A Message from the Chairman

It gives me great pleasure as I write this message for the first time as part of the Spring edition of the Societies' newsletter, to introduce myself as your new Chairman. As your Chairman I look forward to promoting the Societies' activities both within the building services sector and the wider construction industry.

Before I outline my views, thoughts and initiatives for 2011 I must first pay tribute to my predecessor Martin Shouler. Most of you will know that Martin led the Society from its' initial inception back in 2002 up until June of last year and guided SoPHE to the prominent industry position that it now occupies. I have had the pleasure of working with Martin during that time and I am pleased that we are able to continue to use his many talents in his new role as our Honorary Treasurer. I must also thank all of the members of the steering group and regional committees for all their effort and hard work over the last year and look forward to their continued support during 2011.

On the 4th November 2010 we successfully held our 7th Annual dinner at the Royal Garden Hotel, Kensington with an impressive total attendance of 290 individuals. We at SoPHE see this as our premier event of the year and a chance to celebrate the industries high achievers in the form of the annual SoPHE awards.

One of the main themes during 2011 will be that of a membership drive, with the overall aim of increasing our current membership base to reach 200 members and beyond.

In order to encourage Public Health Engineers to join our cause we will be launching a number of initiatives to raise the profile of membership. One of these initiatives which was launched in March will be a new set of membership guidance notes which will explain the full requirements of the application process.

I am also pleased to announce that the SoPHE website is currently undergoing an update and I hope that this new layout will be completed and readily available to our members early in the new year.

With the launch of this newsletter this will be the first of four quarterly editions which will be issued each year as part of our marketing strategy and information transfer to our members. We are extremely pleased with the level of content and professional look that has been reached with this publication.

I believe that our series of CPD technical events for 2011 will continue to provide our members with insight into new products, technologies and legislative changes within the Public Health industry. I see this as one the core of our activities of SoPHE and place great emphasis on maintaining this important service.

I and others on the committee will continue to work collaboratively with other organisations that share some of the areas of interest that SoPHE represents. These will include such organisations as the Worshipful Company of Plumbers, City & Guilds, CIPHE, BSRIA, RIBA, Summit Skills, Engineering Council, Construction Industry Council and others.

SoPHE has come a long way during the last eight years and looking forward, I will endeavour to do as much as I can to promote and develop further the needs of the Society.

I would finally like to wish all our members a prosperous 2011 and look forward to informing you of further SoPHE initiatives during the year.

Tribute

It is with great sadness to inform you of the recent death of Professor John Swaffield. Professor Swaffield will be known to many as a Past President of CIBSE, a friend, colleague and great supporter of SoPHE. Professor Swaffield will leave behind a legacy which we within SoPHE will never forget.

Chris Northey
Chairman, SoPHE
It is with great sadness that SoPHE acknowledges the death of Professor John Swaffield, Professor Emeritus, of Heriot-Watt University who died on 21 February 2011. Professor Swaffield will be known to many as President of the Chartered Institution of Building Services Engineers, 2008-2009, and as a friend, colleague and great supporter of SoPHE. An academic whose contribution to the industry was recognised internationally, John pioneered the use of both low-flow sanitary appliances and the application of numerical simulation techniques to assess the performance of building drainage and ventilation systems. Building on the use of the Method of Characteristics approach, previously applied to large-scale pressure surge problems, John developed techniques to enable the simulation of pressure transients in building drainage ventilation systems and in attenuating flows in drainage pipework. The resultant simulation models, AIRNET and DRAINET, for which John was responsible, will be familiar to many, and facilitated a wide range of exploratory investigations, otherwise impossible to conceive of, in the field of public health engineering.

John always willingly and enthusiastically shared his knowledge and was particularly supportive of SoPHE, dating back to when the society was first established. He maintained close links with the society and its members assisting with Engineering Chartership of individuals. John chaired many industry events, including a number of SoPHE technical meetings, helping to transfer his academic work into practical engineering knowledge and guidance on public health systems. He was made an Honorary Fellow of SoPHE in 2009.

