoring domestic hot water system storage, flow and return temperatures available?			
26	Is domestic hot water stored and distributed above 60^{0}C as it enters the supply system and circulated at no less than 55^{0}C at the return into the calorifier?			
27	Does the calorifier storage capacity meet normal daily fluctuations in hot water use while maintaining a supply temperature of at least 55^{0}C to the furthermost draw-off (sentinel) point in the circulating system?			
28	Are the hot water distribution pipes insulated?			
29	If more than one calorifier is used, are they connected in parallel?			
30	Does the calorifier have the following fitted:			
a)	A drain valve?			
b)	A temperature gauge on the calorifier and on inlet and outlet pipework?			
c)	An accessible access panel?			

(continued overleaf)

Assessment and any Comments *(to clarify assumptions, eliminate hazards and risks and provide information about any remaining risks):*	

Assessed by: Designer (Print name)		Signature		Date	
Co-ordinated by Authorised Person (Water) (Project / Estates Officer) (Print name)		Signature		Date	
Approved by Deputy Responsible Person (Water) (Head of Projects) (Print name)		Signature		Date	
Accepted by Authorised Person (Water) (For the Written Scheme holder accepting Pre-Start) (Print name)		Signature		Date	

Completed record forms to be held in Water Safety Log Book

Figure B.16 - 025 Flushing water outlets record form

Flushing water outlets record form (025)

Healthcare organisation	
Site/ Premises:	
Ward/ Dept:	

Outlet being flushed	Date Flushed	Time	Duration of Flush (Mins)	Initials

Supervisor Accepted by (Signature)	
Print name	

NB: This record to be retained for 5 years, to comply with regulations.

Figure B.17 - 026 Estates chloramines record form

Estates chloramines record form (026) *(Use where applicable)*

Healthcare organisation			
Estates department			
Site/Premises		Thermometer and Calibration No's.	
System(s)		Chlorometer No.	

Instructions for Palintest DPD Test Chlorometer PTH 045D:

1. Select an appropriate hot or cold water outlet, representative of secondary distribution pipework system. Run hot water for 1 minute and cold water for 2 minutes before commencing sampling in Test A.
2. **Test A Free Chlorine** – rinse test tube with sample leaving 2 or 3 drops in the tube. Add one DPD No 1 tablet, crush table, then fill to the 10ml mark. Mix dissolved tablet and ensure particles have settled. Take reading immediately and record.
3. **Test B Total Chlorine** – Using solution from Test A – Add one DPD No 3 Table, crush and mix to dissolve. Stand for 2 minutes. Take reading immediately thereafter and record.
4. **Calculate Combined Chlorine** – Subject A from B and record. Readings should normally be just less than 1.0 mg/litre down to 0.4 mg/litre. If the reading is less than 0.4 mg/litre – inform the Authorised Person, who will investigate.

Data recorded

Ward / Dept	Room No.	Date and Time	Outlet Details				Palintest Readings			Comments Okay - Yes / No (tick / cross)
			WHB/SINK/ BATH/SHWR	HOT (tick)	COLD (tick)	Temp (°C)	Free Chlorine (Tablet No 1) (A) (mg/litre)	Total Chlorine (Tablet No 3) (B) (mg/litre)	Combined Chlorine (B – A) (mg/litre)	

Additional comments/Actions			
Reading taken by (Print name)		Signature	
Supervisor accepted by (Print name)		Signature	
Assessor (Authorised Person (Water))	Print name		
Signature		Date	
Manager (Responsible Person (Water))	Print name		
Signature		Date	

Completed record forms to be held in Water Safety Log Book

Figure B.18 - 027 Safety control log (including plant and maintenance) record form

Safety control log (including plant and maintenance) record form (027)

Healthcare organisation				
Estates department				
Site/Premises				
Block/System		Plant Room		

Date (day /month/ year)	Description / Comments	Actions to	Time of Record	Name & Signature

Accepted by (Signature of Supervisor)		Print name	

Completed record forms to be held in Water Safety Log Book

Figure B.19 - 028 acceptance of work to be conducted and confirmation of work completed on a water system

Record form for acceptance of work to be conducted and confirmation of work completed on a water system (028)

Healthcare organisation			
Estates department			
Pre-start			
Project Number:		Project Manager:	
Site / Block / Premises:		Location of Work (Ward/Department):	
Written Scheme Ref. No.:		Authorised Person (Water) The holder of the Written Scheme:	
Expected Start Date:		Project Designer:	
Anticipated Duration:		Project Contractor:	
Expected Completion Date:		Contractor(s) Working on the Water System:	
Reference Specification No.:		Reference Drawing No(s):	
Form 024 Completed and attached:		Form 025 Completed and attached:	
Water Quality Sampling Certificate and Palintest Results completed and attached:		Where required are -Leachate / Disinfection Test Results completed and attached:	
Confirmation that those working on the water system are Approved Plumbers (PILS):			
The Water System remains operational in **part?** or **whole?** or **not operational?**			
Date Form Compiled:		Water Quality acceptable prior to work commencing:	
Authorised Person (Water) From the Project Team compiling this Form and taking responsibility for the work:			

