Legionella Solutions Ltd.

Legionella Risk Assessment and Legionella Control Specialists

Legionella Bacteria Risk Assessment

Client:	Arches Housing	**Site Contact:**	Jamie Taylor
Premises:	140-142 Burngreave Road Sheffield South Yorkshire S3 9DH	**Telephone:**	0114 228 8118
Risk Assessor:	M. Glossop	**Date:**	28.03.2017

CONTENTS

1. EXPLANATION OF LEGIONELLA RISK, SITE INTRODUCTION AND SCOPE OF WORK

2. SUMMARY OF SYSTEMS INSPECTED

3. RISK ASSESSMENT SCORING KEY

4. MANAGEMENT RESPONSIBILITIES AND TRAINING

5. HOT AND COLD WATER SYSTEM DESIGN AND CONSTRUCTION

Cold water system
5.1 Cold water system overview and design
5.2 Cold water storage tank inspection report

Hot water system
5.3 Hot water system overview and design
5.4 Water Heater inspection report

6. SHOWERS

7. THERMOSTATIC MIXING VALVES (TMVs) - n/a

8. EXPANSION VESSELS - n/a

9. WATER SOFTENERS - n/a

10. PARTS OF SITE TEMPORARILY OUT OF USE (MOTHBALLED) - n/a

11. WATER TREATMENT FOR HOT AND COLD WATER SYSTEMS - n/a

12. OTHER RISK SYSTEMS
12.1 Header Tanks for Heating Systems
12.2 Miscellaneous equipment

13. SCHEMATIC DRAWING, OUTLET REGISTER AND TEMPERATURE PROFILE

14. RECORD KEEPING
14.1 Review of the existing logbook and monitoring records
14.2 Review of the existing written scheme

15. ASSESSMENT OF RISKS IDENTIFIED AND RECOMMENDED ACTIONS

16. DEAD LEG APPENDIX AND OTHER AREAS OF CONCERN

17. INFORMATION FOR THE TENANTS

18. GLOSSARY

1. EXPLANATION OF LEGIONELLA RISK, SITE INTRODUCTION AND SCOPE OF WORK

What is Legionnaires' disease?

Legionnaires' disease is a potentially fatal form of pneumonia and everyone is susceptible to infection. The risk increases with age but some people are at higher risk including:

- People over the age of 45
- Smokers and heavy drinkers
- People suffering from chronic respiratory or kidney disease, diabetes, lung or heart disease
- Anyone with an impaired immune system

The bacterium *Legionella pneumophila* and related bacteria are common in natural water sources such as rivers, lakes and reservoirs, but usually in low numbers.

Outbreaks of the illness occur from exposure to legionella growing in purpose-built systems where water is maintained at a temperature high enough to encourage growth, e.g. cooling towers, evaporative condensers, hot and cold water systems and spa pools used in all sorts of premises.

How do people get legionnaires' disease?

People contract Legionnaires' disease by inhaling small droplets of water (aerosols), suspended in the air, containing the bacteria. Certain conditions increase the risk from legionella if:

- The water temperature in all or some parts of the system are between 20-45 °C, which is suitable for legionella bacteria growth
- It is possible for breathable water droplets to be created and dispersed e.g. aerosol created by a cooling tower, spa pool or water outlets including showers and taps
- If water is stored and/or re-circulated in cold water tanks, hot water heaters, cooling towers or spa pools for example
- If there are deposits that can support bacterial growth providing a source of nutrients for the organism e.g. rust, sediment, scale, organic matter and biofilms. These can be commonly found on shower heads, on filters, in TMVs, in cold water storage tanks, hot water heaters, cooling towers and spa pools

How is the risk controlled?

If conditions are favorable, the bacteria may grow, thus increasing the risks of Legionnaires' disease and it is therefore important to control the risks by introducing appropriate measures outlined in ACoP - L8 *Legionnaires' disease - The Control of Legionella bacteria in water systems* and the technical guidance in HSG274.

This guidance gives clear instructions on controlling and managing the risks associated with legionella bacteria in water systems.

This guidance states that a legionella bacteria risk assessment should be undertaken to identify the risks present. From there, the risks can be properly managed and controlled.

Site Introduction

This legionella risk assessment has been undertaken on behalf of Arches Housing at 140-142 Burngreave Road, Sheffield. It is a 3 storey building consisting of communal areas with water facilities and 8 flats.

Members of staff, residents and visitors are male and female of all ages; some may be over the age of 45, be in poor health and may include smokers, so they fall into the susceptible risk group regarding legionella.

Communal Water Facilities
There is a Kitchen, Laundry Room, Gents Toilet and Ladies Toilet located on the Ground Floor. Cold water services to the Kitchen, Laundry Room and external tap are provided by the direct mains supply. Cold water services to the Gents and Ladies Toilets are provided by the Cold Water Storage Tanks, which are located in the Voids of the 2nd Floor Bathrooms in Flats 7 and 8. Hot water services are provided by the Water Heaters 1 and 2, which are supplied by Cold Water Storage Tanks 1 and 2 and are located in the 1st Floor Flats 3 and 4.

Private Flats
There are 8 private flats on site. As part of this risk assessment, access was gained to Flat 3. The water services in that flat have been included in this assessment and we assume all the other flats have the same or a similar water system. The recommendations given in this assessment, will therefore apply to all of the flats in the building. Cold water services are provided by the direct mains supply to the Kitchen sink and electric shower and by Cold Water Storage Tanks 1 and 2 to the Wash Basin and WC. Hot water services are provided by Water Heaters 1 and 2.

