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PREFACE

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Date of Assessment:	**17th March 2011**
Date of Review:	**March 2013**

INTRODUCTION

This report relates to a water source Risk Assessment carried out by Mr Chris Wilson of Freeston Water Treatment Ltd on the 31st March 2011 on behalf of Hampshire County Council. The Survey was carried out at Merrydale Respite Care Centre, Church Lane, Kings Worthy, Winchester, Hampshire SO23 7QS. 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).

The Survey has been limited to the terms of reference agreed between Hampshire County Council and Freeston Water Treatment Ltd. Observations relating to system conditions and other factors applicable to the requirements of L8 have been recorded during the Survey and specific references are made to compliance with these documents in the Observations section of the report.

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 20°C and 50°C. Human blood temperature of approximately 37°C 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 20°C but is considered to be in a dormant state with no growth activity. The bacterium does not survive temperatures maintained consistently at 60°C 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 HSC'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 buildings at Merrydale Respite Care Centre 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 tank 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 HSC's ACoP L8)

I was informed that there was a dedicated water systems logbook in place until recently when it got completely soaked in water and was effectively destroyed. I was informed that monthly temperature monitoring of all the hot and cold outlets is being carried out. No monthly temperature monitoring of the calorifier storage and return temperatures is being carried out and should be commenced as soon as is practicable and a new logbook should be produced.

System Reference	Merrydale Respite Care Centre
Location	Site Buildings
Method	Visual Assessment and Temperature Profiling

HOT WATER STORAGE

Hot water storage at Merrydale Respite Care Centre is by one calorifier located within the Boiler Room. The calorifier was manufactured by AO Smith Water Products Company and is supplied by the mains cold water supply via a pressure reducer. The calorifier has insulation under the factory fitted metal outer casing, is of a steel construction and is directly heated by gas. There is a return system fitted to the calorifier which has a circulation pump that at the time of the Survey appeared to be working correctly. There is an anti-stratification pump fitted to the calorifier which again 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 a six monthly period and recorded within a water systems logbook when carried out. I was informed that this is not being carried out.

L8 recommends that calorifiers are checked internally for scale and sludge on an annual basis. It is unknown if this is being carried out.

There is a digital temperature gauge on the unit to show the storage temperature but no gauge on the return pipe on this unit and I would recommend that one be fitted to allow monthly temperature monitoring to be carried out.

L8 recommends hot water storage to be a minimum of **60°C** and the return to be maintained at a minimum of **50°C** at all times.

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

Calorifier	Storage	63.0°C	Satisfactory
Calorifier	Return	53.7°C	Satisfactory

PHOTOGRAPHS

Boiler Room

Calorifier.

COLD WATER STORAGE

There is no longer any domestic cold water storage at Merrydale Respite Care Centre as the tanks have been disconnected and the building is fed by the mains cold water supply only.

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 60°C and distributed at no less than 50°C, obtainable at user outlets within one minute of opening. Cold water should be stored and distributed at no more than 20°C.

Domestic hot water within the Merrydale Respite Care Centre site distributes from one AO Smith Water Products Company, gas fired calorifier located within the Boiler Room. It is fed by the mains cold water supply and supplies all the hot water appliances and outlets on site.

There is no domestic cold water storage within Merrydale Respite Care Centre, all cold water is supplied by the underground.

Mains cold water within Merrydale Respite Care Centre supplies the calorifier, the heating boilers pressurisation unit and all the cold water outlets and appliances on site.

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:-

Merrydale Respite Care Centre Hot Water Outlet Temperatures	
House 4 First Floor Sleeping In Room S2 Wash Basin	58.6°C Inlet to TMV Satisfactory 42.0°C TMV Outlet Satisfactory
House 4 First Floor Toilet Wash Basin	54.9°C Inlet to TMV Satisfactory 49.4°C TMV Outlet Not Satisfactory
House 4 First Floor Play Room Sink	59.9°C Inlet to TMV Satisfactory 43.6°C TMV Outlet Not Satisfactory
House 4 Ground Floor Main Kitchen Sink	62.8°C Satisfactory
House 4 Ground Floor Laundry Sink	62.9°C Satisfactory
House 3 First Floor Bathroom Wash Basin	59.8°C Inlet to TMV Satisfactory 43.5°C TMV Outlet Not Satisfactory
House 1 First Floor Bathroom Wash Basin	56.4°C Inlet to TMV Satisfactory 43.8°C TMV Outlet Not Satisfactory
House 1 Ground Floor Kitchen Sink	55.7°C Inlet to TMV Satisfactory 43.5°C TMV Outlet Not Satisfactory

L8 recommends that the hot water should achieve 50°C, 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 43°C and scald users.