John’s expertise in industry was always in demand, especially by government regulators, and this brought him into contact with practitioners, manufacturers and experts in public health engineering. He was Chairman of Defra’s Water Regulations Advisory Committee (WRAC), a member of the Building Regulations Advisory Committee (BRAC), and he participated in the Expert Working Groups on Part G (sanitation, hot water safety and water efficiency) and Part H (waste and drainage).

His academic work helped provide part of the evidence to allow the introduction of enhanced minimum standards for water using appliances and fixtures which are now common practice. John retired from Heriot-Watt in 2008, but retained a part-time research contract, thus freeing up time to complete Transient Airflow in Building Drainage Systems. John had long sought to pen this textbook — an abridged presentation of more than 25 years research in the area of building drainage ventilation. John firmly believed in ‘sound engineering thinking as the basis of all good solutions’, and he championed interaction between academia and industry. He understood that the guidance of industry colleagues was vital to success in academic research, and he established and maintained a number of long-standing stakeholder relationships.

John often commented that his career shift, from aeronautical engineering to drainage engineering was seamless, and enabled by his ‘bag of tools’ – the term he used to describe the simulation techniques employed to analyse pressure surges in fluid flows. He was a firm believer in the application of fundamental engineering principles to real-life challenges, and to aid learning, he established a number of highly successful Building Services Engineering undergraduate and postgraduate teaching programmes.

Throughout his career, John maintained an overseas research interest and led a number of water conservation initiatives with site trials in Botswana, Lesotho, China and Brazil, similarity undertaking research and development of systems to reduce water demand in countries where water scarcity is a growing problem. In addition, he was involved in the investigation into the outbreak of SARS in 2003 in Hong Kong, demonstrating the role the drainage ventilation system played in transmission of the virus.

John was, without doubt, a pioneer in the field of public health engineering, and will be greatly missed by all.
This is now the third year that we have held this prestigious award for “SoPHE Young Engineer”, in the field of public health engineering.

I am pleased to say that the competition has grown over this period and we have seen a steady progression in the quality of the entries. This is particularly pleasing as one of the aims of this competition is to assist in raising the status of Public Health Engineers within the industry.

2010’s challenge was all about “innovation” in public health engineering. This was quite a broad theme, but the thinking behind this was that we did not want in any way to constrain the thinking of the perspective entrants.

We changed the format from previous years, asking that initially entries comprise only a conceptual idea submitted on a maximum of one A3 sheet.

Of the entries received, four were selected, and invited to further develop their conceptual ideas, for presentation to the judging panel.

The entries were judged on the quality of their proposal, it’s fitness for purpose, originality, potential benefit to the community and practical application.

The presentations for 2010 submissions were of a very high standard, presenting the judges with some difficult decisions. The winning entry was from Grzegorz Jaroszewicz, whose proposal, was the development of a heat recovery unit for transfer of thermal energy from waste water, to act as a preheat to the hws cold feed providing potential savings in the energy required to heat the domestic hot water, won him the prize of a trip to New York and Niagara falls.

Greg’s presentation was in its’ self very good managing to convey clearly the ideas for his proposed innovation. It was felt that Greg’s presentation best met these criteria set down in rules. The research material presented was convincing and it was felt he demonstrated how this device could potentially reduce the energy consumption necessary in heating the hot water systems in both domestic and commercial markets.

In second place and highly Commended were the team of Paul Aspinall, Joanna Gregorowics and Stephen Platt. Their submission was concerned with the generation of electrical energy from surface and grey water systems by the integration of a turbine within the systems. In their presentation the team developed case studies of actual projects, to show the potential for electrical generation and presented the potential energy cost savings.

Joint third place and Commended were Martin Gage and Ed Sayce. Martin’s, proposal was a variation on the previous entry and considered a method of waste water energy recovery, which enabled the extraction of electrical energy from waste and storm water systems. Ed’s concept was for the lowhi shower management system, which allowed the user to control flow rate, by their position in the shower, which would trigger controls to adjust the flow stream giving the potential to reduce energy consumption, reduce water usage and a cost saving.

The prizes and framed certificates were presented to the winners at the SoPHE annual dinner held at the Royal Garden hotel in Kensington.