Scope of Work

The scope of work has been agreed with the client and includes the following elements:

- A full survey and risk assessment of the site (all communal water facilities and 1 private flat)
- A schematic drawing, showing the pipe work layout, cold water tanks and hot water vessels.
- A full outlet register and temperature profile (all communal water facilities and 1 private flat)
- A review of the current monitoring paperwork and written schemes
- Recommendations for remedial and monitoring actions required

In accordance with the ACOP(L-8) and the associated technical guidance in part 2 and 3 of the HSG274 and based on the level of risk on this site, we recommend this risk assessment is reviewed on a biennial basis. However, if any changes are made to the water services and the current assessment is no longer valid, the Responsible Person will require the assessment to be reviewed immediately.

We recommend that any remedial or monitoring actions identified in this risk assessment in section 15 should be addressed in order to comply with your obligations under ACOP L8, HSG274 and more specifically obligations under the Control of Substances Hazardous to Health Regulations 2002, the Health and Safety at Work Act 1974 and Management of Health and Safety at Work Regulations 1999.

All information contained in this report, including any engineering conclusions, is based on information made available to Legionella Solutions Limited during our investigations. Because this report is based on available and possibly incomplete information, some of its conclusions could be different if the information on which it is based is determined to be false, inaccurate, or contradicted by additional information. This report represents a good faith effort conducted in a professional manner consistent with applicable environmental engineering standards.

This Legionella Bacteria Risk Assessment is in accordance with ACoP (L8), HSG274 and BS8580:2010 water quality risk assessments for Legionella.

M. Glossop
Legionella Risk Assessor
Legionella Solutions Ltd.

2. SUMMARY OF SYSTEMS INSPECTED AS PARK OF THIS LEGIONELLA BACTERIA RISK ASSESSMENT

SITE DETAILS	140-142 Burngreave Road, Sheffield	
SITE CONTACT NAME	Jamie Taylor	
DATE OF RISK ASSESSMENT	28.03.2017	
RISK ASSESSOR	M. Glossop - Legionella Solutions Ltd	
DESCRIPTION	**PRESENT YES / NO**	**DETAILS / LOCATION**
Hot and Cold Water Systems		
Mains water supply	Yes	All areas. Incoming supply not located
Cold Water Storage Tanks	Yes	Cold Water Storage Tank 1 - 2nd Floor Flat 7 Bathroom Void Cold Water Storage Tank 2 - 2nd Floor Flat 8 Bathroom Void
Water Heaters	Yes	Water Heater 1 - 1st Floor Flat 3 Water Heater 2 - 1st Floor Flat 4
Showers	Yes	1 Shower in each flat
Other Risk Systems		
Header Tanks for Heating Systems	Yes	1 x 2nd Floor Flat 7 Roof Space
Miscellaneous Equipment	Yes	1 Washing machine in the Ground Floor Laundry Room

3. RISK ASSESSMENT SCORING KEY

Each section is divided into the various factors under consideration; in general terms and specifically related to the equipment or system under assessment.

On completion of the above, each parameter will be allocated a risk score which will be commented on individually.

The key to risk scores is set out below:-

Individual items scoring 0 are considered low risk and therefore no further action is required.
Individual items scoring 1 require further clarification or regular monitoring to control the risk
Individual items scoring 2 require remedial action to reduce the risk and comply with current guidelines - these are highlighted in red in the risk assessment.

Individual items are totalled to produce a total risk score for each section and the following priority category is then applied.

TOTAL RISK SCORE	RISK CATEGORY
8 and above	**HIGH**
5 - 7	**MEDIUM**
0 - 4	**LOW**

Please see Section 15 for any risks identified and the recommended actions to take.

4. MANAGEMENT RESPONSIBILITIES AND TRAINING

In 2013 the Health and Safety Executive issued the revised ACOP(L-8) and in 2014 the associated technical guidance notes HSG274 part 1, 2 and 3. This guidance gives practical advice on the legal requirements of the Health and Safety at Work Act 1974, the Control of Substances Hazardous to Health Regulations 2002 concerning the risk from exposure to legionella, and guidance on compliance with the relevant parts of the Management of Health and Safety at Work Regulations 1999.

This guidance is for Duty Holders, which includes employers, those in control of premises and those with health and safety responsibilities for others, to help them comply with their legal duties as specified in the *ACOP (L-8) Legionnaires' disease: The control of legionella bacteria in water systems*. It gives specific information on the health and safety law that applies.

The guidance includes identifying and assessing sources of risk, preparing a scheme to prevent or control the risk, implementing, managing and monitoring precautions, keeping records of precautions and appointing a manager responsible for others.

Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you follow the guidance, you will normally be doing enough to comply with the law. Health and Safety Inspectors seek to secure compliance with the law and may refer to this guidance.

Under general health and safety law, Duty Holders, including employers or those in control of premises, must ensure the health and safety of their employees or others who may be affected by their undertaking.

They must take suitable precautions to prevent or control the risk of exposure to legionella. They need to appoint somebody competent, who knows how to identify and assess sources of risk, manage those risks, prevent or control any risks, keep records and carry out any other legal duties that they may have.

In the Approved Code of Practice L-8, there is a requirement to prepare a Legionella Bacteria Risk Assessment and a Written Scheme of Control. It is essential they remain up to date as required under Health and Safety law.

In the management of risks from legionella bacteria, the Duty Holder must appoint a competent person known as the Responsible Person to take day-to-day responsibility for managing the control scheme. The responsible person should prepare a Written Scheme of Control for legionella bacteria and ensure that all operational procedures are carried out in a timely and effective manner. The responsible person should ensure adequate records are maintained and available for inspection and auditing, for at least five years. A Deputy Responsible person should also be appointed to take care of the day-to-day responsibilities should the Responsible person be absent due to holidays and illness etc. The Duty Holder should also ensure that all employees involved in work that may expose an employee or other people to legionella are given suitable and sufficient information instruction and training.

