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PREFACE

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Date of Assessment: 1st June 2010

Date of Review: June 2012

INTRODUCTION

This report relates to a water source Risk Assessment carried out by Mr Chris Wilson of Freston Water Treatment Ltd on the 1st June 2010 on behalf of Hampshire County Council. The survey was carried out at Heathfield School, Oldbury Way, Fareham, Hampshire PO14 3BN. 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 Freston 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 Heathfield 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)

It appears that there is no dedicated water systems logbook in place. I would recommend a logbook be produced along with a written scheme.

System Reference	Heathfield School
Location	Site Buildings
Method	Visual Assessment and Temperature Profiling

HOT WATER STORAGE

Hot water storage at Heathfield School is by two calorifiers. The Old School calorifier is located within the Old School main boiler room and supplies hot water to all areas in the Old School. The calorifier is manufactured by Andrews Water Heaters and is fed from the mains cold water supply. It is directly heated by gas and has fibre type insulation under a metal outer casing. There is a return system fitted to the calorifier that has a circulating pump which at the time of the survey appeared to be working correctly. It is also fitted with an anti-stratification 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 a six monthly period and recorded within a water systems logbook when carried out, I was informed that it is unknown if this is being carried out.

There are no temperature gauges fitted on either the flow or return pipe work. I would recommend that temperature gauges are fitted for monthly temperature monitoring to be carried out.

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.

L8 recommends hot water storage to be 60.0°C and the return to be maintained at 50.0°C at all times.

The temperature of the stored water within the calorifier at the time of the survey was:-

Old School Calorifier	Storage	60.1°C	Satisfactory
Old School Calorifier	Return	55.6°C	Satisfactory

The New School calorifier is located within the New School boiler room and supplies all the outlets within the New School. The calorifier is manufactured by OSO hot water. It is directly heated by two electrical elements and has fibre type insulation under a plastic outer casing. There is a return system fitted to the calorifier that has a 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 a six monthly period and recorded within a water systems logbook when carried out, I was informed that it is unknown if this is being carried out.

There are no temperature gauges fitted on either the flow or return pipe work. I would recommend that temperature gauges are fitted for monthly temperature monitoring to be carried out.

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.

L8 recommends hot water storage to be 60.0°C and the return to be maintained at 50.0°C at all times.

The temperature of the stored water within the calorifier at the time of the survey was:-

New School Calorifier	Storage	51.9°C	Not Satisfactory
New School Calorifier	Return	50.6°C	Satisfactory

I would recommend that the calorifier is adjusted as soon as is practicable to achieve a minimum of 60°C storage temperature.

PHOTOGRAPHS

Old School Calorifier.



New School Calorifier.



COLD WATER STORAGE

There is no domestic cold water storage at Heathfield 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 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 Heathfield School distributes from two calorifiers. The Old School calorifier is located within the Old School main plant room and supplies all the hot outlets within the Old School. The New School calorifier is located within the Old School main plant room and supplies all the hot outlets within the Old School.

There is no domestic cold water within Heathfield School.

Mains cold water within Heathfield School supplies the calorifiers, the heating boilers and all cold water outlets within both the Old and New School Buildings.

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:-

Heathfield School	
Hot Water Outlet Temperatures	
Old School Blue Class Hygiene Area Sink	54.7°C Inlet to TMV Satisfactory 41.2°C TMV Outlet Satisfactory
Old School Staff Kitchen Sink	57.4°C Inlet to TMV Satisfactory 42.9°C TMV Outlet Satisfactory
Old School OU Kitchen Sink	55.6°C Inlet to TMV Satisfactory 41.1°C TMV Outlet Satisfactory
Old School Swimming Pool Hygiene Area Wash Basin	Inlet to TMV No Access 46.8°C TMV Outlet Satisfactory
New School Female Toilets Wash Basin	50.5°C Inlet to TMV Satisfactory 42.8°C TMV Outlet 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:

Heathfield School	
Cold Water Outlet Temperatures	
Old School Blue Class Hygiene Area Sink	16.3°C Satisfactory
Old School Staff Kitchen Sink	22.5°C Not Satisfactory
Old School OU Kitchen Sink	19.8°C Satisfactory
Old School Swimming Pool Hygiene Area Wash Basin	22.2°C Not Satisfactory
New School Female Toilets Wash Basin	18.1°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 Heathfield School; these valves should be serviced and maintained to the manufacturers recommendations. Records show that this is carried out annually.
- 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. There is currently no flushing being carried out. Areas to include on the flushing regime but may not have previously been noticed are the bib tap on the mains cold water pipe in both plant rooms and in the swimming pool changing area on the wall.
- 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:-

- Old School Main Kitchen under the conventional sink.
 - Old School Main Kitchen under the wash basin.
 - New School Ruby Class on the supply to the old water fountain.
- The shower heads and hoses must be cleaned and disinfected quarterly and recorded when carried out as recommended in L8. I was informed that this is done as and when but has not been done since 4th January 2010.

- 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 and hot and cold outlets is not being carried out and I would recommend that it is recommenced as soon as is practicable.
- Some of the cold water temperatures at the outlets are elevated. It should be ensured that all domestic pipework is insulated against heat loss / gain. The flow pipe on the New School calorifier also needs insulating in places.
- There is a filter on the mains water cooler in the staff kitchen. This should be cleaned / replaced in-line with the manufacturer's recommendations.
- The Swimming Pool is a stand alone system and is not connected to the mains cold water supply; the pool is topped up by a pipe at height above the pool therefore creating an air gap.

I was informed that the following checks are carried out:-

- Three times a day - free chlorine level, total chlorine level and pH.
- Twice a day - filter pressures and water temperature.
- Weekly-Filters are backwashed.
- Monthly bacteriological samples are taken by outside contractors.

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 calorifiers

Purging of calorifiers

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

Old School Plant Room

Infrequently used outlet.



Old School Plant Room

Insulation missing on calorifier flow pipe.



Old School Main Kitchen

Dead leg behind sink.



Old School Main Kitchen

Dead legs under wash basin.



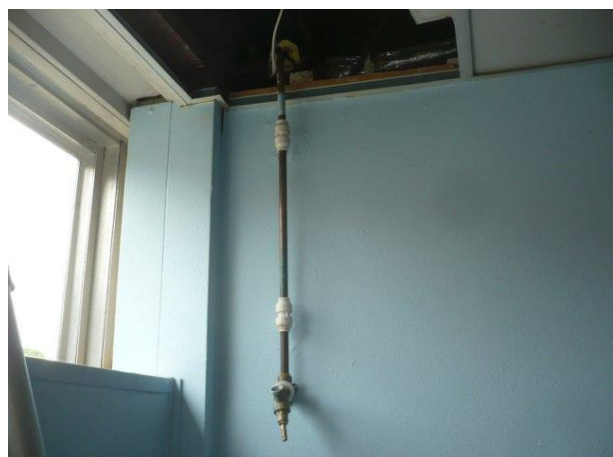
Old School Staff Kitchen

Filter on water cooler.