(continued overleaf)

Summary Description of the Work / Project and the Area / Rooms affected:			
Duty Holder(s) or their devolved Local Manager(s) informed and affected by the work / project are:			
Approval and acceptance of work and conditions			
Duty Holder(s) or their devolved Local Manager(s)	Accepted by (Print name)		
Signature		Date	
Authorised Person (Water) (Holder of the written scheme)	Approved by (Print name)		
Signature		Date	
Authorised Person (Water) (From the project team accepting responsibility for the work, working with the holder of the Written Scheme – who remains responsible for the water system	Accepted by (Print name)		
Signature		Date	

Completed record forms to be held in Water Safety Log Book

Figure B.20 - 029 Acceptance of Work to be Conducted and Confirmation of Work Completed on a Water System record forms

Post completion - Confirmation of work completed and acceptance:

Post Completion Checklist:

Ref	Design, Planning and Construction	Yes	No
	General		
1	Has all the work as described in the PRE-START Section been completed? Comments:		
2	Has the Commissioning Data been validated against the Design Specification (by either client side rep, or independent engineer)		
3	Where an existing system has been altered, are all outstanding and retrospective issues in the *Legionella* Risk Assessment or Written Scheme accounted for in the completed work to ensure the Temperature Regime works?		
4	Where a new system or where new components have been fitted to an existing system, do any of the materials or fittings to be used support the growth of micro-organisms?		
5	Have low corrosion materials been used?		
6	Have arrangements followed the requirements of SHTM 04-01 Supplement Part E (materials and filtration) and include the leachate flushing and disinfection regime?		
7	Where fitted, are thermostatic mixing valves (TMVs) sited as close as possible to the point of use?		
8	Has the inclusion of flexible hoses been avoided (and any existing removed) in the project?		
9	Are all showers fitted with fixed heads, or are showers with hose handsets permanently restrained or shortened to achieve an air gap to prevent backflow and cross contamination?		
10	Have all dead-legs and blind stub-ends/plugged-tees been removed from the system?		
11	At hand wash stations – has an assessment been completed to ensure that the tap outlet is appropriate and suits the basin? i.e. is without requiring water straighteners to avoid splashing? – and water from the tap outlet does not flow directly into basin drain hole, whilst avoiding splashing?		
12	At hand wash stations, have soap dispensers/ alcohol hand rubs been placed to avoid drips on taps or into the basin?		
13	Has the Written Scheme for the water system been updated to take account of this project, with written operating instructions, accurate schematic and detailed as fitted drawings provided at handover?		
14	Has the updated Written Scheme for the water system been *Legionella* risk assessed?		

15	Has the water system been connected to BEMS with the required performance parameters?		
16	Have arrangements been made after the work has been completed for water quality sampling and testing to follow the requirements of SHTM 04-01 Supplement Part C?		
17	Have arrangements been made for Palintest Chlorometer readings of the water system(s) after completion of the project? **(026)**		
18	Have the Palintest Chlorometer readings of the water system(s) been included in the commissioning details for the project at completion? **(026)**		
19	Has a certificate of disinfection to BS6700 (or BS EN 806) been provided?		
20	Whether a BEMS has been fitted or not – is a visible and accessible manual means of monitoring cold water system supply (at building block inlet or meter point), tank storage, flow (and return where appropriate) temperatures available?		
21	Is cold water stored and distributed to outlets at below 20^{0}C?		
22	Is the cold water circulated?		
23	If cold water is circulated – is it (or require to be) chilled to ensure distribution below 20^{0}C?		
24	Are low use outlets installed upstream of higher use outlets?		
25	Has cold water storage been assessed and minimised, i.e. holds enough for one days use?		
26	Has all supply and distribution piping been insulated and kept away from all heat sources?		
27	Is the cold water tank:		
a)	Fitted with a cover and insect screen(s) on any pipework open to the atmosphere?		
b)	Located in a cool place and protected from external temperature?		
c)	Accessible?		
	Domestic Hot Water Systems		
28	Whether a BEMS has been fitted or not – is a visible and accessible manual means of monitoring domestic hot water system storage, flow and return temperatures available?		
29	Is domestic hot water stored and distributed above 60^{0}C as it enters the supply system and circulated at no less than 50^{0}C at the return into the calorifier?		
30	Does the calorifier storage capacity meet normal daily fluctuations in hot water use while maintaining a supply temperature of at least 55^{0}C to the furthermost draw-off (sentinel) point in the circulating system?		

