



Hampshire County Council
Castle Primary School

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PREFACE

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Date of Assessment: 4th April 2012

Date of Review: April 2014

INTRODUCTION

This report relates to a water source Risk Assessment carried out by Mr Peter Smith of Freeston Water Treatment Ltd on the 4th April 2012 on behalf of Hampshire County Council. The Survey was carried out at Castle Primary School, Castle Street, Portchester, Fareham, Hampshire PO16 9QQ. During the course of the survey the water systems within the special needs areas only were risk assessed; therefore this report does not include the entire school.

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 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 Castle Primary School Special Needs Area 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)

System Reference	Domestic Hot & Cold Water Systems
Location	Castle Primary School Special Needs Area Only
Method	Visual Assessment and Temperature Profiling

At the time of this assessment it was found that there is no Legionella control being carried out within the special needs areas of the school; this would therefore indicate there is no Legionella control being carried out within the Primary School. There was found to be no water systems logbook in place for the school; no temperature monitoring is being carried out on the domestic water systems; there is no written scheme in place and no management structure detailing the duty holder, responsible person and operational staff. I would recommend a water systems logbook be produced for the school and monitoring and checks are started as soon as possible. I would recommend that all staff which will be involved with Legionella control have training; I would also recommend that the Primary School have a Legionella risk assessment carried out as soon as possible as it appears one has not been carried out on the entire school water systems.

HOT WATER STORAGE

Hot water storage serving the special needs area disabled toilet is from two AO Smith hot water calorifiers located within the boiler room; the calorifiers are linked in parallel and serve the primary school main kitchen and all toilet areas; they have a capacity of 336 litres in each calorifier. The calorifiers are both gas fired and have insulation located beneath the outer metal casings; there is a return system this is fitted with a single return pump. There is a temperature gauge fitted to the hot water flow pipe work only; I would recommend gauges are fitted to the return pipe work to aid with monthly temperature monitoring. There was seen to be an inline strainer on the cold mains feed to the calorifiers; I would recommend this is cleaned on a regular basis or as part of a maintenance schedule as they are ideal areas for bacteria proliferation. Both calorifiers are fitted with long drains on the return pipe work these can act as deadleg pipe work and should be flushed through on a regular basis.

As already mentioned monthly temperature monitoring of the calorifiers is not being carried out and should be started as soon as possible; I would recommend the site manager be instructed on how to carry out monitoring of the hot water calorifiers.

The temperatures of the calorifiers at the time of the assessment were:-

Calorifier No.1 Storage	60.0°C	This is Satisfactory
Calorifier No.1 Return	53.0°C	This is Satisfactory
Calorifier No.2 Storage	57.0°C	This is not Satisfactory
Calorifier No.2 Return	52.0°C	This is 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 No.2 calorifier be adjusted to achieve this.

PHOTOGRAPHS

Hot water calorifiers serving the special needs area disabled toilet and primary school main kitchen and toilet areas.

Recommend temperature monitoring is started as soon as possible and recorded in a water systems logbook.



Hot water return pump serving both calorifiers.

Recommend temperature monitoring is started as soon as possible and recorded in a water systems logbook.



Long drains act as deadleg pipe work; recommend flushed on a regular basis; record when carried out in water systems logbook.



Hot water serving the special needs area physio room is from the local water heater located beneath the wash basin area; the water heater has approximately 10-15 litres water storage capacity and is supplied directly from the mains water services via a pressure reducer. The water heater serves the wash basin via a TMV; the water heater has temperature adjustment and was not set high at the time of this assessment. The water storage within the local water heater should be maintained at 60.0c at the time of this assessment monitoring indicated it was only at 46.0°C; I would recommend adjustment.

Physio room local water heater serving one wash basin via a TMV; adjust to store hot water at 60.0°C.



COLD WATER STORAGE

There is no cold water storage at the Primary School; the special needs areas are served directly from the mains water services.

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 special needs area Physio room is supplied by one local water heater serving one wash basin only.