**Old School Swimming Pool
Changing Room**

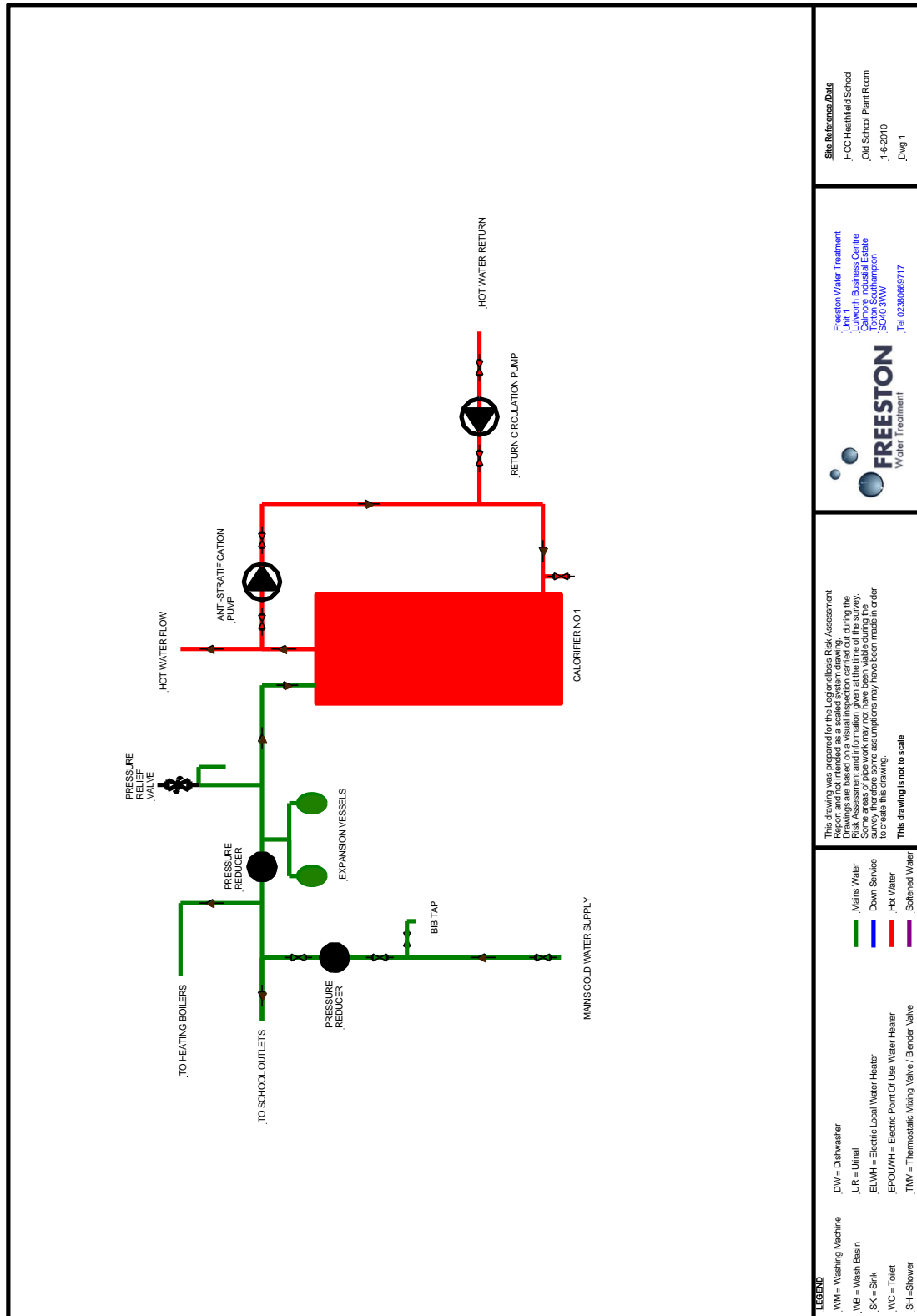
Infrequently used outlet.

