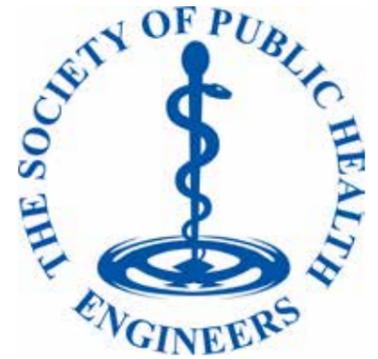


SoPHE JOURNAL



2019

Your update from The Society of Public Health Engineers

Issue 1

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your say on the
future of
THE SoPHE JOURNAL
with our online survey

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The SoPHE network

SoPHE is an international organisation that aims to provide a higher profile and focus for public health engineers within CIBSE. We run technical events, site visits and provide support to our members around the world.



SoPHE membership

Includes members, affiliates, associates, fellows, honorary fellows, industrial associates and student members.

UK	947
Ireland	33
UAE	114
Hong Kong	127
Australia and New Zealand	48

To start the 1st Edition of the 2019 SoPHE newsletter, we welcome our new Chairman, Jonathan Gaunt, to lead our society forward. Jonathan has been a long standing SoPHE member and active contributor to the committee and previous versions of the newsletter, so is more than qualified for the challenging role ahead.

This latest edition of the newsletter has been a long time coming. The main reason for this is that all SoPHE newsletter articles are from voluntary contributions and always have been since the society's formation in 2000. The Society of Public Health Engineers (SoPHE) was formed by passionate engineers on a voluntary basis. These engineers foresaw a need to have an independent platform from CIBSE to provide a higher profile and focal point for public health engineers. This remains the Society's key aim today.

This edition sees James Day from the Education Group presenting a strong focus on the Young Engineers Award, The Plumbing Centre of Excellence, Public Health Training Framework and the Public Health Masterclasses. We also have a British Standards update and an informative article by Richard Beattie (SoPHE Scotland Representative) on Legionella Risk Assessments.

Member Survey
 Going forward we are keen to get your views on what you would like to see in the newsletter. With that in mind we would kindly ask that you type the link below into a web browser (or if viewing as a PDF just click on the link) to participate in an online survey regarding the content of our newsletter. All feedback is welcome if we want to keep pace with an ever-changing industry, world and professional culture.
<https://cibse.survey.fm/sophe-journal-survey>

We are also keen to hear from you, so please get involved, write an article and have your voice heard! If you have an interesting subject, knowledgeable information or captivating project you would like to produce an article about please contact the SoPHE Newsletter team.

Many thanks for reading,



James Ziebarth
Editor

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Changes to British Standards on Legionella risk assessments

Although still rare, cases of Legionnaires diseases are rising in the UK and represent a life-threatening risk. AECOMs Dr. Richard Beattie sets out the three key changes to the BSI's recently updated Legionella guidance that responsible persons and occupiers need to know to manage this threat effectively.

Contaminated tap water poses a serious threat to health, in particular for those with weakened or impaired immune systems, and recent studies show an increase in infections in healthcare facilities. For example, in 2018, a hospital was fined £300,000 and a private care home £3 million in the UK for health and safety breaches that resulted in patients' deaths due to Legionnaire's disease.

Employers, occupiers and others responsible for the control of hospitals and premises across sectors need to ensure that the quality of water they provide is safe, and actively work to reduce the risks of exposure to infection.

To help with this, the BSI recently published BS8580-1:2019 Water quality, Risk assessments for Legionella control, Code of practice. The new guidance updates the original British Standard — reflecting the revisions made since its release in 2010, and incorporating supplementary materials previously published separately.

There are the three main changes to the British Standard that employers and people in control of premises (the Duty Holder or Appointed Person) need to identify and manage the risks associated with Legionella more effectively and perform risk assessments to the standard required.

1. Defining and ensuring the right level of competence

The term 'competence' is often used in water guides, but rarely defined in detail. And, prior to the 2019 guidance, no minimum level of qualification or experience has been required to undertake risk assessments.

BS 8580-1 seeks to rectify this, setting out the essential criteria that a Responsible Person should consider when appointing their risk assessor, and the standards of detail, clarity and quality that their final risk assessment report should meet.

Primarily, this involves ensuring that the assessor demonstrates the appropriate specialist knowledge, experience and understanding of the factors that contribute to legionella colonisation, as well as the water systems and equipment to be assessed.

To assist with this, the guidance provides a list of questions for building owners to ask when sub-contracting their risk assessments to make sure they appoint the appropriate risk assessor for their organisation's needs.

This includes, for example, consideration of the assessor's previous work: How previously has the assessor evaluated a risk? How has the risk assessor undertaken prior surveys? And measured the issues? Does the risk assessor understand how to mitigate a risk? Such as in maintenance regimes?

Also, as water systems vary in complexity depending on the nature of the building and their usage, what is the depth of the risk assessor's understanding of the facility's water system and its associated equipment? Is the hot water calorifier reaching temperature? And are the water services' flow temperatures in compliance?

For the BSI, comprehensive answers to these questions and others covered in the guidance are essential to ensure an assessor's competence, help reduce harmful bacterial growth in water systems and reinforce compliance.

2. Highlighting the main points of risk

Building on this, the revised British Standard provides additional details to the elements of inspection. These 11 points are designed to inform more comprehensive assessments — again emphasising the levels of competence and standard of risk assessment required to help manage water systems safely.

- The 11 points to risk cover:
- Dead ends (no flow points, capped ends, etc)
 - Little-used outlets.
 - Imbalances in water flow.
 - Routes for potential contamination.
 - Cool areas at the base of calorifiers.
 - Cross flow of hot and cold water systems.
 - Locations for potential incubating temperatures
 - Sources of heat transfer.
 - Materials of construction.
 - Sources of nutrients for bacterial growth.
 - Any changes to the system that might cause stagnant areas.

3. Looking at the bigger picture

The BSI has also updated the Annexes to BS 8580-1, with extensive revisions made to Annex B (informative) — hot and cold water systems. This includes, in section B.8, advising that the assessor should inspect the whole system and not just the tanks and calorifiers; and that, during the inspection, the assessor should look for any elements of the design, construction or operation of the water system that could lead to conditions for Legionella growth.

