

# Society of Public Health Engineers

Newsletter  
Issue May 2006



A tittle or two to celebrate SoPHE's Second Anniversary held at The Clink Prison. Pictured left to right: Martin Shouler (SoPHE Chairman), Donald Leeper (CIBSE President) and Chris Northey (SoPHE Hon. Secretary)

The Society of Public Health Engineers is a part of the Chartered Institution of Building Services Engineers (CIBSE):

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If you would like to know more about the SoPHE or are interested in becoming a member visit [www.cibse.org/sophe](http://www.cibse.org/sophe) or contact Samantha Caplan at [scaplan@cibse.org](mailto:scaplan@cibse.org)

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## Message from the Chairman

It has been an interesting few months for our industry. There have been a growing number of predictions of 'the worst drought for 100 years'. As well as drought, climate change predictions indicate new risks of flooding.

We have seen Folkestone and Dover designated as an area of water scarcity (granted on 1 March 2006 will last for ten years). There is a growing agreement that there is a risk to public water supplies across south east England. Increased stress will be placed on this same resource as this is the area for which new housing development is targeted. Recently, DEFRA and ODPM have announced that they will look at regulating together. Water efficiency is contained within element of the Water Supply (Water Fittings) Regulations 1999 and was proposed for the revision of Part G (Hygiene) of the Building Regulations.

What does this all mean for us? My feeling is that we need to be seen as the professional engineers who can provide sustainable water management solutions for buildings both new and refurbishment. We need new tools to assist us in this including guidance on the use of alternative water supplies, such as rainwater harvesting, greywater and borehole water. We need to work with our regulators, DEFRA and ODPM, water utilities, our professional bodies and manufacturers and suppliers to demonstrate sustainable solutions. Equally, building occupiers need to play their role. Again we can assist in this by providing good quality information on our systems. Water management needs to be considered in the round, i.e. we are part of a total water cycle. For example, can on-site stormwater retention be combined with rainwater harvesting?

This issue of the newsletter includes a wide range of topics from protecting the health of building occupants through to the use of water urinals to reduce demand. I hope you find the information stimulating and interesting. I would like to thank our contributors and editors, especially Jonathan Gaunt. We are always on the look-out for interesting articles. Please speak to our newsletter editor if you have any ideas. I look forward to meeting you at our AGM on 27<sup>th</sup> June 2006 at O'Neils Function Room (see forthcoming events for full details on Page 5).

## SOPHE celebrated behind bars

The Society of Public Health Engineers celebrated its second year anniversary on 24 November 2005 at The Clink Prison in London Bridge. The event was attended by over 160 guests from throughout the industry who mingled with familiar and new faces at the unique reception in the Prison surrounded by real torture artefacts, followed by a hot buffet sit-down dinner and drinks, jazz band and sword fighters in an enchanting gothic room upstairs.

The President of CIBSE, Donald Leeper, was in attendance and gave an insightful address of support for all the efforts and developments that SOPHE had achieved in the past year.

Martin Shouler, SOPHE Chairman, gave great appreciation to the pro-active committee and outlined that the Society had: an increase in membership of 50% across the grades over the past 12 months, including as far a field as Australia, Hong Kong and New Zealand; the North West



Region had celebrated its first year anniversary recently thanks to the sterling efforts of Kate Longley; a full technical programme including talks that branch out to national conferences and to the CIBSE regions; a quarterly newsletter as a way of disseminating information and best practice; developed a PH degree in partnership with the IPHE and Greenwich University with the first students set to join in September 2006 and a SoPHE Award Scheme for students also in the pipeline; provided advice information and advice to policy makers including the Mayor of London Water Strategy, the revision of Building Regulation Part G (Water Conservation and Hygiene) and the House of Lords Enquiry on Water Management. Martin Shouler also highlighted that alongside all the Society's activities was a very active Industrial Group which had blossomed to eleven members in the past year.

Martin Shouler reflected that the effect of the climate has had a focus on a number of natural disasters including Tsunami and the storms of America and that there was growing evidence to support the concept of climate change. He said, 'I have said previously that PH Engineering has traditionally been seen as the guardian of the nation's health; providing safe, hygienic and effective sanitation and drainage within buildings. This is an extremely important role and we have seen news reports from developed countries what happens when that infrastructure breaks down. Our emerging role is the provision of sustainable solutions which reduce man's impact on the environment (and the impact of the environment on man!)'.

