UNIVERSITY OF LEICESTER

Estates and Digital Services (EDS)
(including water assets directly under its control)

WATER SAFETY PLAN

Book 2 of 3 Processes, Procedures and Permits

This Water Safety Plan 'Processes, Procedures and Permits Document' was approved by the University of Leicester Building Services Engineer (Water) on:

Date: **17th April 2025**

Name: **Paul Gamble**

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Date of Review: **one year from issue date**

Not to be read in isolation of other WSP Books 1 and 3

HYDROP

HYDROP E.C.S.

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i. DISTRIBUTION CONTROL

This EDS Water Safety Plan (WSP) - 'Processes, Procedures and Permits' has a controlled circulation and should not be copied without the permission of the Director of Asset Management and Compliance.

All WSP books are under control of the Building Services Engineer (Water), who instructs any required changes to the current approved document. The current copy of the WSP is to be uploaded upon instruction of the Building Services Engineer (Water) to the University of Leicester EDS intranet where it can be accessed by all parties.

Where changes are requested by persons other than the Building Services Engineer (Water), draft changes are issued to the originator of the change, and the Building Services Engineer (Water) for approval. If after a week no comments are returned, the changes are incorporated into a final copy to be issued as above.

The WSP should not be printed, or stored in other locations than the approved location to ensure the version used is the latest approved version.

1. INTRODUCTION AND AIM

This WSP - Processes, Procedures and Permits provides the detailed instruction, specification and infrastructure for the implementation of the EDS WSP requirements.

All WSP books are under control of the Building Services Engineer (Water), who instructs any required changes to the current approved document. The current copy of the WSP is to be uploaded upon instruction of the Building Services Engineer (Water) to the University of Leicester EDS intranet where it can be accessed by all parties.

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2. MANAGEMENT PRO-FORMAS

Pro-forma Reference	Task Details
No. 1	Permit to derogate from instructions detailed in the WSP
No. 2	Risk Assessment Status Enquiry Pro-forma
No. 3	Urgent - Interim Problem Notification Pro-forma
No. 4	Consultancy Memorandum Pro-forma
No. 5	Local Legionella Contamination Risk Assessment

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Management Pro-forma No.	1
Task:	Permit to derogate from instructions detailed in the WSP

Application submitted by:		Date	
Location/System affected by this derogation:			
Specific section/instruction pertaining to the sought derogation:			
Reasons for seeking derogation:			
Proposed alternative processes/procedures/ instructions:			
Potential issues which may arise from this derogation and proposed pertinent mitigation:			

This section to be completed by Director of Asset Management and Compliance

Derogation approved?	YES/NO

Director of Asset Management and Compliance:

Signed:..... Date: .....

Completed document to be filed: Water Safety Intranet File	Copy to be sent to: Building Services Engineer (Water)

HYDROP	UNIVERSITY OF LEICESTER	UKAS 7775

Water Quality Management And Control PPM Programme

Risk Assessment Status Enquiry

Management Pro-forma No. 2

Purpose: To review existing Legionella risk assessments (RA) to ensure that it remains current and that the management and control systems are effective.

Site:	
Property:	
Date of most recent risk assessment:	
Risk Assessment ref. No.	

Methodology: New and revised risk assessments shall be commissioned as and when required. The status of each assessment shall be reviewed by the Building Services Engineer (Water), with oversight from the Health, Safety and Compliance Officer EDS and with contribution from the Duty Holders, on at least an annual basis and instructions given to the Director of Asset Management and Compliance to commission new risk assessments whenever there is reason to believe that the original assessment may no longer be valid or in accordance with the schedule detailed in the table below:

Query	Comments
i) Has there been a significant change to the plant or water or its use?	
ii) Has there been a significant change to the use of the building in which the system is installed?	
iii) Has there been a significant change to related guidance regarding risks or control measures?	
iv) Has there been a significant change to key personnel?	
v) Have sample results indicated that the control measures are no longer effective?	
Additional Notes	

Date of review:	
Review conducted by:	
Building Services Engineer (Water) Signature:	

Next Process required:	New risk assessment		Review most current risk assessment in 12-months	

Date of next review:	

Signature of Health, Safety and Compliance Officer Estates and Campus Services		Date of check	

Completed document to be filed: Water Safety Intranet File	Copy to be sent to: Building Services Engineer (Water)

URGENT

Interim Problem Notification

Management Pro-forma No.3

No	Tasks	Comments		
1	Date of Risk Assessment:			
2	Risk Assessment Ref. No.:			
3	Risk Assessor:			
4	Building/Facility:			
5	System:			
6	Date of fault identification:			
7	Level of Risk posed by the fault identified:			
8	Remedial Works Priority Level:			
9	Fault description:			
10	Remedial Works required:			
11	Date Remedial Works completed:		Works Ref. No.:	
12	Works completed by:			
13	Current status of fault:			
Additional Comments				
	Signature of		Date of check	
Completed document to be filed: Water Safety Intranet File		Copy to be sent to: Building Services Engineer (Water)		

Consultancy Memorandum

Management Pro-forma No.4

Subject:	
Issued by:	
Date:	

Comments

Completed document to be filed: Water Safety Intranet File	Copy to be sent to: Building Services Engineer (Water)

UNIVERSITY OF LEICESTER	Water Quality Management & Control

Management Pro-forma No.4

Task:	LOCAL LEGIONELLA CONTAMINATION RISK ASSESSMENT
Frequency:	AS REQUIRED

Outlet Asset No.		Location:	

Date of risk assessment:		Carried out by:		Signature	

Parameter	Risk Weight Points	Scored
A. System/Operational Conditions		
Infrequently used outlet	**1**	
Presence of local dead-legs	**1**	
Scale and/or dirt on outlet aerator and/or flow straightener	**1**	
Scale and/or dirt on the TMV/TMT strainer	**1**	
Water temperatures/on-line disinfectant outside of control limits	**1**	
Lack of proper hand wash basins assignment	**1**	
Evidence of improper use of hand wash basin	**1**	
Evidence of poor cleaning practices	**1**	
A: Sub Total		
B. Managed Mitigation		
None	**1**	
POU filter adequately fitted to outlet	**0.5**	
'User' removed/outlet isolated	**0**	
B: Sub Total		
C. System Contamination		
Legionella sp. @<100cfu/l	**1**	
Legionella sp. >100 - <1000cfu/l	**2**	
Legionella sp. >1000cfu/l	**3**	
C: Sub Total		
D. 'User' Susceptibility		
Low	**1**	
Moderate	**2**	
High	**3**	
D: Sub Total		
Total: A x B x C x D		

Overall Risk Score	Assessed Risk	Actions
0	**NONE**	Review local risk assessment when need arises
1 - 20	**LOW**	Continue to monitor system
21 - 39	**MODERATE**	Investigate and correct system failures.
40 - 65	**HIGH**	Ensure that the 'User' is not exposed to the domestic water system unless the outlets accessible to the 'User' are fitted with Point-of-Use filters. Investigate and correct system failures.
>65	**URGENT**	Ensure that the 'User' is not exposed to the domestic water system unless the outlets accessible to the 'User' are fitted with Point-of-Use filters. Relocate 'User' where practicable and only allow further use of contaminated outlet when contamination has been brought under control. Investigate and correct system failures.

Completed document to be filed: Water Safety Intranet File	Copy to be sent to: Building Services Engineer (Water)

3. PPM TASK SPECIFICATIONS

Task Reference (LEG) No.	Task Details
LEG 01	Distribution and Outlet Temperature Monitoring
LEG 02A	ClO2 Level Monitoring
LEG 03	Water Storage Tank – Temperature Monitoring
LEG 04	Water Storage Tank – Visual General Inspection
LEG 05	Water Storage Tank - 24 hr Drop-test
LEG 06	Storage Calorifier or Plate Heat Exchanger Buffer Vessel – 24 hr Temperature Profiling
LEG 07	Storage Calorifier or Plate Heat Exchanger Buffer Vessel –Manual Temperature Monitoring
LEG 08	Storage Calorifier or Plate Heat Exchanger Buffer Vessel –Visual General Inspection including drain flushing
LEG 09	Circulation and destratification pumps visual inspections and servicing
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LEG 18	Thermostatic Mixing Valves/Taps – General Condition Inspections & servicing
LEG 19	Thermostatic Mixing Valves/Taps – Clean, Descale and Disinfection
LEG 21	Shower Heads– Head Replacement / Clean and Disinfection
LEG 22	Air Conditioning/Air Handling –Trap cleaning and disinfection
LEG 23	Air Conditioning/Air Handling – General Inspection/Clean & disinfection
LEG 24	Air Conditioning/Air Handling –Clean & disinfection
LEG 37	Water coolers and water dispensers – sanitisation and inspection
LEG 38	Water Butt – Visual inspection, Cleaning and Disinfection
LEG 39	Non-Thermostatic Shower Mixer Valves – Visual Inspection
LEG 40	Water Feature routine inspection

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task No:	LEG 01
Task:	Distribution and Outlet Temperature Monitoring
Frequency:	As specified in the WSP Books 1 and 3
Limits:	Stored Cold Water <20°C. Cold Water Services (CWS) Distribution at <20°C. Stored hot water at ≥60°C. Hot Water Services (HWS) Flow at ≥60°C. Recirculating HWS Distribution at ≥50°C*. Non-Recirculating HWS at ≥50°C within one minute of running the tap. Direct fed hot water taps <65°C *Note – where new systems are being tested or commissioned, in line with requirements of WSP book 3 HWS returns should achieve ≥55°C
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current guidance and the needs of the site.	

Water temperatures at all outlets, both Cold and Hot, shall be measured at least once every year and Sentinel monitoring points shall be measured at monthly intervals. Hot shall be measured from the designated sentinel points on return pipework. Outlet monitoring of hot shall only be carried out where there is no recirculation on the hot system.

Where designated cold monitoring outlets are fitted with Thermostatic Mixing Valves allowing no direct fed cold only measurement, the temperature of the cold supply must be taken from the inlet to the Thermostatic Mixing Valves by surface (contact) temperature measurement. Where surface temperatures are to be taken, it must be taken from bare metal surfaces (paint must be removed where already in place).

Where Sentinel temperatures are due to be taken in the same area as other tasks at the same visit, Sentinel monitoring should always be carried out first.

All data must be logged at the time of the test, and must not be recorded on paper and input later to allow accurate time logging of temperatures recorded where electronic monitoring systems are used. A calibrated thermometer and probes shall be used for all measurements. A valid calibration certificate shall be uploaded to the electronic logbook for each thermometer before the thermometer is allowed to be used.

Task Procedure (Hot Recirculating Systems):

a. Take hot temperature from hot return pipework. Surface temperature, or binder point (if fitted) should be used.
b. Monitoring the temperature throughout, run cold for 2 minutes. Where a TMV/TMT is fitted to the monitored point, the inlet to the valve must be taken. Record the temperature at exactly 2 minutes of running, and the peak temperature found during the 2 minute run.
c. Run hot and cold in turn, inspect condition of water and outlet and record any defects to include:
    - Scale
    - Visible microbiological contamination
    - Discolouration of water
    - Corrosion
    - Leaking glands or connections
    - Low flow
    - Low usage

Task Procedure (Hot Non Recirculating Systems) – outlet with separate hot and cold controls:

a. Monitoring the temperature throughout, run cold for 2 minutes. Where a TMV/TMT is fitted to the monitored point, the inlet to the valve must be taken. Record the temperature at exactly 2 minutes of running, and the peak temperature found during the 2 minute run.
b. Monitoring the temperature throughout, run the hot outlet for 1 minute. Where a TMV/TMT is fitted to the monitored point, the inlet to the valve must be taken. Record the temperature at exactly 1 minute of running, and the time taken to steady temperature (in seconds).
c. Run hot and cold in turn, inspect condition of water and outlet and record any defects to include:
    - Scale
    - Visible microbiological contamination
    - Discolouration
    - Corrosion
    - Leaking glands or connections
    - Low flow
    - Low usage

Task Procedure (Hot Non Recirculating System) – outlet with single thermostatically mixed outlet control, the hot and cold monitoring must be done on separate visits:

a. Monitoring the temperature throughout, run the hot outlet for 1 minute, the inlet to the valve must be taken. Record the temperature at exactly 1 minute of running, and the time taken to steady temperature (in seconds).
b. Leave the system until the cold supply reaches ambient temperature
c. When the system has returned to ambient temperature; monitoring the cold TMV inlet temperature throughout, run outlet for 2 minutes. Record the temperature at exactly 2 minutes of running, and the peak temperature found during the 2 minute run.
d. Run outlet, inspect condition of water and outlet and record any defects to include:
    - Scale
    - Visible microbiological contamination
    - Discolouration
    - Corrosion
    - Leaking glands or connections
    - Low flow
    - Low usage

Blended Outlets

The outlet temperature measured shall NOT exceed:

a. 41^{o}C max for showers.
b. 41^{o}C max for washbasins.
c. 44^{o}C max for baths.
d. 38^{o}C max for bidets.

Direct fed taps scalding temperature: All direct fed hot water taps shall be a maximum of 65^{o}C.

All temperature recording will be carried out on the electronic logbook system that will automatically defect on the above limits.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task No:	LEG 02A
Task:	1oxide (ClO2) Level Monitoring
Frequency:	As specified in the WSP Book 1
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Chlorine dioxide is an oxidising biocide capable of reacting with a wide range of organic substances. Levels of 0.5 ppm can, if properly managed, be effective against planktonic and sessile legionella (biofilm) in domestic water systems. The Drinking Water Inspectorate prescribes a maximum value for chlorine dioxide in drinking water supplies which is the combined chlorine dioxide, chlorite and chlorate concentration. This must not exceed 0.5 ppm as chlorine dioxide. The unit validation should be carried out on commissioning to include chlorine dioxide, chlorite and chlorate tests. Where these show the unit producing significant amount of chlorite, or chlorate, this check will need to be repeated at periodical revalidation.

