Hampshire County Council

Oak Lodge School

DT Block

CONTENTS

PREFACE

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Date of Assessment: **26th January 2012**

Date of Review: **January 2014**

INTRODUCTION

This report relates to a water source Risk Assessment carried out by Mr Chris Wilson of Freeston Water Treatment Ltd on the 26th January 2012 on behalf of Hampshire County Council. The Survey was carried out at the **DT BLOCK only**, at Oak Lodge School, Roman Road, Dibden Purlieu, Hampshire SO45 4RQ. During the course of the Survey water systems within the properties were risk assessed. These sources were chosen as being fully representative of the overall domestic water systems and outlets within the buildings.

The Survey and Risk Assessment were undertaken in order to comply with the Health and Safety Executive requirements on the control and prevention of Legionellosis. The Risk Assessment has been carried out in accordance with ACoP L8 - The control of Legionella bacteria in water systems (Approved Code of Practice and Guidance) & BS8580 (Water Quality- Risk Assessments for Legionella control - Code of Practice).

A Summary of Recommendations concludes the report. ACoP L8 places responsibility on employers and others to prepare a scheme for preventing or controlling the risk from Legionellosis. Adoption of a monitoring scheme in conjunction with a regime of preventative maintenance and associated record keeping will meet these requirements.

BACKGROUND TO LEGIONELLA

Legionella is the bacterium that causes Legionnaires disease. Of this bacterium, Legionella pneumophila is the species most commonly associated with disease outbreaks. Legionnaire's disease is identified as a pneumonia type of infection of the lower respiratory tract. The infection is most commonly acquired by the inhalation of airborne droplets or particles containing viable Legionella. Exposure to Legionella can also cause a short feverish illness without pneumonia known as Pontiac Fever.

Research indicates that Legionella can occur in hot and cold water services.

Sediment, scale, and organic materials present in water systems, can provide nutrients and give protection for Legionella. Legionella has been shown to colonise certain types of water fittings, pipe work and materials used in the construction of water systems.

The formation of bio films within water systems is undesirable and may also provide harbourage and favourable conditions for Legionella growth. Legionella is most likely to proliferate in water systems that have a temperature between 20ºC and 50ºC. Human blood temperature of approximately 37ºC is the most ideal temperature for proliferation. Stagnant water within the above temperature range appears to provide the ideal conditions for proliferation of Legionella.

Once a risk has been identified and assessed, a scheme should be prepared for preventing or controlling it. The risk is heightened when conditions are not monitored and control of the system is lost, thereby allowing Legionella to proliferate.

Legionella will survive at temperatures below 20ºC but is considered to be in a dormant state with no growth activity. The bacterium does not survive temperatures maintained consistently at 60ºC or above.

ASSESSMENT OF RISK

The Legionella risk

Legionnaire's disease is most commonly caused by the inhalation of water droplets contaminated with the Legionella bacteria. It is therefore important that systems susceptible to colonisation by Legionella and which incorporate a potential means for creating and disseminating water droplets should be identified and the risk they present assessed.

The assessment must be completed for routine system operation and also for circumstances such as breakdown, abnormal operation, commissioning or other unusual circumstances.

Risk assessment categories:-

A) The potential for the formation of droplets.

B) The condition of the water.

C) Water temperature.

D) The water turnover rate.

E) The susceptibility of persons exposed to droplets.

F) The population density exposed to droplets.

In undertaking the Risk Assessment and drawing up precautions, particular attention must be paid to situations where the population exposed contains a relatively high number of people susceptible to Legionella, due to there age and in many cases poor health.

Risk Assessment Review

The Risk Assessment should be reviewed every 2 years as stated in the HSE's ACoP L8 or otherwise for any of the reasons below:-

1) Changes are made to plant or water systems or its use.

2) Changes are made to building use in which the water system is installed.

3) New information about risks or control measures becomes available.

4) Results of checks indicate that control measures are no longer effective.

OBSERVATIONS

General and specific observations on the systems made during the course of the Survey are recorded and the more general requirements of L8 are commented where applicable, although references are made to compliance with the requirements of L8.

