



Fernmount House  
Hampshire County Council

## CONTENTS

PREFACE	Page 3
INTRODUCTION	Page 4
BACKGROUND TO LEGIONELLA	Pages 5
ASSESSMENT OF RISK	Pages 6-7
OBSERVATIONS	Pages 8-10
SITE SURVEY HOT & COLD DISTRIBUTION	Pages 11-20
GENERAL RECORDS, ADDITIONAL PHOTOGRAPHS & DRAWINGS	Pages 21-27
WRITTEN SCHEME & REMEDIAL RECOMMENDATIONS	Pages 28-32

**PREFACE**

**Customer:** Hampshire County Council

**Customer Address:** Property, Business and Regulatory Services  
Three Minsters House  
76 High Street  
Winchester  
Hampshire SO23 8UL

**Customer Contact:** Martin De Wied

**Telephone:** 01962 846284

**Site:** Fernmount House  
Forest Pines  
New Milton  
Hampshire BH25 5SX

**Site Contact:** Lynne Chessel  
**Site Telephone:** 01425 611558

**Freeston Water Treatment Address:**

Unit 1  
Lulworth Business Centre  
Nutwood Way  
Calmore Industrial Estate  
Totton  
Southampton SO40 3WW  
Telephone: 02380 669713  
Fax: 02380 663825

**Risk Assessment Consultant:** Mr Chris Wilson MWM Society

**Date of Assessment:** 26<sup>th</sup> July 2011

**Date of Review:** July 2013

## INTRODUCTION

This report relates to a water source Risk Assessment carried out by Mr Chris Wilson of Freeston Water Treatment Ltd on the 26<sup>th</sup> July 2011 on behalf of Hampshire County Council. The Survey was carried out at the Fernmount House, Forest Pines, New Milton, Hampshire BH25 5SX. 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 their 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 buildings at Fernmount House 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 HSE's ACoP L8)

**There is a dedicated water systems logbook in place.**

**Monthly temperature monitoring of the hot and cold outlets is being carried out and recorded.**

**Monthly temperature monitoring of the heating boiler flow and return pipes is being carried out and recorded as opposed to the calorifier. I would recommend that the calorifier storage temperature (there is no return system) is taken monthly and recorded within the logbook.**

System Reference	Fernmount House
Location	Site Buildings
Method	Visual Assessment and Temperature Profiling

## HOT WATER STORAGE

Hot water storage at Fernmount House is by one calorifier located within a cupboard outside the office. The manufacturer of the calorifier is unknown and it is a domestic copper cylinder type unit. The calorifier has a fibre jacket type insulation and the unit is indirectly heated by the central heating boiler via an internal coil. There is also an electric immersion heater fitted as a back up. The calorifier supplies all the hot water on site. There is no return system fitted to this calorifier and it is supplied by the domestic cold water storage tank within the roof space.

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 it is not thought that this is 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 no temperature gauge on the calorifier flow pipe and I would recommend that a temperature gauge 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	60.0°C	Satisfactory
Calorifier	No return system fitted		

## PHOTOGRAPHS

Cupboard outside of the office

Calorifier.



## COLD WATER STORAGE

Domestic cold water storage at Fernmount House consists of one domestic cold water storage tank located within the roof space. The tank is of a one piece plastic construction with fibre jacket insulation to the body and lid which needs refitting. There is no screened lid vent and no screen on the overflow pipe and I would recommend that WRAS (Water Regulations Advisory Scheme) approved items be fitted.

As the vessel is under 1000 litres in capacity there is no requirement for an overflow warning pipe to be fitted. There is a returning vent pipe entering the vessel and I would recommend that this is re-routed to a foul drain via an air gap and the hole in the lid be covered with a WRAS approved material.

There is a satisfactory cross flow of water through the vessel. Although the outlet pipes are at the same end of the vessel as the inlet pipe the vessel is quite small and therefore the cross flow of water is satisfactory.