The advert below gives details the 2011 competition. We invite individuals or teams of young engineers to take part in what is both an exciting and informative experience. Details of the entries for 2011 will shortly be posted on the SoPHE web site.

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**Society of Public Health Engineers (SoPHE) in association with WaterAid**

**YOUNG ENGINEERS AWARD 2011**

**The Challenge**
Sanitation for all!
Design a low-cost dewatering device for a decentralised wastewater treatment system.

**Submissions**
Demonstrate your idea on one A1 poster
Please refer to the SoPHE website.

**Entrants**
Teams of up to 3 people,
age 18-35.

**The Award**
An in-country trip to verify the applicability of the design, either Maputo or Dar es Salaam & an iPad

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**By Ian Fellingham**
2011 Phew! There must be some truth in the toilet roll syndrome … you know the one, “the nearer to the end of the roll, the faster it goes?” – I recently discovered I qualify for a senior’s entertainment card, this being the year of my 55th birthday which is rather frightening yet tantalizingly intriguing. Growing up as a child, seniors were people like my lovely old gran who with her blue rinse perm and slobbery kisses used to ruffle my hair and enquire when I had last cleaned the inside of my ears!

I have puerile memories of drawing boards, Xerox copies and cheerful tea ladies with the biscuit trolley and office gossip; to me it all seemed so much more personal then. It’s also made me realise, how in a few short years, our own discipline has morphed into a colourful high tech subject of green buildings, blue roofs, grey water and red herrings.

Looking back at sanitary history and following the demise of the Roman Empire after they were sent packing by the Germanic chief ‘Odoacer, we effectively had centuries of ‘every man for himself’. The closest humans got to orderly sanitation was a hole in the ground - better known as a ‘cesspool’. This seemed to do the trick, although their immediate vicinity to habitable areas proved problematic as the Emperor of the Holy Roman Empire found out. Following a banquet in the great halls of the Palace of Efurt in 1183, the floor of the main hall collapsed and many of the dinner guests fell into the cesspool directly below and drowned …. ‘Mead and After Eight mints untouched’.

Thankfully we’ve moved on but some decisions are still rather perplexing. What is now considered best practice or just plain common sense is being derided as superfluous and woolly thinking if it’s not laid down in the building code. For example, for the last eight months I’ve been immersed in a large extension to an existing hospital on the North Island. On several occasions I’ve found myself embroiled in heated disputes because I’ve felt the need to implement higher levels of backflow protection to mitigate risk whilst at the same time doing my utmost to minimise the over extravagant use of floor traps as part of infectious control awareness. To me, this is a basic common sense approach to health care and it surprised me that few on the professional team put their hand up in agreement.

Months before settling in New Zealand in 2004, I was involved in a project in Ballyfin just south of Dublin whilst working for one of the UK’s large consultancies. The project revolved around the restoration of a period manor house dating back to the early 1800’s. To cut a long story short, the manor was part of a sprawling estate several miles from a water main. Water demand was becoming a concern as the well water source yield had been over utilised and to make matters worse, the proposed usage of the manor house and its gardens would impose an even greater demand.

The project management team obviously needed to justify their exorbitant fees and suggested engaging the services of a hydrogeologist to study the subsurface hydrologic and geologic conditions. If there was another potential ground water source, then our man in the white field coat on his hands and knees eyeballing the type and thickness of geologic materials, pore spaces and fractures could eventually conclude whether or not to drill down through the strata .... actually I’m sure it was much more involved than this.

A few weeks passed and another idea was spawned following a successful meeting at the local pub, – ‘why not undertake an aerial investigation’ .... apparently a tested and well documented approach! To all this seemed like a productive idea whilst imbuing the project with a touch of 21st century technology. ‘Biggle’s’ was duly commissioned and soon the sky above was filled with a buzzing engine and clicking Nikons. When the results were analysed, it was agreed that perhaps the estate was devoid of another source of water and there the matter was laid to rest and forgotten. I heard a year or so later that with indications that the economy was slowing the project was shelved but not before a local water diviner had offered his own services … guess what, he found a source of water within three days using no more than experience, understanding of the land and common sense.