Using a suitably calibrated electronic test kit for chemical testing, the following areas are checked at regular intervals:

a. DAILY (UoL Reactive Maintenance) - the quantity of chemicals in the reservoir;
b. DAILY (UoL Reactive Maintenance) - the rate of addition of chlorine dioxide to the water supply (this to be done automatically and subject to appropriate alarms);
c. DAILY (UoL Reactive Maintenance) - the concentration of chlorine dioxide on the controller should be recorded.
d. Weekly (Water Hygiene Contractor) - the quantity of chemicals in the day tanks. Change out the tanks if the level of chemical is expected to run out before the next visit.
e. Weekly (Water Hygiene Contractor) – check there is a spare full drum of each chemical in the storage area. Replenish if required.
f. Weekly (Water Hygiene Contractor) - the concentration of chlorine dioxide on the controller should be recorded. 0.25 and 0.5ppm (Note: 0.5ppm must be considered as the maximum allowed level at point of injection and it is only allowed at this level at this point in order to allow for the minimum levels to be achieved at the point of delivery). Any level fluctuations must only be tolerated within this range and care must be exercised to ensure that the level of ClO2 at the nearest outlet does not exceed 0.5ppm (this to be done automatically and subject to appropriate alarms);
g. MONTHLY - the concentration of chlorine dioxide at, the sentinel taps - the concentration must be between 0.1 and 0.5 ppm;
h. On an annual basis, the chlorine dioxide concentration at a representative number of outlets - the concentration must be between 0.1 and 0.5 ppm.
i. SIX MONTHLY – Interim service visit in line with supplier procedure.
j. ANNUALLY – Full service in line with manufacturer recommendations.
k. ANNUALLY – revalidation of dosing unit including chlorine dioxide, and chlorite testing. Tests to be undertaken at point of dosing. The tests shall be taken both before the unit dosing point, and after the unit dosing point to calculate the actual dosed chlorine dioxide and chlorite levels.

Chemical sampling must be accompanied by temperature of the outlet measured and usage evaluation of the same.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 03
Task:	Water Storage Tank – Temperature Monitoring
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Measure and report the following:

a. Stored water temperature taken from the drain point remote from the inlet valve.*
b. Incoming supply temperature.
c. Repeat tasks a and b for all tanks connected in parallel or series.

Limits:

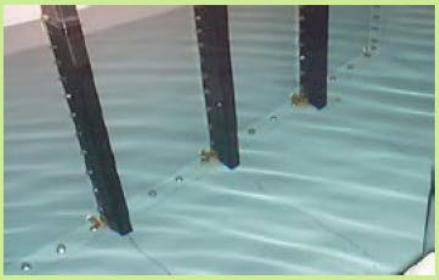
Tank inlet and stored temperature should be <20^{o}C.
Where tanks are connected in series, or parallel, there should be <1^{o}C between the stored temperatures of all tanks. More than 1^{o}C difference between tanks would indicate unsuitable balance of tanks leading to stagnation.

*If stored temperature cannot be taken from the drain point, measure and record temperature reading from as far away from the inlet valve as possible. If temperature cannot be taken from a suitable area, a defect should be logged.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 04
Task:	Water Storage Tank – Visual General Inspection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. All external surfaces shall be wiped clean with wetted cloth prior to opening of lid.
b. Confirm status of Inlet Valve and Confirm status of Outlet Valve.
c. Measure and report external temperature).
d. Measure and report tank room temperature.
e. Measure and report Stored water temperature (Temperature of the tanked water should be monitored via the drain point if practicable).
f. Measure and report tank inlet temperature.
g. Review and record if tank is under, or over capacity for building usage.
h. Visually inspect tank room for evidence of bird, rodent or insect infestation and state amount.
i. If insulation allows for inspection of the external condition of the tank walls, inspect for corrosion pitting and leaks.
j. Visually inspect internal walls of tank for signs of scale deposition, corrosion, and slime deposits and algae growth and state amount.
k. Visually inspect tank and associated valves/pipework for leaks.
l. Visually inspect bottom of tank for sludge deposition and state amount.
m. Visually inspect water surface for; dirt, oil films, insects and algae and state amount.
n. Visually inspect for slimy deposits on the internal walls of tank and state the colour of substance and state amount.
o. Visually inspect the insulation for signs of wear and tear and areas where the insulation has been removed.
p. Visually inspect that the lid is correctly fitted and that any bolts are securely tightened.
q. Visually inspect that all insect/rodent screens fitted are clear from debris so that water can flow easily.
r. Visually inspect all valves for correct operation, signs of corrosion and leaks.
s. Visually inspect all booster pumps fitted for correct operation.
t. Indicate the date that the tank was last cleaned and disinfected and indicate whether it was disinfected as routine or due to adverse conditions.

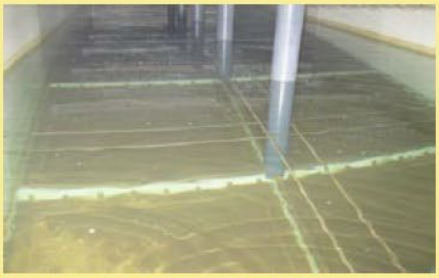
Figure 2.12 Cold water storage tank inspection



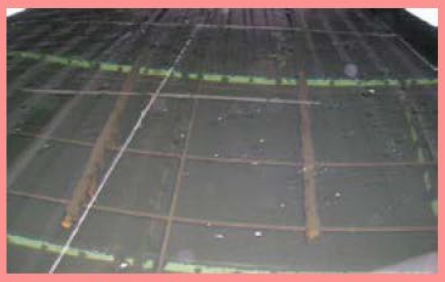
Clean tank but with slight corrosion on bolts

Light debris but corrosion to restraining bars

Moderate fouling suggesting cleaning should be conducted during the next 12 months



Slight to moderate level of debris, tank cleaning should be planned. Hollow tube supports should also no longer be used – see EFA/2013/004 at www.dhsspsni.gov.uk/efa-2013-004.pdf



Heavy debris and corrosion of internal parts that will require remedial works

Severe stagnation could indicate that the tank is oversized, or not being used

Unusually heavy scale formation requiring more than a regular clean and disinfection

Gel coat (glass reinforced plastic) failure resulting in local biological fouling (dark spots)

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 05
Task:	Water Storage Tank – Capacity Determination
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Water storage tanks shall be sized and arranged so as to minimise retention time of stored water (12hrs maximum), and therefore to increase the rate of stored water exchange.

Water storage tanks shall be subjected to a periodic "need" test which requires the Operational Responsible Person to question the presence of each unit and consider its removal if the services it supplies can be supplied by converting the systems to domestic Mains fed only.

Each unit shall be subjected to a "Capacity Determination" designed to ascertain the capacity and demand requirements of each system, in order to ensure that excessive volumes of water are not unnecessarily stored.

Note: When tanks are linked, readings should be taken for each tank.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 06
Task:	Storage Calorifier or Plate Heat Exchanger Buffer Vessel – 24hr Temperature Profiling ***(To be carried out on an 'As Required' basis)***
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Operating temperatures of storage Calorifiers or Plate Heat Exchanger Buffer Vessels must be maintained within the following limits:

- Flow temperature: ≥60°c - <65°c each unit
- Return temperature: ≥50°c each unit
- Drain temperature: ≥60°c each unit
- Cold feed temperature: <20°C each unit

a. Where the unit is monitored using BMS, collect the readings of all the fields listed above, for at least a 24hr period and consider the results. Adjust control parameters as necessary.

b. Where the unit is not monitored using BMS, attach a data-logger on the flow, return, and cold feed (as close to the unit as practicable) and collect temperature data for at least a 24hr period and consider the results. Adjust control parameters as necessary and the frequency and duration of temperature logging dependent upon results.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 07
Task:	Storage Calorifier or Plate Heat Exchanger Buffer Vessel – Manual Temperature Monitoring
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Measure and record the Flow temperature using a contact thermometer. Temperature to be taken from "Flow" pipework as close to the Calorifier or Plate Heat Exchanger Buffer Vessel as possible. Temperature to exceed 60°C, but be less than 65°C
b. Measure and record the Return temperature using a contact thermometer. Temperature to be taken from Return pipework as close to the Calorifier or Plate Heat Exchanger Buffer Vessel as possible. Temperature must exceed 50°C.
c. Isolate Cold Feed and open drain point of vessels and measure and record temperature. Temperature must exceed 60°C.
d. Measure and record the Cold Feed temperature using a contact thermometer. Temperature to be taken from Cold Feed pipework, one metre from the Calorifier or Plate Heat Exchanger Buffer Vessel if possible. Temperature must not to exceed 20°C.
e. Where heaters are fitted with destratification pumps, these shall be checked for function. Where not constantly running, the destratification pump shall be forced on via override, or timer. The leg shall be proven to be flowing, then reset to the original setting. The pump shall be set to achieve a vessel temperature of at least 60°C for a minimum of 1 hour, this will require timer for over 1 hour per day where timers are fitted.

The temperature measurements shall be carried out at different times during the day in order to allow indicative temperature monitoring of the vessel during a typical daily usage profile.

All direct fed hot water taps shall be a maximum of 65°C. For this to occur, the water heaters must be limited to a maximum temperature of 65°C, both for stored and flow.

All temperature recording will be carried out on the electronic logbook system that will automatically defect on the above limits.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 08
Task:	Storage Calorifier or Plate Heat Exchanger Buffer Vessel – General Visual Inspection including drain flushing ***(to be carried out at the same time as LEG 07 and in conjunction with plant room inspection)***
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Ensure operational status of Calorifier or Plate Heat Exchanger Buffer Vessel by checking the status of the associated isolation valves.
b. If the Calorifier or Plate Heat Exchanger Buffer Vessel is OFF, indicate the date it came Off-line.
c. Confirm the operational status of the circulation pump(s) and destratification pumps.
d. Visually inspect Calorifier or Plate Heat Exchanger Buffer Vessel and associated valves for leaks.
e. Visually inspect all pipework for signs of corrosion and leaks, and visually inspect the condition of insulation fitted.
f. Visually inspect all valves for correct operation, signs of corrosion and leaks.
g. Visually inspect all pumps fitted for correct operation and leaks.
h. Measure and record the temperature setting of the thermostat (if fitted).
i. Measure and record the Flow and Return temperature using a contact thermometer. Temperature to be taken from pipework as close to the Calorifier or Plate Heat Exchanger Buffer Vessel as possible.
j. Open drain point into a bucket and collect approximately the 1st litre of water discharged while measuring the temperature.
k. Check for colour, viscosity and sludge deposition amount.
l. Measure and record the temperature of the Calorifier or Plate Heat Exchanger Buffer Vessel at the top, middle and bottom. If there is more than 10°C difference between the top temperature and the bottom temperature then the Calorifier or Plate Heat Exchanger Buffer Vessel is suffering from temperature stratification. If a contact thermometer cannot be used, then measure and record the difference in the "flow" temperature and the "drain" temperature.
m. Visually inspect the insulation for signs of wear and tear and areas where the insulation has been removed.
n. Visually inspect that any temperature gauges fitted are operating correctly. Compare against calibrated instruments.
o. Open the CW feed valve and then open the drain point allowing enough water to flow through so that any water discoloration is removed.
p. Indicate the date of the last insurance inspection, if applicable.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 10
Task:	Expansion and Pressurisation Vessel Flushing ***(Non Flow-Through types only)***
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Where expansion and pressurisation vessels are of the single entry type they must be fitted with suitable 'flow through valves' or, where this is not practicable, with appropriate drain valves to facilitate flushing of the unit. Care must be taken to avoid damage to the diaphragm while flushing. Procedure should be carried out as follows:

a. Isolate the vessel at the isolation valve
b. Drain the water from the drain valve, collecting the water to allow for inspection and reporting on the condition.
c. Open the isolation valve to refill the vessel.
d. Repeat steps a-c until the water collected is clear and at the same temperature as the system water.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 11
Task:	Cistern Type Water Heaters – Temperature Monitoring
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Measure and record the "Set" temperature setting of the thermostat (if fitted and calibrated). Temperature to be 60°C, and not exceed 65°C
b. Measure and record the temperature of the furthest outlet supplied by the unit. Temperature to be at least 50°C within 1 min.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 12
Task:	Cistern Type Water Heaters – Inspection of Tank Section
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. If casing allows for inspection of the external condition of the unit walls, inspect for corrosion pitting and leaks.
b. Visually inspect tank and associated valves/pipework for leaks.
c. Visually inspect bottom of tank for sludge deposition and state amount.
d. Visually inspect internal walls of tank for corrosion and state amount.
e. Visually inspect water surface for; dirt, oil films, insects and state amount
f. Visually inspect for slimy deposits on the internal walls of tank and state the colour of substance and state amount.
g. Visually inspect for algae growth indicated by either green or red plant like growth on water surface.
h. Visually inspect the insulation of the unit (if practicable) for signs of wear and tear.
i. Visually inspect that the lid is correctly fitted.
j. Visually inspect that all insect/rodent screens fitted are clear from debris so that water can flow easily.
k. Visually inspect that the inlet valve opens and closes correctly.
l. Visually inspect all pipework for signs of corrosion and leaks, and check the condition of insulation fitted.
m. Indicate the date that the tank was last cleaned and disinfected and indicate whether it was disinfected as routine or due to adverse conditions.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 13
Task:	Cistern Type Water Heaters – Tank Clean and Disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. To be cleaned and disinfected in accordance with LEG 27/LEG 28.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 14
Task:	Low Volume Water Heater @ ≥15 litres– Temperature Monitoring and Condition Inspection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Measure and record the flow temperature. Temperature to be at least 60°C, and not exceed 65°C.
b. Measure and record the temperature of the furthest outlet supplied by the unit. Temperature to be at least 50°C within 1 min.
c. Ensure operational status of the unit by checking the status of the associated isolation valves.
d. If the unit is OFF, indicate the date it came Off-line.
e. Confirm status of Inlet Valve and Confirm status of Outlet Valve.
f. Confirm the operational status of the circulation pump(s) and destratification pumps (if installed).
g. Visually inspect unit and associated valves for leaks.
h. Visually inspect all pipework for signs of corrosion and leaks, and visually inspect the condition of insulation fitted. Visually inspect all valves for correct operation, signs of corrosion and leaks. Visually inspect all pumps fitted for correct operation and leaks.
i. Measure and record the temperature setting of the thermostat (if fitted).
j. Measure and record the Flow and Return temperature using a contact thermometer or fitted gauge. Temperature to be taken from “flow” pipework as close to the unit as possible.
k. If practicable, isolate CW feed and open drain point into a bucket and collect approximately the 1st litre of water discharged. Measure and record the condition, viscosity and colour of this water.
l. Check for colour, viscosity and sludge deposition amount. Measure and record the temperature of the water collected.
m. Visually inspect the insulation for signs of wear and tear and areas where the insulation has been removed.
n. Visually inspect that any gauges/thermostats fitted are operating correctly. Compare against calibrated instruments.
o. Indicate the date that the unit was last pasteurised and indicate whether it was disinfected as routine or due to adverse conditions.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 15
Task:	Combination Boiler – Temperature Monitoring and Condition Inspection
Frequency:	AS SPECIFIED IN SECTION 7 OF THE EDS WSP
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Measure and record the Set temperature setting of the thermostat (if fitted and calibrated). Temperature to be at least 60°C, and not exceed 65°C.
b. Measure and record the temperature of the furthest outlet supplied by the unit. Temperature to be at least 50°C within 1 min.
c. Ensure operational status of the unit by checking the status of the associated isolation valves.
d. If the unit is OFF, indicate the date it came off-line.
e. Confirm status of Inlet Valve and Confirm status of Outlet Valve.
f. Confirm the operational status of the circulation pump(s) and destratification pumps (if installed).
g. Visually inspect unit and associated valves for leaks.
h. Visually inspect all pipework for signs of corrosion and leaks, and visually inspect the condition of insulation fitted. Visually inspect all valves for correct operation, signs of corrosion and leaks. Visually inspect all pumps fitted for correct operation and leaks.
i. Measure and record the temperature setting of the thermostat (if fitted).
j. Measure and record the Flow and Return temperature using a contact thermometer or fitted gauge. Temperature to be taken from flow pipework as close to the unit as possible.
k. Visually inspect the insulation for signs of wear and tear and areas where the insulation has been removed.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 16
Task:	Instant Water Heater @ ≤15 litres– Temperature Monitoring – Temperature Monitoring and Condition Inspection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Units of this type, because of the limited stored water volume, do not usually need to be operated within the temperature profile and limits prescribed for larger systems (≥60°C for the 'flow' and (≥50°C for the 'return' and 'outlet') which are necessary for thermal disinfection. It may be possible to operate these units at "safe" temperatures of ≤50°C although they should be switched on at all times to ensure and encourage adequate use. However, infrequent use of these units (less than weekly) would increase the potential of bacterial growth and proliferation (as would be the case in all infrequently used areas throughout the system – both hot and cold), although particularly in this case because of the low temperatures operated.