The water temperatures from the domestic cold water storage tanks should be taken on a six monthly basis and record within the logbook. This is not being carried out.

The inside of this vessel showed a heavy deposit of sediment on the base, a heavy amount of biofilm on the sides and heavy corrosion on the steel overflow pipe fitting. It is unknown when this vessel was last cleaned and disinfected and I would recommend that this is carried out as soon as is practicable and the corroded pipe fitting be replaced.

**The cold water storage temperature of the domestic cold water storage tank was:-**

**19.0°C          Satisfactory**

**WATER STORAGE TANK SURVEY**

Tank Location/ No.	Domestic cold water storage tank Roof space at the front of the building
Materials of Construction	Plastic - one piece
Tank Dimensions	1.0mtr x 0.55mtr x 0.60mtr Approximately
Lid Condition / vent fitted	Good/ No
Tank Insulation	Fibre jacket to body and lid - <b>needs re-fitting</b>
Overflow Pipe/Insect Screen	Yes / No
Overflow Warning Pipe/Insect Screen	N / A
Isolation Valves Fitted Inlet /Outlets	Yes / Yes
Cross Flow of Water	Satisfactory
Internal Condition of Tank	<b>Heavy sediment, heavy biofilm and heavy corrosion on overflow pipe fitting.</b>
Water Temperature	19.0°C Satisfactory
Tank linked/Single	Single
Drain Fitted	No
Any Returning Vent Pipes	<b>Yes x 1</b>

Notes	<p>Clean and disinfect as soon as is practicable; repeat annually if deemed necessary.</p> <p>Replace the corroded overflow pipe fitting.</p> <p>Take water temperatures from the tank on a six monthly basis and record within the logbook.</p> <p>Fit a WRAS approved screened lid vent.</p> <p>Fit a WRAS approved screen to the overflow pipe.</p> <p>Re-fit the insulation.</p> <p>Re-route the returning vent pipe to a foul drain via an air gap and cover the hole in the lid with a WRAS approved material.</p>
-------	--

The maximum allowed water temperature is 20°C as outlined in L8.



## PHOTOGRAPHS

An external view of the domestic cold water storage tank.



An internal view of the domestic cold water storage tank.



An internal view of the domestic cold water storage tank showing the corroded overflow pipe fitting.



## 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.

Hot water storage at Fernmount House is by one calorifier located within a cupboard outside the office. The manufacturer of the calorifier is unknown and it is a domestic copper cylinder type unit. The calorifier is indirectly heated by the central heating boiler via an internal coil and also has an electric immersion heater fitted as a back up. This unit supplies all the domestic hot water on site.

Domestic cold water storage at Fernmount House consists of one domestic cold water storage tank located within the roof space. This vessel supplies the calorifier, the laundry, bedroom 1 and the first floor bathroom and toilet. All other cold outlets and appliances are mains cold water fed.

Mains cold water within Fernmount House supplies all the central heating boiler and all domestic cold water outlets and appliances not stated above.

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:-

Fernmount House Hot Water Outlet Temperatures	
First Floor Bedroom 5 Wash Basin	22.8°C Inlet to TMV Not Satisfactory 22.8°C TMV Outlet Satisfactory
First Floor Bathroom Wash Basin	No access to TMV 42.5°C TMV Outlet Satisfactory
Ground Floor Laundry Sink	57.5°C Inlet to TMV Satisfactory 44.5°C TMV Outlet Not Satisfactory
Ground Floor Shower Room Wash Basin	60.0°C Inlet to TMV Satisfactory 43.9°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:

<b>Fernmount House</b>	
<b>Hot Water Outlet Temperatures</b>	
First Floor Bedroom 5 Wash Basin	18.4°C Satisfactory
First Floor Bathroom Wash Basin	18.9°C Satisfactory
Ground Floor Laundry Sink	19.1°C Satisfactory
Ground Floor Shower Room Wash Basin	18.4°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 Fernmount House; these valves should be serviced and maintained to the manufacturer's recommendations. I was informed that this should be carried out by an outside contractor on a six monthly basis but it was unknown when this was last carried out.
- 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. Every outlet is flushed on a weekly basis and recorded within the logbook.
- 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:-
  - Roof Space - The supply pipe to the redundant and drained heating boiler feed and expansion tank is shut at the valve and this pipe has become a dead leg.
  - Kitchen - The dishwasher is out of service and is therefore creating a dead leg
- The shower heads and hoses must be descaled and disinfected quarterly (or as necessary) and recorded when carried out as recommended in L8. This is being carried out and recorded with the logbook.