(continued overleaf)

31	Have the hot water distribution pipes been insulated?		
32	If more than one calorifier is used, have they been connected in parallel?		
33	Does the calorifier have the following fitted:		
a)	A drain valve?		
b)	A temperature gauge on the calorifier and on inlet and outlet pipework?		
c)	An accessible access panel?		
34	Leachate / Disinfection Test Results completed and attached:		
35	Water Quality Sampling Certificate and Palintest Resulted completed and attached:		
36	Water Quality acceptable prior to returning the water system into use?		
Any other comments			
Confirmation of work completed and acceptance:			

Completed record forms to be held in Water Safety Log Book

Confirmation of work completed and acceptance:

This confirms compliance of all work described in the Post completion checklist, in accordance with the Healthcare organisation - Management and Control of Water Safety Policy and associated Procedures. No other work has been carried out under this notification other than that described previously.

Confirmed all Work Completed by:		
(signed) (Designer)	Date:	
(print name)		
and:		
(signed)	Date:	
(print name)		
Authorised Person (Water) (From the Project Team accepting responsibility for the work, completing work with an updated Written Scheme)		
Approved and Accepted by:		
(signed)	Date:	
(print name)		
Authorised Person (Water) (Holder of the updated Written Scheme)		
Accepted by **Duty Holder(s)** or their devolved Local Manager(s)		
(signed)	Date:	
(print name)		
(for those that were affected by the work / project)		

Completed record forms to be held in Water Safety Log Book

Figure B 21 - 029 Watere cooler risk assessment template

Water cooler risk assessment template (029)

Healthcare organisation:		Person Making Assessment (Print Name):			
Estates department:		Job title of person undertaking risk assessment:			
Site/Premises:		Qualification of person:			
Ward/Department:		Date:	Revision number:		
		Date of last risk assessment:			
Brief description of the activity of the location, or equipment details: to determine the level of risk from the water cooler poses to the persons in the area.					
Description of the hazards	Persons affected by the work (installation, maintenance, sampling) activity and how	Control measures	Likelihood	Impact	Risk rating (see risk scoring matrix)
Infection/ colonisation with opportunistic waterborne bacteria from contaminated water. Transient flora from person touch, cleaning and environment.	Patients, visitors, staff	<u>Use of water</u> Has the potential frequency of use been assessed? <u>Type of cooler</u> Is the cooler of the type which minimises tap contamination? Is the mains-fed cooler non-pressurised and vented, does it have an air filter of at least 5 micron?			

		Installation WSG/ AE have reviewed the location for the cooler. Cooler location – has it been installed in correct area as agreed by the Water Safety Group Is there a log sheet detailing: cooler description and serial number? Has all RAMS for breaking into existing water system been received and reviewed by the Water Safety Group? Correct installation and commissioning of water system in line with SHTM 04-01. Incl. appropriate backflow protection. System components are WRAS approved. Schematic water drawings are up to date and available.			

		Operation and maintenance Cooler cleaning methods are understood, based on who undertakes these, when and frequency. WSG/ AE have reviewed the cooler cleaning methodology. The flushing of the cooler is carried out and recorded. Sampling plans are in place. Local water temperatures to the cooler are being monitored. Maintenance plans and records are available. COSHH documentation and risk analysis for authorised chemicals provided? Is there a full sanitisation programme in place?			

		Is there a programme in place for disinfection of taps with an appropriate food-grade disinfectant spray? Is there a programme in place to change the filter? Is there a programme in place to replace the tap outlets? Is there a programme for descaling outlet tap? Is there a programme for disinfection of tap outlets? Are there accurate asset registers of the coolers? Is the drip tray emptying and exterior cleaning of the cooler between contracted cooler care visits part of the Healthcare organisation's maintenance policy?			

		Are warning notices available and part of the maintenance policy to be displayed to prevent inadvertent use while sanitisation and filter changes are being carried out?			
Any other comments:					

Water Safety Group Meeting date		Date	
Water Safety Group/ RP (Print name)		Signature	

Risk scoring matrix

Risk scoring: Use the grid below to achieve and overall score for the risk by measuring across for the impact and down for the likelihood.						
		IMPACT				
		1	2	3	4	5
LIKELIHOOD	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25
Key		Green Low		Amber Medium		Red High

Notes:

1) 'High risk' can be defined as a combination of frequent use, poor environmental surroundings, public usage, lack of interim disinfection and location where immune-compromised users are local.
2) No water cooler should be fitted / installed without the authorisation of the Water Safety Group.
3) Water coolers installed without Water Safety Group authorisation should be decommissioned and removed.
4) Any water coolers installed without a suitable approved maintenance regime should be taken out of use.
5) Microbiological sampling should be undertaken as per the sampling plan for each healthcare facility.
6) Should the nature of the water cooler location change, this risk assessment should be reviewed and assessed.
7) This is an example risk assessment. The control measures outlined are not exhaustive. Each healthcare facility will have its own risks and will need to carry out a risk assessment based on these risks.