Domestic hot water within the special needs area disabled toilet is from the boy's toilet area adjacent to the disabled toilet and this is supplied from the hot water calorifiers located within the boiler room.

Mains cold water serves the special needs areas within the primary school.

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) for hot water and (within two minutes) for cold water outlets in the building were recorded as follows:-

Location	Temperature °C			Comments
	Hot	Cold	Mixed	
Physio Room	46.0		44.2	Not Satisfactory
Disabled Toilet	52.0	16.6	41.9c	Satisfactory
Disabled Toilet Shower		16.6	41.5	Satisfactory

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) and is no lower than 39°C.

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

GENERAL

- Thermostatic Mixing Valves (TMV's) are fitted in the special needs areas Physio room and on the supply to the disabled toilet wash basin; these valves should be serviced and maintained to the manufacturers recommendations. This is being carried out on a six monthly basis and was last carried out by Carillion in January 2012.
- Infrequently used outlets are ideal areas for the proliferation of bacteria. Areas where 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 the special needs area disabled toilet shower does not get used; I would therefore recommend it be flushed at least on a weekly basis and recorded when carried out. I was informed that the only flushing within the school is at holiday periods only; this is not adequate and should be addressed.
- 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. As the shower in the disabled toilet is not used this is creating deadleg pipe work.
- The showerhead within the special needs disabled toilet is not being cleaned and descaled; there is no regime in place for this. I would recommend that the showerhead be cleaned and descaled at least on a quarterly basis or as required and recorded within a water systems logbook when carried out.

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

The electric shower in the special needs area disabled toilet is not used; I would recommend this is flushed at least on a weekly basis and recorded when carried out.

The shower is locked on setting 5 which gave a temperature reading of 41.5°C at the time of this assessment.



The showerhead should be cleaned and descaled at least on a quarterly basis or as required.

I would recommend a regime is put in place for the cleaning and descaling of the showerhead; record in water systems logbook when carried out.



TMVs are being serviced and maintained by contractors Carillion this is carried out on a six monthly basis.