More information has been provided on spa pools, humidifiers, vehicle wash systems, and thermal processing in the food industry (pasteurizers), to elaborate on the limited information given in previous documents relating to these risks.

Finally, one of the most obvious updates to the guidance is that its name has changed from BS 8580 to BS 8580-1. This is in preparation for the later planned release of a risk assessment standard for Pseudomonas, a common bacterium found in soil and water that can cause infections in humans — usually with weakened immune systems or long-term lung conditions

For full reference, the BS 8580-1 2019 can be obtained with track changes, helping readers to more clearly see the updates made to BS 8580:2010.

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 James Day (Education)
 Sanjay Modasia (Contractors Working Group)
 James Zeibarth (Communications Officer)
 Steve Vaughan
 Simon Oliphant

Representatives from Industry Working Group:
 Alan Flight

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 Events: Miker Darvill

A word from the Chair



In this edition **Jonathan Gaunt** talks about new ..society growth, the shifting shape of SoPHE, importance of education within the discipline and Bursaries to promote our valued youngsters.



Welcome to the latest edition of the SoPHE Journal. As I am sure you are all aware, it has been

some time since an edition of the journal has 'landed on your doormats' and am pleased to announce that we have a new team of enthused contributors on-board with the intention of ensuring that the SoPHE Journal becomes a more regular periodical with diverse content that will appeal to all of our members. As with all of these initiatives, it relies on the generosity of volunteers to give their time to create a positive impact on the society and to provide a worthwhile source of information for our members. I would like to take this opportunity to thank those that have been involved and contributed in re-launching the SoPHE Journal as we see it today.

Much water has passed under the bridge since the last Journal was launched – I was elected as SoPHE Chairman which was a great honour, and have now been in the position for just over 12 months. Since taking on the role, the Society has developed in a number of areas; membership has grown to a point where we are now 1,276 members strong and boast an Industrial Group of 70 with 6 Contractor members – this represents further growth in the society for the last 12 months which is encouraging, given the current uncertainty within the economy.

In September 2018, the Plumbing Centre of Excellence (PCE) was launched at Havering College (East London) in partnership with CIPHE. The initiative was the brain child

of Sanjay Modasia (SoPHE Contractors Working Group) and Steve Vaughan (SoPHE ex-Chairman) and was intended to provide CPDs in line with the NVQ syllabus, to provide an enhancement to the current training and to provide further career opportunities to the students ensuring that they are best equipped for a career in plumbing and construction. Complimenting Sanjay and Steve's vision, the Industrial Associates have been instrumental to the success of the PCE, through the development of product boards and CPD material. We have now seen the completion of the first full academic PCE year at Havering, and, although there are areas that can be improved upon for the second year, believe that the scheme has been a success and worthwhile. Moving forward, the intention is to learn from the proceedings at Havering college and launch further PCE schemes within additional tertiary colleges across the country.

Through discussions with the SoPHE Young Engineers Network (YEN), we are now looking to engage the YEN with the students undertaking the PCE. This will start with a presentation given by the YEN in the Autumn term of 2019 and also hope to hold a YEN/PCE student competition as part of National Apprenticeship Week in February 2020, which we hope will see the YEN and Havering PCE students working side by side to learn from each other and create a greater bond between SoPHE and the Plumbing students.

World Plumbing Day, celebrated on 11th March 2019, saw the launch of the Chris Sneath Bursary which looks to recognise the dedication and success of individuals studying in field of Plumbing. Chris Sneath has generously provided an annual bursary fund for the next 10 years, which will be awarded to the PCE Level 2 Plumbing competition winner. This year saw Alfie Adams become the first recipient of the bursary – which is to be used to provide funds for education books or attendance on additional training courses. The SoPHE committee are currently looking for appropriate tertiary colleges in the north of England to establish a second bursary scheme to take the name of the Dr. Steve Ingle Bursary. Steve was a recognised and proactive member of the Public Health community who sadly passed away in September 2016 – to recognise Steve's contribution to the industry, it seems fitting to launch a second bursary in his name in the region where he was so proactive in encouraging the development of students in the field of Public Health.

As part of the Societies growth, SoPHE launched the Collaborative Working initiative which saw key representatives from the SoPHE Steering Committee tasked with forming closer links with specific like-minded

organisations. The intention is to provide cross fertilisation through knowledge sharing, specifically through promoting technical events, providing guest speakers and guest columns within Journals, while contributing to industry wide design standards. SoPHE have already started to see some success with this initiative. In addition to the already existing relationship with CIPHE at Havering college, SoPHE are exhibiting at the Healthcare Estates Conference on 8-9th October 2019 in Manchester in collaboration with IHEEM, while we have also been asked to present at the Water Management Society (WMSoc) training day in November. In addition to this, I have been invited by British Water to represent SoPHE as a member of a newly formed panel looking at the development of appropriate industry wide FOG (Fats, Oils and Grease) guidance. In terms of developing closer links with ASPE (American Society of Plumbing Engineers), SoPHE hosted John Lansing in June at the AGM and at a British Water event, while also organising a site and manufacturer visit for him. John has close links with ASPE, and was also awarded a bursary from the World Plumbing Council which involved him visiting the UK, researching the UK plumbing codes and developing a technical paper that compares US and UK plumbing design approaches. John's work is currently in progress but will make for an interesting read! Our time with John, we hope, will help develop closer links between ASPE and SoPHE.

July saw the launch of SoPHE's first Trade Exhibition and Technical Event, held at the Building Centre in Store Street, central London. The event comprised of around 30 Industrial Associate manufacturer stands providing technical support on their products throughout the afternoon, culminating in an evening Technical Presentation provided by Dr Malcolm Wearing (CRM) on 'The successful drainage design of flat roofs'. The event was well attended with encouraging feedback received from those that attended and those that exhibited. A mark of the events success is that we intend to rerun the event next year with a view to incorporating a second technical seminar or Chairman's address during the afternoon – watch this space.

Dr. Malcolm Wearing's presentation was keenly received and prompted some interesting questions and lively debate. On reflection, it highlighted the level of uncertainty that remains within the consulting industry in terms of interpreting BS EN 12056-3, and the most appropriate rainfall intensities to be used for different roof types. Dr Wearing's presentation acted as the precursor to the launch of the second SoPHE Technical Bulletin entitled 'Rainfall Intensity and Storm Water Drainage

Design' which should be available to SoPHE members in the very near future.