Figure B.22 - 030 Scalding risk assessment template

Scalding risk assessment template (030)

RECORD OF GENERAL RISK ASSESSMENT	
Department	
Managers Responsible	Estates Managers, Clinical Leads, Service Managers
Risk Assessor(s)	
Description of Task/ Environment/ Objectives **Mitigating Scalding from Hot Water Outlets/Surfaces/Pipework**	

What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks
Scalds/Burns	Staff, Patients & Visitors by use of hot water outlets when washing.	NHS (insert board name) safe bathing, showering and surface temperature policy, and the associated hot water systems procedures documents sets out the organisational arrangements for the safe management for bathing and showering inpatients and community patients. The arrangements provide assurance that safe operating procedures are in place to prevent the risk of injury or significant harm to patients from scalding. NHS (insert Board name) Water Safety Group meets regularly with representation from all relevant stakeholders. Staff responsible for the management of water services are sufficiently trained and are formally appointed.	
What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks

Scalds/Burns	Patients by using showers & baths and due to incorrect temperature management of domestic hot water services or failure of thermostatic mixing valve on hot water taps.	All domestic hot water systems are maintained in accordance with SHTM 04-01, water safety for healthcare premises, HSE document L8 and HSG274 All domestic hot water taps & showers used for patient washing are set at the relevant temperature as per SHTM 04 01 Part A, table 4, safe water temperatures and delivery devices. All thermostatic mixing valves are type 3 for use in healthcare premises. All type 3 thermostatic mixing valves and thermostatic mixing taps comply with the standards of the performance specification D08:'Thermostatic mixing valves (healthcare premises)' All type 3 thermostatic mixing valves and thermostatic mixing taps are checked at intervals not exceeding 6 Months. All thermostatic mixing valves and taps have integral maximum temperature settings which are fixed at commissioning and checked under planned preventative maintenance schedules. There is no user accessible adjustment of the mixed water temperature beyond the maximum permitted for the application, as defined in SHTM 04 01 Part A, table 4, safe water temperatures and delivery devices. In the case of a dual function delivery device, i.e. shower/bath diverter, a risk assessment will have been carried out to establish what temperature setting is required.	
What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks

Scalds/Burns	This scalding may occur as a result of coming into direct contact with hot water including submersion.	A risk assessment has been carried out to identify potential scalding risks from hot water temperatures and to assess the vulnerability of all those who have access to bathing and washing facilities (this risk assessment). All risk control measures identified are communicated to nursing staff. Procedures relating to the management and control of hot water are fully implemented within the clinical environment as appropriate. Signage indicating the correct bathing / showering temperature(s) is displayed in all bathroom and shower rooms. All hot water outlets which are not thermostatically controlled have 'caution hot water' labels at each outlet. All managers who have responsibility for an area shall log all requests to the maintenance department whenever a temperature exceeds the prescribed maximum temperature. Ensure that pre-bathing checks are in place, which are recorded in the vulnerable patient record each time before the vulnerable patient/service user is bathed or showered. Confirm that temperature records are monitored by the Charge Nurse on a regular basis e.g. during any ward round. For the purposes of the policy, bathing includes a bath, shower and during hand washing. Those patients/service users that should be considered particularly at risk and vulnerable include: Babies & Children The elderly Patients with sensitive skin Mentally/physically impaired patient groups.	
What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks

Scalds/Burns	This scalding may occur as a result of coming into contact indirectly with surfaces containing hot water, such as unprotected radiators and pipework.	Provision of low surface temperature heat emitters. Provision of high-level heat emitters. Provision of guards around heat emitters with surface temperatures exceeding 43° C. Heating and hot water pipe work insulated with appropriate material to ensure the heating surface does not exceed 43° C. All exposed surfaces must be assessed to ensure compliance with this requirement, as per hot water procedure document. Where measures to reduce temperatures are provided in some, but not all areas of a property, warning labels should be fitted to all "non-protected" surfaces. Devices (including sensors) installed to reduce or control temperatures should be regularly tested to ensure that they are still effective, and any faulty temperature control device or guard should be repaired or replaced.	

Figure B.23 - 031 Permit to Works Water Systems (PTW) template

Permit to Works Water Systems (PTW) template (031)

Part 1 – Design Acceptance and Permission to Proceed	
Healthcare organisation	
Site	
Building	
Floor Level	
Department/Ward	
Patient Risk Group (If Applicable)	
Written Scheme Reference No:	
Description of New Installation or Alterations to Existing Water System	

Design Acceptance	
Designer Details	**Designer:** Name _____Signed _____Date _____ (Print) Company: _____
Design Specification Refs	The design has been carried out to SHTM 04-01 Part A, BS EN 806-2 and the following design Specifications: (Insert details of all relevant specifications used to develop this design):

