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## PREFACE

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

| | |
|---|---|
| **Date of Assessment:** | **21st June 2010** |
| **Date of Review:** | **June 2012** |

## INTRODUCTION

This report relates to a water source Risk Assessment carried out by Mr Chris Wilson of Freeston Water Treatment Ltd on the 21st June 2010 on behalf of Hampshire County Council. The survey was carried out at Forest Park Secondary School, Commercial Road, Totton, Hampshire SO40 3AF. 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 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 Forest Park Secondary 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 | Forest Park Secondary School |
| Location | Site Buildings |
| Method | Visual Assessment and Temperature Profiling |

## HOT WATER STORAGE

There is no hot water storage at Forest Park Secondary School. Hot water in the Main Building is supplied by two, mains cold water fed, gas fired combi-boilers. The combi-boilers are located in the Main Kitchen and the Boiler Room but I was informed that it is unknown which boilers supply which outlets. There are mains cold water fed electric local water heaters in the Upper and Lower Sixth Form portacabins.

## COLD WATER STORAGE

There is no domestic cold water storage at Forest Park Secondary School. All cold water is supplied from the mains water supply.

## 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.

There is no hot water storage at Forest Park Secondary School. Hot water in the Main Building is supplied by two, mains cold water fed, gas fired combi-boilers. The combi-boilers are located in the Main Kitchen and the Boiler Room but I was informed that it is unknown which boilers supply which outlets. There are mains cold water fed electric local water heaters in the Upper and Lower Sixth Form portacabins.

There is no domestic cold water storage at Forest Park Secondary School. All cold water is supplied from the mains water supply.

Mains cold water within Forest Park Secondary School supplies the heating boilers, the combi boilers, the electric local water heaters and all other 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:-

| Forest Park Secondary School<br>Hot Water Outlet Temperatures | |
|---|---|
| **Main Building**<br>Main Kitchen Sink | 55.8°C Satisfactory |
| **Main Building**<br>Caretakers Room Sink | 50.9°C Satisfactory |
| **Main Building**<br>Hygiene Room near Classroom 2 Sink | 52.3°C Inlet to TMV Satisfactory<br>41.6°C TMV Outlet Satisfactory |
| **Main Building**<br>Foyer Toilet Wash Basin | 53.0°C Satisfactory |
| **Main Building**<br>Staff Toilet Wash Basin | 50.3°C Inlet to TMV Satisfactory<br>42.8°C TMV Outlet Satisfactory |
| **Main Building**<br>Boys Toilets near Classroom 4 Wash Basin | No Access to TMV<br>41.2°C TMV Outlet Satisfactory |
| **Lower Sixth Form Portacabin**<br>Kitchen Sink | 57.3°C Inlet to TMV Satisfactory<br>42.7°C TMV Outlet Satisfactory |
| **Upper Sixth Form Portacabin**<br>Kitchen Sink | 42.7°C Inlet to TMV Satisfactory<br>41.1°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:

| **Forest Park Secondary School**<br>**Cold Water Outlet Temperatures** | |
|---|---|
| **Main Building**<br>Main Kitchen Sink | 16.1°C Satisfactory |
| **Main Building**<br>Caretakers Room Sink | 16.7°C Satisfactory |
| **Main Building**<br>Hygiene Room near Classroom 2 Sink | 17.7°C Satisfactory |
| **Main Building**<br>Foyer Toilet Wash Basin | 18.1°C Satisfactory |
| **Main Building**<br>Staff Toilet Wash Basin | 18.2°C Satisfactory |
| **Main Building**<br>Boys Toilets near Classroom 4 Wash Basin | 16.4°C Satisfactory |
| **Lower Sixth Form Portacabin**<br>Kitchen Sink | 18.8°C Satisfactory |
| **Upper Sixth Form Portacabin**<br>Kitchen Sink | 16.8°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 Forest Park Secondary School; these valves should be serviced and maintained to the manufacturers recommendations. I was informed that this is carried out but no records were seen.

- 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. This is being carried out and recorded.

- 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:-

  - Lower Sixth Form Portacabin- in the Staff Toilets there are two dead legs.

- 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 being carried out but not recorded.

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

- It is unknown which outlets are supplied by which combi-boilers. I would recommend that during a school holiday or weekend that one combi-boiler is shut down so that this can be ascertained.

- Monthly temperature monitoring of the hot and cold outlets is being carried out and recorded. The water temperatures of every sentinel outlet must be taken monthly and recorded. Other representative outlets should have temperatures taken on a monthly rotational basis so that over a period of 12 months all outlets will have been covered.