If you decide to employ contractors to carry out water treatment works, it is still the responsibility of the Responsible Person to ensure that the treatment is carried out to the required standards.

Staff responsibilities and lines of communication must be properly defined in writing and clearly set out. Staff responsibilities must be understood by all concerned. Staff must be properly trained and competent. Arrangements should be made to allow for staff that leave or are absent.

Shared premises

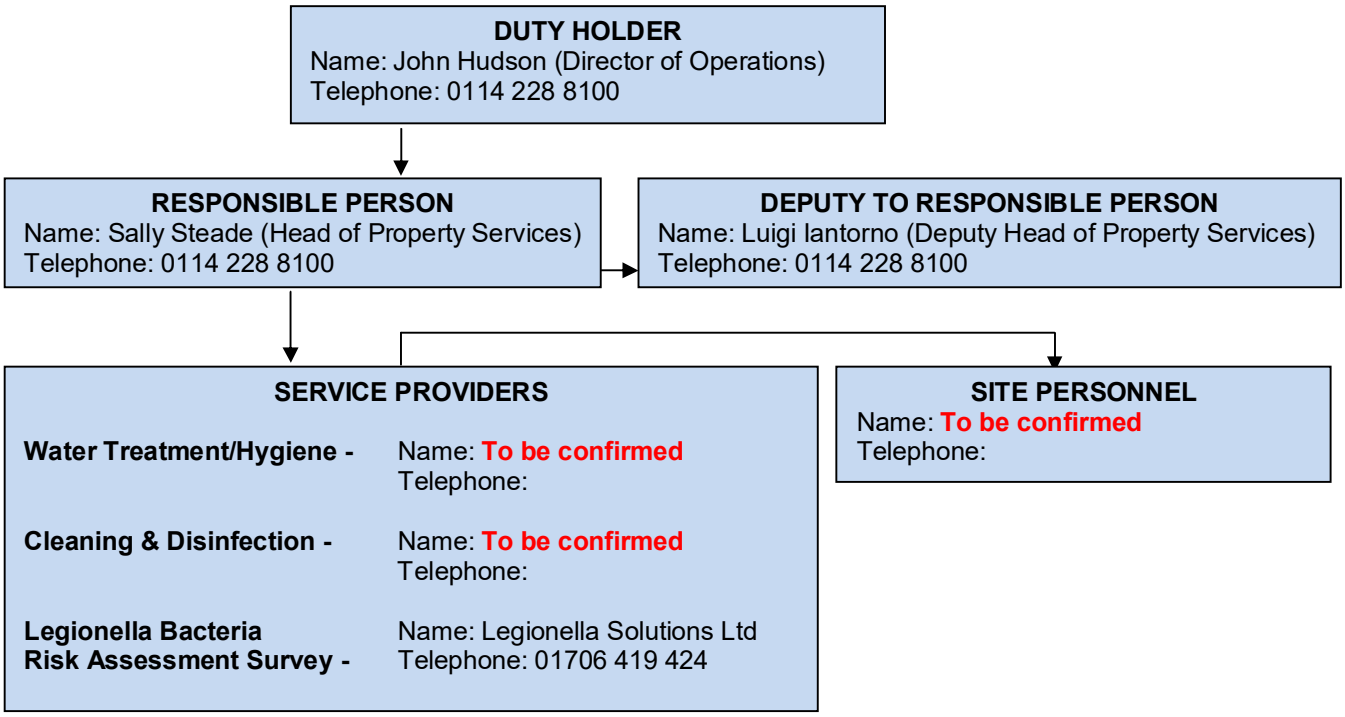
Those who have, to any extent, control of premises for work-related activities or the water systems in the building, have a responsibility to those who are not their employees, but who use those premises.

In estate management, it is increasingly common for there to be several duty holders in one building. In such cases, duties may arise where persons or organisations have clear responsibility, through an explicit agreement, such as a contract or tenancy agreement. The extent of the duty will depend on the nature of that agreement.

For example, in a building occupied by one lease holder, the agreement may be for the owner or lease holder to take on the full duty for the whole building or to share the duty. Alternatively, it might be that the duty is shared where, e.g. the owner takes responsibility for the common parts while the leaseholder takes responsibility for the parts they occupy.

In other cases, there may be an agreement to pass the responsibilities to a managing agent. Where a managing agent is used, the management contract should clearly specify who has responsibility for maintenance and safety checks, including managing the risk from Legionella.

4. MANAGEMENT RESPONSIBILITIES AND TRAINING continued



REF.	MANAGEMENT RESPONSIBILITIES AND TRAINING	RISK SCORE
4A	Has a Duty Holder been nominated and clearly defined in writing?	0
	Yes	
4B	Has a Responsible Person been nominated and clearly defined in writing?	0
	Yes	
4C	Has a Deputy Responsible Person been nominated and clearly defined in writing?	0
	Yes	
4D	Are the roles and responsibilities of all staff involved in the control regime clearly defined in writing?	0
	Yes	
4E	Are the roles and responsibilities of external contractors clearly defined in writing?	2
	No, to be confirmed	
4F	Have all staff involved in the control regime received appropriate training within the last 2 years?	2
	No training records found	
	TOTAL RISK SCORE	4
	RISK CATEGORY	LOW

5. HOT AND COLD WATER SYSTEM DESIGN AND CONSTRUCTION

Temperature control is the traditional strategy for reducing the risk of legionella in water systems. Cold water temperatures should be maintained, where possible, at a temperature below 20°C. Hot water should be stored at least at 60°C and distributed so that it reaches a temperature of 50°C within one minute at the outlets (55°C in healthcare premises).