The event was generously sponsored by Hydrotec (UK) Ltd, Andrews Water Heaters, AO Smith, Climate Pipework Systems Ltd, Geberit Ltd, Honeywell, Douglas Controls and Saint-Gobain Pipelines. And once the sawdust had settled, it was calculated that through ticket sales and collection on the night over £120 was raised for the charity WaterAid which has a vision that everyone throughout the world has access to safe water and effective sanitation.



**Non- members were put through their paces until they had sworn allegiance to SoPHE**



## PREVIOUS TECHNICAL EVENTS (2003-2006)

1. **TYCO/WORMALD FIRE SYSTEMS.** Life and building fire protection  
Contact: [www.wormald.co.uk](http://www.wormald.co.uk)
2. **MARLEY PLUMBING.** Sanitation sizing to BS12056, Part 2.  
Contact: [www.marleyplumbinganddrainage.com](http://www.marleyplumbinganddrainage.com)
3. **HYDROTEC UK LTD.** Technical overview of physical water conditioners and ultra violet disinfection.  
Contact: [www.hydrotec.co.uk](http://www.hydrotec.co.uk)
4. **A O SMITH (WATER PRODUCTS Co).** Assessing, sizing of direct and storage type hot water heaters for commercial/industrial applications, giving consideration to latest building regulations.  
Contact: [www.hotwater.com](http://www.hotwater.com)
5. **VERNAGENE.** Chlorine dioxide, Disinfection. Understanding the principles of dosing with consideration to health and safety aspects.  
Contact: [www.vernagene.com](http://www.vernagene.com)
6. **NEW HADEN PUMPS.** The design and sizing of both foul and surface water pump sump chambers and stations.  
Contact: [SouthEast@NHPumps.com](mailto:SouthEast@NHPumps.com)
7. **ALLAN AQUA LTD.** Design principles for boosted cold water and fire services relating specifically to high rise buildings.  
Contact: [www.allanaqua.co.uk](http://www.allanaqua.co.uk)
8. **THAMES WATER PLC.** Discussions on items within the Regulations which required clarification.  
Contact: [www.thames-water.com](http://www.thames-water.com)
9. **CLAY PIPE DEVELOPMENT ASSOCIATION LTD.** An overview of Building Regulations 'H', Parts H1-H6 Drainage and Waste Disposal.
10. **KSB LTD.** Grey Water Re-cycling for various types of buildings; general over view on the design principles with advantages and disadvantages on the possible options for re-using water.
11. **BRE.** Control of Legionella Bacteria in water systems.
12. **SPEL Products.** An introduction to surface water/Foul water Purceptors, Stormceptors, both full retention and by-pass types. Sizing, Alarms, Regulations and update on the latest Rivers Authority Requirement etc.
13. **EVAC.** Design principles for vacuum drainage systems.
14. **GRINEL.** Designing Sprinkler Mist systems.
15. **GEBERIT.** Design principles of symphonic rainwater systems.
16. **HONEYWELL.** Applications of Thermostatic Mixing Valves. TM2 and TM3 valves
17. **NEW HADEN PUMPS.** Over pumping into surcharged sewers.
18. **Grundfos.** The principles of borehole pumping and pump sizing. [www.grundfos.co.uk](http://www.grundfos.co.uk)
19. **Micro Drainage.** Suds attenuation modelling through the use of Micro Drainage computer software.
20. **Conder.** Sizing principles of small sewage treatment works. [www.conderproducts.com](http://www.conderproducts.com)
21. **Polypipe.** Engineering solutions in relation to SUDS. [www.polypipe.com](http://www.polypipe.com)



## Previous Technical Events Continued...

22. A Review of the Design Principles Associated with Irrigation Systems



A recent technical presentation given by John Wilson (Pipelines) and Peter Snoad (Geberit) on 14 February 2005 on the advantages and disadvantages of Cast Iron Pipework compared to HDPE pipework. The event was a sell out with standing room only, despite being held on Valentines Night!

## FORTHCOMING EVENTS

**27<sup>th</sup> June – Annual General Meeting (Members Only) followed by a presentation by Microdrain- free and everyone is welcome. Venue: O’Neils Function Room, 4 Conway Street, London W1T 6BB.**



## NEWS

### **CIBSE Healthcare Steering Group Launch:**

A Healthcare focus/working group has recently been formed under the CIBSE banner. Their mission statement is to improve the performance of Healthcare buildings by increasing awareness amongst all building professionals and supporting the implementation of relevant standards and legislation aimed at improving the effective use of Healthcare Buildings.