- 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 L8.
- Monthly temperature monitoring of the calorifier flow pipework is not being carried out and recorded and this should commence as soon as is practicable. It appears that the temperatures are currently being taken from the central heating boiler pipes in the kitchen which have been mistaken for a combi boiler (that would heat the central heating and domestic hot water).
- Monthly temperature monitoring of the hot and cold outlets is being carried out on all the hot and cold sentinel 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 some of the TMV's may be behind panels.
- Water temperatures from the cold water storage tank should be taken (remote from the inlet valve) on a six monthly basis and be recorded within the logbook. This is not being carried out.
- The domestic hot water supply to bedroom 5 was very low and didn't improve even after running for several minutes. This must be investigated further to ensure that the supply to the TMV reaches a minimum of 50°C within one minute.

## 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 the domestic water storage tank

Cleaning and disinfection of the domestic water storage tank

Inspection of the domestic water storage tank

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

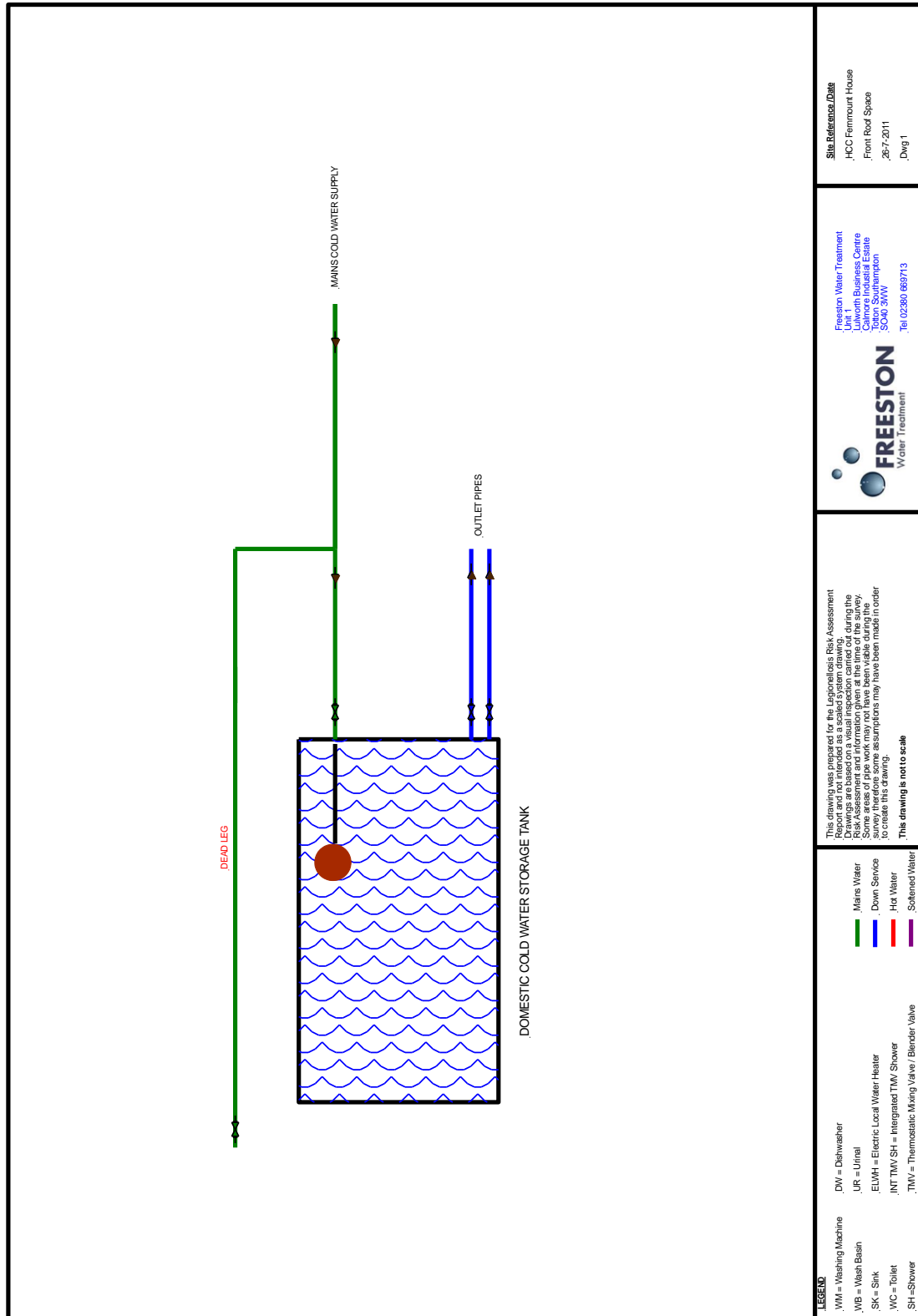
### Roof Space

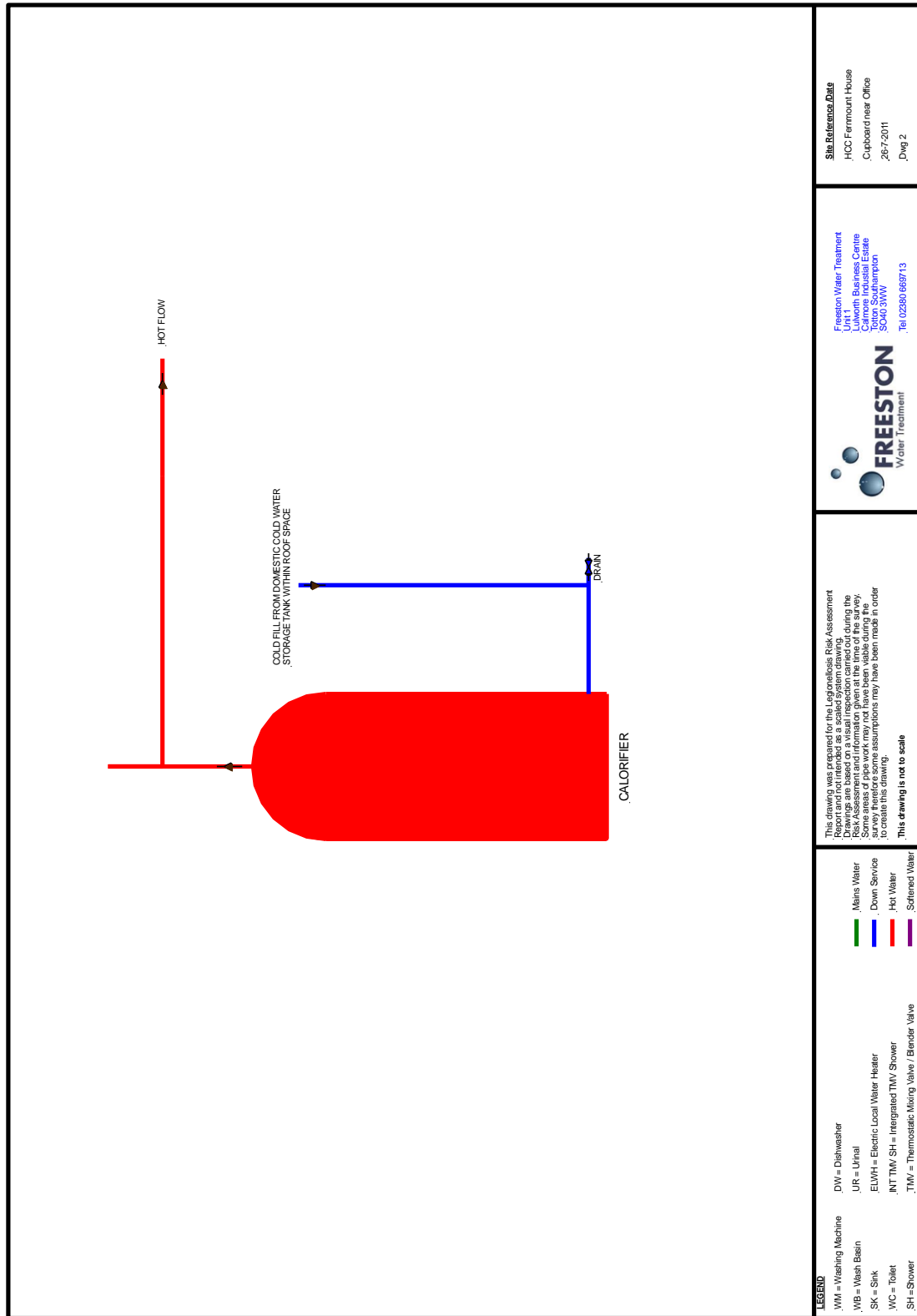
The mains cold water dead leg pipe to the redundant and drained central heating boiler feed and expansion tank.