Water fittings and components should be used that comply with the Water Regulations Advisory Scheme (WRAS) and compliant with BS6920.

All parts of the hot and cold water services should be in regular use with all outlets being used at least weekly (twice weekly in healthcare premises). Pipe work should be insulated and free from dead legs. All water based equipment, pipe work, fittings and outlets should be free from scale and corrosion.

The following section is intended to survey all of the domestic hot and cold water distribution services to evaluate the risk of proliferation by legionella bacteria.

REF.	HOT AND COLD WATER SYSTEM DESIGN AND CONSTRUCTION		RISK SCORE
5A	**Dead leg identification**		2
	Have any dead legs been identified?	Yes. See section 16 for the details and locations	
5B	**Little used outlets**		1
	Have any little used outlets been identified?	Yes	
	1 External tap		
5C	**Materials in use**		0
	Based on available information, are all materials used WRAS approved	Yes	
	Are there any signs of scale or corrosion on any of the hot and cold water pipe work or outlets?	No	
5D	**Hot and cold distribution pipe work insulation**		2
	Is the hot and cold distribution pipe work fully insulated where possible?	No. Some of the pipe work is uninsulated	
5E	**Potential for droplet formation**		1
	Possible		
5F	**Are there any users in the susceptible category**		1
	Yes, staff, residents and visitors over 45 years of age, possible smokers and people of ill health		
5G	**Routine sampling for legionella required**		0
	No		
		TOTAL RISK SCORE	7
		RISK CATEGORY	MEDIUM

5.1 COLD WATER SYSTEM OVERVIEW AND DESIGN

There are 2 Cold Water Storage Tanks and 1 direct mains supply on site.

DESCRIPTION	LOCATION	SERVICES IT FEEDS
Direct Mains Supply	Incoming supply not located	It supplies the Ground Floor Communal Kitchen, External tap, Laundry Room, and the Kitchen sinks and Electric showers in the flats. It also supplies cold water to Cold Water Storage Tanks 1, 2 and the header tank for the heating system.
Cold Water Storage Tank 1	2nd Floor Flat 7 Bathroom Void	They supply cold water to the Wash basins and WCs in the flats and Ground Floor communal Gents and Ladies Toilets. They also supply cold water to Water Heaters 1 and 2.
Cold Water Storage Tank 2	2nd Floor Flat 8 Bathroom Void	

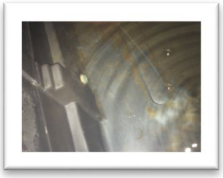
REF	COLD WATER SYSTEM DESIGN		RISK SCORE
5.1A	Are all cold taps inspected 20^{0}C or below within 2 minutes of running?	Yes	**1**
5.1B	Are any outlets on the cold water system out of service or faulty?	No	**0**
5.1C	Is the cold water system pumped?	No	**0**
5.1D	Are there any filters on the cold water system?	No	**0**
5.1E	**Cold Water Storage Tank nearest and furthest points - location and temperatures (^{O}C)**		**1**
	Nearest points		
	Cold Water Storage Tank 1 - 2nd Floor Flat 7 Bathroom Wash Basin - 15 **Cold Water Storage Tank 2 -** 2nd Floor Flat 8 Bathroom Wash Basin - 15		
5.1F	**Furthest points**		**1**
	Cold Water Storage Tank 1 - Ground Floor Flat 1 Bathroom Wash Basin - 18 **-** Ground Floor Ladies Toilet Wash Basin - 18 **Cold Water Storage Tank 2 -** Ground Floor Flat 2 Bathroom Wash Basin - 18		
		TOTAL RISK SCORE	**3**
		RISK CATEGORY	**LOW**

5.2 COLD WATER STORAGE TANK INSPECTION REPORT - Tank 1

REF.	COLD WATER TANK INSPECTION REPORT				RISK SCORE
5.2A	Location	2nd Floor Flat 7 Bathroom Void			0
	Access for inspection/C&D	Ladder required			
	Tank usage	Cold water services and Water Heater 2 cold supply			
	Material of construction	Plastic			
5.2B	Tank volume	227 Litres			1
	Does the tank hold enough water 24 hours use only (12 hours in healthcare premises)	Yes			
5.2C	Cross-flow of water	Poor			2
	Are hollow tube supports in use	No			
5.2D	**Is the tank**:				2
	Insulated	Yes			
	Covered and sealed	Yes			
	Overflow fitted with insect screens	No			
5.2E	Is there an expansion vessel associated	No			2
	Is there an expansion pipe feeding into the tank	Yes from Water Heater 2			
5.2F	**Visual condition**				2
	Condition of stored water	Clear			
	Signs of sediment	Heavy sediment			
5.2G	Signs of scale/corrosion	No			0
	Internal condition	Ok			
5.2H	**Water temperature °C**				1
	At the inlet	13	In the tank	15	
5.2i	**Clean and disinfection**				1
	Date of last clean and disinfection	Not known			
				TOTAL RISK RATING	11
				RISK CATEGORY	**HIGH**