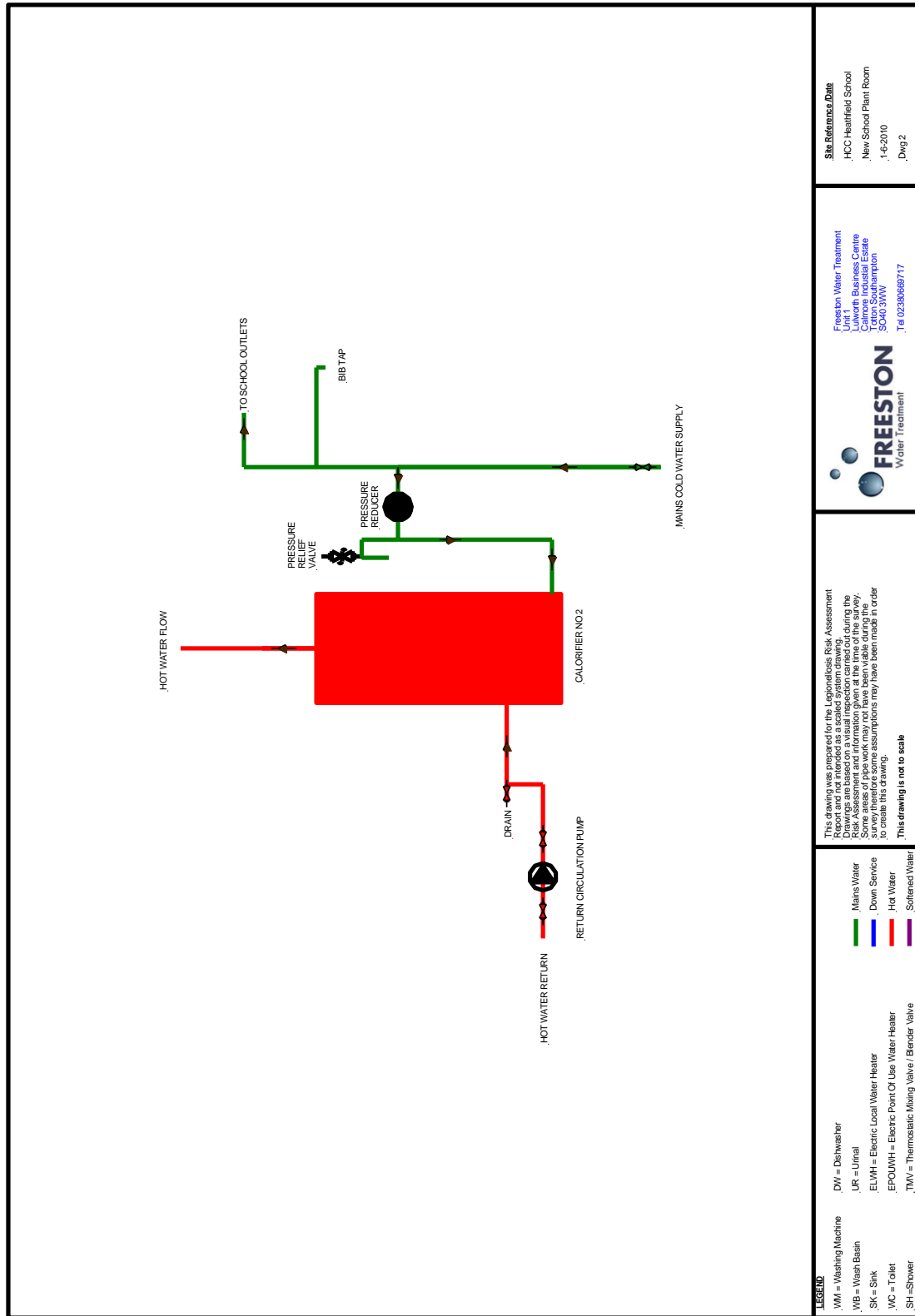


New School Ruby Class

Dead leg to old water fountain.







LEGEND

- .MM = Washing Machine
- .WB = Wash Basin
- .SK = Sink
- .TO = Toilet
- .SH = Shower
- .DW = Dishwasher
- .UR = Urinal
- .ELWH = Electric Local Water Heater
- .EPQWH = Electric Point Of Use Water Heater
- .TMV = Thermosatic Mixing Valve / Barndler Valve