Compliance with ACoP L8 may be classified into two distinct categories:

a) Management Procedures - The management procedures, which have been implemented, to ensure that all control measures, record keeping and monitoring are adequate and effective.

b) Systems Conditions - The physical conditions of the water systems in the building must be considered when assessing the risk from Legionellosis.

This report therefore addresses the above categories. A general overview of existing Management Procedures is included and followed by comprehensive observations of the Systems Conditions as seen during the course of the Survey.

General Management Compliance

ACoP L8 para 23 - Identify Sources of Risk

Observations

The assessments are detailed in the relevant section of this report.

General Management Compliance

ACoP L8 para's 39, 53 and 66 - Prepare a Scheme for Preventing or Controlling the Risk - Implement and Manage Precautions - Maintain Records

Observations

A regime of repair and breakdown maintenance should be implemented for the DT Block at Oak Lodge School for all of the water services and systems. Procedures and records for the various maintenance activities must be documented and the Written Scheme recommendations be implemented in order to control Legionellosis. The precautions taken must be documented within an operational logbook.

Further Action Required

A Logbook should be prepared and records kept within it, as outlined in our recommendations.

The logbook, documentation and operation should be audited on a periodic basis in order to ensure that the system conditions and precautionary procedures are being carried out satisfactorily.

The precise procedures relating to the precautionary measures, i.e. cleaning of water cistern systems and calorifiers together with start up and shut down procedures for calorifiers, should be maintained within the logbook system and updated as required. The details of persons who are trained and competent to undertake the works should also be recorded in the logbook along with details of the training undertaken. This also applies to specialist contractors who may undertake part of these duties.

The Risk Assessment report relates to observations made and information supplied at the time of the Survey. Every effort has been made to examine as much of the water system as possible although some areas, such as pipe work beneath floors or behind walls would not have been inspected due to restricted access.

SITE SURVEY

A responsible person should be appointed to take day-to-day responsibility for the Written Scheme. If the assessment shows that there is a reasonably foreseeable risk and it is reasonably practicable to prevent exposure or control the risk from exposure, the person on whom the statutory duty falls (see paragraph 23) should appoint a person or persons to take managerial responsibility and to provide supervision for the implementation of precautions. (Paragraph 39 HSE's ACoP L8)

There is a dedicated water systems logbook in place for the DT Block which is shared with the main school. Monthly temperature monitoring of the hot and cold outlets and the calorifier is being carried out and recorded. A Written Scheme should be produced for this site.

System Reference	**DT Block only**
Location	**Site Buildings**
Method	**Visual Assessment and Temperature Profiling**

HOT WATER STORAGE

Hot water storage at the DT Block of Oak Lodge School is by one calorifier. The calorifier is located within the main boiler room. The calorifier was manufactured by IMI Rycroft Ltd. It is of a steel construction and is indirectly heated by an internal coil from the heating boiler. It has foil backed fibre type insulation which is damaged and missing in places, in particular over the access door, and this should be rectified. There is a return system fitted to the calorifier that has one circulating pump which at the time of the Survey appeared to be working correctly. I would recommend that the calorifier be purged to drain to check the water quality on at least an annual basis and recorded within a water systems logbook when carried out, I was informed that it is unknown if this is being carried out.

There is a temperature gauge on the calorifier but not on the hot return pipe work. I would recommend that a temperature gauge be fitted to the return pipework for monthly temperature monitoring to be carried out.

ACoP L8 recommends that calorifiers are checked internally for scale and sludge on an annual basis. I was informed that it is unknown if this is being carried out.

The temperature of the calorifier at the time of the Survey was:-

Calorifier	Storage	52.3°C	Not Satisfactory
Calorifier	Return	45.8°C	Not Satisfactory

ACoP L8 recommends hot water storage to be at a minimum of 60°C and the return to be maintained at a minimum of 50°C at all times. I would recommend that the calorifier be adjusted to increase these temperatures.

PHOTOGRAPHS

Boiler Room calorifier.

COLD WATER STORAGE

There is no cold water storage at the DT Block of Oak Lodge School.