5.2 COLD WATER STORAGE TANK INSPECTION REPORT - Tank 2

REF.	COLD WATER TANK INSPECTION REPORT				RISK SCORE
5.2A	Location	2nd Floor Flat 8 Bathroom Void			0
	Access for inspection/C&D	Ladder required			
	Tank usage	Cold water services and Water Heater 1 cold supply			
	Material of construction	Plastic			
5.2B	Tank volume	227 Litres			1
	Does the tank hold enough water 24 hours use only (12 hours in healthcare premises)	Yes			
5.2C	Cross-flow of water	Poor			2
	Are hollow tube supports in use	No			
5.2D	**Is the tank**:				2
	Insulated	Yes			
	Covered and sealed	Yes			
	Overflow fitted with insect screens	No			
5.2E	Is there an expansion vessel associated	No			2
	Is there an expansion pipe feeding into the tank	Yes from Water Heater 1			
5.2F	**Visual condition**				2
	Condition of stored water	Clear			
	Signs of sediment	Heavy sediment			
5.2G	Signs of scale/corrosion	No			0
	Internal condition	Ok			
5.2H	**Water temperature °C**				1
	At the inlet	13	In the tank	15	
5.2i	**Clean and disinfection**				1
	Date of last clean and disinfection	Not known			
				TOTAL RISK RATING	**11**
				RISK CATEGORY	**HIGH**



5.3 HOT WATER SYSTEM OVERVIEW AND DESIGN

There are 2 Water Heaters on site.

DESCRIPTION	LOCATION	FED BY	AREAS IT FEEDS
Water Heater 1	1st Floor Flat 3	Tank 2	Hot water supply to all areas.
Water Heater 2	1st Floor Flat 4	Tank 1	

REF.	HOT WATER SYSTEM DESIGN		RISK SCORE
5.3A	Are all hot taps inspected 50°C or above within 1 minute of running?	Yes	**1**
5.3B	Are any outlets on the hot water system out of service or faulty?	No	**0**
5.3C	Is the hot water system pumped?	Yes. 1 pump on the returns to Water Heaters 1 and 2	**0**
5.3D	Are there any filters on the hot water system?	No	**0**
5.3E	**Hot water system nearest and furthest point location and temperatures (°C)** **Nearest points** **Water Heater 1 -** 1st Floor Flat 3 Bathroom Wash Basin - 50 **Water Heater 2 -** 1st Floor Flat 4 Bathroom Wash Basin - 55		**1**
5.3F	**Furthest points** **Water Heater 1 -** Ground Floor Flat 2 Kitchen Sink - 50 **Water Heater 2 -** Ground Floor Kitchen Sink - 50		**1**
		TOTAL RISK SCORE	**3**
		RISK CATEGORY	**LOW**

5.4 WATER HEATER INSPECTION REPORT - Water Heater 1

REF.	WATER HEATER INSPECTION REPORT		RISK SCORE
5.4A	Location	1st Floor Flat 3	0
	Water heater type	Vented calorifier	
	Access to Water heater	Ok	
	Water heater usage	Hot water services	
5.4B	Volume	140 Litres	1
	Make-up supply	Tank 2	
	Shunt pump installed/on a timer?	No	
5.4C	Is the water heater insulated?	Yes	0
5.4D	Is there an expansion vessel associated with this water heater?	No	0
5.4E	Is there an inspection hatch	No	0
	Is there a drain valve fitted	Yes	
5.4F	**Condition of drain water**		1
	Clear		
5.4G	**Water temperatures (℃)**		2
	Stored water temperature	52	
	Flow temperature	52	
5.4H	Return temperature	47	2
5.4i	**Disinfection**		1
	Date of last disinfection	Not known	
		TOTAL RISK SCORE	7
		RISK CATEGORY	MEDIUM

5.4 WATER HEATER INSPECTION REPORT - Water Heater 2

REF.	WATER HEATER INSPECTION REPORT		RISK SCORE
5.4A	Location	1st Floor Flat 4	0
	Water heater type	Vented calorifier	
	Access to Water heater	Ok	
	Water heater usage	Hot water services	
5.4B	Volume	140 Litres	1
	Make-up supply	Tank 1	
	Shunt pump installed/on a timer?	No	
5.4C	Is the water heater insulated?	Yes	0
5.4D	Is there an expansion vessel associated with this water heater?	No	0
5.4E	Is there an inspection hatch	No	0
	Is there a drain valve fitted	Yes	
5.4F	**Condition of drain water**		1
	Clear		
5.4G	**Water temperatures (℃)**		2
	Stored water temperature	55	
	Flow temperature	55	
5.4H	Return temperature	50	1
5.4i	**Disinfection**		1
	Date of last disinfection	Not known	
		TOTAL RISK SCORE	6
		RISK CATEGORY	MEDIUM

6. SHOWERS

Where showers are fitted they should be in regular use (at least weekly) and all their removable parts, heads, inserts and hoses should be cleaned, descaled and disinfected on a 3 monthly basis. The risk associated with a shower is affected by the quality of the hot and cold water supply.

REF.	SHOWERS INSPECTION REPORT	RISK SCORE
6A	Location	**n/a**
	Showers - 1 in Each Flat	
6B	Hot water supply	**0**
	Electric (Low risk)	
6C	Cold water supply	**0**
	Mains (Low risk)	
6D	Condition of the spray heads	**1**
	Good condition in Flat No 3, condition of the others is not known	
6E	Are the showers in regular use (at least weekly) or flushed weekly if not in regular use?	**1**
	The showers in the flats are expected to be in regular use	
6F	Potential for droplet formation	**1**
	High	
6G	Nature of persons using the showers	**1**
	Users are male and female of all ages and may include smokers, persons over the age of 45, and persons possibly in poor health, who are in the susceptible category regarding legionella.	
	TOTAL RISK SCORE	**4**
	RISK CATEGORY	**LOW**

12. OTHER RISK SYSTEMS

12.1 HEADER TANKS FOR HEATING SYSTEMS

REF.	HEADER TANKS FOR HEATING SYSTEMS INSPECTION REPORT	RISK SCORE
12.1A	1 x 2nd Floor Flat 7 Roof Space The header tank and the heating system are fully enclosed and no reasonably foreseeable risk regarding Legionella. However, care must be taken during maintenance to avoid any exposure to water from the system.	**0**
	TOTAL RISK SCORE	**0**
	RISK CATEGORY	**LOW**