The first technical meeting is due to take place on 24<sup>th</sup> March

Additional information on the focus group can be found through the CIBSE website ([www.cibse.org](http://www.cibse.org)) or contacting the Chairman Ken Holmes at [Ken.Holmes@dh.gsi.gov.uk](mailto:Ken.Holmes@dh.gsi.gov.uk) or on 0870 855 0601.

### **Sewers and Sewer Connections:**

WRC have recently issued the 6<sup>th</sup> Edition of “Sewers for Adoption” a design and construction guide for developers. The document is due to come into effect from 1<sup>st</sup> May 2006.

The document has been updated to encompass current SUDS philosophy, guidance on Flood Risk Assessment for planning applications and a number of technical matters. The document has received a wider acceptance by the water authorities than 5<sup>th</sup> Edition. Where there are differences e.g. manhole sizes, these are set out in a helpful tabulated form.

Also of interest to members will be the section on “Micro Pumping Stations” to cover small pumping stations for up to 15 properties. Such stations can now be accepted for adoption.

For the first time, a section has been included to cover adoption of the “Lateral Drains” or connections to the sewer. Useful diagrams show how it is possible to obtain adoption of private sewers from multiple properties on private land e.g. a collector sewer passing through the front gardens of a number of different properties.

Copies can be obtained from WRC via [www.webookshop.com](http://www.webookshop.com)



## **Thames Water announces major infrastructure works in London:**

On 3<sup>rd</sup> March 2006 Thames Water held a seminar in the City of London, where they were advising on their forthcoming project to replace all of London's water mains over the next 3 years. The particular area being discussed during the seminar was the City of London, the focus of their presentation was to advise everyone of the long overdue need to replace London's water main network due to the massive wastage that currently occurs through leakage in their network. Below are a list of the main bullet points defining the issues raised during the seminar:

33% of all buried water main pipes in the City of London are over 150 years old.

A further 50% of all water main pipes in the same area are over 100 years old.

The replacement of the mains in London is to cost £500 million over the next 3 years.

33% of all water supplied by Thames Water to the general London area is lost to the ground due to leakage.

The total amount of mains pipework to be replaced is 1200 kilometres of pipe.

In the City of London alone there is a total of 109 kilometres of pipe. All of it will be replaced.

The extent of mains replacement includes **all** main runs and **all** branch connections up to the boundary of **every** property served. Meters will only be replaced where necessary.

The aim of this mains replacement programme is to save 120 million litres per day (15% saving of entire water supplied to the TWA region).

TWA estimate a saving of 17 million litres per day in the City alone.

They stated that the replacement works project will have no bearing on system pressures. They did not however categorically withdraw their concerns regarding system pressures.

Work on mains replacement in the City starts next month and will run until March 2009 (seems optimistic).

In the next 12 months, the areas to be affected are the Temple, Monument and Liverpool Street areas of the City.

The vast majority of the replacement will be utilising open cut trenching.



Some mains replacement will be done using moleing and pipe bursting techniques. This is limited though due to impact on adjacent services and the vast number of branch connections where excavation is necessary anyway.

TWA are carrying out a full ground radar survey of their mains network and plotting it electronically. This could potentially be very useful if the information is made available in the future. This exercise is partly being done to identify where pipe bursting etc could be used.

All mains in open cut trenches will be laid along side the existing mains so that disruption to users will be minimal. They said that disruption for change over will only take 40 minutes.

TWA will do letter drops to all building owners etc 3 weeks before they intend to commence any work and they will advise all building owners etc at least 72 hours before any shut down is likely to occur.

They are aware that there are many commercial buildings with uninterruptible supplies for sprinkler systems. They will take additional measures to ensure that the water supplies in these instances are not closed down by providing temporary supplies etc.

When things go wrong, they have a fleet of bowsers and hosing on standby to provide temporary water supplies.

Any user who may have special requirements or cannot afford to have a temporary shut down of their supply can arrange a temporary supply. This is not just for sprinkler systems.

Clancy Docwra is the groundwork's contractors for the City mains replacement works.

There are three other major groundwork's contractors who will work in other areas of London. The important point to note with this is that Thames Water may tie up most of the ground works contracting resource in the London area over the next 3 years so it might have implications on your individual projects, so watch out.