As one work stream closes on the production of the second Technical Bulletin, a second stream starts. The SoPHE Technical committee held a Technical Forum session on 4th June for members addressing design guidance and standards associated with High Rise Sanitary Venting. The evening consisted of presentations and Q&A session from a panel of esteemed professionals within the industry, combined with the launch of new interactive audience software which enabled live Q&A monitoring, opinion poll monitoring and general feedback to be harvested from those that attended. The presentation information and interactive feedback from the audience will form the basis of the Third SoPHE Technical Bulletin, providing our members with much sought after guidance on the topic.

Building on the past few months, the remaining months of 2019 and 2020 look to hold some interesting and enjoyable events in the SoPHE calendar. Following SoPHE's presence at the Healthcare Estates Conference in October, the SoPHE annual dinner will be held on Thursday 7th November at the Royal Garden Hotel Kensington, which never fails to deliver. This year sees us joined by an inspirational speaker who has travelled the world and lead some epic expeditions, which I suspect might awaken everyone's travel bug within!

Following the annual dinner in the south, the Northern Annual Dinner held at the Midland Hotel in Manchester will be held as a landmark event, marking 10 years of the successful members event – another good reason to celebrate!

As always, my thanks go out to the Steering committee, specialist committees and Industrial Associates for supporting SoPHE's endeavours. If you would like to become involved with the running and development of the society, we would love to hear from you. We hope you enjoy the content of this latest Journal, with many more to come.



Best regards,

Jonathan Gaunt
SoPHE Chair

chairman@sophe.co.uk

An education masterclass

Continuing the work to improve the future of our industry



James Day provides an update on what's been happening and what's coming up for our Education Group.

Kirk Douglas once said, "the learning process continues until you die" and at the unbelievable age of 102 I reckon he still learns something new every day. I wholeheartedly believe in his sentiment and as such will try to steer the education group to ensuring everyone in the public health engineering fraternity is given every opportunity to further their learning.

So it's been a year since I took the role of chair for the education group, and even though there are numerous initiatives the group run or assist, I can't take credit for any of it. Instead there is a masterful support team running all our projects leaving me free to boast to you all about how good they really are. Below is a summary of our current missions that I hope you enjoy learning about, and if your intrigued by any of them and think you can help please get in touch.

I look forward to hearing from you.

The SoPHE YEA 2019

The SoPHE young engineers award 2019 has been launched. With a slight shift from our normal task-based project, this year's challenge is to produce an inspiring video presentation on the subject of being a public health engineer or fascinating discipline related project you are working on. We hope the videos can be used to encourage the new generation of public health engineers coming into the industry. Further information, submission guidance and competition rules can be found on the SoPHE website.

Best of luck to everyone that enters.

The Plumbing Centre of Excellence

As many of you have read on the SoPHE linked-in account the plumbing centre of excellence has had an exceptional inaugural year.

Headed by Sanjay Modasia of the contractors working group and Steve Vaughan of the education group, the PCE is a joint venture with CIPHE to provide additional learning opportunities for students studying their NVQ level 1-3 at Havering College.

By providing additional lectures, up to date material and system display boards, in-depth workshops and access to emerging technologies, the scheme hopes to boost the technical knowledge of site operatives or provide a good foundation for students moving to work in consultancy. After a very successful first year the team are in discussion with rolling the scheme out to other colleges.

We're all excited about this one and expect great things in the future.

Public Health Training Framework

The education group recognise that formal public health engineering courses are not currently being provided by Universities in England, meaning today's trainee public health engineers are being trained almost exclusively in-house. This has inevitably led to inconsistencies in the training being provided, making it difficult for both employers and employees to demonstrate what training will be given or received.

In response to this, over the past few years, the education group have been developing the public health engineering training framework.

The framework is currently a set of 10 modules outlining subjects we might expect most public health engineers to have knowledge of. Their purpose is to provide trainee public health engineers and their mentors with a structure for their in-house training. By providing this framework our intention is that training will follow a common structure that becomes recognised throughout our industry. The details of the training framework can be found on the SoPHE website.

Go have a look and tell us what you think.

Public Health Engineering Masterclasses

In the future the education group look forward to helping the SoPHE young engineers network develop a set of public health engineering masterclass courses.

The masterclass Scheme will be intended to provide all those interested in joining engineering consultancies with suitable basic design knowledge to be able to transition into consultancy smoothly, with confidence in their technical capabilities.

The courses will be aimed at university graduates, those wishing to change from site to office or those who trained in another country and want a guide to UK design standards. If anyone is keen to help set up and contribute to the masterclasses and supporting material, please get in touch.

Society of Public Health Engineers (SoPHE)

Young Engineers Award 2019

CHALLENGE

Produce a promotional video celebrating the work of a public health engineer.

It could be:

- Based around a day for a public health engineer
- How particular problems were solved
- The fascinating PH aspects of projects

The video should be exciting, seek to inspire the next generation of Public Health Engineers and produced in a way that celebrates problem solving based on your professional experience.

Submission deadline: 25/10/19

For further information, submission guidance and competition rules please visit:

cibse.org/sophe



Considering the legionella risk in domestic water services

Richard. K. Beattie, Senior Mechanical Engineer at AECOM Edinburgh and Damien Kane, Associate Engineer at AECOM Glasgow give us their views on the subject.

Due to the modern advances in technology, combined with the drive to conserve water (e.g. low flush toilets, low flow devices) it is clear there is a need to obtain current and reliable data on building water consumption to allow building water demand to be more accurately assessed. Without considering the implications of current practices which reduce or limit building water consumption, demand and water tank turnover rates can lead to stagnation of water in domestic installations and result in public health issues, i.e. bacteria growth.

If Legionellae are stressed via, starvation, chemical disinfection, UV light or heated they can opt for a VBNC state rather than die [5]. Whilst bacteria may be in a state of Viable But Non Culturable (VBNC) at low temperatures, they are capable of amplification in warmer water temperatures. A biofilm is any group of microorganisms in which cells stick to each other and often also to a surface. These adherent cells become embedded within a slimy extracellular matrix that is composed of extracellular polymeric substances (EPS).