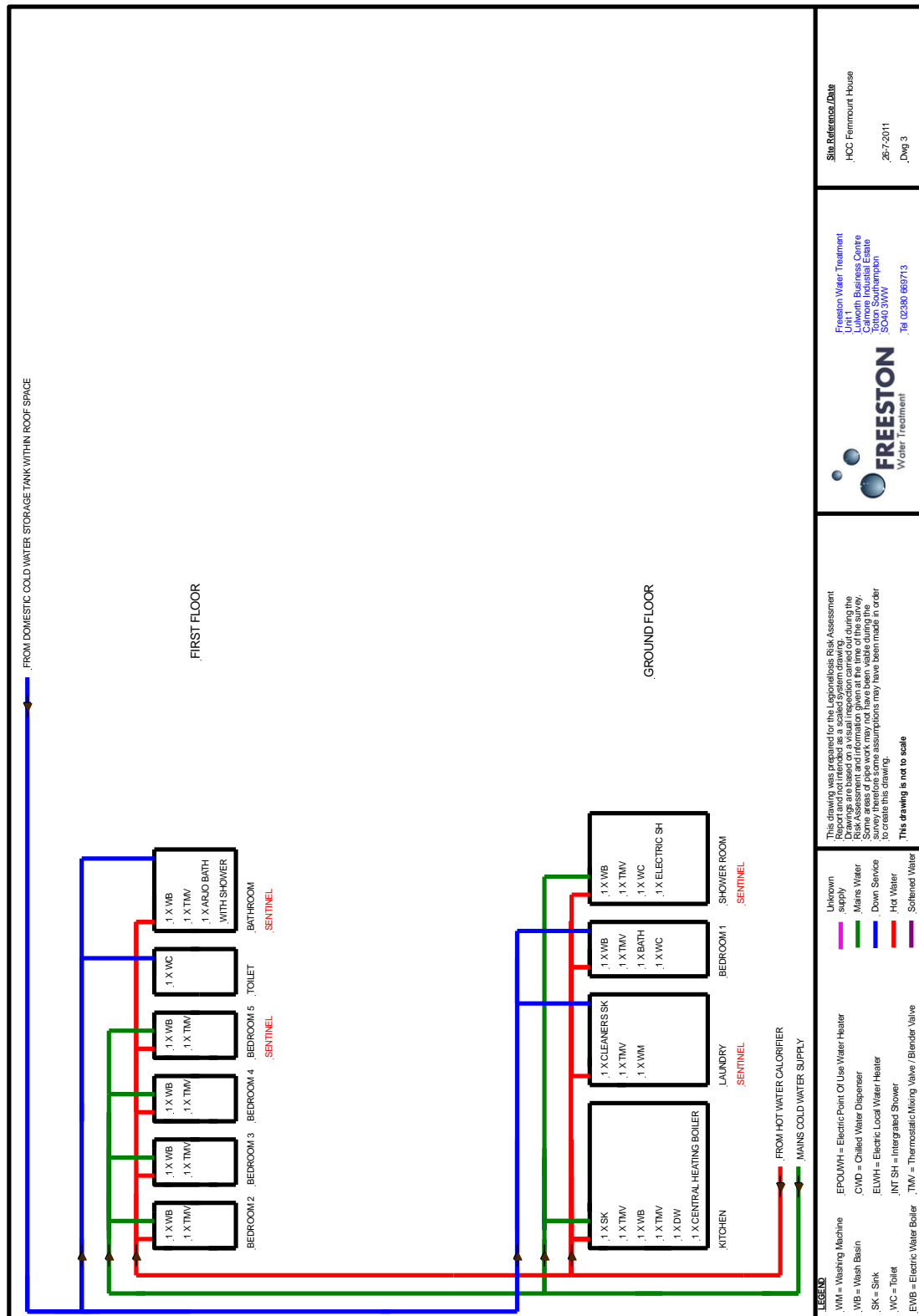




DRAWINGS







**WRITTEN SCHEME**

	<b>Task</b>		<b>Frequency</b>
1	Flush infrequently used outlets.		<b>Weekly</b>
2	Record hot water calorifier flow temperature.		<b>Monthly</b>
3	Record cold water outlet temperatures.		<b>Monthly</b>
4	Record hot water outlet temperatures.		<b>Monthly</b>
5	Record domestic cold water tank temperature.		<b>Six Monthly</b>
6	Clean and descale shower heads and hoses.		<b>Quarterly or as necessary</b>
7	Purge hot water calorifier to drain and record.		<b>Six Monthly</b>
8	Inspect, clean and disinfect cold water storage tank if required.		<b>Annually</b>
9	Internally inspect hot water calorifier annually and descale if required.		<b>Annually</b>

## 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
<u>Hot Water</u> <u>Storage &amp; System</u> Fernmount House	Continue full monthly temperature monitoring of the domestic hot water systems; all sentinel outlets. Record within the logbook.	3		
	Commence monthly temperature monitoring of the calorifier storage 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 hot flow pipe of the calorifier.	2		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Cold Water Storage</u> Fernmount House	Continue full monthly temperature monitoring of the domestic cold water systems; all sentinel outlets. Record within a logbook.	3		
	Take water temperatures from the cold water storage tank on a six monthly basis and record within the logbook.	5		
	Clean and disinfect the domestic cold water storage tanks. Inspect annually and repeat if required.	5		
	Replace the corroded overflow pipe fitting on the domestic cold water storage tank.	4		
	Fit a WRAS approved screened lid vent to the domestic cold water storage tank.	3		
	Fit a WRAS approved screen to the overflow pipe on the domestic cold water storage tank.	3		
	Re-fit the insulation on the domestic cold water storage tank.	5		
	Re-route the returning vent pipe to a foul drain via an air gap and cover the hole in the lid with a WRAS approved material on the domestic cold water storage tank.	3		
	Investigate the low hot water temperature to the TMV in bedroom 5 and rectify.	5		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Distribution</u> Fernmount House	Remove dead leg pipe work or put on a weekly flushing regime 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.	3		
	Continue <b>weekly</b> flushing of <b>all</b> low use outlets, toilets, showers, outside taps etc and record when carried out.	3		
	Clean and descale showerheads quarterly, or as necessary. Record when carried out.	3		
	Ensure that all TMV's are serviced and maintained regularly.	5		