DOMESTIC WATER DISTRIBUTION

Domestic water services should operate at temperatures that prevent the proliferation of Legionella. L8 specifies that hot water should be stored at no less than 60ºC and distributed at no less than 50ºC, obtainable at user outlets within one minute of opening. Cold water should be stored and distributed at no more than 20ºC.

Domestic hot water within the DT Block of Oak Lodge School distributes from one calorifier located within the Boiler Room and supplies all the hot water to the DT Block. The calorifier is supplied by mains cold water and indirectly heated by an internal coil from the heating boiler.

There is no cold water storage within the DT Block of Oak Lodge School.

Mains cold water within the DT Block of Oak Lodge School rises within the Boiler Room and supplies the heating boiler pressurisation unit, the calorifier and all cold outlets and appliances.

In all areas of distribution and use, inspection, test and measurement was undertaken at representative positions in order to evaluate conditions and areas of potential risk.

At the time of the Survey (within one minute) these hot water outlets within the buildings were recorded as follows:-

DT Block **Oak Lodge School** **Hot Water Outlet Temperatures**	
DT Room Sink	50.0ºC Inlet to TMV Satisfactory 39.4ºC TMV Outlet Satisfactory
Science Room Sink	50.0ºC Inlet to TMV Satisfactory 37.1ºC TMV Outlet Not Satisfactory

ACoP L8 recommends that the hot water should achieve 50ºC, obtainable at user outlets within one minute of opening.

TMV's (Thermostatic Mixing Valves) are fitted to ensure that the water temperature at hot water outlets does not exceed 43ºC (and scald users) and is no lower than 39ºC.

The hot water supplying the TMV's should be 50ºC at the TMV inlet as recommended in ACoP L8.

At the time of the Survey (within two minutes) the cold water outlets within the buildings were as follows:

DT Block **Oak Lodge School** **Hot Water Outlet Temperatures**	
DT Room Sink	12.9ºC Satisfactory
Science Room Sink	12.9ºC Satisfactory

ACoP L8 recommends cold water should be stored and distributed at no more than 20ºC.

GENERAL

- Thermostatic Mixing Valves (TMV's) are fitted in the DT Block; these valves should be serviced and maintained to the manufacturers recommendations. This was last carried out on the 11th January 2012.

- Infrequently used outlets are ideal areas for the proliferation of bacteria. Areas where the outlets are not used at least on a weekly basis should be removed or put on a weekly flushing regime (without creating an aerosol) and recorded. I was informed that flushing is carried out weekly.

- Dead leg pipework are ideal areas for the proliferation of bacteria and should be removed or put on a twice weekly flushing regime (without creating an aerosol) and recorded. Dead legs were found in the following areas:-

  - Boiler Room - The mains cold water pipe to the quick fill line on the heating boiler pressurisation unit is too long and creating a dead leg.
  - Boiler Room - There is a dead leg on the hot return pipe to the calorifier that appears to have once been connected to another dead leg clearly seen near it.
  - Boiler Room - There is a dead leg on the mains cold water pipe behind the calorifier (that supplies the heating boiler pressurisation unit) that appears to have once been connected to another dead leg clearly seen near it.
  - Boiler Room - There is a dead leg on the hot flow pipe from the calorifier that appears to have once been connected to another dead leg clearly seen near it.

  There are sinks within the Science Room that I was informed are completely disconnected from the water supply due to them being supplied by the same pipework that supplied a sink in another room that was removed.

- It is unknown when Legionella or bacteriological samples were last taken and I would recommend that this is carried out if temperatures fall outside of the limits as detailed in ACoP L8.

- All hot and cold water pipe (including heating pipes are un-insulated in all areas outside of the Boiler Room.

This situation is made worse by the fact that the mains cold water pipe is fitted directly above the domestic hot water and heating water flow and return pipes. I would recommend that all pipework be adequately insulated against heat loss / gain.

RECORDS

It is recommended that a water quality log book be produced for the site to include records of weekly, monthly, quarterly, six monthly and annual procedures. These should be carried out as recommended in this Risk Assessment.

Details of the responsibilities they hold should be included together with items listed as follows:

Maintenance carried out on water systems
Monthly temperature monitoring
Flushing of infrequently used outlets
Annual inspections of the calorifier
Purging of the calorifier
Faults and defects to be recorded
Audit sheet for inspections of the logbook and dated when completed

All of the above should be included in the water systems logbook and signed for when completed.