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

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

Merrydale Respite Care Centre **Cold Water Outlet Temperatures**	
House 4 First Floor Sleeping In Room S2 Wash Basin	11.5°C Satisfactory
House 4 First Floor Toilet Wash Basin	Blended hot water only
House 4 First Floor Play Room Sink	13.1°C Satisfactory
House 4 Ground Floor Main Kitchen Sink	10.7°C Satisfactory
House 4 Ground Floor Laundry Sink	10.6°C Satisfactory
House 3 First Floor Bathroom Wash Basin	12.7°C Satisfactory
House 1 First Floor Bathroom Wash Basin	13.8°C Satisfactory
House 1 Ground Floor Kitchen Sink	13.5°C Satisfactory

L8 recommends cold water should be stored and distributed at no more than 20°C.

GENERAL

- Thermostatic Mixing Valves (TMV's) are fitted in many areas of Merrydale Respite Care Centre; these valves should be serviced and maintained to the manufacturers recommendations. I was informed that this is carried out by an outside contractor on a reactive basis only.

- 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 every outlet is also flushed on a weekly basis and recorded within the logbook. In House 4 Admin Office there is a pipe that feeds an outside tap which is shut off at the ballofix valve. I was informed that the valve will be opened and the outlet added to the flushing list. It must be ensured that no aerosol is created when flushing this outlet.

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

  - Boiler Room - There is a drain on the mains cold water pipe that is too long and should be shortened.
  - House 4 Roof Space - There is a capped mains cold water pipe that used to feed the heating boilers feed and expansion tank that should be removed.
  - House 4 Laundry – There is a short pipe protruding through the ceiling which could be a dead leg on the domestic water system.

- The shower heads and hoses must be cleaned and disinfected quarterly (or as necessary) and recorded when carried out as recommended in L8. I was informed that this is being carried out and was recorded within the logbook.

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

- Monthly temperature monitoring of the calorifier flow and return pipework is not being carried out and recorded and I would recommend that this is commenced as soon as is practicable.

- I was informed that monthly temperature monitoring of the hot and cold outlets is being carried out on all the hot and cold outlets. The water temperatures of every sentinel (the nearest and furthest from the supply) outlet must be taken monthly and recorded. Other representative basis should have temperatures taken on a monthly rotational basis so that over a period of 12 months all outlets will have been covered. This may be hindered by the fact that many of the TMV's are behind panels that are not easy to remove in all cases. I was informed that this will be carried out in the future and all results be recorded within the logbook.

- The bubble tube within the Sensory Room should be dosed with an appropriate and safe biocide, cleaned and maintained in line with manufacturer's recommendations. I was informed that it is not known if this is being carried out.

- There is an inline anti-scale device on the mains cold water pipe within the Boiler Room. This should be maintained in line with the manufacturers recommendations. It is unknown if this is being carried out.

RECORDS

The log book should 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

House 4

Roof Space

Dead leg on the mains cold water pipe.

Boiler Room

Mains cold water pipe drain is too long creating a dead leg.

House 4

Laundry

Possible domestic water system dead leg.