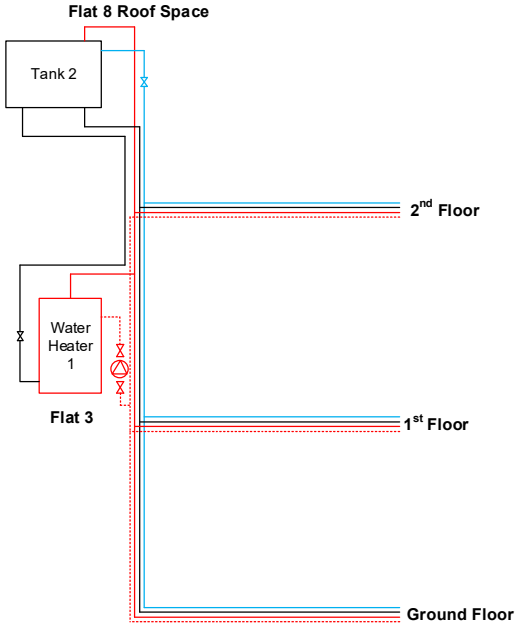
12. OTHER RISK SYSTEMS

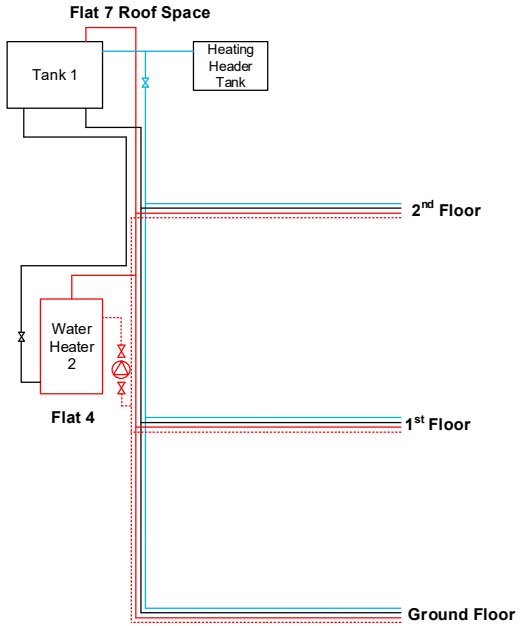
12.2 MISCELLANEOUS EQUIPMENT

REF.	MISCELLANEOUS EQUIPMENT INSPECTION REPORT	RISK SCORE
12.2A	1 Washing machine in the Ground Floor Laundry Room	0
	TOTAL RISK SCORE	0
	RISK CATEGORY	LOW

No action is required as long as kept in regular use and operated and maintained in accordance with the manufacturer's instructions.

13. SCHEMATIC DRAWING





Legionella Solutions Ltd.
Legionella Risk Assessment and Legionella Control Specialists

Site: Arches Housing, 140-142 Burngreave Rd
Date: 28.03.2017
Drawn by: M. Glossop

Mains cold water
Tank cold water
Hot water flow
Hot water return
Isolation valve
Pump

13. OUTLET REGISTER AND TEMPERATURE PROFILE

LOCATION	SINK	TMV	WHB	TMV	WC	URINAL	SHOWER/ POT SPRAY/ SPRAY TAP	TMV	BATH	BIB TAP	OTHERS	MAINS	TANK	HOT WATER SUPPLY	TEMPERATURE PROFILE ^{O}C		
															HOT	PRE TMV	COLD
Communal Water Facilities - Ground Floor																	
Kitchen	1											✓		Water Heater	50		11
Ladies Toilet			1		1								Tank	Water Heater	50		18
Gents Toilet			1		1								Tank	Water Heater	50		18
Laundry Room											1 Washing machine	✓		Water Heater			
Outside										1		✓					11
Typical Flat (Flat 3)																	
Kitchen	1											✓		Water Heater	50		9
Bathroom			1*		1*		1 Shower Electric					✓	Tank*	Water Heater	50		15

14. RECORD KEEPING

14.1 REVIEW OF THE EXISTING LOG BOOK AND MONITORING RECORDS

This section is a review of the current site log book. The following table indicates what records should be in place and whether the appropriate actions are being undertaken and recorded in accordance with the guidelines set out in ACOP L8 and parts 2 and 3 of the HSG274. **Records should be kept for 5 years.**

REF.	EXISTING LOG BOOK AND MONITORING INSPECTION REPORT				RISK SCORE
14.1A	**Is there a log book in place?**				2
	No				
Are the following actions being undertaken:		YES	NO	N/A	
14.1B	Weekly flushing and recording of little used outlets		To be instigated		2
14.1C	Monthly inspection and recording of the calorifier/water heater flow and return temperatures		To be instigated		2
14.1D	Monthly inspection and recording of combination water heater temperature taken at an outlet			✓	n/a
14.1E	Monthly temperature inspection and recording of the hot water system nearest and furthest points (recorded pre TMV where applicable)		To be instigated		2
14.1F	Monthly temperature inspection and recording of the cold water tank nearest and furthest points on the system		To be instigated		2
14.1G	Monthly temperature inspection and recording of the long branches on the tank cold water system			✓	n/a
14.1H	3 monthly dismantling, cleaning, descaling and disinfection of the showers		To be instigated		2
14.1i	3 monthly cleaning, descaling and disinfection of the spray taps			✓	n/a
14.1J	3 monthly temperature inspection and recording of the hot water system subordinate loops			✓	n/a
14.1K	6 monthly inspection and recording of the POU water heater temperature taken at an outlet			✓	n/a
14.1L	6 monthly expansion vessel flushing and purging to drain			✓	n/a
14.1M	Annual expansion vessel bladder test			✓	n/a
14.1N	Annual tank inspection and recording of the water temperature		To be instigated		2
14.1O	Annual calorifier/water heater internal inspection or drain water clarity test		To be instigated		2
14.1P	Annual combination water heater header tank inspection			✓	n/a
14.1Q	Annual cleaning, descaling and disinfection of the filters and strainers associated with the TMVs			✓	n/a
14.1R	Annual temperature inspection and recording of a representative number of hot and cold taps on a rotational basis (recorded pre TMV where applicable)		To be instigated		2
				TOTAL RISK SCORE	18
				RISK CATEGORY	HIGH