Further, this means Legionella may be protected from normal water treatment methods [1]. However, it is still possible for biofilm to form that will support bacterial

growth if water is circulated within a system. Water flowing/ pumped in a water distribution system only causes shearing of biofilm; it does not remove the biofilm once it is established. Surfaces of pipework are not smooth so biofilms will adhere to the surface. Therefore, regular draw off and water movement through the system supported through automated flushing systems or via manual intervention by janitorial or Facilities Management (FM) staff are important to help minimise the risk. Therefore, consideration in the sizing of all aspects of domestic water systems should include an accurate estimation of the water consumption anticipated by the end users.

For Legionella bacteria to amplify several factors need to be correct including ambient temperature, relative humidity (RH), and wind. For the bacteria to proliferate there are several potential areas in domestic water systems where bacteria may grow under the correct environment. These include storage tanks, calorifiers, pipework and plant, filters, TMVs and particular types of fittings and materials [4]. All bacterium need a substrate (food source). With the common causes of contamination from hot water or cold water systems being showers, taps, spray heads and spa baths.

Other risk systems include humidifiers and air washers, car wash-lances, horticultural misting systems etc [1].

For Legionella to proliferate there are a number of conditions required which include [2]:

1. Water temperature in the system between 20°C – 45°C,
2. Potential for water aerosols to be formed and become airborne,
3. Water being stored and/or re-circulated,
4. Presence of deposits in the system, such as sludge, organic matter, rust, scale and nutrient,
5. Amoebae are also known to cause retro grade contamination of Legionella bacteria.

Water that is contaminated can become a risk of infection if it can become an aerosol and airborne. Small particles can remain suspended in air for prolonged periods of time and travel over considerable distances [1].

These particles are dry and contain no free moisture. Only bound water is present which represents a small percentage of the total mass. When contaminated air is inhaled into the lungs, (5m diameter or less), particles will be retained in the lungs as these sizes

are difficult to expel [1]. Further the risk increases with duration of exposure, respiratory rate and number of Legionella in the air [1].

Legionellae are only able to grow in water in the presence of other micro-organisms. In addition, Legionellae have been shown to be associated with biofilm on surfaces in water systems where they can grow in the protozoa grazing the biofilm [1]. This enables the Legionellae to survive under conditions that would otherwise be fatal to them and to be transported within both protozoa and cysts to more favourable environments where they might subsequently grow. The association with biofilms, as with other aquatic bacteria, offers Legionellae a nutritional advantage and also provides them with some protection against adverse environmental conditions, particularly biocides that would otherwise kill them if they were simply suspended within the water column. Thus control of biofilm formation within water systems is of paramount importance for the control of Legionellae.

Water flow temperatures also have an influence on water volume being used (and hence water circulation), particularly in relation to hot water services.

However, hot water temperatures need to be sufficiently low enough to mitigate against scalding risk but in doing so this also introduces a concern in relation to bacterial growth, and the presence of Legionella bacteria, Stenotrophomonas and Pseudomonads including other waterborne opportunistic pathogens. The optimum Legionella bacteria multiplication temperature is between 32°C and 42°C [1]. HSE L8 [2] requires there is a need to maintain temperatures above 50°C - 60°C for domestic hot water systems. Interestingly there is no minimum time limit for 60°C in the calorifier. HSE L8 also mentions to ensure stored hot water is generally not less than 60°C with a recommended distribution temperature of not less than 50°C and 55°C in healthcare premises, within one minute of running an outlet [3]. Temperatures in excess of approximately 44°C [3] may result in burns to the skin therefore there is a conflict between storing hot water at 60°C and the risk of scalding. Hot water temperatures therefore need to be controlled either via thermostatic control devices such as thermostatic mixer valves (TMVs) or suitable warning signs adjacent to hot water outlets. Or better still a thermostatic mixing tap (TMT) directly on the WHB minimising pipe lengths from lowered blended temperatures from a TMV to the outlets.

Identifying risk of infection

The ideal temperature, based on empirical data suggests that the perfect microbial growth and proliferation is 37°C. Below 37°C the rate of multiplication declines, were it can be considered marginal below 20°C [1]. Also, certain groups of people are known to be more susceptible, for example; over 45 year olds, smokers, alcoholics, diabetics, immune compromised and those with cancer, respiratory or kidney disease. The HSG 274 states, that all pipe branches to individual outlets should be capable of delivering cold water at a temperature that is as close to the incoming water temperature within two minutes of running.

The management of Legionella risks are described within the Approved Code of Practice (ACOP) Guidance document 'L8' Legionnaires' disease: The control of Legionella bacteria in water systems [2] and HSG Part 2 [3]: The control of legionella bacteria in hot and cold water systems.

The key actions are:

1. Appointment of a 'responsible person' to be managerially responsible;
2. Identification and assessment of sources of risk including the preparation a risk minimisation scheme for preventing and controlling the risk;
3. Implementation and management of the risk minimisation scheme;
4. Record keeping and checking the actions taken are effective in preventing or controlling the risk.

Risk assessments are about compliance and vulnerability. Therefore, risk assessments involve assessing compliance status using checklists, the response to which are either 'yes' – indicating compliance or 'no' – meaning non-compliance. A 'Risk' increases when the non-compliant aspects accumulate. Fundamentally this means the more non-compliant conditions, there is an increased likelihood that something shall transpire. When the risk has been assessed it is then necessary to minimise and control

it. The risk assessment must be reviewed regularly as stated in HSE L8.

The record of the assessment is a living document that must be reviewed to ensure it remains up-to-date. Arrangements must be made to review the assessment regularly and specifically whenever there is reason to suspect it is no longer valid. An indication of when to review the assessment and what to consider should be recorded [1&3], this may result from, e.g.:

1. Changes to the water system or its use;
2. Changes to the use of the building in which the water system is installed;
3. The availability of new information about risks or control measures;
4. The results of checks indicating that control measures are no longer effective;
5. Changes to key personnel;
6. A case of legionnaires' disease/ legionellosis associated with the system.