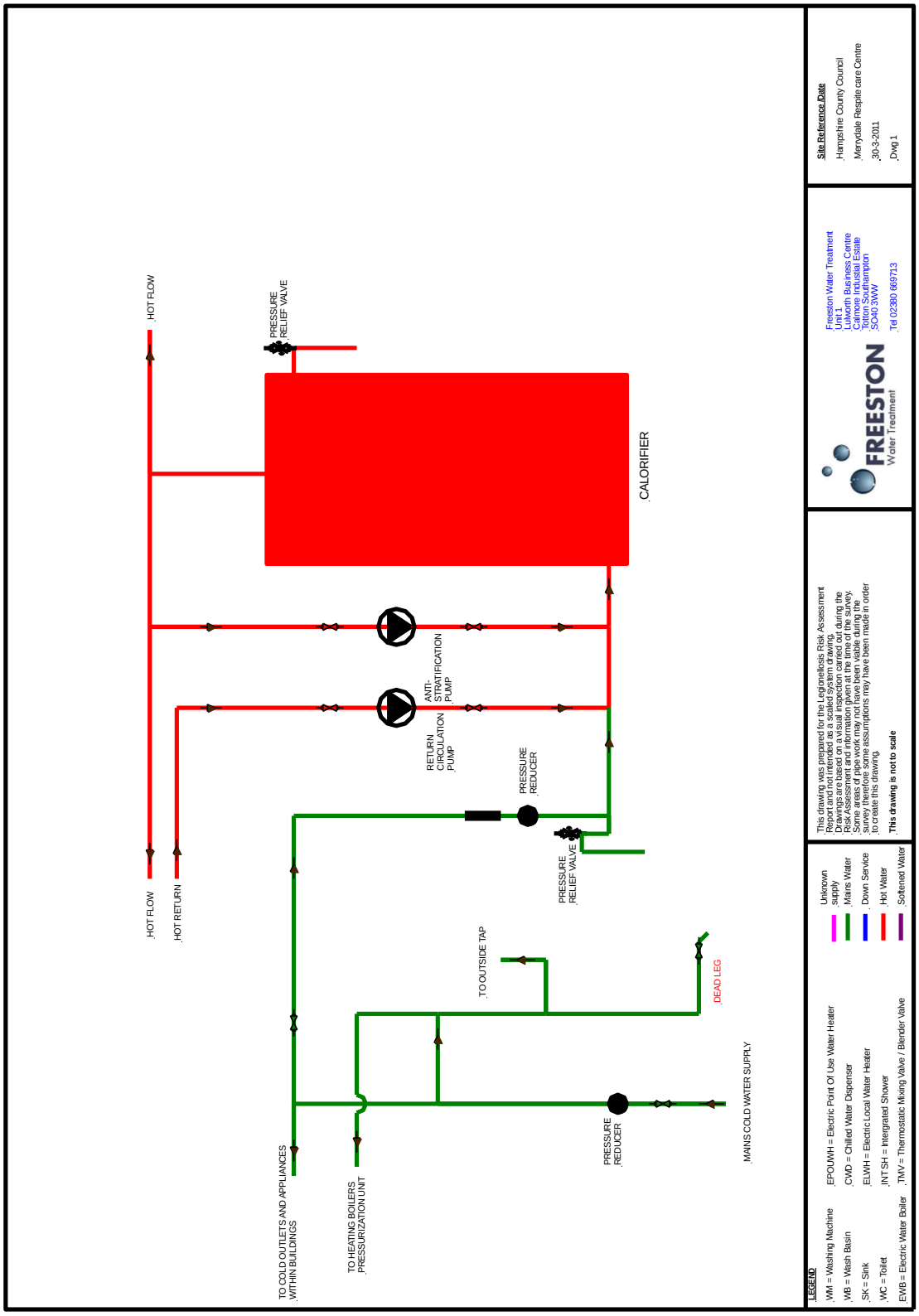
Boiler Room

Anti scale device on the mains cold water pipe.

Sensory Room

Bubble tube.