14. RECORD KEEPING

14.2 REVIEW OF THE EXISITING WRITTEN SCHEME

The risk from exposure will normally be controlled by measures which do not allow the proliferation of legionella bacteria in the system. Once the risk is identified and assessed, a written control scheme should be prepared, implemented and properly managed. The scheme should specify the various control measures and how to carry out those measures. The scheme should be specific and relate to the water services being operated on site.

The following table identifies which information has or has not been included in the current written scheme.

REF.	EXISTING WRITTEN SCHEME INSPECTION REPORT				RISK SCORE
14.2A	**Is there a Written Scheme for controlling the risk from exposure to legionella bacteria?**				2
	No				
Does the written scheme include the following sections:		YES	NO	N/A	
14.2B	An introduction into the system		✓		2
14.2C	Names and positions of those responsible for carrying out the tasks		✓		2
14.2D	Complete schematics, reviewed and updated annually		✓		2
14.2E	Cold water storage tanks		✓		2
14.2F	Calorifiers/water heaters		✓		2
14.2G	Point of use water heaters (POU's)			✓	n/a
14.2H	Non-Storage water heaters			✓	n/a
14.2 I	Hot and cold water systems		✓		2
14.2J	Thermostatic Mixing Valves (TMV's)			✓	n/a
14.2K	Temperature monitoring		✓		2
14.2L	Showers		✓		2
14.2M	Expansion Vessels			✓	n/a
14.2N	Water softeners			✓	n/a
14.2O	Parts of site temporarily out of use			✓	n/a
14.2P	Water treatment			✓	n/a
14.2Q	Other risk systems			✓	n/a
14.2R	Escalation procedures for out of specification conditions		✓		2
14.2S	Details of record keeping		✓		2
				TOTAL RISK SCORE	22
				RISK CATEGORY	HIGH

15. ASSESSMENT OF RISK AND RECOMMENDED ACTIONS

REF.	DESCRIPTION	RISK SCORE AND CATEGORY	RECOMMENDED ACTIONS	DATE OF COMPLETION AND SIGNATURE
14.2	Review of the Existing Written Scheme	**22 HIGH**	A written scheme of control for legionella should be created. It should be reviewed regularly, be kept up to date, and include the following information: An introduction to the system, the names and positions of those responsible in the control regime, complete schematic drawings, details of record keeping and escalation procedures for out of specification conditions. It should also include the maintenance, operating and control procedures for: Cold Water Storage Tanks, Water Heaters, Showers, Temperature Monitoring and Hot and Cold Water Systems.	

15. **ASSESSMENT OF RISK AND RECOMMENDED ACTIONS** Continued.

REF.	DESCRIPTION	RISK SCORE AND CATEGORY	RECOMMENDED ACTIONS	DATE OF COMPLETION AND SIGNATURE
14.1	Review of the existing logbook and monitoring records	**18 HIGH**	A Legionella control book should be created, be kept up to date and include the following records: Any outlets that aren't used at least weekly should be flushed for 2 minutes and recorded on a weekly basis. See section 5B for the locations of the little used outlets identified. The temperature of the nearest and furthest points (sentinels) from Tank 1, Tank 2, Water Heater 1 and Water Heater 2 should be recorded on a monthly basis. See section 5.1E/F and 5.3 E/F for the locations. The flow and return temperatures of Water Heaters 1 and 2 should be recorded on a monthly basis to ensure the flow is a minimum of 60^{O}C and the return a minimum of 50^{O}C. The showers should be dismantled, cleaned, descaled and disinfected on a quarterly basis. Cold Water Storage Tanks 1 and 2 should be internally inspected and the temperature recorded on an annual basis. The condition of the drain water from Water Heaters 1 and 2 should be recorded on an annual basis. The temperature of all of the hot and cold water outlets on the system should be recorded over an annual period. This can be done on a rotational basis.	

15. **ASSESSMENT OF RISK AND RECOMMENDED ACTIONS** Continued.

REF.	DESCRIPTION	RISK SCORE AND CATEGORY	RECOMMENDED ACTIONS	DATE OF COMPLETION AND SIGNATURE
5.2	Cold Water Storage Tank 1	**11 HIGH**	There was heavy sediment found on the base of the tank. It should be cleaned and disinfected as soon as possible. The cross flow of water within the tank is poor. The inlet and outlets should be repositioned as soon as possible.so they are on opposite sides of the tank Insect screens should be fitted onto the overflow pipe work as soon as possible. The expansion pipe from Water Heater 2 should be rerouted away from the tank to a suitable tun-dish/drain as soon as possible. The tank should be internally inspected and the temperature recorded on an annual basis.	
5.2	Cold Water Storage Tank 2	**11 HIGH**	There was heavy sediment found on the base of the tank. It should be cleaned and disinfected as soon as possible. The cross flow of water within the tank is poor. The inlet and outlets should be repositioned as soon as possible.so they are on opposite sides of the tank Insect screens should be fitted onto the overflow pipe work as soon as possible. The expansion pipe from Water Heater 1 should be rerouted away from the tank to a suitable tun-dish/drain as soon as possible. The tank should be internally inspected and the temperature recorded on an annual basis.	