They intend to set up marketing cabins to allow people to obtain information easily. There will also be drop in sessions arranged for questions etc. Further seminars will be held in due course for all other areas of London.

## Pictures of the Month:



The Restaurant soon went down the pan when the customers saw the décor...



### **The new Instantaneous Hot Water Heater Approach...**

## **Article 1:**

### **Overview by Les Wilson (Senior Engineer), Beca - Auckland**

#### **Waterless Urinals**

With the world's fresh water resources being stretched to the limit and the greater emphasis on water savings, the responsibility now lays with the engineer to actively promote water saving technology with all its pros and cons.

A colleague in our office recently prepared a review for a client expanding on the advantages and disadvantages of refill and cartridge type waterless urinals. I felt he chose a balanced approach and his article (edited below) may render some interesting and fruitful technical feedback amongst SoPHE members.

#### **Introduction:-**

Waterless urinals were introduced via the USA market place about 12 years ago and have since gained worldwide exposure. Based on the principle of a oil/alcohol mixture layer being lighter



than urine and thus floating on the top forming a barrier, the urine is effectively sealed from its surrounding environment.

*Advantages;*

Apart from obvious water savings the following could be perceived;

- The surface of the urinal bowl is kept dry (no flushing of water) therefore bacteria from aerosols are unable to multiply and are inhibited from forming a layer on the surface of the bowl.
- Formation of lime deposits on the bowl, caused by the repeated flushing is minimised.
- Hands free operation reducing possible source of contamination.
- Capital savings on infrastructure.
- Less likely to block.
- Less exposed parts with reference to potential vandalism.

*Disadvantages; (Refill and Cartridge type)*

- Reliance on maintenance to maintain effectiveness of seal against sewer gases and associated micro-organisms from entering toilets.
- Sudden failure of cartridge/seal leading to smells.
- Frequency of cartridge replacement is greater than what the manufacturers advise especially in areas of high usage.
- Cartridges could be considered to be a hazardous waste (Especially as uric salts and detritus are retained in trap).
- Reluctance of personnel to remove cartridges (Handling of hazardous waste).

**Summary:**

Water free urinal/s provide cost benefits at installation whilst demonstrating a positive conservation ethic to the community at large. However, the initial cost benefit must be viewed across its potential operational life. The frequency of cartridge replacements or oil/alcohol refills required will be proportional to their usage.

**Conclusion:**

The design engineer in their final selection will need to evaluate whether a water fed sensor controlled flushing mechanism will ultimately serve an installation better than the installation of waterless urinals with the ongoing costs. Regardless whether urinals are water flushed or



waterless they all require a maintenance regime to be in place. The concept of the waterless urinal arose out of the need to conserve urinal flushing water and benefits this could provide.

At the end of the day, use of cartridge/refill type urinals help eliminate uric salt build up in trap (a source of most blockages in urinal waste pipes) but raises problems with disposal and replacement of cartridges.

Thanks to Malcolm Tindal who prepared the original review and Jon Williams (our Technical Director) who allowed me to edit this article for our SoPHE newsletter.



## Article 2:

### The Great George Street Debate, October 13<sup>th</sup> 2005, RICS

#### *‘Drainage and the risk of contamination with reference to the SARS outbreak at Amoy Gardens, Hong Kong’*

Buoyed by a number of the attendees catching a glimpse of half of the pop sensation the ‘Cheeky Girls’ the second Great George street debate on the ‘Cross contamination and infection spread routes within building drainage and vent systems’ was a well attended and diverse affair. Those present came from a variety of Public Health related backgrounds offering differing perspectives on the topic. The evening began with Professor John Swaffield and Dr. Lynne Jack of Heriot Watt University, co-presenting on the background, causes and possible solutions to cross contamination within buildings through drainage and ventilation systems. The example of the SARS outbreak at Amoy Gardens, Hong Kong was used to illustrate the mechanism by which the infection spread via floor drains. Preventative measures were then proposed to minimise long term risk of a similar outbreak occurring. A vociferous and lively debate then ensued in the second half of the evening.