b. Visually inspect and report the general operational and physical condition of the unit and consider its current status regarding general status of repair.

a. Open the outlet to full hot mixed position, record the temperature and time taken to reach steady state.
   - 43°C max for showers.
   - 46°C max for baths.
   - 43°C max for wash hand basins and sinks.

b. Where these temperatures are exceeded, the TMV/TMT shall be adjusted in order to allow the unit to operate within the recommended temperature limits described above.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 18
Task:	Thermostatic Mixing Valves/Taps – General Condition Inspections & Servicing
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Measure inlet pipework surface temperature for indication of cross-flow. If cross flow is suspected, non return valves should be cleaned, checked for function, and replaced if required.
b. Before running the outlet, measure and record the temperature of the local HWS return pipework, the temperature shall be ≥50°C.
c. Open the outlet to full hot mixed position, record the temperature and time taken to reach steady state. Outlet temperature shall not exceed:
   - 43°C max for showers.
   - 46°C max for baths.
   - 43°C max for wash hand basins and sinks.
d. With the outlet still running, measure the cold inlet temperature by contact probe. The temperature should be <20°C. Where temperature is 20°C or above, record peak temperature, and time taken to achieve <20°C.
e. With the outlet still running, isolate cold supply. If there is no flow after 5 seconds, the failsafe is recorded to have passed. If there is flow, collect the water for 60 seconds, if there is less than 120ml, the valve can still be recorded as having passed.
f. Isolate and visually inspect strainers and clean and disinfect before replacing. If scale or excessive contamination is found, valve should also be removed and descaled/disinfected in line with LEG 18.
g. Visually inspect valve, and report condition. If scale or excessive contamination is found, valve should also be removed and descaled/disinfected in line with LEG 18. If seals are breaking down or other parts corroded, or in need of repair or replacement, this should be carried out.
h. Supply pipe-work: Visually inspect for damage leaks, etc. and rectify.
i. Retest outlet temperature at full flow hot setting, to ensure the setting is below the approved maximum temperature before signing off the TMV for reinstatement to operation.

Note - TMVs may also require specific servicing requirements over and above this procedure. Where TMVs are fitted, and manufacturer's requirements are known to include periodical parts replacement, or other tasks, these should be scheduled in line with this task.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 19
Task:	Thermostatic Mixing Valves/Taps – Clean, Descale and Disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

When site conditions are found to result in scale or other contamination build-up within a valve, the valve should be descaled and disinfected as per this specification to a frequency determined by site tests and inspections.

a. Each TMV/TMT shall be removed from its location and replaced with a new or previously serviced TMV/TMT. The removed TMV/TMT shall be taken to a suitably equipped work-shop for service.
b. At the work-shop, each TMV/TMT shall be dismantled and physically cleaned from all scale deposits and scale deposition (using a suitable descaling solution where necessary). This shall include the cleaning of all strainers.
c. All components shall be disinfected (this applies to all cleaned and new components). All components shall be flushed with clean water and immersed in a free chlorine disinfectant solution (100 ppm) for 30 minutes minimum. This shall include the disinfection of all strainers.
d. Remove components from disinfectant solution and rinse with clean water to remove presence of disinfectant.
e. Reassemble, refit and test operation of valve, including fail-safe test.
f. Rinse in clean water, allow to drip-dry and store in a cool and dry place.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 20
Task:	Taps – Clean, Descale and Disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

As indicated by outlet inspection, taps shall be descaled, and disinfected.

Each noted scaled, dirty, or poor condition tap shall where possible be removed. Where it is not possible, or practicable to remove, the tap shall be descaled and disinfected in situ.

Process for poor condition outlet which can be removed:

a. Take photo and upload to electronic logbook before work commences
b. Isolate the outlet/fitting
c. Demount the fitting from the feed pipework
d. Physically clean the fitting inside and out
e. Immerse the fitting in approved Descaler and Disinfectant solution
f. Rinse the fitting in clean water
g. Reassemble the fitting
h. Open any isolation valves
i. Flush the outlet for a minimum of 2 minutes
j. Wipe the fitting dry with a clean paper towel to ensure no chemical remains externally
k. If any debris remains, or the outlet is damaged following descaling, report via the logbook app.
l. Take photo and upload to logbook of completed descaled and disinfected outlet.

Process for poor condition outlet which cannot be removed:

a. Take photo and upload to electronic logbook before work commences
b. Isolate the outlet/fitting
c. Physically clean as far as practicable with plastic bristled brush
d. Apply Descaler and Disinfectant gel
e. Wait for the gel to descale
f. Repeat steps b to d until the tap is scale free and no visible contamination remains
g. Rinse the outlet using water, and plastic bristled brush
h. Open the isolated valves
i. Flush the outlet for a minimum of 2 minutes
j. Wipe the fitting dry with a clean paper towel to ensure no chemical remains externally
k. If any debris remains, or the outlet is damaged following descaling, report via the logbook app.
l. Take photo and upload to logbook of completed descaled and disinfected outlet.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 21
Task:	Shower Heads Clean and Disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Each shower head and associated hose (where fitted) shall be removed from its location and replaced with a new or previously serviced shower head. The removed unit shall be taken to a suitably equipped work-shop for service.
b. At the work-shop, each shower head and associated hose shall be dismantled and physically cleaned from all scale deposits and debris deposition (using a suitable descaling solution where necessary on the shower-head only).
c. Rinse in clean water
d. All components shall be dip descaled and disinfected using approved descale and disinfectant solution.
e. Remove components from solution and rinse with clean water to remove presence of disinfectant.
f. Allow to drip-dry and store in a cool and dry place.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 22
Task:	Air Conditioning/Air Handling – Trap cleaning and disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Carefully remove each trap form the AHU and replace with a previously cleaned and disinfected unit. Collect all removed traps and take to the work-shop for cleaning, disinfection and storage.
b. At the work-shop, each trap shall be dismantled and physically cleaned from all scale deposits and scale deposition (using a suitable descaling solution where necessary).
c. Rinse in clean water.
d. All components shall be disinfected (this applies to all cleaned and new components). All components shall be flushed with clean water and immersed in a free chlorine solution of 100 ppm disinfectant solution for 30 minutes minimum.
e. Allow to drip-dry and store in a cool and dry place.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 23
Task:	Air Conditioning/Air Handling – General Inspection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Report on the operational status of the unit.
b. Visually inspect the condition of the external surfaces of the unit and comment.
c. Visually inspect (if possible) the condition of the internal surfaces of the unit and comment. If practicable, isolate unit in order to allow for thorough internal inspection to be carried out.
d. Visually inspect the condition of all traps fitted and comment.
e. Visually inspect (if possible) the condition of the drip-trays and drains of the unit and comment. If practicable, isolate unit in order to allow for thorough internal inspection of the drip-trays to be carried out. Alternatively, remove drip-trays from the system and inspect.
f. Visually inspect (if possible) the condition of the eliminators of the unit and comment.
g. Visually inspect (if possible) the condition of the filters fitted and comment.
h. Visually inspect (if possible) the condition of the humidifier components of the unit and comment.
i. Visually inspect (if possible) the condition of the Chiller battery fitted and comment.
j. Visually inspect (if possible) the condition of the Heater battery and comment.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 24
Task:	Air Conditioning/Air Handling –Clean & disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Using clean wet cloth, wipe over the unit's components.
b. When coils and /or drip-trays are heavily contaminated and they are to be disinfected, spray the components with a Sodium hypochlorite (free chlorine) solution of 500 ppm strength, using a well vented small hand spray. Allow to stand for 3 mins only. Spray with fresh clean water. Dry area with clean and clean cloth.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 37
Task:	Water coolers and water dispensers – sanitisation and inspection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

All water coolers and dispensers shall be sanitised weekly in addition to any requirements for unit cleaning, and tray emptying in line with routine cleaning and unit usage requirements.

a. Run outlet, inspect condition of water and outlet and record any defects to include:
   - Scale
   - Visible microbiological contamination
   - Discolouration
   - Corrosion
   - Leaking glands or connections
   - Low flow
   - Low usage

b. Descale outlet and/or physically clean if scale, or visible contamination is present on the outlet. Record the descale or clean in line with procedure LEG20 above.

c. Sanitise the outlet using disinfectant wipe

d. Record on the electronic logbook system

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 38
Task:	Water Butt – Visual Inspection, Cleaning and Disinfection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. All external surfaces shall be wiped cleaned with wetted cloth prior to opening of lid.
b. Measure and report ambient external temperature.
c. Measure and report stored water temperature (Temperature of the tanked water should be monitored via the drain point if practicable).
d. Visually inspect internal walls of tank for signs of scale deposition, corrosion and slime deposits.
e. Visually inspect tank and associated valves/pipework for leaks.
f. Visually inspect bottom of tank for sludge deposition and state amount.
g. Visually inspect water surface for; dirt, oil films, insects and algae and state amount.
h. Visually inspect for slimy deposits on the internal walls of tank and state the colour of substance and state amount.
i. Visually inspect that the lid is correctly fitted and that any bolts are securely tightened.
j. Visually inspect that all insect/rodent screens fitted are clear from debris so that water can flow easily.
k. Visually inspect all valves for correct operation, signs of corrosion and leaks.
l. Clean and disinfect vessel in line with approved tank cleaning processes (Process LEG 27, LEG 28 or LEG 29).

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 39
Task:	Non-Thermostatic Shower Valves – General Inspection
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Measure inlet pipework surface temperature for indication of cross-flow. If cross flow is suspected, non return valves should be cleaned, checked for function, and replaced if required.
b. Before running the outlet, measure and record the temperature of the local HWS return pipework, the temperature shall be ≥50°C.
c. Open the outlet to full hot mixed position, record the temperature and time taken to reach steady state.
d. Turn the shower to cold supply. With the outlet still running, measure the cold inlet temperature by contact probe. The temperature should be <20°C. Where temperature is 20°C or above, record peak temperature, and time taken to achieve <20°C.
e. Isolate and visually inspect strainers and clean and disinfect before replacing. If scale or excessive contamination is found, valve should also be removed and descaled/disinfected in line with LEG 19.
f. Supply pipe-work: Visually inspect for damage leaks, etc. and rectify.

Note - Shower valves may also require specific servicing requirements over and above this procedure. Where TMVs are fitted, and manufacturer's requirements are known to include periodical parts replacement, or other tasks, these should be scheduled in line with this task.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 40
Task:	Water Feature Routine Inspection
Limits:	Body of water to be <20°C.
Frequency:	As specified in the WSP Books 1 and 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

All water features with aerosol generation are subject to routine temperature monitoring in the summer months.

a. Record temperature of water feature. If accessible, the temperature should be taken from the jet outlet.
b. Where the jet outlet is not accessible, the temperature should be taken from the body of water around the jet outlets – i.e. all sides of a water feature.
c. The temperature recorded should be the highest temperature found in the above tests. This should be recorded into the electronic logbook system.
d. Where water is above 20°C in any test point, record where the test was taken from by uploading a photo including the thermometer readout in the picture, and upload to the electronic logbook system.
e. If the temperature is above 20oC at any point, also record the air temperature at the location of the highest failed temperature.
f. Record if the fountain/feature pump is on or off at the time of the visit.

All recordings except the temperature recorded at c above – the control regime monitoring record temperature can be entered into the logbook as comments.

g.

4. AD-HOC RISK MANAGEMENT AND CONTROL PROCESSES

Task Reference (LEG) No.	Task Details
LEG 25	Microbiological Sample Collection Protocol
LEG 26	Small sized pipework installation projects and associated components pre and post installation cleaning and disinfection
LEG 27	Water storage tank cleaning and disinfection using Sanosil (Silver stabilised hydrogen peroxide)
LEG 28	Water storage tank cleaning and disinfection using Sodium hypochlorite - Spray Method and/or Soak Method
LEG 29	Domestic water services disinfection using Sanosil (Silver stabilised hydrogen peroxide)
LEG 30	Domestic water services disinfection using Chlorine Dioxide (ClO2) as the disinfecting agent
LEG 31	Domestic water services disinfection using Sodium hypochlorite (NaClO) as the disinfecting agent
LEG 32	Calorifier or Plate Heat Exchanger Buffer Vessel Pasteurisation
LEG 33	Domestic Water HWS distribution system pasteurisation
LEG 34	Point of Use (POU) filter installation and replacement
LEG 35	Dead Legs/Areas of Low-Use - Usage Evaluation & Flushing
LEG 36	Management of Water Dispensers/Water Coolers

If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.

MICROBIOLOGICAL SAMPLING METHODOLOGY

Microbiological sampling shall be carried out in order to consider two distinct areas of water quality management & control: a) localised bacterial contamination; and b) systemic bacterial contamination. Localised contamination is detected by collecting and analysing a 'pre-flush' sample consisting of the unadulterated collection of a sample of the water present at the outlet achieved by running the tap without flushing or cleaning the tap and collecting the water dispensed. Systemic contamination is detected by collecting and analysing a 'post-flush' sample consisting of the water collected following spraying the outlet with a disinfectant solution equivalent to 1% sodium hypochlorite, leaving disinfectant in contact with the tap for at least 2 minutes then flushing the outlet for another 2 minutes before collecting the sample. These two types of samples are useful in determining the location of the contamination detected and in determining the appropriate remedial corrective action required to remove the identified bacterial contamination.