15. **ASSESSMENT OF RISK AND RECOMMENDED ACTIONS** Continued.

REF.	DESCRIPTION	RISK SCORE AND CATEGORY	RECOMMENDED ACTIONS	DATE OF COMPLETION AND SIGNATURE
5.	Hot and cold water system design and construction	**7 MEDIUM**	The dead legs identified in section 16 should be removed and the pipe work cut back to the common supply. All of the hot and cold pipe work should be fully insulated where possible.	
5.4	Water Heater 1	**7 MEDIUM**	The temperature of Water Heater 1 should be increased to ensure the flow is a minimum of 60^{O}C and the return a minimum of 50^{O}C. The flow and return temperature should be tested and recorded on a monthly basis to ensure this. The quality of the drain water should be tested and recorded annually to ensure the cylinder is free from sediment. As Water Heater 1 is being supplied by Tank 2, which has been deemed to be a high risk, the legionella risk is therefore increased until the remedial actions identified on Tank 2 have been undertaken.	
5.4	Water Heater 2	**6 MEDIUM**	The temperature of Water Heater 2 should be increased to ensure the flow is a minimum of 60^{O}C. The flow and return temperature should be tested and recorded on a monthly basis to ensure this. The quality of the drain water should be tested and recorded annually to ensure the cylinder is free from sediment. As Water Heater 2 is being supplied by Tank 1, which has been deemed to be a high risk, the legionella risk is therefore increased until the remedial actions identified on Tank 1 have been undertaken.	

15. **ASSESSMENT OF RISK AND RECOMMENDED ACTIONS** Continued.

REF.	DESCRIPTION	RISK SCORE AND CATEGORY	RECOMMENDED ACTIONS	DATE OF COMPLETION AND SIGNATURE
4.	Management responsibilities and training	**4 LOW**	The roles and responsibilities of the external contractors involved in the control regime should be clearly defined in writing. All staff involved in the control regime should have received appropriate legionella training within the last 2 years.	
6.	Showers	**4 LOW**	The showers should be used at least weekly, or be flushed for 2 minutes and recorded once a week if not. The showers should be dismantled, cleaned, descaled and disinfected on a quarterly basis.	
5.1	Cold water system design	**3 LOW**	Monthly temperature monitoring should be undertaken to confirm the cold water system is operating below 20^{O}C at all times.	
5.3	Hot water system design	**3 LOW**	Monthly temperature monitoring should be undertaken to confirm that all of the hot water outlets reach a minimum of 50^{O}C within 1 minute of running.	
12.1	Header Tanks for Heating Systems	**0 LOW**	No action required. However, care must be taken during maintenance to avoid any exposure to water from the system.	
12.2	Miscellaneous Equipment	**0 LOW**	No action required as long as the equipment remains in regular use and is maintained in accordance with the manufacturer's instructions.	

16. **DEAD LEG APPENDIX AND OTHER AREAS OF CONCERN Page 1 of 2**

Image	Location and details	Date of completion and signature
	Ground Floor Communal Kitchen - 1 dead leg (cold). Remove and cut back the pipe work to the common supply.	
	Ground Floor Communal Laundry Room - 1 dead leg (hot). Remove and cut back the pipe work to the common supply.	
	Ground Floor Communal Shower Room - 1 dead leg (cold). Remove and cut back the pipe work to the common supply.	
	Ground Floor Outside of the Kitchen - Isolated water point. Put into use/flush weekly or remove and cut back the pipe work to the common supply if no longer required.	

16. **DEAD LEG APPENDIX AND OTHER AREAS OF CONCERN Page 2 of 2**

Image	Location and details	Date of completion and signature
	Typical picture showing the expansion pipes feeding into Tanks 1 and 2. Reroute this pipe work away from the Tanks to a suitable tun-dish/drain.	

17. INFORMATION FOR THE TENANTS

The landlord should inform the tenant of the following:

All taps and showers should be in regular use. Any that are not used at least weekly should be flushed for 2 minutes, once a week.

All showers should be regularly cleaned and kept free from scale.

If the tenant has a problem with low hot water temperatures at the outlets (below $50^{O}C$), or there is a fault with the Water Heaters, it should be reported immediately and rectified as soon as possible.

The cold water should be a maximum of $20^{O}C$. If the tenant is finding that the cold water is warm, it should be reported immediately.

Any faults found with the water system should be reported immediately to the landlord.

18. GLOSSARY

ACOP L-8	The control of Legionella bacteria in water system Approved Code of Practice
HSG 274	The Health and Safety Technical Guidance on the control of Legionella
BS8580:2010	British Standards Water Quality - Risk assessments for Legionella control - Code of practice
LRA	Legionella Risk Assessment
N/A	Not applicable
WH	Water Heater
POU	Point of use water heater
CWH	Combination water heater
IWH	Instant water heater
WHB	Wash Hand Basin
CO	Cold only
MO	Mixed only
HO	Hot only
WRAS	Water Regulations Advisory Scheme
EPDM	Ethylene Propylene Diene Monomer
GRP	Glass Re-enforced Plastic
MSG	Mild steel galvanized
DHWS	Domestic hot water services
DCWS	Domestic cold water services
BCWS	Boosted cold water services
TMV	Thermostatic mixing valve
TT	Thermotap TMV
AAV	Air Admittance Valve