The following list contains some of the factors which should be considered [2]:

1. Source of system supply water;
2. Possible sources of contamination of the water within the premises before it reaches cold water storage, hot water storage, cooling tower or any other system using water that may present a risk;
3. Plant operating characteristics;
4. Unusual but foreseeable operating conditions;
5. Means of disinfection;
6. Review of current control measures;
7. Local environment.

When the assessment indicates there is a reasonably foreseeable risk from a water system, exposure has to be avoided so far as is reasonably practicable. Where this is not reasonably practicable a Written Scheme for controlling the risk from exposure should be implemented and properly managed. The scheme should specify measures to be taken to ensure it remains effective.

Controlling the risk

Risk of exposure is typically controlled by measures which may minimise Legionella growth and also by reducing exposure to water droplets [2]. These measures include:

1. By avoiding water temperatures 20°C to 45°C;
2. Control water spray;
3. Avoid water stagnation;
4. Do not use materials that can harbour bacteria or nutrients;
5. Maintain cleanliness of the systems;
6. Use water treatment techniques;
7. And, ensure correct and safe operation and maintenance.

In respect to domestic water systems

The following lists several important aspects which can help prevent Legionella proliferating within domestic water systems [1 & 4, this list has been extended from the references]:

Cold water system:

1. The cold water outlets, mains or stored achieves <20°C
2. Suspected low use outlets are disconnected or run full flow until temperature stabilises weekly, also to achieve a temperature <20°C;
3. Dead legs are removed and piped through; if possible, if not then they should be managed as per L8 paragraph 80 and identified in the Legionella risk assessment;
4. The cold water storage tank shall be an appropriate size for the demand;
5. Through flow of water from inlet to outlet of the tank, for good tangential flow;
6. A lid is required and insect screens on overflows, warning pipes and lid air vents;
7. The inlet flow is fitted with the appropriate backflow protection;
8. And the temperature achieves <20°C – with the tank insulated where possible to prevent heat gain.

Hot water system:

1. Storage temperature 60°C;
2. Check for temperature variations regularly;
3. Check volume, usage and recovery rates;
4. All hot water outlets achieve >50°C within 1 minute; unless fitted with a TMT or TMV;
5. Remove any dead legs; if possible;
6. Install or extend secondary pipework. If required in the design;

The above aspects may not be exhaustive, but may contribute to minimising Legionella growth in domestic hot and cold water installations.

Legionella risk scoring systems

Legionella risk assessments may contain a "risk scoring system" or "risk algorithm" as an aid to understanding the relative risk of the systems assessed. However, any scoring system used by the risk assessor should be explained to the intended reader and cover the following.

Contamination:

An evaluation of the risk at source, including assessment of the quality, temperature and integrity of the water supply.

Amplification:

Determination of the cultivation conditions: assessment of the likelihood that Legionella will proliferate, including an assessment of conditions such as the temperature, water change rate, areas of static or slow water movement and how conducive the conditions are to microbial growth.

Transmission:

An assessment of whether droplets or aerosols are likely to form and spread

Exposure:

Determination of the risk that droplets or aerosols will be inhaled or contaminated water aspirated.

Host susceptibility:

An evaluation of the nature of the exposed population, taking account of their vulnerability when exposed to legionellae.

For the implementation of a risk scoring system to be of value, the repeatability of the system should be assured by clear guidance on the application of such a system to all risk assessors undertaking such evaluations.

Continued from page 5

Summary

It is becoming ever increasingly difficult to size cold water and hot water systems as more low flow devices and mixing valves are being incorporated.

Even though Legionnaires' disease outbreaks are infrequent they are potentially life threatening, which may be avoidable through engineering design and operational side maintenance and management. The successful control of Legionella bacteria is a combination of good technical engineering design and client side control management. One of the engineering key considerations for this examination of domestic water systems should be to review the sizing guides/methodologies to account for modern practices; this will also require more research data analysis and promotion of knowledge sharing of raw, live consumption data from actual buildings.

Competing interests

The issues raised in this article have accumulated through several resources and

in no way reflect any one specific project or AECOM design. The issues and mitigation measures have been compiled through the experience of multiple engineers from many consultancies over several years.

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SoPHE Technical update



Jassim Daureeawo provides the latest Technical update.

The focus of the Technical Committee this year is to promote knowledge sharing through a number of activities and publications.

Technical publications are becoming increasingly popular and they are gaining the necessary momentum to enable more regular publications on key topics.

Technical Bulletin (TB), TB-01-16 "Domestic Water Demand Assessment for Pipe Sizing" based on the LUNA (Loading Unit Normalisation Assessment) project, is available from the SoPHE and CIBSE Website.

Technical Bulletin (TB), TB-17-01 "Rainfall Intensities and Drainage Design", is currently under development and has recently been approved by the Technical Committee for publication. The bulletin will be made available to the SoPHE members. The document will be released at the end of 2019.

The next TB which is currently under draft is based on: "Ventilation requirements in Above Ground Drainage stacks".

A technical forum was organised on the 4th of June 2019, primarily to gather designers' opinions and concerns associated with lack of guidance on the provision for ventilation in drainage systems.

The forum's objectives was:

- To provide an insight from professionals with regards to three key categories associated with ventilation in drainage stacks:
 - Designers' Perspective - Peter White - Director - PHDC Ltd
 - Manufacturers'/ Installers' Perspective - Steve White - Head of Building Drainage - Global - Aliaxis Group
 - Researchers' Perspective - Dr Michael Gormley - Heriot-Watt University
- To gather and understand the industry's concerns about UK current practice.
- Open forum to discuss the way forward to assist the industry, in particular, the designers of drainage systems.

The design of ventilation in drainage stacks are limited to the provision made in BS EN 12056 Part 2 and IOP design guide. However, it is understood that there is no clear guidance on the subject, particularly when considering the design of high-rise building drainage ventilation system.

The current practice within our industry is to use our best engineering judgement to incorporate the "appropriate and adequate" ventilation system within our drainage design. This approach is resulting in an

Join the SoPHE Masterclass Scheme



A series of 1 day training courses in basic Public Health Engineering Design related subjects with the aim of providing an opportunity for young engineers to gain knowledge in the fundamentals of public health services design and provide them with technical guidance on the design process.

The SoPHE Young Engineers Network committee have been working hard developing a training scheme to help young UK engineers at the start of their career.