A brief background on the identification of entrained airflow and the causes of trap seal depletion was explained with a physics-based description of how pressure transients are generated. This subsequently results in problems associated with negative and positive pressure. A negative pressure may induce siphonage. This negative pressure is generated by an increase in applied water flow such as an appliance discharge. The danger is that ‘bubble through’ may occur even if the trap seal is not completely broken. This is difficult to determine as no evidence is exhibited post event. Positive transients may be generated by a sudden decrease in entrained air flow such as the closure of air path at the base of a stack due to surcharge. Trap depletion occurs as contents may be forced up into the appliance. Similarly ‘bubble through’ may occur leaving no post event evidence.

To prevent trap depletion, the transient should be dealt with between its source and first appliance trap seal. This renders the traditional practice of venting to atmosphere ineffective while reliance on ‘roof penetrating terminations’ allows the transient to travel the whole system before action is taken. The introduction of Active Control offers a ‘point of need’ approach to the problem. The use of Variable Volume Containment Devices or Positive Air Pressure Attenuators (PAPA) have been devised for this active control measure. The PAPA inflates and deflates relating to the pressures exerted thus absorbing the affects of the transient. The installation of multiple PAPA will minimise the possibility of trap seals being broken.

An example of the affects of such transients generated in the building drainage and ventilation systems is Amoy Garden where the spread of SARS was widely attributed to the shortcomings in these systems. 329 people were affected with 42 fatalities in



the high density building complex. It was established that the transmission was, in part, due to the interaction between the drainage network, the local air pressure within shower cubicles and poor maintenance levels resulting in dry floor trap seals. The SARS infection entered the stack from the WC and generated a mist of infected water droplets drawn downwards within the entrained flow. The cubicle fan then drew this contaminated airflow into the living space. The situation was propagated by the existence of dry floor drains which allowed contamination to penetrate the interior. In analysing the risk factors at Amoy gardens the tall nature of the building, adaptation and maintenance of the floor traps were identified as key factors in the outbreak. Risk variables can be identified which will help in preventing such outbreaks including the building type, drainage design, active control devices and what maintenance regime the services will have.

A new method of detecting trap seal failure has been identified measuring the change in transient reflection. The mechanism works by identifying that full and dry traps offer different reflections of a transient. A dry trap is basically an open end and would have a reflection coefficient of -1 whereas a full trap is similar to a dead end and has a +1 reflection coefficient. The resulting differences would allow defective traps to be identified with the aid of pressure changes shown on a graph.

The World Plumbing Council, in response to the outbreak of SARS, has responded by highlighting the need for well designed and well installed plumbing systems to prevent any further outbreak of contamination. The International SARS symposium made a recommendation to the WHO to develop an international body of standardised knowledge and called for a group of integrated organisations to help implement this. In support of these aims the '*Consortium Addressing the Role of Drainage in Infection Spread*' (CARDIS) was established in September 2004 by Heriot Watt University and CIBW62. CARDIS will facilitate the pooling of experimental and simulation approaches in order to maximise the benefit of ongoing research. In every outbreak in the future CARDIS will create research resource in the event of any future outbreak.

Overall the presentation touched on the main transient issues transients whilst illustrating, through the example of the SARS outbreak at Amoy Gardens, how inappropriate plumbing and venting systems can lead to the outbreaks of infection. Point of use active control measures were explained and the new method of pinpointing defective seal traps described. It is evident that the conditions for the SARS outbreak was a resultant of the particular conditions of the Amoy Gardens area. Specifically the extreme population density, drainage design, high rise nature of the building and poor maintenance of the system which allowed the seal traps to run dry. However these are specific conditions to the area of Hong Kong which are seldom replicated in modern day buildings, particularly in the West. It is therefore prudent to suggest that differing building environments require alternative mitigation measures; other than those put forward in this presentation. As a result it may not be practical to use these potential solutions to address differing environments, particularly in the West. *Many thanks to Professor John Swaffield and Dr. Lynne Jack for their very interesting insight into contamination through drainage and venting systems.*



## Article 3:



Belated New Year greetings to you all...

This, my third contribution to our newsletter is being written from 'Pukenui' – a delightful little fishing village anchored to the Pacific ocean on the West side of the promontory some sixty minutes drive South of Cape Reinga ...(N Z's answer to Lands End less the souvenir mugs and fridge magnets). Actually, looking on the map, this narrow strip of land mass rather resembles a glorious one fingered salute to the Australians across the Tasman Sea.