ADDITIONAL PHOTOGRAPHS

Boiler Room

Dead leg on the mains cold water pipe to heating boiler pressurisation unit quick fill line.

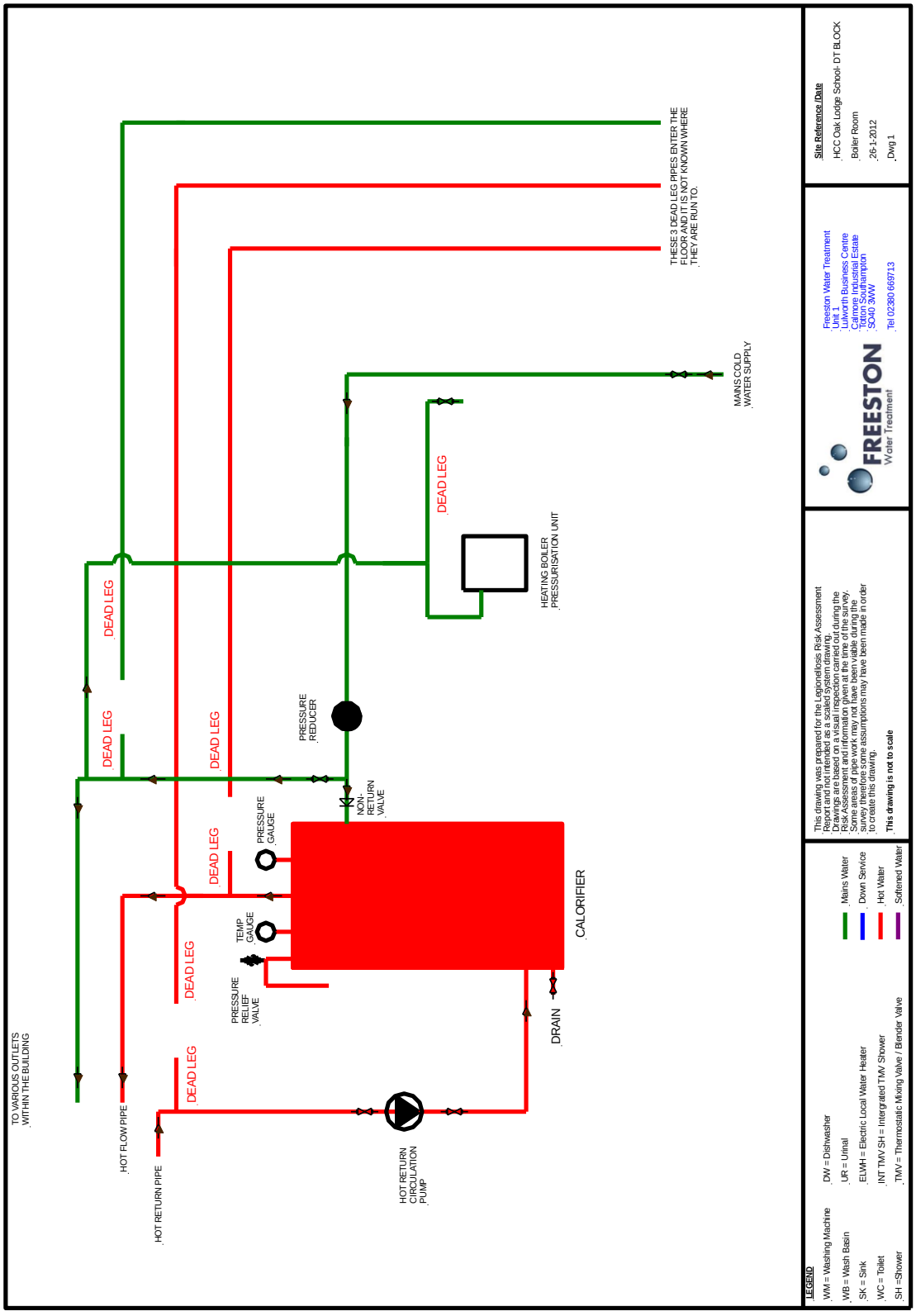
Boiler Room