- There is an inline scale reducer on the mains cold water pipe in the Staff Room under the sink. This should be cleaned / replaced in-line with the manufacturer's recommendations. It is unknown if this is being carried out.

- The Hydrotherapy Pool is a stand alone system and is not connected to the mains cold water supply. The pool is topped up by hoses from the mains cold water supply and also the combi boiler. Neither taps are fitted with backflow protection. I would recommend that suitable devices are fitted or the hoses are shortened to create an air gap between the end of the hoses and the pool water.

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

  - Three times a day free chlorine level, total chlorine level, pH and water temperature.
  - Monthly bacteriological samples, total dissolved solids, alkalinity and calcium levels 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
Cleaning and disinfection of water cisterns
Monthly temperature monitoring
Flushing of infrequently used outlets
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

**Lower Sixth Form Portacabin**

Staff Toilet

Dead leg

**Main Building**

Staff Room

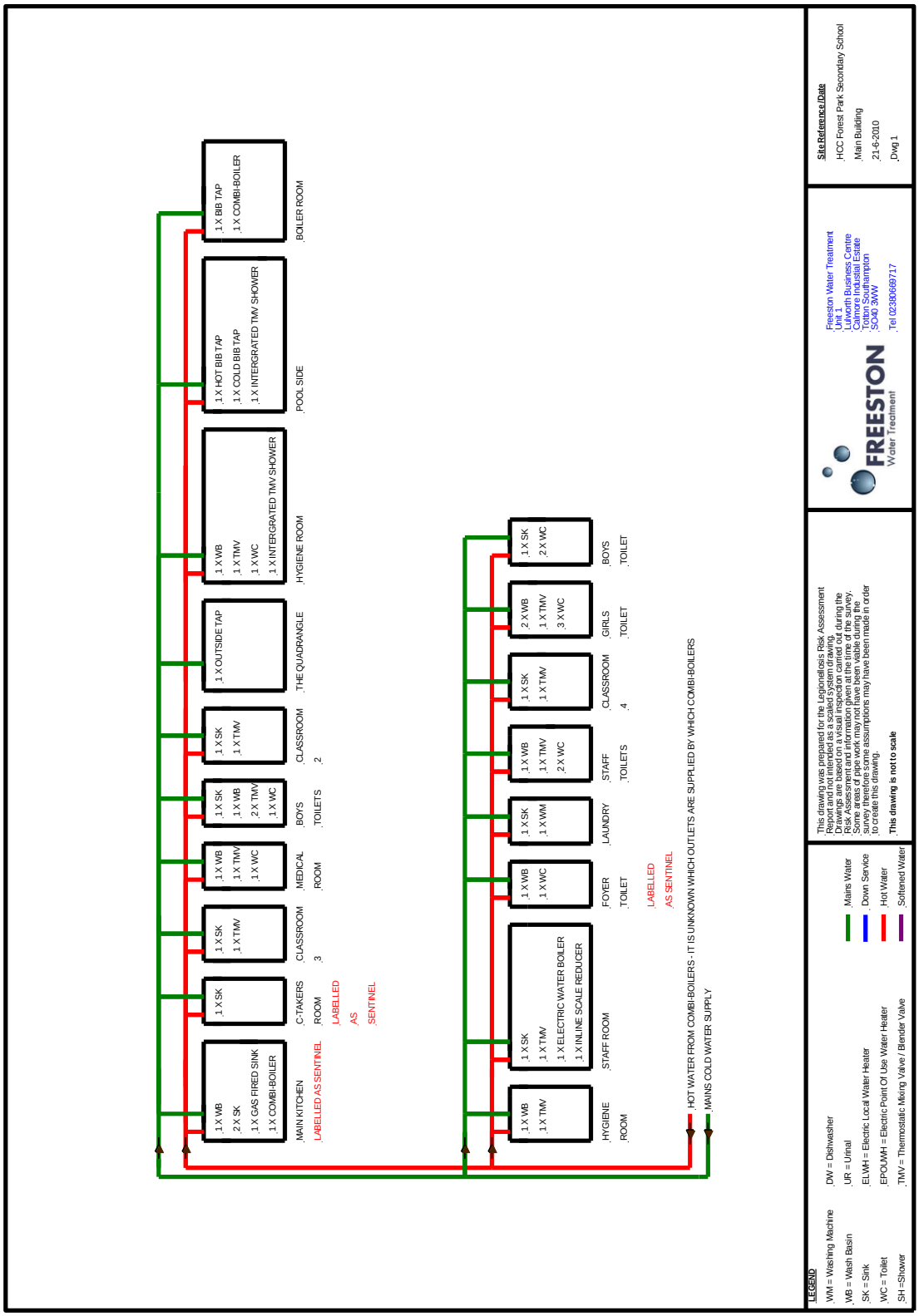
Inline scale reducer

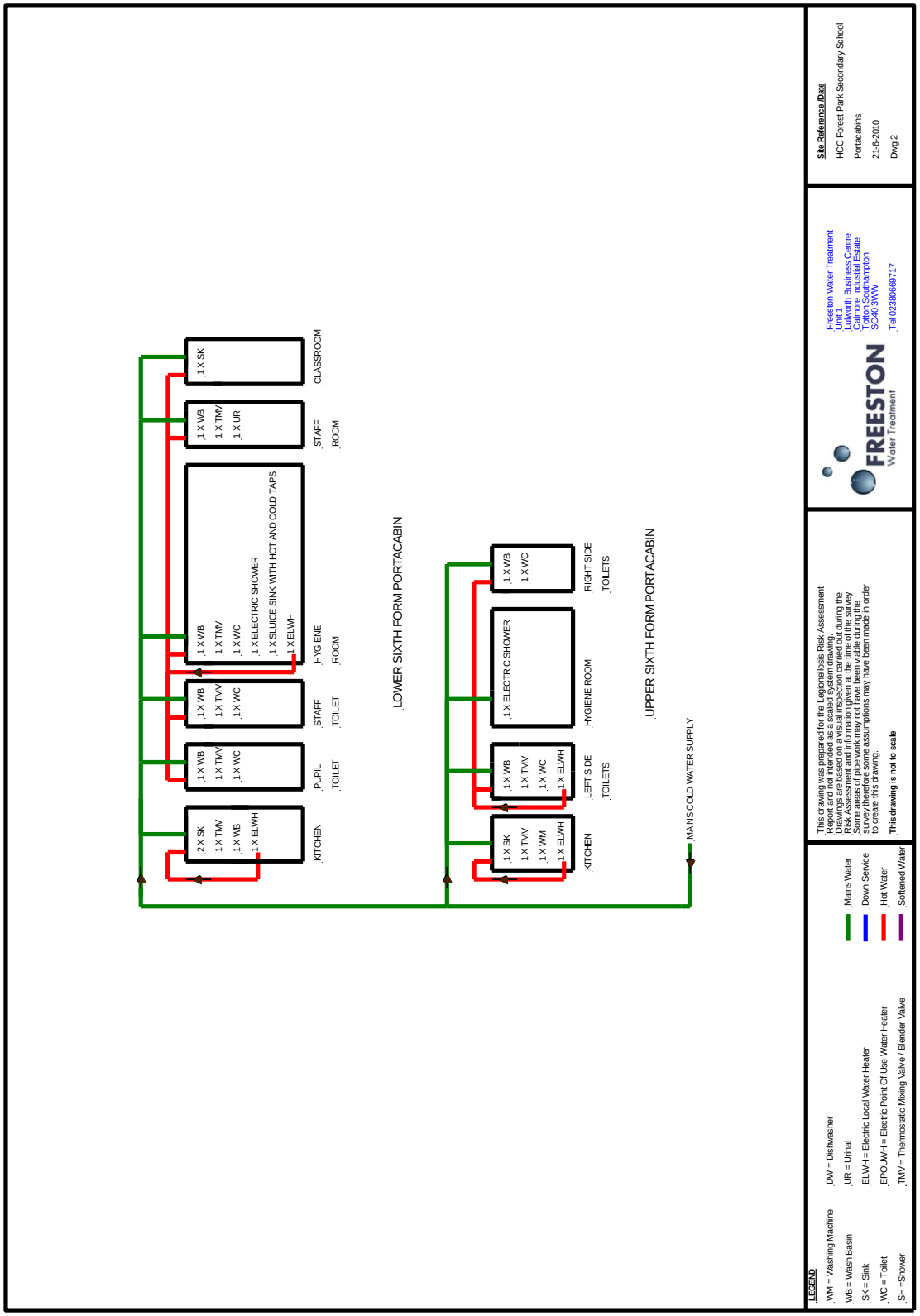
**Main Building**

Main Kitchen

Typical combi-boiler

# DRAWINGS


1 X WB
2 X SK
1 X GAS FIRED SINK
1 X COMBI-BOILER
MAIN KITCHEN
1 X SK
C-TAKERS
ROOM
LABELLED AS SENTINEL
1 X SK
1 X TMV
CLASSROOM
3
1 X WB
1 X TMV
1 X WC
MEDICAL
ROOM
1 X SK
1 X WB
2 X TMV
1 X WC
BOY'S
TOILETS
1 X SK
1 X TMV
CLASSROOM
2
1 X OUTSIDE TAP
THE QUADRANGLE
1 X WB
1 X TMV
1 X WC
1 X INTERGRATED TMV SHOWER
HYGIENE ROOM
1 X HOT BIB TAP
1 X COLD BIB TAP
1 X INTERGRATED TMV SHOWER
POOL SIDE
1 X BIB TAP
1 X COMBI-BOILER
BOILER ROOM
1 X WB
1 X TMV