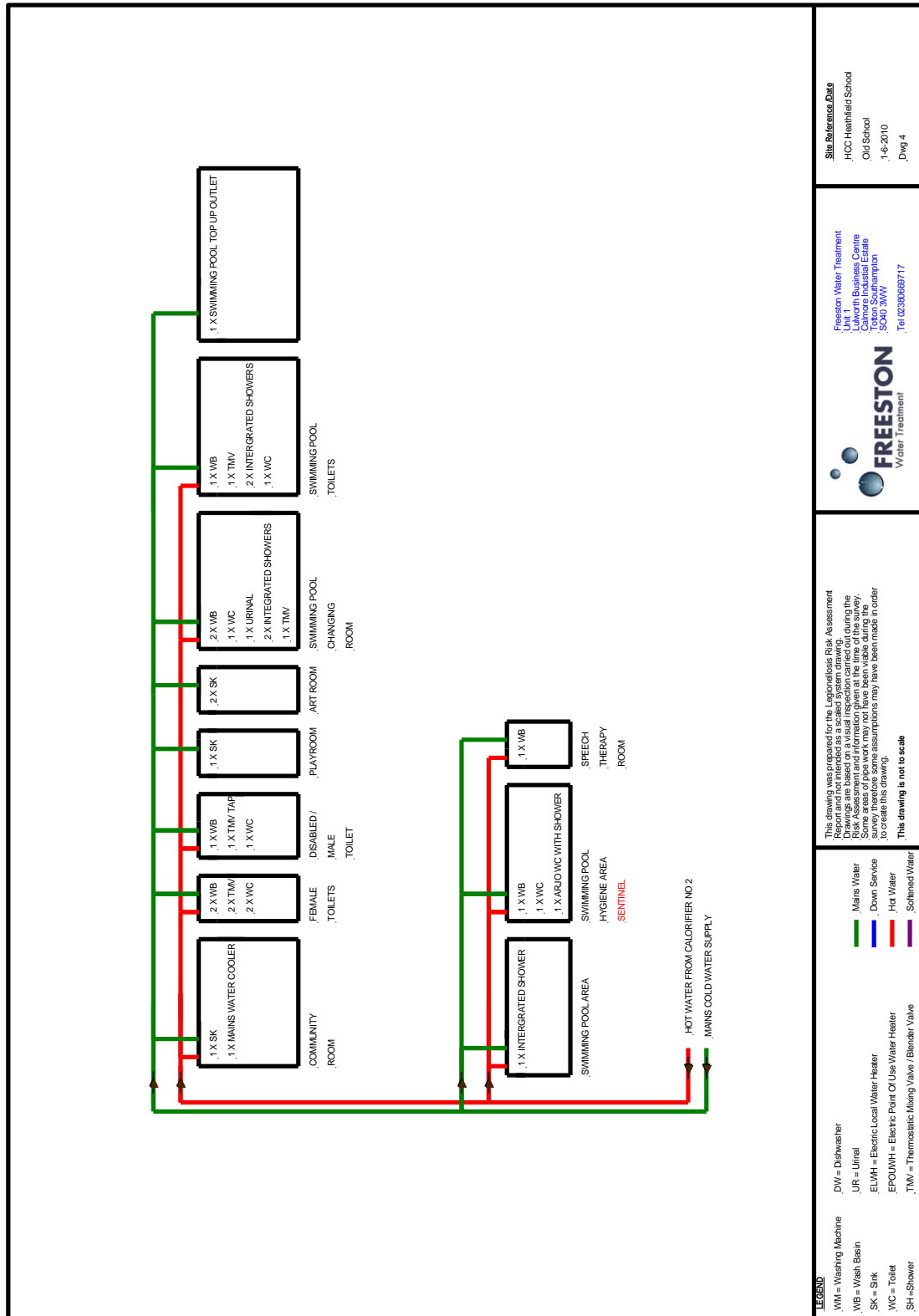
- █ Mains Water
- █ Down Service
- █ Hot Water
- █ Softened Water