DRAWINGS


HOT FLOW
PRESSURE RELIEF VALVE
CALORIFIER
ANTI-STRATIFICATION PUMP
RETURN CIRCULATION PUMP
PRESSURE REDUCER
PRESSURE RELIEF VALVE
HOT FLOW
HOT RETURN
TO OUTSIDE TAP
DEAD LEG
MAINS COLD WATER SUPPLY
PRESSURE REDUCER
TO COLD OUTLETS AND APPLIANCES WITHIN BUILDINGS
TO HEATING BOILERS PRESSURIZATION UNIT
LEGEND
WM = Washing Machine
WB = Wash Basin
SK = Sink
WC = Toilet
EWB = Electric Water Boiler
EPOUWH = Electric Point Of Use Water Heater
CWD = Chilled Water Dispenser
ELWH = Electric Local Water Heater
INT SH = Intergrated Shower
TMV = Thermostatic Mixing Valve / Blender Valve
Unknown supply
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
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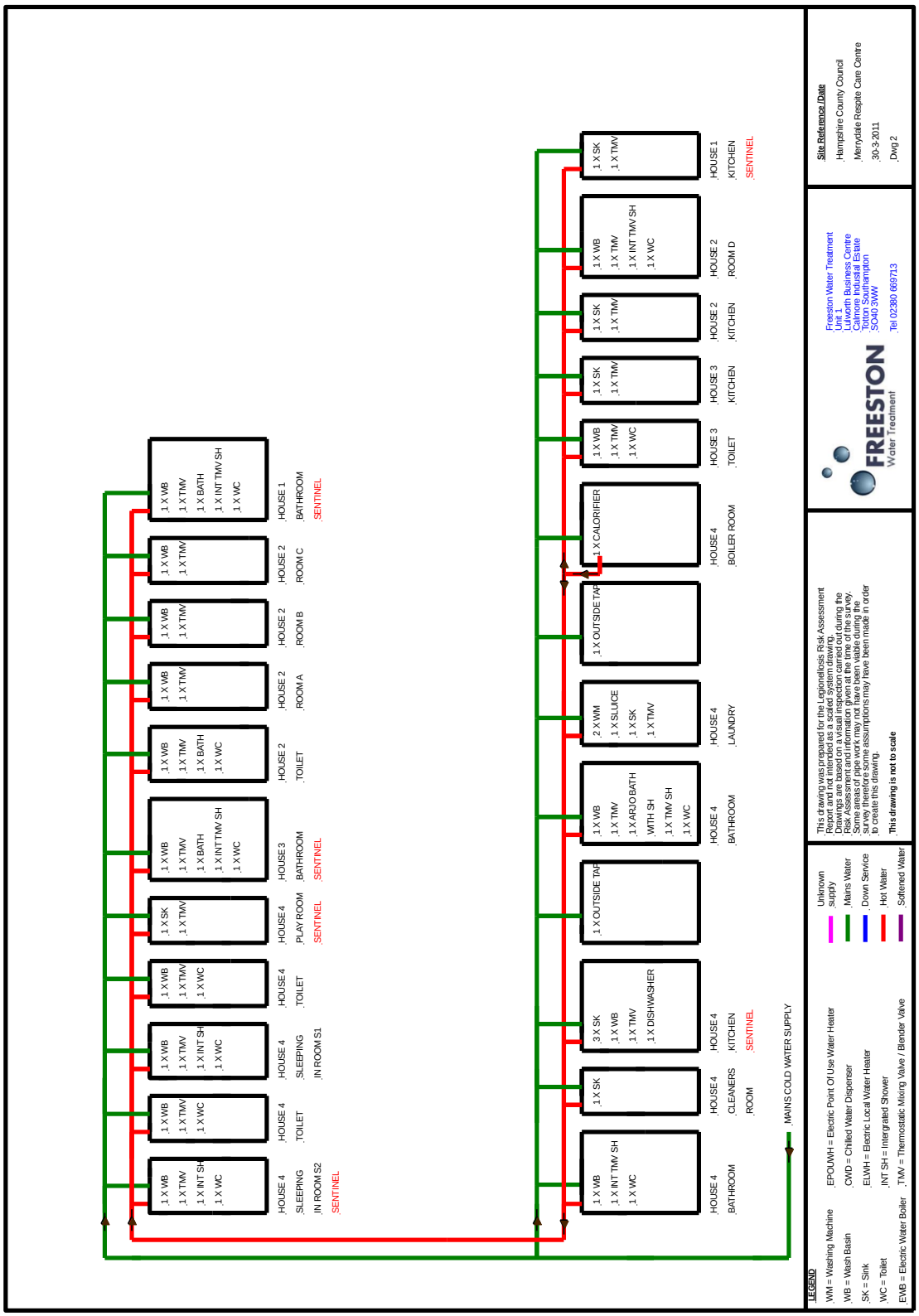
Tel 02380 669713
Site Reference /Date
Hampshire County Council
Merrydale Respite care Centre
30-3-2011
Dwg 1