HYGIENE
ROOM
1 X SK
1 X TMV
1 X ELECTRIC WATER BOILER
1 X INLINE SCALE REDUCER
STAFF ROOM
1 X WB
1 X WC
FOYER
TOILET
1 X SK
1 X WM
LAUNDRY
1 X WB
1 X TMV
2 X WC
STAFF
TOILETS
1 X SK
1 X TMV
CLASSROOM
4
2 X WB
1 X TMV
3 X WC
GIRLS
TOILET
1 X SK
2 X WC
BOYS
TOILET
LABELLED
AS SENTINEL
HOT WATER FROM COMBI-BOILERS - IT IS UNKNOWN WHICH OUTLETS ARE SUPPLIED BY WHICH COMBI-BOILERS
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
EPOUWH = Electric Point Of Use Water Heater
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 visual inspection carried out during the Risk Assessment and information gained at the time of the survey. Some areas of pipe work may not have been viable 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 Lulworth Business Centre
Calmore Industrial Estate
Totton Southampton
SO40 3WW
Tel 02380669717
Site Reference /Date
HCC Forest Park Secondary School
Main Building
21-6-2010
Dwg 1


LOWER SIXTH FORM PORTACABIN
UPPER SIXTH FORM PORTACABIN
MAINS COLD WATER SUPPLY
2 X SK
1 X TMV
1 X WB
1 X ELWH
KITCHEN
1 X WB
1 X TMV
1 X WC
PUPIL TOILET
1 X WB
1 X TMV
1 X WC
STAFF TOILET
1 X WB
1 X TMV
1 X WC
1 X ELECTRIC SHOWER
1 X SLUICE SINK WITH HOT AND COLD TAPS
1 X ELWH
HYGIENE ROOM
1 X WB
1 X TMV
1 X UR
STAFF ROOM
1 X SK
CLASSROOM
1 X SK
1 X TMV
1 X WM
1 X ELWH
KITCHEN
1 X WB
1 X TMV
1 X WC
1 X ELWH
LEFT SIDE TOILETS
1 X ELECTRIC SHOWER
HYGIENE ROOM
1 X WB
1 X WC
RIGHT SIDE TOILETS
LEGEND
WM = Washing Machine
WB = Wash Basin
SK = Sink
WC = Toilet
SH =Shower
DW = Dishwasher
UR = Urinal
ELWH = Electric Local Water Heater
EPOUWH = Electric Point Of Use Water Heater
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
Lulworth Business Centre
Channel Islands Estate
Totton Southampton
SO40 3WW
Tel 02380668717
Site Reference /Date
HCC Forest Park Secondary School