To say that New Zealand is a land of diversity is an understatement; on our journey North from Auckland we transversed the most beautiful iridescent bays and coves, drove alongside magnificent sand dunes, crossed a breath taking gorge, gawked at giant Kauri trees in the ancient forests - and in seeing all this; we only encountered a handful of motorists. We also photographed an abundance of exquisite Maori-carvings, but one of the more interesting pieces of abstract art that wouldn't have looked out of place in the Tate Gallery adorned the bottom of a farm drive out in the middle of nowhere. The piece in question consisted of a WC pan mounted in front of a 45 gallon drum, upon the top of the drum sat a rectangular shaped rock sculptured to the shape of a cistern, slightly to the right of the pan stood a huge pine cone with a stick impaled into its top. My two young sons were suitable impressed with the sanitary ensemble but there again they've already witnessed a 1960's era station wagon mounted on a tree trunk in the middle of a field so they tend to take Kiwi humour all in their stride!

We have in our Auckland office, a talented fire engineer who happens to possess a natural flair for drawing, needless to say – his talents were commandeered a few weekends ago and we now have our own 'Anecdotes from the Antipodes' logo – so a big thank you to Martin Wong our engineer extraordinaire. In my last communiqué I



mentioned that Tim Surridge and myself were keen to promote a branch of SoPHE out here in Auckland. We approached the local chapter of CIBSE and met up early one morning last July (in this case early meant 7am!). After putting our case forward and discussing its merits, Ian Sumner and Gemma Collings who hold the posts of President and Secretary respectively, pointed out that we may well be hard pressed to attract/locate significant numbers of engineers within our discipline based on the 47,000 000 sheep, 4,000 000 people scenario! Ian put forward a suggestion which made sense at the time, and still does, for Tim and I to join forces with them as full technical committee members where we could combine and promote SoPHE interests with the opportunity to broaden CIBSE's appeal.

This has proved to be quite successful. Tim over the years has built up some good contacts in the industry and in the latter half of last year he managed to secure several sponsors for seminars. Spirax Sarco hosted a steam event show casing products and covering golden rules of steam design, which was attended by about eighteen mechanical engineers plus a few from the plumbing fraternity. A supplier of piping products sponsored a seminar on 'Daily Water Consumption Assessment', which I put together and presented to a huge audience of ten people (and they all stayed awake!). Ian Sumner organised a visit to one of N.Z's navy ships which really was an eye opener and another sponsor hosted a seminar of 'Combustion and setting up of burners' – which may sound dull but turned out to be very interesting.

So what's on our agenda for this year? I'm hoping to secure a visit to one of the big cruise liners over the next six weeks as right now we're in the middle of the cruising season in the Southern Hemisphere and Auckland is one of the main docking ports. I've heard that the QE 11 is due in any time so I'm trying to locate a contact who will be prepared to allow a gaggle of engineers to view one of the many plant rooms on board.... after all, they are little more than self contained floating mini-cities on the open sea. We also have seminars planned for; 'Medical Gases', 'Fire Engineering', 'Solar Hot Water', 'Pump Selections', 'Syphonic Drainage', 'On-site water treatment' and finally 'Building Services education' with more to follow.

Tim Surridge is presently working in with one of the larger suppliers of PP-R piping systems to trial and record heat losses with an aim to clarify and establish a common basis for engineers to be able to specify copper and PPR installations with a better understanding of the insulation factors required... Phew! We have a situation in New Zealand where there appears to be a bit of misinformation being bantered about in some trade magazines. Not only is it confusing but also this leads to many different opinions being touted! Tim intends to monitor a mock-up central heating boiler installation with a both a copper & PPR circuit with no insulation installed. The same circuits will be then insulated with 13mm and again with 19mm insulation. The room housing the circuits has an industrial air conditioning unit and this will be used to control and simulate different seasonal effects so a true comparison can be made! So as you can see folks, we haven't been idle.

Right, I'm off for a bit of Kayaking with one of my sons on the harbour.

## Article 4:

# Plastics Evolve in Chemical and Laboratory Waste Drainage

As organisations look to minimise chemical waste, operating under stricter safety regulations and rising disposal costs, the way they handle chemical waste is increasingly important.

For many educational and commercial buildings, the process begins with a system of waste drainage from the point of use. A laboratory must be equipped to remove hazardous liquids efficiently and above all, with no risk to the safety of its occupants.



So what are the main considerations when choosing a laboratory waste, or chemical waste drainage system? It is many years since cast iron, or glass, were the only commonly available options and plastic systems are now

the most widely used in new installations.