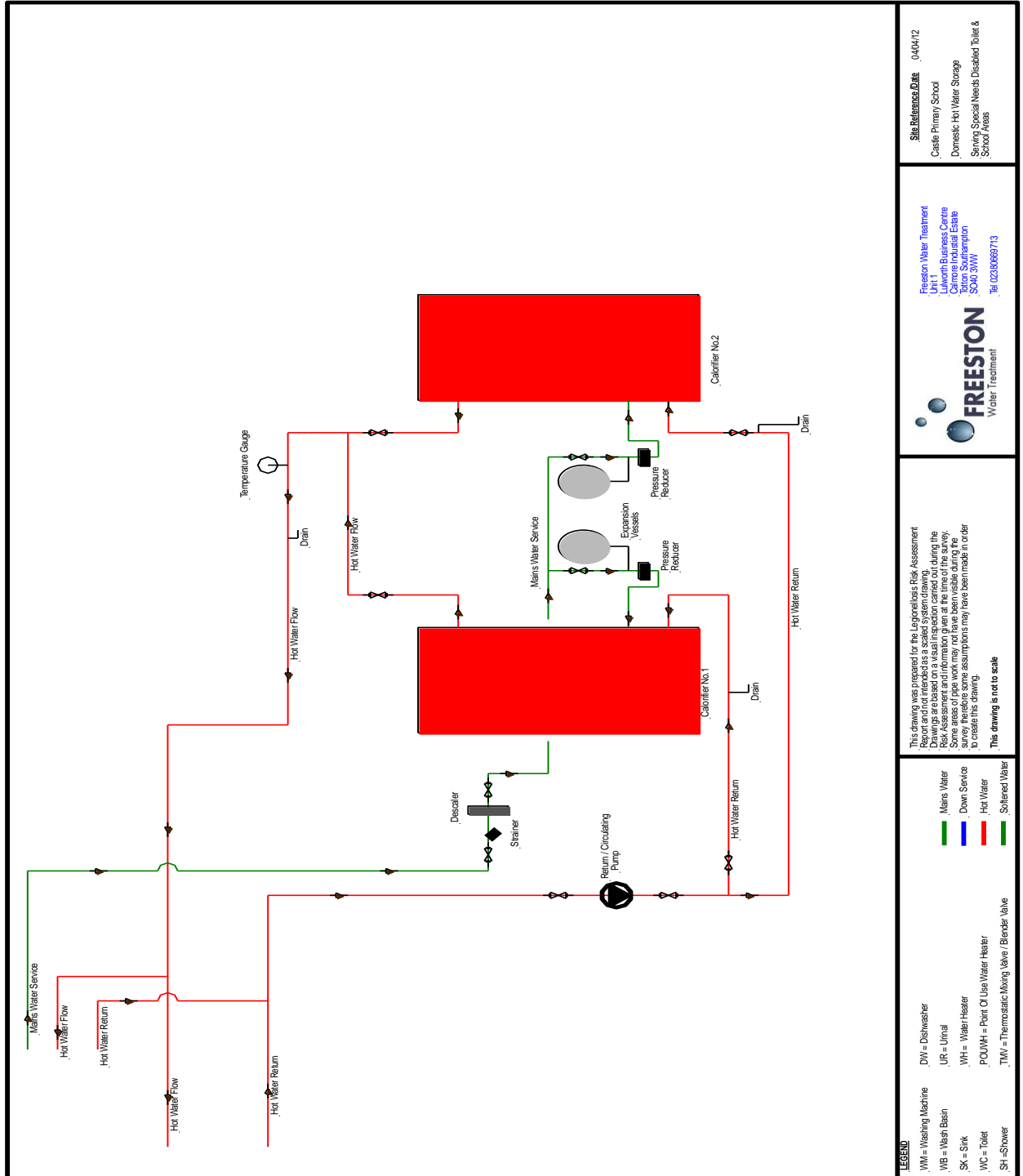
Inline strainer on mains feed to calorifiers serving special needs disabled toilet area should be cleaned on a regular basis or as part of a planned maintenance schedule.