Our aim is to prepare a range of comprehensive courses, with material for approximately 8 hours of training in Public Health Design related subjects including:

- Rainwater Drainage design
- Foul Water Drainage design
- Domestic Water Services design
- Fire Protection services (with inclusion of domestic and residential sprinkler design)
- Gas Services Design
- Medical Gases Design
- Below Ground Drainage Systems

inconsistency and lack of standardisation for the provision of ventilation in drainage system. Some design engineers will start to introduce secondary ventilation for 15-storey buildings and above, whereas some will choose to use 20-storey as a threshold. Which one is right?

Some questions that the next TB will hopefully be able to answer include; when do we need to start considering secondary ventilation in drainage system? Do we have current clear guidance in our BS and other Standards? What is the UK current and best practice? Is hydraulic modelling of Drainage Stacks required? Do we need to adopt international standards, including American Standards/Guides ASPE etc? What are the relevant calculations and methodologies to be using to validate the relevant design associated with ventilation in drainage stacks? Loading of stacks and Ventilation requirements?

If you are interested in joining our mission to help us provide young engineers with robust training, please contact the organisers within SOPHE YEN Committee and help us create a strong future for Public Health Engineering in the UK.

- Email:
- katarzyna.lechowska@aecom.com
 - ben.goodfellow@wsp.com
 - eric.nascimento@wsp.com

Your comments and feedback on the next TB are welcomed and please send your comments to technical@sophe.co.uk.

Technical Events

For Future SoPHE events please visit us at: www.sophe.co.uk

Contact SoPHE's Events team at events@sophe.co.uk should you wish to propose some ideas on future events.

Technical Publications

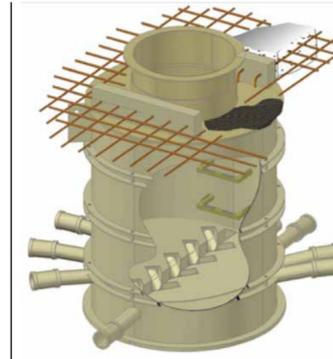
If you would like to see publications in relevant topics please send us your suggestions at technical@sophe.co.uk

If you are a SoPHE member and would like to obtain copies of relevant SoPHE's publications, please send us an email on technical@sophe.co.uk.

Stay on-track by going off-site



Design for Manufacture (DfMA), or Offsite Build has now become common practice within the Construction Industry; improved manufacturing techniques interfacing with 3D Modeling methods have aided the dramatic improvement of available offsite build solutions.



Designers and Contractors now have the opportunity to consider factory-assembled products designed to improve installation programs and enhance on-site safety. The selection of offsite built valve skid assemblies and modular boiler rooms is also becoming standard procedure by mechanical engineers as they are a proven and effective alternative for traditional site installation methods.

For DfMA to be considered for project utilization, early engagement with the manufacturer is essential in order to evaluate and understand the process of product design through to manufacture.

Thermoplastic manholes are not new to Public Health engineering and have been successfully installed since the 1970's. They have been primarily associated with chemical and trade effluent waste systems for which traditional built, brick and concrete manholes are not suitable due to composition of the effluent being discharged into the drainage system.

The majority of thermoplastic manholes are manufactured using either High Density Polypropylene (HDPE) or Homopolymer Polypropylene (PP-H), both of these materials have good corrosion resistant properties however PP-H offers an increased operational temperature.

DfMA thermoplastic manholes can be fabricated to suit specific project drainage

layouts, with branch sizes and angles corresponding directly with the drainage layout drawings. The thermoplastic material has a smooth finish and also provides superior resistance to the build-up of fats, oils and grease.

Pipework dimensions will need to be selected by the manufacturer to suit the specified interconnecting pipework between the manholes - such as cast iron, vitrified clay or other thermoplastic pipework systems, ensuring that the internal bore diameters correspond. Mechanical type joints can be used for manhole connections, alternatively Electro-Fusion jointing of interconnecting PP-H pipework can provide a fully welded drainage system thus preventing any potential groundwater issues or root attack into the drainage system.

During manhole selection it is important that Public Health Engineers are aware of current manufacturing standards, and the relevant testing required for associated specifications.

Thermoplastic manholes should be designed and manufactured to BS EN 13598, which is also mentioned in Sewers for Adoption

7th Edition. Manufacturers of these types of manholes will be required to obtain third part product testing, with the BBA & WRc, to provide clear verification that the manholes have been tested to the respective BS EN standard.

Open channel and bolted internal hatch boxes are available within the manholes to suit the Public Health Engineers' project specific requirements. The manhole dimensions must correspond with the requirements of Section H Building Regulations for man entry into manhole chambers.

Steel core, plastic encapsulated manhole steps, manufactured to BS EN 13101:2002 are factory installed as per usually provided with concrete and brick manholes, the manholes steps are welded through the chambers to provide a water tight seal.

The manufacturer will be responsible for providing a detailed drawing for each of the manholes to ensure accurate recording purposes of the installed system. Interfaces with the structural slab should also be provided to suit project requirements with access openings ready to accept the manhole cover and frame and finishes to bond with a damp proof membrane if required.

Contractors who have experience in the use of thermoplastic manholes for chemical applications, can furthermore appreciate the advantages of utilising this product for installation in foul and surface drainage systems. The speed of installation and quality of factory tested manholes provides significant improvements when directly compared to traditional on-site build methods. As on-site space limitations continue to become more of an issue, in regards to the stocking of materials, the fast track delivery and direct installation afforded with these manholes offers a major advantage. The long periods of time conventionally spent by site operatives



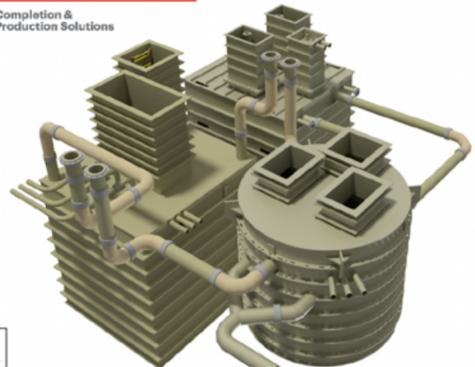
working in deep excavations can be vastly reduced, and the necessity of confined space works is almost eliminated.