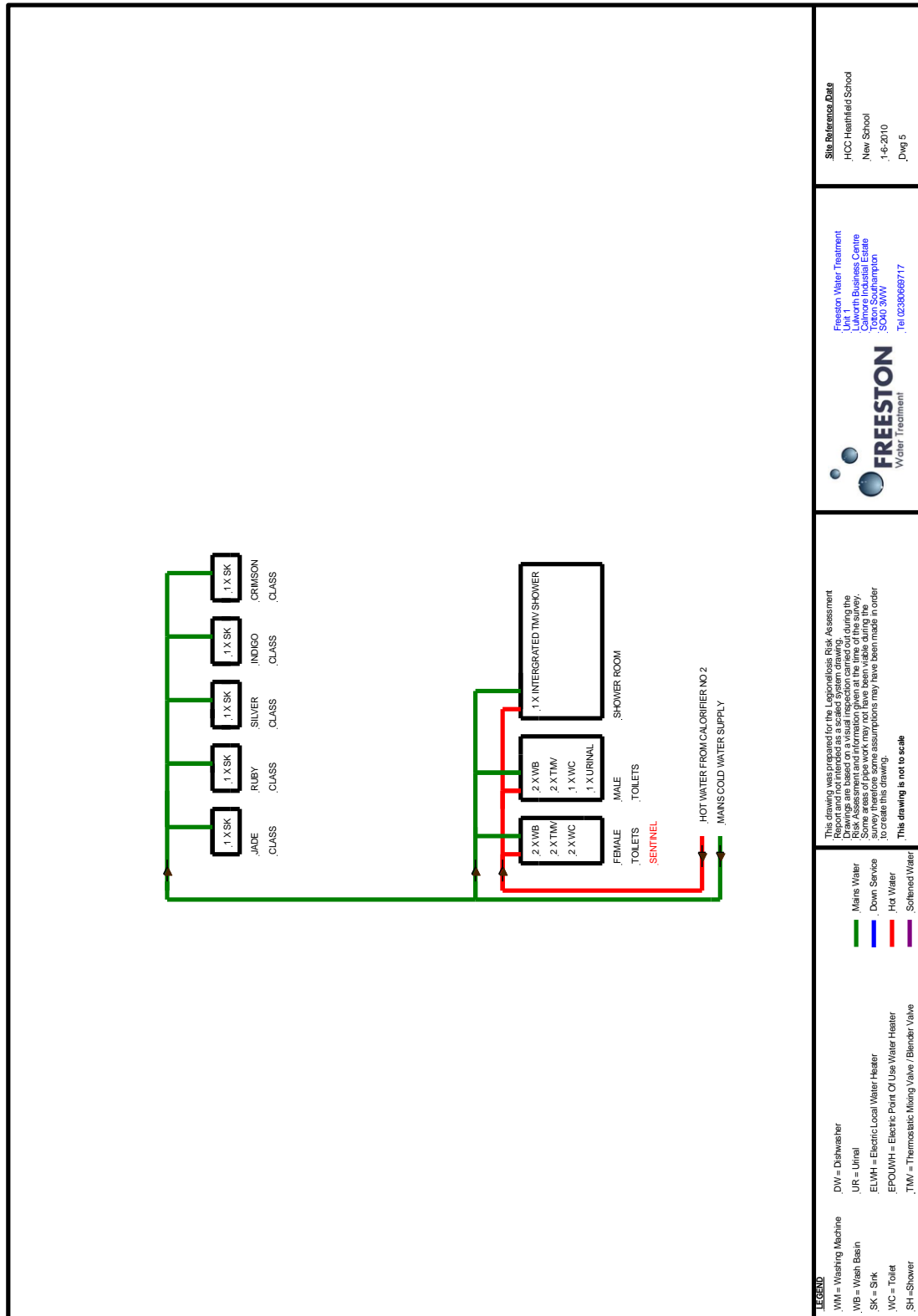
This drawing was prepared for the Legionellosis Risk Assessment
 based on the information provided during the
 survey. The drawing is not to scale.
 Some areas of pipe work may not have been visible during the
 survey. Assumptions may have been made in order
 to create this drawing.
 This drawing is not to scale

FRESTON
Water Treatment

Freeston Water Treatment
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Carnons Industrial Estate
Carnons, Southampton
SO40 3WW
Tel: 02380668717

Site Reference: Date:
 HCC Heathfield School
 .HCC Heathfield School
 .New School Plant Room
 .1-6-2010
 .Dwg 2





WRITTEN SCHEME

	Task		Frequency
1	Prepare 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 shower head and hoses.		Quarterly
7	Purge hot water calorifier to drain and record.		Six Monthly
8	Internally inspect hot water calorifier annually and descale if required.		Annually

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Hot Water Storage & System</u> HCC Heathfield School	Commence monthly temperature monitoring of the domestic hot water systems; sentinel outlets. Record within a logbook.	5		
	Commence monthly temperature monitoring of the hot water calorifier flow and return water temperatures. Record within a logbook.	5		
	Purge calorifiers to drain on at least a six monthly basis and record when carried out.	3		
	If access allows, visually inspect the calorifiers internally for scale and sludge on an annual basis.	3		
	Adjust the New School calorifier to achieve a minimum storage temperature of 60°C and a minimum return temperature of 50°C.	5		
	Fit temperature gauges to flow and return pipes on both Calorifiers	3		
	Ensure the hot flow pipe on the Old School calorifier is adequately insulated.	3		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Distribution</u> HCC Heathfield School	Commence monthly temperature monitoring of the domestic cold water systems; sentinel outlets. Record within a logbook.	5		
	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.	5		
	Commence weekly flushing of any low use outlets etc and record when carried out.	5		
	Clean and descale showerheads at least quarterly. Record when carried out.	3		
	Ensure all domestic hot and cold pipe work is insulated within the building.	2		
	Ensure inline filters are cleaned/replaced in-line with the manufacturer's recommendations.	3		

LEGIONELLA RISK

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.