And how does this story relate to my opening paragraph or any of the others? To be honest I haven’t got a clue but it’s been enjoyable reminiscing!!
AECOM recently sponsored a unique, new engineering degree at Greenwich University. The “Water Engineering in the Built Environment” degree is the only public health engineering degree of its kind in the UK.

Steve Vaughan, associate director of AECOM’s Building Engineering practice, said: “For many years, public health engineers have been few in number, with a limited intake of young engineers entering the industry each year.

“The current economic slowdown intensifies this strain on our discipline because jobs have been cut, and people have left the industry forever. It is therefore vital that we attract talented new people into our sector so that they can gain valuable knowledge from experienced colleagues and cultivate new ideas.

“Young engineers will be able to nurture new thoughts on water conservation, sustainability and energy saving, which are now key aspects of public health engineering design within many types of building.”

As sponsor of the degree programme, AECOM is a member of the university’s advisory board, providing input and influence on course development.

Vaughan added: “The public health engineering degree offers a fantastic opportunity for engineers to train in a more specialised field than previously available. Before this degree course, public health engineers came to their career from a plumbing background, as I did, or via a mechanical or civil engineering academic background.

“This course ensures that the public health engineering experts of the future can be provided with the skills necessary to tackle the continually increasing demands for the design of water supply, sanitation, specialist drainage and fire-protection systems within and around a building rather than the traditional civil engineering elements.”

The BEng Hons course is a three-year programme designed to meet the academic requirements to achieve incorporated engineer (IEng) status. Greenwich University recently secured funding for bursary sponsorship, and AECOM has agreed to provide summer placements to two students in the future.

As with many new courses, there has been some refinement and development during the early stages of the curriculum, and one of the fundamental decisions was to change the course name to Water Engineering in the Built Environment. This degree title will enable students with limited industry knowledge to better relate to the potential career path.

CASE STUDY

James Day is one of the first students to complete the three-year course at Greenwich University. The 22-year old graduated in June 2010 and has recently started a full-time role as a public-health engineer with AECOM.

He said: “The first year of the degree gave me a solid foundation of knowledge about the principles of engineering, while the second and third years included a more detailed look at issues such as above and below ground drainage systems, water supply and distribution, the application of public health engineering, fire supplies and non potable water systems.

“The efficient use of resources, sustainability and environmental impact were also key elements covered in the course.

“We also looked at legislation associated with public health engineering and how the approach has changed throughout history from public baths in Roman times up to the modern day.”

In its final year, the course covered a selection of public health engineering systems. Among the subjects investigated were the safe design and operation of swimming pools and water recycling.

The individual student project and the group design project focussed on real public health systems in industry. For his final year project, Day researched the affects of ultra-low flow WCs on system III design, and for his final year group study James looked at the fire plan strategy for Greenwich University.

Day added: “The group study brought together individuals from various engineering disciplines such as electrical, mechanical, marine, and public health.

“It was a good way of seeing how different people think and work when looking at a problem, and the guidance we had received over the previous two years was invaluable.

“All the public health modules were conducted by people who worked in the industry, and they were able to give us a real insight into how systems are integrated into real-life situations.”
The Oxidation of Organisms in Water Services Systems

The Titanium AOP (Advanced Oxidation Process) is a method of disinfecting and purifying water without the use of chemicals that has become established and grown very quickly over the last 10 years across the Far East and Europe.

With the system now WRAS tested in the UK, large installations are taking place for improved levels of Legionella control. Applications in the UK include hospitals, office buildings and power stations.

The Advanced Oxidation Process has been shown to provide an exceptional capacity to kill water borne organisms as well as to decompose the resulting organic matter. It is starting to revolutionise the way in which water treatment is being conducted around the world.

Until now if high killing rates needed to be achieved unstable “high maintenance” chemical systems such as Ozone were required. Now the user has the option of using the Titanium AOP system that offers the highest killing rates but it does so in a chemical free, simple to maintain and an environmentally friendly package.

The Hydroxyl Radical OH is characterised by being extremely unstable, aggressive and reacting instantaneously with microorganisms and other organic contaminates in a way that destroys their cell structure.