For some specifiers, glass (borosilicate glass) drainage is still a long-trusted choice, with extremely good resistance to corrosive chemicals and an established range of accessories. Although tried and tested over a much longer period than plastics, glass systems are expensive to install and maintain. Prone to furring and discolouration, they need cleaning after intervals of use, while the rubber ‘O’-ring seals also have a finite life.

As with any pipe system dealing with fluids of varying temperature, expansion and contraction must be accommodated in a chemical drainage system. Although plastics have a relatively high coefficient of thermal expansion, their ductility and flexibility generally make it easier, and much less costly, to allow for movement than it is for a rigid material. They are also much easier to vent than glass systems. This can be another important cost factor, bearing in mind that venting must be introduced every 6m to minimise the risk of explosion.

Plastic waste systems have become prominent mainly because of their lower costs, yet they have existed long enough to evolve their own particular advantages over competing products. Polypropylene drainage products have proved themselves reliably resistant to

most organic and mineral acids, alkalis, alcohols and salt solutions.

Relatively new to the UK market, the CPV Zurn system is one example, which offers better structural integrity and installation advantages over its main rivals.



These distinctive blue pipes and fittings are produced in extremely tough, block copolymer polypropylene, which contributes to a crush strength roughly 2.5 times that of a typical plastic system. This can be a valuable benefit on a construction site and is also reflected in the rigidity of the finished pipework. It will operate at temperatures from  $-20^{\circ}\text{C}$  to  $+95^{\circ}\text{C}$ , with fewer brackets than other plastic systems require and there is no need to install galvanised steel trays underneath pipes above  $40^{\circ}\text{C}$ . It is also a comfort to know that CPV Zurn can sustain system pressure bursts of up to 10bar, compared with the 0.5bar limit of typical alternatives.

Even so, installation time and costs are most often the prime factor when selecting any type of pipe system and this is where the design of CPV Zurn really excels. Each fitting allows the option of either making a mechanical, or an electrofusion, joint. Electrofusion connections give the ultimate peace of mind, particularly in overhead pipe runs, or in inaccessible spots.



For electrofusion connections, pipework runs are first built up using the mechanical nut, thereby avoiding time consuming and awkward clamp arrangements. Fusion terminals also swivel  $360^{\circ}$  to ensure fast, convenient connections in tight corners.



Fusion controllers have also improved to make installation as simple as possible. The CPV Zurn control box can weld several joints simultaneously, triggered remotely from a hand-held switch, if required. A USB memory stick connection offers a very



convenient means of getting weld data onto a PC.

CPV Ltd, founded in 1949, specialises in manufacturing a wide range of industrial and building related thermoplastic piping products. These include above and below ground chemical waste system, chemical resistant pressure pipes, pre-insulated

pipes, fittings and valves and custom fabricated bulk tanks and vessels. All are supported by CPV's technical back-up and training.

*Many thanks to Mark Whettall of CPV for this editions Sponsors Article*

## The Members Forum

This section will enable members to raise or ask questions relating to specific projects or design items for comments or guidance. This would enable other members to assist by explaining or giving design advice, considerations, or stating where/which BS Codes or authorities could be contacted in answering original questions.

1. Please inform us of any technical subjects or design issues which you feel we would all benefit from arranging for an evening presentation.
2. We would appreciate any comments on the previous technical evening events.
3. Is there any design issues within the Water, Drainage, Sanitation, PHE scope of works which you may feel could be investigated or which you feel could be reviewed /re-evaluated. Example 24 Hour Cold Water Storage within buildings. Do you think the storage allowance is grossly over the top, should storage figures be revised to avoid risks of stagnation etc?

Please forward any questions, comments or answers you may have to the above points to:  
[jonathan.gaunt@arup.com](mailto:jonathan.gaunt@arup.com)

A question has been kindly posed by one of the committee members for this edition. If you can offer advice on the query or have questions of your own that you would like to pose, please forward them to the editorial team for inclusion in the next edition of the newsletter.

### **Question:**

If you are designing a large water supply network, for a hotel for example, the loading units in BS 6700 and the IOP guide only go up to 8000? What is the best way to take this forward if you have say 10,200 loading units, if you have a single water booster set? (This was the case for a hotel we actually had.)