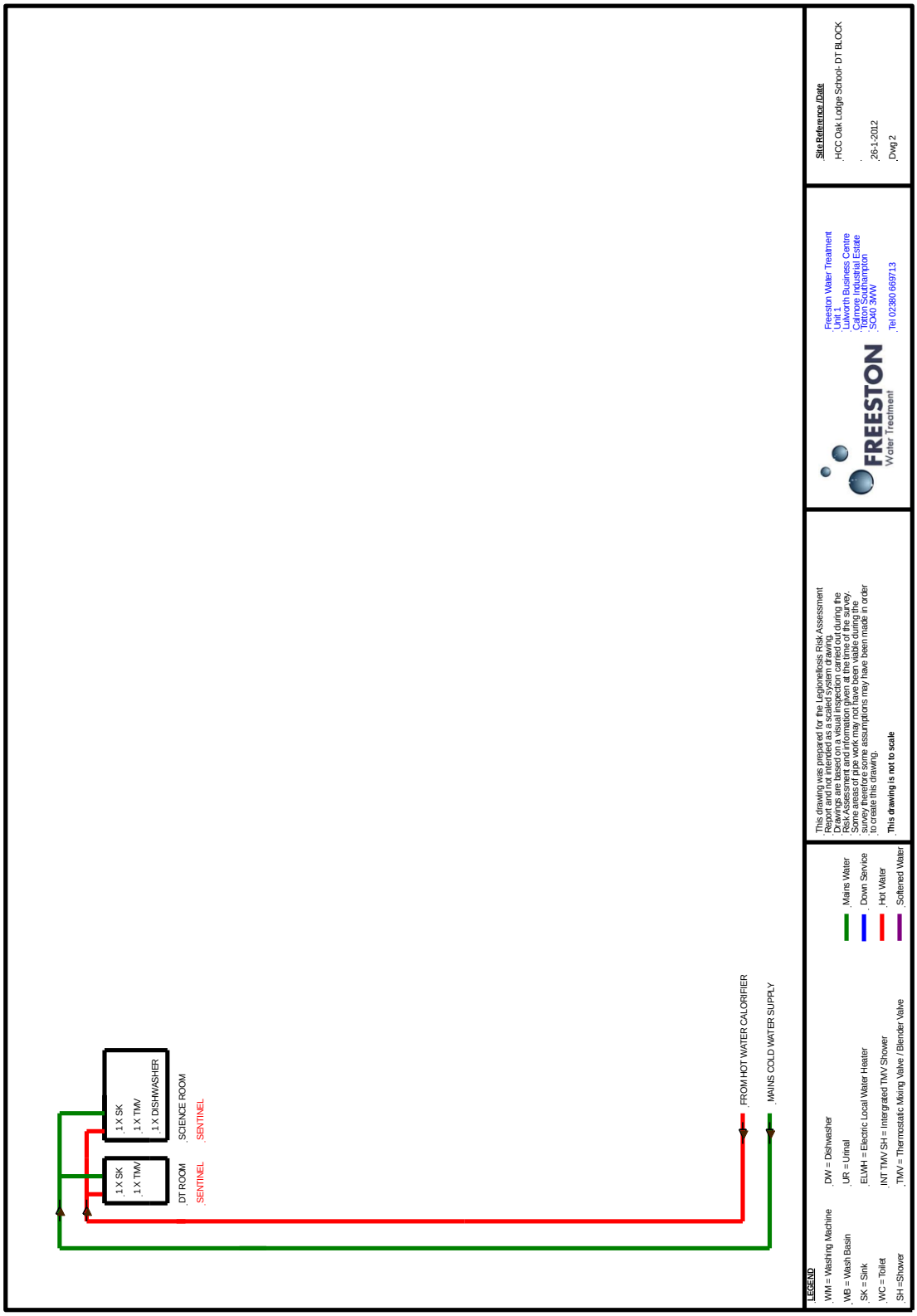
There is a dead leg on the hot return pipe to the calorifier that appears to have once been connected to another dead leg clearly seen near it.