In order to compare the effectiveness of the Hydroxyl Radical and it’s relative Oxidation strength we have set out in the table below the simple performance comparisons of the various oxidation methods:

<table>
<thead>
<tr>
<th>Oxidant</th>
<th>Formula</th>
<th>Oxidation Strength (Ov)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorine</td>
<td>F₂</td>
<td>2.87</td>
</tr>
<tr>
<td>Hydroxyl radical</td>
<td>OH</td>
<td>2.8</td>
</tr>
<tr>
<td>Singlet: Oxygen</td>
<td>O (1Δ)</td>
<td>2.42</td>
</tr>
<tr>
<td>Ozone</td>
<td>O₂</td>
<td>2.07</td>
</tr>
<tr>
<td>Hydrogen peroxide</td>
<td>H₂O₂</td>
<td>1.78</td>
</tr>
<tr>
<td>Permanganate</td>
<td>MnO₄⁻</td>
<td>1.67</td>
</tr>
<tr>
<td>Hypochlorous acid</td>
<td>HOCI</td>
<td>1.48</td>
</tr>
<tr>
<td>Monochloramine</td>
<td>NH₄Cl</td>
<td>1.4</td>
</tr>
<tr>
<td>Chlorine</td>
<td>O₂</td>
<td>1.36</td>
</tr>
<tr>
<td>Hypohalous acid</td>
<td>HOBr</td>
<td>1.33</td>
</tr>
<tr>
<td>Oxygen</td>
<td>O₂</td>
<td>1.23</td>
</tr>
<tr>
<td>Bromide</td>
<td>Br₂</td>
<td>1.07</td>
</tr>
<tr>
<td>Chlorite dioxide</td>
<td>ClO₂</td>
<td>0.85</td>
</tr>
</tbody>
</table>

To understand the Titanium AOP treatment it is important to understand what a Hydroxyl Radical is and how we can create it.

Hydroxyl Radical OH

Is a very reactive, unstable and aggressive radical, oxidising any organisms and organic structure unselectively and indiscriminately.
Photocatalysis Reaction.  
This occurs when UV light at 254nm reacts with Titanium Dioxide TiO2 to produce OH Hydroxyl Radical

To put the reaction into perspective the number of OH radicals produced runs into many millions and they are created for just a few nanoseconds. As an OH radical they aggressively oxidise any organism or organic matter within the water or instantly revert back to H2O water.

Key applications in building services include potable water supplies and protection from Legionella and Pseudomonas bacteria as well as on cooling towers negating the requirements for chemicals.

<table>
<thead>
<tr>
<th>Flow (L/min.)</th>
<th>Time (min)</th>
<th>Number of Legionella</th>
<th>Average Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>60</td>
<td>&lt; 50</td>
<td>&gt; 6.4</td>
</tr>
<tr>
<td>40</td>
<td>60</td>
<td>&lt; 50</td>
<td>&gt; 6.4</td>
</tr>
<tr>
<td>60</td>
<td>60</td>
<td>&lt; 50</td>
<td>6.4</td>
</tr>
<tr>
<td>80</td>
<td>60</td>
<td>400</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Other applications where Titanium AOP technology is successfully implemented include Laboratory and Hospital sterilisation, Swimming Pool treatment, Process and Manufacturing, Agriculture and Fisheries as well as many others.

For further information on the Titanium AOP technology please contact:
Gary Maddison, National Sales Manager, The Rodin Group Ltd.
T: 01425 622581
M: 07789 766020
NEW MEMBERS

Associate:
Michael Saban

Associate Member:
Ewa Mielczarek
Artur Nowakowski
Richard Smith (transfer from Associate)
Roger Taylor

Member:
Ho Yuen Chan
Brian Pester

Industrial Associate:
ACO Building Drainage
Crane Building Services and Utilities
Evinox LTD
Hamworthy Heating LTD
Kemper LTD
KSB LD
Marshalls Mono LTD
Smedegaaard Pumps

SoPHE South East Technical Seminars

Venue: THE BUILDING CENTRE, 26 STORE STREET, LONDON, WC1E 7BT
Time: 6.30 p.m. to 8.30 p.m. (approx.)