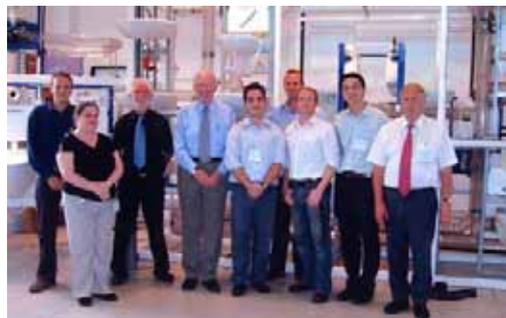
## Article 5:

### Eight Go To Geberit

Last September, a number of SoPHE members visited the legendary Geberit drainage display wall at their Head Office in the UK. As part of their R&D work, they have created a wall of fittings including WC's and basins, all plumbed in connected up with transparent drain pipes. By using a central control station to provide flushing water to WC's and supplies to wash basins, the Geberit technicians are able to simulate many different scenarios within the fitting traps and drain runs and as a result, demonstrate how certain trap and waste pipe configurations can lead to the loss of trap seals.

Due to the waste pipework being installed in a transparent material, it was possible to examine the flow patterns down the pipework and determine which fitting configurations cause the greatest problems within the drainage network. As a PH engineer, the demonstration installation is extremely interesting and a very good way of visibly seeing the difference between good drainage design and bad drainage design. It is also useful to aid in the understanding of the Building Regulations and BS EN guidelines and to see how the guidance has helped.

*Many thanks to David Tovey for kindly supplying the photographs*





## New Members:

### **ASSOCIATE**

G Chubb  
P H Sportel  
F Torrilla

### **MEMBER**

T M Duke  
G J M Hamilton-Fletcher  
A Homewood  
R C Horton  
K J Thompson  
R Vincer (30419)  
D K S Waites  
S Walsh  
G P White  
J A Wilson  
T M Chan  
E J Clarke  
P Heath  
C Moore  
S J Nield

### **FELLOW**

L A Dulieu  
M W Toovey  
I Fellingham

### **INDUSTRIAL ASSOCIATE**

Andrews Water Heaters  
Climate Pipework Systems (Roth UK)  
Saint-Gobain Pipelines Plc  
Wade  
Multipipe Ltd  
Enware Europe Ltd



## USEFUL WEBSITES AND EMAILS

### **The Chartered Institution of Building Services Engineers**

[www.cibse.org](http://www.cibse.org)

### **Society of Public Health Engineers**

[www.cibse.org/sophe](http://www.cibse.org/sophe)

### **Technical Group:**

Alan Neall – [alan.neall@fabermaunsell.com](mailto:alan.neall@fabermaunsell.com)

### **Membership Group:**

Martin Shouler - [shoulerm@bre.oc.uk](mailto:shoulerm@bre.oc.uk)

### **Communication Group:**

Alan Watson - [awatson@cibse.org](mailto:awatson@cibse.org)

Chris Northey- [cnorthey@zbp.co.uk](mailto:cnorthey@zbp.co.uk)

### **Education Group:**

Ian Fellingham – [ian.fellingham@arup.com](mailto:ian.fellingham@arup.com)

### **SoPHE Industrial Group:**

Mike Darville (Chairman) – [mike@climatepipework.co.uk](mailto:mike@climatepipework.co.uk)



## **THE STEERING COMMITTEE**

Chairman:	Martin Shouler martin.shouler@arup.com
Vice Chairman:	David Shaw dshaw@geneverandpartners.co.uk
Honorary Secretary:	Chris Northey cnorthey@zbp.co.uk
Honorary Treasurer:	Richard Mountney richard@mountneyconsultants.co.uk
Roger Baker	Peter Jefferson
Jim Buckmaster	Iain Johnstone
Bill Bumstead	Paul Marsden
Ian Fellingham	Alan Neall
Alan Flight	Jack Osbourne
Alison Franklin	Peter Pavlovic
Jonathan Gaunt	Mark Sampson
Simon Hedger	Steve Vaughan
Alan Homewood	Alan Watson
Mike Darvill (Representative of the SoPHE Industrial Group)	

## **Regional Committee Contacts**

Manchester:  
Kate Longley  
kate.Longley@arup.com

## **FEEDBACK**

We would welcome any comments on this newsletter or contributions to future editions, in particular with regards to:

- Future events for consideration
- What should SoPHE be providing to our members
- 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.

**Please email comments to Jonathan Gaunt at [jonathan.gaunt@arup.com](mailto:jonathan.gaunt@arup.com)**