Portacabins
21-6-2010
Dwg 2

## WRITTEN SCHEME

| | Task | | Frequency |
|---|---|---|---|
| 1 | Prepare site logbook for the Site. | | **ASAP** |
| 2 | Flush infrequently used outlets. | | **Weekly** |
| 3 | Record cold water outlet temperatures. | | **Monthly** |
| 4 | Record hot water outlet temperatures. | | **Monthly** |
| 5 | Clean and descale shower head and hoses. | | **Quarterly** |

## 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 System HCC Forest Park Secondary School** | Continue monthly temperature monitoring of the domestic hot water systems; sentinel outlets. Record within a logbook. | **2** | | |
| | Adjust electric local water heaters to achieve a minimum of 50°C at the hot outlet or inlet to the TMV within one minute. | **5** | | |

| Site Reference/ Address | Remedial/Recommendations | Priority | Date Actioned | Signature |
|---|---|---|---|---|
| **Distribution** **HCC Forest Park Secondary School** | 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** | | |
| | Continue **weekly** flushing of any low use outlets etc and record when carried out. | **2** | | |
| | 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** | | |
| | Continue monthly temperature monitoring of the domestic cold water systems; sentinel outlets. Record within a logbook. | **2** | | |
| | Clean / change the inline water filter in the Main Building Staff Room in-line with the manufacturers recommendations | **3** | | |
| | During a school closure, shut down one of the combi-boilers so that it can be ascertained which outlets are supplied by which combi-boiler. | **2** | | |
| | Fit suitable backflow protection devices to pool fill taps or shorten the hoses to ensure that there is an air gap between the hose end and the pool water | **4** | | |