Microbiological Sampling must be carried out in accordance BS 7592:2008 - Sampling for Legionella bacteria in water systems – Code of practice, BS EN ISO 5667 -:2006/BS 6068-6.1:2006 Water quality Sampling and BS 8554:2015

Microbiological Sampling must be carried out by suitably trained personnel, preferably accredited to ISO/IEC 17025:2010 and/or ISO/IEC 17020:2012, and in accordance with this Protocol.

Routine sample collection locations and type of analysis shall be agreed by the Estates and Campus Services Management Team, with assistance from the University's Authorising Engineer (Water) and shall be representative of the system under surveillance and the reasons why a system is under surveillance.

For new builds and refurbishments, sample locations and results parameters shall be determined and agreed between contractor and the Water Systems Operational Responsible Person on a 'scheme-by-scheme' basis prior to the commencement of each scheme. All sampling rationales shall be ratified by the Estates and Campus Services Management Team, with assistance from the University's Authorising Engineer (Water).

In general, microbiological sampling, in domestic water supplies, shall be carried out in order to consider two distinct areas of water quality management & control:

a. localised bacterial contamination; Localised contamination is detected by collecting and analysing a 'pre-flush' sample consisting of the unadulterated collection of a sample of the water present at the outlet achieved by running the tap without flushing or cleaning the tap and collecting the water dispensed.
b. systemic bacterial contamination; Systemic contamination is detected by collecting and analysing a 'post-flush' sample consisting of the water collected following spraying the outlet with a disinfectant solution equivalent to 1% sodium hypochlorite, leaving disinfectant in contact with the tap for at least 2 minutes then flushing the outlet for another 2 minutes before collecting the sample. A third sample may be required where there is reason to suspect that TMV/TMT strainers maybe responsible for apparent systemic contamination. This sample shall be collected by removing all strainers, aerators and flow straighteners and then following the process for the collection of 'post-flush' samples.

These three types of samples are useful in determining the location of the contamination detected and in determining the appropriate remedial corrective action required to remove the identified bacterial contamination.

Microbiological Sampling must be carried out in accordance with:

1. BS EN ISO 5667-1:2006 BS 6068-6.1:2006 - Water quality Sampling - Part 1: Guidance on the design of sampling programmes and sampling techniques.
2. BS ISO 5667-24:2016 Water quality - Sampling Part 24: Guidance on the auditing of water quality sampling.
3. BS 7592:2008 - Sampling for Legionella bacteria in water systems – Code of practice.
4. BS 8554:2015 Code of practice for the sampling and monitoring of hot and cold water services in buildings.

Microbiological samples can be analysed for the following organisms:

1. *E. coli*
2. Coliforms
3. TVCC
4. *Legionella spp*.

HEALTH AND SAFETY CONSIDERATIONS

Sampling of water may occur in a wide variety of locations. Each location and reason for sampling has its own risks associated with it, and it is important to make an assessment of these risks and put appropriate control measures in place before commencing any sampling. Examples of risks include:

1. Wet floors that present a slip hazard when sampling from kitchen areas, toilet/rest rooms, cooling towers etc.
2. Working at height when ladders/steps are required to reach water sampling points.
3. Manual handling risk when carrying large amounts of sampling equipment around.
4. Working in confined spaces when sampling from difficult-to-reach parts of water systems.
5. *Legionella* infection risk if sampling from water sources that create aerosols, such as cooling towers and showers.

Appropriate precautions shall be taken to minimise aerosol production, as described in BS 7592:2008 (British Standards Institution, 2008). For example, running taps gently to reduce splashing; using a sterile plastic bag with one corner cut off to enclose the shower head and to funnel the water into a sampling container; sampling cooling towers from sampling points on the return service of the cooling water to the tower, rather than the tower itself.

In addition, some specific safety notes have been included in the sections below:

The following is a list of equipment that may be needed for sampling. The list is not intended to be exhaustive and not all items may be required for all types of sampling.

1. Sterile food-grade plastic bags.
2. Laboratory supplied sterile sample bottles.
3. Labels.
4. Permanent waterproof marker pens and biros.
5. Laboratory request forms for water samples.
6. Nitrile (plastic) gloves.
7. Alcohol medical wipes.
8. Plastic shoe coverings.
9. Cool boxes with separators, temperature data-loggers and 10% by volume of frozen ice-packs (ice packs shall not be used for *Legionella* samples).
10. Digital camera.
11. Digital voice recorder.
12. Calibrated thermometer.
13. Calibrated stop-watch.
14. Calibrated disinfectant residual measuring device

SAMPLE BOTTLES REQUIRED FOR THE COLLECTION OF WATER FOR DIFFERENT MICROBIOLOGICAL ANALYSES

Test Required	Sample Bottles
Coliforms, *Escherichia coli, Pseudomonas aeruginosa*, Aerobic Colony Counts, environmental mycobacteria	1 x sterile 100 ml plastic bottle containing an appropriate neutraliser to neutralise any residual disinfectant in the water.
Legionella (and other pathogenic bacteria such as *Salmonella*, *Campylobacter* and *E. coli* O157, where required	1 x sterile 1 litre bottle *Or 2 x sterile 500 ml plastic bottles (as above)*
The most commonly used neutraliser, which is appropriate for chlorinated or brominated water systems and those using ozone or hydrogen peroxide, is sodium thiosulphate. For mains water, 18 ppm sodium thiosulphate shall be added.	

MICROBIOLOGICAL SAMPLING COLLECTION & SUBMISSION FOR ANALYSIS PROTOCOL

The prime objective is to obtain a sample which is representative as far as possible of the water to be examined. To achieve this, certain precautions are necessary which are common to all sampling procedures for the bacteriological examination of water:

1. A suitably UKAS ISO 11731:2009 Water quality -- Detection and enumeration of Legionella (or equal) accredited laboratory must be used for all samples collected for bacteriological analysis.
2. All staff undertaking bacteriological sampling must be suitably and adequately trained in the process of sample collection. Samples will usually be collected by suitably and adequately trained Estates and Campus Services or specialist contractor staff.
3. Good personal hygiene procedures, including thorough washing of hands using soap, must be adopted by the operative prior to the commencement of the exercise. A fresh pair of disposable gloves must be worn for each sample
4. Sterile bacteriological sampling bottles must be used containing sodium thiosulphate to neutralise residual chlorine in the water to be sampled.
5. Scrupulous care shall be taken to avoid accidental contamination of the sample during collection and subsequent handling. Avoid splashing. Ensure the sample bottle does not touch the tap. Do not touch the water as it flows into the bottle or the inside of the cap or bottle. Replace the lid.
6. When sampling for *Pseudomonas aeruginosa*, only pre-flush samples shall be collected from outlets which have not been used for at least 2 hours prior to sample collection. During sample collection the tap shall not be cleaned or sprayed with disinfectant solution nor flamed.
7. The changes which occur in the bacteriological content of water between the time of sampling and examination shall be reduced to a minimum by ensuring that the sample is not exposed to light, is kept cool in an insulated container (cool-box) and is transported to the laboratory as quickly as possible.
9. The sample shall be examined as soon as possible after collection, preferably within six hours but no more than eighteen hours.

Every sample bottle must be clearly identifiable, and the following information shall be supplied with the sample:

1. Agency requesting the examination
2. Sampled by
3. Reference number
4. Date and time of sampling
5. Reason for sampling
6. Sample point (whb, sink, tank, Calorifier or Plate Heat Exchanger Buffer Vessel, etc)
7. Type of water (domestic, process, other)
8. Location of sampling point
9. Disinfectant residual (to be measured when sampling is carried out following disinfection)
10. Pre or Post Flush sample
11. Sample collected from HWS, CWS or Blended (or mixed)
12. Usage frequency

13. Temperature of HWS and CWS (HWS and CWS temperature to the TMV must be measured when sample collected from a blended outlet) to the TMV must be measured when sample collected from a blended outlet)

TECHNIQUE OF SAMPLING

a. Sample Bottles

1. Sterile bottles, of appropriate volume, should be provided by the laboratory performing the examination and should be used exclusively for bacteriological purposes.
2. All sample bottles provided by the laboratory performing the examination should contain adequate neutralising agent necessary to neutralise residual chlorine or chloramines.

b. Order of collection of Samples

1. When a number of samples for different purposes are to be taken from the same sampling point, certain precautions are necessary:
2. Samples for bacteriological examination of *Pseudomonas aeruginosa* should be collected on a separate day from all other samples.
3. TVCC samples to be collected after the Legionella samples for both pre and post flush samples.
4. Where a single spout is present (with either a single blended supply, hot and cold, blended and cold) a single mixed pre and single post mixed post flush samples to be collected.
5. To avoid contamination, samples for bacteriological examination should be kept strictly separate from all others. Boxes for the transport of samples should be made of materials that can be disinfected regularly. They should not be used for carrying anything other than samples of water for bacteriological examination.
6. For residual chlorine estimation, a bottle which does not contain Sodium thiosulphate should be used and where possible, this test for chlorine should be done immediately on site (to be measured when sampling is carried out following disinfection).

c. Opening and filling of Sample Bottles

1. Keep the sample bottle unopened until the moment it is required for filling.
2. Never rinse out a bottle before taking a sample.
3. Loosen the string or rubber band holding the cover in position; hold the bottle by the base in one hand and remove the stopper and cover together with the other hand.
4. Retain the stopper and cover in the hand whilst the bottle is filled, and replace them immediately.
5. Finally secure the cover.

d. Sampling from Taps (See also 'Order of collection of Samples' above)

1. Good personal hygiene procedures, including thorough washing of hands using soap, must be adopted by the operative prior to the commencement of this exercise. A fresh pair of disposable gloves must be worn for each sample.
2. Taps chosen for sampling should be clean, free of all attachments and in good repair. Remove all external fitting such as anti-splash devices or hoses where fitted, and dispose of, before collecting samples.
3. Any alteration of the tap setting during sampling should be avoided as it may have an adverse effect.
4. A “pre-flush” sample (first draw-off) and a “post-flush” sample (after flushing for at least 2 minutes) should be collected from taps.
5. When collecting a “post-flush” sample; the outlet must be disinfected inside (up the spout) and outside with a 1% solution of chlorine, and left for 2 minutes then flushed for 2 minutes, before the sample is collected. This is to ensure that there is no contamination of the water introduced from the outlet.
6. Fill the bottle from a gentle stream. Avoid splashing. Ensure the sample bottle does not touch the tap. Do not touch the water as it flows into the bottle or the inside of the cap or bottle. Replace the lid.
7. Occasionally, when a tap is turned on, water may leak between the spindle and the gland. This may run down the outside of the tap and, by gaining access to the sample, cause contamination. Under such conditions, no sample for bacteriological examination should be taken until the leak has been remedied.

d(s1). Sampling from Taps fitted with POU filters (With the POU filter removed)

1. A “pre-flush” sample (first draw-off) is collected once the POU filter is removed.
2. A "post-flush sample (after flushing for at least 2 minutes) is collected with the POU still filter removed. When collecting a “post-flush” sample; the outlet must be disinfected inside (up the spout) and outside with a 1% solution of chlorine, and left for 2 minutes then flushed for 2 minutes, before the sample is collected. This is to ensure that there is no contamination of the water introduced from the outlet.
2. Fill the bottle from a gentle stream. Avoid splashing. Ensure the sample bottle does not touch the tap. Do not touch the water as it flows into the bottle or the inside of the cap or bottle. Replace the lid.
3. Re-install POU filter or install new unit as per manufacturer's instructions.

d(s2). Sampling from Taps fitted with POU filters (With the POU filter attached) – *On the instruction of the Health, Safety and Compliance Officer Estates and Campus Services only*

1. A sample (first draw-off) is collected from the POU filter whilst attached to the tap.
2. Fill the bottle from a gentle stream. Avoid splashing. Ensure the sample bottle does not touch the tap. Do not touch the water as it flows into the bottle or the inside of the cap or bottle. Replace the lid.

e. Sampling from Showers (See also 'Order of collection of Samples' above)

1. Good personal hygiene procedures, including thorough washing of hands using soap, must be adopted by the operative prior to the commencement of this exercise. A fresh pair of disposable gloves must be worn for each sample.
2. A “pre-flush” sample (first draw-off) and a “post-flush” sample (after flushing for at least 2 minutes) should be collected from showers. The “pre-flush” sample must be collected with the shower head in place. The “post-flush” outlets must be collected with the shower head (where practicable) removed.
3. Create a funnel using a clean food grade bag with a corner cut-off using a clean pair of scissors wiped with alcohol based anti-bacterial medical wipes immediately prior to use. Place the showerhead into the bag, seal the open end and put the cut corner into the sample bottle.
4. If the shower is fed from a central distribution domestic hot water system, turn the temperature up to maximum. For instant electric heated showers turn the shower onto the lowest temperature where the heater is used.
5. Turn the shower on to a gentle flow and fill the bacteriological bottle(s) without rinsing, leaving a small air gap. Avoid splashing. Ensure that the sample bottle does not touch the showerhead. Replace the lid.

e(s1). Sampling from Showers fitted with POU filters (With the POU filter removed)

1. A “pre-flush” sample (first draw-off) is collected once the POU filter is removed.
2. A "post-flush sample (after flushing for at least 2 minutes) is collected with the POU filter still removed.
3. If the shower is fed from a central distribution domestic hot water system, turn the temperature up to maximum. For instant electric heated showers turn the shower onto the lowest temperature where the heater is used.
4. Turn the shower on to a gentle flow and fill the bacteriological bottle(s) without rinsing, leaving a small air gap. Avoid splashing. Ensure that the sample bottle does not touch the showerhead. Replace the lid.
5. Re-install POU filter or install new unit as per manufacturer's instructions.

e(s2). Sampling from Showers fitted with POU filters (With the POU filter on) – *On the instruction of the Health, Safety and Compliance Officer Estates and Campus Services only*

1. A sample (first draw-off) is collected from the POU filter whilst attached to the shower. Create a funnel using a clean food grade bag with a corner cut-off using a clean pair of scissors wiped with alcohol based anti-bacterial medical wipes immediately prior to use. Place the showerhead into the bag, seal the open end and put the cut corner into the sample bottle.
2. Fill the bottle from a gentle stream. Avoid splashing. Ensure the sample bottle does not touch the tap. Do not touch the water as it flows into the bottle or the inside of the cap or bottle. Replace the lid.