MAINS COLD WATER SUPPLY
HOUSE 4 BATHROOM 1 X WB 1 X INT TMV SH 1 X WC
HOUSE 4 CLEANERS ROOM 1 X SK
HOUSE 4 KITCHEN SENTINEL 3 X SK 1 X WB 1 X TMV 1 X DISHWASHER
HOUSE 4 BATHROOM 1 X OUTSIDE TAP
HOUSE 4 BATHROOM 1 X WB 1 X TMV 1 X ARJO BATH WITH SH 1 X TMV SH 1 X WC
HOUSE 4 LAUNDRY 2 X WM 1 X SLUICE 1 X SK 1 X TMV
HOUSE 4 BOILER ROOM 1 X OUTSIDE TAP 1 X CALORIFIER
HOUSE 3 TOILET 1 X WB 1 X TMV 1 X WC
HOUSE 3 KITCHEN 1 X SK 1 X TMV
HOUSE 2 KITCHEN 1 X SK 1 X TMV
HOUSE 2 ROOM D 1 X WB 1 X TMV 1 X INT TMV SH 1 X WC
HOUSE 1 KITCHEN SENTINEL 1 X SK 1 X TMV
HOUSE 4 SLEEPING IN ROOM S2 SENTINEL 1 X WB 1 X TMV 1 X INT TMV SH 1 X WC
HOUSE 4 TOILET 1 X WB 1 X TMV 1 X WC
HOUSE 4 SLEEPING IN ROOM S1 1 X WB 1 X TMV 1 X INT SH 1 X WC
HOUSE 4 TOILET 1 X WB 1 X TMV 1 X WC
HOUSE 4 PLAY ROOM SENTINEL 1 X SK 1 X TMV
HOUSE 3 BATHROOM SENTINEL 1 X WB 1 X TMV 1 X BATH 1 X INT TMV SH 1 X WC
HOUSE 2 TOILET 1 X WB 1 X TMV 1 X BATH 1 X WC
HOUSE 2 ROOM A 1 X WB 1 X TMV
HOUSE 2 ROOM B 1 X WB 1 X TMV
HOUSE 2 ROOM C 1 X WB 1 X TMV
HOUSE 1 BATHROOM SENTINEL 1 X WB 1 X TMV 1 X BATH 1 X INT TMV SH 1 X WC
LEGEND
WM = Washing Machine
WB = Wash Basin
SK = Sink
WC = Toilet
EWB = Electric Water Boiler
EPOUWH = Electric Point Of Use Water Heater
CWD = Chilled Water Dispenser
ELWH = Electric Local Water Heater
INT SH = Intergrated Shower
TMV = Thermostatic Mixing Valve / Blender Valve
Unknown supply
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 could not be inspected and therefore some assumptions survey therefore some assumptions may have been made in order to create this drawing.
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FREESTON
Water Treatment
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30-3-2011
Dwg 2

WRITTEN SCHEME

	Task		Frequency
1	Prepare full site logbook for the Site.		**ASAP**
2	Flush infrequently used outlets.		**Weekly**
3	Record hot water calorifier flow and return temperatures.		**Monthly**
4	Record cold water outlet temperatures.		**Monthly**
5	Record hot water outlet temperatures.		**Monthly**
6	Clean and descale showerheads and hoses.		**Quarterly, or as necessary**
7	Purge the hot water calorifier to drain and record.		**Six Monthly**
8	Internally inspect the hot water calorifier (if access allows) annually and descale if required.		**Annually**

REMEDIAL RECOMMENDATIONS

Legionella Risk Category Key

1 = Insignificant risk.

2 = Controlled risk monitoring is being carried out maintain this standard.

3 = Risk is controlled, but deteriorating conditions could increase risk.

4 = Potential hazards identified.

5 = Risk Uncontrolled.

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
Hot Water Storage & System HCC Merrydale Respite Care Centre	Commence full monthly temperature monitoring of the domestic hot water systems; all sentinel outlets. Record within the logbook.	**5**		
	Commence monthly temperature monitoring of the calorifier storage and return temperatures and record within the logbook.	**5**		
	Purge the calorifier to drain on at least a six monthly basis and record when carried out.	**3**		
	If access allows, visually inspect the calorifier internally for scale and sludge on an annual basis.	**3**		
	Fit a temperature gauge to the return pipe on the calorifier.	**4**		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
Distribution **HCC Merrydale Respite Care Centre**	Investigate possible dead leg in the Laundry. If found to be a dead leg on the domestic water system then remove and record in 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**		
	Commence **weekly** flushing of **all** low use outlets, toilets, showers, outside taps etc and record when carried out.	**5**		
	Clean and descale showerheads quarterly, or as necessary. Record when carried out.	**2**		
	Ensure that the inline anti-scale device is cleaned / maintained in line with the manufacturers recommendations.	**4**		
	Clean, maintain and dose the bubble tube with a safe biocide inline with the manufacturers recommendations.	**4**		