Boiler Room

There is a dead leg on the mains cold water pipe behind the calorifier (that supplies the heating boiler pressurisation unit) that appears to have once been connected to another dead leg clearly seen near it. There is also a dead leg on the hot flow pipe from the calorifier that appears to have once been connected to another dead leg clearly seen near it.

DRAWINGS


THESE 3 DEAD LEG PIPES ENTER THE FLOOR AND IT IS NOT KNOWN WHERE THEY ARE RUN TO.
MAINS COLD WATER SUPPLY
DEAD LEG
HEATING BOILER PRESSURISATION UNIT
DEAD LEG
DEAD LEG
DEAD LEG
PRESSURE REDUCER
NON-RETURN VALVE
PRESSURE GAUGE
DEAD LEG
TEMP. GAUGE
PRESSURE RELIEF VALVE
DEAD LEG
CALORIFIER
DRAIN
DEAD LEG
TO VARIOUS OUTLETS WITHIN THE BUILDING
HOT FLOW PIPE
HOT RETURN PIPE
HOT RETURN CIRCULATION PUMP
LEGEND
WM = Washing Machine
WB = Wash Basin
SK = Sink
WC = Toilet
SH =Shower
DW = Dishwasher
UR = Urinal
ELWH = Electric Local Water Heater
INT TMV SH = Intergrated TMV Shower
TMV = Thermostatic Mixing Valve / Blender Valve
Mains Water
Down Service
Hot Water
Softened Water
This drawing was prepared for the Legionellosis Risk Assessment Report and not intended as a scaled system drawing. Drawings are based on a visual inspection carried out during the Risk Assessment and information given at the time of the survey. Some areas of pipework may not have been visible during the survey therefore some assumptions may have been made in order to create this drawing.
This drawing is not to scale
FREESTON
Water Treatment
Freeston Water Treatment
Unit 1
Lakeside Business Centre
Lakeside Industrial Estate
Totton Southampton
SO40 3WW
Tel 02380 669713
Site Reference /Date
HCC Oak Lodge School- DT BLOCK
Boiler Room
26-1-2012
Dwg 1


1 X SK
1 X TMV
DT ROOM
SENTINEL
1 X SK
1 X TMV
1 X DISHWASHER
SCIENCE ROOM
SENTINEL
FROM HOT WATER CALORIFIER
MAINS COLD WATER SUPPLY
LEGEND
WM = Washing Machine
WB = Wash Basin
SK = Sink
WC = Toilet
SH =Shower
DW = Dishwasher
UR = Urinal
ELWH = Electric Local Water Heater
INT TMV SH = Intergrated TMV Shower
TMV = Thermostatic Mixing Valve / Blender Valve
Mains Water
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Softened Water
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26-1-2012
Dwg 2

CONTROL MEASURES

	Task		Frequency
1	Flush infrequently used outlets.		**Weekly**
2	Record hot water calorifier flow and return temperatures.		**Monthly**
3	Record cold water outlet temperatures.		**Monthly**
4	Record hot water outlet temperatures.		**Monthly**
5	Purge hot water calorifier to drain and record.		**Six Monthly**
6	Internally inspect hot water calorifier annually and descale if required.		**Annually**

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
Hot Water Storage & System **DT Block** **HCC Oak Lodge School**	Purge the calorifier to drain on at least an annual basis and record when carried out.	**3**		
	If access allows, visually inspect the calorifier internally for scale and sludge on an annual basis.	**3**		
	Adjust the calorifier to achieve a minimum storage temperature of **60ºC** and a minimum return temperature of **50ºC at all times.**	**5**		
	Fit a temperature gauge to the return pipe on the calorifier.	**3**		
	Replace insulation to calorifier where needed	**4**		
Distribution **DT Block** **HCC Oak Lodge School**	Remove all dead legs or put on a weekly flushing regime (without creating an aerosol). Record within the logbook when carried out.	**5**		
	I would recommend Bacteriological and Legionella water samples be taken if the temperatures fall out of the recommended limits.	**5**		
	Ensure all domestic hot and cold pipe work is insulated within the building.	**4**		
	Produce a Written Scheme for the site.	**5**		