Design Acceptance (Cont.)	
Design Drawings Refs:	(Insert details of design drawings):
SHTM 04-01 Part G Design Checklist Completed	SHTM 04-01 Part G design checklist completed and held in Water Safety Logbook. Completed: Date _____
Design Checklist Approved By	**Deputy Responsible Person (Water) - Head of Projects** Name _____Signed _____Date _____ (Print)
Details of any Pre-Installation Water Sampling to BS 7592:2022 & BS 8554:2015	

IPCT Acceptance - HAI-SCRIBE (SHFN 30) Stage 2 & Stage 3 SCRIBEs Completed.	**IPCT** - HAI Stage 2 & Stage 3 SCRIBEs Completed and Signed off. Name _____Signed _____Date _____ (Print)
Authorised Person (Water) Acceptance and Permission to Proceed	**Authorised Person (Water)** - Acceptance of Pre-Installation Stage and Permission to Proceed Name _____Signed _____Date _____ (Print)
Clinical Permission to Proceed	**Clinical/Nursing** permission is required for this work to proceed, and is granted by: (Delete if not applicable) Name _____Signed _____Date _____ (Print)

Part 2 – Competent Person (Water) Acceptance of Work and Conditions	
I accept responsibility for installation of the works in accordance with the design specifications, design drawings, SHTM 04-01 Part A and BS EN 806-4. No other work will be carried out by me, or persons under my control.	**Competent Person (Water)** Name _____ Signed _____ Date _____ (Print) Company: _____
Part 3 – Confirmation of Work Completion, Commissioning and Microbiological Test Results	
All works as described in Part 1 have been completed in accordance with the design specifications, design drawings, SHTM 04-01 Part A and BS EN 806-4	**Competent Person (Water)** Name _____ Signed _____ Date _____ (Print) Company: _____

Pressure Testing to BS EN 806-4:	System has been pressure tested to BS EN 806-4 using: Water/Air/Inert Gas (Delete as applicable) **Competent Person (Water)** Name _____Signed _____Date _____ (Print)
Flushing & Disinfection to PD 855468:2015:	System has been flushed and disinfected to PD 855468:2015: Disinfectant Used: _____ Concentration PPM _____ Contact Time_____ **Competent Person (Water)** Name _____Signed _____Date _____ (Print)

Commissioning of TMVs to HTM D08:2017:	Thermostatic Mixing Valves have been commissioned to HTM04-01: Performance Specification D 08:2017 **Competent Person (Water)** Name _____Signed _____Date _____ (Print)
Details of any Post-Installation Water Sampling to BS 7592:2022 & BS 8554:2015	
Microbiological Test Results and authorisation to use system:	I have reviewed the Microbiological Test Results and confirm they are satisfactory, and the system may be taken into use. **Consultant Microbiologist/Infection Prevention & Control Team Lead** Name _____Signed _____Date _____ (Print) **Authorised Person (Water)** Name _____Signed _____Date _____ (Print)

Clinical acceptance of system:	I understand all aspects of the works undertaken and the commissioning & testing of the water system, and I accept that the system is ready for use. **Clinical/Nursing** acceptance of system is granted by: (Delete if not applicable) Name _____Signed _____Date _____ (Print)

Reference Documents:

Design & Installation:

Scottish Health Technical Memorandum 04-01:2014 Water safety for healthcare premises Part A: Design, installation and testing

BS EN 806-1:2000 Specification for installations inside buildings conveying water for human consumption - Part 1: General

BS EN 806-2:2005 Specification for installations inside buildings conveying water for human consumption - Part 2: Design

BS EN 806-4:2010 Specification for installations inside buildings conveying water for human consumption - Part 4: Installation

Scottish Health Facilities Note 30 Parts A, B and C: HAI-SCRIBE manual, implementation, assessment, question sets and check lists.

Flushing & Disinfection:

PD 855468:2015 Guide to the flushing and disinfection of services supplying water for domestic use within buildings and their curtilages.

BS EN 806-4:2010 Specification for installations inside buildings conveying water for human consumption - Part 4: Installation

Commissioning of TMVs:

Health Technical Memorandum 04-01: Supplement Performance specification D 08: thermostatic mixing valves (healthcare premises) 2017 edition

Sampling:

BS 8554-2015: Code of practice for the sampling and monitoring of hot and cold water services in buildings

BS 7592-2022: Sampling for Legionella bacteria in water systems — Code of practice

Figure B.24 - 032 Permit to Works Above Ground Drainage Template

Permit to Works Above Ground Drainage Template (032)

Part 1 – Design Acceptance and Permission to Proceed	
Healthcare organisation	
Site	
Building	
Floor Level	
Department/Ward	
Patient Risk Group (If Applicable)	
Written Scheme Reference No:	
Description of New Installation or Alterations to Existing Water System	
Design Acceptance	
Designer Details	**Designer:** Name _____Signed _____Date _____ (Print) Company: _____