f. Sampling from Drinking Fountains/Water dispensers

1. When a number of samples for different purposes are to be taken from the same drinking fountain:
    i. Sample collected from supply source (to be collected as close to 'T' off the supply as possible. When this is not practicable, select a direct-fed outlet as close to the unit as possible which is fed from the same supply).
    ii. Pre-flush sample from the tap/spout of the drinking fountain (when sampling hot and cold taps/outlets, the samples collected must be separate and not mixed).
    iii. Post flush sample from tap/spout of the drinking fountain (when sampling hot and cold taps/outlets, the samples collected must be separate and not mixed).
2. Taps/spouts chosen for sampling should be clean, free of all attachments and in good repair. Remove all external fitting such as anti-splash devices or hoses where fitted.
3. Any alteration of the tap/spout setting during sampling should be avoided as it may have an adverse effect.
4. A “pre-flush” sample (first draw-off) and a “post-flush” sample (after flushing for at least 2 minutes) must be collected from taps.
5. When collecting a “post-flush” sample; the outlet must be disinfected inside (up the spout) and outside with a 1% solution of chlorine, and left for 2 minutes then flushed for 2 minutes, before the sample is collected. This is to ensure that there is no contamination of the water introduced from the outlet.
6. Fill the bottle from a gentle stream, avoiding splashing. Ensure the sample bottle does not touch the tap. Do not touch the water as it flows into the bottle or touch the inside of the cap or bottle. Replace the lid.
7. Occasionally, when a tap is turned on, water may leak slightly between the spindle and the gland. This is liable to run down the outside of the tap and, by gaining access to the sample, cause contamination. Under such conditions, no sample for bacteriological examination should be taken until the leak has been remedied.

g. Sampling from Tanks

1. Remove tank lid, avoiding tipping any dirt into the tank.
3. Good personal hygiene procedures, including thorough washing of hands using soap, must be adopted by the operative prior to the commencement of the sampling. A fresh pair of disposable gloves must also be worn by the operative after the lid has been removed.
4. Sampling from tanks must be carried out as far from the inlet as possible.
5. Collect a sample using sterile bottle(s), suitable for collecting samples for bacteriological analysis required by immersing the bottle under the surface of the water, without rinsing, leaving a small air gap. Avoid splashing.
6. Ensure that the sample bottle does not touch the tank or other structures prior to sample collection.
7. Do not touch the water as it flows into the bottle or touch the inside of the cap or bottle.
8. Ensure that the sample bottle does not touch the tank or other structures following sample collection.

h. Sampling from Calorifier or Plate Heat Exchanger Buffer Vessel and other Hot Water Generation Units

1. Good personal hygiene procedures, including thorough washing of hands using soap, must be adopted by the operative prior to the commencement of this exercise. A fresh pair of disposable gloves must be worn for each sample.
2. Sampling from calorifiers and buffer vessels must be carried from the drain and both; a “pre-flush” sample (first draw-off) and a “post-flush” sample (after flushing for at least 2 minutes) must be collected. When collecting a “post-flush” sample; the drain-point must be disinfected inside (up the drain spout) and outside with a 1% solution of chlorine, and left for 2 minutes then flushed for 2 minutes, before the sample is collected. This is to ensure that there is no contamination of the water introduced from the drain-point.
3. Collect a sample using sterile bottle(s) suitable for collecting samples for bacteriological analysis without rinsing, leaving a small air gap. Avoid splashing.
4. Ensure that the sample bottle does not touch the Calorifier or Plate Heat Exchanger Buffer Vessel or other structures.
5. Do not touch the water as it flows into the bottle or touch the inside of the cap or bottle.

j. Sampling Collected Ice from Ice Making Machines

1. Good personal hygiene procedures, including thorough washing of hands using soap, must be adopted by the operative prior to the commencement of this exercise. A fresh pair of disposable gloves must be worn for each sample.

2. Collect a sample using a wide-mouth sterile bottle(s), suitable for collecting samples for bacteriological analysis, without rinsing, leaving a small air gap. Avoid splashing.
3. Ensure that the sample bottle does not touch the icemaker or other structures.
4. Do not touch the ice as it is collected into the bottle or touch the inside of the cap or bottle.

k. <u>Additional Measures</u> to be followed when collecting Samples for Bacteriological Examination of *Legionella spp.*

1. Samples shall be collected in accordance with BS 7592:2008 - Sampling for Legionella bacteria in water systems – Code of practice
2. The sampling method for *Legionella* should be in accordance with ISO 11731:1998. A UKAS accredited laboratory that takes part in the Health Protection Agency's water external quality assessment (EQA) scheme for the isolation of *Legionella* from water should test samples (visit http://www.hpaweqa.org.uk for further information). The laboratory should also apply a minimum theoretical mathematical detection limit of <100 *Legionella* bacteria/litre sample.
3. All staff undertaking bacteriological sampling must be suitably and adequately trained in the process of sample collection and be aware of the risks of *Legionellosis*. Staff who are likely to be more susceptible to *Legionellosis* **<u>should not</u>** undertake sampling. It is the responsibility of the operative's manager (this shall apply equally to University employees as well as to Contractor staff), to assess their risk of Legionellosis before being assigned the task of sample collection.
4. Sterile bottles, of 1 litre volume, suitable for collecting samples for bacteriological examination of *Legionella sp* should be provided by the laboratory performing the examination.
5. Collection of samples from taps:
   Follow item **d. Sampling from Taps.**
6. Collection of samples from Showers:
   Follow item **e. Sampling from Showers.**
7. Collection of samples from Tanks:
   i. In addition to item **f. Sampling from Tanks**, follow the instructions below:
   ii. Collect a **further** sample using sterile bottle(s), of 1 litre volume, suitable for collecting samples for bacteriological examination of *Legionella sp* by immersing the bottle under the surface of the water, without rinsing, leaving a small air gap. Avoid splashing.
8. Collection of samples from Calorifier or Plate Heat Exchanger Buffer Vessel:
   i. In addition to item **g. Sampling from Calorifier or Plate Heat Exchanger Buffer Vessel**, follow the instructions below:
   ii. Collect a **further** sample using sterile bottle(s), of 1 litre volume, suitable for collecting samples for bacteriological examination of *Legionella sp*, without rinsing, leaving a small air gap. Avoid splashing.

Following sampling, all water samples for *Legionella sp*. analysis shall be stored at an ambient temperature (approximately 20°C), in the dark, and returned to the laboratory as soon as possible, preferably the same day but at the latest so that processing can begin within 24 hours of taking the sample. Transporting and/or storing the sample at temperatures below 6 °C might reduce subsequent recovery of legionellae since the bacteria might be induced into a non-culturable state.

HANDLING AND SHIPPING OF SAMPLES

Samples shall be packaged and shipped to the laboratory for analysis as soon as possible - within 24hrs for TVCC and *E. coli*/coliforms, which need to be kept cool in a cool box and within 24hrs for *Legionella sp*. which need to be kept separately at room temperature. With *P. aeruginosa* samples, these should also be delivered in a cool box and processed within 2 hours at the laboratory (if this is not possible, the samples must be refrigerated between 2°C and 8°C and processed at the laboratory within 24 hours). Generally, the shorter the time between sample collection/processing and sample analysis, the more reliable the analytical results will be.

Before shipping samples to the laboratory:

1. Check that sample bottles are labelled correctly.
2. Pack samples carefully in the shipping container to prevent bottle damage, shipping container leakage, and sample degradation.
3. Check that the bottle caps are securely fastened.

4. Check that the temperature data-logger is activated and time of activation.

LABELLING SAMPLE BOTTLES

Protocols for labelling, documenting, and packaging samples established by the receiving laboratory must be followed. Obtain authorisation from the laboratory before shipping samples for analysis. Each sample bottle must be correctly labelled with the site/building identification, exact location of sample collection, date, time, and sample designation. ***Samples must be accompanied by the suitably completed 'Microbiological Analysis Sample Management' pro-forma (attached).***

PACKAGING SAMPLES

When packaging samples for shipment to the laboratory, remember that all bottles must be protected from damage (especially glass bottles) and (or) leaking. The laboratory usually will return with the cooler reusable packing materials such as mesh bags, foam sleeves, and bubble wrap. Plastic bags and cardboard boxes will not be returned. Do not use foam peanuts or vermiculite.

When packaging samples:

1. Make sure bottle labels are waterproof and that information is legible.
2. Tighten all bottle caps to prevent leakage.
3. Use adequate packing material to prevent bottle damage.
4. When shipping multiple sets of samples in the same container, label each set of sample bottles with a different letter of the alphabet (A, B, C) so that bottles of each sample set will have the same letter.
5. Place all bottles from a sample set into a separate bag (such as plastic or mesh) or bind with a rubber band to keep them together.

6 Activate temperature data logger and record time and date of activation.

SHIPPING SAMPLES

Whenever possible, deliver samples to the laboratory on the day of collection. Check laboratory hours of operation—keep in mind that the laboratory might not receive samples on Saturdays, Sundays, or holidays. The integrity of chilled samples sent late on a Thursday or on a Friday could be compromised if not received by the laboratory in time to be unpacked and refrigerated. Upon delivery, interrogate temperature data logger and record duration of delivery and highest and lowest temperature of cool box during that time. If the time taken to deliver the samples exceed the maximum recommended submission time, the samples must be discarded and the collection process repeated. If the temperatures of the cool box during delivery fall outside the recommended limits, the samples must be discarded and the collection process repeated.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 26
Task:	Small sized pipework installation projects and associated components pre installation cleaning and disinfection
Complete Certificate of conformity no.10	Small sized component disinfection and fitting
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

This method should not be used for pipework lengths longer than 2m, which should be soak disinfected.

a. Thoroughly clean all new pipework and fittings to be installed. Pipework and fittings should be visibly clean before disinfection.
b. Using a suitable vessel, safely prepare a disinfectant solution of 100mg/l *free chlorine*.
c. Safely immerse all cleaned pipework and associated components in the disinfectant solution and leave to soak for a minimum of 30 minutes.
d. Remove pipework and associated components from disinfectant solution and allow to drip dry in a clean, cool dry place and install within 12 hours of disinfection.
d1. When using XPress fittings, if additional lubrication of the fitting is required, then a WRAS approved silicone grease should be used.
e. Where disinfection is not carried out at the site of installation, components should be bagged for transport using food grade plastic bags, and pipework should be capped using disinfected pipe caps.
f. Installation shall include a clean tools process, where all cutting tools, or tools which are used to manipulate pipework and fittings are disinfected before use. Tools may be dipped using this method, or disinfected using alcohol wipes where dipping is not possible or practicable.
g. Thoroughly flush the new pipework with clean mains water until tests indicate that the residual level of *free chlorine* is no greater than 0.5 ppm (ppm), or that present in the mains water supply.

Microbiological sampling before and after this type of works *is not to be carried out* unless expressly requested by University Estates.

NOTE: Ensure that for larger installations than a total of 2m of pipework, and new complete installations, , found in WSP Book 2, are completed before putting system into use. These records and associated certificates must be issued with 'hand-over documentation'.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 26a
Task:	Estates repairs and replacement components disinfection
Recording	The task should be recorded in the asset works system. Where parts are disinfected this should be recorded as either: 1. Parts soak disinfected at site 2. Parts pre-disinfected 3. Parts spray disinfected 4. Parts wiped with disinfectant wipes 5. Water heater thermal disinfection If multiple methods are used, this should be recorded, i.e. Water heater thermally disinfected and connecting pipework soak disinfected at site.
This process is for use by Estates staff only, and to be used for repairs and replacements only. Where a replacement or repair is not undertaken by internally trained Estates staff, or is a contractor, procedure LEG26 must be used.	

This method should not be used for pipework lengths longer than 2m, which should be soak disinfected in a system disinfection.

All tools which cut into live, or new pipework, and any parts fitted should be cleaned and disinfected before being fitted. Due to the inability to soak some parts, where parts are unable to be soak disinfected, they may be disinfected by other approved methods. The approved methods are:

1. Soak disinfection using chlorine
2. Spray disinfection using chlorine
3. Wiping with disinfectant wipes
4. Water heater thermal disinfection

Whichever method is used, every part replaced which is in contact with water should be disinfected.

<u>Soak disinfection using chlorine tablets</u>

a. Thoroughly clean all tools, new pipework and fittings to be installed. Pipework and fittings should be visibly clean before disinfection.
b. Using a suitable vessel, safely prepare a disinfectant solution of chlorine, for soak disinfection this should be made up with 1 tablet to 10L water. The tablet should be left to dissolve until no solids are visible.
c. Safely immerse all cleaned pipework and associated components in the disinfectant solution and leave to soak for a minimum of 30 minutes.
d. Remove pipework and associated components from disinfectant solution and allow to drip dry in a clean, cool dry place and install within 24 hours of disinfection.
e. Where disinfection is not carried out at the site of installation, components should be bagged for transport using food grade plastic bags, and pipework should be capped using disinfected pipe caps.
f. Thoroughly flush the new fitted pipework for 5 minutes with clean mains water.

<u>Spray disinfection using chlorine at site of repair or replacement</u>

a. Make up the solution in a 1 Litre spray bottle with one tablet to 1L of clean water. Let the tablet dissolve before closing the screw top.
b. Thoroughly clean all tools, new pipework and fittings to be installed. Pipework and fittings should be visibly clean before disinfection.
c. Spray parts to be disinfected ensuring all parts are wet.
d. Check parts to ensure they are kept wet for 5 minutes, if the parts dry out, spray again to keep all parts to be disinfected wetted for 5 minutes.

e. Allow to drip dry.
f. Fit the parts immediately.
g. Thoroughly flush the new fitted pipework for 5 minutes with clean mains water.

Wiping with disinfectant wipes

Wipes should only be used which have been provided by the Estates Team Stores. Using wipes may be required where spray disinfection is not suitable – disinfection of cutting tools etc.

a. Thoroughly clean all tools, new pipework and fittings to be installed. Pipework and fittings should be visibly clean before disinfection.
b. Using wipes provided, wipe all parts of the tool or fittings which will come into contact with water.
c. Thoroughly flush the new fitted pipework for 5 minutes with clean mains water.

Water heater thermal disinfection

Where small volume water heaters are to be disinfected, and it is not practicable to soak, spray disinfect, or wipe, the heaters may be thermally disinfected. All connecting parts, and other downstream fittings which are to be replaced should be disinfected using an alternative method.

a. Thoroughly clean all new pipework and fittings to be installed. Pipework and fittings should be visibly clean before disinfection.
b. Fit the heater in line with manufacturer recommendations.
c. When filled, and ready for disinfection, the heater should be turned up to maximum setting.
d. When the heater has reached maximum setting, the temperature should be tested using a calibrated surface probe on the heater. If the heater body cannot be accessed, outgoing pipework should be tested which should reach at least 60°C.
e. Leave the water heater at this maximum setting and retest the temperature at 60 minutes after the first test. If the temperature is at least 60°C, the disinfection can be recorded as being completed.