Date: Tuesday 7th June 2011

SoPHE AGM and Technical Seminar (subject to be confirmed)

Date: Thursday 3rd November 2011

SoPHE Annual Dinner
The Royal Garden Hotel, Kensington, London

USEFUL WEBSITES AND EMAILS

The Chartered Institution of Building Services Engineers
www.cibse.org

Society of Public Health Engineers
www.cibse.org/sophe

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Education Group:
Ian Fellingham – ian.fellingham@googlemail.com

SoPHE Industrial Group:
Mike Darville (Chairman) – mike.darvill@roth-uk.com
SoPHE North West Update

By Malcolm Atherton

Having to fill the “boots” of Paul Angus was, and is, a daunting task. I’ve been very lucky in that Paul, when he went to pastures new in the summer of 2009, had already organised some very interesting technical meetings for one and all up to and including May 2010; these included informative presentations by Ormandy on the design principles associated with the sizing & selection for plate heat exchangers and calorifiers, as well as Honeywell on the pressure control in tall buildings.

I’ve been fortunate in being able to carry on Paul’s good work by having some interesting and well attended meetings for 2010; special thanks to Douglas Delabie for their presentation on solutions for healthcare and infection control.

Once again, SoPHE NW would like to thank all the various manufacturers who have sponsored previous and future meetings, and thanks must also go to everyone who has contributed and attended these meetings – without these people, each of these meetings would not be a resounding success. Special thanks must also go to Steve Ingle who, without his “fire & energy”, I would not have been able to cope!

The “diary” of events is currently full until at least May 2011 with, already, a number of manufacturers expressing an interest in providing a technical meeting beyond that date – please contact me if you wish to discuss any future dates.

“SoPHE Scotland Update

By Paul Angus

After the inaugural launch of SoPHE Scotland at the beginning of 2010, the background dream team of Dr Lynne Jack, Joe Hendry and Paul Angus have endeavoured to organise a series of successful technical events alternating between venues in Edinburgh and Glasgow.

In February, an extremely interesting insight into rainwater harvesting was provided by Polypipe Terrain, at the Melvin House Hotel in Edinburgh. The evening was really well attended, with a fantastic introduction also being provided by CIBSE Scotland chairman Stuart MacPherson.

This was followed in May in the charming setting of the Mitchell Library in Glasgow, where Geberit presented an excellent technical evening providing an in depth overview of Siphonic rainwater systems. In addition, Robert Burgon (World Plumbing Council Chairman) also co-presented on the theme of Plumbing - Vital to Global Health.

The most recent event was recently held in September, again held at the Melvin House Hotel in Edinburgh. The theme of the evening covering methods of controlling legionella in hot and cold water systems, presented by Kemper. Furthermore, Dr Tom Makin, co-author of HSE L8 also presented a highly entertaining and detailed overview of the causes of legionella and keeping it under control.

All the events to date have been extremely well attended and we would like to take this opportunity to express our thanks, to not only the manufacturers, who fully sponsor these events, but also most importantly to the delegates who kindly attend these evenings.

Looking forward, SoPHE Scotland have been organising the programme for 2011. In May, the theme of Green Roofs is currently being organised to be held in Edinburgh. The World Plumbing Council (WPC) conference is being held in Edinburgh in September, with various presentations currently being organised to collaborate and provide a joint technical evening between the WPC and SoPHE Scotland.

Finally, the SoPHE North Dinner is currently being organised to be held in May 2011 in Manchester. Further information will be announced in due course.

For more details of future events, venue and dates, please contact Lynne, Joe or Paul for further details, (contact details provided to the left).
THE STEERING COMMITTEE

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Honorary Secretary:  David Shaw  
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Honorary Treasurer:  Martin Shouler  
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Steering committee
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Bill Bumstead  Mike Darvill
Alan Neall  Alan Flight
Jonathan Gaunt  Steve Ingle
Steve Vaughan  Ashveen Jeetun
Simon Hedger  Maria, Delia Marginean
Iain Johnstone  Geoff Chubb
Allan Homewood  Kris Wojcik

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Lynne Jack  
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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