Factory tested, welded thermoplastic manholes are also suitable for deeper site excavations in high water table environments, and provide prevention of groundwater ingress into the drainage system. This is often an issue with traditional built brick and concrete chambers.. Thermoplastic manholes are now the preferred option for brown field sites, or locations where H2S is an issue for concrete manholes. Manufacturers should also be able to assist with chemical resistance to site specific hydrocarbons.

The manufacturing process of thermoplastic manholes involves modeling the manholes from either 2D or 3D drainage construction drawings. Standard components such as reinforced bases, bodies and pipework are stocked ready for final butt fusion assembly to suit the construction drainage drawings. Co-ordination between the manufacture and contractor is extremely important to ensure that any possible design changes are captured prior to delivery of the manholes to site.

Site testing is subsequently reduced as it is the responsibility of the manufacturer to provide factory test certificates of the manholes, and respective product warranties and design life.

Additional options of external or internal backdrops can also be factory fitted with internal rodding eyes as per the drainage design drawings, thus allowing a complete solution from the works to site.

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Regional round-up

Thank you to all SoPHE members, including our Technical, Industry and Contractors group members for their continued support for the various regional groups.

SoPHE North West



The SoPHE Northern Dinner 2019

Technical evenings occur on a regular basis and thanks must go to all the Industrial Associate (IA's) members willing to provide these, as well as those individuals willing to attend; I know that on some nights the football (Man Utd or Man City) may appear to be more important but these evenings are provided for your benefit! At the time of writing, the next available date slot for an IA to provide a technical evening is NOVEMBER 2022 !!

As some of you may have seen in the CIBSE Journal, the SoPHE Northern Dinner took place on Friday 10th May 2019 in which we had 126 people attend; the guest speaker was Graham Poll, ex-premiership referee who is infamous for booking the same player 3 times in the same match at the World Cup! Great stories were told by Graham who had the audience captivated by his humour & interesting insight into the world of professional football!!

Normally, the SoPHE Northern Dinner takes place on the Friday immediately after the May Day Bank Holiday Monday; however, for 2020 – due to the Government having moved this Bank Holiday – it has been necessary to hold the next Dinner (our 10th!) to Friday 1st May 2020.

We do hope that as many of you as possible are able to attend & that as many of the IA's are willing to sponsor this event. Thank you to all those that have attended / sponsored over the past years; I hope that this one will be a bit special!

If anyone should have any ideas / suggestions for an event or wishes to be more involved in what the region is doing then please don't hesitate in contacting me; I need all the help I can get!!

Upcoming events

All technical sessions for the Region are held every other month on the 3rd Wednesday of the month at the Rain Bar, Boardroom (2nd Floor), 80 Great Bridgewater Street, Manchester. M1 5JG; 6pm (for a 6.30pm start) to 8pm approximately. The next one is Wednesday 20th November "Controlling waterborne pathogens with copper and silver ionisation", to be presented by ProEconomy.

With regards to IHEEM NW region : technical sessions are held at various different sites mainly within the Greater Manchester area & on different days of the week, primarily on a monthly basis. The next one is due at the end of September (date, time & place yet to be announced) & will be entitled "Lighting solutions for Healthcare".

At the beginning of October (8th & 9th) is the Annual IHEEM Exhibition & Conference which takes place at the Manchester Central Conference Hall (formerly known as the G-Mex); apply online if you wish to attend. On the 16th October, there will be a joint IHEEM NW / SoPHE Northern event ; EUSR Water Hygiene course undertaken by a MUUK EUSR Trainer. Delegates at the end will be able to apply for their EUSR Water Hygiene card upon completion of the course.



SoPHE London

So far this year we have covered a range of subjects with the London technical evenings with some good attendances.

Past events have included:

January

Copper Silver Ionisation for the control of water borne pathogens by ProEconomy

February

Sacrificial zinc limescale treatment by Aquabion

March

Sprinkler head spacing rules by Steve Vaughan, AECOM Regional Director

April

Protection against surge in water services systems by Wilo

May

Water Mist Fire Suppression Systems by Marioff

June

SoPHE AGM and 2018 SoPHE Young Engineers Competition winners presentation

SoPHE Drainage Ventilation Forum

This was a special event to discuss some of the issues on the subject drainage ventilation to mark the initiation of the writing of a SoPHE technical bulletin on the subject.

Upcoming events

November

Natural gas regulations and installation

Date TBC

Vacuum drainage systems

SoPHE South West

Recent events include:

Water Hygiene CPD

10th June 2019

A presentation held at Arup's office from Water Hygiene Centre (Daniel Pitcher) and from Malcolm Atherton who presented on Water Safety and best Engineering Practices, covering the following:

- Temperature monitoring (WH)
- Water sampling (WH)
- Appropriate components and tools (WH)
- Record keeping & log books (WH)
- Best engineering practices (MA)
- Do's and Don'ts (MA)

18th September 2019

Blue Roofs from an Engineers perspective

Venue: Arup's Office, Bristol

Presenter: Rod Green

An understanding of a Blue roofs, what they are? Regulations, types, what to consider? do's and don'ts etc.

This will all be from an Engineer's perspective.



Steve Vaughan talks about Sprinkler head spacing rules



The ProEconomy talk on Copper Silver Ionisation for the control of water borne pathogens

SoPHE Scotland

Since Dr Richard Beattie was handed the reins by Jonathan Gaunt to restart the SoPHE Scotland branch in March, it's been slow but building progressive momentum to show SoPHE Scotland is back. To kick-start SoPHE, Richard had the pleasure of attending the CIBSE Scotland Conference, Glasgow – 'Evolving Building Technology', on the 13th March this year. Where standing at our SoPHE banners we received some attention and some potential new joiners.

Richard was then fortunate to be invited to the Northern Dinner organised by Malcolm Atherton, kindly sponsored by John Wilson of Teekay couplings, this allowed him to discuss the Scotland branch further.

With the holiday season appearing rapidly we decided to have some technical evening CPDs after the holiday period and after the Edinburgh Festival.

Going forward then, we have been in discussion for two technical evenings each with a different manufacturer, details TBC. Each is expected to be held at the Edinburgh Training and Conference Venue, City Centre.