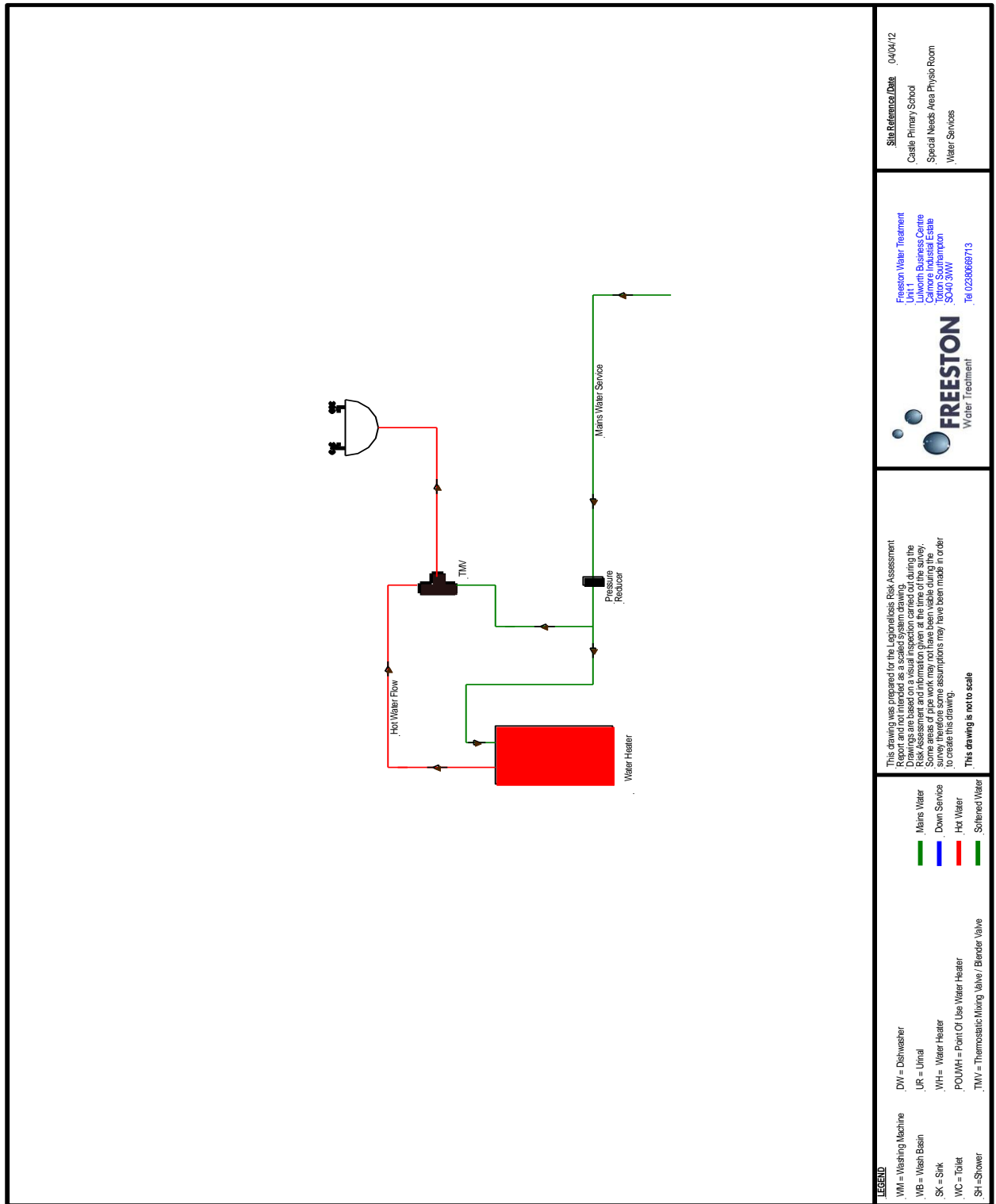


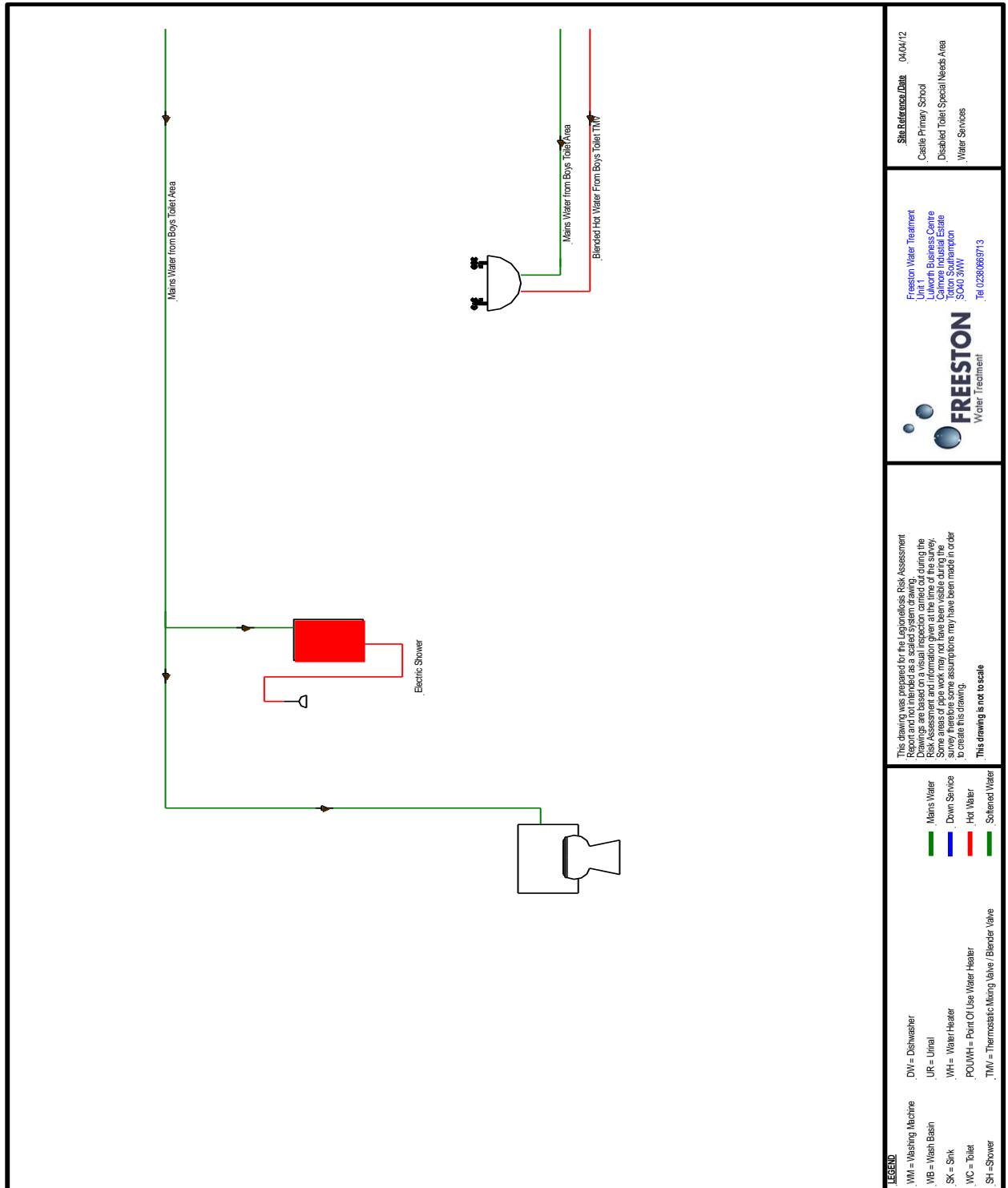
Special needs areas tap outlets should be kept clean and free from scale build up.



DRAWINGS







CONTROL MEASURES

	Task		Frequency
	Issue Legionella Control Water System Logbook		ASAP
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	Clean and descale shower head and hoses.		Quarterly or as Necessary
6	Purge hot water calorifiers to drain and record.		Annually
7	Internally inspect hot water calorifier 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
HCC Castle Primary School Special Needs Area	Issue Primary school with a Legionella control water systems logbook as soon as possible.	5		
	Ensure the Primary school in which the special needs areas are sited has had a Legionella risk assessment carried out. Carry out risk assessment of whole school if a risk assessment is not in place.	5		
	Start temperature monitoring of the domestic water systems within the special needs areas and Primary school as soon as possible.	5		
	Ensure all staff involved with Legionella control within the special needs areas and primary school have Legionella awareness training given	5		
<u>Hot Water Storage & System</u> HCC Castle Primary School Special Needs Area	Adjust No.2 calorifier to achieve a minimum storage temperature of 60°C at all times. Adjust Physio room water heater to store hot water at 60.0°C.	5		
	Fit temperature gauges to the return pipe on both calorifiers.	3		
	Purge the calorifiers to drain on at least an annual basis and record when carried out.	3		

Site Reference/ Address	Remedial/Recommendations	Priority	Date Actioned	Signature
<u>Distribution</u> HCC Castle Primary School Special Needs Area	I would recommend Bacteriological and Legionella water samples be taken if the temperatures fall out of the recommended limits.	3		
	Start weekly flushing of all low use outlets showers etc in special needs areas and primary school and record when carried out.	3		
	Clean and descale showerhead in special needs area quarterly, or as necessary. Record when carried out.	3		
	Ensure that all TMV's are continued to be serviced and maintained in the special needs areas and primary school.	3		