Notes:

- Microbiological sampling before and after this type of works *is not to be carried out* unless expressly requested by University Estates Team.
- Any parts to be fitted due to repair or replacement which contain non-metal parts such as taps and pumps may require manufacturer specific chemical or thermal disinfection only. Disinfection should always be undertaken for these parts in line with manufacturer recommendations.
- These procedures are to be used with Estates approved fittings, and disinfection chemicals only. Where chemicals are to be used including chlorine tablets and disinfectant wipes, only those chemicals supplied by University Estates should be used.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 27
Task:	Water Storage Tank – Cleaning and Disinfection Using SANOSIL (Silver stabilised hydrogen peroxide)
Complete Certificate of Conformity No:	No. 1
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Tank Cleaning Using Sanosil (silver stabilised hydrogen peroxide - H_2O_2) as the disinfecting agent

a. All external surfaces shall be wiped cleaned with wetted cloth prior to opening of lid.
b. Fix ball valve in close position.
c. Isolate Tank from system.
d. Introduce appropriate volume of disinfectant solution to achieve 150ppm H_2O_2. The levels achieved must be measured using 'Dropper Bottles' (Test Strips – a portion of test paper should be dipped into the water and the colour change compared to the indicator range on the box. This will give an indication of concentration).
e. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant where necessary, until the concentration is stabilised at 150 ppm H_2O_2. Additional dosing should be carried out if required to achieve this. If the level does fall below 60% of the start point, then the tank requires re-dosing and the contact time re-starts from zero.
f. Once concentration has stabilised, leave tank to soak for 1 hour minimum.
g. Empty the Tank via drain-point or by using a submersible or barrel type pump, in the absence of a drain-point or must draining from drain-point is impracticable.
h. The surfaces of the tank(s), including walls, overflow, under-side of lid, ball valve etc, must be manually cleaned (including the removal of rust, scale deposition and scum discolouration where practicable). Clean Tank using a combination of hand scraping and brushing together with application of chemicals to dissolve or soften the scale (where necessary). Vacuum out all loose debris and deposits.
i. Upon completion of the cleaning process, the internal surfaces must be rinsed with fresh water and the residual water drained as described above in vi.
j. Refill tank and follow steps iii. and v.
k. In addition, disinfect all surfaces above the water-line, including walls, overflow, under-side of lid, ball valve etc, by spraying with a minimum of 2500 ppm H_2O_2 solution using an adequately vented pressure sprayer ensuring surfaces remain wet for 10 minutes.
l. When using high-pressure jet washers to clean the internal surfaces of the Tank, suitable PPE must be used, including a positive pressure respirator. In this circumstance, the escape of aerosols must be restricted or, certainly, minimised.
m. Where oil and grease contaminants on the tank surface are implicated, they shall be removed using suitable degreasants. Where necessary (and practicable) the tank can be steam cleaned to remove grease contaminants.
n. When required to do so, collect a water sample, as described in LEG 25 Microbiological sample collection protocol and submit for biological analysis for the organisms required. The analysis must, at least, measure the presence of contamination by *Legionella* where specifically requested. Samples to be collected no earlier than 48 hours following disinfection.

Neutralisation:

For tank fed down water services, Sanosil may be left in the system and flushed out by routine use after the cleaning process. It is assumed the drinking water will be off the rising main. You should refer to current approved products and processes (Regulation 31 of the Water Supply (Water Quality) Regulations 2000 &2001 in England and Wales)

UNIVERSITY OF LEICESTER	Water Quality Management & Control	
Task Reference No.:	LEG 28	
Task:	Water Storage Tank – Cleaning and Disinfection Using Sodium hypochlorite	
Complete Certificate of Conformity No:	Spray Method	No. 2
	Soak Method	No. 3
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.		

Tank Cleaning using NaClO:

a. Any water treatment equipment shall be disconnected from the system. The pH of the water shall be measured and must be between 5.5 and 7.8 before disinfectant solution is introduced. If pH is found to be below 5.5 or above 7.8 the tank shall be drained, flushed and refilled with fresh water.
b. Fix ball valve in close position.
c. Isolate Tank from system. Outlets should be sealed from inside tank.
d. *It is important to disinfect the tank before any manual cleaning of the internal surfaces is carried out in order to ensure that all operatives are protected from potential exposure to pathogenic bacteria which may be present in the tank to be cleaned.*
e. Introduce appropriate volume of disinfectant solution to achieve 50 ppm *free chlorine*. The levels achieved must be measured using a suitably calibrated chlorine comparator.
f. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant where necessary, until the concentration is stabilised at 50 ppm *free chlorine*.
g. Once concentration has stabilised, leave tank to soak for 1 hour minimum.
h. Empty the Tank via drain-point or by using a submersible or barrel type pump, in the absence of a drain-point or should draining from drain-point is impracticable. If the *free chlorine* level is ≥30ppm after one hour, dilute concentration with fresh water and put to drain, without deactivation, provided that the system volume is less than 2m^3 and the residual less than 20ppm as free chlorine. . Where the chemical residual or volume is greater it should be deactivated using an appropriate neutralising agent at the correct concentration
i. The surfaces of the tank(s), including walls, overflow, lid, ball valve etc, should be manually cleaned. Clean Tank and remove all deposits of scale, corrosion and sludge deposition using a combination of hand scraping and brushing together with application of chemicals to dissolve or soften the scale (where necessary). Vacuum out all loose debris and deposits.
j. When using high-pressure jet washers to clean the internal surfaces of the Tank, suitable PPE must be used, including a positive pressure respirator. In this circumstance, the escape of aerosols must be restricted or, certainly, minimised.
k. Where oil and grease contaminants on the tank surface are implicated, they shall be removed using suitable degreasants. Where necessary (and practicable) the tank can be steam cleaned to remove grease contaminants.

Tank Disinfection using NaClO – Spray Method:

a. Once the tank has been cleaned as described above, spray all surfaces of the tank using an adequately vented pressure sprayer or fogger, with ready prepared 500ppm *free chlorine* solution, ensuring that all surfaces remain wet with disinfectant for at least 10 minutes. Note the requirements for personal protective equipment when spraying of fogging NaClO solutions.
b. When the spray disinfection is complete and the solution has been in contact with all surfaces for at least 10 minutes, thoroughly rinse all sprayed surfaces with clean water and remove any residues with a cleaned and disinfected pump/wet vac or flush through to drain.
c. Refill with fresh water and put back into service. Check residual of *free chlorine* is below 1ppm.
d. When required to do so, collect a water sample, as described in LEG 25 Microbiological sample collection protocol and submit for biological analysis for the organisms required. The analysis must,

at least, measure the presence of contamination by *Legionella* where specifically requested. Samples to be collected no earlier than 48 hours following disinfection.

Tank Disinfection using NaClO – Soaking Method (as an alternative to the Spray Method of disinfection):

a. Any water treatment equipment shall be disconnected from the system. The pH of the water shall be measured and must be between 5.5 and 7.8 before disinfectant solution is introduced. If pH is found to be below 5.5 or above 7.8 the tank shall be drained, flushed and refilled with fresh water.
b. Fix ball valve in close position.
c. Introduce appropriate volume of disinfectant solution to achieve 50 ppm *free chlorine*. The levels achieved must be measured using a suitably calibrated chlorine comparator.
d. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant where necessary, until the concentration is stabilised at 50 ppm *free chlorine*.
e. Once concentration has stabilised, leave tank to soak for 1 hour minimum. After 1 hour soak period, check *free chlorine* level; if below 30 ppm, repeat step iii. If level is ≥30ppm after one hour, dilute concentration with fresh water and put to drain, without deactivation, provided that the system volume is less than 2m^3 and the residual less than 20 ppm as *free chlorine*. Where the chemical residual or volume is greater it should be deactivated using an appropriate neutralising agent at the correct concentration. Use a cleaned and disinfected submersible or barrel type pump, in the absence of a drain-point or should draining from drain-point is impracticable.
f. The area of the storage vessel above the water line (overflow, lid, ball valve etc) should be manually cleaned and then disinfected by spraying with 500 ppm *free chlorine* solution using an adequately vented pressure sprayer ensuring surfaces remain wet for 10 minutes.
g. Refill with fresh water and put back into service. Check residual of *free chlorine* is below 1ppm.
h. Any equipment isolated at stage ii. should be reinstated.
i. When required to do so, collect a water sample, as described in LEG 25 Microbiological sample collection protocol and submit for biological analysis for the organisms required. The analysis must, at least, measure the presence of contamination by *Legionella* where specifically requested. Samples to be collected no earlier than 48 hours following disinfection.

Neutralisation:

a. Normally, *free chlorine* solutions do not require neutralisation prior to disposal to foul sewer. However, if local conditions require it, 50 ppm disinfectant solutions can be neutralised before disposal with sodium bisulphite (SB) or sodium thiosulphate (ST) at the rate of 350 gm SB/m^3 or 525 gm ST/m^3 of disinfectant solution. It is important to flush the system thoroughly, before being allowed back into use, if such neutralisers are to be used as they are known to be a laxative agent in low concentrations.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 29
Task:	Domestic HOT AND COLD Water Services Disinfection Using Silver stabilised hydrogen peroxide (SSHP)
Complete Certificate of Conformity No:	No. 4
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

When disinfecting hot and cold domestic water distribution systems in buildings, it is important to ensure that:

a. All persons in the building are notified that the distribution system is being disinfected and that the water must not be used. Where necessary, outlets must be taped and signs placed on each outlet advising of this.
b. Ensure that all hot water is quickly purged from the HWS system and replaced with cold water, prior to the commencement of the disinfection process.
c. Any water treatment equipment shall be disconnected from the system . All white goods and other equipment connected to the system to be disinfected must be removed to allow for the supply pipework to these units to be flushed to enable draw-through of the disinfectant to the outlet.

Disinfection Domestic hot and cold water services using Sanosil (silver stabilised hydrogen peroxide - H2O2) as the disinfecting agent.

a. If CWS storage vessels are associated with the system, they must be cleaned and disinfected before the distribution system is disinfected.
b. Treated water must then be used to charge the distribution system. If a storage vessel is associated with the system, the disinfectant solution must be prepared in and supplied by this vessel. If a storage vessel is not associated with the system, a portable vessel must be used to prepare within and supply from the disinfectant solution.
c. Introduce appropriate volume of disinfectant solution into the storage vessel(s) to achieve 250ppm H2O2 (This is typically required to allow a minimum of 150 ppm H2O2 at the outlets). The levels achieved must be measured using 'Dropper Bottles' (Test Strips – a portion of test paper should be dipped into the water and the colour change compared to the indicator range on the box. This will give an indication of concentration).
d. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant where necessary, until the concentration is stabilised at 250 ppm H2O2. Additional dosing should be carried out if required to achieve this. If the level does fall below 60% of the start point, then the tank requires re-dosing and the contact time re-starts from zero.
e. Once concentration has stabilised, ensure that the disinfectant solution is drawn to each outlet (measure as described in iii. above).
f. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant where necessary, until the concentration is stabilised at 150 ppm H2O2. Additional dosing should be carried out if required to achieve this. If the level does fall below 60% of the start point, then the tank requires re-dosing and the contact time re-starts from zero. Confirmation that the disinfectant level has stabilised must be obtained from each outlet.
g. v. Once concentration has stabilised, the whole system must be allowed to stand charged for a minimum period of 1 hour before any outlets are allowed to be flushed or used.
h. vi. If relevant, both duty and standby pumps should be cycled and valves opened to ensure that the disinfectant solution contacts all surfaces.
i. Following completion of the disinfection process, all TMV/TMT strainers and all other strainers, aerators and flow straighteners must be removed, cleaned and disinfected and replaced/renewed.

Neutralisation:

For tank fed down water services, SSHP may be left in the system and flushed out by routine use after the cleaning process. It is assumed the drinking water will be off the rising main.

When disinfecting hot and cold domestic water distribution systems in buildings, it is important to ensure that:

a. All persons in the building are notified that the distribution system is being disinfected and that the water must not be used. Where necessary, outlets must be taped and signs placed on each outlet advising of this.
b. Ensure that all hot water is quickly purged from the HWS system and replaced with cold water, prior to the commencement of the disinfection process.
c. Any water treatment equipment shall be disconnected from the system . All white goods and other equipment connected to the system to be disinfected must be removed to allow for the supply pipework to these units to be flushed to enable draw-through of the disinfectant to the outlet.

Disinfection Domestic hot and cold water services using Chlorine Dioxide (ClO2) as the disinfecting agent. **As this process can potentially be dangerous, due to the concentration of ClO2 used, it shall only be undertaken by suitably experienced, accredited and equipped contractors:**

a. If CWS storage vessels are associated with the system, they must be cleaned and disinfected before the distribution system is disinfected. Treated water **MUST NOT** then be used to charge the distribution system.
b. If a storage vessel is associated with the system, the disinfectant solution must be prepared in and supplied by this vessel. If a storage vessel is not associated with the system, a portable vessel must be used to prepare within and supply from the disinfectant solution.
c. Introduce appropriate volume of disinfectant solution into the storage vessel(s) to achieve 25ppm ClO2.
d. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant where necessary, until the concentration is stabilised at 25 ppm ClO2. Additional dosing should be carried out if required to achieve this. If the level does fall below 15ppm ClO2, then the vessel(s) would require re-dosing and the contact time re-starts from zero.
e. Once concentration has stabilised, ensure that the disinfectant solution is drawn to each outlet.
f. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant in the vessel(s) where necessary, until the concentration is stabilised at 25 ppm ClO2 at the outlets. Additional dosing should be carried out if required to achieve this. If the level does fall below 15ppm ClO2, then the vessel(s) would require re-dosing and the contact time re-starts from zero. Confirmation that the disinfectant level has stabilised must be obtained from each outlet.
g. Once concentration has stabilised, the whole system must be allowed to stand charged for a minimum period of 1 hour before any outlets are allowed to be flushed or used.
h. If relevant, both duty and standby pumps should be cycled and valves opened to ensure that the disinfectant solution contacts all surfaces.
i. After a minimum f 1 hour contact time, flush the system (at each outlet) with fresh water until level of ClO2 is equal to that of the incoming mains (untreated).
j. Following completion of the disinfection process, all TMV/TMT strainers and all other strainers, aerators and flow straighteners must be removed, where practicable, cleaned and disinfected and replaced/renewed.
k. When required to do so, collect water samples from agreed locations (sampling points), as described in LEG 25 - Microbiological sample collection protocol and submit for biological analysis for the organisms

required. The analysis must, at least, measure the presence of contamination by *Legionella* where specifically requested. Samples to be collected no earlier than 48 hours following disinfection.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 31
Task:	Domestic HOT AND COLD Water Services Disinfection Using Sodium hypochlorite (NaClO) as the disinfecting agent
Complete Certificate of Conformity No:	No. 6
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

When disinfecting hot and cold domestic water distribution systems in buildings, it is important to ensure that:

a. All persons in the building are notified that the distribution system is being disinfected and that the water must not be used. Where necessary, outlets must be taped and signs placed on each outlet advising of this.
b. Ensure that all hot water is quickly purged from the HWS system and replaced with cold water, prior to the commencement of the disinfection process.
c. Any water treatment equipment shall be disconnected from the system . All white goods and other equipment connected to the system to be disinfected must be removed to allow for the supply pipework to these units to be flushed to enable draw-through of the disinfectant to the outlet.