Design Specification Refs:	The design has been carried out to SHTM 04-01 Part A, BS EN 12056, CIBSE Guide G and the following design Specifications: (Insert details of all relevant specifications used to develop this design):
Design Acceptance (Cont.)	
Design Drawings Refs:	(Insert details of design drawings):
Design in accordance with CIBSE Guide G Public health & plumbing engineering 2019 & SHTM 04-01 Part A	**Designer** Name _____Signed _____Date _____ (Print)
Design Checklist Approved By	**Deputy Responsible Person (Water) - Head of Projects** Name _____Signed _____Date _____ (Print)

IPCT Acceptance - HAI-SCRIBE (SHFN 30) Stage 2 & Stage 3 SCRIBEs Completed.	**IPCT** - HAI Stage 2 & Stage 3 SCRIBEs Completed and Signed off. Name _____ Signed _____ Date _____ (Print)
Authorised Person (Water) Acceptance and Permission to Proceed	**Authorised Person (Water)** - Acceptance of Pre-Installation Stage and Permission to Proceed Name _____ Signed _____ Date _____ (Print)
Clinical Permission to Proceed	**Clinical/Nursing** permission is required for this work to proceed, and is granted by: (Delete if not applicable) Name _____ Signed _____ Date _____ (Print)
Part 2 – Competent Person (Water) Acceptance of Work and Conditions	
I accept responsibility for installation of the works in accordance with the design specifications, design drawings, CIBSE	**Competent Person (Water)** Name _____ Signed _____ Date _____ (Print)

Guide G Public health & plumbing engineering, BS 12056-2 & SHTM 04-01 Part A. No other work will be carried out by me, or persons under my control.	Company: _____
Part 3 – Confirmation of Work Completion and Commissioning	
All works as described in Part 1 have been completed in accordance with the design specifications, design drawings, CIBSE Guide G Public health & plumbing engineering, BS 12056-2 & SHTM 04-01 Part A	**Competent Person (Water)** Name _____ Signed _____ Date _____ (Print) Company: _____
Pre commissioning checks conducted in accordance with BS EN 12056-5 and SHTM 04-01 Part A	**Water Safety Group Representative & Project Team Representative** Name _____ Signed _____ Date _____ (Print) Name _____ Signed _____ Date _____ (Print)

Intrusive CCTV Survey in accordance with SHTM 04-01 Part A	**Water Safety Group Representative & Project Team Representative** Name _____ Signed _____ Date _____ (Print) Company: _____ Reviewed by Name _____ Signed _____ Date _____ (Print) Name _____ Signed _____ Date _____ (Print)
Testing & Commissioning Acceptance	I have reviewed the test and commissioning results and confirm they are satisfactory, and that the system may be taken into use. **Deputy Responsible Person (Water) - Head of Projects** Name _____ Signed _____ Date _____ (Print)

	Consultant Microbiologist/Infection Prevention & Control Team Lead Name _____Signed _____Date _____ (Print) **Authorised Person (Water)** Name _____Signed _____Date _____ (Print)
Clinical acceptance of system:	I understand all aspects of the works undertaken and the commissioning & testing of the water system, and I accept that the system is ready for use. **Clinical/Nursing** acceptance of system is granted by: (Delete if not applicable) Name _____Signed _____Date _____ (Print)

Reference Documents:

Design & Installation:

Scottish Health Technical Memorandum 04-01:2014 Water safety for healthcare premises Part A: Design, installation and testing

BS EN 12056-2 Gravity drainage systems inside buildings - Part 1: general and performance requirements

BS EN 12056-1 Gravity drainage systems inside buildings - Part 2: Sanitary pipework – Layout & calculation

BS EN 12056-4 Gravity drainage systems inside buildings - Part 4: Wastewater lifting plants – Layout & calculation

BS EN 12056-5 Gravity drainage systems inside buildings - Part 5: Installation & testing, instructions for operation, maintenance & use

BS EN 806-4:2010 Specification for installations inside buildings conveying water for human consumption - Part 4: Installation

CIBSE Guide G Public health & plumbing engineering - 2014

Figure B.25 - 033 WHB placement or removal risk assessment template

WHB placement or removal risk assessment template (033)

RECORD OF GENERAL RISK ASSESSMENT			
Healthcare organisation			
Department			
Managers Responsible	Estates Managers, Clinical Leads, Service Managers		
Risk Assessor(s)			
Description of Task/ Environment/ Objectives **Review of removal of clinical wash hand basins**			
What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks
CWHB in the clinical space. Waterborne microorganisms splash within 2 metres from CWHB causing HAI. (mode of transmission droplet/aerosol)	Susceptible host - patient who has a route of entry and receiving care either as an inpatient or outpatient. How: Portal of entry - water splash transmission onto broken skin/ mucous membranes exposed to	Design development has positioned Clinical wash hand basins (CWHB) 2 metres from route of entry or semi-invasive or invasive equipment in all clinical rooms (inpatient and outpatient). (2m distance outlined within NHSS Repeatable Rooms 2020). Note: NIPCM Chapter 4 notes splash zones up to 2 metres from outlet, however risks should still be considered in areas where splash or spray exceeds this distance. Design will incorporate: • SHTM 64 compliance. • CWHB's water will not run directly into drain.	