Richard will also be attending the Healthcare Estates Conference and Exhibition, Manchester Central in October. Where he will be presenting in the main conference hall as a SoPHE representative and then stationed at the SoPHE stand for the remainder of the day.

SoPHE LinkedIn Group is approaching 900 Members



The SoPHE LinkedIn group is growing and accumulated nearly 900 members.

The CIBSE SoPHE group members include designers and consultants from the UK and abroad, also members from other PH related groups like academic and contractors, planners and local authorities, also manufactures and equipment suppliers.

"The SoPHE LinkedIn group is a very convenient hub to share information on any upcoming events organised by the Society in all regions, also a share point for the industry announcements. It is used to exchange ideas or just to explore on other members experience and advise" says Steve Vaughan from AECOM, one of the group managers.

Be inspired to join the group share your views and experience on any technical subject and add to our discussion!

To join us on LinkedIn search: "CIBSE SoPHE"

Have you completed our online survey? Give us your views on The SoPHE Journal
DETAILS ON INSIDE FRONT COVER



Collaborative Working Group updates

Water Management Society (WMSoc)

Steve Vaughan

The Water Management Society (WMSoc), for those of you who are not aware are a society that endeavours to provide definitive and informed guidance on the control of Legionella, Legionnaires' disease, Pseudomonas, other water-borne organisms and all related aspects of water management. They also strive to maintain and improve associated standards within the industry and provide a high level of expertise and knowledge as part of comprehensive training schemes.

Future partnership plans include developing a SoPHE training event at the WMSoc facilities where their practical training area has test rigs which allow faults to be

replicated within domestic hot and cold water systems for diagnostic analysis.

It has also been agreed that SoPHE members can attend WMSoc technical events and CPD's at members rates. Their next conference is titled "Designing Out 3" on 20th November will include presentations on Smarter Healthcare design, New hospital with new problems and Engineering for Public Health which will be presented by our very own Chair, Jonathan Gaunt.

For further details and registration please go online at <https://www.wmsoc.org.uk>



SoPHE and CIPHE partnership goes from strength to strength

Martin Shouler

SoPHE and CIPHE have been collaborating for many years, especially developing new guidance for the public health engineering practitioners. The two professional organisations are now building a more formal structure and have agreed to work to develop a Memorandum of Understanding (MoU). As well as collaborating technically, this collaboration will bring the opportunity to develop a common position on issues affecting the sector'

SoPHE Chairman Jonathan Gaunt commented that 'this collaboration will help further the art and science of public health engineering'.

CIPHE CEO Kevin Wellman said 'Whilst we have enjoyed great success through numerous joint initiatives this affords a great opportunity to reinforce our working relationship and at the same time enhance standards within the plumbing industry and public health engineering sector.'

CIPHE President and Past Chairman of SoPHE, Chris Northey welcomed the collaboration saying 'I have been a long standing member of both organisations and I believe this will improve education and training for those entering our industry and, at the same, raise awareness of best practice to safeguard the health, safety and welfare of the public.'



IHEEM Collaborative

Malcolm Atherton

Due to the good working relationship between SoPHE Northern & IHEEM NW region that has grown over many years, it was felt appropriate that the Northern region representative should approach IHEEM with a view to creating a collaboration to work together for a "common goal".

This, obviously, has had to be carried out on a formal basis and as a result, the Memorandum of Understanding document was provided to the local region for review and comment, before being forwarded onto the Institute's head office committee for their comments.



Industrial Working Group update

Alan Flight

Less than 12 months ago Mike Darvill hung up his gloves as Chairman of the IWG following several years of stewardship. We thank and congratulate Mike for his years of hard work as Chairman of the IWG, by guiding the group through Annual Dinners, enhancing the IWG organisation to grow membership and keeping pace with the busy events calendar. His positive influence on the industry is highly evident. Mike has now taken a back role as IWG Events Manager.

I was sworn in as temporary Chair at the end of last year to be officially sworn in at the IWG Annual General Meeting in the summer.

To give an overview to the strides taken over the last 12 months by the IWG these include:

Our 13th SoPHE Annual Dinner at the Royal Garden Hotel with a successful Young Engineers award ceremony, a £1000 charitable donation to the chosen SoPHE charity – "Engineers Without Borders" and a healthy profit to help fund other SoPHE activities.

The Northern Dinner organised by Malcolm Atherton who has tirelessly worked for many years in running a great event with the usual IWG Charitable donation and profits..

The IWG holding its first manufactures Exhibition at the Building Centre in London. This had approximately 30 companies exhibiting. An informative presentation on 'The successful drainage design of flat roofs' by Dr. Malcolm Wearing was well received.

We now have a Contractors Group within the IWG which is guided by Sanjay Modasia from J.A. Brooks. Sanjay has been working on training programmes with colleges for plumbing apprentices and has now officially represented SoPHE in assisting the setup of the Plumbing Centres of

Excellence at Havering college. Please refer to the Education Group update for further information on this.

We have a larger range of CPD training presentations offered from within the IWG of which details can be found on the CIBSE website. There has also been a number of Young Engineers training events this year sponsored by the IWG.

Our IWG membership has also grown healthily to over 70 manufacturers.

The IWG meets its objectives through the hard work of 15 very active committee members that meet quarterly. We also meet bi-monthly with the main SoPHE Steering Group Committee to review the objectives, activities and goals.

If you would like to know more about the Industry Working Group or would like to contribute, please contact me.

Email: alan.flight@bwater.eu

Contributions

We would welcome any contributions to future editions, please let us know us about:

Future events

Items or comments you think may be worth raising or informing your fellow members.

Technical articles from members, giving situations encountered and how they were overcome.

Email: info@sophe.co.uk

Feedback

We're always open to suggestions about how we can make this publication better for our members. Please share your opinions and ideas about what we should be providing to our members.

Email: info@sophe.co.uk

Sponsorship

If you are interested in sponsoring one of our feature articles, please get in touch with us.

Email: info@sophe.co.uk

Social

The SoPHE LinkedIn group (Society of Public Health Engineers (CIBSE SoPHE)) is an ideal platform to reach out to your SoPHE colleagues to discuss new technologies, raise technical queries and keep up to date with whats going on with SoPHE in your region. You can also follow the latest updates on Twitter @The_SoPHE



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