Disinfection of the System using NaClO.

a. If CWS storage vessels are associated with the system, they must be cleaned and disinfected before the distribution system is disinfected. Treated water **MUST NOT** then be used to charge the distribution system.
b. Any water treatment equipment shall be disconnected from the system. The pH of the water shall be measured and must be between 5.5 and 7.8 before disinfectant solution is introduced. If pH is found to be below 5.5 or above 7.8 the system shall be drained, flushed and refilled with fresh water.
c. Disinfectant solution must then be used to charge the distribution system. If a storage vessel is associated with the system, the disinfectant solution must be prepared in and supplied by this vessel to achieve a 50 ppm *free chlorine* solution. If a storage vessel is not associated with the system, a portable vessel must be used to prepare and supply the disinfectant solution.
d. Sampling points representative of the system must be tested to ensure 50 ppm *free chlorine* throughout the system to start disinfection. The whole system must be allowed to stand charged for a minimum period of 1 hour.
e. Continue to measure and record the level of disinfectant every 10 minutes, adding disinfectant in the vessel(s) where necessary, until the concentration is stabilised at 50 ppm *free chlorine* at the outlets. Additional dosing should be carried out if required to achieve this. If the level does fall below 30 ppm *free chlorine*, then the vessel(s) would require re-dosing and the contact time re-starts from zero. Confirmation that the disinfectant level has stabilised must be obtained from each outlet.
f. Once concentration has stabilised, the whole system must be allowed to stand charged for a minimum period of 1 hour before any outlets are allowed to be flushed or used.
g. The system shall be thoroughly flushed out with clean mains water until tests indicate that the residual *free chlorine* concentration is no greater than 0.5ppm more than that present in the mains water supply.
h. Following completion of the disinfection process, all TMV/TMT strainers and all other strainers, aerators and flow straighteners must be removed, where practicable, cleaned and disinfected and replaced/renewed.
i. Any equipment isolated at stage ii. should be reinstated.
j. When required to do so, collect water samples from agreed locations (sampling points), as described in LEG 25 - Microbiological sample collection protocol and submit for biological analysis for the organisms required. The analysis must, at least, measure the presence of contamination by *Legionella* where specifically requested. Samples to be collected no earlier than 48 hours following disinfection.

Neutralisation:

a. Normally, sodium hypochlorite solutions do not require neutralisation prior to disposal to foul sewer. However, if local conditions require it, 50 ppm disinfectant solutions can be neutralised before disposal with sodium bisulphite (SB) or sodium thiosulphate (ST) at the rate of 350 gm SB/m^3 or 525 gm ST/m^3 of disinfectant solution. It is important to flush the system thoroughly, before being allowed back into use, if such neutralisers are to be used as they are known to be a laxative agent in low concentrations.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 32
Task:	Calorifier or Plate Heat Exchanger Buffer Vessel Pasteurisation
Complete Certificate of Conformity No:	No. 7
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation, and the needs of the site.	

a. Purge Calorifier or Plate Heat Exchanger Buffer Vessel via drain point and refill.
b. Isolate all valves on the incoming and outlet sides.
c. Ensure that the “blow” valve is capable of withstanding temperatures of up to 80°C.
d. Bring Calorifier or Plate Heat Exchanger Buffer Vessel to 70°C and allow to stand at this temperature for at least 1 hour.
e. Ensure that no water is drawn from the Calorifier or Plate Heat Exchanger Buffer Vessel whilst pasteurisation in progress.
f. Allow Calorifier or Plate Heat Exchanger Buffer Vessel to reach its normal operating temperature (≥60°C) and return to service.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 33
Task:	Domestic Water HWS Distribution System Pasteurisation
Complete Certificate of Conformity No:	No. 8

Note: This process must only be carried in systems which are empty of users or where the risk of scalding has been assessed, in accordance with the University's Risk Assessment Process, and determined to be low.

If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.

a. Purge Calorifier or Plate Heat Exchanger Buffer Vessel via drain point and refill.
b. Isolate all valves on the incoming and outlet sides.
c. Ensure that the pressure and/or temperature relief valve is capable of withstanding temperatures of up to 80°C.
d. Bring Calorifier or Plate Heat Exchanger Buffer Vessel to 70°C and allow to stand at this temperature for at least 1 hour.
e. Ensure that no water is drawn from the Calorifier or Plate Heat Exchanger Buffer Vessel whilst pasteurisation in progress.
f. Whilst maintaining the Calorifier or Plate Heat Exchanger Buffer Vessel temperature at "pasteurising temperature" open all isolation valves to allow water from the Calorifier or Plate Heat Exchanger Buffer Vessel to distribute adequately throughout all parts of the system, checking at 15 minute intervals that the temperature at sentinel outlets is maintained at "pasteurising temperature".
g. Maintain temperature throughout the system at "pasteurising temperature" for 1 hour.
h. Allow Calorifier or Plate Heat Exchanger Buffer Vessel and distribution system to reach its normal operating temperature, ≥60°C, and return to service.
i. ix. Following completion of the pasteurisation process, all TMV/TMT strainers and all other strainers, aerators and flow straighteners must be removed, cleaned and disinfected and replaced/renewed.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 34
Task:	Point of Use (POU) filter installation and replacement
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

a. Outlets to be fitted with POU filters shall be selected by the Water Systems Operational Responsible Person to instruct their installation.
b. POU filters shall be fitted by suitably and adequately trained staff.
c. POU filters shall be replaced according to manufacturer's instructions or when there is a significant fall in flow-rate/pressure at the outlet indicating filter blockage.
d. POU filters, when installed and/or replaced must be dated and signed for and adequate recorded data be maintained of their status.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 35
Task:	Dead Legs/Areas of Low-Use - Usage Evaluation & Flushing
Frequency:	WEEKLY MINIMUM
Complete Certificate of Conformity No:	No. 9

Systems or individual outlets that are not frequently used allow the development of stagnant water conditions, which increase the potential of bacterial growth and proliferation, including Legionella. In order to remove any stagnation that may have developed or to stop stagnation from occurring in the first place, it is important to introduce a "flushing" programme where necessary. The Water Systems Operational Responsible Person shall have the responsibility to ensure that this requirement is implemented and systematically audited to ensure adequate and correct implementation.

The flushing programme shall be designed so that it allows for the whole dead-leg to be removed. This is achieved by ensuring that the flushing is carried out at the specified system or outlet and for an appropriate length of time. The length of time of purging water from the system is important because it is vital to ensure that all the stagnant water has been expelled from the pipe-work and at least until "circulating" or "fresh" water is drawn from the outlet (water at temperatures exhibited throughout the rest of the system).

The flushing programme shall follow the procedure outlined below:

A. For all areas which are in "normal operating use", the responsibility for the Usage Evaluation and Flushing process shall be that of the "user".

B. For all areas which are "out of use", the responsibility for the Usage Evaluation and Flushing process shall be that of the Estates and Campus Services.

a. Carry out the “Usage Evaluation” process in order to identify areas/outlets which are not used at least weekly so that they can be flushed.
b. If a system or an area consisting of multiple outlets requires flushing, it is important to begin with the nearest outlet to the main distribution pipe-work, working progressively away from the main distribution pipe-work.
c. Ensure that the system/outlet can be flushed safely and in a tidy manner into an appropriate drain if not plumbed for drainage.
d. Ensure that the purging of water from outlets does not create an unnecessary amount of aerosol at least no more than would be created when outlet is operated normally.
e. Ensure that "splash-back" is minimised, where practicable, by placing a sponge or another material capable of absorbing some of the force of the water against the surface of the appliance.
f. Purge the hot and the cold or the mixed water (hot then cold) in turn for a minimum of 3 minutes or for a period of time necessary to draw water from the outlet at temperatures exhibited throughout the rest of the system.
g. Consider whether the system/outlet can be removed negating further flushing.

Additional requirements will be required for entire systems and/or buildings which are not occupied, or systems are not in “normal use”. To ensure stagnant water in the tanks is replaced before the outlets are flushed as described above, and fresh water reaches all outlets, any systems with tanks should either:

A. Have all tanks dropped of standing stagnant water, and refilled, or

B. Have the tanks turned over by opening and flushing the furthest cold outlets to within 2C of the incoming (ballvalve) temperature.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Task Reference No.:	LEG 36
Task:	Management of Water Dispensers/Water Coolers ***To be used in conjunction with Permit No. 4: 'Permit for the Installation of new Water Dispenser/Water Coolers.***
If the maintenance staff or appointed contractor cannot, at any stage, comply with any part of this specification, then an alternative specification shall be agreed which both meets the requirements of current legislation and the needs of the site.	

Note: The use of Bottled Water Dispensers shall not be allowed.

Request to install new Water Dispenser/Water Cooler

a. The installation of Water Dispensers/Water Coolers shall only be approved following formal completion of and authorisation of 'Permit for the Installation of new Water Dispensers/Water Coolers'.
b. Any new Water Dispensers/Water Coolers fitted without the appropriate authorisation for its installation, shall be removed by the Health, Safety and Compliance Officer EDS.

Guidance on the selection of Water Dispensers/Water Coolers

a. Units selected must be WRAS approved.
b. In order to avoid stagnation and resultant potential increase in bacterial growth and proliferation within the unit, it is preferable that the unit selected does not have a water storage tank.
c. In order to maximise bacterial growth and proliferation control, it is preferable that the unit selected has UV bacterial control.
d. In order to reduce the potential of bacterial growth and proliferation on the spout caused by the collection of scale and other debris deposits, it is preferable that the unit selected has the facility to replace the spout.
e. In order to reduce the potential of bacterial growth and proliferation and the build-up of biofilm in the supply connections to the unit, it is important that the unit does not require connection using EPDM flexible hose connectors as these have been shown to promote bacterial growth and proliferation and support the development of biofilm locally.
f. In order to reduce the potential of bacterial growth and proliferation and the build-up of biofilm in the supply connections to the unit, it is important that the unit does not incorporate EPDM seals/gaskets as these have been shown to promote bacterial growth and proliferation and support the development of biofilm locally.

Installation

a. All Water Dispensers/Water Coolers must be installed by suitably qualified contractors and in accordance with all Water Regulations requirements and the requirements of this WSP.
b. All Water Dispensers/Water Coolers must be installed in a proper manner and connected onto a potable water supply.
c. All Water Dispensers/Water Coolers must be suitably serviced at installation in accordance with manufacturer's instructions.

Maintenance

a. All Drinking Water Dispensers/Water Coolers shall be subject to a suitable contract, to include a minimum of 6-monthy service visits, to ensure maintenance in accordance with manufacturers' instructions. All contracts shall be subject to approval by the Health, Safety and Compliance Officer Estates and Campus Services.

b. Any Water Dispensers/Water Coolers found in use without a suitably approved maintenance contract shall be taken out of use, by the Health, Safety and Compliance Officer Estates and Campus Services, until the unit is placed under a contract.
c. All dispenser/cooler outlets shall be subject to weekly sanitisation and inspection.

Certificate of Conformity No. 1

Water Storage Tank Cleaning and Disinfection

Using Sanosil (H2O2) as the disinfectant agent

No	Tasks		Date	Tank Asset No.	Comments	Signature of operative (all boxes to be completed)
1	Tank Volume:					
2	Method of disinfection:					
3	Disinfectant used:					
4	Was tank disinfected prior to cleaning?					
5	Was tank physically cleaned?					
6	Volume of disinfectant used:					
7	H2O2 level ppm	Initial				
8		After 1 hour:				
9		Post disinfection				
10	Date of last disinfection:					
11	Any refurbishment, improvements carried out during this disinfection:					
12	Further upgrading, refurbishment, improvements works required					

Comments

Task carried out by (Print Name)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 2

Water Storage Tank Cleaning and Disinfection - Spray Method

Using Sodium Hypochlorite (NaClO) as the disinfectant agent

No	Tasks	Date	Tank Asset No.	Comments	Signature of operative (all boxes to be completed)
1	Tank Volume:				
2	Method of disinfection:				
3	Disinfectant used and tested strength (mg/l):				
4	Spray all surfaces of the tank using a suitably vented knapsack or garden pressure sprayer, with ready prepared 500 mg/l *free chlorine* solution, ensuring that all surfaces remain wet with disinfectant for at least 60 minutes, sprayed over all surfaces at least every 15 minutes.				
5	Thoroughly rinse all sprayed surfaces with clean water and remove any residues with pump/wet vac or flush through to drain				
6	Refill with fresh water and put back into service. Chlorine test result in tank when refilled (must be less than 1.0 mg/l)				
7	Date of last disinfection:				
8	Any refurbishment, improvements carried out during this disinfection:				
9	Further upgrading, refurbishment, improvements works required				

Comments

Task carried out by (Print Name)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 3

Water Storage Tank Cleaning and Disinfection - Soak Method

Using Sodium Hypochlorite (NaClO) as the disinfectant agent

No	Tasks		Date	Tank Asset No.	Comments	Signature of operative (all boxes to be completed)
1	Tank Volume:					
2	Method of disinfection:					
3	Disinfectant used:					
4	pH level in tank before dosing					
5	Was tank disinfected prior to cleaning?					
6	Was tank physically cleaned?					
7	Volume of disinfectant used:					
8	*Free chlorine* level ppm	Initial				
9		After 1 hour:				
10		Post disinfection				
11	Date of last disinfection:					
12	Any refurbishment, improvements carried out during this disinfection:					
13	Further upgrading, refurbishment, improvements works required					

Comments

Task carried out by (Print Name)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 4

Distribution Water Services Disinfection

Using Sanosil (H2O2) as the disinfectant agent

No	Tasks	Date	System	Comments	Signature of operative (all boxes to be completed)
1	System Volume:				
2	Method of disinfection:				
3	Disinfectant used:				
4	Volume of disinfectant used:				
5	Disinfectant level at the tank (H2O2 ppm)				
6	Initial disinfectant level at outlets - maximum/minimum (H2O2 ppm)				
7	After 1 hour level at outlets - maximum/minimum (H2O2 ppm)				
8	Post disinfection level at outlets - maximum/minimum (H2O2 ppm)				
9	TMV/TMT strainers and all other strainers, aerators and flow straighteners cleaned, disinfected and replaced/renewed				
10	Further upgrading, refurbishment, improvements works required				

Comments – record all other testing and times below.