PPM and reactive repair activities in clinical spaces.	waterborne microorganism. Splash onto invasive equipment or broken skin/mucous membranes causing Healthcare Associated Infection.	• No flow straightener. • Thermostatic Mixer Taps. • Planned Preventative Maintenance (PPM) schedule, clean tools procedures. • Training of domestic, clinical and engineering staff.	
What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks
HAI for staff No CWHB in the clinical room. Occupational exposure to blood or body fluids infection. Therefore, colleagues cannot wash hand in a timely/ convenient way.	Who: Staff How: through contact exposure to blood body fluids during clinical procedures leading to infection	Standard Infection Control Precautions include – • Mitigate occupational exposure to blood body fluids – PPE available in the room includes aprons and gloves. • Staff have completed NES SIPCEP module and PPE Donning and Doffing training. • Hand hygiene before a clean/ aseptic procedure is with alcohol-based hand rub. • Hand hygiene for surgical hand preparation can be with Surgical rub (ABHR) • Clinical wash hand basins are available in nearby rooms to ensure hands are visibly clean before entering the room • Broken skin covered with impervious dressing	

What are the hazards	Who might be harmed & how	Current Control Measures	Evaluate the risks
HAI for patient	Who: Patient HAI due to no water and soap hand hygiene facility in the room for staff. How: staff hands remain soiled with organic matter which contains infectious agents which spread to the patient or healthcare surfaces	Standard Infection Prevention and Control Measures • Staff have completed NES TURAS SIPCEP module and PPE Donning and Doffing training and hand hygiene. • Hand hygiene (moment 2) before a clean/aseptic procedure is with alcohol-based hand rub on clean dry hands • Hand hygiene for surgical hand preparation can be with surgical rub (ABHR) on clean dry hands • Clinical wash hand basins are available in the department to ensure staff hands are visibly clean before entering the clinical room (required for use of ABHR) • Visibly soiled healthcare surfaces are cleaned or disinfected promptly • Frequently touched healthcare surfaces are routinely cleaned and kept clean i.e. door handles	

Figure B.26 - 034 Tool and Equipment Maintenance record form

Tool and Equipment Maintenance (034)

Healthcare organisation:	Site/Premises:	
Estates department:	Supervisor Name:	Supervisor Signature:

Check condition of all tools and equipment for damage prior to use.

Ensure tools and equipment are calibrated where necessary, clean, corrosion free and are fit for purpose.

Clean tools **after each task** using a light detergent if necessary.

Store tools in a secure, clean and dry environment away from extremes of moisture and temperature.

Date	Time	Tools/ equipment used	Department/ Ward	Exact location including room and asset numbers	Task undertaken	PPM/ Job number	Signature

Figure B.27 - 035 TMV and TMT Maintenance Record

TMV and TMT Maintenance Record (035)

Healthcare Organisation:					**Site/Premises:**					**Department/Ward:**				
Date	Time	Location (Room Number)	Outlet Asset ID	Outlet Type	Strainers & Check Valves Cleaned	Hot Supply Temp 55°C Max	Cold Supply Temp 20 °C Max	Initial mixed temp at max flow	Failsafe Check No Flow After 5s	Volume Flow After 60s 120ml Max	Restored Mixed Temp	Change from initial mixed temp 2 °C max	Final Mixed Temp	TMV In Service Test
					Yes/No	°C	°C	°C	Pass/Fail	ml	°C	°C	°C	Pass/Fail

CP to isolate supplies to non-compliant outlets, report to supervisor and charge nurse. Repair /replace faulty TMV/TMT as necessary.

Competent Person Name ..... Competent Person Signature ..... Date .....

Supervisor Name ..... Supervisor Signature ..... Date .....

Authorised Person Name .....Authorised Person Signature ..... Date .....

Abbreviations

ABHR:	Alcohol Based Hand Rub
ACOP:	Approved Code of Practice
AHU:	Air Handling Unit
AP:	Authorised Person
ARHAI:	Antimicrobial Resistance and Healthcare Associated Infection
BEMS:	Building Energy Management System
BS:	British Standard
CDM:	Construction Design Management
CIBSE:	Chartered Institution of Building Services Engineers
COSHH:	Control of Substances Hazardous to Health [Regulations]
CPHM:	Consultant in Public Health Medicine
CW:	Cold Water
CWS:	Cold Water Services
CWST:	Cold Water Storage Tank
DHW:	Domestic Hot Water
DHWS:	Domestic Hot Water Service
DL:	Director Letter
GIA:	Gross Internal Area
HAI-SCRIBE:	Healthcare Associated Infection Systems for Controlling Risk in the Built Environment
HBN:	Health Building Note
HPN:	Health Protection Network
HSE:	Health and Safety Executive
HSG:	Health and Safety Guidance
ICP:	Infection Control Practitioner
IPC:	Infection Prevention and Control