Task carried out by (Print Name)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 5

Distribution Water Services Disinfection

Using Chlorine Dioxide (ClO2) as the disinfectant agent

No	Tasks	Date	System	Comments	Signature of operative (all boxes to be completed)
1	System Volume:				
2	Method of disinfection:				
3	Disinfectant used:				
4	Volume of disinfectant used:				
5	Disinfectant level at the tank (ClO2 ppm)				
6	Initial disinfectant level at outlets - maximum/minimum (ClO2 ppm)				
7	After 1 hour level at outlets - maximum/minimum (ClO2 ppm)				
8	Post disinfection level at outlets - maximum/minimum (ClO2 ppm)				
9	TMV/TMT strainers and all other strainers, aerators and flow straighteners cleaned, disinfected and replaced/renewed				
10	Date of last disinfection:				
11	Any refurbishment, improvements carried out during this disinfection:				
12	Further upgrading, refurbishment, improvements works required				

Comments – record all other testing and times below.

Task carried out by (Print Name)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 6

Distribution Water Services Disinfection

Using Sodium hypochlorite (NaClO) as the disinfectant agent

No	Tasks	Date	System	Comments	Signature of operative (all boxes to be completed)
1	System Volume:				
2	Method of disinfection:				
3	Disinfectant used:				
4	Volume of disinfectant used:				
5	Disinfectant level at the tank (*Free chlorine* ppm)				
6	Initial disinfectant level at outlets - maximum/minimum (*Free chlorine* ppm)				
7	After 1 hour level at outlets - maximum/minimum (*Free chlorine* ppm)				
8	Post disinfection level at outlets - maximum/minimum (*Free chlorine* ppm)				
9	TMV/TMT strainers and all other strainers, aerators and flow straighteners cleaned, disinfected and replaced/renewed				
10	Date of last disinfection:				
11	Any refurbishment, improvements carried out during this disinfection:				
12	Further upgrading, refurbishment, improvements works required				

Comments – record all testing and times below.

Task carried out by (Print Names)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 7

Calorifier or Plate Heat Exchanger Buffer Vessel Pasteurisation

No	Tasks	Date	Unit Asset No.	Comments	Signature of operative (all boxes to be completed)
1	Unit drain flush carried out:				
2	Inlet valve closed:				
3	Outlet valve closed:				
4	Circulation pumps off:				
5	Destratification pump on (where fitted):				
6	Are there any leaks (Y/N):				
7	Type of heating provided:				
8	Time of beginning of process (24hr clock):				
9	Pasteurising temperature achieved:				
10	Time pasteurising temperature kept:				
11	Time of end of process (24hr clock):				
12	Date of last disinfection:				
13	Any refurbishment, improvements carried out during this disinfection:				

Comments

Task carried out by (Print Names)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 8

Domestic Water HWS Distribution System Pasteurisation

Note: This process must only be carried in systems which are empty of users or where the risk of scalding has been assessed, in accordance with the University's Risk Assessment Process, and determined to be low.

No	Tasks	Date	System	Comments	Signature of operative (all boxes to be completed)
1	Does Risk Assessment carried out allow for this process to be carried out (Y/N) *Attach Risk Assessment*				
2	Type of heating provided				
3	Time of beginning of process (24hr clock)				
4	Pasteurising temperature achieved				
5	Time pasteurising temperature kept				
6	Time of end of process (24hr clock)				
7	Inlet valve opened (Y/N)				
8	TMV/TMT strainers and all other strainers, aerators and flow straighteners cleaned, disinfected and replaced/renewed(Y/N)				
9	Water analysis carried out (Y/N)				
10	Analysis results				
11	Date of last disinfection				
12	Any refurbishment, improvements carried out during this disinfection				

Comments – record all other testing and times below.

Task carried out by (Print Names)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 9

Usage Evaluation and Flushing

Department:	
Location:	
Area:	
Process Responsible Person (name):	
Start date (Monday):	

Has Usage Evaluation been carried out?	**Yes**		**No**	
If No; why Not?				
If Yes; have any outlets been identified as infrequently used?	**Yes**		**No**	

If Yes; list locations and date of flushing, sign in each box to show :

Room/Outlet:	Mon (date below)	Tue (date below)	Wed (date below)	Thu (date below)	Fri (date below)	Sat (date below)	Sun (date below)	Comments

Have any outlets/facilities been identified as redundant and requiring removal?	**Yes**		**No**	
Tasks carried out by (Print all Names)				

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.
EDS Engineers – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 10

Small Sized Component Disinfection and Fitting

Note - Maximum 2m length of pipes and fittings otherwise newly fitted section shall be soak/injection disinfected when fitted.

No	Tasks	Date		Signature of operative (all boxes to be completed)
1	Parts disinfected (list all)			

No	Tasks	Task Detail	Comments	Signature of operative (all boxes to be completed)
2	Method of disinfection:			
3	Disinfectant used:			
4	Volume of water in soaking vessel			
5	Volume of disinfectant used:			
6	Disinfectant level at the start of disinfection and time.			
6	Disinfectant level at the end of disinfection, and time.			
7	All fittings drip dried			
8	All fittings fitted within 12 hours, and area back in service, or on flushing regime (note time completed)			
9	All tools disinfected before fitting process?			
10	All legs flushed through following fitting?			

Comments – record all testing and times below.

Task carried out by (Print Names)	

Document control: Project work – copy to project file and email to Building Services Engineer (Water). Any defects to be reported to Project Manager by email.
Approved contractor – document to be uploaded to Zetasafe by engineer, and any defects entered into Zetasafe as manual defects.

Certificate of Conformity No. 11

Water Storage Tank Temperature Profile

Note: This certificate is only to be used for project work, routine monitoring and maintenance is to be logged on the EDS logbook – Zetasafe.

Tank Asset Number	Tank Location	Date	Tasks			Comments	Signature of operative
			Stored Water Temp. (°C)	Incoming Water Temp. (°C)	Ambient Temp. (°C)		
Name(s) of persons undertaking checks						Date of checks	

Water Quality Management & Control Log-Book

Certificate of Conformity No. 12

Note: This certificate is only to be used for project work, routine monitoring and maintenance is to be logged on the EDS logbook – Zetasafe.

Domestic Hot and Cold Water Source and Distribution ClO2/Temp Profile

Date	Time	Building/Area/Room	Type of outlet	Condition	ClO2 Levels (mg/l)	Distribution HWS (°C)				Distribution Cold (°C)			Signature
						Direct fed Outlet temp. (non recirculating systems only)	Time to steady temp.	Return loop temperature (recirculating systems)	Source Unit temp	Peak cold temp.	Temp at 2 minutes	Tank Temp (remote from valve)	
Project Manager Signature												Date of check	

6. PERMITS AND NOTIFICATIONS

Permit No.	Task Details
No. 3	Permit for the Installation of new Water Dispenser/Water Coolers
No. 4	Permit for the Installation of new Ice Making Machine
No. 5	Permit to Use Portable “Wet” Evaporative Cooling Point-of-use Air Conditioning Unit
No. 6	Permit for the Installation of new Water Butt
No. 7	Competent Persons Suitability Assessment and Authorisation to undertake works.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Permit Number - Name	3 - Permit for the Installation of new Water Dispenser/Water Coolers
Task:	Application for connection of a new water dispenser/water cooler
Permit to be completed by:	Person or department requesting the new facility, or associated Project Manager
Document Control	Upon completion of application, a copy is to be sent to: Health, Safety and Compliance Officer Estates and Campus Services. Upon authorisation, a copy is to be sent to the applicant. A copy of the approval shall be kept by the applicant to provide proof (on request) of authorisation to fit the facility.

Management Criteria

Application submitted by:		Date	
Proposed location of Drinking Fountain:			
Drinking Fountain to be procured by:			
Drinking Fountain to be supplied by:			
Drinking Fountain make and model;			
Proposed date of unit installation:			
Drinking Fountain to be installed by:		Is installer an EDS approved contractor (Yes/No)	
Unit to be maintained by:		Contract start/end date:	
Is unit included in the PPM Programme?		Contract start/end date:	

Please Note: The selection and maintenance of each Water Dispenser/Water Cooler must be in accordance with 'Management of Drinking Fountains - LEG 34' of this WSP Book.

Facility features

Is unit selected WRAS approved?	YES	NO	N/A
Does unit have a water storage tank?	YES	NO	N/A
Does unit use UV bacterial control?	YES	NO	N/A
Does unit have hot and cold facility?	YES	NO	N/A
Does unit have replacement spout facility?	YES	NO	N/A
Does unit have the capacity to chill water below 10°C?	YES	NO	N/A
State maximum flow-rate of unit			

Drinking Fountain Installation approved by Health, Safety and Compliance Officer Estates and Campus Services?	YES/NO

Health, Safety and Compliance Officer Estates and Campus Services:

Signed: ..... Date:.....

NOTE: TO ALLOW FOR THE INSTALLATION OF THE WATER DISPENSER/WATER COOLER THIS PRO-FORMA MUST BE ACCOMPANIED BY MANUFACTURER'S TECHNICAL DATA

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Permit No. - Name	4 - Permit for the Installation of new Ice Making Machine
Task:	Application for connection of a new water Ice Machine
Permit to be completed by:	Person or department requesting the new facility, or associated Project Manager
Document Control	Upon completion of application, a copy is to be sent to: Health, Safety and Compliance Officer Estates and Campus Services. Upon authorisation, a copy is to be sent to the applicant. A copy of the approval shall be kept by the applicant to provide proof (on request) of authorisation to fit the facility.

Management Criteria

Application submitted by:		Date	
Proposed location of Ice Making Machine:		Assessed 'User' Risk Level:	
Drinking Fountain to be procured by:			
Ice Making Machine to be supplied by:			
Ice Making Machine make and model:			
Proposed date of unit installation:			
Ice Making Machine to be installed by:		Is installer approved by the University (Yes/No)	
Unit to be maintained by:		Contract start/end date:	
Is unit included in the PPM Programme?		Contract start/end date:	
	Please Note: The maintenance of each Ice Making Machine must be in accordance with manufacturers' instructions.		

Ice Making Machine Features

Is unit selected WRAS approved?	YES	NO	N/A
Does unit have a water storage tank?	YES	NO	N/A
Does unit use UV bacterial control?	YES	NO	N/A
Is unit connected to mains using flexible hose made of EPDM rubber?	YES	NO	N/A
Does unit construction incorporate seals/gaskets made from EPDM rubber?	YES	NO	N/A

Drinking Fountain Installation approved by the Health, Safety and Compliance Officer Estates and Campus Services?	YES/NO

Health, Safety and Compliance Officer Estates and Campus Services:

Signed: ..... Date:.....

NOTE: TO ALLOW FOR THE INSTALLATION OF THE ICE MAKING MACHINE THIS PRO-FORMA MUST BE ACCOMPANIED BY MANUFACTURER'S TECHNICAL DATA

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Permit No.	5
Task:	Permit to Use Portable "Wet" Evaporative Cooling Point-of-use Air Conditioning Unit

THIS SECTION TO BE COMPLETED BY THE PERSON REQUESTING THE USE OF THIS TYPE OF UNIT
(PLEASE USE A SEPARATE FORM FOR EACH UNIT APPLIED FOR)

Application submitted by:				Date	
Location of intended use:					
Period of intended use:					
Reasons for use:					
Unit make and model:				Serial No.	
Is unit new or used:					
If used; state condition of unit:					
Date and place unit last used:					
PPM Programme arranged?	Yes		No	With whom	
Cleaning & Disinfection Programme arranged?	Yes		No	With whom	
Reporting and Logging Systems arranged?	Yes		No	By whom	
Has unit been suitably prepared for use?	Yes		No	By whom	
Person responsible for the management of the unit:					
Location of work:					
Telephone:				E-mail	

This section to be completed by the
Health, Safety and Compliance Officer Estates and Campus Services

Unit authorised for use?	Yes		No	Until (Date)	

Health, Safety and Compliance Officer Estates and Campus Services:

Signed: ..... Date: .....

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Permit No.	6
Task:	Permit for the Installation of New Water Butt

Management Criteria

Application submitted by:		Date	
Proposed location of Water Butt:		Assessed 'User' Risk Level:	
Water Butt to be procured by:			
Water Butt to be supplied by:			
Water Butt model:			
Proposed date of unit installation:			
Water Butt to be installed by:		Is installer approved by the University (Yes/No)	
Unit to be maintained by:		Contract start/end date:	
Are conditions of use understood? (see Book 3 2.20)		Is the Water Butt to be suitably labelled in line with WSP Book 3 2.20? (Yes/No)	
Is unit included in the PPM Programme?		Contract start/end date:	
	Please Note: The maintenance of each Water Butt must be in accordance with manufacturers' instructions, and include an annual Visual Inspection, Clean and Disinfection in line with Procedure LEG 38		

Health, Safety and Compliance Officer Estates and Campus Services:

Signed: ..... Date:.....

NOTE: TO ALLOW FOR THE INSTALLATION OF THE WATER BUTT THIS PRO-FORMA MUST BE ACCOMPANIED BY MANUFACTURER'S TECHNICAL DATA

A SIGNED COPY OF THIS PERMIT MUST BE SUPPLIED TO THE PERSON/DEPARTMENT RESPONSIBLE FOR THE MANAGEMENT AND MAINTENANCE OF THE UNIT. THIS PERMIT MUST BE PRODUCED WHEN REQUESTED BY THE HEALTH, SAFETY AND COMPLIANCE OFFICER ESTATES AND CAMPUS SERVICES TO PROVE AUTHORISATION FOR INSTALLATION. FAILURE TO PROVIDE A SIGNED PERMIT WOULD ALLOW THE HEALTH, SAFETY AND COMPLIANCE OFFICER ESTATES AND CAMPUS SERVICES TO DISCONNECT AND REMOVE THE UNIT.

UNIVERSITY OF LEICESTER	Water Quality Management & Control
Permit No.	7
Task:	Competent Persons Suitability Assessment and Authorisation to undertake works.

Organisation:					
Name:					
Position (job title):					
Is the nominee a Contractor?			If a Contractor, have they provided suitable accreditation certification?		
Is nominee currently acting in this position?			If Yes; how long has the nominee acted in this position:		
Has candidate held this position previously?			If Yes; when and for how long:		
Tasks covered by this Assessment (list procedure numbers)					
Has nominee been provided with relevant approved Procedures for tasks and agrees to abide by their requirements?			If no Procedures are available for the task, have Procedures been provided for ORP-W to approve?		
Has nominee been provided with Policy and Water Safety Plan and agrees to abide by their requirements?					
Is nominee suitably trained in Legislation and Guidance			If No; is nominee scheduled to attend training imminently?		
Is nominee suitably trained in Tasks covered by this assessment?			If No; is nominee scheduled to attend training imminently?		
Is nominee willing to accept the nomination?			If No; why not?		
Additional Information					
Is nominee approved?			If No; why not?		

Signed – Authorised Person: ..... Date: .....

Signed – Nominee: ..... Date: .....