IPCT:	Infection Prevention and Control Team
IMT:	Incident Management Team
LP:	Licensed Provider
NSS:	National Services Scotland
NPF:	National Performance Framework
NTM:	Non Tuberculosis Mycobacteria
NWSAG:	National Water Services Advisory Group
OCT:	Outbreak Control Team
PAG:	Problem Assessment Group
PDA:	Personal Digital Assistant
pH:	potential of hydrogen
PHLS:	Public Health Laboratory Service
PILS:	Plumbing Industry Licensing Scheme
POU:	Point-of-use
PPE:	Personal Protective Equipment
ppm:	parts per million
PPM:	Pre Planned Maintenance
PTW:	Permit to Work
PWTAG:	Pool Water Treatment Advisory Group
RIDDOR:	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
RP:	Responsible Person
SAN:	Safety Action Notice
SEPA:	Scottish Environmental Protection Agency
SETAG:	Scottish Engineering and Technology Advisory Group
SHPN:	Scottish Health Planning Note
SHTM:	Scottish Health Technical Memorandum
SNIPEF:	Scottish and Northern Ireland Plumbing Employers Federation
SSD:	Sterile Services Department

TMT: Thermostatic Mixing Tap

TMV: Thermostatic Mixing Valve

TVC: Total Viable Count

UKAS: United Kingdom Accreditation Service

WHO: World Health Organization

WIAPS: Water Industry Approved Plumbers Scheme

WRAS: Water Regulations Advisory Scheme

WSG: Water Safety Group

WSP: Water Safety Plan

References

Acts and regulations

26. Building Standards Technical Handbook 2017 Non Domestic 4. Safety, Standard 4.9 Danger from Heat.
27. Control of Substances Hazardous to Health Regulations 2002, SI 2002 No 2677.
28. Food Safety and Hygiene (England) Regulations 2013.
29. The Food Hygiene (Scotland) Regulations 2006.
30. Health and Safety at Work etc. Act 1974.
31. Management of Health and Safety at Work Regulations 1999. SI 1999 No. 3242.
32. Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR).

Water Regulations Scotland

33. The Water (Scotland) Act 1980.
34. The Public Water Supplies (Scotland) Regulations 2014.
35. The Public Water Supplies (Scotland) Amendment Regulations 2017.
36. The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017.
37. The Public and Private Water Supplies (Miscellaneous Amendments) (Scotland) Regulations 2017.
38. The Water Supply (Water Fittings) (Scotland) Byelaws 2014.

Scottish Government Acts

39. Public Health etc. (Scotland) Act 2008.
40. Public Services Reform (Scotland) Act 2010.
41. Patient Rights (Scotland) Act 2011.

NHS Scotland Assure Publications

42. National Infection Prevention and Control Manual (NIPCM).
43. Property Asset Management System (PAMS).

Scottish Health Facilities Note (SHFN)

44. SHFN 30 Part A: Manual Information for Design Teams, Construction Teams, Estates & Facilities, and Infection Prevention & Control Teams.

Scottish Health Technical Memorandum (SHTM)

45. SHTM 00 - Best practice guidance for healthcare engineering Policies and principles.
46. SHTM 04-01 - Water safety guidance Part B: Operational management.
47. SHTM 04-01 - Water safety guidance Part C. Microbiological sampling.
48. SHTM 04-01 - Water safety guidance Part E. Alternative materials and filtration.
49. SHTM 06-01 - Electrical services supply and distribution. Part A Design Considerations.
50. SHTM 08-01 - Specialist services Acoustics.
51. SHTM 08-07 - Confined Spaces policies, procedures and guidance (SHTM 08-07)

Health Building Note (HBN)

52. HBN 00-10 Part C - Sanitary assemblies.
53. HBN 07-01 - Satellite dialysis unit.

Health Technical Memorandum (HTM)

54. HTM 07-02 - Encode. 2015.
55. HTM 04-01 - Supplement. Performance specification D 08: thermostatic mixing valves (healthcare premises).

Estates and Facilities Alerts

56. Safety Action Notice (SAN)(SC)09/03 - Flexible water supply hoses.
57. SAN(SC)96/30 27 AUG 1996 - Portable Evaporative Cooling Equipment risk of infection.
58. EFA/2013/004 - Cold water storage tanks.

Government Publications

59. The Charter of Patient Rights and Responsibilities - supporting documents - Charter of patient rights and responsibilities - revised: June 2022 - (www.gov.scot).
60. The Healthcare Quality Strategy for NHS Scotland.
61. Health and Social Care Standards My support, my life.
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